Strata® DK280

Digital Business Telephone System

Release 3

Installation

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IMPORTANT!

System Configuration can be complex and time consuming. For best results:

- *Use the software program 280Quote to provide easy, fast, automated configuration. This runs on an IBM compatible 486 PC, or higher, with a hard drive.*
- *If the above software is not available, use all the Worksheets in Chapter I—Configuration.*

Important Installation Notes:

1. Place the RCTU jumper plug(s) into battery position; otherwise, all programmed data will be lost upon power down. Battery jumper plugs are on: RCTUA, RCTUB, RCTUBA3, RCTUC, and RCTUD3 PCBs.
2. Install RCCS PCBs on RCTU PCBs as required.
3. Install PDKU, PEKU, or RSIU in slot 11.

   - and/or -

   If an RSIU is installed in slot 11, install a PDKU or PEKU in slot 12.
4. Starting with the lowest empty slot (S12 or S13), install all station, attendant console, loop start, ground start, and RCIU/RCIS PCBs from lower to higher numbered slots (left to right). Do not leave empty slots except when installing RDTU PCBs when required per Tables 1-9 and 1-10 of Chapter 1—Configuration.
5. After all station, attendant console, and ground/loop start line, and RCIU/RCIS PCBs are installed, install all DID and tie line PCBs starting from the first numbered empty slot to the highest needed (in left to right order). Do not leave empty slots except when installing RDTU PCBs per Tables 11-1, 11-2, and 11-3 of Chapter 11—T1.
6. Install PIOU, PIOUS, PEPU, or RSSU in any convenient vacant slot.
7. Check power factors for each cabinet and for the entire system as explained in Chapter 1—Configuration.
8. If needed, run Program 91-9 **twice** to initialize program data. Do this if you have just completed Step 1 above. Run Program 03 and turn system power OFF (five seconds) and then ON to activate and identify to Program 03 any subassembly PCBs installed.
9. Perform memory test as in Program 00, Part 2.
10. Program customer database manually or upload customer database using a 280Admin or 280Backup personal computer.
11. Backup the customer database using a 280Admin or 280Backup personal computer.

Configuration

1

1.1 System Capacity and Hardware Description

This chapter explains how to configure a Strata DK280 system. It also provides space to record the hardware and station devices that make up the system.

The focus of this chapter is a series of worksheets, providing a systematic procedure for determining the system's size. Tables and example worksheets are also included to assist in filling out the worksheets.

1.2 System Configuration

The number of CO lines and stations needed determine the size of the system. The exact hardware requirements depend on the features required. The Strata DK280 can support a maximum of 240 stations, and 40 CO lines, or, in a squared system, 144 stations and 136 lines. Figure **1-1** shows the station and line capacities for the case of eight-port RCOU/RCOS CO line PCBs. There is a trade-off between stations and lines. Every group of eight stations installed decreases the CO line capacity of the system by eight, and vice versa.

Each system contains a base cabinet (DKSUB280). The base cabinet has two slots dedicated for the common control unit and six universal slots, each of which can support any station or line printed circuit board (PCB) compatible with the Strata DK280 system. The base cabinet holds a power supply which powers all of the devices connected to the PCBs in the base cabinet. The base cabinet can support as many as 32 stations and 16 trunks with any RCTUA common control unit; with an RCTUC/D, RCTUB, or RCTUBA/BB common control unit, the base cabinet can support as many as 40 stations and eight lines. RCTU processors and the RSIU option PCBs must be installed in dedicated slots of the base cabinet.

As many as five expansion cabinets (DKSUE280 or DKSUE424) can be added to the base cabinet to add more lines and stations to the system. With DK280 software, DKSUE280 and DKSUE424 are interchangeable and can be mixed in any order. The expansion cabinet looks almost identical to the base cabinet. The DKSUE424 contains two universal slots reserved for future upgrades and six universal slots that can be used with all DK280 hardware/software releases. DKSUE280 provides six universal slots that can be used with DK280 hardware/software releases; it also has two additional slots but they cannot be used with future upgrades.

Like the base cabinet, the expansion cabinet has a power supply. Each expansion cabinet adds up to 40 DKT or EKT stations and eight lines. All slots may be used for station or non-station PCBs.

1.3 Common Control Unit

The system operates with one of three common control units: the RCTUA (1 or 3), the RCTUB (1 or 2), RCTUBA/BB, and the RCTUC/D. These units consist of a single printed circuit board, except for the RCTUC (1 or 3)/D (1, 2, or 3), and RCTUBA/BB, which consist of two PCBs. All are installed in dedicated slots in the base cabinet which are not the six universal slots.

The common control unit selected for the system depends on the size of the system and the features required. The RCTUA (1 or 3) unit can only support one cabinet system. The feature capacities are listed in Table 1-1.

The RCTUB (1 or 2) or RCTUBA/BB units can support one or two cabinets; its feature capacities are listed in Table 1-1. The RCTUC (1 or 3)/D (1, 2, or 3) unit can support one to six cabinets; its feature capacities are also listed in Table 1-1.

1.4 Printed Circuit Boards

The system interfaces with CO lines, stations, and peripheral devices via printed circuit boards (PCBs), which plug into the base and expansion cabinet Slots, and subassembly PCBs, which mount onto the plug-in type PCBs. The Strata DK280 can support the following PCBs:

Station PCBs (see Table 1-2)

- PDKU (Versions 1 and 2)—Eight digital telephone circuits. Some limitations apply to Version 1, see Worksheet 2, Table **A.**
- PEKU—Eight electronic telephone circuits.
- PSTU (Versions 1, 2)—Eight standard telephone circuits.
- RSTU/RSTU2—Eight standard telephone circuits.
- RDSU—Two standard and four digital telephone circuits (RSTS subassembly can be added for two more standard telephone circuits).
- PESU—Two standard and four electronic telephone circuits.

Line PCBs (see Table 1-2)

- RCOU—Four Loop Start CO lines (RCOS subassembly can be added for four more Loop Start lines).
- RCIU—Four circuit Caller ID FSK receiver/ decoder PCBs.
- PCOU—Four Loop Start CO lines.
- RGLU—Four circuits that can individually be assigned for Ground Start or Loop Start CO line operation.
- REMU—Four E&M tie lines, Type I or II signaling.
- PEMU—Four analog E&M tie lines, Type I signaling only.
- RDDU—Four analog Direct Inward Dialing (DID) line circuits.
- RDTU—T1 interface PCB (can have 8, 16, or 24 channels for DID, tie, Ground Start CO, or Loop Start CO line operation).

Console PCBs (see Table 1-2)

- RATU—Provides interface for up to four attendant consoles or PC attendant consoles.

Option Interface PCB (see Table 1-3)

- PIOU—Provides Page, Relay Control, Alarm Sensor, Maintenance Port, SMDR, SMDI, and MIS for ACD.
- PIOUS—(see Table 1-3).
- PEPU—(see Table 1-3).
- RSIU—(see Table 1-3).

Optional Subassembly PCBs (see Table 1-4)

- RRCS—4, 8, or 12 DTMF receiver PCB (on RCTU).
- RKYS—Feature Key 1, 2, 3, or 4 (on RCTU).
- R48S—48-volt supply PCB (on RSTU, RDSU).
- RSTS—two-circuit standard telephone PCB (on RDSU).
- RCOS—four-circuit loop-start line PCB (on RCOU).
- RMDS—remote maintenance PCB (on RSIU).
- RSIS—RS-232 interface PCB (on RSIU).
- IMDU—remote maintenance PCB (on PIOU, PIOUS).
- EOCU—OCA PCB for electronic telephone PCBs (on PEKU, PESU).
- RCIS—Four-circuit Caller ID FSK receive/decoder PCBs (on RCIU).

1.5 Telephones

The Strata DK280 system supports Toshiba Proprietary Digital (DKT) and older series Electronic Telephones (EKTs). Standard telephones (500 or 2500 series) and devices that require a standard telephone line interface (fax, modem, VM, etc.) can also be connected to DK280.

Toshiba provides the following 2000-series digital telephones for Strata DK280 systems.

- DKT-2020SD—20-button speakerphone with LCD.
- DKT-2010SD—10-button speakerphone with LCD.
- DKT-2020S—20-button speakerphone.
- DKT-2010H—10-button handsfree answerback telephone.

Toshiba telephones may be equipped with optional subassemblies; the function of each subassembly is given in Table 1-5.

1.6 Attendant Position Options

The DK280 provides three options for attendant positions which answer system incoming calls.

- PC Attendant Console—For medium-to-heavy traffic systems where an attendant must answer and transfer incoming calls. The PC attendant console requires a customer-provided personal computer plus the RATU PCB (see Table 1-2).

  With DK280 Release 2 and 3, up to two consoles can be connected on systems with RCTUB or RCTUBA/BB or four with RCTUC/D (2 or 3) common control PCBs (RCTUA (1 or 3) does not support attendant consoles). The RATU PCB uses four station ports in system software.

- Direct Station Select (DSS) Console—For medium traffic systems where an attendant must answer and transfer incoming calls. See Table 1-1 for capacities. The DSS console must connect to circuit *8* on a PDKU PCB (see Table 1-6 for configuration considerations).

- Add-On-Module (ADM)—For medium traffic, smaller systems, where an attendant must answer and transfer incoming calls. The ADM connects to any 2000-series digital telephone. The ADM shares the associated telephones circuit so it does not require a designated PCB or circuit port (see Table 1-5).

1.7 Door Phones (MDFBs)

Up to 12 door phones can be installed in a system with DK280 Release 1, 2, or 3 RCTUB and C/D, nine with RCTUA. Each is connected to a DDCB or HDCB door phone control box. See Table 1-6 for door phone configuration considerations.

1.8 AC and Reserve Power Hardware

Detailed information for AC and reserve battery power installation is described in Chapter 3—Cabinet Installation. These optional assemblies may be required.

- RBTC-2M and PBTC-3M—Battery connecting cables (see Table 1-7).
- RBDB—Battery power distribution box (see Table 1-7).
- RPSB1 and RPSB2—three-outlet AC power strips (see Table 1-7).

1.9 Floor Mount Installation Hardware

Floor mounting DK280 requires RFIF and RCCB hardware assemblies; wall mounting DK280 does not require special hardware but may require a plywood backboard (see Chapter 3—Cabinet Installation).

- RFIF—Floor mount stand and wall securing brackets (see Table 1-7).
- RCCB—AC power and battery power conduit connection box (see Table 1-7).

1 CABINET (RCTUA)

CO LINES	STATIONS
16	32
8	40

2 CABINETS (RCTUB)

CO LINES	STATIONS
48	40
44	40
40	48
36	48
32	56
28	56
24	64
20	64
16	72
12	72
8	80

3 CABINETS (RCTUCID)

CO LINES	STATIONS
72	64
68	64
64	72
60	72
56	80
52	80
48	88
44	88
40	96
36	104
32	104
28	112
24	112
20	120

4 CABINETS (RCTUC/D)

CO LINES	STATIONS
96	88
92	88
88	96
84	96
80	104
76	104
72	112
68	112
64	120
60	120
56	128
52	128
48	136
44	136
40	144
36	144
32	152
28	152
24	160

5 CABINETS (RCTUC/D)

CO LINES	STATIONS
120	112
116	112
112	120
108	120
104	128
100	128
96	136
92	136
88	144
84	144
80	152
76	152
72	160
68	160
64	168
60	168
56	176
52	176
48	184
44	184
40	192
36	192
32	200

6 CABINETS (RCTUCID)

CO LINES	STATIONS
144	136
140	136
136	144
132	144
128	152
124	152
120	160
116	160
112	168
108	168
104	176
100	176
96	184
92	184
88	192
84	192
80	200
76	200
72	208
68	208
64	216
60	216
56	224
52	224
48	232
44	232
40	240

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Figure 1-1
Strata DK280 Cabinet Configuration Tables for 8-Port CO Line PCBs Without Caller ID

Table 1-1
Common Control Unit Feature Capacities

ITEM	RCTUA	RCTUBA/BB	RCTUC/D
Universal Slots	6	12	36
CO Lines — Loop Start[1]	16	48	144
CO Lines — Ground Start[1]	16	40	136
DID Lines (Analog)[2]	16	40	136
Tie Lines (Analog)[2]	16	40	136
T1 (DS-1) Interface Units (1 ~ 8, 1 ~ 16, or 1 ~ 24 Programmable Lines each)[3]	0	2	6
DKT/EKT Stations[4]	32	80	240
Handset OCA Stations	32	80	240
Speaker OCA Stations	32	80	160
Standard Stations	24	72	232
DKT 2004 -CT Cordless Telephones (simultaneous calls)	9	9	9
DKT 2004 -CT Cordless Telephones	32	80	240
OPS	32	80	232
PDIU-DS[5]	31	79	159
RPCI-DI used for data[5]	32	80	146
RPCI-DI used for TAPI[5]	32	80	200
Attendant Consoles	0	2	4
Auto Attendant (Built in) Simultaneous Announcements	12	12	24
Add-on Modules (ADM)	12	40	120
DSS Consoles	3	4	8
Door Phones	9	12	12
Door Locks	4	5	5
CO Line Groups	8	8	16
Simultaneous Party Conferencing	3	7	7
Simultaneous Two-CO Line Conferencing	4	10	10
System Speed Dial	40	100	100
Station Speed Dial	40	40	40
System LCD Messages	40	40	40
Personal Message DKTs (Messages / Timed Reminder Memo/Personal Speed Dial Memo)	16	32	96
Personal LCD Messages per DKT	10	10	10
Verified Account Codes	300	300	300
Telephone Pickup Groups	20	20	20
External Page Zones	4	4	4
Individual Call Park Orbits	32	80	240
General Call Park Orbits	20	20	20
Telephone Page Groups	5	5	9
DNIS Numbers	200	350	500
DNIS Network Routing Numbers	100	200	300
Prime Directory Numbers per System	32	80	240
Phantom Directory Numbers per System	32	80	240
Caller ID/ANI Abandoned Call Numbers Stored per System	200	400	1000
Caller ID/ANI Abandoned Call Numbers Stored per Station	(10 ~ 100)	(10 ~ 100)	(10 ~ 100)
Group Page - Simultaneous Paging Stations	32	80	120
Ring Tones	3	3	3
Tenants	2	4	4
Distributed Hunt Groups[6]	16	16	16
Distributed Hunt Stations per Group[6]	32	32	32
Distributed Hunt Calls in Queue per Group[6]	10	10	10

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Notes:

1. *All CO Line capacities assume a PIOU, PIOUS, PEPU, RSSU, or RSIU is installed for RCTUBA/BB or RCTUC/D, but not Caller ID RCIU/RCIS PCBs.*
2. *Limits apply to analog DID and tie lines, not T1 DID/tie lines.*
3. *T1 lines can be loop start, ground start, tie, or DID (maximum 24 lines per unit, any type or combination).*
4. *Maximum capacity of DKT/EKT 6500 stations per cabinet is 48, less for EKT 2000, 3000.*
5. *PDIU and RPCI capacity is determined by 2B channel slot availability and power supply limits.*
6. *Distributed Hunt is available with Strata DK280 Release 3.1.*

ITEM	RCTUA	RCTUBA / BB	RCTUC/D
DTMF Receivers (Optional)	12	12	24
LCR Route Plans	8	8	16
LCR AC AC/OC Exception Tables	8	8	16
LCR Time Schedules	3	3	3
LCR Station Classes	4	4	8
LCR Route Definition Tables	4	4	6
LCR Modify Digit Tables	6	6	12
Toll Restriction (AC/OC) Table	8	8	16
Toll Restriction Classes	4	4	8
Voice Mail Simplified Message Desk Interface (SMDI)	No	Yes	Yes
ACD/MIS	No	Yes	Yes
ACD Groups	0	8	16
ACD Agent IDs	0	200	256
ACD Music Interface Ports (1 per Group)	0	8	16
ACD Announce Interface Ports (3 per Group)	0	24	48

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Table 1-2
Strata DK280 Printed Circuit Boards (PCBs)

PCB	CIRCUITS PER PCB	INTERFACES	CONNECTOR
PDKU	8 Digital Telephone Circuits	• Digital Telephones with or without RPCI-DI, DVSU, ADMs or Digital Cordless Telephone • Stand-alone Digital Cordless Telephone • DDSS Console • PDIU-DS • DDCB	25-Pair Amphenol[1]
RDSU	Without RSTS: 2 Standard Telephone *I* **4** Digital Telephone Circuits With RSTS: 4 Standard Telephone *I* 4 Digital Telephone Circuits	• Digital: Same as PDKU, except no DDSS Console • Standard: Same as RSTU (Standard Telephone Message Waiting (MW) Not Available)	25-Pair Amphenoll
RSTU2 or PSTU	8 Standard Telephone Circuits	• Auto Attendant and ACD announcement devices • Standard Telephones (With/Without MW Lamps[3]) • Voice Mail Ports • Alternate Background Music Source • Off-premises Stations • Fax Machines	25-Pair Amphenol[1]
PEKU	8 Electronic Telephone Circuits	• Electronic Telephones • HDSS Console • Alternate Background Music Source • External Conference Amplifier • HDCB	25-Pair Amphenol'
PESU	2 Standard Telephone / 4 Electronic Telephone Circuits	• Standard: Same as RSTU or PSTU (No MW) • Electronic: Same as PEKU except PESU does not support HDSS Console	25-Pair Amphenol'
RATU	4 PC Attendant PC Console Circuits	• PC Attendant Console • Conventional Attendant Console	25-Pair Amphenol'
RCIU	Without RCIS Subassembly: 4 circuits With RCIS: 8 circuits	• Analog Loop or Ground Start Lines with Caller ID • Requires: RCOU, RCOS, RGLU or PCOU	RJ14C Modular
RCOU	Without RCOS Subassembly: 4 Loop Start Line Circuits With RCOS: 8 Loop Start Line Circuits	• Loop Start Lines	RJ14C Modular
RGLU	4 Line Circuits (Loop Start or Ground Start Lines)	• Loop or Ground Start Lines	RJ14C Modular
PCOU	4 CO Line Circuits	• Loop Start Lines	RJ14C Modular
RDDU	4 Direct Inward Dialing Circuits	• DID Lines	RJ14C Modular
RDTU	1 - 8, 1 - 16, or 1 - 24 Channels (lines) depending on system programming	• Loop Start Lines • Ground Start Lines • Tie Lines (Wink or Immediate) • DID Lines (Wink or Immediate)	2-Pair Amphenol' RJ48M
REMU or PEMU	4 Tie Line Circuits	• E & M Tie Lines — 2- or 4-wire transmission — Type I Signaling — Type II Signaling2 — Immediate Start — Wink Start2	REMU (8-wire Modular Jack) USOC RJ1CX Modular, 2- or 4-wire/Type I or II PEMU (6-wire Modular Jack) USOC RJ2EX-2 wire USOC RJ2GX-4 wire
PIOU, PIOUS, PEPU RSSU	See Table 1-3	See Table 1-3	25-Pair Amphenol (PIOU or PEPU)[1] Spring Clip Terminal (PIOUS) Two 3-pair Modular (TTY/SMDR/SMDI/SMIS)
RSIU	Up to 4 interface ports when installed with the optional RSIS or RMDS piggy-back PCBs	• ACD/SMIS or ACD/MIS • SMDI for Voice Mail • SMDR printer or call accounting machine • PC or maintenance terminal (local or remote) • System Open Architecture4	3-pair Modular

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lotes:

1. *All PCB Amphenol connectors are Female.*
2. *REMU only, not available on PEMU.*
3. *RSTU2 is required to provide the Message Waiting Lamp function for standard telephones*
4. *System Open Architecture is available with DK280 Release 3.2.*

Table 1-3
Interface PCB Options (PIOU/PIOUS/PEPU/RSIU/RSSU)

PIOU/PIOUS/PEPU/RSIU/RSSU INTERFACE OPTIONS	PIOU'	PIOUS	PEPU	RSIU/RSIS[1]	RSSU[1]
Unamplified page output (single zone, 600 ohms, duplex)	X	X	X		
Amplified page output (single zone, 3 watts, 8 ohms)	X		X		
Zone page interface (unamplified, 4 zones)	X				
Night transfer or Music-on-hold control relay					
Door lock or external amplifier control relay					
Alarm sensor	X	X			
SMDR output (RS-232/6-wire modular connector)	X"	X[2]		X	
Remote maintenance modem subassembly (IMDU or RMDS) (disables TTY output when they are piggy-backed onto the PIOU, PIOUS, or RSIU / RSIS cards)[3]	X (IMDU)	X (IMDU)		X (RMDS)	
Remote Maintenance using External Modem (requires TTY output port)[3]	X	X		X	X
MIS for ACD (requires TTY output port)[3, 4]	X	X		X	X
Voice Mail SMDI (requires TTY output port)[3]	X	X		X	X
280Admin PC (requires TTY output port)[3]	X	X		X	X
System Open Architecture Port (requires TTY output port)[3, 4, 5]				X	

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Notes:

1. *PIOU, PIOUS, and RSSU each provide one TTY port which can be flexibly programmed for the features marked with X. RSIU/RSIS can provide up to four flexible TTY/SMDR ports.*
2. *SMDR output will function simultaneously on the same PIOU or PIOUS with one of the following 280Admin PC, remote modem, MIS for ACD, or SMDI features.*
3. *Maintenance modem, ACD/MIS, Voice Mail SMDI, and 280Admin PC Interface each require a separate TTY output. PIOU, PIOUS, and RSSU provide one TTY output each; RSIU with RSIS PCBs provide up to four TTY outputs.*
4. *MIS for ACD requires that the system processor (RCTU PCB) must be equipped with an RKYS3 or RKYS4 feature key.*
5. *The system processor (RCTU PCB) must be equipped with RKYS4 feature key to support System Open Architecture Port. System Open Architecture is available with DK280 Release 3.2.*

General Note:

X = the option is provided.

Table 1-4
Subassemblies for Cabinet Circuit Boards

	SUBASSEMBLY	HOST PCB	CAPACITY	FUNCTION
SYSTEM CONTROL	RRCS - 4, 8, or 12	RCTUA, RCTUBNBB or RCTUC/D	With: RCTUA - 12 circuits max. RCTUBA/RCTUBB - 12 circuits max. RCTUC/D, 24 circuits max.	Provides Dual-tone Multi-frequency (DTMF) receiver for DISA, DTMF standard telephone circuits, DID and Tie lines, and built-in Auto Attendant and remote change of Call-Forward-External destination.
STATION	RSTS	RDSU	1 maximum per RDSU.	Provides two additional standard telephone circuits.
	R48S	RSTU2 or RDSU	1 maximum per RSTU2 or RDSU.	Provides loop voltage of 48V instead of 24V to extend standard telephone circuit loop length 600 to 1200 ohms. Required for OPS operation with OL13C class circuits.
CO LINE	RCOS	RCOU	1 maximum per RCOU.	Provides four additional Loop Start CO lines.
	RCIS	RCIU	1 maximum per RCIU	Provides an additional 4 caller ID circuits: to be used in conjunction with RCOU/RCOS, PCOU, and RGLU CO line PCBs to provide Caller ID to the system.
OPTION INTERFACE	RKYS (1, 2, 3, or 4)	RCTUA, RCTUBA/BB or RCTUC/D *RCUTA supports RKYS1 (AA) only.*	1 maximum per RCTU	Provides system with the following feature upgrades: • RKYS1 for built-in Auto Attendant (AA) • RKYS2 for AA feature plus Automatic Call Distribution (ACD). • RKYS3 for AA and ACD features plus Management Information System (MIS) application for ACD. • RKYS4 for System Open Architecture* and all RKYS3 features.
	IMDU	PIOU or PIOUS	1 per PIOU/PIOUS	Provides remote maintenance 300 bps or 1200 bps full-duplex modem for 280Admin or 280Backup.
	RSIS (RS-232), RMDS (Modem/RS-232)	RSIU	Up to 3 RSISs or 1 RMDS and 2 RSISs per RSIU	Provides up to 4 interface ports (RS-232 and modem) for system interface with: • RMDS (1200 or 2400 bps) • Voice Mail SMDI • ACD/MIS • System Open Architecture* • SMDR • Local or Remote Maintenance for 280Admin or 280Backup PC.
	EOCU	PEKU or PESU	1 for PEKU or PESU that supports Speaker OCA.	Provides Speaker OCA path for 8 circuits on PEKU or 4 circuits on PESU. (Handset OCA is not available on EKTs.)

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**System Open Architecture is available with DK280 Release 3.2.*

Table 1-5
Subassemblies for Toshiba Telephones

Subassembly	Host Telephone	Capacity	Function
DVSU	2000- and 1000-series Digital Telephones	1 per telephone	Provides interface for digital telephone to receive Speaker Off-hook Call Announce (OCA). Not required for Handset/Headset OCA.
HVSU2	6500-series Electronic Telephones	1 per telephone	Provides interface for electronic telephone to receive Off-hook Call Announce.
HHEU	2000- and 1000-series Digital Telephones. 6500- and 6005-series Electronic Telephones.	1 per telephone	Provides interface for headset and Loud Ringing Bell to telephone.
PDIU-D12	DKT2000 Digital telephones	1 per telephone	Provides Data Calling interface.
PDIU-DI	DKT1000 Digital telephones:		
RPCI-DI	DKT2000 Digital Telephones	1 per telephone	Provides Two Modes of Operation: 1. Provides TAPI PC application interface. 2. Provides Data Calling interface.
	2000-series Digital Telephones		
DADM	2000-series Digital Telephones	1 or 2 per telephone	Provides telephone with 20 (or 40 with two DADMs) additional feature buttons for DSS, System or Station speed dial, or CO line appearances.

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Table 1- 6
DSS Console and Door Phone Configuration

OPTION UNIT	INTERFACE/ PCB	DK280 Release 1, 2, and 3 CAPACITY	FUNCTION
DDSS (Digital DSS Console)	PDKU (Circuit 8)	3-RCTUA 4-RCTUB, RCTUBNBB 8-RCTUC/D[1]	Provides a 60-button console that functions with digital or electronic telephones. Buttons are flexibly assigned as CO line, speed dial, and DSS.
HDSS (Electronic DSS console)	PEKU (Circuits 7 and 8)	3-RCTUA 4-RCTUB or RCTUBNBB 8-RCTUC/D[1]	Provides a 60-button console that functions with digital or electronic telephones. Buttons are flexibly assigned as CO line, speed dial, and DSS.
DDCB (Digital Door Phone/Lock Control)	PDKU or RDSU (Circuit 5)[2, 3]	4 per system: RCTUB, RCTUBNBB and RCTUC/D 3 per system: RCTUA	Each DDCB provides interface for up to three door phones (MDFBs) or two MDFBs and one door lock.
HDCB (Electronic Door Phone/Lock Control)	PEKU or PESU (Circuit 5)[2, 3]	4 per system: RCTUB, RCTUBNBB and RCTUC/D 3 per system: RCTUA	Each HDCB provides interface for up to three door phones (MDFBs) or two MDFBs and one door lock.
MDFB (Door Phone)	DDCB or HDCB	12 per system: RCTUB, RCTUBNBB and RCTUC/D 9 per system: RCTUA	• Door monitor with two-way talk path to system telephones. • Doorbell that rings designated digital and electronic telephones. • Microphone for talkback amplifier with HESB.

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{Votes:

1. *DSS consoles can be flexibly assigned to designated electronic and digital telephone stations: Up to 8-DSS consoles may be assigned to a designated electronic or digital telephone station. (See Table 1-6 above)*
2. *DDCBs/HDCBs can only be connected to Ports 004, 012, 020, and 028, in slots 11, 12, 13, and 14, respectively.*
3. *Always install DDCB / HDCB station PCBs (PDKU, RDSU, PEKU, or PESU) in slots that have lower slot numbers than RDDU, PEMU, REMU2, RATU, or RDTU PCBs.*

General Notes:

- *DSS (DDSS and HDSS) Console*
  - *No additional hardware is required for DSS consoles.*
  - *DSS consoles are assigned to associated digital and electronic telephones in programming.*
  - *DSS consoles cannot be connected to RDSU or PESU electronic circuits.*
- *Door Phone*
  - *DK280 can support as many as 12 MDFBs. See Table 1-1.*
  - *Each DDCB requires one circuit (Circuit 5) on a PDKU or RDSU, and each HDCB requires one circuit (Circuit 5) on either a PEKU or PESU.*
  - *One door lock control can be configured on each DDCB and HDCB in place of one door phone.*

Table 1-7
Cabinet AC Power, Reserve Power, and Floor Mount Hardware Assemblies

ASSEMBLY'	DESCRIPTION	FUNCTION
RBTC1A-2M	Reserve Power Cable[2] —RBDB to Battery Terminals	Two cables are required (for current carrying capacity) when connecting reserve (battery) power to three or more KSU cabinets (wall mount). RBDB is also required—see RBDB below.
PBTC-3M	Reserve Power Cable[2] —Cabinet Power Supply to Battery Terminals	One cable is required for each KSU cabinet if connecting reserve power to one or two cabinets (wall or table mount).
RBDB	Battery Distribution Box	Distributes reserve power when three or more KSU cabinets require reserve power (floor or wall mount). Six RBTC2A-1.5M cables are provided with the RBDB distribution box to connect up to six DK280 power supplies to the Battery Distribution Box.
RFIF	Floor Mount Fixture Kit	Provides two metal stands for mounting three or more KSU cabinets on floor. Three pairs of wall brackets (RWBF) are supplied with RFIF. Wall brackets are needed to secure floor mounted systems to the wall for safety purposes (not required to wall mount cabinets). Cabinet " A and " B screws are also provided with RFIF (see Figure 3-14).
RCCB	Conduit Connection Box	Conduit box required for AC and Battery power connection to three or more floor mounted KSU cabinets. (Not required for mounting two cabinets on table or any number of cabinets on wall.)
RPSB1 (See RPSB Table below)	Three-outlet AC Power Strip	One RPSB1 required when installing three or four KSU cabinets (wall or floor mount). Two RPSB1s required when installing five or six KSU cabinets (wall or floor mount). Two AC cords will exit the cabinets in some configurations.
RPSB2 (See RPSB Table below)	Three-outlet AC Power Strip —Heavy Cord	High current carrying capacity cord for application where local electric codes (or user) requires only one AC cord to exit four or more cabinets. It is **highly recommended** to begin using the RPSB2 for two-cabinet installations.

LOCAL ELECTRIC CODE REQUIREMENT	QUANTITY OF RPSBI AND RPSB2 POWER STRIPS NEEDED[3]					
	1 - Cabinet	2 - Cabinet	3 - Cabinet	4 - Cabinet	5 - Cabinet	6 - Cabinet
Two AC power cords allowed from system.	0 - RPSB1 0 - RPSB2	0 - RPSBI 0 - RPSB2	1 - RPSB1 0 - RPSB2	1 - RPSB1 0 - RPSB2	2 - RPSB1 0 - RPSB2	2 - RPSBI 0 - RPSB2
Only one AC power cord allowed from system.	0 - RPSBI 0 - RPSB2	1 - RPSB1 0 - RPSB2	1 - RPSB1 0 - RPSB2	1 - RPSBI 1 - RPSB2	1 - RPSB1 1 - RPSB2	2 - RPSB1 1 - RPSB2

1.10 Worksheets

The worksheets help you configure the system. Designed to make the system configuration as orderly as possible, they also provide room to record the hardware—cabinets, PCBs, stations, and options—that comprise the system. Each worksheet serves a distinct purpose, as follows:

- **Worksheet 1, Printed Circuit Boards:** Determines the system's printed circuit board requirements, using guidelines A1 - A4, B1 - B4 and C1 ~ C8.
- **Worksheet 2, Cabinet Total:** Provides tables to help determine the number of PCB slots and cabinets required and the type of common control PCBs needed, using Steps 1 - 10 and "Chart 1: PCB Configuration."
- **Worksheet 3, Miscellaneous Options:** Provides room to record the quantity of all of the hardware options available with the system.
- **Worksheet 4, System Power Factor (PF) Check:** The DK280 power supply was engineered for maximum cost efficiency to provide power for the most configurations. Because of this design, some power limitations exist when using old electronic-type telephones and/or telephone option hardware.

  Example, only 24 3000-series telephones can be installed in a cabinet. Each telephone and printed circuit board has a negative PF and the RPSU280 power supply has a positive PF (+65). The sum of the PFs of telephones and PCBs connected to a signal cabinet must not exceed –65 and the sum of the calculated cabinet PFs must not exceed the values provided in Worksheet 4, Chart 3.

1.11 Configuration Worksheet Example

The following example demonstrates how to configure the system. This example does not represent the only way to configure the system. The flexibility of the Strata DK280 enables a system to be configured any one of several ways for a given set of requirements.

"Company A currently has a Strata DK24 telephone system and is expanding to a DK280. They are adding a new customer service department which requires the following new telephone equipment.

- 46 digital telephones (40 with OCA/4 with headsets/6 with RPCI-DI for API personal computer)
- One facsimile machine
- Stratagy voice mail System (four-ports) with SMDI interface
- ACD/MIS (with one Day- and one After-Shift announcement)
- Remote maintenance with built-in modem
- One PC attendant console
- Two door phones
- Battery back-up
- Alternate background music, because ACD will use the Music-on-Hold (MOH) music source for advertising purposes.

- 8 analog loop start CO lines (with Caller ID)
- 4 analog E&M tie lines
- 24 T1, ground start lines
- 16 T1, DID lines

"Company A's" DK24 currently has the following equipment which must be moved to the DK280 system:

- 16 electronic telephones upgrade for OCA
- 2 HDSS consoles
- 3 PEKU PCBs
- 2 PCOU PCBs (eight loop start lines need upgrade for Caller ID)
- 1 RSSU PCB (SMDR)

Fill out worksheets as follows to configure the system (see example worksheets):

1. Record all new and existing telephones and other devices on Worksheet 1: A1 - A4, B1 - B6, and C1 - C3.
2. Determine the quantity of cabinet slots and PCBs needed using Worksheet 1, C4 ~ C10.
3. Use Worksheet 2 to configure system PCBs, slots, and cabinets.
4. Use Worksheet 3 to record miscellaneous option requirements
5. Use Worksheet 4 to verify that the system's power factor is not exceeded.

Worksheet 1 — Summary - *Example*

This Worksheet provides guidelines for determining the required quantity of each PCB type, PCB slot and cabinet.

A1 ~ A4 – Determine the company's Digital Telephone, Door phone, and Data Interface needs.

B1 ~ B6 – Determine Company A's Electronic Telephone, Door phone, Alternate BGM, and External Amplified conference needs.

C1 – Determine Digital Port Requirements

c2 – Determine Standard Port Requirements

c3 – Determine Electronic Port Requirements

c4 – Determine Station PCB/Slot Requirements

C4.1 – PDKU PCB/Slot

C4.2 – RSTU or PSTU PCB/Slots

c4.3 – RDSU/RSTU PCB/Slots

c4.4 – PEKU PCB/Slots

c4.5 – PESU PCB/Slots

C4T – Total Station PCB Slots

c5 – Determine CO Line PCB/Slot Requirements

C5.1 – RCOU/RCOS PCB Slots

C5.2 – RGLU PCB Slots

c5.3 – RCIU/RCIS PCB Slots

c5.4 – REMU or PEMU PCB Slots

c5.5 – RDDU PCB Slots

C5.6 – RDTU PCB Slots

C5T – Total CO Line PCB Slots

C6 – Attendant Console Slot

c7 – PIOU/PIOUS/RSIU/RSSU Slots

C8 – PEPU SLOT

Worksheet 1 — System PCB (Slot) Requirements - *Example*

Customer: Company "A" Location: Anywhere

Complete Worksheet 1 before proceeding with other worksheets.

A1. DDSS consoles required (refer to DDSS in Table 1-6): (A1) DDSS 0

A2. Digital door phone/lock units required (refer to DDCB in Table 3-6): (A2) DDCB 1

A3. PDIU-DSs required (refer to PDIU-DS in Table 1-5): (A3) PDIU-DS 0

A4. Digital telephones, with or without PDIU-DI or RPCI-DI, required (refer *to* PDKU in Table 1-2):

2010-SD 14 + 2010-H 20 + 2020-SD 12 + 2020-S 0

1020-H 0 + 1020-SD 0 = (A4) Total digital telephones 46

B1. HDSS consoles required (refer to HDSS in Table 1-6): (B1) HDSS 2 (existing)

82. Door phone/lock units required (refer to HDCB in Table 1-6): (B2) HDCBs 0

83. Electronic telephones required (refer to PEKU and PESU in Table 1-2):

6510-H 6 + 6510-S 0 + 6520-S 5 + 6520-SD 5

Note:
***Add** in all other electronic telephones if upgrading an existing Strata DK system using 2000-/6000-/6005-series electronic telephones.*

(B3) Total electronic telephones 16 (existing)

84. Separate BGM source (connected to electronic telephone circuit) required (1 maximum):

(B4) Separate BGM source 1 (existing)

85. External amplifiers for two-CO line amplified conference required (4 maximum):

(B5) Two-CO line conference amplifiers 0

B6. Determine standard telephone device requirements, and add to C2 on next page.

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Worksheet 1 — System PCB (Slot) Requirements (continued) - *Example*

Fill in System Requirements below (refer to Table 1-1 for maximum quantities)

C1.

A. Total Digital Telephones*	46	1 port per each DKT
B. Total Digital DSS Consoles		1 port per each DDS
C. Total Digital Door Phone Control Boxes**	1	1 port per each DDCB
D. Total Stand Alone Data Interface Units		1 port per each PDIU-1

*Digital telephone equipped with PDIU-D12 or ADM only require 1 digital port.
**1 Door Phone Control Box (DDCB) supports three Door Phones (MDFBs)

C2. Determine Standard Port Requirements (from B5):

A. Total Standard Telephones (On and Off Premise)		1 port per Telephone
B. Total Voice Mail Ports	4	1 port per VM Port
C. Total FAX or MODEM devices	1	1 port per Device
D. Total ACD and Auto Attendant Digital Announcement Devices	2	1 port per Device
E. Alternate BGM Source*		1 port
F. Total Other Devices**		1 port per Device
C2 = Standard Telephone Ports =	7	

*Isolation transformer may be required, see Chapter 6—Peripheral Installation.
**Other devices include Dictation equipment, etc.

A. Total Electronic Telephones	16	1 port per Telephone
B. Total Electronic DSS Consoles	2x2 = 4	2 ports per HDSS console
C. Total Electronic Door Phone Control Boxes		1 port per HDCB (3-max)
D. Total		2 ports per Amplifier
E. Alternate BGM Source	1	1 port
C3 = Total Electronic Telephone Ports =	21	

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Worksheet 1 — System PCB (Slot) Requirements (continued) - *Example*

C4. Determine Station PCBs / Slots Required (Refer to Table 1-2 for PCB information)

C4.1 Total PDKU PCBs = $\frac{\text{DIGITAL PORTS (from C1)}}{8}$ – $\frac{47}{8}$ – 5.87 = 6 (round up)

Total PDKU PCBs (Slots) = [6] (Refer to C4.3 before finalizing this number)

General Notes:

- *PDKU provides eight digital telephone ports (circuits). Circuit 5 (when associated with ports 004, 012, 020, and 028) can only interface with a DDCB. Circuit 8 can only interface with a DDSS console (see Table 1-6).*
- *The PDKU1 can also be used. The PDKU1 can only support Data Interface Units (DIUs) on circuits 1 - 7, while the PDKU2 can support DIUs on all eight circuits. See Worksheet2, Table 1-8 (Example) for slot limitations.*

C4.2 Total RSTU PCBs = $\frac{\text{STANDARD PORTS (from C2)}}{8}$ – $\frac{7}{8}$ – .87 = 1 (round up)

Total RSTU PCBs (Slots)= [1]

General Notes:

- *The PSTU2 or PSTU1 can also be used. These earlier version PCBs can interface with the same devices that the RSTU can, but they have different ring generators and cannot support MW. See the RSTU/PSTU section in Chapter 4 —Printed Circuit Boards for more details.*
- *The RSTU provides eight standard telephone ports (circuits). Circuit 2 only can connect to a separate Background Music (BGM) source. The RSTU can be equipped with an R48S to extend the loop length of the RSTU from 600 ohms to 1200 ohms (see Table 1-4).*
- *RSTU2 is required to operate message waiting lamps on a standard telephone.*

c4.3

Total RDSU PCBs [0] four digital/two standard ports

Total RSTS PCBs [0] adds two standard ports to RDSU

General Note:

- *RDSU provides two standard telephone ports (circuits) and four digital ports (circuits) in its basic configuration. The optional RSTS can be attached to the RDSU to provide two more standard telephone ports. The RSTU can be equipped with an R48S to extend the loop length of the RSTU standard telephone ports from 600 ohms to 1200 ohms (see Table 1-4).*

C4.4 Total PEKU PCB / Slots = $\frac{\text{ELECTRONIC PORTS (from C3)}}{8}$ – $\frac{21}{8}$ = 2.6 = 3 (round up)

Total PEKU PCBs (Slots) = [3] (Refer to C4.5 before finalizing this number)

General Note:

- *PEKU provides eight electronic telephone ports (circuits). Circuit 5 (when associated with ports 004, 012, 020, or 028) can only interface with an HDCB. The HDSS consoles requires two circuits, circuits 7 and 8, on a PEKU (see Table 1-6). Each conference amplifier requires use of circuits 2 and 3 of a PEKU.*

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Worksheet I — System PCB (Slot) Requirements (continued) - *Example*

c4.5 PESU can be used when four or less electronic or two or less standard ports are needed.

Total PESU PCB (Slots) = [0]

General Note:
- *PESU provides two standard telephone ports (circuits) and four electronic telephone circuits (ports). Circuit 5 (when associated with Ports 004, 012, 020, and 028) can only interface with an HDCB (see Table 1-6).*

Total Station PCBs / Slots:

PDKU 6 (from C4.1)
RSTU 1 (from C4.2)
RDSU 0 (RSTS 0) from C4.3
PEKU 3 (from C4.4) Existing
PSTU 0 (from C4.2)
PESU 0 (from C4.5)

C4T = Total Station PCB Slots = [10]

C5. Determine CO Line PCB / Slot Requirements

C5.1 Determine Analog Loop Start Line PCB /Slot Requirements

Total loop start lines (with or without caller ID) needed: 16 (from Company A s requirements, eight exist already)

A = Total RCOU / RCOS PCB (Slots) = $\frac{\text{Loop Start Lines}}{8} - \frac{8}{8} = 1$

B = *RGLU, RCOU or PCOU PCB (Slots) = $\frac{\text{Loop Start Lines}}{4} = \frac{8}{4} = 2$ PCOU (existing)

C5.1 = Total Loop Start LIne slots (A + B) = 1 + 2 = [3]

**RGLU can provide loop or ground start lines.*

General Notes:
- *RCOU provides four loop start CO lines in its basic configuration. An RCOS can be attached to the RCOU to add four more loop start CO lines for a total of eight per slot.*
- *PCOU2 provides four loop start CO lines.*
- *The PCOU1 and the PCOU2 are identical in fit, form, and function for the U.S. market.*

C5.2 Determine Analog Ground Start Line PCB / Slot Requirements

Total ground start lines (with or without caller ID) needed: 0 (from Company A's requirements)

C5.2 = Total Loop Start Lines A + B = ~~Ground Start Lines~~ $\frac{0}{4} = \frac{0}{4}$

General Note:
- *RGLU provides four CO lines that can be individually configured as loop start or ground start.*

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Worksheet 1 — System PCB (Slot) Requirements (continued) - *Example*

c5.3 Determine Caller ID **FSK** receiver/decoder PCB / Slot Requirements

Total Ground/Loop Start Line with caller ID: 16 (from Company A's requirements)

A = Total RCIU/RCIS PCB (Slots) = $\frac{\text{Caller ID Lines}}{8} = \frac{16}{8} =$ **2 Slots**

General **Note:**
- *RCIU provides four caller ID receiver/decoder circuits. RCIU with RCIS subassembly provides eight caller ID receiver/decoder circuits. Always use RCIU with RCIS for up to eight circuits as opposed to using two RCIU PCBs. These circuits do not use up station port or CO line software assignments.*

C5.4 Determine Analog Tie Line PCB / Slot Requirements

Total analog Tie lines (with or without ANI/DNIS) needed: 4 (from Company **A's** requirements)

CT = Total REMU or PEMU PCB (Slots) = $\frac{\text{TIE Lines}}{4} = \frac{4}{4} =$ 1

General Notes:
- *REMU provides four E&M Tie Trunks (Type I or II signaling, Wink or Immediate Start, 2- or 4-wire transmission).*
- *The PEMU1 can also be used. The PEMU only provides Type I signaling, 2- or 4-wire transmission and Immediate Start.*
- *See Table 1-1 for REMU / PEMU maximum quantities. Each REMU or PEMU reduces system station port line and capacity by four ports and four lines.*

c5.5 Determine Analog DID Line PCB (Slot) Requirements

Total DID lines (with or without ANI/DNIS) needed: 0 (from Company A's requirements)

C5.4 = Total RDDU PCB (Slots) = $\frac{\text{Analog DID lines}}{4} - \frac{0}{4} = 0$

General Notes:
- *RDDU provides four Direct Inward Dialing lines. (Each RDDU reduces system station port and line capacity by four ports and four lines.)*
- *See Table 1-2 for RDDU maximum quantities.*

C5.6 Determine RDTU T I PCB (Slot) Requirements (Loop / Ground / Tie / DID Lines)

T I / DS-1 Channels needed (from Company A's requirements)'

Loop Start Lines 0 (channels)
Ground Start Lines 24 (channels)
Tie Line (with or without ANI/DNIS) 0 (channels)
DID Lines (with or without ANI/DNIS) 16 (channels)
C5.6 = Total RDTU Lines 40 (channels)

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Worksheet 1 — System PCB (Slot) Requirements (continued) - *Example*

C5.7 Total Number of RDTU Slots:

8-channel RDTU PCB / Slots 0
16-channel RDTU PCB / Slots 1 PCB (include skipped slots)^2-2 Slots
24-channel RDTU PCB / Slots 1 PCB (include skipped slots)^2-2 Slots
C5.6 = Total RDTU PCB / *Slots* 2 RDTU / 4 Slots

Notes:
1. *Contact the T1 provider (Telco or Carrier company) to determine exact T1 channel / line needs.*
2. *When installing 16 or 24 channel RDTU PCBs into a slot, the next slot or two slots may not be usable for other PCBs (see Worksheet2, Tables 1-9 (Example) and 1-10 (Example)).*

General Notes:
- *RDTU provides either 8, 16, or 24 channels [lines), depending on programming. Each channel can be set for either DID, ground start CO, loop start CO, or tie line operation. (Each RDTU tie line or DID line reduces the system line and station port capacity by one port.)*
- *As many as six RDTU PCBs can be installed in systems operating with the RCTUC/D common control unit, as many as two with RCTUB operated systems. The RCTUA does not support RDTU.*
- *Each tie or DID line reduces the system station port capacity by one port.*

Total CO LINE PCB/Slots (C5):

RCOU / RCOS 1 (from C5.1)
PCOU 2 (from C5.1)
RGLU _____ (from C5.1, 5.2)
RCIU / RCIS 2 (from C5.3)
REMU 1 (from C5.4)
RDDU _____ (from C5.5)
RDTU 2 PCBs / 4 Slots (from C5.6)

C5T = Total CO line PCB / Slots = 8 PCBs / 10 Slots

C6. Attendant Console Slots

C6T = RATU PCB /Slot 1 one required for 1 - 4 Attendant Console (Maximum)

C7. PIOU / PIOUS / RSIU / RSSU Option Slot (see Table 1-3)

A. MIS for ACD required new
B. Remote / Local Maintenance with "280Admin" or "280Backup" Personal Computer
C. Simplified Message Desk (SMDI)
D. Station Message Detail Recording (SMDR) existing PIOU
E. System Open Architecture (OA)
F. Miscellaneous Options (see Table 1-3)

General Note:
- *The subassembly PCBs listed below do not require additional cabinet slots.*
  - *The IMDU subassembly plugs onto PIOU or PIOUS to provide a remote maintenance modem.*
  - *The RMDS subassembly plugs onto the RSIU to provide a remote maintenance modem.*
  - *Up to three RSIS subassemblies can plug onto RSIU to provide any option (A ~ E).*

C7T = Total existing RSSU and new RSIU / RMDS PCB /Slots = 2 Slots. RSIU for RSSU, RSIU for MIS output, RMDS for Remote Maintenance, and existing RSSU for SMDR.

General Note:
- *RMDS does not require a slot.*

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Worksheet 1 — System PCB (Slot) Requirements (continued) - *Example*

C8. PEPU Page Option PCB

PEPU provide 600-ohm interface or 3-watt page output

Total PEPU PCBs (Slots) [0]

C9. Total System Slots = C4T 10 **+ C5T** 10 **+ C6T** 1 **+ C7T** 2 **+ C8T** 0

C9T = Total Slots = 23

C10. Total Cabinets = $\frac{\text{C9T}}{6}$ = $\frac{23}{6}$ = 3.f = 4 (round-up)

C11. Go to Worksheet 2 and fill-in Worksheet 2, Chart 1.

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Worksheet 2 — System PCB Assignment Guide - *Example*

A. After completing Worksheet 1, use the procedure in B (below) to configure each PCB in the correct slots and cabinets. Fill in Chart 1 in this worksheet section as follows:

- Write the PCB type under the correct slot of the configuration chart.
- If the following is installed:
  - Station, PC attendant console, DID, or tie line PCB: record the appropriate port numbers used by each.
  - CO, tie, or DID line is installed: record the line numbers.
  - RCIU/RCIS is installed: record the Caller ID circuit numbers.
  - Option: record the option.

  When this is complete, system configuration is known.

B. Fill in Chart **1** by installing PCBs in the following order (see Worksheet 1 for PCB type and quantities).

RSIU in slot 11	PDKU or PEKU in slot 11
PDKU or PEKU in slot 12 ↓	Starting with Slot 12, install all station' ground and loop start lines', and option PCBs[3] from left to right, from lowest to highest numbered slots without leaving any empty slots[4]. They may be intermixed in cabinets, and do not have to be placed in consecutive order by PCB type, providing that no slots are skipped and left empty. Remember to install subassembly PCBs onto plug-in PCBs before inserting plug-in PCBs into cabinet slots.
Starting with Slot 13, install all station' ground and loop start lines', and option PCBs[3] from left to right, from lowest to highest numbered slots without leaving any empty slots[4]. They may be intermixed in cabinets, and do not have to be placed in consecutive order by PCB type, providing that no slots are skipped and left empty. Remember to install subassembly PCBs onto plug-in PCBs before inserting plug-in PCBs into cabinet slots.	↓

Next Highest Available Slot(s):

- If the system is equipped with a PC or Toshiba Conventional Attendant Console, install the RATU PCB in the next highest available slot. The Attendant Console PCB will be assigned the next four station ports.
- If the system is equipped with tie or DID lines[4], install the tie and DID line PCBs from left to right, starting with the next highest empty slot in the system to the highest numbered slot needed — do not skip slots[5].
- After all station, line, and option PCBs have been recorded in Chart 1, determine which Common Control PCBs should be used: RCTUA, RCTUB, RCTUBA/BB, RCTUC/D — refer to Table 1-1. Complete Chart 1: PCB Configuration by installing the RCTU PCB(s).

Worksheet 2 — System PCB Assignment Guide (continued) - *Example*

After completing Worksheet 2, follow Worksheet 3 guidelines to configure miscellaneous items.

Notes:

1. *Station PCBs include: PDKU, RDSU/RSTS, RSTU, RSTU2, PEKU, PESU, and PSTU. When installing PDKU1 and PDKU2, see Worksheet 2, Table 1-8 (Example) for configuration requirements regarding OCA, RPCI-DI, PDIU-DI/DS, and PDKU1. All station PCBs use four to eight station port software time slot requirements.*
2. *Ground and loop start CO line PCBs include RCOU/RCOUS, RGLU, PCOU, and RDTU. Do not install tie or DID line PCBs because they use station ports and will cause station port shifting. If installing RDTU (T1) PCBs, see Worksheet 2, Tables 1-9 (Example) and 1-10 (Example) for RDTU slot requirements. Always atfempt to install RDTU PCBs starting with cabinet slots that only require two slots to allow all 24-channels to operate. All CO PCBs use from 4, 8, 26 or 24 CO line software time slot assignments.*
3. *Option PCBs that require a cabinet slot include PIOU, PIOUS, PEPU, RSIU, RSSU, and RCIU.*
4. *Tie and DID line PCBs include: REMU, RDDU, PEMU, and RDTU. tie/DID line PCBs. These PCBs use station ports and CO line ports in DK280 software, so they should not be installed in lower numbered slots than station PCBs whenever practical. This will prevent station port number shifting which could cause problems with BLF, station directory number, or Primary Directory Number [PDN] sequences. If installing an RDTU, see Worksheet 2, Tables 1-9 (Example) and 1-70 (Example) for RDTU slot requirements.*
5. *If installing RDTU (T1) PCBs, it may be required to skip certain slots. In this case, these slots must be skipped and remain vacant. See Worksheet 2, Tables 1-9 (Example) and 1-10 (Example).*

General Note:

The maximum number of station ports used by station, PC attendant console, tie, and DID PCBs can not exceed the following quantities:

RCTUA	=	32 maximum
RCTUB or RCTUBA/BB	=	80 maximum
RCTUC/D	=	240 maximum

In some rare configurations, when using RDTU (T1) tie or DID lines in systems, the maximum number of stations allowed may be reduced because the RDTU PCB takes up two or three cabinet slots and one station port per RDTU tie/DID channel used. RCIU/RCIS PCBs do not take from or use station ports or CO line software time slot assignments.

Worksheet 2 — System PCB Assignment Guide (continued) - *Example*

Table 1-8 (Example)
PDKU1/PDKU2/OCA/RPCI/PDIU Configuration

	Slots → 11	12	13	14	15	16
Base Cabinet (1)	(A)	(A)	(A)	(A)	(A)	(A)
	Slots → 21	22	23	24	25	26
Cabinet (2)	(A)	(A)	(B)	(B)	(B)	(B)
	Slots → 31	32	33	34	35	36
Cabinet (3)	(A)	(A)	(C)	(C)	(C)	(C)
	Slots → 41	42	43	44	45	46
Cabinet (4)	(A)	(A)	(D)	(D)	(D)	(D)
	Slots → 51	52	53	54	55	56
Cabinet (5)	(A)	(A)	(C)	(C)	(C)	(C)
	Slots → 61	62	63	64	65	66
Cabinet (6)	(A)	(A)	(D)	(D)	(D)	(D)

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General Notes:

- *All slots support PDKU2.*
- (A) *slots support OCA, RPCI-DI*, or PDIU-DI/DS with PDKU1 or PDKU2 installed.*
- (B) *slots do not support OCA, RPCI-DI*, or PDIU-DI/DS with PDKU1 but do support OCA, RPCI-DI*, or PDIU-DI/DS with PDKU2.*
- (C) *slots do not support PDKU1 PCBs.* (C) *slots support PDKU2 but do not support OCA, RPCI-DI*, or PDIU-DI/DS.*
- (D) *slots do not support OCA, RPCI-DI*, or PDIU-DI/DS with PDKUI or PDKU2.*
- *PDKUI does not support continuous DTMF tones on 2000-series digital telephones.*

**All slots support RPCI-DI if it is connected to PDKU2 when the RPCI is used for API computers only and is not used for switched data calls (RPCI to RPCI or RPCI to PDIU connections).*

Worksheet 2 — System PCB Assignment Guide (continued) - *Example*

Table 1-9 (Example)
1 ~ 8 or 1 - 16 Channel RDTU Slot Configuration

Cabinet	"Allowed" RDTU Slot Number[1]	Slots that must remain vacant if a 16 channel RDTU is installed in the "allowed" slot shown to the left of this column.
1 (Base Unit)	13	No slot must be vacant
	15	No slot must be vacant
2 (Expansion Unit)	21	No slot must be vacant
	23	No slot must be vacant
	25	No slot must be vacant
3 (Expansion Unit)	31	No slot must be vacant
	33	35
4 (Expansion Unit)	41	No slot must be vacant
	43	45
5 (Expansion Unit)	51	No slot must be vacant
	53	55
6 (Expansion Unit)	61	No slot must be vacant
	63	65

Table 1-10 (Example)
1 ~ 24 Channel RDTU Slot Configuration

Cabinet	"Allowed" RDTU Slot Number'	Slots that must remain vacant if a 24 channel RDTU is installed in the "allowed" slot shown to the left of this column.
1 (Base Unit)	13	14
2 (Expansion Unit)	21	22
	23	24
	25	26
3 (Expansion Unit)	31	32
	33	34, 35
4 (Expansion Unit)	41	42
	43	144.45
5 (Expansion Unit)	51	52
	53	54, 55
6 (Expansion Unit)	61	62
	63	164.65

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Note:
1. RDTU PCBs can only be rnstalled in the "Allowed slots shown.

General Notes:
- If *installing an RDTU with 1 - 24 channels:*
  - *Install the RDTU in the "Allowed" RDTU slot.*
  - *You are required to leave the slots indicated vacant.*

Worksheet 2 — System PCB Assignment - *Example*

CHART 1: DK280 PCB CONFIGURATION

CABINET1	R11	RCTU	S11	S12	S13	S14	S15	S16
PCB Type >	RCTU C	RCTU D	RSIU	PDKU 2	PDKU 2	PDKU 2	RDTU	Vacant*
Port Nos. >	—	—	RMDS	000 ~ 007	008 - 015			
Line Nos. >	—	—	—	—	—		001 - 024	
Option/Note >	RRCS12	RRCS12	MIS / RM	OCA	DDCB / OCA			
CABINET 2	s21	s22	S23	S24	S25			
PCB Type >	PDKU2	PDKU2	PDKU2	PEKU	PEKU	PEKU		
Port Nos. >	024 - 031	032 - 039	040 ~ 047	048 - 055	056 - 063	064 ~ 071		
Line Nos. >	—	—	—	—	—	—		
Option/Note >	OCA		DSS / OCA	DSS / OCA	OCA	OCA		
CABINET 3	S31	S32	s33	S34	s35	S36	S37	S38
PCB Type >	RSTU	RATU	RCOU / RCOS	PCOU	PCOU	RSSU		
Port Nos. >	072 - 079	080 - 083	—	—	—	—		
Line Nos. >	—	—	025 - 032	033 ~ 036	037 ~ 040	—		
Option/Note >	FAX / VM Ports	A—— &&&	S/+	+/*	+/+	SMDR		
CABINET 4	S41	S42	s43	s44	s45	S46	S47	S48
PCB Type >	RDTU	Empty**	REMU	Empty**	Empty**	Empty**		
Port Nos. >	084 - 099	—	100 ~ 103	—	—	—		
Line Nos. >	041 - 056	—	057 ~ 060	—	—	—		
Option/Note >	16 - DID	—	4-Tie	—	—	—		
CABINET 5	S51	S52	s53	s54	S55	S56	S57	S58
PCB Type >	RCIU / RCIS	RCIU / RCIS						
Port Nos. >	—	—						
Line Nos. >	—	—						
Option/Note >	CLID CKT (1 ~ 8)	CLID CKT (9 ~ 16)						
CABINET 6	S61	S62	S63	S64	S65	S66	S67	S68
PCB Type >								
Port Nos. >								
Line Nos. >								
Option/Note >								

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* *Vacant means the slot cannot be used because its time slots are used by an RDTU PCB in a lower slot number (see Tables 1-9 (Example) and 1-10 (Example)).*

***Empty means the slot can be used for future expansion.*

Worksheet 3 — Configuration Guide - *Example*

(Miscellaneous Option Requirements)

A. Add-on Module (refer to Table 1-5): Total 0

2000-series digital telephones can be equipped with one or two Add-on Module(s) to provide an additional 20 or 40 combinations of CO Lines, DSS, and Speed Dial buttons.

B. RRCS PCB:

1. An RRCS (-4, -8 or 12) must be installed on the RCTUA, RCTUB, RCTUBA/BB, or RCTUC/D, if Company A has DTMF DID, tie, ANI, DNIS, DISA lines (remote change of call forward destination), DNIS External Call Routing, using DTMF standard telephones or voice mail-type devices with DTMF interfaces or built-in auto attendant connected to RDSU, RSTU, RSTU2, PSTU, or PESU standard telephone ports. RCTUC/D supports one RRCS on each PCB, two RRCS's total (maximum 24 DTMF receivers).

2. For normal traffic, an RRCS-4 (providing four DTMF receiver circuits) will be sufficient. However, for extremely high traffic requirements, an RRCS1-8 or RRCS-12 (providing eight or twelve DTMF receiver circuits) may **be** required, or multiple RRCS for large systems.

RRCS-4 ____ or RRC2-8 ____ or RRCS-12 2

General Note:

- *Only one RRCS can be used per system with RCTUA or RCTUB; RCTUC/D and RCTUBA/RCTUBB support 2 RRCS PCBs (total 24 DTMF receivers maximum).*

C. RKYS (1, 2, 3, or 4) RKYS3. (for ACD/MIS plus built-in Auto Attendant)

If auto attendant (built-in), ACD, ACD/MIS, or System Open Architecture (OA) port is required, one RKYS option key is required see Table 1-4.

D. EOCU (refer to Table 1-4):

An EOCU must be installed on each PEKU and/or PESU that is connected to electronic telephones which are equipped to receive Off-hook Call Announce (OCA).

Actual EOCU PCBs 3 — 3-PEKU with OCA (existing)

General Notes:

- *One EOCU for each PEKU or PESU that supports electronic telephones that must receive* ***OCA.***
- *Be sure that proper consideration is given to where the PEKU or PESU is placed to provide the most efficient use of the 8-circuit EOCU: The PESU only provides four electronic telephone ports; HDSS consoles use two ports on a PEKU; HDCBs use one port on a PESU or PEKU.*

E. DVSU (refer to Table 1-5):

One DVSU is required for each digital telephone that must receive telephone speaker OCA – not Handset/Headset OCA.

Actual DVSU 40 — 40 DKT stations with telephone speaker OCA

F.

Actual HVSU2s 16 — 16 EKT stations with OCA (existing)

G.

Worksheet 3 — Configuration Guide (continued) - *Example*

H. PIOU/RSIU Subassembly PCBs

H1. IMDU PCB (refer to Table 1-4):

One IMDU PCB may be installed on the PIOU or PIOUS PCB to provide built-in remote maintenance modem capability for the Strata DK system.

IMDU PCB 0 PIOUS

H2.

RMDS PCB 1 (installed on RSIU in slot 11)

H3.

RSIS PCB 1

Actual HHEU PCBs 4 Four Telephones with headsets

K. HESB Amplifier/Speaker:

1. One HESB is required for each digital and electronic telephone providing the Loud Ringing Bell option.
2. One HESB is optional to provide single-zone external page connected to either a PIOU, PIOUS, or PEPU (customer-supplied amplifiers/speakers may be used in place of the **HESB) .**
3. One HESB is optional to provide a talkback amplifier/page speaker connected to a PIOU, PIOUS, or PEPU (a customer-supplied talkback amplifier/page speaker may be used in place of HESB).

PPTC (25-pin) | PPTC-9 (9-pin)

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Worksheet 3 — Configuration Guide (continued) - *Example*

N. DPFT Unit:

The DPFT provides a means to connect eight selected CO lines to standard telephones in the event of a power failure (each DPFT requires an RSTU or PSTU PCB). There is no limit to the number of DPFTs installed, provided that the system power factor is not exceeded.

DPFT 0

***O.* MDFB (Door Phone):**

The MDFB plugs into the DDCB or HDCB control box to provide a door phone. Three MDFBs can be connected to each DDCB or HDCB. The MDFB may also be connected to the HESB amplifier/speaker to provide page talkback.

Actual MDFBs 2

P. RPCI-DI:

Digital telephones must be equipped with a RPCI-DI to transmit and receive voice and data calls and/or interface with an Application Program Interface (API) personal computer.

Actual 6
Actual

for 2000-series DKTS

Q. RBDB (refer to Table 1-7):

RBDB Battery Box: Required when connecting reserve power batteries to three or more cabinets (wall or floor mount—see Chapter 3—Cabinet Installation, Figure 3-23 - 3-26)

RBDB 1

R. RCCB (refer to Table 1-7):

RCCB conduit box is required for floor mount installations of three or more cabinets (see Chapter 3—Cabinet installation, Figure 3-21 and 3-22).

RCCB 0

S. RFIF (refer to Table 1-7):

RFIF floor mount kit is required when floor mounting any number of cabinets (see Chapter 3—Cabinet Installation, Section 3.5).

RFIF 0

T. RPSB1/RPSB2 (refer to Table 1-7):

RPSB power strips may be required if installing two or more cabinets (see Chapter 3—Cabinet Installation, Figure 3-20).

RPSB1 1 RPSB2

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Worksheet 3 — Configuration Guide (continued) - *Example*

U. VP or Stratagy [1] **Voice Mail**

Refer to Toshiba VP or Stratagy documentation for detailed information about the VM machines and to C2 of Worksheet 2 in this chapter for DK280 VM port requirements.

V. Personal Computers for:

Attendant Consoles (with RATI and RATHC)	
280Admin / 280Backup	
SMIS for ACD	
System Open Architecture	

W. Other Customer Supplied Items:

1. 2-Digital Announcers for ACD
2. 1-Digital music-on-hold device for ACD
3. 1-Tuner for Alternate BGM
4. 2-12 Volt Gel Cell Batteries
5. 1-PC for SMIS for ACD
6.

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Worksheet 4 — System Power Factor Check - *Example*

Power Factor (PF)

1. General Limits
   - Maximum 48 DKT 1000 or 2000 or EKT6500 stations per cabinet
   - Maximum 27 DKTs with any combination of PDIU-DI2 and RPCI-DI in base cabinet or 28 in expansion cabinets.
   - Maximum 120 telephones can be paged simultaneously (this is controlled by system software)
2. Calculate Power Factor (PF) for the four cabinet examples (from page 1-25) starting with Chart 2.
   Use the Power Factors provided in following Tables 1-8 (Example), 1-9 (Example), and 1-10 (Example), along with Charts 2, 3 and 4 that follow to check that the system configuration does not exceed the specified power factor limits.
3. Power Factor Examples for two other example system configurations:

1-Cabinet

System Configuration:
- 40-Digital telephones
- 4-E&M tie lines
- 24-PDIU-DI2

Equipment Type	Qty	PF
RCTUBA/BB	2	1.9
PDKU	5	1.5
REMU	1	7.5
Digital Telephone	40	40.0
PDIU-DI2	24	12.0
Total PF		62.9

OK – Less than 65

6-Cabinets

System Configuration:
- 220-Digital telephones
- 14-E&M tie lines
- 16-Loop start lines
- 4-Attendant consoles
- 104-PDIU-DI2s

Equipment Type	Qty	PF
RCTUC3/D3	2	1.9
PDKU	28	8.4
REMU	4	30.0
RCOU/RCOS		
RATU		
Digital Telephone (first 120, PF = 1.0)	120	120.0
Digital Telephone (last 120, PF = 0.6)	100	60.0
RPCI-DI	104	52.0
Attendant Console	4	16.0
Total PF		296.6

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Worksheet 4 — System Power Factor Check (continued) - *Example*

Table 1-11 (Example)
DK280 Cabinet Power Factor (PF)

Power Supply	Power Factor
RPSU 280	+65

Table 1-12 (Example)
Total System Power Factors

Number of Cabinets	1	2	3	4	5	6
Power Factor	+65	+130	+195	+260	+300	+300
AC input Current	2.5A	5.0A	7.5A	10.0A	11.5A	11.5A

A.C. Current Limitation
by National Electric Code

Table 1-13 (Example)
Printed Circuit Board (PCB) Power Factors (PF)

PCB Type	PF	PCB Type	PF
RCTUA	1.0	RDSU (–24V)	0.3
RCTUB	1.0	PSTU/RSTU (–24V)	0.5
RCTUC/D	1.9	RCOU (4 CO)	2.0
RCTUBA/BB	1.9	RCOU + RCOS (8 CO)	4.0
RRCS-4	0.3	REMU/PEMU	7.5
RRCS-8	0.5	RGLU	2.5
RRCS-12	1.0	RDDU	7.0
PCOU1, 2	2.0	RDSU + R48S (–48V)	0.5
RDTU	1.0	RSTU + R48S (–48V)	1.0
PDKU1, 2	0.3	PEPU	6.5
PEKU	0.7	PIOU	6.5
PESU	0.5	PIOUS	4.0
RATU	0.3	RSIU	0.3
RCIU	0.2	RSIS	0.15
RCIS	0.1	RMDS	0 1 6
IMDU	0.16		

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Worksheet 4 — System Power Factor Check (continued) - *Example*

CHART 2: TELEPHONE/DEVICE POWER FACTORS

The power supply of each cabinet supplies a limited amount of power. For each cabinet, calculate the total Telephone/Device Power Factor (PF) and add it to the appropriate cabinet in PCB/Telephone/Device Charts on the next page.

TELEPHONE / DEVICE	BASE CABINET, CAB. 1					EXP. CABINET, CAB. 2					EXP. CABINET, CAB. 3				
	Quantity	X	Power Factor	=	PF Total	Quantity	X	Power Factor	=	PF Total	Quantity	X	Power Factor	=	PF Total
Digital Telephone (any series)	30	X	1.0*	=	30	16	X	1.0*	=	16		X	1.0*	=	
2000-series Electronic Telephone		X	2.0	=			X	2.0	=			X	2.0	=	
3000-series Electronic Telephone		X	2.5	=			X	2.5	=			X	2.5	=	
6000-series Electronic Telephone		X	2.0	=			X	2.0	=			X	2.0	=	
6005-series Electronic Telephone		X	2.0	=			X	2.0	=			X	2.0	=	
6500-series Electronic Telephone		X	1.0*	=		16	X	1.0-	=	16		X	1.0'	=	
DDCB/HDCB (w. MDFB)	1	X	1.2	=	1.2		X	1.2	=			X	1.2	=	
DDSS/HDSS Console		X	0.8	=		2	X	0.8	=	1.6		X	0.8	=	
Add-on Module		X	0.4	=			X	0.4	=			X	0.4	=	
Integrated PDIU-DI		X	0.5	=		6	X	0.5	=	3		X	0.5	=	
Integrated RPCI-DI		X	0.5	=			X	0.5	=			X	0.5	=	
Stand-alone Data Interface Unit		X	0.8	=			X	0.8	=			X	0.8	=	
Standard Telephone (–48V)		X	1.0	=			X	1.0	=			X	1.0	=	
Standard Telephone (–24V)		X	0.5	=			X	0.5	=		8	X	0.5	=	4
Attendant Console		X	4.0	=			X	4.0	=		1	X	4.0	=	4
Power Failure Unit (DPFT)		X	3.0	=			X	3.0	=			X	3.0	=	
HHEU	4	X	0.1	=	04		X	0.1	=			X	0.1	=	
	Total Power Factor*				31.6	Total Power Factor*				36.6	Total Power Factor'				8

TELEPHONE / DEVICE	EXP. CABINET, CAB. 4					EXP. CABINET. CAB. 5					EXP. CABINET. CAB. 6				
	Quantity	X	Power Factor	=	PF Total	Quantity	X	Power Factor	=	PF Total	Quantity	X	Power Factor	=	PF Total
Digital Telephone (any series)		X	1.0'	=			X	1.0*	=			X	1.0*	=	
2000-series Electronic Telephone		X	2.0	=			X	2.0	=			X	2.0	=	
3000-series Electronic Telephone		X	2.5	=			X	2.5	=			X	2.5	=	
6000-series Electronic Telephone		X	2.0	=			X	2.0	=			X	2.0	=	
6005-series Electronic Telephone		X	2.0	=			X	2.0	=			X	2.0	=	
6500-series Electronic Telephone		X	1.0*	=			X	1.0'	=			X	1.0*	=	
DDCB/HDCB (w. MDFB)		X	1.2	=			X	1.2	=			X	1.2	=	
DDSS/HDSS Console		X	0.8	=			X	0.8	=			X	0.8	=	
Add-on Module		X	0.4	=			X	0.4	=			X	0.4	=	
Integrated PDIU-DI		X	0.5	=			X	0.5	=			X	0.5	=	
Integrated RPCI-DI		X	0.5	=			X	0.5	=			X	0.5	=	
Stand-alone Data Interface Unit		X	0.8	=			X	0.8	=			X	0.8	=	
Standard Telephone (–48V)		X	1.0	=			X	1.0	=			X	1.0	=	
Standard Telephone (–24V)		X	0.5	=			X	0.5	=			X	0.5	=	
Attendant Console		X	4.0	=			X	4.0	=			X	4.0	=	
Power Failure Unit (DPFT)		X	3.0	=			X	3.0	=			X	3.0	=	
HHEU		X	0.1	=			X	0.1	=			X	0.1	=	
	Total Power Factor'					Total Power Factor'					Total Power Factor'				

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**The PF for the first 120 telephones (DKT or EKT) in the system is "1.0"; for telephones 121 to 240, the PF is "0.6". This is because of station paging limit of 120 telephones. Always use "1.0" for DKT telephones when calculating PFs for individual cabinets.*

Worksheet 4 — System Power Factor Check (continued) - *Example*

CHART 3: CABINET POWER FACTOR, PCB/TELEPHONE/DEVICE

Calculate the total Power Factor (PF) of each cabinet (must be less than 65). See Worksheet 2, Chart 1 for PCB quantity and type, and Worksheet A - C for power factors.

CABINET 1

Slots	PCB Type	PF
R11	RCTU-C / RRCS12	-2
RCTU	RCTU-D / RRCS12	-2
Slot 1	PDKU2	-.3
Slot 2	PDKU2	-.3
Slot 3	PDKU2	-.3
Slot 4	PDKU2	-.3
Slot 5	RDTU	-1
Slot 6	—	
Telephone/Device PF See Chart 1		-31.6
Total Cabinet PF		-37.8

CABINET 2

Slots	PCBType	PF
Slot 1	PDKU2	-.3
Slot 2	PDKU2	-.3
Slot 3	PEKU	-.7
Slot 4	PEKU	-.7
Slot 5	PEKU	-.7
Slot 6	PIOUS	-4.0
Slot 7	N/A	
Slot 8	N/A	
Telephone/Device PF See Chart 1		-36.6
Total Cabinet PF		-43.3

CABINET 3

Slots	PCB Type	PF
Slot 1	RSTU	-.5
Slot 2	RATU	-.3
Slot 3	RCOU/RECOS	-4.0
Slot 4	PCOU	-2.0
Slot 5	PCOU	-2.0
Slot 6	PIOUS	-4.0
Slot 7	N/A	
Slot 8	N/A	
Telephone/Device PF See Chart 1		-8
Total Cabinet PF		-20.8

CABINET 4

Slots	PCB Type	PF
Slot 1	—	
Slot 2	—	
	RDTU	-1.0
Slot 4	—	
Slot 5	—	
Slot 6	REMU	-7.5
Slot 7	N/A	
Slot 8	N/A	
Telephone/Device PF See Chart 1		
Total Cabinet PF		-8.5

CABINET 5

Slots	PCB Type	PF
Slot 1		
Slot 2		
Slot 3		
Slot 4		
Slot 5		
Slot 6		
Slot 7	N/A	
Slot 8	N/A	
Telephone/Device PF See Chart 1		
Total Cabinet PF		

CABINET 6

Slots	PCBType	PF
Slot 1		
Slot 2		
Slot 3		
Slot 4		
Slot 5		
Slot 6		
Slot 7	N/A	
Slot 8	N/A	

Number of Cabinets	1	2	3	4	5	6
Max. PF Allowed	65	130	195	260	300	300
Calculated Sum of Cabinet PFs	-37.8	81.1	101.9	170.4		

Worksheets 1 ~ 4 Blanks

Copy as required before using

Worksheet 1 — Summary

This Worksheet provides guidelines for determining the required quantity of each PCB type, PCB slot and cabinet.

A1 ~ A4	–	Determine the customer's Digital Telephone, Door phone, and Data Interface needs.
B1 ~ 66	–	Determine the customer's Electronic Telephone, Door phone, Alternate BGM, and External Amplified conference needs.
C1	–	Determine Digital Port Requirements
c2	–	Determine Standard Port Requirements
c3	–	Determine Electronic Port Requirements
c4	–	Determine Station PCB/Slot Requirements
C4.1	–	PDKU PCB/Slot
C4.2	–	RSTU or PSTU PCB/Slots
c4.3	–	RDSU/RSTU PCB/Slots
c4.4	–	PEKU PCB/Slots
c4.5	–	PESU PCB/Slots
C4T	–	Total Station PCB Slots
c5	–	Determine CO Line PCB/Slot Requirements
C5.1	–	RCOU/RCOS PCB Slots
C5.2	–	RGLU PCB Slots
c5.3	–	RCIU/RCIS PCB Slots
c5.4	–	REMU or PEMU PCB Slots
c5.5	–	RDDU PCB Slots
C5.6	–	RDTU PCB Slots
C5T	–	Total CO Line PCB Slots
C6	–	Attendant Console Slot
c7	–	PIOU/PIOUS/RSIU/RSSU Slots
C8	–	PEPU SLOT

IMPORTANT!

Before using, copy the following blank worksheets as needed.

Worksheet 1 — System PCB (Slot) Requirements

Customer:_____ Location:_____

Complete Worksheet 1 before proceeding with other worksheets.

A1. DDSS consoles required (refer to DDSS in Table 1-6): (A1) DDSS_____

A2. Digital door phone/lock units required (refer to DDCB in Table 3-6): (A2) DDCB_____

A3. PDIU-DSs required (refer to PDIU-DS in Table 1-5): (A3) PDIU-DS_____

A4. Digital telephones, with or without PDIU-DI or RPCI-DI, required (refer to PDKU in Table 1-2):

2010-SD_____ + 2010-H_____ + 2020-SD_____ + 2020-S_____

1020-H_____ + 1020-SD_____ = (A4) Total digital telephones_____

B1. HDSS consoles required (refer to HDSS in Table 1-6): (B1) HDSS_____ (existing)

B2. Door phone/lock units required (refer to HDCB in Table 1-6): (B2) HDCBs_____

B3. Electronic telephones required (refer to PEKU and PESU in Table 1-2):

6510-H_____ + 6510-S_____ + 6520-S_____ + 6520-SD_____

Note:
Add in all other electronic telephones if upgrading an existing Strata DK system using 2000-/6000-/6005-series electronic telephones.

(B3) Total electronic telephones_____ (existing)

B4. Separate BGM source (connected to electronic telephone circuit) required (1 maximum):

(B4) Separate BGM source_____ (existing)

B5. External amplifiers for two-CO line amplified conference required (4 maximum):

(B5) Two-CO line conference amplifiers_____

66. Determine Standard Telephone device requirements, and add to C2 on next page,

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Worksheet 1 — System PCB (Slot) Requirements (continued)

Fill in System Requirements below (refer to Table 1-1 for maximum quantities)

C1. Determine Digital Port Requirements (from A1 ~ A4):

B. Total Digital DSS Consoles		1 port per each DDS
C. Total Digital Door Phone Control Boxes**		1 port per each DDCB
D. Total Stand Alone Data Interface Units		1 port per each PDIU-1

*Digital telephone equipped with PDIU-D12 or ADM only require 1 digital port.
**1 Door Phone Control Box (DDCB) supports three Door Phones (MDFBs)

C2. Determine Standard Port Requirements (from B5):

A. Total Standard Telephones (On and Off Premise)		1 port per Telephone
B. Total Voice Mail Ports		1 port per VM Port
C. Total FAX or MODEM devices		1 port per Device
D. Total ACD and Auto Attendant Digital Announcement Devices		1 port per Device
E. Alternate BGM Source*		1 port
F. Total Other Devices**		1 port per Device

C2 = Standard Telephone Ports =

*Isolation transformer may be required, see Chapter 6—Peripheral Installation.
**Other devices include Dictation equipment, etc.

A. Total Electronic Telephones		1 port per Telephone
B. Total Electronic DSS Consoles		2 ports per HDSS console
C. Total Electronic Door Phone Control Boxes		1 port per HDCB (3-max)
D. Total		2 ports per Amplifier
E. Alternate BGM Source		1 port

Worksheet 1 — System PCB (Slot) Requirements (continued)

C4. Determine Station PCBs / Slots Required (Refer to Table 1-2 for PCB information)

C4.1 Total PDKU PCBs = $\frac{\text{DIGITAL PORTS (from C1)}}{8}$ = _____ = _____ (round up)

Total PDKU PCBs (Slots) = [ ] (Refer to C4.3 before finalizing this number)

General Notes:

- *PDKU provides eight digital telephone ports (circuits). Circuit 5 (when associated with ports 004, 012, 020, and 028) can only interface with a DDCB. Circuit 8 can only inferface with a DDSS console (see Table 1-6).*
- *The PDKU1 can also be used. The PDKU1 can only support Data Interface Units (DIUs) on circuits 1 - 7, while the PDKU2 can support DIUs on all eight circuits. See Worksheet 2, Table 1-8 (Example) for slot limitations.*

C4.2 Total RSTU PCBs = $\frac{\text{STANDARD PORTS (from C2)}}{8}$ = _____ = _____ (round up)

Total RSTU PCBs (Slots) = [ ]

General Notes:

- *The PSTU2 or PSTU1 can also be used. These earlier version PCBs can interface with the same devices that the RSTU can, but they have different ring generators and cannot support MW. See the RSTU/PSTU section in Chapter 4—Printed Circuit Boards for more details.*
- *The RSTU provides eight standard telephone ports (circuits). Circuit 2 only can connect to a separate Background Music (BGM) source. The RSTU can be equipped with an R48S to extend the loop length of the RSTU from 600 ohms to 1200 ohms (see Table 1-4).*
- *RSTU2 is required to operate message waiting lamps on a standard telephone.*

C4.3 RDSU (RSTS) can be used when four or less digital or standard ports are needed.

Total RDSU PCBs [_____] four digital/two standard ports

Total RSTS PCBs [_____] adds two standard ports to RDSU

General Notes:

- *RDSU provides two standard telephone ports (circuits) and four digital ports (circuits) in its basic configuration. The optional RSTS can be attached to the RDSU to provide two more standard telephone ports. The RSTU can be equipped with an R48S to extend the loop length of the RSTU standard telephone ports from 600 ohms to 1200 ohms (see Table 1-4).*

C4.4 Total PEKU PCB / Slots = $\frac{\text{ELECTRONIC PORTS (from C3)}}{8}$ = _____ = _____ (round up)

Total PEKU PCBs (Slots) = [ ] (Refer to C4.5 before finalizing this number)

General Note:

- *PEKU provides eight electronic telephone ports (circuits). Circuit 5 (when associated with ports 004, 012, 020, or 028) can only interface with an HDCB. The HDSS consoles requires two circuits, circuits 7 and 8, on a PEKU (see Table 1-6). Each conference amplifier requires use of circuits 2 and 3 of a PEKU.*

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Worksheet 1 — System PCB (Slot) Requirements (continued)

C4.5 PESU can be used when four or less electronic or two or less standard ports are needed.

Total PESU PCB (Slots) = _____

General Note:
- *PESU provides two standard telephone ports (circuits) and four electronic telephone circuits (ports). Circuit 5 (when associated with Ports 004, 012, 020, and 028) can only interface with an HDCB (see Table 1-6).*

Total Station PCBs / Slots:

PDKU _____ (from C4.1)

RSTU _____ (from C4.2)

RDSU _____ (RSTS _____) from C4.3

PEKU _____ (from C4.4) Existing

PSTU _____ (from C4.2)

PESU _____ (from C4.5)

C4T = Total Station PCB Slots = _____

C5. Determine CO Line PCB / Slot Requirements

C5.1 Determine Analog Loop Start Line PCB /Slot Requirements

Total loop start lines (with or without caller ID) needed: _____ (from Company A s requirements, eight exist already)

A = Total RCOU / RCOS PCB (Slots) = ~~Loop Start Lines~~ / 8 − 8 − _____

B = *RGLU, RCOU or PCOU PCB (Slots) = Loop Start Lines / 4 = _____ / 4 − _____ PCOU (existing)

C5.1 = Total Loop Start Llne slots (A + B) = _____ + _____ = _____

**RGLU can provide loop or ground start lines.*

General Notes:
- *RCOU provides four loop start CO lines in its basic configuration. An RCOS can be attached to the RCOU to add four more loop start CO lines for a total of eight per slot.*
- *PCOU2 provides four loop start CO lines.*
- *The PCOU1 and the PCOU2 are identical in fit, form, and function for the U.S. market.*

C5.2 Determine Analog Ground Start Line PCB / Slot Requirements

Total ground start lines (with or without caller ID) needed: _____ (from Company A's requirements)

C5.2 = Total Loop Start Lines A + B = Ground Start Lines / 4 = _____ / 4 = _____

General Note:
- *RGLU provides four CO lines that can be individually configured as loop start or ground start.*

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Worksheet I — System PCB (Slot) Requirements (continued)

C5.3 Determine Caller ID FSK receiver/decoder PCB / Slot Requirements

Total Ground/Loop Start Line with caller ID: _____ (from Company A S requirements)

A = Total RCIU/RCIS PCB (Slots) = $\frac{\text{Caller ID Lines}}{8} = \frac{\quad}{8} =$ [ ]

General Note:

- *RCIU provides four caller ID receiver/decoder circuits. RCIU with RCIS subassembly provides eight caller ID receiver/decoder circuits. Always use RCIU with RCIS for up to eight circuits as opposed to using two RCIU PCBs. These circuits do not use up station port or CO line software assignments.*

C5.4 Determine Analog Tie Line PCB / Slot Requirements

Total analog tie lines (with or without ANI/DNIS) needed: _____ (from Company A's requirements)

CT = Total REMU or PEMU PCB (Slots) = $\frac{\text{Tie Lines}}{4} = \frac{\quad}{4} =$ [ ]

General Notes:

- *REMU provides four E&M tie trunks (Type I or II signaling, Wink or Immediate Start, 2- or 4-wire transmission).*
- *The PEMU1 can also be used. The PEMU only provides Type I signaling, 2- or 4-wire transmission and Immediate Start.*
- *See Table I-I for REMU / PEMU maximum quantities. Each REMU or PEMU reduces system station port line and capacity by four ports and four lines.*

C5.5 Determine Analog DID Line PCB (Slot) Requirements

Total DID lines (with or without ANI/DNIS) needed: _____ (from Company A s requirements)

C5.4 = Total RDDU PCB (Slots) = $\frac{\text{Analog DID lines}}{4} = \frac{\quad}{4} = \frac{\quad}{\quad}$

General Notes:

- *RDDU provides four Direct Inward Dialing lines. (Each RDDU reduces system station port and line capacity by four ports and four lines.)*
- *See Table 1-2 for RDDU maximum quantities.*

C5.6 Determine RDTU T1 PCB (Slot) Requirements (Loop / Ground / Tie / DID Lines)

T1 / DS-1 Channels needed (from Company A s requirements)'

Loop Start Lines _____ (channels)

Ground Start Lines _____ (channels)

TIE Line (with or without ANI/DNIS) _____ (channels)

DID Lines (with or without ANI/DNIS) _____ (channels)

C5.6 = Total RDTU Lines _____ (channels)

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Worksheet 1 — System PCB (Slot) Requirements (continued)

C5.7 Total Number of RDTU Slots:

8-channel RDTU PCB / Slots _____

16-channel RDTU PCB / Slots _____ (include skipped slots)^2-2 Slots

24-channel RDTU PCB / Slots _____ (include skipped slots)^2-2 Slots

C5.6 = Total RDTU PCB / Slots [ ] / [ ]

Notes:
1. *Contact the T1 provider (Telco or Carrier company) to determine exact T1 channel/line needs.*
2. *When installing 16 or 24 channel RDTU PCBs into a slot, the next slot or two slots may not be usable for other PCBs (see Worksheet2, Tables 1-9 (Example) and 1-10 (Example)).*

General Notes:
- *RDTU provides either 8, 16, or 24 channels (lines), depending on programming. Each channel can be set for either DID, ground start CO, loop start CO, or tie line operation. (Each RDTU tie line or DID line reduces the system line and station port capacity by one port.)*
- *As many as six RDTU PCBs can be installed in systems operating with the RCTUC/D common control unit, as many as two with RCTUB operated systems. The RCTUA does not support RDTU.*
- *Each tie or DID line reduces the system station port capacity by one port.*

Total CO LINE PCB / Slots (C5):

RCOU / RCOS _____ (from C5.1)

PCOU _____ (from C5.1)

RGLU _____ (from C5.1, 5.2)

RCIU / RCIS _____ (from C5.3)

REMU _____ (from C5.4)

RDDU _____ (from C5.5)

RDTU _____ (from C5.6)

C5T = Total CO line PCB / Slots = [ ] / [ ]

C6. Attendant Console Slots

C6T = RATU PCB / Slot [ ] one required for 1 ~ 4 Attendant Console (Maximum)

c7. PIOU / PIOUS / RSIU / RSSU Option Slot (see Table 1-3)

A. MIS for ACD required new
B. Remote / Local Maintenance with "280 ADMIN" or "280 Backup" Personal Computer
C. Simplified Message Desk (SMDI)
D. Station Message Detail Recording (SMDR) existing PIOU
E. System Open Architecture (OA)
F. Miscellaneous Options (see Table 1-3)

General Notes:
- *The subassembly PCBs listed below do not require additional cabinet slots,*
  - *The IMDU subassembly plugs onto PIOU or PIOUS to provide a remote maintenance modem.*
  - *The RMDS subassembly plugs onto the RSIU to provide a remote maintenance modem.*
  - *Up to three RSIS subassemblies can plug onto RSIU to provide any option (A - E).*

List which Option PCBs are required [ ] [ ] [ ] [ ] .

C7T = Total PIOU / PIOUS / RSIU / RSSU PCB / Slots = [ ] .

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Worksheet I — System PCB (Slot) Requirements (continued)

C8. PEPU Page Option PCB

PEPU provide 600-ohm interface or 5-watt page output

Total PEPU PCBs (Slots) [ ]

C9. Total System Slots = C4T_____ + C5T_____ + C6T_____ + C7T_____ + C8T_____

C9T = Total Slots = _____

C10. Total Cabinets = $\frac{\text{C9T}}{6} = \frac{\_\_\_\_}{6} = \_\_\_\_ -$

C11. Go to Worksheet 2 and fill-in Worksheet 2, Chart A.

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Worksheet 2 — System PCB Assignment Guide

A. After completing Worksheet 1, use the procedure in B (below) to configure each PCB in the correct slots and cabinets. Fill in Chart 1 in this worksheet section as follows:

- Write the PCB type under the correct slot of the configuration chart.
- If the following is installed:
  - Station, PC attendant console, DID, or tie line PCB: record the appropriate port numbers used by each.
  - CO, tie, or DID line is installed: record the line numbers.
  - RCIU/RCIS is installed: record the Caller ID circuit numbers.
  - Option: record the option.

  When this is complete, system configuration is known.

B. Fill in Chart 1 by installing PCBs in the following order (see Worksheet 1 for PCB type and quantities).

RSIU in slot 11	PDKU or PEKU in slot 11
PDKU or PEKU in slot 12 ↓	Starting with Slot 12, install all station' ground and loop start lines', and option PCBs[3] from left to right, from lowest to highest numbered slots without leaving any empty slots[4]. They may be intermixed in cabinets, and do not have to be placed in consecutive order by PCB type, providing that no slots are skipped and left empty. Remember to install subassembly PCBs onto plug-in PCBs before inserting plug-in PCBs into cabinet slots.
Starting with Slot 13, install all station' ground and loop start lines[2], and option PCBs[3] from left to right, from lowest to highest numbered slots without leaving any empty slots[4]. They may be intermixed in cabinets and do not have to be placed in consecutive order by PCB type, providing that no slots are skipped and left empty. Remember to install subassembly PCBs onto plug-in PCBs before inserting plug-in PCBs into cabinet slots.	↓

Next lighest Available Slot(s):

- If the system is equipped with a PC or Toshiba Conventional Attendant Console, install the RATU PCB in the next highest available slot. The Attendant Console PCB will be assigned the next four station ports.
- If the system is equipped with tie or DID lines[4], install the tie and DID line PCBs from left to right, starting with the next highest empty slot in the system to the highest numbered slot needed — do not skip slots[5].
- After all station, line, and option PCBs have been recorded in Chart A, determine which Common Control PCBs should be used: RCTUA, RCTUB, RCTUBA/BB, RCTUC/D — refer to Table 1-1. Complete the "Chart 1: PCB Configuration" by installing the RCTU PCB(s).

Worksheet 2 — System PCB Assignment Guide (continued)

After completing Worksheet 2, follow Worksheet 3 guidelines to configure miscellaneous items.

Notes:

1. *Station PCBs include: PDKU, RDSU/RSTS, RSTU, RSTU2, PEKU, PESU, and PSTU. When installing PDKU1 and PDKU2, see Worksheet2, Table 1-8 (Example) for configuration requirements regarding OCA, RPCI-DI, PDIU-DI/DS, and PDKU1. All station PCBs use four to eight station port software time slot requirements.*
2. *Ground and loop start CO line PCBs include RCOU/RCOUS, RGLU, PCOU, and RDTU. Do not install tie or DID line PCBs because they use station ports and will cause station port shifting. If installing RDTU (Ti) PCBs, see Worksheet 2, Tables 1-9 (Example) and 1-10 (Example) for RDTU slot requirements. Always attempt to install RDTU PCBs starting with cabinet slots that only require two slots to allow all 24-channels to operate. **All** CO PCBs use from 4, 8, 26 or 24 CO line software time slot assignments.*
3. *Option PCBs that require a cabinet slot include PIOU, PIOUS, PEPU, RSIU, RSSU, and RCIU.*
4. *Tie and DID line PCBs include: REMU, RDDU, PEMU, and RDTU. tie/DID line PCBs use station ports and CO line ports in DK280 software, so they should not be installed in lower numbered slots than station PCBs whenever practical. This will prevent station port number shifting which could cause problems with BLF, station directory number, or Primary Directory Number **[PDN]** sequences. If installing an RDTU, see Worksheet 2, Tables 1-9 (Example) and 1-10 (Example) for RDTU slot requirements.*
5. *If installing RDTU (T1) PCBs, it may be required to skip certain slots. In this case, these slots must be skipped and remain vacant, See Worksheet2, Tables 1-9 (Example) and 1-10 (Example).*

General Note:

The maximum number of station ports used by station, PC attendant console, tie, and DID PCBs can not exceed the following quantities:

RCTUA	=	32 maximum
RCTUB or RCTUBA/BB	=	80 maximum
RCTUC/D	=	240 maximum

In some rare configurations, when using RDTU (T1) tie or DID lines in systems, the maximum number of stations allowed may be reduced because the RDTU PCB takes up two or three cabinet slots and one station port per RDTU tie/DID channel used. RCIU/RCIS PCBs do not take from or use station ports or CO line software time slot assignments.

Worksheet 2 — System PCB Assignment Guide (continued)

Table 1-8
PDKU1/PDKU2/OCA/RPCI/PDIU Configuration

	Slots → 11	12	13	14	15	16
Base Cabinet (1)	(A)	(A)	(A)	(A)	(A)	(A)
	Slots → 21	22	23	24	25	26
Cabinet (2)	(A)	(A)	(B)	(B)	(B)	(B)
	Slots → 31	32	33	34	35	36
Cabinet **(3)**	(A)	(A)	(C)	(C)	(C)	(C)
	Slots → 41	42	43	44	45	46
Cabinet (4)	(A)	(A)	(D)	(D)	(D)	(D)
	Slots → 51	52	53	54	55	56
Cabinet (5)	(A)	(A)	(C)	(C)	(C)	(C)
	Slots → 61	62	63	64	65	66
Cabinet (6)	(A)	(A)	(D)	(D)	(D)	(D)

General Not

- *All slots s*
- (A) *slots*
- (B) *slots do not support OCA, RPCI-DI*, or PDIU-DI/DS with PDKU1 but do support OCA, RPCI-DI*, or PDIU-DI/DS with PDKU2.*
- (C) *slots do not support PDKU1 PCBs.* (C) *slots support PDKU2 but do not support OCA, RPCI-DI*, or PDIU-DI/DS.*
- (D) *slots do not support OCA, RPCI-DI*, or PDIU-DI/DS with PDKUI or PDKU2.*
- *PDKU1 does not support continuous DTMF tones on 2000-series digital telephones.*

**All slots support RPCI-DI if it is connected to PDKU2 when the RPCI is used for API computers only and is not used for switched data calls (RPCI to RPCI or RPCI to PDIU connections).*

Worksheet 2 — System PCB Assignment Guide (continued)

Table 1-9
1 - 8 or 1 ~ 16 Channel RDTU Slot Configuration

Cabinet	"Allowed" RDTU Slot Number[1]	Slots that must remain vacant if a 16 channel RDTU is installed in the "allowed" slot shown to the left of this column.
1 (Base Unit)	13	No slot must be vacant
	15	No slot must be vacant
2 (Expansion Unit)	21	No slot must be vacant
	23	No slot must be vacant
	25	No slot must be vacant
3 (Expansion Unit)	31	No slot must be vacant
	33	35
4 (Expansion Unit)	41	No slot must be vacant
	43	45
5 (Expansion Unit)	51	No slot must be vacant
	53	55
6 (Expansion Unit)	61	No slot must be vacant
	63	65

Table 1-10
1 ~ 24 Channel RDTU Slot Configuration

Cabinet	"Allowed" RDTU Slot Number'	Slots that must remain vacant if a 24 channel RDTU is installed in the "allowed" slot shown to the left of this column.
1 (Base Unit)	13	14
2 (Expansion Unit)	21	22
	23	24
	25	26
3 (Expansion Unit)	31	32
	33	34, 35
4 (Expansion Unit)	41	42
	43	44, 45
5 (Expansion Unit)	51	52
	53	54, 55
6 (Expansion Unit)	61	62

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Note:
1. RDTU PCBs can only be installed in the "Allowed slots shown.

General Notes:
- *If installing an RDTU with 1 - 24 channels:*
  - *Install the RDTU in the "Allowed" RDTU slot.*
  - *You are required to leave the slots indicated vacant.*

Worksheet 2 — System PCB Assignments

CHART 1: DK280 PCB CONFIGURATION

CABINET 1	R11	RCTU	S11	S12	S13	S14	S15	S16
PCB Type >								
Port Nos. >								
Line Nos. >								
Option/Note >								
CABINET 2	S21	S22	S23	S24	S25	S26	S27	S28
PCB Type >								
Port Nos. >								
Line Nos. >								
Option/Note >								
CABINET 3	S31	S32	S33	S34	S35	S36	S37	S38
PCB Type >								
Port Nos. >								
Line Nos. >								
Option/Note >								
CABINET 4	S41	S42	S43	S44	S45	S46	S47	S48
PCB Type >								
Port Nos. >								
Line Nos. >								
Option/Note >								
CABINET 5	S51	S52	S53	S54	S55	S56	S57	S58
PCB Type >								
Port Nos. >								
Line Nos. >								
Option/Note >								
CABINET6	S61	S62	S63	S64	S65	S66	S67	S68
PCB Type >								
Port Nos. >								
Line NOS. >								
Option/Note >								

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Worksheet 3 — Configuration Guide

(Miscellaneous Option Requirements)

A. Add-on Module (refer to Table 1-5): Total_____

2000-series digital telephones can be equipped with one or two Add-on Module(s) to provide an additional 20 or 40 combinations of CO Lines, DSS, and Speed Dial buttons.

B. RRCSPCB:

1. An RRCS (-4, -8 or 12) must be installed on the RCTUA, RCTUB, RCTUBA/BB, or RCTUC/D, if the customer has DTMF DID, tie, ANI, DNIS, DISA lines (remote change of call forward destination), DNIS External Call Routing, using DTMF standard telephones or voice mail-type devices with DTMF interfaces or built-in auto attendant connected to RDSU, RSTU, RSTU2, PSTU, or PESU standard telephone ports. RCTUC/D supports one RRCS on each PCB, 2 RRCS's total (maximum 24 DTMF receivers).

2. For normal traffic, an RRCS-4 (providing four DTMF receiver circuits) will be sufficient. However, for extremely high traffic requirements, an RRCS1-8 or RRCS-12 (providing eight or twelve DTMF receiver circuits) may be required, or multiple RRCS for large systems.

RRCS-4 ____ or RRC2-8 ____ or RRCS-12 ____

General Note:

- *Only one RRCS can be used per system with RCTUA or RCTUB; RCTUC/D and RCTUBA/RCTUBB support 2 RRCS PCBs (total 24 DTMF receivers maximum).*

C. RKYS (1, 2, 3, or 4) _____. (for ACD/MIS plus built-in Auto Attendant)

If auto attendant (built-in), ACD, ACD/MIS, or System Open Architecture (OA) port is required, one RKYS option key is required see Table 1-4.

D. EOCU (refer to Table 1-4):

An EOCU must be installed on each PEKU and/or PESU that is connected to electronic telephones which are equipped to receive Off-hook Call Announce (OCA).

Actual EOCU PCBs____	3-PEKU with OCA (existing)

General Notes:

- *One EOCU for each PEKU or PESU that supports electronic telephones that must receive OCA.*
- *Be sure that proper consideration is given to where the PEKU or PESU is placed to provide the most efficient use of the eight-circuit EOCU: The PESU only provides four electronic telephone ports: HDSS consoles use two ports on a PEKU; HDCBs use one port on a PESU or PEKU.*

E. DVSU (refer to Table 1-5):

One DVSU is required for each digital telephone that must receive telephone speaker OCA – not Handset/Headset OCA.

Actual DVSU _____	40 DKT stations with telephone speaker OCA

F. HVSU2 (refer to Table 1-5):

Electronic telephones equipped with an HVSU2 can receive OCA calls.

Actual HVSU2s _____	16 EKT stations with OCA (existing)

G. HVSU/HVSI (refer to Table 1-5):

Electronic telephones equipped with the older HVSU and HVSI subassemblies can receive OCA calls.

Actual HVSUs/HVSIs _____

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Worksheet 3 — Configuration Guide (continued)

H. PIOU / RSIU Subassembly PCBs

H1.

IMDU PCB _____	PIOUS

H2.

RMDS PCB _____	(installed on RSIU in slot 11)

H3.

_____

Actual HHEU PCBs _____	Four Telephones with headsets

Actual HESC-65As ____

Actual HESBs _____

PBTC-3M _____	RBTC1A-2M _____

PPTC _____ (25-pin)	PPTC-9 _____ (9-pin)

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Worksheet 3 — Configuration Guide (continued)

N. DPFT Unit:

The DPFT provides a means to connect eight selected CO lines to standard telephones in the event of a power failure (each DPFT requires an RSTU or PSTU PCB). There is no limit to the number of DPFTs installed, provided that the system power factor is not exceeded.

DPFT _____

O. MDFB (Door Phone):

The MDFB plugs into the DDCB or HDCB control box to provide a door phone. Three MDFBs can be connected to each DDCB or HDCB. The MDFB may also be connected to the HESB amplifier/speaker to provide page talkback.

Actual MDFBs _____

P. RPCI-DI:

Digital telephones must be equipped with a RPCI-DI to transmit and receive voice and data calls and/or interface with an Application Program Interface **(API)** personal computer.

Actual _____

for 2000-series DKTS

Q. RBDB (refer to Table 1-7):

RBDB Battery Box: Required when connecting reserve power batteries to three or more cabinets (wall or floor mount—see Chapter 3—Cabinet Installation, Figure 3-23 - 3-26)

RBDB _____

R. RCCB (refer to Table 1-7):

RCCB conduit box is required for floor mount installations of three or more cabinets (see Chapter 3—Cabinet Installation, Figure 3-21 and 3-22).

RCCB _____

S. RFIF (refer to Table 1-7):

RFIF floor mount kit is required when floor mounting any number of cabinets (see Chapter 3—Cabinet Installation, Section 3.5).

RFIF _____

T. RPSB1/RPSB2 (refer to Table 1-7):

RPSB power strips may be required if installing two or more cabinets (see Chapter 3—Cabinet Installation, Figure 3-20).

RPSB1 _____ RPSB2 _____

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Worksheet 3 — Configuration Guide (continued)

U. VP or Stratagy [ ] **Voice Mail**

Refer to Toshiba VP or Stratagy documentation for detailed information about the VM machines and to C2 of Worksheet 2 in this chapter for DK280 VM port requirements.

V. Personal Computers for:

Attendant Consoles (with RATI and RATHC)	[ ]
280Admin / 280Backup	[ ]
SMIS for ACD	[ ]
System Open Architecture	[ ]

W. Other Customer Supplied Items:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

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Worksheet 4 — System Power Factor Check

Table 1-11
DK280 Cabinet Power Factor (PF)

Power Supply	Power Factor
RPSU 280	+65

Table 1-12
Total System Power Factors

Number of Cabinets	1	2	3	4	5	6
Power Factor	+65	+130	+195	+260	+300	+300
AC Input Current	2.5A	5.0A	7.5A	10.0A	11.5A	11.5A

A.C. Current Limitation
by National Electric Code

Table 1-13
Printed Circuit Board (PCB) Power Factors (PF)

PCB Type	PF	PCB Type	PF
RCTUA	1.0	RDSU (–24V)	0.3
RCTUB	1.0	PSTU/RSTU (–24V)	0.5
RCTUC/D	1.9	RCOU (4 CO)	2.0
RCTUBA/BB	1.9	RCOU + RCOS (8 CO)	4.0
RRCS-4	0.3	REMU/PEMU	7.5
RRCS-8	0.5	RGLU	2.5
RRCS-12		RDDU	7.0
PCOU1, 2		RDSU + R48S (–48V)	0.5
		RSTU + R48S (–48V)	1.0
PDKU1, 2	0.3	PEPU	6.5
		PIOU	6.5
		PIOUS	4.0
RATU		RSIU	0.3
RCIU	0.2	RSIS	0.15
RCIS	0.1	RMDS	0.16
IMDU	0.16		

Worksheet 4 — System Power Factor Check (continued)

CHART 2: TELEPHONE/DEVICE POWER FACTORS

The power supply of each cabinet supplies a limited amount of power. For each cabinet, calculate the total Telephone/Device Power Factor (PF) and add it to the appropriate cabinet in PCB/Telephone/Device Charts on the next page.

TELEPHONE/DEVICE	BASE CABINET, CAB. 1				EXP. CABINET, CAB. 2				EXP. CABINET, CAB. 3			
	Quantity	X Power Factor	=	PF Total	Quantity	X Power Factor	=	PF Total	Quantity	X Power Factor	=	PF Total
Digital Telephone (any series)	____	X 1.0*	=	____	____	X 1.0*	=	____	____	X 1.0"	=	____
2000-series Electronic Telephone	____	X 2.0	=	____	____	X 2.0	=	____	____	X 2.0	=	____
3000-series Electronic Telephone	____	X 2.5	=	____	____	X 2.5	=	____	____	X 2.5	=	____
6000-series Electronic Telephone	____	X 2.0	=	____	____	X 2.0	=	____	____	X 2.0	=	____
6005-series Electronic Telephone	____	X 2.0	=	____	____	X 2.0	=	____	____	X 2.0	=	____
6500-series Electronic Telephone	____	X 1.0*	=	____	____	X 1.0*	=	____	____	X 1.0*	=	____
DDCB/HDCB (w. MDFB)	____	X 1.2	=	____	____	X 1.2	=	____	____	X 1.2	=	____
DDSS/HDSS Console	____	X 0.8	=	____	____	X 0.8	=	____	____	X 0.8	=	____
Add-on Module	____	X 0.4	=	____	____	X 0.4	=	____	____	X 0.4	=	____
Integrated PDIU-DI	____	X 0.5	=	____	____	X 0.5	=	____	____	X 0.5	=	____
Integrated RPCI-DI	____	X 0.5	=	____	____	X 0.5	=	____	____	X 0.5	=	____
Stand-alone Data Interface Unit	____	X 0.8	=	____	____	X 0.8	=	____	____	X 0.8	=	____
Standard Telephone (–48V)	____	X 1.0	=	____	____	X 1.0	=	____	____	X 1.0	=	____
Standard Telephone (–24V)	____	X 0.5	=	____	____	X 0.5	=	____	____	X 0.5	=	____
Attendant Console	____	X 4.0	=	____	____	X 4.0	=	____	____	X 4.0	=	____
Power Failure Unit (DPFT)	____	X 3.0	=	____	____	X 3.0	=	____	____	X 3.0	=	____
HHEU	____	X 0.1	=	____	____	X 0.1	=	____	____	X 0.1	=	____
	Total Power Factor*			____	Total Power Factor*			____	Total Power Factor'			____

TELEPHONE/DEVICE	EXP. CABINET, CAB. 4				EXP. CABINET, CAB. 5				EXP. CABINET. CAB. 6			
	Quantity	X Power Factor	=	PF Total	Quantity	X Power Factor	=	PF Total	Quantity	X Power Factor	=	PF Total
Digital Telephone (any series)	____	X 1.0*	=	____	____	X 1.0*	=	____	____	X 1.0*	=	____
2000-series Electronic Telephone	____	X 2.0	=	____	____	X 2.0	=	____	____	X 2.0	=	____
3000-series Electronic Telephone	____	X 2.5	=	____	____	X 2.5	=	____	____	X 2.5	=	____
6000-series Electronic Telephone	____	X 2.0	=	____	____	X 2.0	=	____	____	X 2.0	=	____
6005-series Electronic Telephone	____	X 2.0	=	____	____	X 2.0	=	____	____	X 2.0	=	____
6500-series Electronic Telephone	____	X 1.0'	=	____	____	X 1.0'	=	____	____	X 1.0*	=	____
DDCB/HDCB (w. MDFB)	____	X 1.2	=	____	____	X 1.2	=	____	____	X 1.2	=	____
DDSS/HDSS Console	____	X 0.8	=	____	____	X 0.8	=	____	____	X 0.8	=	____
Add-on Module	____	X 0.4	=	____	____	X 0.4	=	____	____	X 0.4	=	____
Integrated PDIU-DI	____	X 0.5	=	____	____	X 0.5	=	____	____	X 0.5	=	____
Integrated RPCI-DI	____	X 0.5	=	____	____	X 0.5	=	____	____	X 0.5	=	____
Stand-alone Data Interface Unit	____	X 0.8	=	____	____	X 0.8	=	____	____	X 0.8	=	____
Standard Telephone (–48V)	____	X 1.0	=	____	____	X 1.0	=	____	____	X 1.0	=	____
Standard Telephone (–24V)	____	X 0.5	=	____	____	X 0.5	=	____	____	X 0.5	=	____
Attendant Console	____	X 4.0	=	____	____	X 4.0	=	____	____	X 4.0	=	____
Power Failure Unit (DPFT)	____	X 3.0	=	____	____	X 3.0	=	____	____	X 3.0	=	____
HHEU	____	X 0.1	=	____	____	X 0.1	=	____	____	X 0.1	=	____
	Total Power Factor*			____	Total Power Factor*			____	Total Power Factor*			____

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**The PF for the first 720 telephones (DKT or EKT) in the system is "1.0"; for telephones 721 to 240, the PF is "0.6". This is because of station paging limit of 720 telephones. Always use "1.0" for DKT telephones when calculating PFs for individual cabinets.*

Worksheet 4 — System Power Factor Check (continued)

CHART 3: CABINET POWER FACTOR, PCB/TELEPHONE/DEVICE

Calculate the total Power Factor (PF) of each cabinet (must be less than 65). See Worksheet 2, Chart 1 for PCB quantity and type, and Worksheet A - C for power factors.

CABINET 1

Slots	PCB Type	PF
Slot 1		
Slot 2		
Slot 3		
Slot 4		
Slot 5		
Slot 6		
Slot 7	N/A	
Slot 8	N/A	
Telephone/Device PF See Chart 1		
Total Cabinet PF		

CABINET 2

Slots	PCB Type	PF
Slot 1		
Slot 2		
Slot 3		
Slot 4		
Slot 5		
Slot 6		
Slot 7	N/A	
Slot 8	N/A	
Telephone/Device PF See Chart 1		
Total Cabinet PF		

CABINET 3

Slots	PCB Type	PF
Slot 1		
Slot 2		
Slot 3		
Slot 4		
Slot 5		
Slot 6		
Slot 7		
Slot 8		
Telephone/Device PF See Chart 1		
Total Cabinet PF		

CABINET 4

Slots	PCB Type	PF
Slot 1		
Slot 2		
Slot 3		
Slot 4		
Slot 5		
Slot 6		
Slot 7	N/A	
Slot 8	NIA	

CABINET 5

Slots	PCB Type	PF
Slot 1		
Slot 2		
Slot 3		
Slot 4		
Slot 5		
Slot 6		
Slot 7	N/A	
Slot 8	*NIA*	
Telephone/Device PF See Chart 1		
Total Cabinet PF		

CABINET 6

Slots	PCB Type	PF
Slot 1		
Slot 2		
Slot 3		
Slot 4		
Slot 5		
Slot 6		
Slot 7	N/A	
Slot 8	N/A	
Telephone/Device PF See Chart 1		
Total Cabinet PF		

CHART 4: Total system power factor, calculate the sum of cabinet power factors (PCBs/Telephones/Devices), the should not exceed the limits shown below (see Table **1-12).**

Number of Cabinets	1	2	3	4	5	6
Max. PF Allowed	65	130	195	260	300	**300**
Calculated Sum of Cabinet PFs						

Site Requirements

2

This chapter defines the installation site requirements necessary to ensure a proper operating environment for the Strata DK280. Also included are input power requirements, cable lengths/network requirements, and grounding requirements.

2.1 Input Power Requirements

The Strata DK280 requires an input power source of 117VAC nominal (85VAC - 135VAC), 50/60 Hz, 15 amps. The system requires one or two AC outlets that must be dedicated to system use, fused, and grounded. (Refer to Chapter 3—Cabinet Installation for complete AC power cabling and ground wiring installation instructions.)

Note:
To avoid accidental power turn-off, it is recommended that an ON/OFF wall switch not be used on AC circuits dedicated for the use of Strata DK280.

A reserve power source (two or four customer-supplied 12-volt batteries) may be connected to the Strata DK280 to **serve** as a backup in case of power failure. (Refer to Chapter 3—Cabinet Installation for battery installation requirements.)

2.2 Site Considerations

2.2.1 Clearance and Location Requirements

The base and optional expansion cabinets may be either floor or wall mounted. Figure 2-1 shows the minimum clearance requirements.

Notes:

1. *Floor mounting requires the following additional hardware that is not necessary for wall mounting (see Chapter 3—Cabinet Installation for details):*
   - *RFIF—floor mounting stands and brackets.*
   - *RCCB—electrical conduit box, if three or more cabinets are installed.*
2. *Wall mounting may require a plywood (3/4 inch thick) backboard. (See Chapter 3—Cabinet Installation for details).*

The following conditions must be considered when selecting a location for the cabinets:

The location **MUST BE:**

- Dryandclean
- Well-ventilated
- Well-illuminated
- Easily accessible

The location **MUST NOT BE:**

- Subject to extreme heat or cold
- Subject to corrosive fumes, dust, or other airborne contaminants
- Subject to excessive vibration
- Next to television, radio, office automation, or high frequency equipment

Optional customer-supplied reserve batteries require a well-ventilated location close (within nine feet) to the KSU.

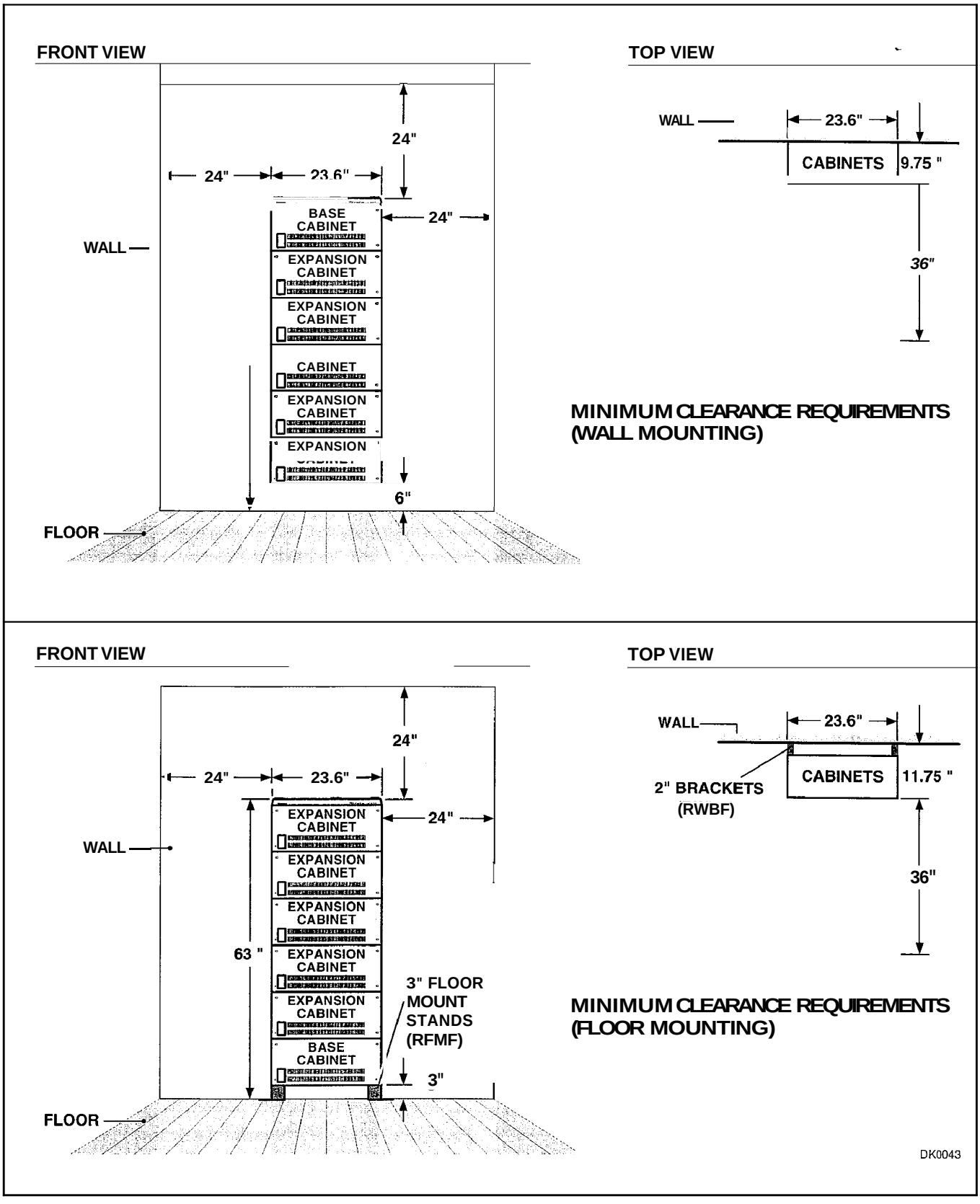

Figure 2-1
Minimum Clearance Requirements

Table 2-1
Summary of Electrical/Environmental Characteristics

Primary power AC Voltage AC Amperes for six cabinet system AC frequency Watts per cabinet (continuous) Watts for six cabinet system (continuous	 85 - 135VAC 15 Ampere circuit 50/60 Hz 180 845	**Maximum AC Input Current:** 1 cabinet – 3.6 amps 2 cabinets – 5.2 amps 3 cabinets – 7.8 amps 4 cabinets – 10.4 amps 5 or 6 cabinets – 11.5 amps
Environmental specifications Operating temperature Operating humidity Storage temperature	 32 ~ 104°F (0 - 40°C) 20 - 80% relative humidity without condensation - 4 - 158°F (-20 - 70°C)	
Power supply DC voltage output specification	 -24VDC: (-26.3 ~ -27.8VDC) +5VDC: (+4.5 - +5.5VDC) - 5VDC: (- 4.5 ~ - 5.5VDC)	
Battery charger characteristics	• Charger: current limiting • Nominal float voltage: 2.275 volts/cell • Charge current: 0.6 amps per cabinet, 3.6 amps max • Battery discharge cut-off voltage: 20.5 ± 0.5VDC	
RSTU/RSTU2 or RDSU (circuits 1 & 2) or RSTS Ring voltage Ringing capability Message Waiting Voltage Capacity* **Standard Telephone Message Waiting lamp is supported by RSTU2 only.*	 Sine wave output: 80V RMS One ringer maximum per circuit (with/without Message Waiting lamp). -90VDC Square wave / one telephone with 90VDC Message Waiting lamp per circuit	
PSTU2/PESU (circuits 1 and 2) Ring Voltage Ringing Capability	 Square wave output: Low position 130± 20V peak-to-peak (no load) High position 190 ± 25V peak-to-peak (no load) Two ringers maximum per circuit, high or low position	
RSTU, RSTU2, PESU, or PSTU modem interface data rate	9600 bps maximum	
BTU rating Per cabinet	**PART** **QTY** PDKU **5** RCOU/RCOS 1 RCTUB 1 DKTs 40	 190 BTUs (56 watt hours) Per cabinet
Traffic Rating and Characteristics	9 CCS per Station System-wide 36 CCS per ACD/MIS station	

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2.2.2 Electrical/Environmental Requirements and Characteristics

The electrical/environmental requirements and characteristics for the Strata DK280 are provided in Table 2-1.

2.3 Cable Lengths/Network Requirements

Table 2-2 lists station loop requirements. Table 6 in the General Description shows the system network requirements. The base and optional expansion cabinets must be placed within the allowed maximum distance of each other as designated by Table 2-2.

2.4 Grounding Requirements

The system requires a solid earth ground for proper operation. System AC power cords already contain a conductor for the "third wire ground" provided by the commercial outlet. But in addition, an insulated conductor must be connected between the frame ground on any cabinet power supply and a cold water pipe or the building ground. Chapter 3 — Cabinet Installation provides complete ground wiring installation instructions, including ground for secondary protectors (see Figure 3-19).

Table 2-2
Loop Requirements

Device Description	Interface PCB	Max Loop Resistance (Including Device)	Max Distance from KSU to Device	Number of Wire Pairs[1]
Digital telephone	PDKU (ckts 1 - 8) or RDSU (ckts 5 - 8)	40 ohms	1000 ft. (303 m)	1-pair
DDSS console	PDKU (ckt 8)	40 ohms	1000 ft. (303 m)	1-pair
Attendant console	RATU (ckts 1 - 4)	40 ohms	1000 ft. (303 m)	2-pair
RPCI-DI or PDIU-DI2	PDKU (ckts 1 - 8) or RDSU (ckts 5 - 8)	40 ohms	1000 ft. (303 m)	Shares digital telephone wire-pair?
PDIU-DS	PDKU (ckts 1 - 8) or RDSU (ckts 5 - 8)	40 ohms	1000 ft. (303 m)	1-pair
ADM	PDKU (ckts 1 - 8) or RDSU (ckts 5 - 8)	40 ohms	1000 ft. (303 m)	Shares digital telephone wire-pair.[3]
DDCB	PDKU or RDSU (ckt 5)	40 ohms	1000 ft. (303 m)	1-pair
HDCB	PEKU (ckt 5) or PESU[2] (ckt 5)	40 ohms	1000 ft. (303 m)	2-pair
HDSS consoles	PEKU (ckts 7 & 8)	20 ohms	500 ft. (152 m)	
Standard telephones, voice mail, auto attendant, etc.	RSTU (ckts 1 - 8) RDSU/RSTS (ckts 1 - 4) PSTU (ckts 1 ~ 8) or PESU[2] (ckts 1 & 2)	• 300 ohms[4] • 600 ohms • 1,200 ohms	• 300 ohms, Approx. 3000 ft. (909 m) • 600 ohms, Approx. 9000 ft. (2,727 m) • 1200 ohms, Approx. 21,000 ft. (6,363 m) (with 150 ohm device. See manufacturer's product specifications for exact resistance of device).	1-pair
EKTs	PEKU or PESU	40 ohms	1000 ft. (303 m)	2-pair OCA Stations need 3-pair.
RATI	RATU (ckts 1 - 4)	40 ohms	1000 ft. (303 m)	1 or2-pair

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Notes:

1. *Use 24 AWG twisted pairs.*
2. *PESU circuits 3 and 4 are not used.*
3. *Two-pair wire or an optional telephone power supply is required to achieve maximum range,*
4. *300 ohms for PSTU/PESU; 600 ohms for RSTU, RDSU/RSTS/RSTU2 without R48S option, and 1200 ohms for RSTU or RDSU equipped with an optional R48S.*

Table 2-3
Network Requirements

PCB	Facility interface Code	Network Jack	Ringer Equivalence	Universal Service Order Code
PCOU/RCOU/RCOS (Loop start line)	02LS2	RJ14C RJ21X	0.2B (PCOU) 0.3B (RCOU/ RCOS)	N/A N/A
PEMU (Type I, Tie line)	TL11M, 2 wire TL31M, 4 wire	RJ2EX RJ2GX	N/A	9.OF
PESU/PSTU/RSTU/ RSTU2/RDSU[1] (Off-premises station)	OL13A (PSTU/PESU) OL13B (RSTU/RSTU2, –24V) OL13C (RSTU/RSTU2, with R48S,-48V)	RJ21X	N/A N/A	9.OF
RGLU (Ground or Loop Start Line)	02GS2 (ground) 02LS2 (loop)	RJ14C RJ1CX	0.3B	N/A
REMU (Type I or II Tie line)	TL11M, 2 wire TL31M, 4 wire TL12—Type II, 2 wire TL32—Type II, 4 wire	RJ1CX	N/A	9.OF
RDTU (DS-1/T1)[2]	(Note 2f)	RJ48C/RJ48X	N/A	6.OP
RDDU (DID line)	02RV2-T	RJ14X/RJ21X	0.0B	AS.2
RCIU/RCIS	N/A	RJ21X RJ14C	0.38	N/A

Notes:

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1. *Only PESU circuits 1 and 2, and RDSU circuits 1 - 4 provide off-premises-station(OPS) capability. All circuits on PSTU, RSTU, provide OPS. PSTU/PESU must use OL13A or equivalent line conditioning for OPS connection. RSTU and RDSU must use OL13A or OL13B if providing –24 volt loop voltage; or, if equipped with the 4 8 volt loop option PCB (R48S), OL13A, OL13B, or OL13C may be used for OPS connection,*
2. *When ordering DS-1/T1 circuits, six items must be specified:*
   a. *The number of channels per T1 circuit, fractional increments are normally 8, 12, or 16 channels, full service is 24 channels. Unused channels must be bit-stuffed.*
   b. *The type of CO line assigned to each channel: Loop Start, Ground Start, tie (Wink or Immediate Start), DID (Wink or Immediate).*
   c. *Frame Format Type: Super Frame (SF) or Extended Super Frame (ESF). The T1 provider normally specifies the Frame Format to be used, either is adequate for DK280 CO digital voice lines. ESF provides a higher level of performance monitoring, but requires trained personnel and the ESF CSU normally costs more than an SF only CSU.*
   d. *Line Code Type: Alternate Mark Inversion (AMI) or Bipolar 8 Zero Substitution (B8ZS). The T1 provider normally specifies the Line Code to be used, either is adequate for DK280 T1 CO digital voice lines.*
   e. *The customer must provide the Channel Service Unit (CSU) to interface the DK280 T1 circuit to the Telco T1 circuit. (CSUs are a Telco requirement.)*
   f. *RDTU Network Channel Interface Codes: 04DU9-BN, 04DU9-DN, 04DU9-ISN, 04DU9-1KN, 04DU9-1ZN.*

Cabinet Installation 3

This chapter explains how to install the Strata DK280 base (DKSUB280) and expansion (DKSUE280 or DKSUE424) cabinets. Instructions are also provided on how to remove and replace cabinets on installed systems.

This chapter also describes how to install ground wiring, AC power cabling, reserve power (Battery Backup) cabling, and printed circuit board (PCB) cabling.

3.1 Inspection, Packaging and Storage

3.1.1 Inspection

When the system is received, examine all packages carefully and note any visible damage. If any damage is found, do not open the packages. Contact the delivery carrier immediately and make the proper claims.

After unpacking (and before installing), check the system against the packing list and inspect all equipment for damage. If equipment is missing or damaged, contact your supplier immediately.

Be sure to retain original packaging materials for re-use when storing or transporting system hardware.

3.1.2 Packaging and Storage

CAUTION !

When handling (installing, removing, examining) PCBs, do not touch the back (soldered) side or edge connector. Always hold the PCB by its edges.

When packaging and storing the system, remove PCBs from the system cabinet (the power supply may remain installed in the cabinet for storage and shipment). PCBs should be packaged in their original antistatic bags for protection against electrostatic discharge. Be sure to package equipment in its original shipping containers.

3.2 Cabinet Installation Considerations

The base (DKSUB280) and expansion cabinets (DKSUE280 or DKSUE424) can be wall or floor mounted. To make it easier to add cabinets (after the initial installation) when a customer needs to expand, it is recommended that the base cabinet be installed on top in wall-mount installations and on the bottom in floor-mount installations .

The dimensions of the base and expansion cabinets are as follows:

Height: base cabinet: 11 3/4 inches

Height: expansion cabinet: 10 inches

Width: 23 5/8 inches

Depth: 9 314 inches

Weight: approx. 30.5 lbs. (14 kg.)

Note:

The weight approximates a cabinet completely filled with PCBs. Weight may vary slightly, depending on PCBs.

It is recommended that the cabinets be installed in the following order:

1. Install power supplies jn cabinets (see Section 3.3).

2. Mount cabinets on floor or wall (see Section 3.4 or *3.5).*

3. Install ground wiring (see Section 3.6).

4. Install AC power cabling to cabinets (see Section 3.7).

5. Install reserve power cabling (see Section 3.8).

6. Install PCBs and PCB cabling (see Figures 3-10, 3-12, and 3-13).

   Note:

   Each cabinet requires four wood screws (#12X 7.25 inch size) for wall mount installation. Wood screws are not provided with the system.

3.3 Power supply Installation and Removal

3.3.1 Installation

The base and expansion cabinets are shipped from the factory without the power supply (RPSU280) installed. Refer to the following instructions and Figures 3-1 and 3-2 to install power supplies in cabinets of new or installed systems:

1. Remove the power supply from its box. The box should also contain a plastic bag with two jumper plugs for the power supply DKSUB or DKSUE connector. An AC power cord and the power supply mounting screws are provided with the KSU cabinet.

2. Make sure that the front and right side covers are removed from the cabinet (Figure 3-1).

3. Slide the power supply into the right side of the cabinet so that its four mounting holes align with the four cabinet mounting holes. (Make sure that the two backplane FG wires are positioned between the **FG** wire holder and the power supply.)

   Note:

   The backplane FG wires are not safety grounds, they are required for proper system CO line operation.

4. Plug the DC OUT cable plug into the DC OUT connector on the power supply. (The plug has a guide key on it to ensure that it is plugged in correctly.)

5. Secure the FG wire spade lug to the power supply with the FG screw.

6. Secure the power supply to the cabinet with the four provided screws.

7. If the cabinet is the base unit, plug the jumper plug that has a wire connected into the "DKSUB" jumper connector on the power supply.

8. If the cabinet is an expansion unit (DKSUE), plug the jumper plug that does not have a wire connected into the "DKSUE" jumper connector.

IMPORTANT!

The power supply with the "DKSUB" jumper plug (plug with wire) installed is called the master and has on/off control over all other power supplies, which are designated as slaves. If the master power supply is turned off or on, all other power supplies will automatically turn off or on. (Individual power supplies must be turned on.)

Power supplies that have the "DKSUE" jumper plugs (plug without wire) installed will not control other power supplies, but can be turned off or on individually with their own on/off switch. (The master power supply must be on and the intercabinet "Data" ribbon cable must be installed to allow a slave power supply to be turned on.)

9. Refer to Figure 3-3 to ensure that the power supply is properly installed.

10. Install power supplies in all cabinets, using steps 1 ~ 9.

11. Install the base and optional expansion cabinets per Section 3.4 or 3.5, install applicable AC cabling (per Section 3.7), ground wiring (Section 3.6), and reserve power cabling (Section 3.8) to the power supply.

    Note:

    Power Supply testing procedures are provided in the Fault Finding section, which should be referred to if it is suspected that the power supply does not work properly.

3.3.2 Removal

Use the following instructions and refer to Figures 3-1, 3-2, and 3-3 to remove power supplies (RPSU280) from cabinets of installed systems.

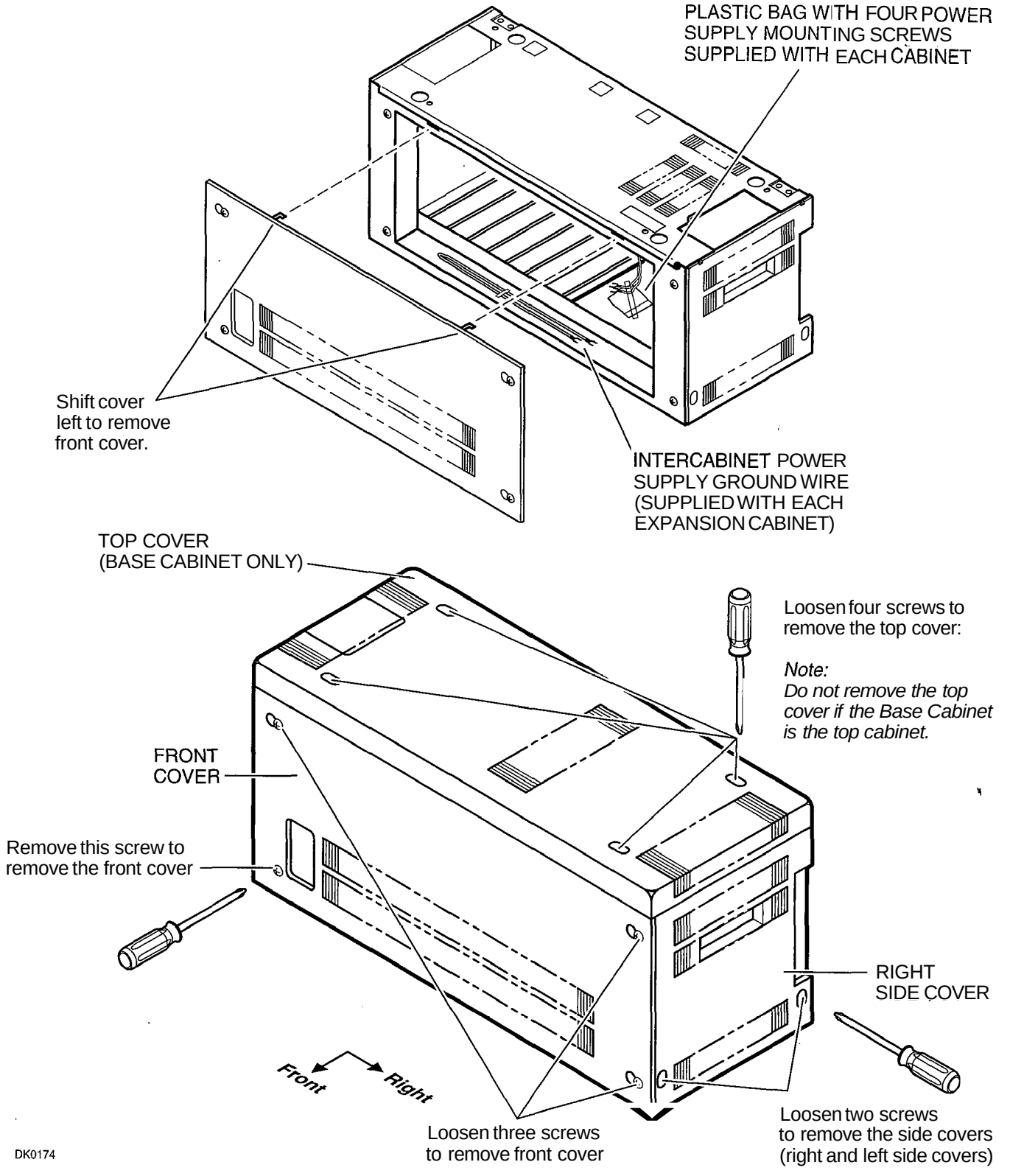


Figure 3-1
Cabinet Front, Side, and Top Cover Removal and Installation

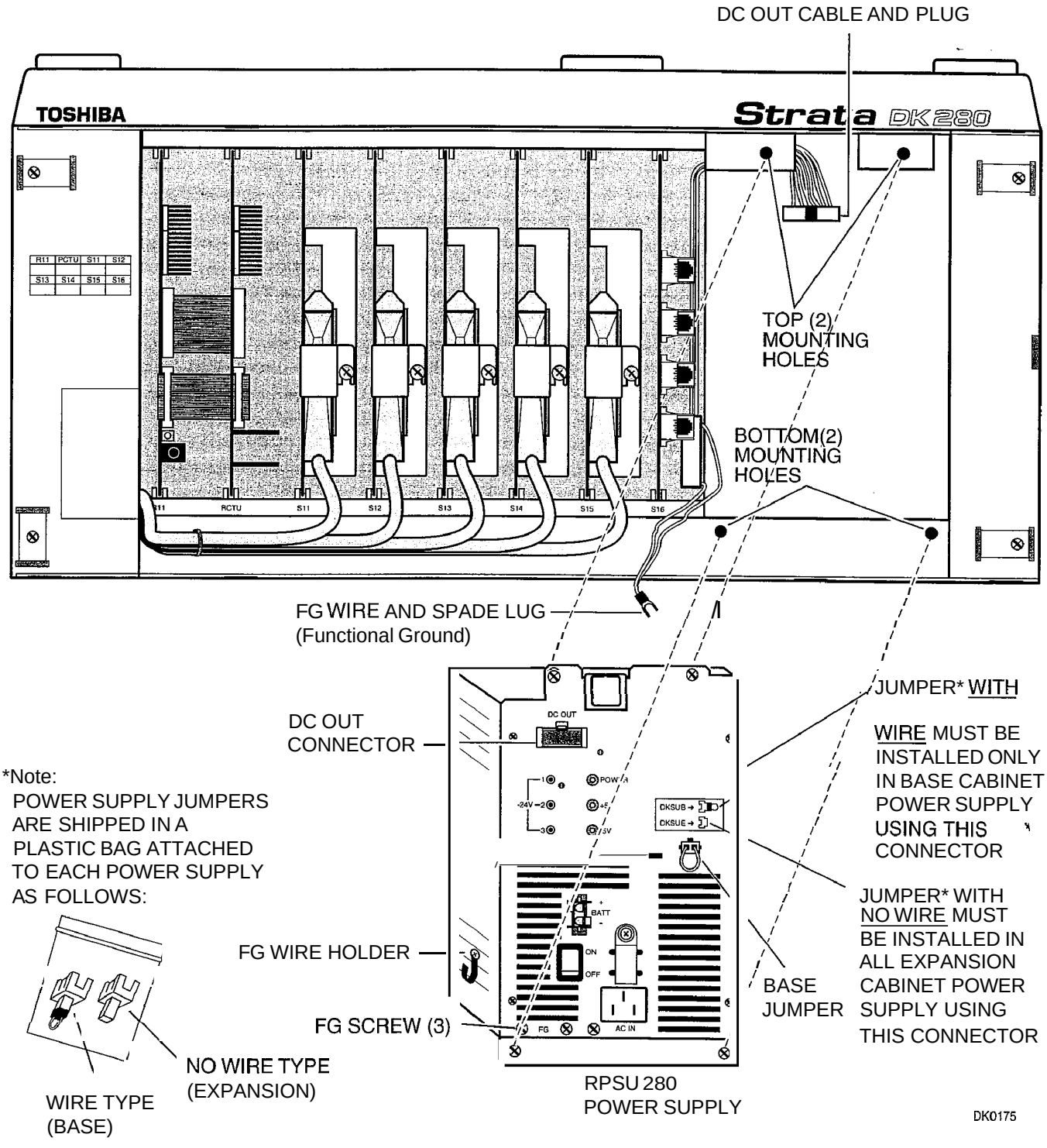


Figure 3-2
DK280 Power Supply (RPSU280) Installation

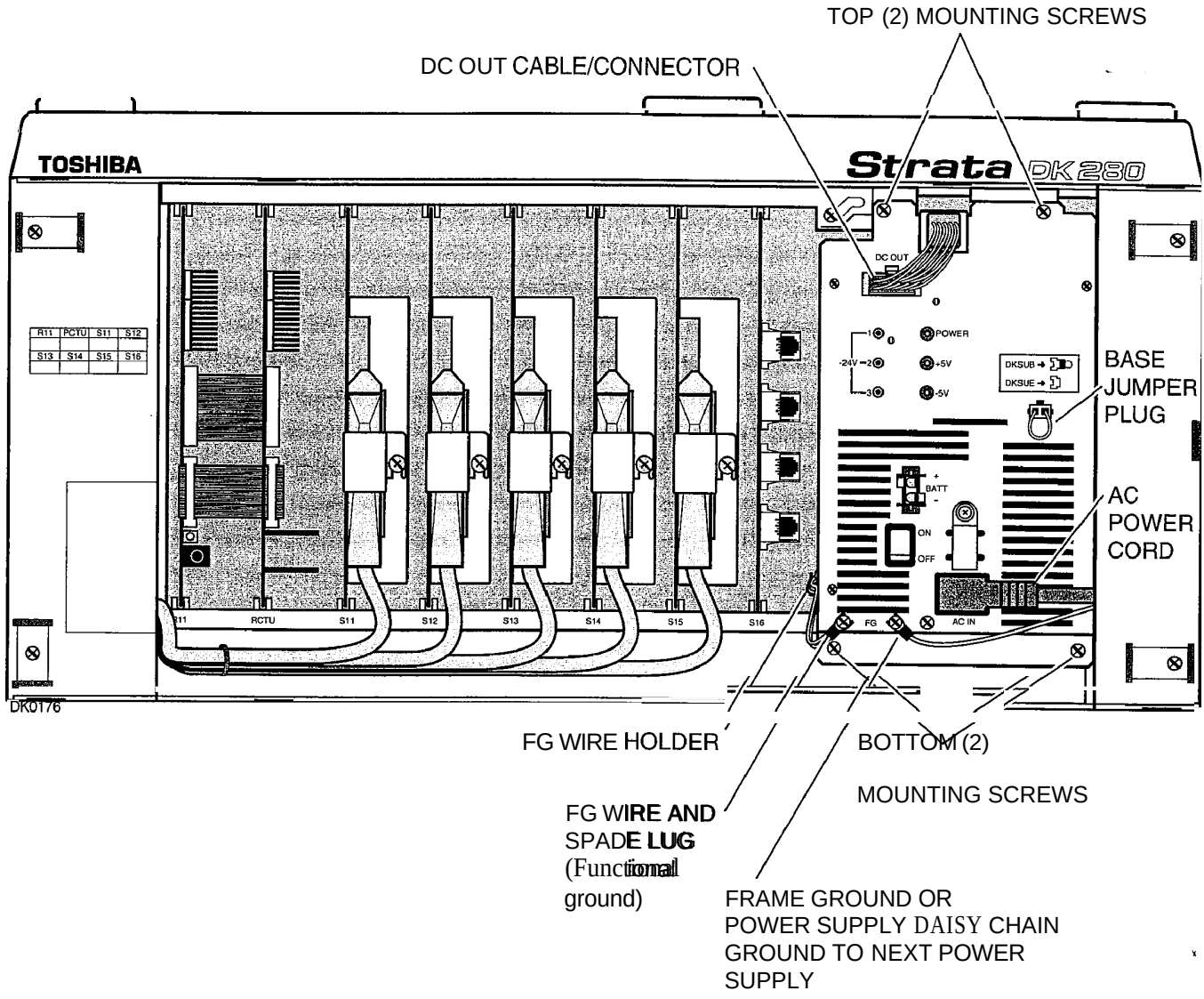


Figure 3-3
DK280 Power Supply (RPSU280) Removal

1. Remove the front and right side covers from the cabinet where the power supply will be removed. Remove the right side covers of other cabinets as necessary to disconnect wiring (Figure 3-1).

2. Turn the power supply off, and disconnect the AC power cord, all ground wiring and reserve power cabling that is connected to the power supply.

3. Disconnect the DC OUT cable plug from the DC OUT connector.

4. Loosen the four mounting screws securing the power supply to the cabinet and remove the power supply.

Power Supply Replacement. Install the replacement power supply per Section 3.3.

3.4 Wall Mounting Base Cabinet

3.4.1 Base Cabinet Installation Instructions

If the cabinet mounting holes align with wall studs, the cabinet can be installed directly on the wall (Figure 3-4). For more than two cabinets, a wooden backboard between the cabinet and the wall is highly recommended (Figure 3-5).

Install the base cabinet (DKSUB280) per the following steps:

1. If using a backboard: Obtain a board, such as plywood, that is at least 3/4 of an inch thick. The board should be at least five feet high (completely expanded systems with six cabinets require this much height) and two feet wide (minimum).

   Secure the board to the wall with wood screws so that the bottom edge of the board is six inches above the floor. (If there are studs behind the wall, make sure the wood screws align with the studs.)

2. Remove the front, back, and side covers from the base cabinet (Figure 3-6).

   Note:

   As shown in the illustration, the two screws on each side cover and the three screws on the front cover (the bottom left screw must be completely removed) should only be loosened and the covers slid to the right for removal.

3. Hold the base cabinet back cover against the wall or backboard so that its two top mounting holes are 5-1/2 feet (66 inches) above the floor (Figure 3-8). This will allow six cabinets to be installed (top-down) with a six-inch clearance between the floor and bottom cabinet.

4. Use a level to make sure that the back cover is held level.

5. Make a mark with a pencil in the marking holes on both sides of the top mounting holes (Figure 3-8). Trace the upper arch of the top mounting holes.

6. Remove the back cover from the wall.

7. For both mounting holes, draw a line between the top two marking hole marks (Figure 3-8).

8. Drill holes on the line in the middle of the arch tracing.

9. Screw #12 X 1.25 inch size wood screws into the two drilled holes, leaving about 1/8 of an inch clearance between the screw heads and the wall.

10. Hang the base cabinet back cover from the top two screws and secure the screws into the wall.

11. Drill holes at the bottom two mounting holes of the back cover, and secure #12 X 1.25 inch wood screws into the two holes.

12. If installing just a base cabinet: Position the base cabinet on the back cover cabinet hangers, slide the cabinet to the right to the proper mounting position, and secure the cabinet to the back cover with two screws on the right side of the cabinet (Figure 3-9). If installing expansion cabinets, skip to Subsection 3.4.2.

13. Install ground wiring per Section 3.6, power (AC and reserve) cabling per Section 3.7 and 3.8, and printed circuit board (PCB) cabling per Figures 3-10, 3-12 and 3-13.

14. Fill out the slot identification label on the cabinet (Figure 3-12).

15. Reinstall front cover, top cover, and side covers onto the cabinet (Figure 3-6).

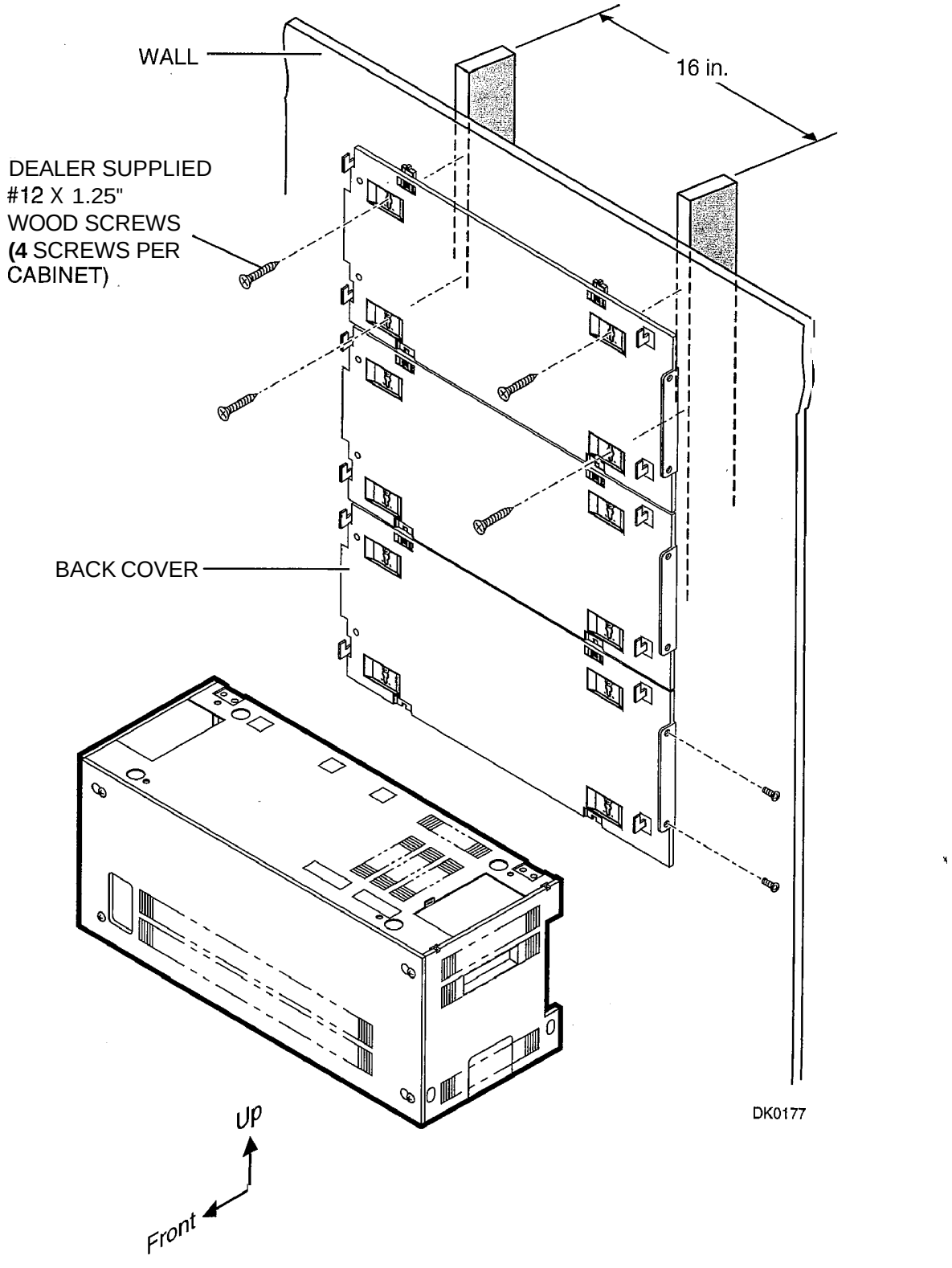


Figure 3-4
Cabinet Mounting Surface Diagram (Directly on Wall)

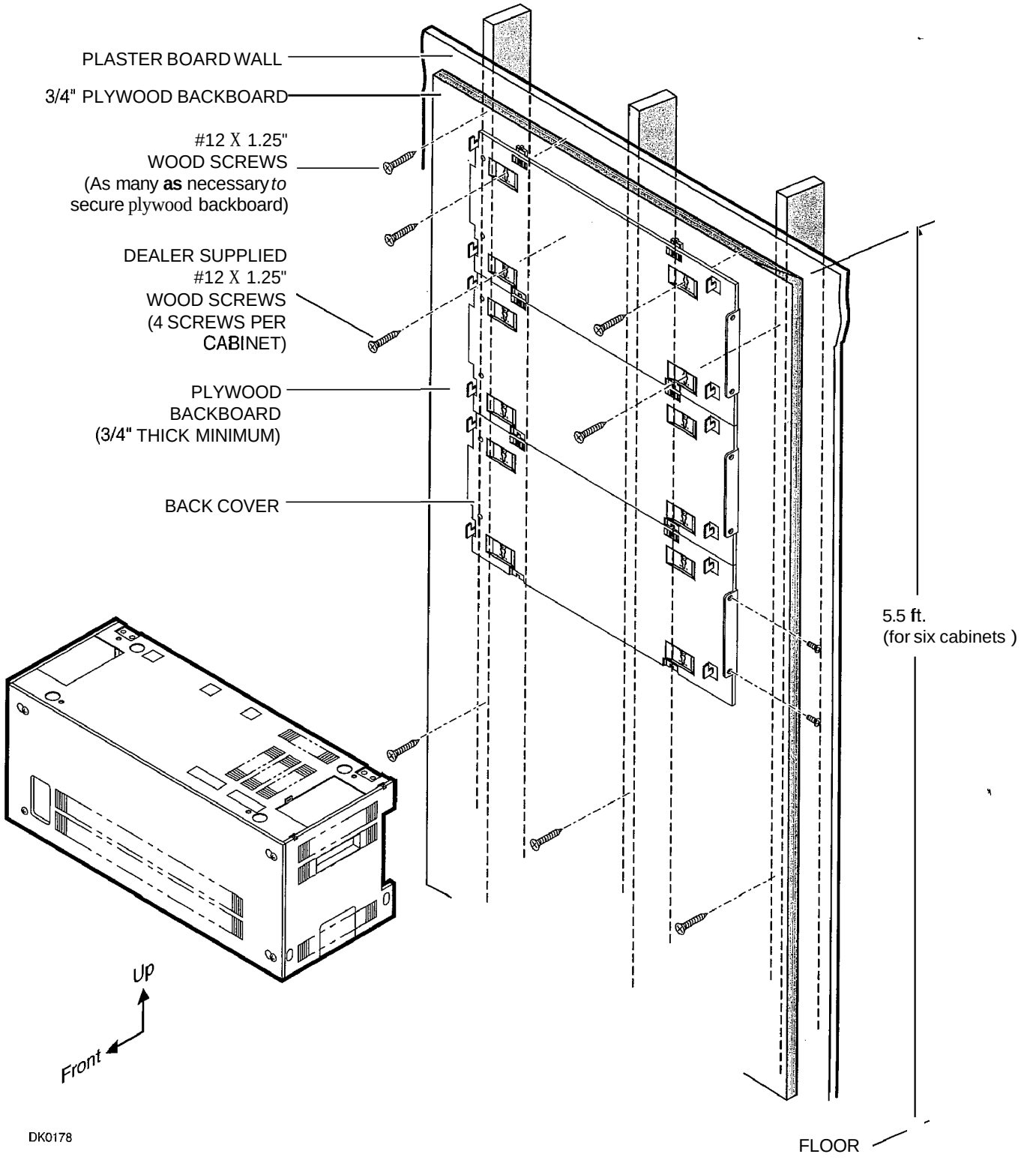


Figure 3-5
Cabinet Mounting Surface Diagram (with Plywood Backboard)

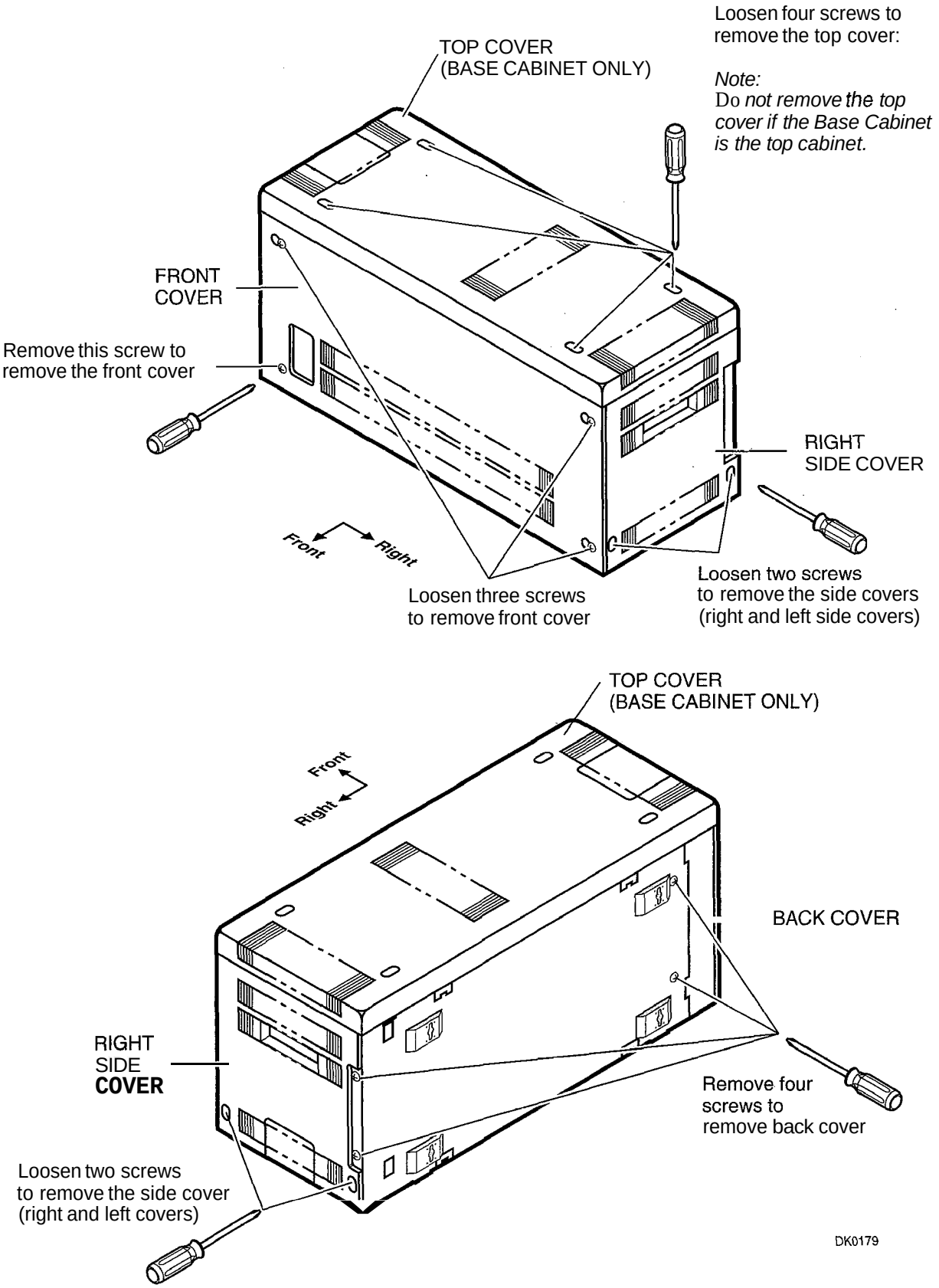


Figure 3-6
Cabinet Cover Removal and Installation

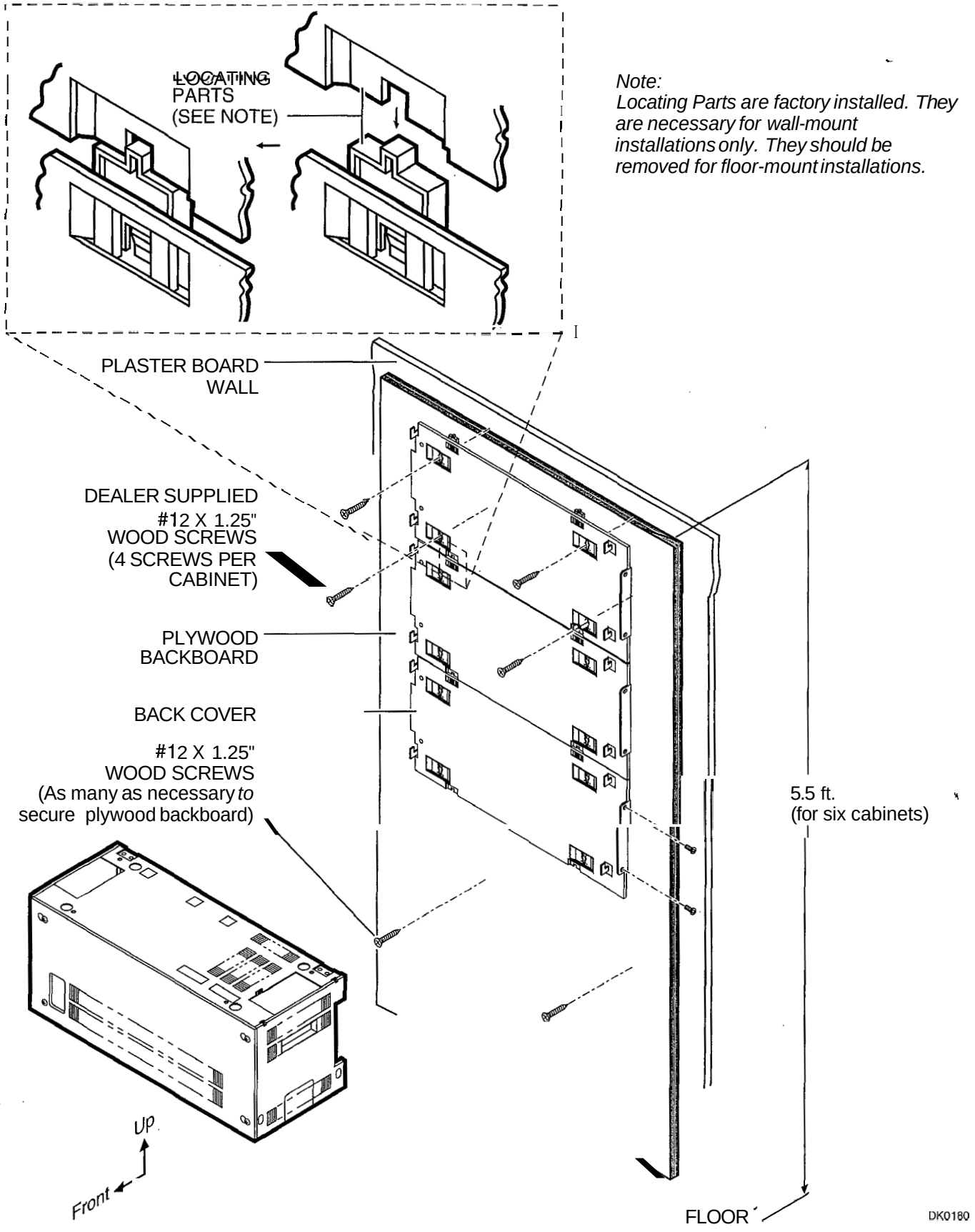


Figure 3-7
Cabinet Back Cover Mounting

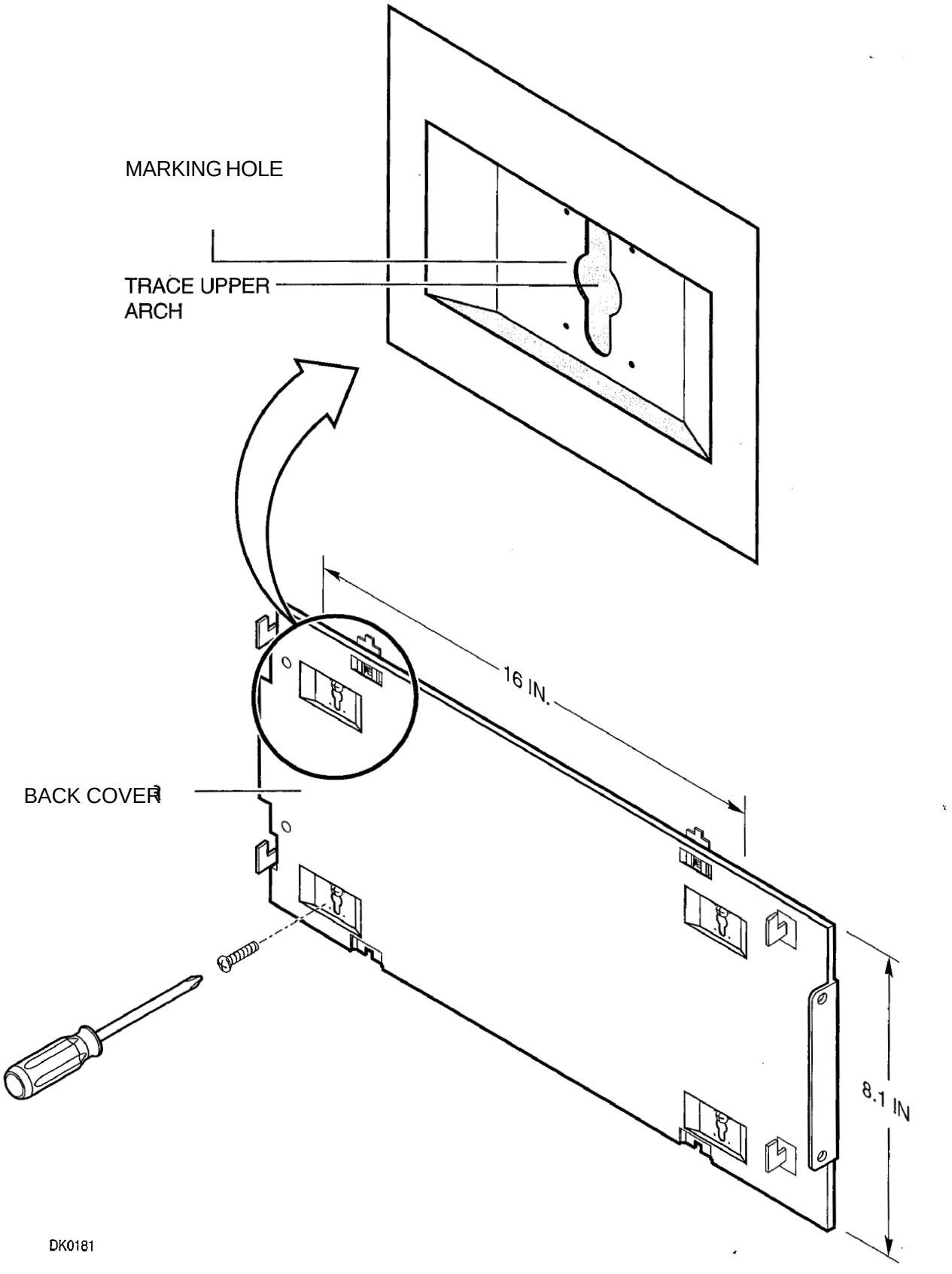


Figure 3-8
Back Cover Mounting Holes

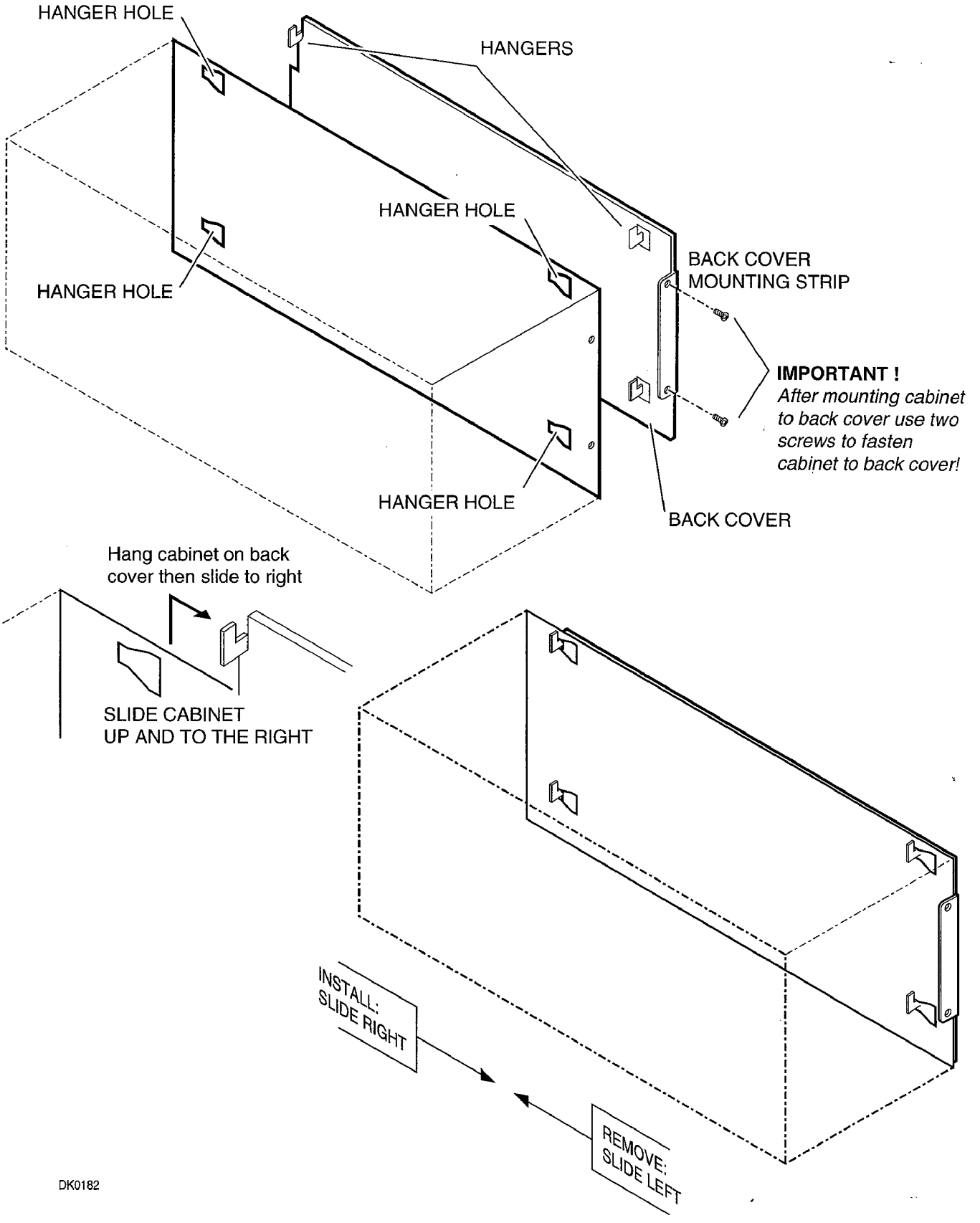


Figure 3-9
Mounting Cabinet on Back Cover

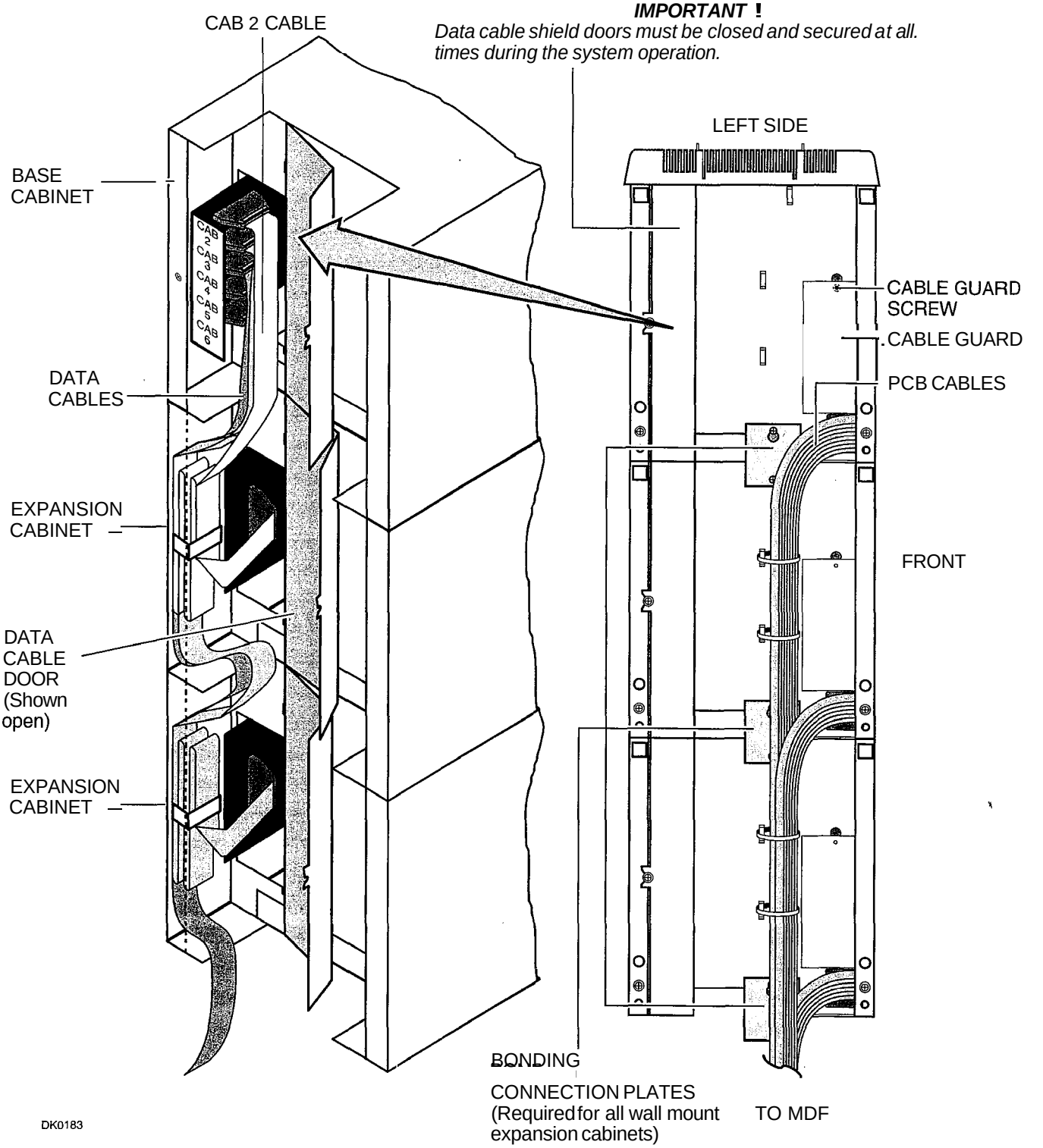


Figure 3-10
left Side View of Cabinet Interior

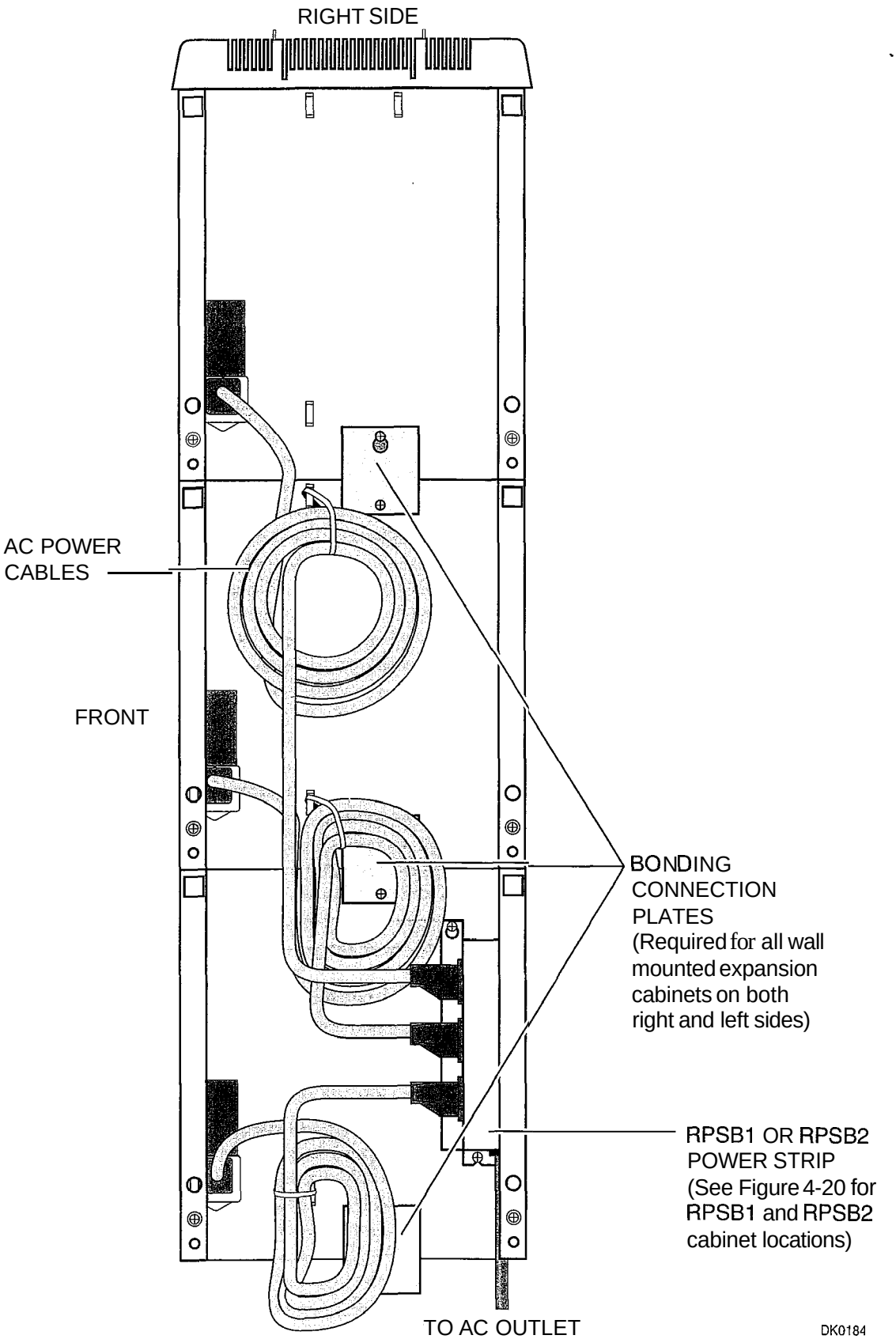


Figure 3-11
Right Side View of Cabinet Interior

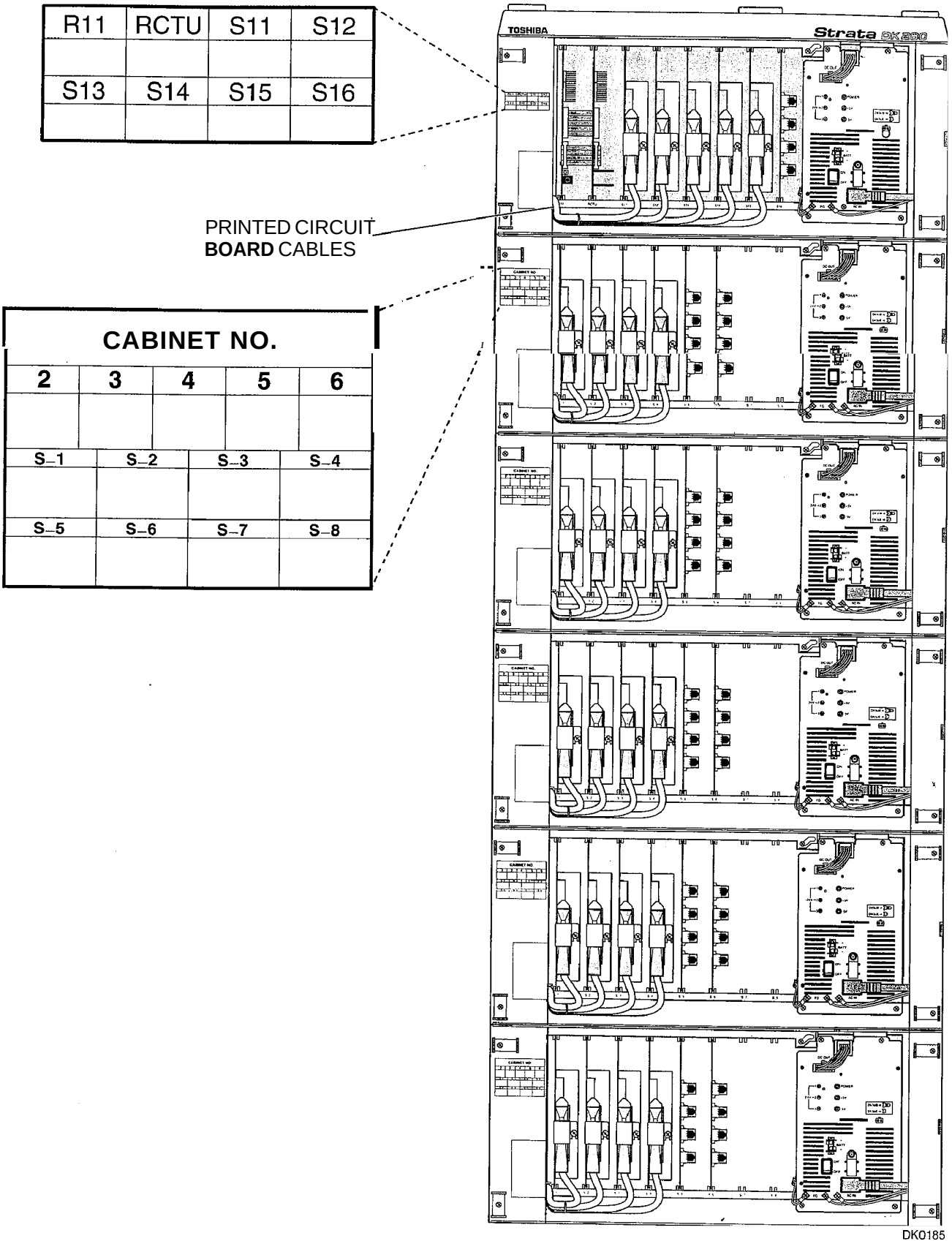


Figure 3-12
Front View of Cabinet Interiors

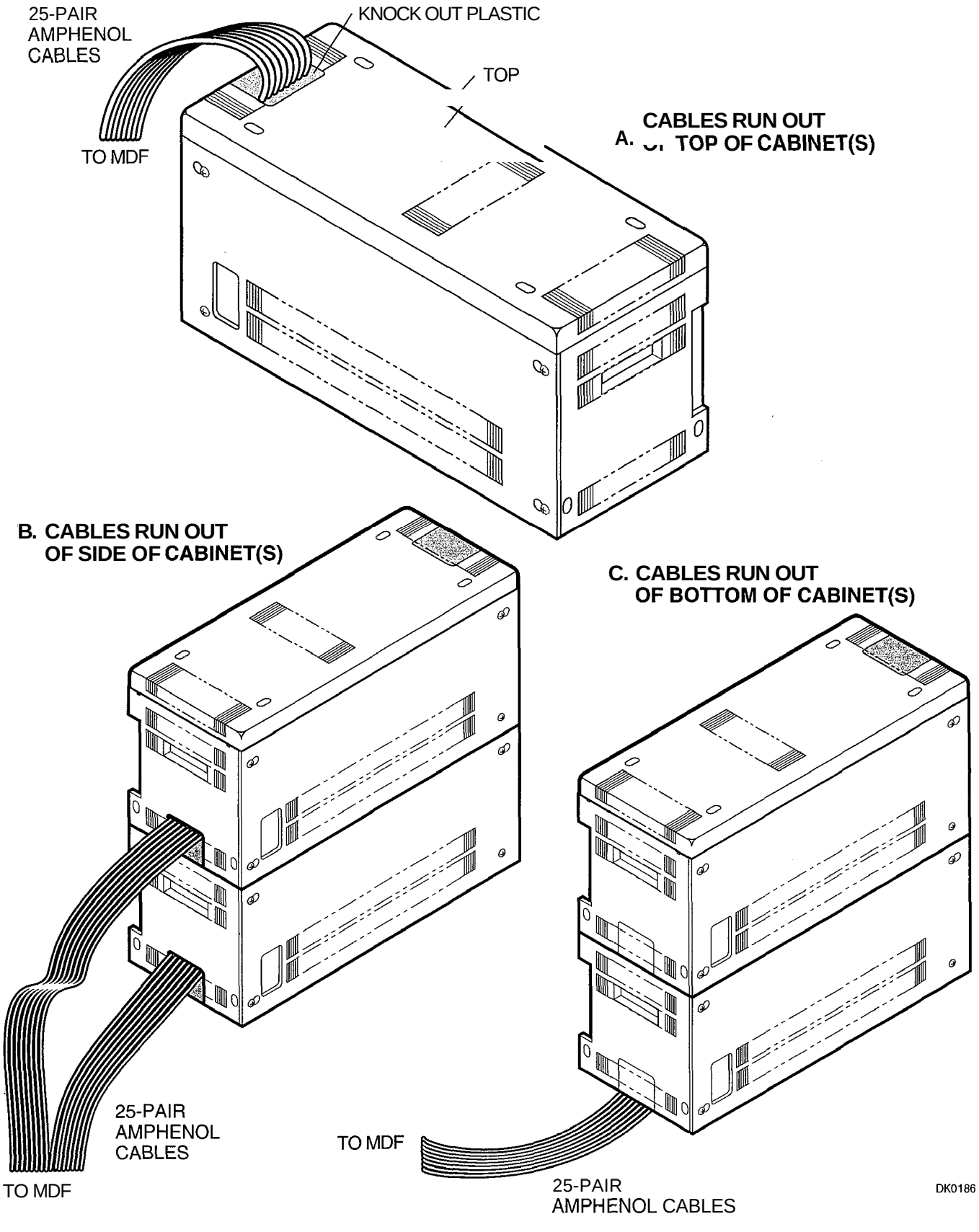


Figure 3-13
DK280 Cabinet Floor Installation

3.4.2 Expansion Cabinet Installation Instructions

Install expansion cabinets (DKSUE280 or DKSUE424) per the following procedure:

Note:
It is recommended to install cabinets from the top down. The base cabinet should be on top, the first expansion cabinet below it, the second expansion cabinet below the first expansion cabinet, etc.

1. Remove the front, back, and side covers from the expansion cabinets (Figure 3-6).

   Note:
   ***As** shown in the illustration, the two screws on each side cover and the three screws on the front cover (the bottom left screw must be completely removed) should only be loosened and the covers slid to the right for removal.*

2. Hold an expansion cabinet back cover against the wall so that its top locating parts align with the bottom locating parts of the base cabinet back cover (Figure 3-7). To secure the expansion cabinet back cover to the wall or wall board, repeat Steps 5 - 11 from Subsection 3.4.1.

3. To install additional expansion cabinet back covers, repeat Step 2 above.

4. Starting with the top expansion cabinet back cover (which is fastened to the wall), position an expansion cabinet on the expansion cabinet back cover cabinet hangers, slide the cabinet to the right to the proper mounting position, and secure the cabinet to the back cover with two screws to the right side *of* the back cover (Figure 3-9). Repeat for all other expansion cabinets.

5. Loosen the bonding connection plates fastened on both sides of the first expansion cabinet, then fasten the plates between the base cabinet and the first expansion cabinet (Figures 3-10 and 3-11). Repeat to connect the first expansion cabinet to the second expansion cabinet, etc.

6. Loosen data cable door locking screws and open data cable doors; then connect the first expansion cabinet data cable to the 'CAB 2" (top) data cable connector on the base cabinet. Install data cables in appropriate connectors for all other expansion cabinets (Figures 3-10 and 3-19).

7. After all data cables are installed, close data cable doors and secure them with the locking screw.

IMPORTANT!
Data cable door screws must be firmly tightened for proper system operation.

8. Install ground wiring per Section 3.6, power cabling (AC and reserve) per Section 3.7, and printed circuit board (PCB) cabling per Figures 3-10, 3-12, and 3-13 and reserve power per Section 3.8.

9. Fill out cabinet/slot identification labels on each cabinet (Figure 3-12).

10. Reinstall covers onto cabinets (Figure 3-6).

3.4.3 Cabinet Removal and Replacement

Cabinet Removal

Use the following procedure to remove the base cabinet (DKSUB280) or an expansion cabinet (DKSUE280 or DKSUE424):

1. Turn the system power off, and remove front and side covers from the cabinet to be removed. (If removing an expansion cabinet, turn off both the expansion and base cabinet power supplies.)

2. Unplug the AC power cord of the cabinet, and, if applicable, unplug the reserve power battery cable connected to the power supply of the cabinet (Figure 3-20).

3. If an outlet power strip or a battery distribution box is connected to the cabinet, remove them (Figure 3-20).

4. If removing an expansion cabinet: Disconnect intercabinet ground wiring(s) connected to the cabinet power supplies (Figure 3-19).

5. Disconnect the Frame ground wire from the cabinet (Figure 3-19).

6. If removing an expansion cabinet: Remove the left side cover from the base cabinet, and disconnect the data cable of the cabinet that is to be removed from the data cable connector on the base cabinet (Figure 3-10).

7. Loosen any bonding connection plates connecting the cabinet to any cabinet above or below it (Figures 3-10 and 3-11).

8. Remove cabling from printed circuit boards (PCBs) installed in the cabinet and remove cabling from the cabinet (Figures 3-12 and 3-13).

9. Loosen the two right side screws securing the cabinet to the back cover and remove the cabinet by sliding it to the left and pulling out (Figure 3-9).

Cabinet Replacement

Use the following procedure to replace the base or expansion cabinet that has already been removed:

1. Make sure the system power is off.

2. Make sure front, side, and back covers are removed from the replacement cabinet (Figure 3-6).

3. If installing an expansion cabinet: Remove the front and side covers from all the cabinets above the back cover where the replacement cabinet will be installed. Also remove the front and side covers from the cabinet below the back cover (Figure 3-6).

4. Position the cabinet on the back cover hangers, slide the cabinet to the right so that it is positioned correctly, and secure the cabinet to the right side of the back cover with two screws (Figure 3-9).

5. Secure bonding connection plates to both sides of the replacement cabinet, if applicable (Figures 3-10 and 3-11).

6. If installing an expansion cabinet: Connect the data cable of the replacement cabinet to the data cable connector on the base cabinet (Figures 3-10 and 3-19).

7. If the frame ground wire should be connected to the cabinet, connect the ground wire to the cabinet (Figure 3-19).

8. If installing an expansion cabinet: connect intercabinet ground wires to the power supplies (Figure 3-19).

9. If an outlet power strip or a battery distribution box should be connected to the replacement cabinet, install them now (Figures 3-20 and 3-24).

10. Install PCBs in cabinet and connect cabling to PCBs (Figures 3-10, 3-12, and 3-13).

11. Plug the replacement cabinet AC power plug into either a power outlet strip or a wall outlet, and connect reserve power cable to the cabinet (Figures 3-20 and 3-26).

12. Reinstall covers on cabinets.

3.5 Cabinet Floor Mounting

Strata DK280 systems can be floor mounted. Floor mounting requires an installation kit (RFIF), which contains the following parts (Figure 3-14).

- Two floor fixtures (RFMF1) and two screws for each fixture. (These may not be labeled as RFMF.)
- Six wall securing brackets (RWBF1) and two screws for each bracket. (These may not be labeled as RWBF.)

Notes:

1. *Some configurations do not require the use of a//of the parts in the kit.*
2. *Floor-mounted systems with three or more cabinets may require* ***up*** *to six customer-provided wood screws (#12 X 1.25 inch). The Method I installation shown in Figure 3-15 and detailed in Subsection 4.5.2 requires four customer-provided anchor bolts (3/8-inch size).*

3.5.1 Floor Mounting One or Two Cabinets

Refer to the following instructions to floor mount systems that have just one or two cabinets:

1. Remove front, side, and top covers from cabinet(s) (Figure 3-1). Remove plastic locating parts from all cabinet back covers using a Phillips screwdriver (Figure 3-7).

2. Make sure that cabinet power supplies (RPSU280) are installed per Section 3.3.

3. If installing just one cabinet, install the RFMF fixtures on each side of the bottom of the cabinet (Figure 3-14) and place the cabinet where it should be installed (go to Step 6).

4. If installing two cabinets, install a floor fixture (RFMFI) on each side of the cabinet that will be the bottom cabinet (Figure 3-14), making sure that the fixture is inside of the cabinet edge.

Note:

The bottom cabinet can be the base cabinet (DKSUB280) or an expansion cabinet (DKSUE280 or DKSUE424). It is recommended, however, to put the base cabinet on the bottom to facilitate cabinet expansion.

5. If installing two cabinets:
   - Set the bottom cabinet on the floor or mount surface, then set the top cabinet on the bottom cabinet.
   - Fasten the two cabinets together with the four screws provided: (two screws at front " A and two at back " B of cabinet, see Figure 3-14). Place cabinet where it should be installed.
   - Connect the expansion cabinet data cable to the "CAB. 2 data cable connector on the base cabinet (Figures 3-10 and 3-19).
6. Install ground wiring per Section 3.6, power cabling (AC and reserve) per Sections 3.7 and 3.8, and printed circuit boards (PCBs) and PCB cabling per Figures 3-10, 12 and 13.
7. Fill out cabinet/slot identification labels on cabinet(s) (Figure 3-12).
8. Reinstall covers on to cabinet(s) (Figure 3-6).

3.5.2 Floor Mounting Three or More Cabinets

There are two methods available for floor mounting systems with three or more cabinets. Both methods require that the cabinet stack must also be secured to the wall, and one of these methods (referred to as Method 1) requires that the bottom cabinet be bolted to the floor (Figure 3-15).

Method 1

If the system should be bolted to the floor, refer to the following procedure.

1. Make sure that cabinet power supplies (RPSU280) are installed per Section 3.3.
2. Remove front, side, and top covers from all cabinets (Figure 3-1).

Note:

As shown in the illustration, the two screws on each side cover and the three screws 'on the front cover (the bottom left screw must be completely removed) should only be loosened and the covers slid to the right for removal.

Remove plastic locating parts from all cabinet back covers using Phillips screwdriver (Figure 3-7).

3. Install a floor fixture (RFMF1) on each side of the bottom cabinet (Figure 3-14). (Make sure that the fixture is inside of the cabinet edge.)

   Note:

   The bottom cabinet can be the base cabinet (DKSUB280) or an expansion cabinet (DKSUE280 or DKSUE424). It is recommended, however, to put the base cabinet on the bottom to facilitate cabinet expansion.

4. Place cabinet 2 on top of the bottom cabinet and connect them together at points A and B (called out in Figure 3-14) with the screws provided.
5. Place cabinet 3 on top of cabinet 2 and connect them together at points A and B (called out in Figures 3-14 and 3-15) with the screws provided.
6. If installing more than three cabinets, install wall brackets (RWBF1) on the top of cabinet 3. Position the 3 cabinets parallel to the wall (2 inches from the wall) and secure the wall brackets to the wall with customer-provided wood screws and wall anchors as required (Figures 3-14 and 3-15).
7. For systems with just three cabinets, secure the floor fixtures (already attached to the bottom cabinet) to the floor with the customer-provided floor bolts (Figure 3-14). Guidelines for anchoring DK280 to concrete, wood, and computer room type floors is provided in Figures 3-16, 3-17, and 3-18 respectively. After completing this step, proceed to Step 11. For systems with four or more cabinets, skip this step and proceed to Step 8.
8. Add remaining cabinets, making sure that the cabinets are connected together at points A and B (called out in Figures 3-14 and 3-15) with the screws provided
9. For systems with four or more cabinets, make sure that wall brackets (RWBFI) are installed on

both sides of the top cabinet, in addition to cabinet 3 (Figure 3-15).

10. Check to make sure the cabinets are parallel to the wall. Secure the floor fixtures attached to the bottom cabinet to the floor with the customer-provided floor anchors (Figure 3-16, 3-17, or 3-18).

11. Connect the data cable of each expansion cabinet to the applicable data cable connector on the base cabinet (Figures 3-10 and 3-19). (The data cable from the first expansion cabinet should be connected to the connector labeled "CAB. 2", the cable from the second expansion cabinet to the "CAB. 3 connector, etc.)

12. Install ground wiring per Section 3.6, power (AC and reserve) cabling per Paragraph 8 and **9,** and printed circuit boards (PCBs) and PCB cabling per Figures 3-10, 3-12 and 3-13.

13. Fill out cabinet/slot identification labels on each cabinet (Figure 3-12), and reinstall covers on the cabinets. (The top cover should be installed on the top cabinet.)

Method 2

If the system should not be bolted to the floor, refer to the following procedure (see Figure 3-15, method 2).

1. Make sure that cabinet power supplies (RPSU280) are installed per Section 3.3.

2. Remove front, side, and top covers from all cabinets (Figure 3-1).

   Note:

   As shown in the illustration, the two screws on each side cover and *the three screws* on *the front cover (the bottom left screw must be completely removed) should only be loosened and the covers slid to the right for removal.*

   Remove plastic locating parts from all cabinet back covers using a Phillips screwdriver (Figure 3–7).

3. Install a floor fixture (RFMF1) on each side of the bottom cabinet (Figures 3-14 and 3-15), making sure that the fixture is inside of the cabinet edge.

   Note:

   The bottom cabinet can be the base cabinet (DKSUB280) or an expansion cabinet (DKSUE280 or DKSUE424). It is recommended, however, to put the base cabinet on the bottom to facilitate cabinet expansion.

4. Secure a wall bracket (RWBFI) to both floor fixtures with the screws provided. Secure the wall brackets to the wall with customer-provided wood screws and wall anchors (Figures 3-14 and 3-15).

5. Place a cabinet on top of the bottom cabinet and connect the cabinets together at points A and **B** (called out in Figures 3-14 and 3-15) with the screws provided.

6. Place a cabinet on top of cabinet 2 and connect these cabinets together at points A and B (called out in Figures 3-14 and 3-15) with the screws provided.

7. Install wall brackets (RWBFI) on the top of cabinet 3 and secure them to the wall with customer-provided wood screws and wall anchors (Figures 3-14 and 3-15).

8. Add remaining cabinets, making sure that the cabinets are connected together at points A and B with screws provided.

9. For systems with four or more cabinets, make sure that wall brackets (RWBFI) are installed on both sides of the top cabinet, in addition to cabinet 3 (Figures 3-14 and 3-15).

10. Connect the data cable of each expansion cabinet to the applicable data cable connector on the base cabinet (Figures 3-10 and 3-19). (The data cable from the first expansion cabinet should be connected to the connector labeled "CAB. 2", the cable from the second expansion cabinet to the "CAB. 3" connector, etc.)

11. Install ground wiring per Section 3.6, power (AC and reserve) cabling per Section 3.7 and 9, and printed circuit boards (PCBs) and PCB cabling per Figures 3-10, 3-12, and 3-13.

12. Fill out cabinet/slot identification labels on each cabinet (Figure 3-12), and reinstall covers on the cabinets. (The top cover should be installed on the top cabinet.)

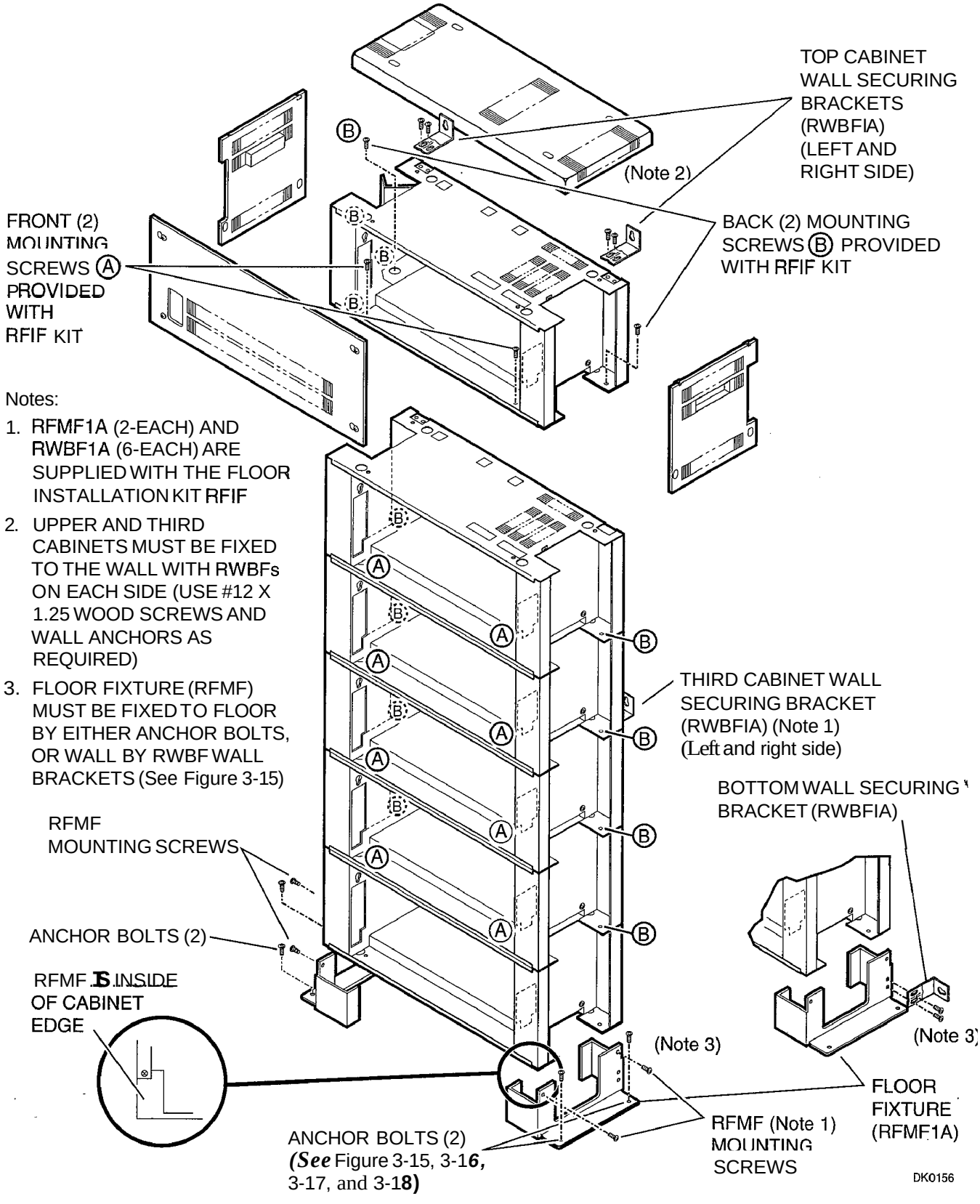
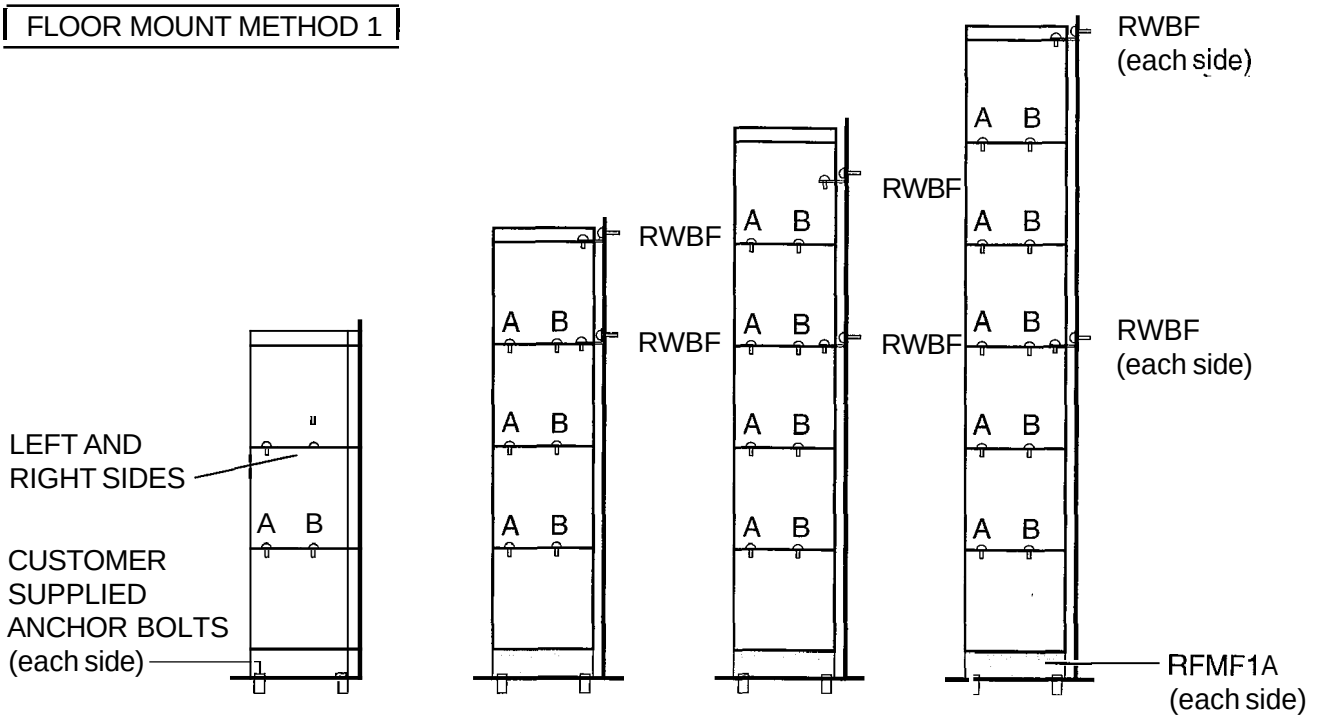


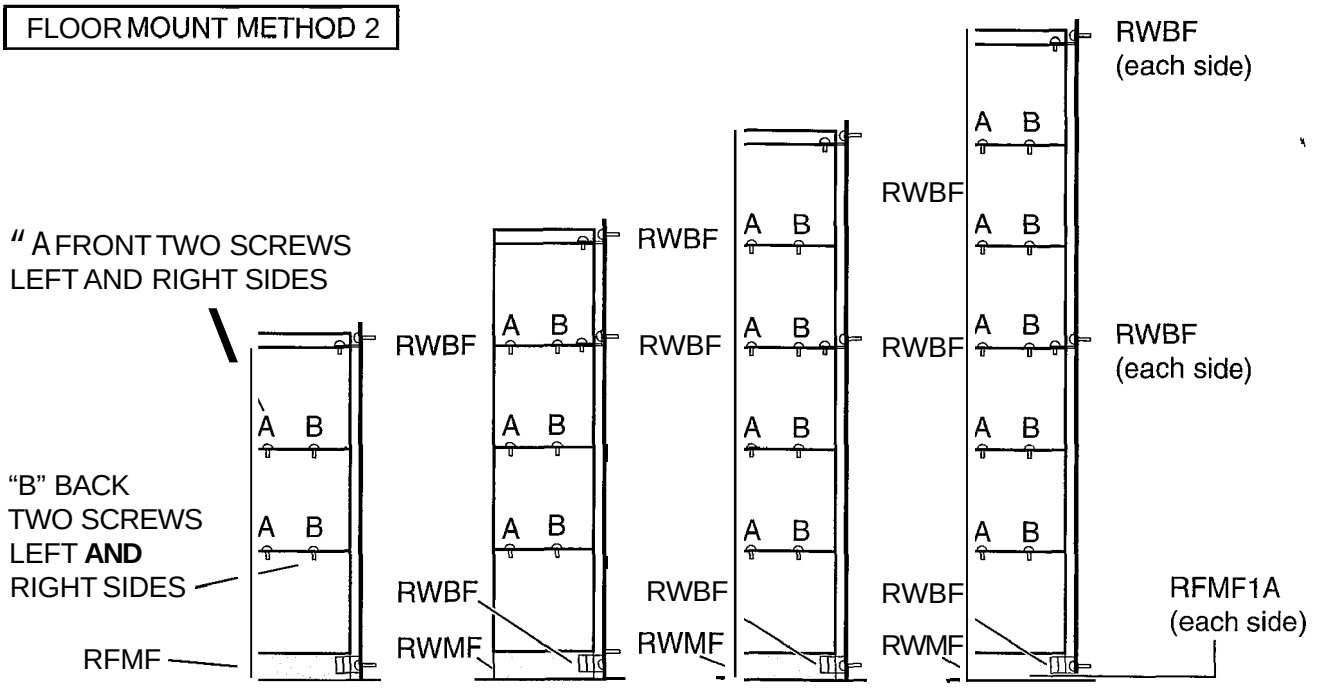
Figure 3-14
DK280 Cabinet Floor Installation

FLOOR MOUNT METHOD 1



Note: RWBF1A (3-pairs) and RFMF1A (I-pair) are supplied with floor installation kit RFIF

FLOOR MOUNT METHOD 2



Note: RWBF1A (3-pairs) and RFMF1A (1-pair) are supplied with floor installationkit RFIF. DK0188

Figure 3-15
Floor Mounting Cabinets, Methods 1 and 2

Instructions for floor mounting DK280 on a concrete floor.

1. Mount the DK280 Base Cabinet on Floor Mount Fixtures per Figure 3-14.
2. Position the Base Cabinet at the selected installation location.
3. Using a marking pen or pencil, mark the floor where holes will be drilled.
4. Move the Base Cabinet prior to drilling.

   *Note: Cover the Base Cabinet with a suitable drop cloth to prevent contamination of **power** equipment by dust created during drilling.*
5. Using a hammer drill, drill holes to accept 3/8-inch bolt anchors.
6. Install the bolt anchors, with plugs, in the drilled holes as shown in Figure 3-16.
7. Using the driving tool and a hammer, drive each bolt anchor into the floor.
8. Move the Base Cabinet into position on the equipment room floor.
9. Secure the Base Cabinet to the floor using bolts, lockwashers, and flat washers as shown in Figure 3-16.

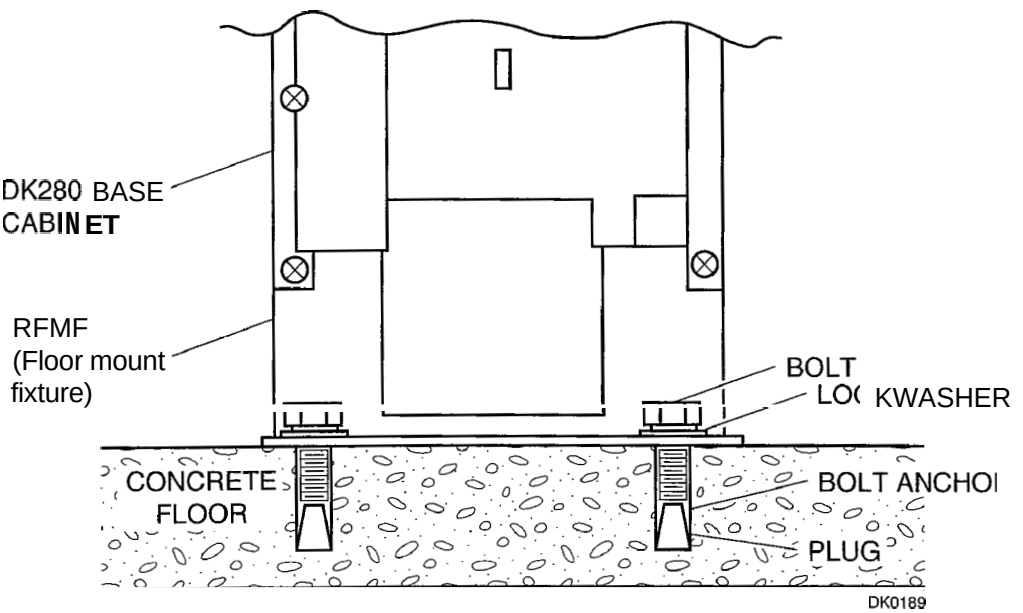


Figure 3-16
Floor Mount Installation — Concrete Floor

Instructions for floor mounting a DK280 on a wooden floor.

1. Mount the DK280 Base Cabinet on Floor Mount Fixtures (RFMF) per Figure 3-14.
2. Position the Base Cabinet at the selected installation location.
3. Using a marking pen or pencil, mark the floor where holes will be drilled.
4. Move the Base Cabinet prior to drilling.

   Note: Cover the Base Cabinet with a suitable drop cloth to prevent contamination of power equipment by dust created during drilling.

5. Drill pilot holes to make insertion of 3/8 inch lag bolts easier, and to prevent splitting of wood flooring.
6. Move the Base Cabinet into position on the equipment room floor.
7. Secure the Base Cabinet to the floor using lag bolts, lockwashers, and flat washers as shown in Figure 3-17.

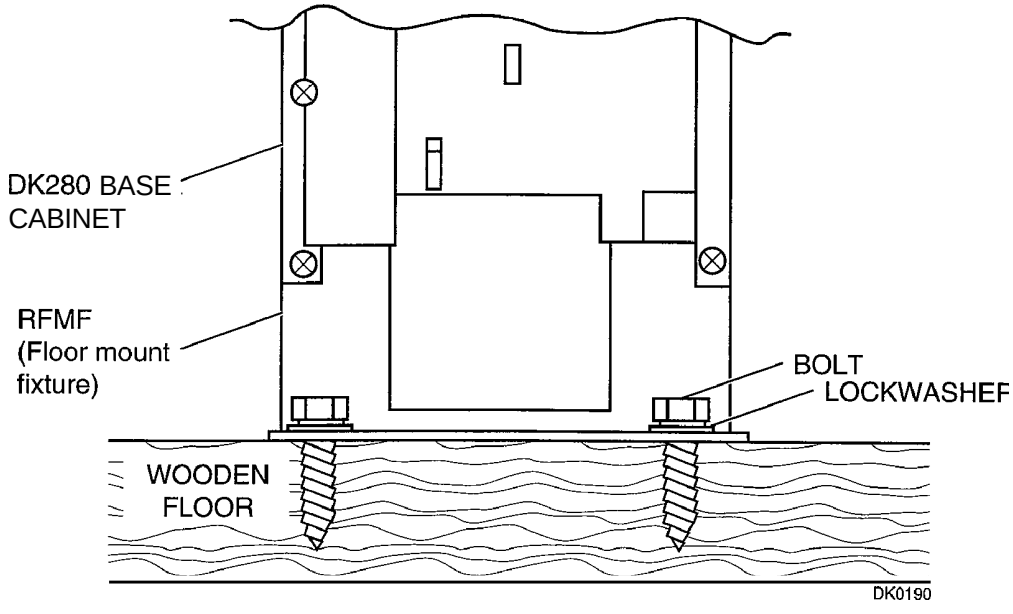


Figure 3-17
Floor Mount Installation — Wooden Floor

Instructions for floor mounting DK280 on a computer room floor.

1. Mount the DK280 base cabinet on Floor Mount Fixtures (RFMF) per Figure 3-14.
2. Position the base cabinet at the selected installation location.
3. Using a marking pen or pencil, mark the floor where holes will be drilled.
4. Move the base cabinet prior to drilling.

   Note: Cover the base cabinet with a suitable drop cloth to prevent contamination of power equipment by dust created during drilling.
5. Drill holes through tile to accept 3/8-inch threaded rod.
6. After the tiles have been drilled, insert threaded rod through the holes in the tile and mark the concrete floor directly beneath the holes in the tiles.
7. Remove the tiles. Using a hammer drill, drill holes in the concrete to accept 3/8-inch bolt anchors.
8. Install the bolt anchors, with plugs, in the drilled holes.
9. Using the driving tool and a hammer, drive each bolt anchor into the floor.
10. Screw threaded rods into each bolt anchor.
11. Install a hex nut, lockwasher, and flat washer on each threaded rod. Screw the nuts down far enough to allow floor tiles to be replaced over the threaded rods.
12. Replace tiles, over threaded rods, in their original positions on the floor.
13. Reach under the tiles, and screw the hex nuts upward until the flat washers are touching the bottom of the tile.
14. Using a hack saw, cut the threaded rods at a height of approximately 1.5 inches above the floor tile.
15. Move the base cabinet into position over the threaded rods.
16. Secure the base cabinet to the floor using flat washers, lockwasher, and hex nuts on each threaded rod as shown in Figure 3-18.

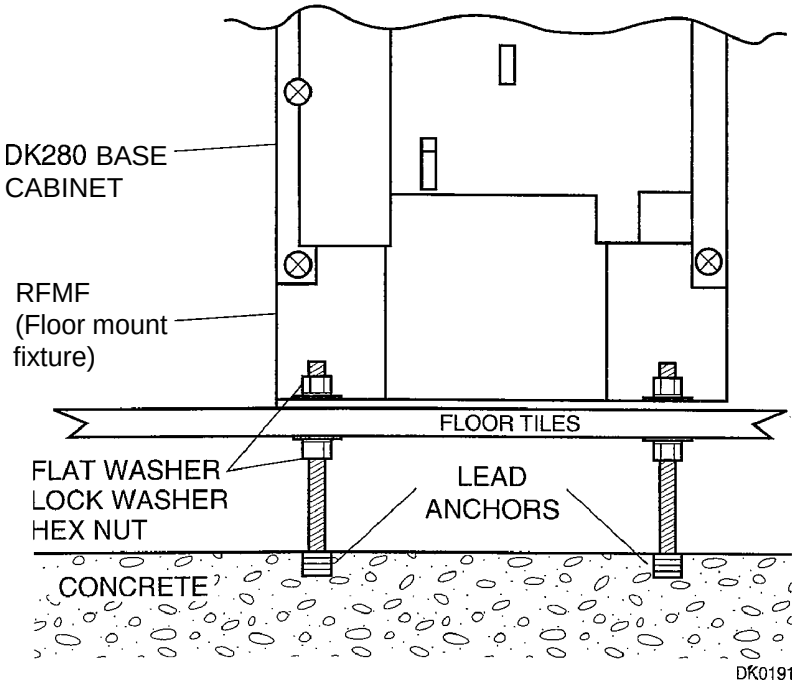


Figure 3-18
Floor Mount Installation — Computer Room Floor

3.5.3 Cabinet Removal and Replacement— Floor Mounted Systems

Cabinet Removal

Use the following procedure to remove a cabinet from a floor mounted system: (This procedure is written on the presumption that the base cabinet is the bottom cabinet of systems with two or more cabinets.)

1. Turn the system power off, and remove the front and side covers from the cabinet to be replaced and any cabinets above it. Remove the top cover from the top cabinet if it is to be replaced (Figure 3-1).

2. Unplug the AC power cord of the cabinet and any reserve power cabling connected to the power supply. Repeat this procedure for each cabinet above the cabinet to be replaced.

3. If a power strip (RPSB1) (Figure 3-20), Conduit Connection Box (RCCB1), or Battery Distribution Box (RBDB1) is connected to the cabinet, remove them (Figures 3-22 and 3-24).

4. If the cabinet to be replaced is the base cabinet (DKSUB280), disconnect all data cables connected to the base cabinet data cable connector.

5. If the cabinet to be replaced is an expansion cabinet (DKSUE280 or DKSUE424), disconnect the data cable of the cabinet from the data cable connector on the base cabinet. Repeat this procedure for all expansion cabinets above the cabinet to be replaced.

6. Disconnect any intercabinet ground wiring or system ground wiring connected to the cabinet. Repeat this procedure for any cabinets above the cabinet to be replaced.

7. Remove any cabinets above the cabinet to be replaced, and then remove the cabinet to be replaced.

Cabinet Replacement

For systems with just one or two cabinets refer to Subsection 3.5.1. For systems with three or more cabinets that are bolted to the floor (Method 1), refer to Subsection 3.5.2. For systems with three or more cabinets that are not bolted to the floor (Method 2), refer to Subsection 3.5.2.

3.6 Grounding Requirements

The system requires a solid earth ground for proper operation and safety. Failure to provide ground may be a safety hazard or lead to confusing trouble symptoms and, in extreme cases, system failure. The AC power cord(s) already contains a conductor for the "third wire ground provided by the commercial power outlet. It is also necessary to connect an insulated conductor between the frame ground terminal on the base cabinet (or the bottom expansion cabinet) and a cold water pipe or the building ground (Figure 3-19).

Notes:

1. *The "third wire ground ('A" in Figure 3-19) must be dedicated.*
2. *The conductor connected to the frame ground ("A" in Figure 3-19) must comply with the general rules for grounding contained in Article 250 of the National Electrical Code, NFPA 70, but must not depend on the cord and plug of the system.*

3.6.1 Third Wire Ground Test

Test each "third wire ground" separately for continuity by either measuring the resistance between the third prong terminal (earth ground) and a metal cold water pipe (maximum: 1 ohm) or by using a commercially available earth ground indicator. If neither procedure is possible, perform the following procedure.

WARNING!
Hazardous voltages that may cause death or injury are exposed during the following test. Use great care when working with AC power line voltage.

1. Obtain suitable voltmeter, and set it for a possible reading of up to 250VAC.

2. Connect the meter probes between the two main AC voltage terminals (white and black wires) on the wall outlet. The reading obtained should be between 100 – 120VAC.

3. Move one of the meter probes to the third terminal (green wire ground, point **A** in Figure 3-19). Either the same reading or a reading of zero volts should be obtained.

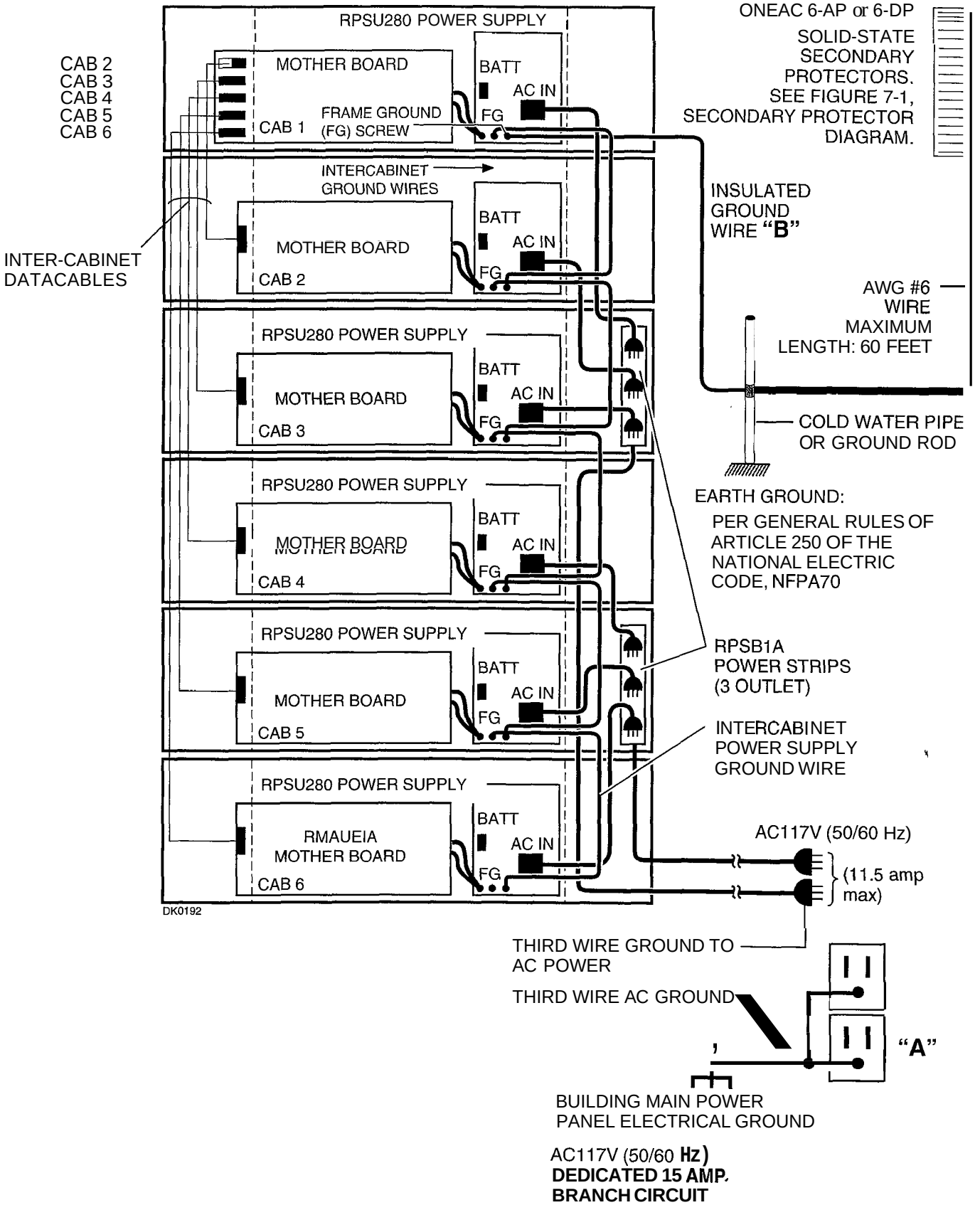


Figure 3-19
System Grounding Diagram

4. If the reading is zero volts, leave one probe on the ground terminal and move the other probe to the second voltage terminal.

CAUTION!

*If a reading of zero volts is obtained on both voltage terminals (white wire to green wire, black wire to green wire), the outlet is not properly grounded. Omit Steps **5** and 6, and proceed directly to Step 7.*

5. If a reading of zero volts on one terminal and a reading of 100 - 120VAC on the other terminal is obtained, remove both probes from the outlet.

6. Set the meter to the "OHMS/Rx1" scale. Place one probe on the ground terminal, and the other probe on the terminal that produced a reading of zero volts. The reading should be less than one ohm.

CAUTION!

If the reading is more than one ohm, then the outlet is not adequately grounded.

7. If the above tests show the outlet is not properly grounded, the condition should be corrected (per Article 250 of the National Electrical Code) by a qualified electrician before the system is connected.

3.6.2 Frame Ground Test

Use the following procedure to test the frame ground (point "B" in Figure 3-19) conductor for continuity.

WARNING!

Hazardous voltages that may cause death or injury are exposed during the following test. Use great care when working with AC power line voltage.

1. Refer to Figure 3-19.

2. Disconnect the AC plug(s) of the system to make sure that the separate earth ground paths are separated.

3. With a suitable volt/ohm meter, perform a reading between points " A and "B" shown in Figure 3-19. Verify that the readings do not exceed the figures listed below. If they do, the condition must be corrected by a qualified electrician before the system is connected.

A to B: 1 volt maximum

then

A to B: 1 ohm maximum

3.6.3 Intercabinet Ground

Intercabinet ground wires must be connected between cabinets in systems with two or more cabinets. Connect intercabinet ground wires supplied with each expansion cabinet per Figure 3-19.

3.7 AC Power Cabling Installation

The system requires an input power source of 50/60 cycles, 120VAC, and 15 amps AC to operate. AC power cabling requirements vary, depending on the method of cabinet installation and the number of cabinets. Refer to the following instructions in Subsection 3.7.1, 3.7.2, or 3.7.3 for AC cabling installation requirements. Refer to Chapter 2—Site Requirements, Table 2-1 for electrical power requirements.

Some floor-mounted configurations and all wall-mounted configurations require AC outlets, which must be dedicated to system use, fused, and grounded. To avoid accidental turn off, do not configure the outlet with an on-off switch.

3.7.1 Floor or Wall-Mounted Systems with One or Two Cabinets

Refer to the following instructions to install AC power cabling to floor or wall-mounted systems with just one or two cabinets (Figure 3-23):

1. Make sure all power supply (RPSU280) switches are in the off position.

2. If two cabinets are installed and local electrical code allows only one AC power cord from the system, install RPSB2 in the bottom cabinet per Figures 3-20 and 3-23.

3. For AC power cords that will be plugged directly into a wall outlet: Undo the tie wrap that keeps the cord coiled. Plug female end of the cord into the power supply, and plug the male end into the wall outlet.

4. For AC power cords that will be plugged into power strips: Do not undo the tie wrap that keeps the cord coiled. Plug female end of the cord into the power supply, and plug the male end into the

RPSB power strip. Plug the power strip power cord into a wall outlet (see Figure 3-11).

Note:

Power Supply testing procedures are provided in the Fault Finding section, which should be referred to if it is suspected that the power supply does *not work properly.*

3.7.2 Wall-Mounted Systems with Three or More Cabinets

Local electrical codes specify that a maximum of one or two AC power cords from the system can be plugged into wall outlets. Systems with three or more cabinets must be equipped with power strips (RPSBI or RPSB2) to adhere to this requirement. Each power strip has three outlets and an AC power cord (Figure 3-20).

Three-cabinet systems require one power strip, while four to six-cabinet systems require two or three power strips depending on local electrical code requirements pertaining to the number of AC power cords (one or two) allowed from the system. Refer to Figure 3-20 for recommended power strip placement.

Refer to the following instructions to install AC power cabling to wall-mounted systems with three or more cabinets:

1. Make sure all power supply (RPSU280) switches are in the off position.
2. Secure power strips to applicable cabinets (Figures 3-20 and 3-23).
3. For AC power cords that will be plugged directly into a wall outlet: Undo the tie wrap that keeps the cord coiled. Plug female end of the cord into the power supply, and plug the male end into the wall outlet.
4. For AC power cords that will be plugged into power strips: Do not undo the tie wrap that keeps the cord coiled. Plug female end of the cord into the power supply, and plug the male end into the power strip. Plug the power strip power cord into a wall outlet (see Figure 3-11).

   Note:

   Power Supply testing procedures are provided in the Fault Finding section, which should be referred to if it is suspected that the power supply does not work properly.

3.7.3 Floor-Mounted Systems with Three or More Cabinets

UL specifies that floor mounted systems with three or more cabinets require the installation of a Conduit Connection Box (RCCBI) to connect AC power cabling (and reserve power) to the system. Cabling from the AC power source to the conduit connection box can only be installed by a licensed electrician (Figures 3-21 and 3-22).

AC power cabling for floor-mounted systems with three or more cabinets requires the installation of one or two power strips (RPSBI), depending on the number of cabinets installed. Refer to Figure 3-20 for recommended power strip placement. Use the following instructions to connect AC power cabling to floor-mounted systems with three or more cabinets:

1. Make sure that the conduit connection box is installed on the bottom cabinet (Figures 3-21 and 3-22). The box can be installed by the regular system installer.
2. Have a licensed electrician install conduit and cabling from the AC power source to the conduit connection box per Figures 3-21 and 3-22 and local electrical codes. The remaining steps in this procedure can be performed by the regular system installer.
3. Make sure all power supply (RPSU280) switches are in the off position.
4. Secure power strips to applicable cabinets (Figure 3-20).
5. For each power supply: Plug the female end of the provided AC power cord into the power supply, without removing the tie wrap that keeps the cord coiled. Plug the other end of the cord into a power strip (Figure 3-20).
6. Plug power strip power cords into the conduit connection box.

3.8 Reserve Power Installation

Two or four customer-supplied, 12VDC batteries (80 ampere hours maximum) can be connected to the system as a power failure backup (see Figure 3-26). In the event of a power failure, the system automatically switches over to battery power without any interruption to existing calls or other ndrmal system functions. The length of time reserve power operates depends on the system, size and number of batteries provided, and

the system load. Typical reserve power duration estimates and battery specifications are provided in Table 3-1.

WARNING!

Some batteries can generate explosive gases. Therefore,

1. *Ensure that batteries are located in a well-ventilated area.*
2. *Do not smoke near batteries.*
3. *Avoid creating any electrical sparks near batteries.*
4. *Use commercially available battery enclosures to reduce risk to nearby people and equipment.*

The procedure for installing reserve power varies, depending on the number of cabinets in the system and the mounting method employed in installing the cabinets. Refer to the following instructions in Subsections 3.8.1, 3.8.2 and 3.8.3 for reserve power battery installation requirements.

WARNING !

Battery cables which exit the cabinet(s) are not UL listed because of possible incorrect installations. Have a licensed electrician install these cables.

3.8.1 Floor or Wall-Mounted Systems with One or Two Cabinets

Refer to the following instructions and Figures 3-23 and 3-26 to install reserve power to floor or wall-mounted systems with just one or two cabinets:

1. Connect the black jumper wire (supplied with the PBTC-3M cable) from the positive terminal of one 12VDC battery to the negative terminal of the second 12VDC battery.
2. Ensure that a serviceable 10-ampere fuse is installed in the in-line fuse holder of the PBTC-3M cable.
3. Connect the white lead of the PBTC-3M battery cable to the open positive terminal of the 12VDC battery. Connect the black lead to the open negative terminal of the second 12VDC battery.

IMPORTANT !

*The cabinet(s) must be connected to the (live) **AC** power source, and the power supply ON/OFF switch set to ON prior to the final step of connecting the reserve power batteries to the power supply via the BATT+/- receptacle. If the batteries are connected after **AC** power is lost, reserve power will not function.*

4. Connect the PBTC-3M battery cable two-prong male plug to the base cabinet power supply BATT +/- receptacle.
5. Repeat Steps 3 and 4 to connect a PBTC-3M to the expansion cabinet.
6. To test reserve power operation, disconnect system AC power plugs with power supply ON/OFF switches in the ON position. The system should continue to operate without any interruption.

   Note:
   If connecting four batteries, follow the wiring diagram in Figure 3-26.

3.8.2 Wall-Mounted Systems with Three or More Cabinets

Refer to the following instructions and Figures 3-25 and 3-26 to install reserve power to wall mounted systems with three or more cabinets.

1. Install the Battery Distribution Box (RBDB1A) to the bottom cabinet (Figure 3-24).
2. Connect two Cable "C" jumper wires from the positive terminal of one 12VDC battery to the negative terminal of the second 12VDC battery (Cable "C" is supplied with the RBTC1A-2M cable).
3. Ensure that a serviceable 12-ampere fuse is installed in the in-line fuse holder of the RBTC1A-2M battery cable.
4. Connect the white lead of the RBTC1A-2M battery cable to the open positive terminal of the 12VDC battery. Connect the black lead to the open negative terminal of the second 12VDC battery.
5. Connect a second RBTC1A-2M in parallel to the first RBTC1A-2M cable per Steps 2, 3 and 4 instructions.

6. Plug the two RBTC1A-2M battery cables into the Battery Distribution Box.

IMPORTANT!

The cabinets must be connected to the (live) AC power source, and the power supply ON/OFF switches set to ON prior to the final step of connecting the reserve power batteries to the power supplies via the BATT +/- receptacle. If the batteries are connected after ***AC*** *power is lost, reserve power will not function.*

7. Connect the RBTC1A-1.5M cables from the Battery Distribution Box to the BATT +/- receptacle of individual power supplies (6-RBTC1A-1.5M cables are supplied with RBDB1 distribution box, Figures 3-25 and 3-26).

8. To test reserve power operation, disconnect the system AC power plugs with the power supply ON/OFF switches in the ON position. The system should continue to operate without any interruption.

Note:

If connecting four batteries, follow wiring diagrams in Figure 3-26.

3.8.3 Floor-Mounted Systems with Three or More Cabinets

Floor mounted systems with three or more cabinets require the installation of a Conduit Connection Box (RCCB1) to connect reserve power cabling (and AC power cabling) to the system (refer to Figures 3-21 and 3-22). Only a qualified electrician can install cabling between the reserve power source (and AC power cabling) and the conduit connection box. All other steps required to install reserve power, including installation of the Battery Distribution Box (RBDB1), can be accomplished by the normal system installer. Refer to the following procedure to connect reserve power to floor-mounted systems with three or more cabinets:

1. Make sure that the Conduit Connection Box is installed on the bottom cabinet (Figure 3-22). The box can be installed by the regular system installer.

2. Have a licensed electrician install conduit and battery cabling to the Conduit Connection Box per Figures 3-21 and 3-22 and local electrical codes. The remaining steps in this procedure can be performed by the regular system installer.

3. Install the Battery Distribution Box on the second cabinet (the cabinet directly above the bottom cabinet) (Figures 3-24 and 3-25).

4. Plug the two Conduit Connection Box cables (coming from the left side of the RCCB box) into the Battery Distribution Box (Figure 3-21).

IMPORTANT !

The cabinets must be connected to the (live) AC power source, and the power supply ON/OFF switches set to ON prior to the final step of connecting the reserve power batteries to the power supplies via the BATT +/- receptacle. If the batteries are connected after ***AC*** *power is lost, reserve power will not function.*

5. Connect RBTCl A-I.5 cables from the the (RBDB) Battery Distribution Box to the BATT +/- receptacle of individual power supplies (6 RBTCl A-1.5 cables are provided with each RBDB distribution box).

6. To test reserve power operation, turn off the system AC power circuit breaker with power supply ON/OFF switches in the ON position. The system should continue to operate without any interruption.

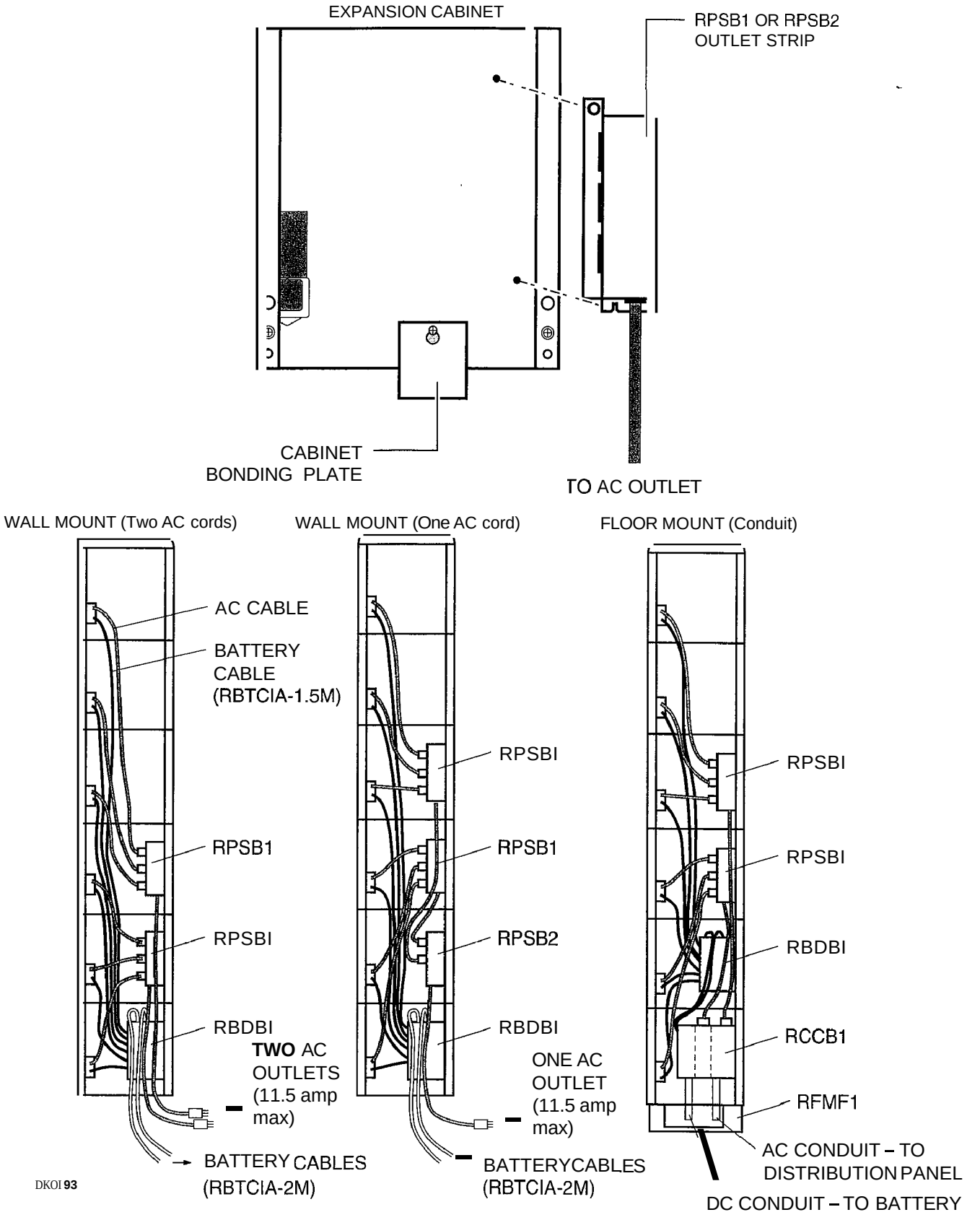


Figure 3-20
Outlet Strip (RPSB1 and RPSB2) Installation

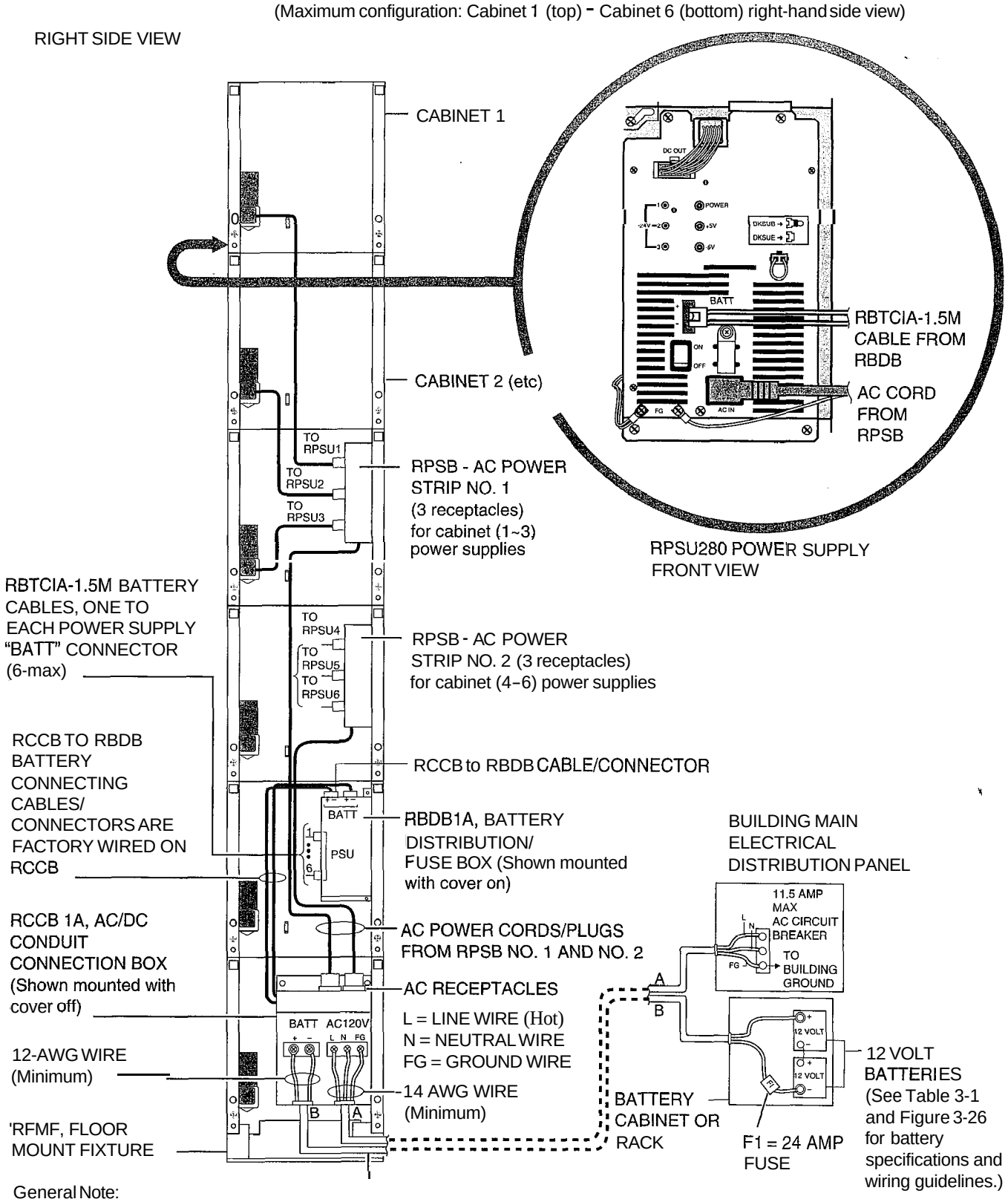


Figure 3-21
Reserve Power/AC Wiring for Three or More Floor Mounted Cabinets

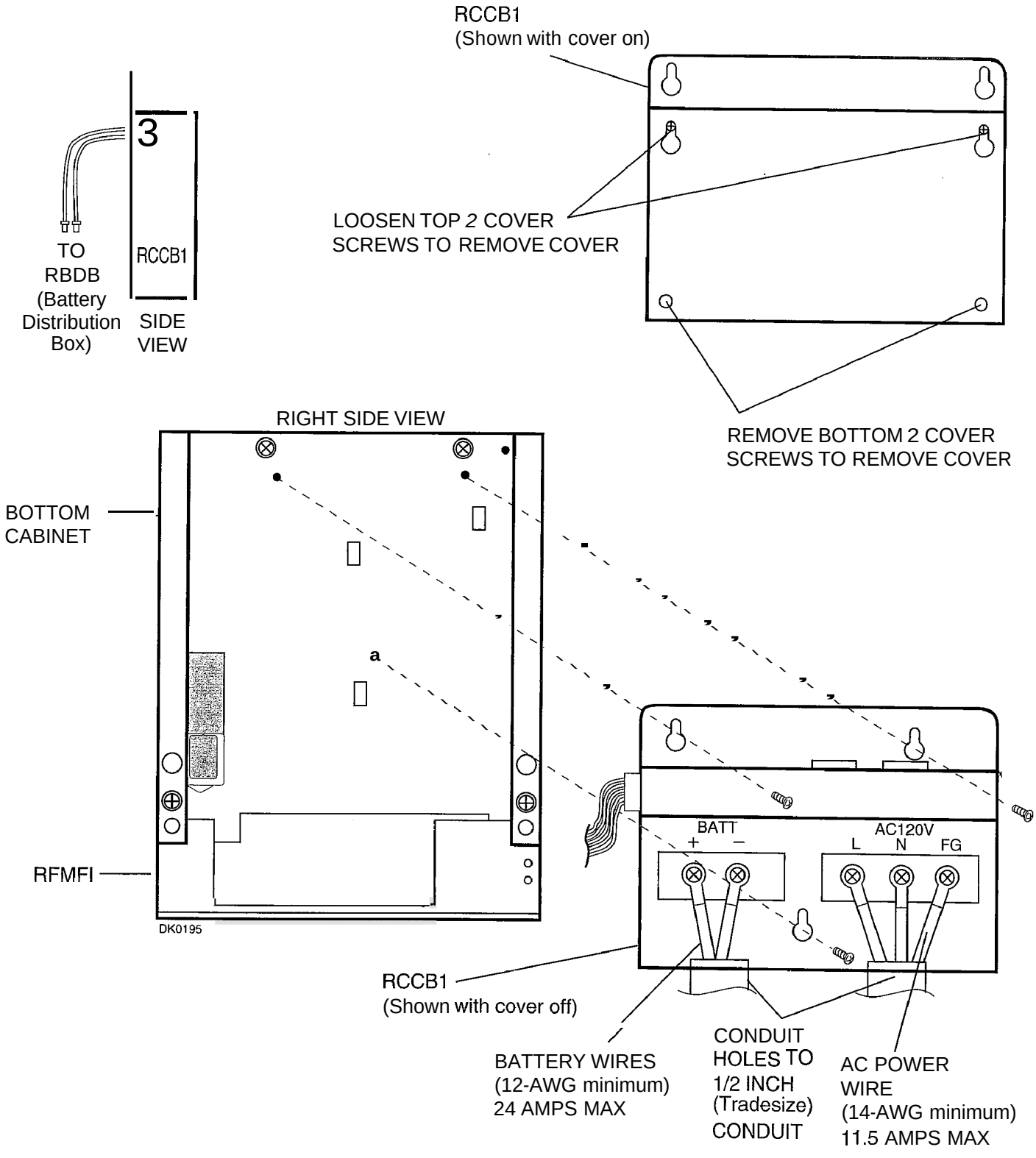
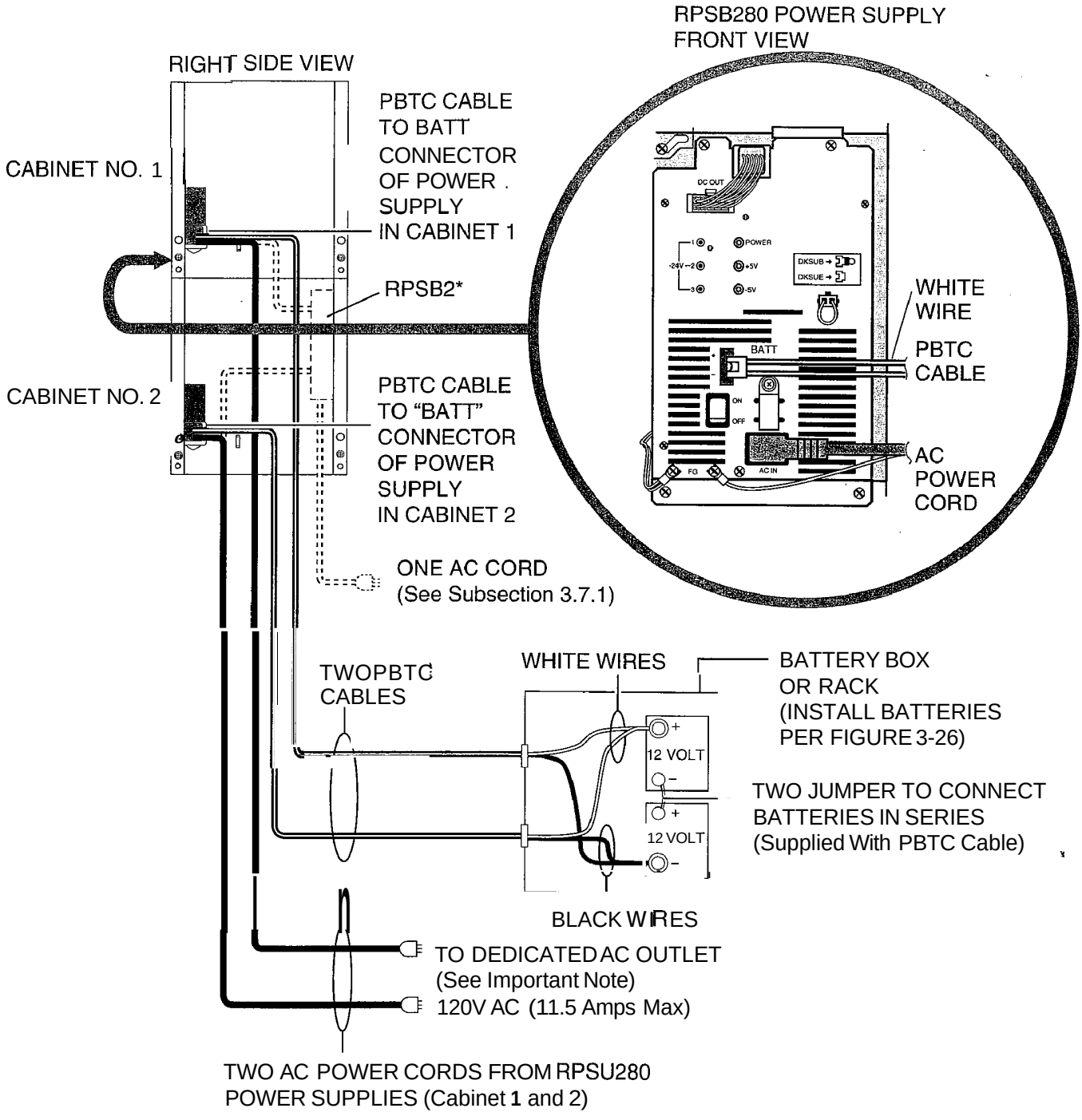


Figure 3-22
Conduit Connection **Box (RCCB)**
(Required to **Floor Mount Three or More DK280 Cabinets Only)**



***Important !**
If local electric code allows only one AC cord from the system, install a RPSB2 in the bottom cabinet (per Figure 3-20). Plug power supplies into the RPSB2 and plug the RPSB2 into the dedicated wall outlet.

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Figure 3-23
AC and Reserve Power, One or Two Cabinets, Wall or Floor Mounted

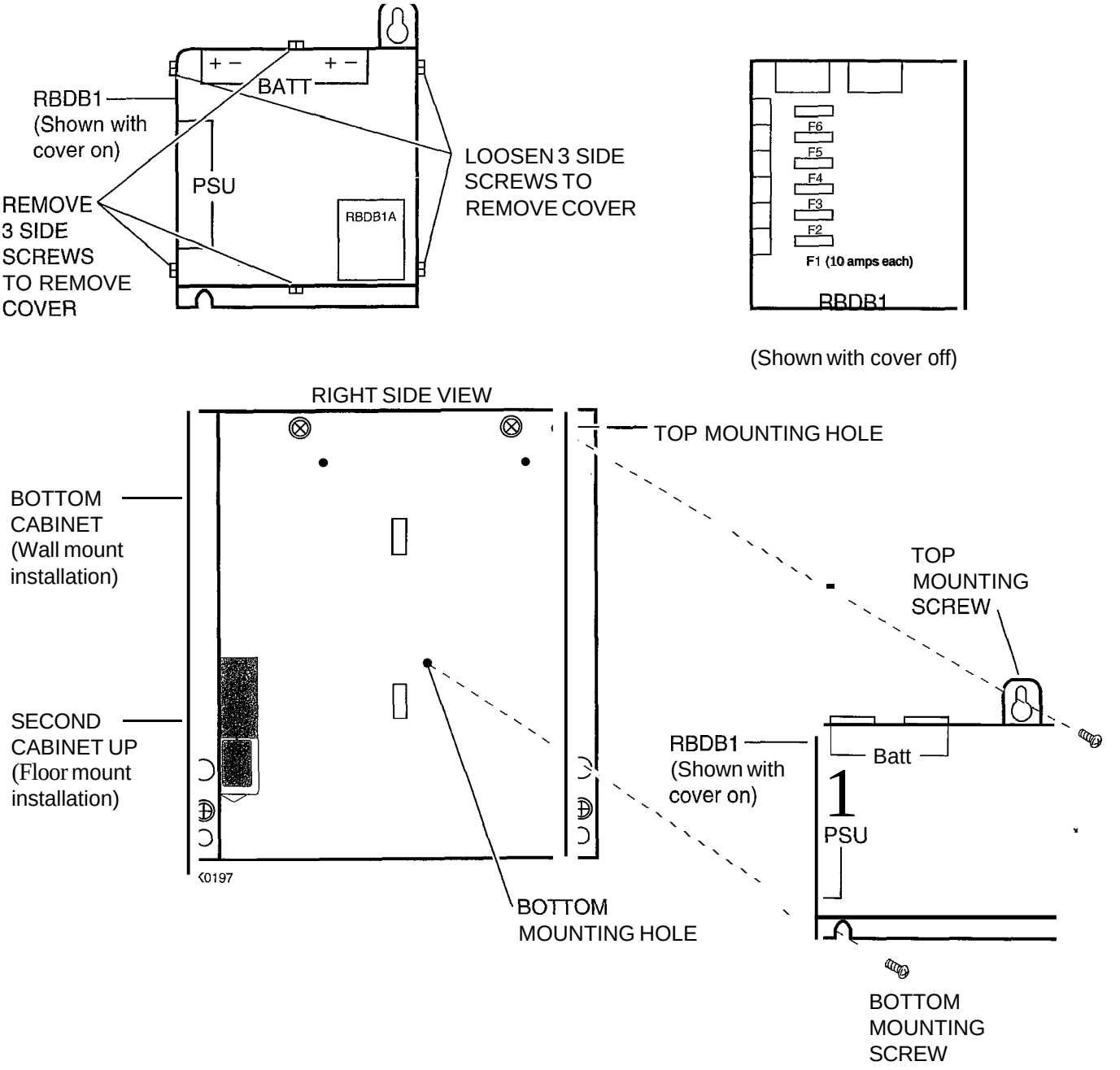


Figure 3-24
Battery Distribution Box (RBDB) Installation
Wall/Floor Mount, Three or More Cabinets with Reserve Battery Back Up

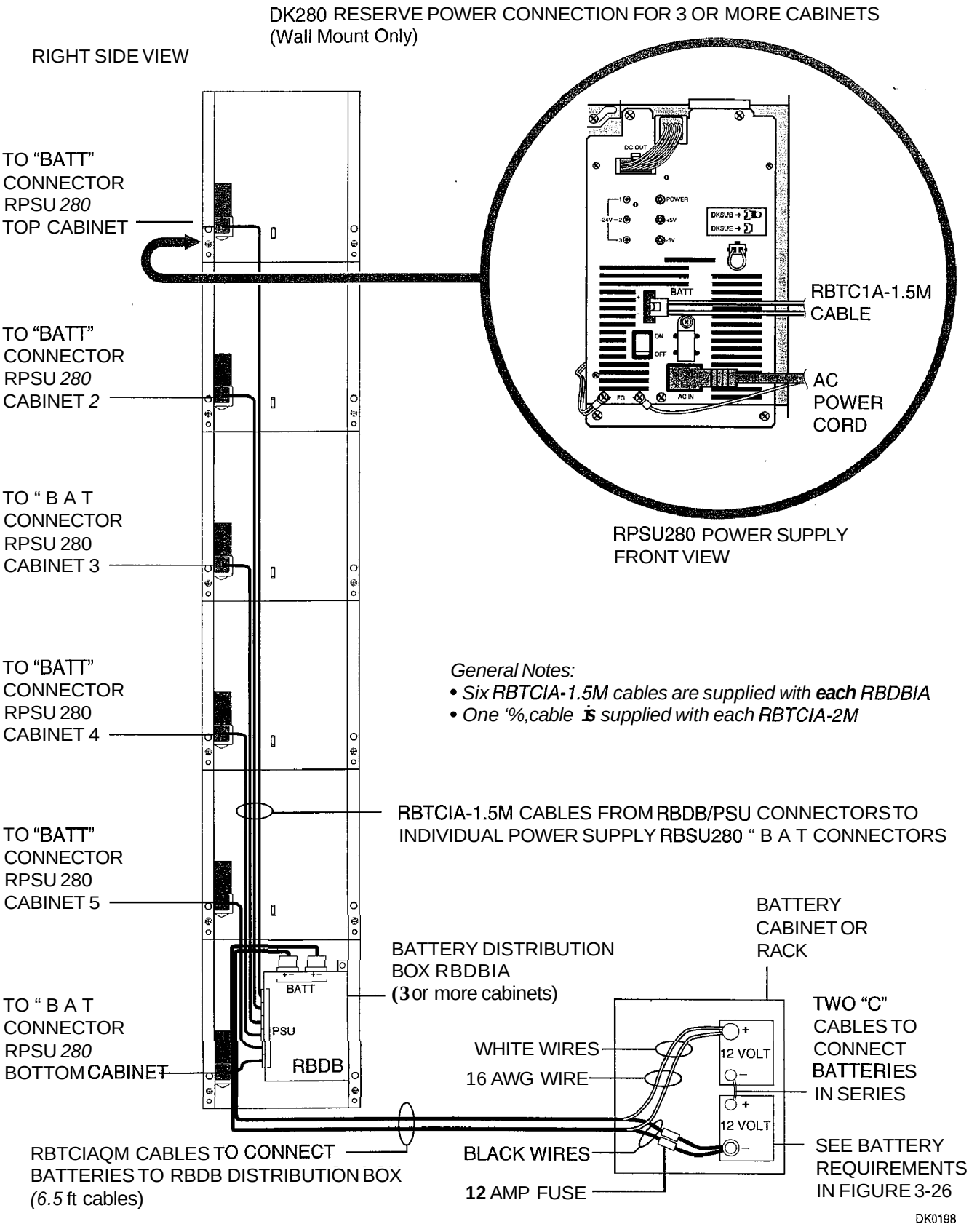


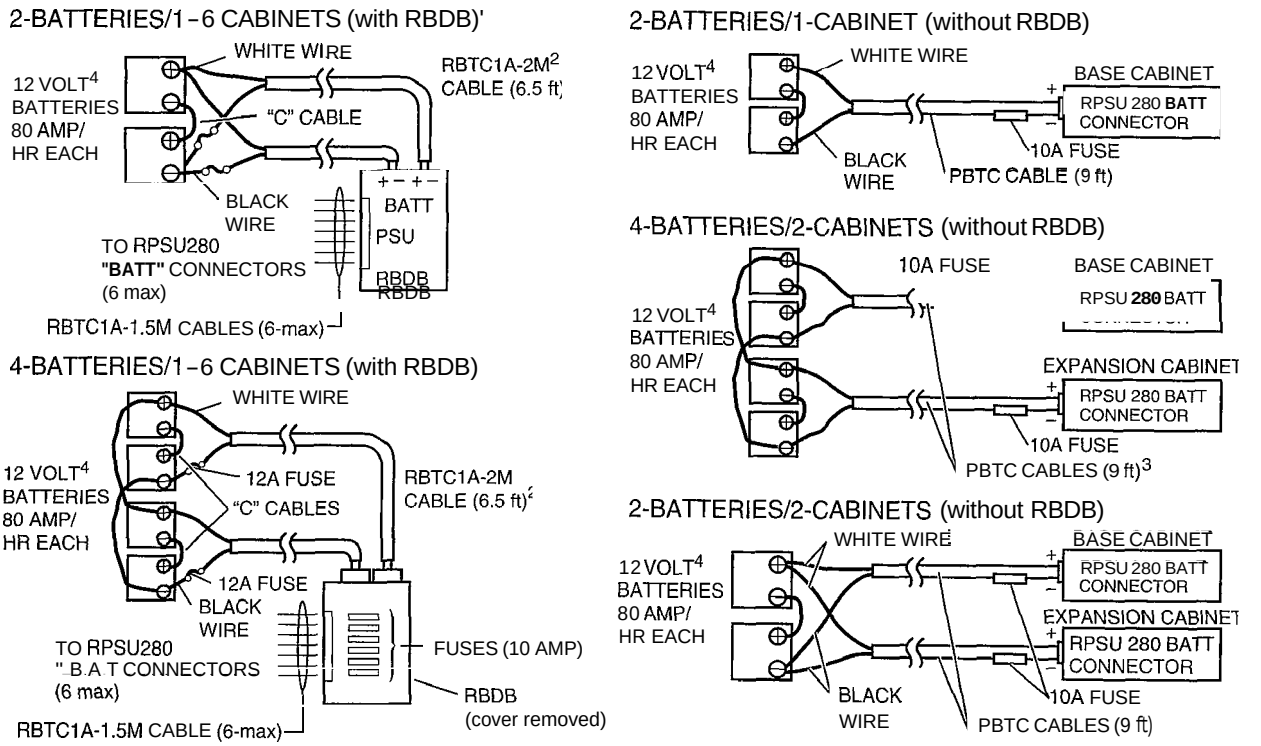
Figure 3-25
Reserve Power, Three or More Wall Mounted Cabinets

Table 3-1
Typical Reserve Power Duration Estimate

Number of Cabinets	1	2	3	4	5	6
Estimated operation time Two-battery configuration	16.0 hr	8.0 hr	5.0 hr	3.7 hr	3.0 hr	2.5 hr
Estimated operation time Four-battery configuration	32.0 hr	16.0 hr	10.0 hr	7.5 hr	6.0 hr	5.0 hr
DC Current Drain (–24 VDC)	3.5 A	6.7 A	9.9 A	13.1 A	16.3 A	19.5 A

Time is estimated with the following considerations:

1. Batteries have full charge at start of operation.
2. Two or four batteries connected per Figure 3-21.
3. Batteries are 12VDC, rated at 80 amp/hours each.
4. System is operating at full load traffic with LCD phones.
5. Batteries used for this test are gel-cell and maintenance-free. Reserve duration will vary depending upon battery type, age, and manufacturer. These figures should only be used as an estimate.



Notes:

1. *When floor mounting DK280, the batteries must be installed electrically as shown above by a licensed electrician per local electric code using conduit (see Figure 3-21).*
2. *RBTC1A-2M cable current ratings: Discharge, 12 amps max/charge, 3.9 amps max.*
3. *PBTC and RBTC1A-1.5M cable current ratings: Discharge, 4.9 amps max/charge 0.6 amps max.*
4. *Batteries should be installed in a customer supplied commercial Battery Box or enclosed Rack.*

General Notes:

- *PBTC cables are used for one or two cabinet installations (see Figure 3-23); two RBTC1A-2M cables are used for three or more cabinet installations (see Figure 3-25).*

IMPORTANT !

Since these cables are not UL listed, a licensed electrician should install them.

- *Cables connecting to Batteries must be 16 AWG minimum.*

DK0199

Figure 3-26
Battery Wiring Diagram (Two or Four Batteries) Wall Mount Only

IMPORTANT!

System Configuration can be complex and time consuming. For best results:

- *Use the software program 280Quote to provide easy, fast, automated configuration. This runs on an IBM compatible 486 PC, or higher, with a hard drive.*
- *If the above software is not available, use all the Worksheets in Chapter 1—Configuration.*

Important Installation Notes:

1. Place the RCTU jumper plug(s) into battery position; otherwise, all programmed data will be lost upon power down. Battery jumper plugs are on: RCTUA, RCTUB, RCTUBA3, RCTUC, and RCTUD3 PCBs.
2. Install RCCS PCBs on RCTU PCBs as required.
3. Install PDKU, PEKU, or RSIU in slot 11.

   - and/or -

   If an RSIU is installed in slot 11, install a PDKU or PEKU in slot 12.
4. Starting with the lowest empty slot (S12 or S13), install all station, attendant console, loop start, ground start, and RCIU/RCIS PCBs from lower to higher numbered slots (left to right). Do not leave empty slots except when installing RDTU PCBs when required per Tables 1-9 and 1-10 of Chapter 1—Configuration.
5. After all station, attendant console, and ground/loop start line, and RCIU/RCIS PCBs are installed, install all DID and tie line PCBs starting from the first numbered empty slot to the highest needed (in left to right order). Do not leave empty slots except when installing RDTU PCBs per Tables 11-1, 11-2, and 11-3 of Chapter 11—T1.
6. Install PIOU, PIOUS, PEPU, or RSSU in any convenient vacant slot.
7. Check power factors for each cabinet and for the entire system as explained in Chapter 1—Configuration.
8. If needed, run Program 91-9 **twice** to initialize program data. Do this if you have just completed Step 1 above. Run Program 03 and turn system power OFF (five seconds) and then ON to activate and identify to Program 03 any subassembly PCBs installed.
9. Perform memory test as in Program 00, Part 2.
10. Program customer database manually or upload customer database using a 280Admin or 280Backup personal computer.
11. Backup the customer database using a 280Admin or 280Backup personal computer.

Printed Circuit Boards

4

This chapter provides procedures for the installation of Strata DK280 system printed circuit boards (PCBs). It includes installation instructions, optional configuration information, wiring, and programming considerations for each PCB.

Install PCBs only after installing the base cabinet and, if applicable, expansion cabinets per Chapter 3—Cabinet Installation.

Note:
Be sure the power supply has been tested, and the ground has been checked.

PCB model numbers end with the letter "A," but in this document the "A is deleted because it is redundant. Examples: PCB model number PDKU1A is written "PDKU," RSTU2A is written "RSTU2."

4.1 Inspection, Packaging and Storage

4.1.1 Inspection

When the system is received, examine all packages carefully and note any visible damage. If any damage is found, do not open the packages. Contact the delivery carrier immediately and make the proper claims.

After unpacking (and before installing), check the system against the packing list and inspect all equipment for damage. If equipment is missing or damaged, contact your supplier immediately.

Be sure to retain original packaging materials for re-use when storing or transporting system hardware.

4.1.2 Packaging and Storage

CAUTION!
When handling (insfalling, removing, examining) PCBs, do not touch the back (soldered) side or edge connector. Always hold the PCB by its edges.

When packaging and storing the system, remove PCBs from the system cabinet (the power supply may remain installed in the cabinet for storage and shipment). PCBs should be packaged in their original antistatic bags for protection against electrostatic discharge. Be sure to package equipment in its original shipping containers.

4.2 PCB Installation Overview

The Strata DK280 system base and expansion cabinets are shipped empty. The power supplies and PCBs are not installed at the factory. PCBs must be installed in accordance with the configuration information obtained and developed in Chapter 1—Configuration. Refer to Chapter 3—Cabinet Installation to install power supplies.

4.2.1 PCB Installation Considerations

The base cabinet has eight slots. The first two slots, labeled "R11" and "RCTU" are reserved for the common control unit and future feature upgrades. The remaining six slots (labeled "S11," "S12," "S13," "S14," "S15," and "S16") are universal and capable of hosting any of the station, line, and option interface PCBs compatible with the DK280 systems. (If needed, RSIU must be installed in slot 11.)

The expansion cabinets have six universal slots, labeled "S_1," "S_2," S_3," "S_4," "S_5," "S_6," where the blank space of the label represents the number of

the expansion cabinet. Like the universal slots in the base cabinet, these universal slots are capable of hosting any of the station, line, and option interface PCBs (except RSIU which can only be installed in slot 11). The expansion cabinets also provide two slots labeled "S_7" and "S_8." These slots should be left vacant; they are reserved for future use with a RCTU processor upgrade using DKSUE424 cabinets only. DKSUE280 slots 7 and 8 cannot be used with future upgrades.

Cabinets are numbered from 1 to 6. The base cabinet is numbered 1; the first expansion cabinet, number 2; the second expansion cabinet, number 3; etc.

The following factors should be considered when installing PCBs:

IMPORTANT!

Use Worksheet 2 in Chapter 1 to determine the position (cabinet/slot) where each PCB should be installed.

- A PDKU, PEKU, or RSIU must be installed in slot S11. If an RSIU is installed in slot 11, then a PDKU or PEKU must be installed in slot 12. The programming telephone must have 20 feature buttons and an LCD, and can only interface with circuit 6 (port 005, station intercom or Primary Directory Number **[PDN]** 205) of the PDKU or PEKU PCB in S11; or, S12 if RSIU is installed in slot 11. (Programming can also be performed from a terminal or 280Admin personal computer, instead of a telephone.) The system, time, date, and day of week can only be set from an LCD telephone connected to logical port 000, usually station intercom or **[PDN]** 200 or an attendant console.

- PDKU1 can only be installed in slots S11 - S16, S21 ~ S26, S31 - S32, S41 ~ S46, S51 ~ S52, and S61 - S66. PDKU2 can work in any slot. See Worksheet 2, Table 1-8 in Chapter 1— Configuration.

- The following 2B-channel slots can only support Speaker OCA, RPCI, or data interface units (stand-alone, and integrated): S11 - S16, S21 - S26, S31 ~S32, S41 - S42, S51 - S52, and S61 - S62. Therefore, PDKUs and RDSUs that must support speaker OCA, RPCI-DI or data interface units have to be installed in these slots. (See Table 1-9 in Worksheet 2 in Chapter 1— Configuration.)

  Note:

  Telephones that provide handset OCA and RPCI-DI TAPI mode features can only be connected to PDKU1 or 2 PCBs installed in any slot, since these features do not require a 2B-channel slot!

- The following limitations apply to the RDTU T I interface PCB (see Worksheet 2, Table 1-9 and 1-10 in Chapter I—Configuration):
  - The RDTU cannot be installed in even numbered slots.
  - If a 24-channel (line) RDTU is inserted in slots S13, S15, S21, S23, S25, S31, S41, S51, or S61, a PCB cannot be inserted in the next slot. For example, if the RDTU is in S21, a PCB cannot be installed in S22.
  - If a 24-channel RDTU is installed in slots S33, S43, S53, and S63, a PCB cannot be inserted in the next two slots. For example, if the RDTU is in S33, a PCB cannot be installed in S34 and S35.
  - If a 16-channel RDTU is installed in slots S33, S43, S53, and S63, a PCB cannot be inserted in the second slot over. For example, if the RDTU is in S43, a PCB cannot be placed in S45. However, to allow channels 17-24 to be used in the future, follow the guidelines for 24 channels above.
  - If an 8-channel RDTU is installed, PCBs can be installed in the next slots and do not have to be left vacant. Adding channels 9-24 in the future will not be possible if slots are not left vacant.

4.2.2 PCB Option Considerations

Strata DK280 PCBs may be configured for a variety of hardware and software options. Hardware options are defined as either internal (generally related to optional PCB subassemblies) or external (related to connection of peripheral equipment such as background music, voice mail, etc). Hardware and software options for each PCB are identified in the individual PCB installation procedures in this chapter.

PCB Hardware Options

Some PCBs must be configured for hardware options prior to installation of the PCB in the KSU. Configuration instructions for internal hardware options are provided in the individual PGB installation procedures in this chapter. Configuration instructions

for external hardware options are provided in Chapter 6—Peripheral Installation.

PCB Software Options

PCBs are configured for software options through programming, following the installation instructions of the PCBs. A programming overview for each PCB is provided in the individual PCB installation procedures in this chapter. Refer to the Programming Part for detailed programming instructions.

4.2.3 PCB Installation Power Supply Considerations

Whenever removing or installing PCBs, observe the following requirements:

1. The power supply must be OFF whenever removing or installing the common control unit—RCTUA, RCTUB, RCTUBNBB, and RCTUC/D.
2. It is recommended that the power supply be OFF, whenever possible, when removing or installing the other PCBs.

4.3 Common Control Units (RCTUA, RCTUB, RCTUBA/BB, RCTUC/D)

The common control unit provides centralized control for the system. It incorporates a 68000-type microprocessor and contains a custom time switch and Conference Large Scale Integration (LSI) circuitry. The unit also provides busy tone detection as a standard feature for Auto Busy Redial (ABR) and interfaces with optional RRCS DTMF receivers, feature keys (RKYS1, 2, 3 or 4) for Auto Attendant (AA), Automatic Call Distribution (ACD), Management Information System (MIS) for ACD. ACD/MIS, Toshiba proprietary RS-232 and SMDI voice mail interfaces, and system Open Architecture interface (OA). ACD and attendant console requires the Release 2 or 3 (4-ROM) version of RCTUB2, RCTUBA/BB, RCTUC1/D2, and RCTUC3/D3 processors. System OA requires DK280 Release 3 processors and an RSIU option PCB. See Figures 4-8 and 4-9. The system operates with one of the following six common control units:

- The RCTUA1 (Release 1) or RCTUA3 (Release 3)
- The RCTUB1 PCB (Release 1), RCTUB2 (Release 2) or RCTUBA/BB (Release 3).

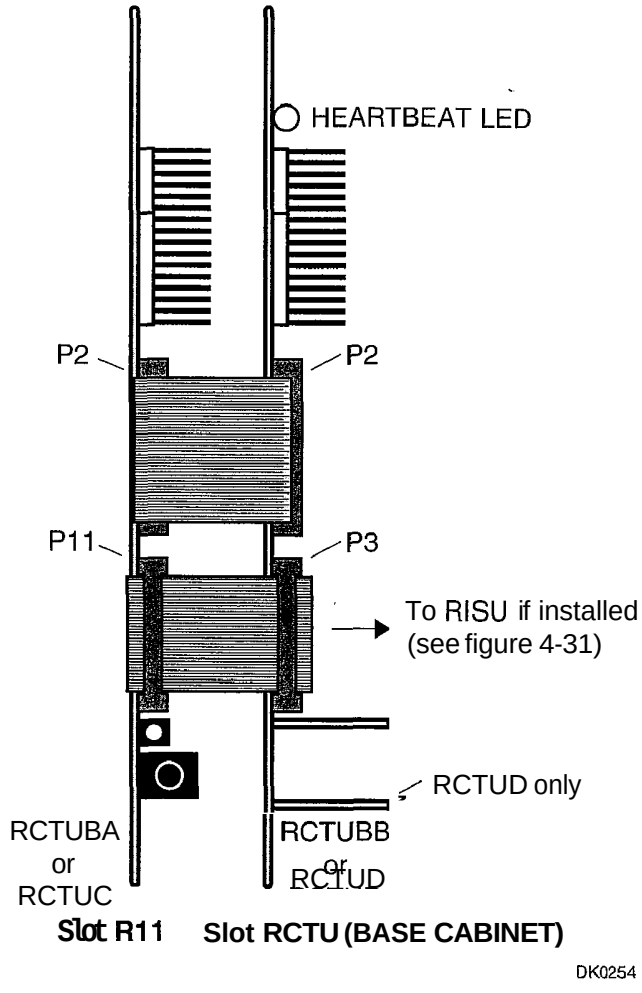


Figure 4-1
RCTUBA/BB, RCTUC/D - Slot Placement

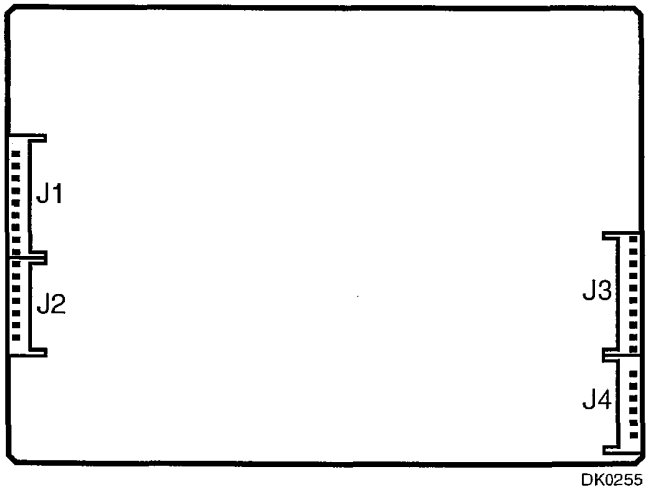


Figure 4-2
RRCS

- The combined RCTUC1/D1 PCBs (Release 1), RCTUC1/D2 (Release 2) or RCTUC3/D3 (Release 3).

  Note:
  There are two versions of RCTUC: RCTUC1 and RCTUC3. RCTUC1 can be used with RCTUD1 or RCTUD2: RCTUC3 can be used with RCTUD1, D2 and D3.

Each of these units supports a distinct number of cabinets, stations, and lines. The RCTUA (1 and 3) PCB can support only one cabinet, and up to 32 stations or 16 CO lines. The RCTUB1, RCTUB2, and RCTUBA/BB PCBs can support up to two cabinets, and up to 80 stations or 48 CO lines. The RCTUC1/D1, RCTUC1/D2, and RCTUC3/D3 PCBs operate together to support up to six cabinets, and up to 240 stations or 144 CO lines.

Additionally, each of the common control units can support a separate set of features. Refer to Chapter I — Configuration for more common control unit capacity and feature information.

Each of the common control units (except RCTU BB) may be equipped with an RRCS (4, 8, or 12) to interpret Dual-Tone Multi-Frequency (DTMF) signals transmitted from tie/DID lines and standard telephone ports. The common control units also provide an interface (along with a volume control) for a Music-on-hold (MOH)/Background Music (BGM) source.

RCTU controls, indicators, and interface connectors are shown in Figure 4-4 through 4-14 and described in Table 4-1 through 4-11.

4.3.1 Common Control Unit Hardware Options

The common control units (RCTUA, RCTUA3, RCTUB, RCTUB2, RCTUBA/BB, RCTUC1/D1, RCTUC1/D2, and RCTUC3/D3) support the following hardware options:

Internal Options

- DTMF receiver unit (RRCS-4, RRCS-8, RRCS-12)

There are three RRCSs: the RRCS-4 has four DTMF receiver circuits; the RRCS-8 has eight receiver circuits; and the RRCS-12 has 12 receiver circuits.

The RCTUAI and RCTUA3 can support up to 12 DTMF receiver circuits; the RCTUB, RCTUB2, and RCTUBA have up to 12 circuits; and the RCTUC/D (1-3) has up to 24 circuits (one RRCS on RCTUC and one RRCS on RCTUD).

- Feature Key—only one slot is available on the card

  RKYS-1 (Works with all RCTU processors to provide auto attendant.)

  RKYS-2 (Works with all processors except RCTUA1 and RCTUA3 to provide auto attendant and ACD.)

  RKYS-3 (Works with all processors except RCTUA1 and RCTUA3 to provide auto attendant, ACD, and ACD/MIS.)

  RKYS4 (Works with RCTUBA/BB and RCTUC3/D3 processors only to provide all RKYS3 features plus the Open Architecture capability for ACD calls.)

  Note:
  RKYS4 is available with DK280 Release 3.2 and above.

Install the appropriate RKYS (1A, 2A, 3A or 4A) per Figure 4-3, to enable the built-in Auto Attendant, Automatic Call Distribution (ACD), Management Information System (MIS) to ACD, and/or Open Architecture for ACD.

IMPORTANT!
*It is not necessary to run any special programs (i.e. Program 03) when RKYS is installed. RKYS can be installed before or after system initialization, and, before or after the customer database is entered. The feature(s) provided by the RKYS are enabled immediately when RKYS is installed. However, configuration programs for **AA** and ACD must be run for the feature to operate.*

External Option

- Music-on-hold (MOH)/Background Music (BGM) Volume Control (VR1)

Each of the common control units (except RCTUD and RCTUBB) has a trim potentiometer (VR1) to adjust the volume of the MOH/BGM source connected to the MOH/BGM RCA jack interface, which is also on the common control unit. The volume control potentiometer and the MOH/BGM interface are on the RCTUA (1 or 3), RCTUB (1 or 2), RCTUBA and RCTUC PCBs.

The VR1 potentiometer does not control the volume of alternate BGM sources connected to either the RSTU, RDSU, PSTU, PEKU, PESU, or other BGM source interfaces.

Install the MOH/BGM source to the common control unit per instructions in Chapter 6 — Peripheral Installation. Adjust the VR1 potentiometer to the desired volume level while listening to MOH or BGM.

RCTUA (1 or 3), RCTUB (1 or 2) RRCS Installation

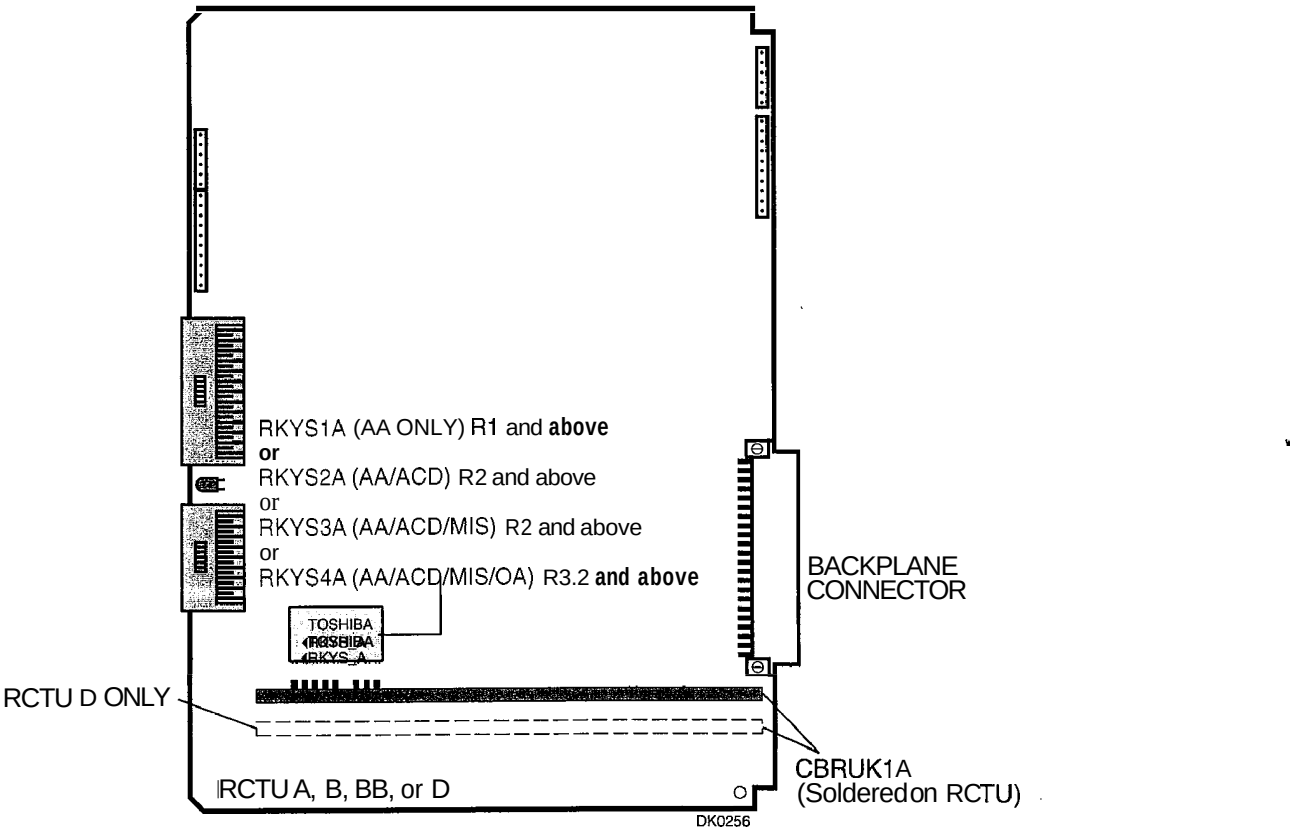
The RCTUA, and the RCTUB can be equipped with a RRCS-4, RRCS-8, or RRCS-12. Install the RRCS (4, 8, or 12) on the RCTUA, RCTUB or in accordance with the following steps:

1. Remove the RCTUA (1 or 3) or RCTUB (1 or 2) from its protective packaging. Remove the RRCS from its protective packaging.

   Note:
   *The RRCS connectors on the RCTUA, RCTUA3, RCTUB and RCTUB2 are labeled P2, P3, **P4,** and P5. The connectors are positioned to allow installation of the RRCS only in the proper position.*

2. Mate RRCS connectors J1, J2, **J3,** and J4 (Figure 4-2) with RCUTA or RCTUB connectors P2, P3, P4, P5. (The connectors on each of the three RRCS versions are labeled **J1,** J2, J3, and J4.)

3. Apply firm, even pressure to the RRCS to ensure proper mating of the connectors.



RKYS1A: Auto Attendant Only (RCTU A, B, BA/BB or C/D)
RKYS2A: Auto Attendant and Automatic Call Distribution (RCTU B, BA/BB or C/D)
RKYS3A: Auto Attendant and Automatic Call Distribution (ACD) with Management Information System (MIS)
RKYS4A: Auto Attendant, ACD with MIS, and Open Architecture port, Caller ID, ANI and DNIS information for ACD calls (RCTUBA/BB, C3/D3).

Figure 4-3
RKYS Feature Key Installation

RCTUBA/BB and RCTUC/D RRCS Installation

RCTUBA/BB provides up to 12 DTMF receiver circuits because an RRCS PCB can be installed on RCTUBA only and not on BB. The combined RCTUC/D common control unit can support up to 24 DTMF receiver circuits. Both the RCTUC and the RCTUD PCBs can be equipped with any of the three RRCS versions. RRCSs can be installed on both the RCTUC and the RCTUD at the same time. If only one RRCS is installed, the RRCS must be on the RCTUC. Always install the RRCS on the RCTUC before RCTUD.

1. Remove the RCTUBA or the RCTUC and the RCTUD from their protective packages. Remove the RRCS(s) from its protective packaging.

   Note:
   The RRCS connectors on the RCTUBA or RCTUC PCB are labeled P3, P4, P5, and P6. The RRCS connectors on the RCTUD PCB are labeled P5, P6, P7, and P8. The connectors on both PCBs are positioned to allow installation of the RRCS only in the proper position.

2. Mate RRCS connectors J1, J2, J3, and J4 (Figure 4-2) with RCTUBA or RCTUC connectors P3, P4, P5, **P6.** (The connectors on each of the three RRCS versions are labeled J1, J2, J3, and J4.)

3. Apply firm, even pressure to the RRCS *to* ensure proper mating of the connectors.

4. If applicable, mate RRCS connectors J1, J2, J3, and J4 (Figure 4-5) with RCTUD connectors P5, P6, P7, P8. (The connectors on each of the three RRCS versions are labeled J1, J2, J3, and J4.)

5. Apply firm, even pressure to the RRCS to ensure proper mating of the connectors.

4.3.2 Common Control Installation Procedures

RCTU PCB Installation

Install the RCTU common control unit in accordance with the following steps (refer to Figures 4-4 - 4-14).

CAUTION !
Do not remove the plastic insulation shield from the back of the RCTU PCB. If the shield comes off, do not allow the back of the PCB to contact metal.

1. Remove the RCTU PCB from its protective packaging.

2. Set the P8 or P9 battery jumper on the RCTU to the "ON" position.

CAUTION !
The RCTU PCBs are shipped from the factoty with the battery jumper in the "OFF" position. Ensure it is moved to the "ON" position before installing the RCTU to protect customer configuration information stored in the RCTU **RAM.**

3. Ensure the RCTU has been configured for the appropriate hardware options (i.e., RRCS or RKYS). Refer to Subsection 4.3.1.

CAUTION !
The power supply must be off when installing the RCTU PCB or damage to the board could result.

4. Insert the RCTUA (1 or 3), RCTUB (1 or **2),** BB, or RCTUD (1, **2** or 3) into the "RCTU" slot in the base cabinet. If RCTUA3 and RSIU is installed, you must also install a ribbon cable between them (see Figure 4-39).

   Note:
   Ensure the component side of the RCTU PCB is facing right when installing it in the base cabinet.

5. Insert the RCTUBA or RCTUC (1 or 3) PCB into slot "R11."

6. After installing the RCTU PCBs, gently pull it outward. If the connectors are properly mated, a slight resistance will be felt.

7. Connect the ribbon supplied ribbon cables between RCTU BA and BB and RSIU, if installed; or, RCTU C and D and RSIU, if installed (see Figure 4-39).

   Note:

   Do not adjust the C14 or C15 trimmer capacitor. The capacitor is factory-calibrated.

CAUTION!

When transporting the RCTU PCBs, keep the P8 or P9 battery jumper in the "ON" position in order to save the configuration data stored in RCTU RAM. (The battery will protect RAM for approximately six years.) Otherwise, to conserve the lithium battery, move the jumper to the "OFF" position.

When packaging the RCTU PCB, use only a nonconductive material enclosure, such as plain cardboard. Conductive material can cause the internal battery to discharge and erase memory in the RCTU PCB.

4.3.3 Common Control Unit Wiring

Refer to Chapter 6—Peripheral Installation to connect a MOH/BGM source to the the RCUTA, RCTUB, RCTUBA or RCTUC.

4.3.4 Common Control Unit Programming

Overview

After initially installing a new and unused common control unit, all on-board RAM memory needs to be erased and initialized by running Program 91-9 twice after all other PCBs are installed. If RAM contains configuration or feature data from previous programming that should be retained, do not run Program 91-9. See the Programming Part. If installing a RCTU PCB, Release 3 or above, perform a processor RAM test using Program 00, part 2. On new RCTU installations, the **RAM** test should be run after RCTU initialization and before entering the customer database.

The following parameters may be specified, through programming, for the RCTU PCB.

Program 00, part 2—RCTU RAM test.

Program 03

- ☐ For RCTUA (1 or 3). Specify Code 91 (no RRCS), 92 (four RRCS circuits), or 93 (eight RRCS circuits) 94 (12 RRCS circuits) for slot "00" ("RCTU").
- ■ For RCTUB (1 or 2): Specify Code 91 (no RRCS), 92 (four RRCS circuits), 93 (eight RRCS circuits), or 94 (12 RRCS circuits) for slot "00" ("RCTU").
- ■ For RCTUBA and RCTUC/D: Specify Code 91 (no RRCS), 92 (four RRCS circuits), or 93 (eight RRCS circuits), 94 (12 RRCS circuits). Assign the appropriate code for each PCB. slot 00 for RCTUBA or RCTUC (1 or 3) and slot 01 for RCTUD (1, 2 or 3).

  Note:

  1. *System Power must be cycled or Program 91-2 must be run after Program 03.*
  2. *If there are no options on the RCTU, Program 03 can be skipped and Program 91-1 or 91-9 can be run instead.*

Program 12—Select the seize time of the RRCS circuits.

Program 90, 91, **92**—RCTU initialization programs.

Table 4-1
RCTUA and RCTUA3 Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
DTMF Receiver Connector P2	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P3, P4, and P5.
DTMF Receiver Connector P3	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P2, P4, and P5.
DTMF Receiver Connector P4	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P2, P3, and P5.
DTMF Receiver Connector P5	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P2, P3, and P4.
BATT Battery Jumper P8	3-terminal jumper	Interface connector for on-board lithium battery that protects configuration data stored in system RAM:
MOH/BGM Source Connector	RCA jack	Interface connector for MOH/BGM source.
Future Feature Upgrade Connector P11	Connector for ribbon cable	Connector for connection with future feature upgrade PCB.
MOH/BGM Source Volume Control VR1	Trim potentiometer	Adjusts volume for MOH/BGM source connected to RCTUA.

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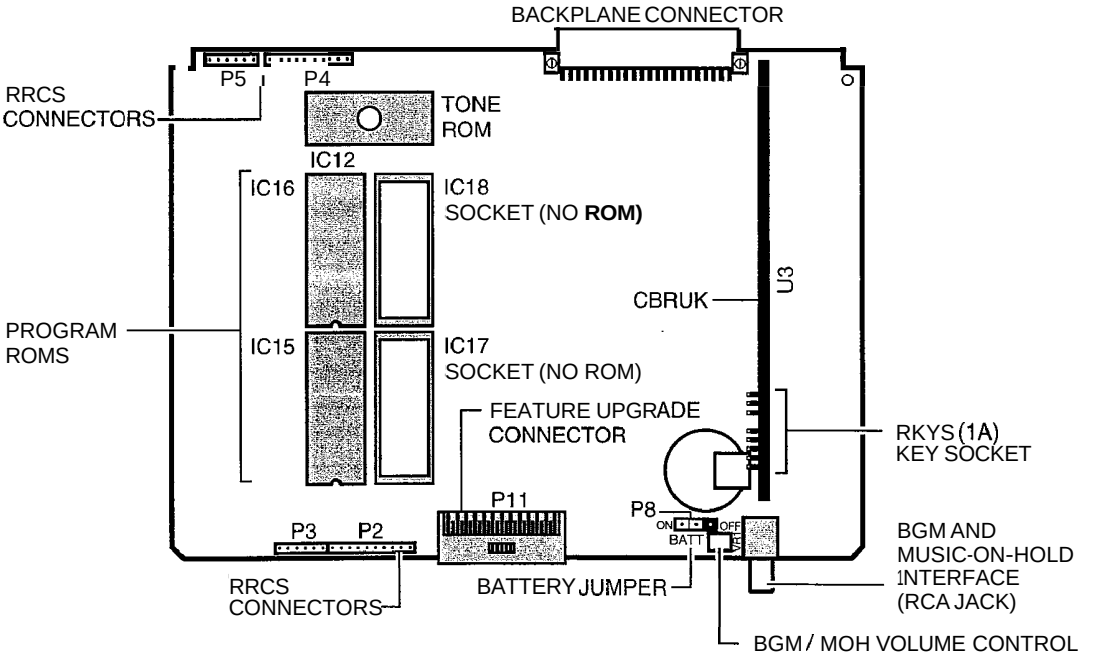

Figure 4-4
RCTUA Controls, Indicators, and Interface Connectors

Table 4-2
RCTUB1 Controls, Indicators, and Interface Connectors (for Release 1 and 2)

Control/Indicator/Connector	Type of Component	Description
DTMF Receiver Connector P2	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P3, P4, and P5.
DTMF Receiver Connector P3	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in coniunction with P2, P4. and P5.
DTMF Receiver Connector P4	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P2, P3, and P5.
DTMF Receiver Connector P5	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P2, P3, and P4.
BATT Battery Jumper P8	3-terminal jumper	Interface connector for on-board lithium battery that protects configuration data stored in system RAM.
MOH/BGM Source Connector	RCA jack	Interface connector for MOH/BGM source.
Future Feature Upgrade Connector P11	Connector for ribbon cable	Connector for connection with future feature upgrade PCB.
Future Feature Upgrade Connector P12	Connector for ribbon cable	Connector for connection with future feature upgrade PCB.
MOH/BGM Source Volume Control VR1	Trim potentiometer	Adjusts volume for MOH/BGM source connected to RCTUB.
Heartbeat Indicator CD11	Red LED	Flashes to indicate operation (1/4 second on—1/4 second off).

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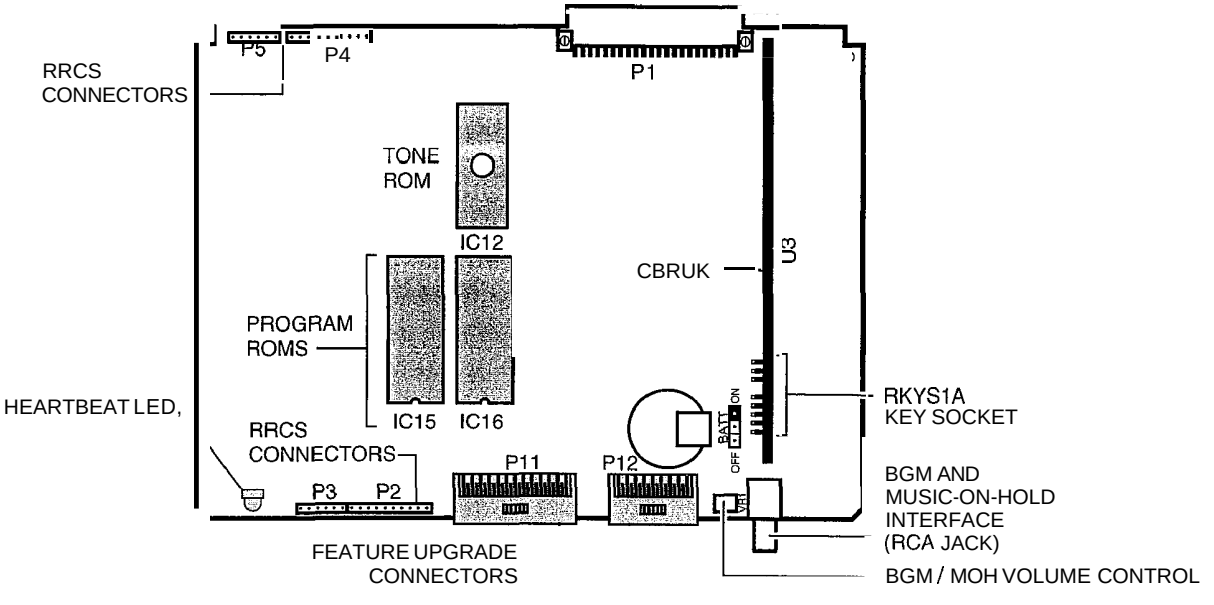

Figure 4-5
RCTUB1 Controls, Indicators, and Interface Connectors (for Release 1)

Table 4-3
RCTUC Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
RCTUC Ribbon Cable Connector P2	Connector and ribbon cable	Ribbon cable connector for connection to RCTUD. Used in conjunction with P2.
DTMF Receiver Connector P3	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in coniunction with P4. P5. and P6.
DTMF Receiver Connector P4	6-pin male connector	Used in conjunction with P3, **P5,** and P6.
DTMF Receiver Connector P5	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in coniunction with P3, P4, and P6.
DTMF Receiver Connector P6	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P3, P4, and P5.
BATT Battery Jumper P9	3-terminal jumper	Interface connector for on-board lithium battery that protects configuration data stored in system RAM.
MOH/BGM Source Connector	RCA jack	Interface connector for MOH/BGM source.
RCTUC Ribbon Cable Connector P11	Connector and ribbon cable	Ribbon cable connector for RCTUD. Used in conjunction with P2.
MOH/BGM Source Volume Control VR1	Trim potentiometer	Adjusts volume for MOH/BGM source connected to RCTUC.

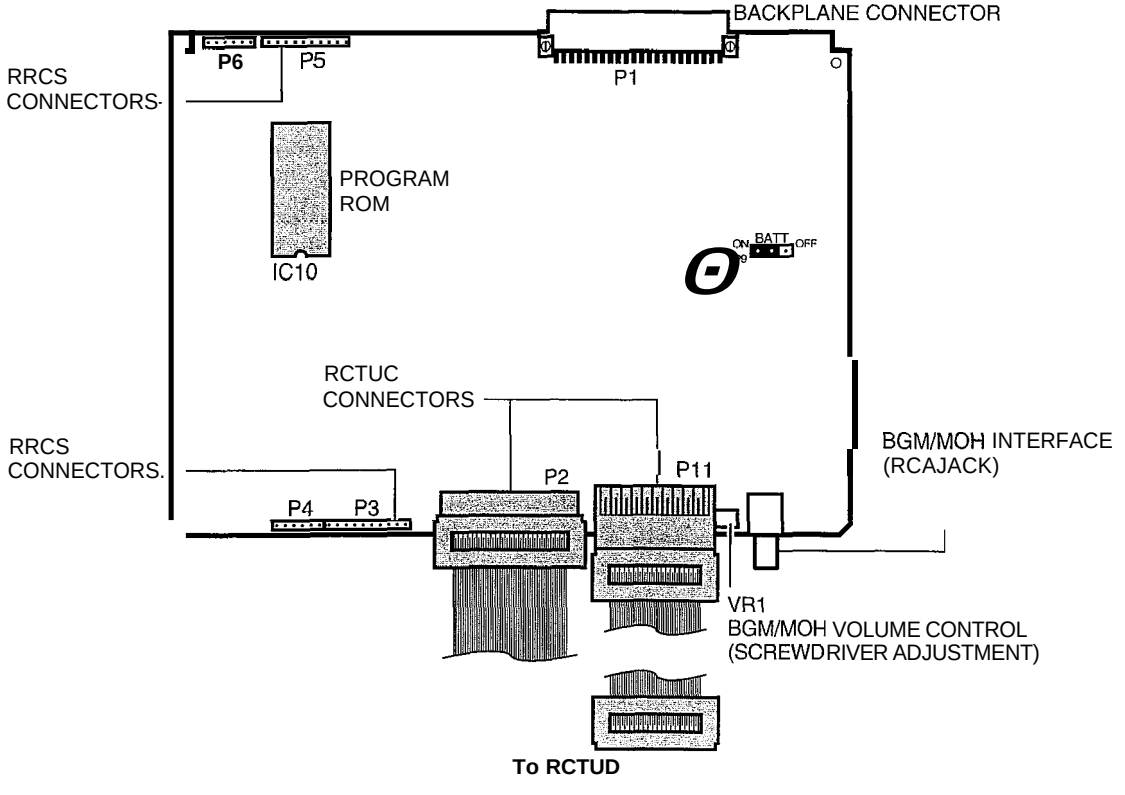

Figure 4-6
RCTUC1 Controls, Indicators, and Interface Connectors

Table 4-4
RCTUD1 Controls, Indicators, and Interface Connectors (for Release 1 and 2)

Control/Indicator/Connector	Type of Component	Description
RCTUD Connector **P2**	Connector for ribbon cables	Connector for RCTUC ribbon cables. Used with **P2.**
RCTUD Connector P9	Connector for ribbon cable	Connector for RCTUC ribbon cable. Used with P11.
DTMF Receiver Connector **P5**	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with **P6, P7,** and **P8.**
DTMF Receiver Connector P6	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P5, **P7,** and **P8.**
DTMF Receiver Connector **P7**	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P5, **P6,** and **P8.**
DTMF Receiver Connector **P8**	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P5, **P6,** and **P7.**
Heart Beat Indicator CD5	Red LED	Flashes to indicate operation (1/4 second on—1/4 second off).

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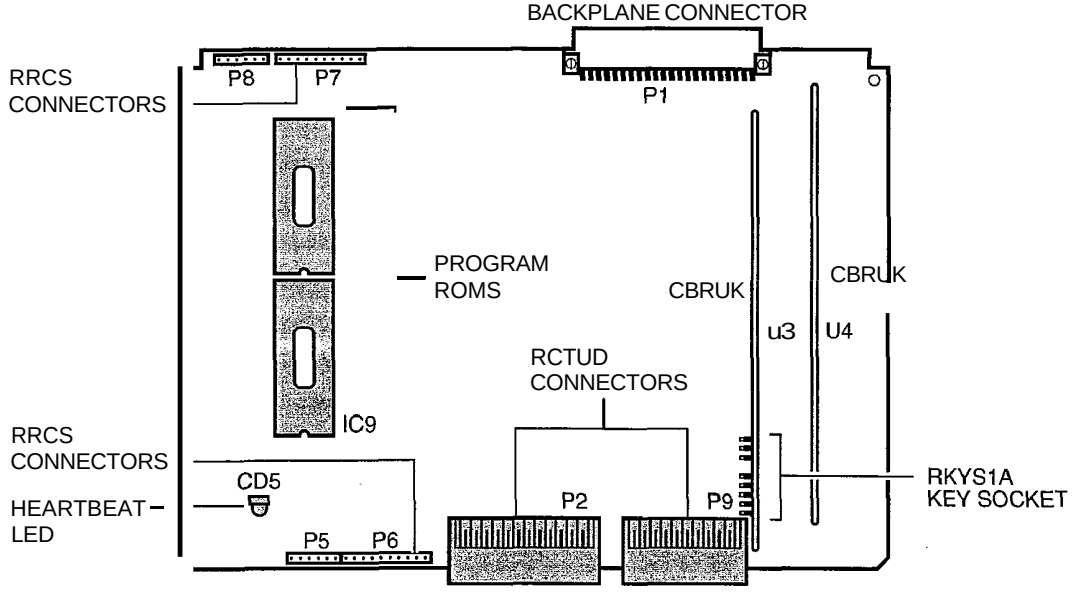

Figure 4-7
RCTUD1 Controls, Indicators, and Interface Connectors (Release 1)

Table 4-5
RCTUB2 Controls, Indicators, and interface Connectors (for Release 1 and 2)

Control/Indicator/Connector	Type of Component	Description
DTMF Receiver Connector P2	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in coniunction with P3, P4, and P5.
DTMF Receiver Connector P3	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in coniunction with P2, P4, and P5.
DTMF Receiver Connector P4	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P2, P3, and P5.
DTMF Receiver Connector P5	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P2, P3, and P4.
BATT Battery Jumper P8	3-terminal jumper	Interface connector for on-board lithium battery that protects,configuration data stored in system RAM.
MOH/BGM Source Connector	RCA jack	Interface connector for MOH/BGM source.
Future Feature Upgrade Connector P11	Connector for ribbon cable	Connector for connection with future feature upgrade PCB.
Future Feature Upgrade Connector P12	Connector for ribbon cable	Connector for connection with future feature upgrade PCB.
MOH/BGM Source Volume Control VR1	Trim potentiometer	Adjusts volume for MOH/BGM source connected to RCTUB.
Heartbeat Indicator CD11	Red LED	Flashes to indicate operation (1/4 second on—1/4 second off).

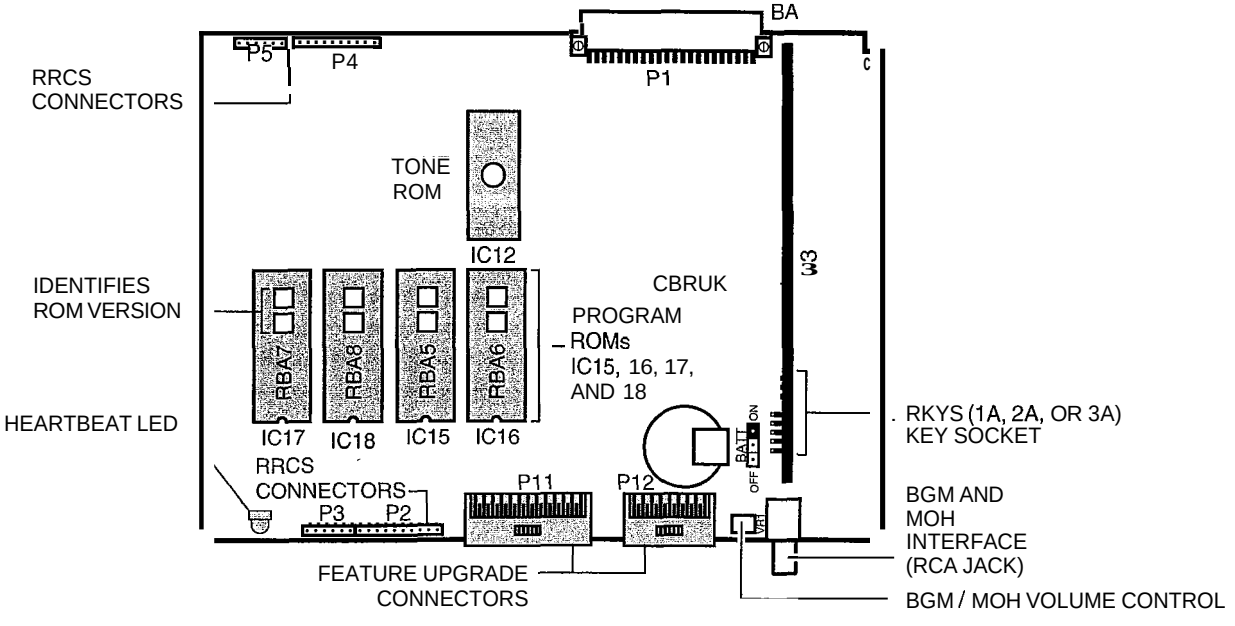

Figure 4-8
RCTUB2 Controls, Indicators, and Interface Connectors (Release 2)

Table 4-6
RCTUD2 Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
RCTUD Connector P2	Connector for ribbon cables	Connector for RCTUC ribbon cables. Used with P2.
RCTUD Connector P3	Connector for ribbon cable	Connector for RCTUC ribbon cable. Used with P11.
DTMF Receiver Connector P5	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P6, P7, and P8.
DTMF Receiver Connector P6	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P5, P7, and P8.
DTMF Receiver Connector P7	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P5, P6, and P8.
DTMF Receiver Connector P8	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P5, P6, and P7.
Heart Beat Indicator CD5	Red LED	Flashes to indicate operation (1/4 second on—1/4 second off).

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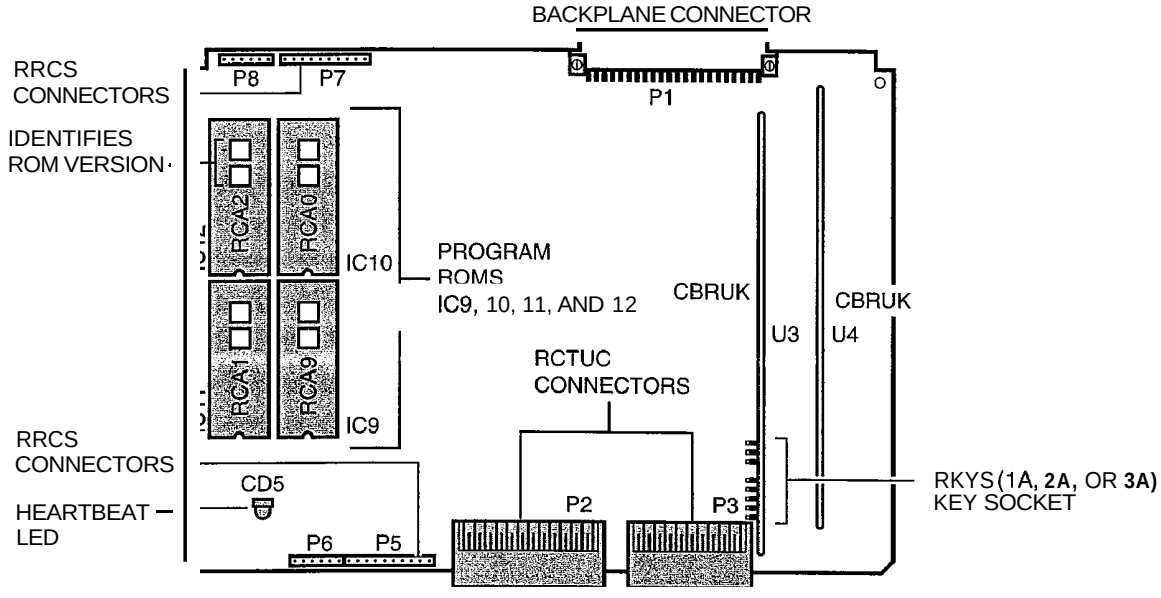

Figure 4-9
RCTUD2 Controls, Indicators, and Interface Connectors (Release 2)

Table 4-7
RCTUA3 Controls, Indicators, and Interface Connectors (for Release 3)

Control/Indicator/Connector	Type of Component	Description
DTMF Receiver Connector P2	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P3, P4, and P5.
DTMF Receiver Connector P3	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P2, P4, and P5.
DTMF Receiver Connector P4	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P2, P3, and P5.
DTMF Receiver Connector P5	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P2, P3, and P4.
BATT Battery Jumper P8	3-terminal jumper	Interface connector for on-board lithium battery that protects configuration data stored in system RAM.
MOH/BGM Source Connector	RCA jack	Interface connector for MOH/BGM source.
Future Feature Upgrade Connector P11	Connector for ribbon cable	Connector for connection with future feature upgrade PCB.
Future Feature Upgrade Connector P12	Connector for ribbon cable	Connector for connection with RSIU PCB. (see Figure 4-31)
MOH/BGM Source Volume Control VR1	Trim potentiometer	Adjusts volume for MOH/BGM source connected to RCTUA3.
Heartbeat Indicator CD11	Red LED	Flashes to indicate operation (1/4 second on—1/4 second off).

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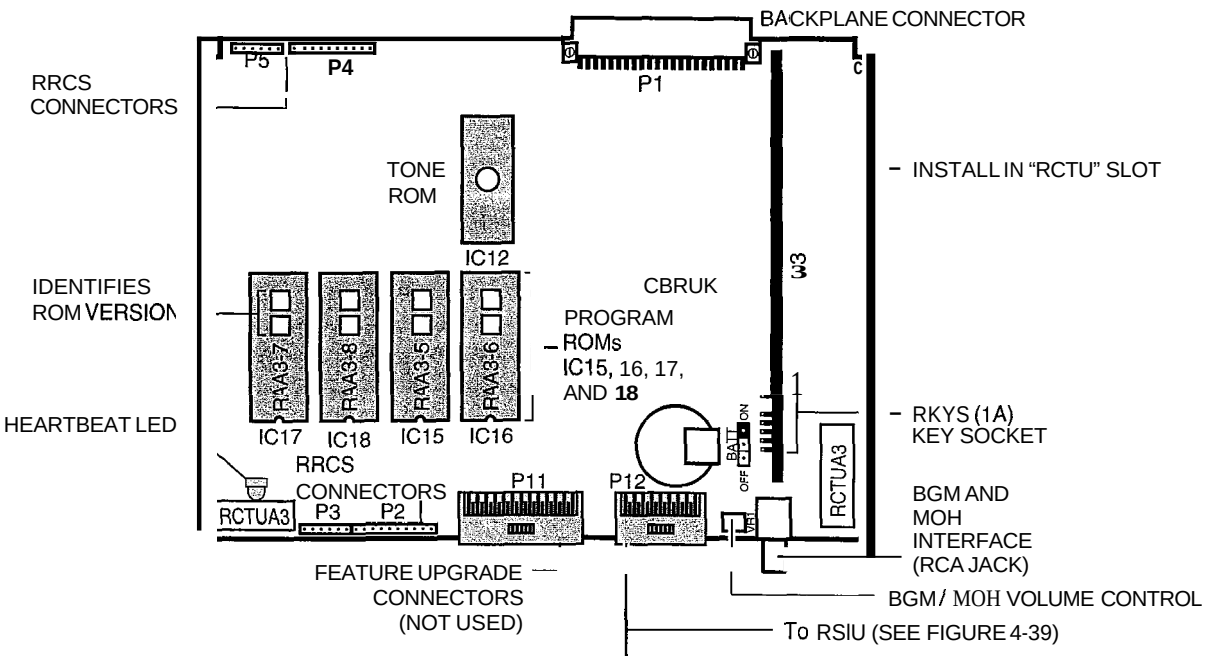

Figure 4-10
RCTUA3 Controls, Indicators, and Interface Connectors (for Release 3)

Table 4-8
RCTUBA Controls, Indicators, and Interface Connectors (Release 3)

Control/Indicator/Connector	Type of Component	Description
RCTUBA Ribbon Cable Connector P2	Connector and ribbon cable	Ribbon cable connector for connection to RCTUBB. Used in conjunction with P2.
DTMF Receiver Connector P3	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P4, P5, and P6.
DTMF Receiver Connector **P4**	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P3, **P5,** and P6.
DTMF Receiver Connector P5	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P3, P4, and P6.
DTMF Receiver Connector P6	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P3, P4, and P5.
BATT Battery Jumper P9	3-terminal jumper	Interface connector for on-board lithium battery that protects configuration data stored in system RAM.
MOH/BGM Source Connector	RCA jack	Interface connector for MOH/BGM source.
RCTUBA Ribbon Cable Connector P11	Connector and ribbon cable	Ribbon cable connector for RCTUBA and RSIU. Used in conjunction with P2.
MOH/BGM Source Volume Control VR1	Trim potentiometer	Adiusts volume for MOH/BGM source, connected to RCTUBA.

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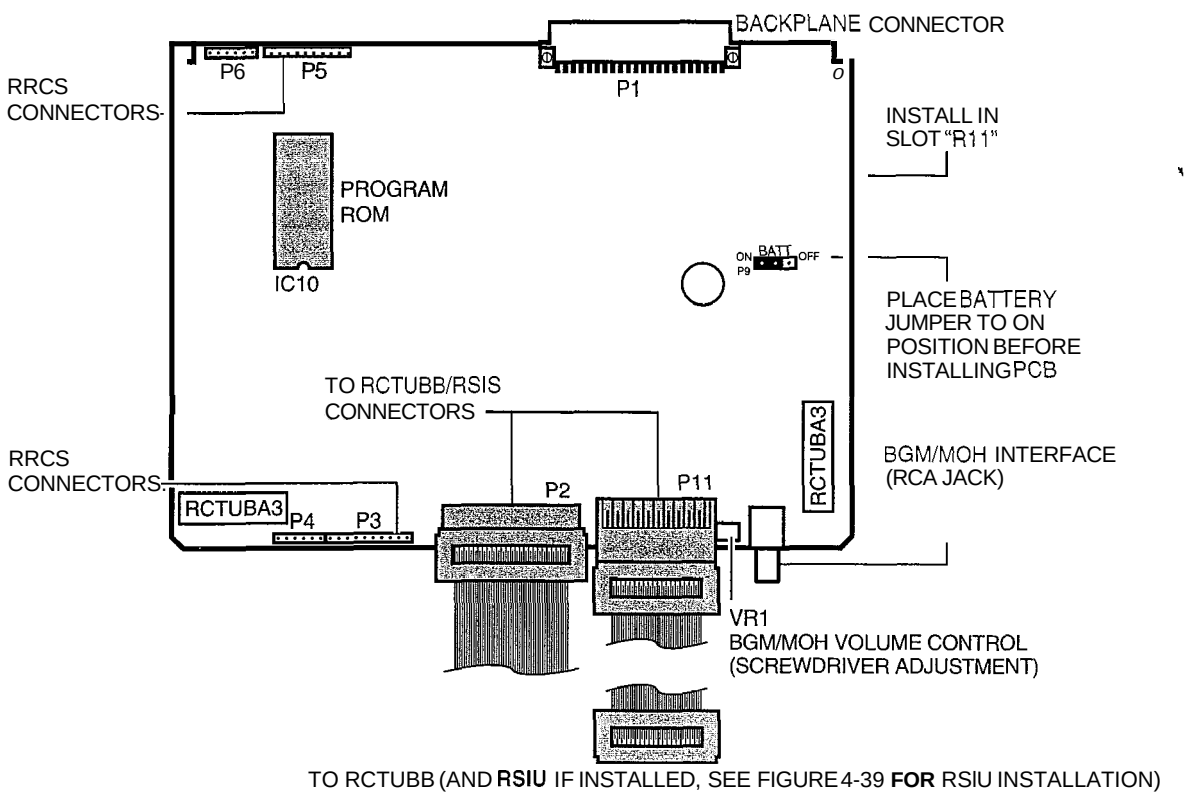

Figure 4-11
RCTUBA Controls, Indicators, and Interface Connectors (Release 3)

Table 4-9
RCTUBB Controls, Indicators, and Interface Connectors (for Release 3)

Control/Indicator/Connector	Type of Component	Description
Connector P2	Connector for ribbon cables	Connector for RCTUBA ribbon cables. Used with **P2.**
Connector P3	Connector for ribbon cable	Connector for RCTUBA and **RSIU** ribbon cable. Used with P11.
Heart Beat Indicator CD5	Red LED	Flashes to indicate operation (1/4 second on—1/4 second off).

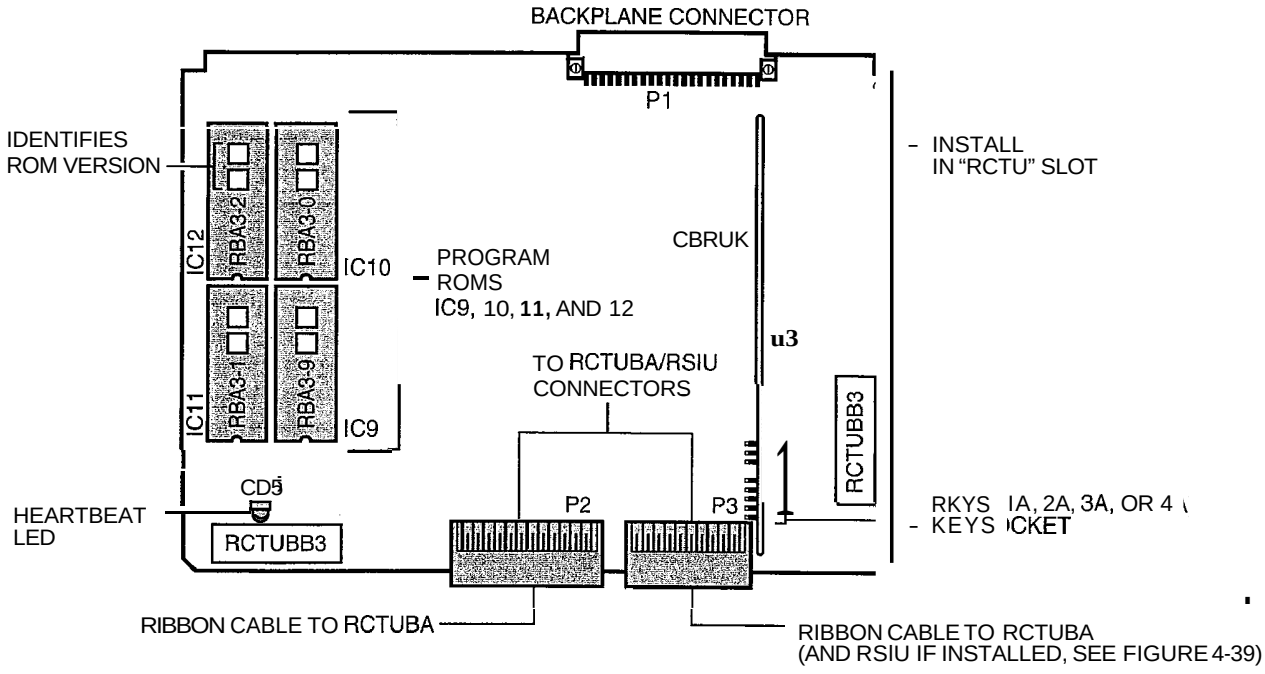

Figure 4-12
RCTUBB Controls, Indicators, and Interface Connectors (for Release 3, see Figure 4-37 for RSIU Installation)

Table 4-10
RCTUC3 Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
RCTUC Ribbon Cable Connector P2	Connector and ribbon cable	Ribbon cable connector for connection to RCTUD. Used in conjunction with P2.
DTMF Receiver Connector P3	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P4, P5, and P6.
DTMF Receiver Connector P4	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P3, P5, and P6.
DTMF Receiver Connector P5	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P3, P4, and P6.
DTMF Receiver Connector P6	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P3, P4, and P5.
BATT Battery Jumper P9	3-terminal jumper	Interface connector for on-board lithium battery that protects configuration data stored in system RAM.
MOH/BGM Source Connector	RCA jack	Interface connector for MOH/BGM source.
RCTUC Ribbon Cable Connector P11	Connector and ribbon cable	Ribbon cable connector for RCTUD and RSIU. Used in coniunction with P2.
MOH/BGM Source Volume Control VR1	Trim potentiometer	Adjusts volume for MOH/BGM source connected to RCTUC.

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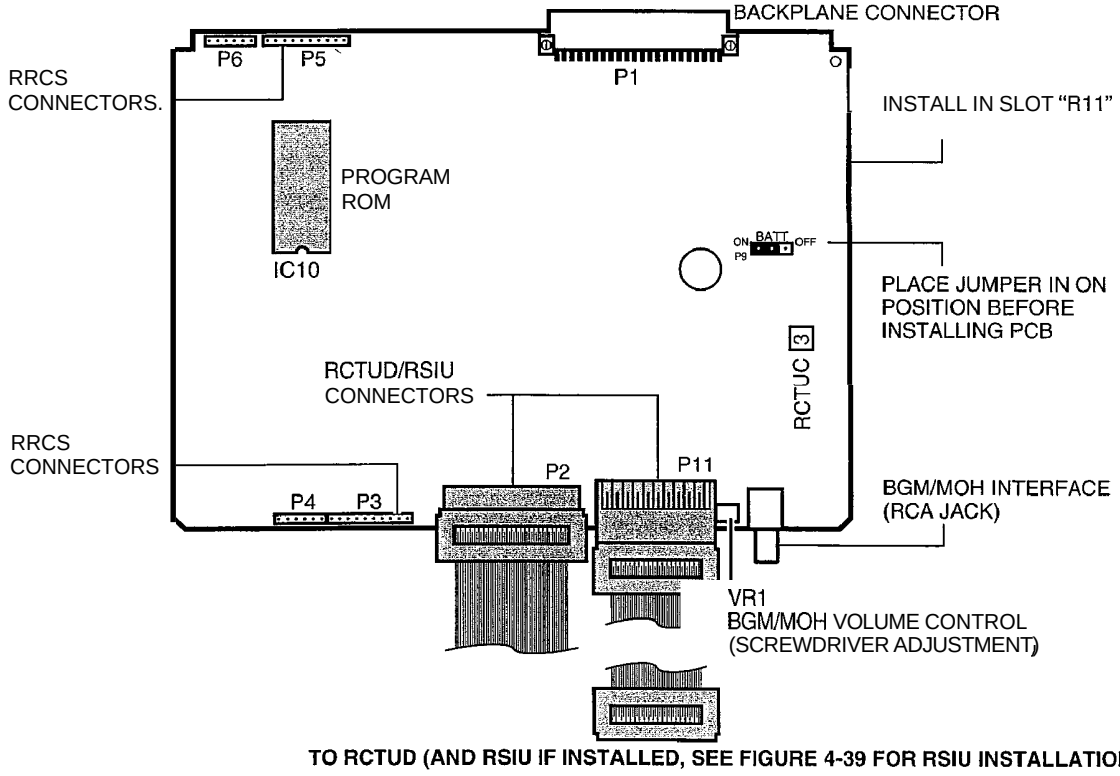


Figure 4-13
RCTUC3 Controls, Indicators, and Interface Connectors (for Release 3)

Table 4-11
RCTUD3 Controls, Indicators, and Interface Connectors (for Release 3)

Control/Indicator/Connector	Type of Component	Description
RCTUD Connector P2	Connector for ribbon cables	Connector for RCTUC ribbon cables. Used with P2.
RCTUD Connector P3	Connector for ribbon cable	Connector for RCTUC ribbon cable. Used with P11.
BATT Battery Jumper P9	3-terminal jumper	Interface connector for on-board lithium battery that protects configuration data stored in system RAM.
DTMF Receiver Connector P5	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P6, P7, and P8.
DTMF Receiver Connector P6	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P5, P7, and P8.
DTMF Receiver Connector P7	10-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P5, P6, and P8.
DTMF Receiver Connector P8	6-pin male connector	Interface connector for optional DTMF Receiver subassembly (RRCS). Used in conjunction with P5, P6, and P7.
Heart Beat Indicator CD5	Red LED	Flashes to indicate operation (1/4 second on—1/4 second off).

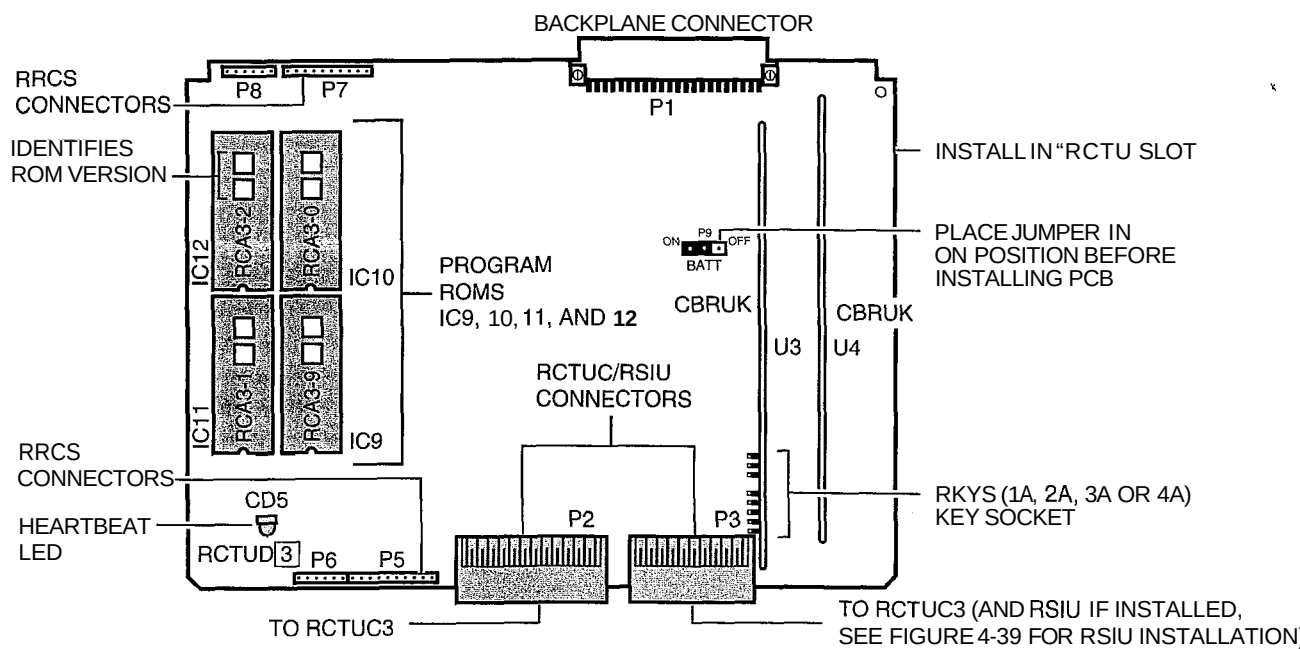


Figure 4-14
RCTUD3 Controls, Indicators, and Interface Connectors (for Release 3)

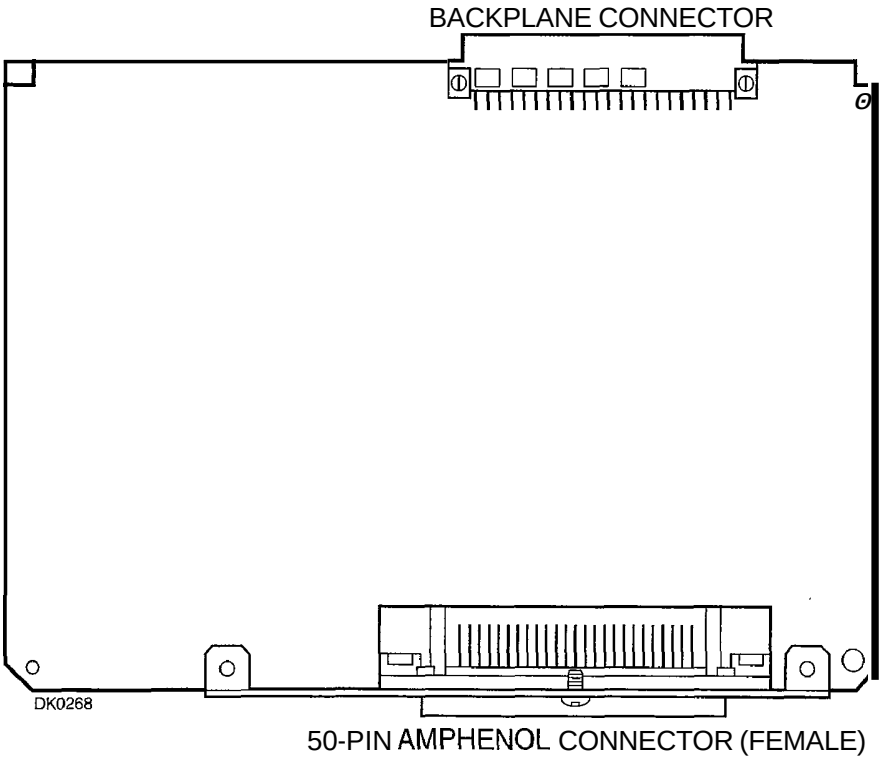


Figure 4-15
PDKU Interface Connectors

4.4 Digital Telephone Interface Unit (PDKU: Versions 1 & 2)

The PDKU provides eight ports (circuits) for digital telephones (with or without RPCI-DI, integrated data interface units and add-on modules), a digital door phone/lock control unit (DDCB), stand-alone data interface units (PDIU-DS), and a digital direct Station selection console (DDSS). There are two versions of the PDKU: the PDKUI and the PDKU2. These versions are identical, except for the following distinctions:

- The original PDKU version, the PDKU1 cannot support Data Interface Units (DIUs) on Circuit 8. The later version PDKU2 can support DIUs on each of its circuits.
- PDKUI can only be installed in slots S11 - S16, S21 ~ S26, S31 - S32, S41 ~ S46, S51 ~ S52, and S61 - S66. PDKU2 can work in any slot. See Table 1-8 of Worksheet 2 in Chapter 1—Configuration.
- PDKUI does not support continuous DTMF tones with DKT2000-series telephones; PDKU2 does support continuous DTMF tones.

Some of the devices that interface with the PDKU (PDKU1 and PDKU2) can be connected to any circuit on the PCB. Others can only be connected to specific circuits, which are noted as follows:

- DDSS Console: Circuit 8 only.
- DDCB: Circuit 5 only (Port 004, 012, 020, and 028).

  Note:
  DIUs can only be connected to Circuits 1 - 7 on the PDKU1.

The following slots only can support Speaker **OCA,** RPCI-DI, or data interface units (stand-alone and integrated): S11 - **S16,** S21 - S26, S31 ~S32, S41 - S42, S51 - S52, and S61 - S62. PDKUs can operate in other slots but stations connected to them will not be able to receive Speaker OCA calls or to make or receive data calls. All slots support Handset OCA and RPCI-DI TAPI mode. (See Table 1-8 of Worksheet *2* in Chapter 1—Configuration.)

There are no controls or indicators on the PDKU (Figure 4-15).

4.4.1 PDKU Hardware Options

PDKUs (PDKUI and PDKU2) do not have to be configured for any option. Refer to Chapter 5—Station Apparatus to connect digital telephones, DDCBs, and DDSS consoles to the PDKU. Chapter 5—Station Apparatus also includes instructions on how to upgrade digital telephones with the following options: an Integrated Data Interface Unit (PDIU-DI, RPCI-DI), a Speaker Off-hook Call Announce upgrade (DVSU), and a Headset/Loud Ringing Bell Interface (HHEU). Refer to Chapter 6—Peripheral Installation to connect the Stand-alone Data Interface Unit (PDIU-DS) to the PDKU.

4.4.2 PDKU Installation Procedures

Install the PDKU in accordance with the following steps:

1. Remove the PDKU from its protective packaging.
2. Insert the PDKU into the appropriate slot, and apply firm, even pressure to ensure proper mating of connectors.

   Note:
   Ensure the PDKU's component side is facing right when installing it in the KSU.
3. After installing the PDKU, gently pull the PCB outward. If the connectors are properly mated, a slight resistance is felt.

4.4.3 PDKU Wiring

Refer to PDKU Wiring Diagrams, Chapter 7—Wiring Diagrams, for wiring/interconnecting details.

4.4.4 PDKU Programming Overview

The following programming parameters may be specified for the PDKU (PDKUI and PDKU2):

Program 03

- Specify Code 61 to indicate a station line PDKU.
- Specify Code 62 to indicate a PDKU supporting Speaker Off-hook Call Announce (OCA) and/or DIUs and RPCI-DI Data mode.
- Specify Code 64 to indicate a PDKU supporting a DDSS console, Speaker OCA, DIUs, and RPCI-DI Data mode.

Notes:

1. *If there are no PDKU options, Program 03 can be skipped, and Program 91-1 or 91-9 can be run instead.*
2. *For RPCI-DI TAPI mode only and Handset **OCA,** code 61 can be used and the PDKU can be in any universal cabinet slot.*

Programs 20, **21, and** 22—Configures DIUs and RPCIs.

Programs 28 **and** 29—Digital Direct Station Selection Consoles (DDSS) assignments.

Program *29—Enables ADMs on 2000-series digital telephones.

Program 27—Adjusts initial off-hook volume level for digital telephone handsets.

Programs 30, 31—Enables **OCA.**

Programs 77-1, 77-2, 79, ***79**—Digital Door Phone/Lock Control Unit (DDCB) and door phone ringing assignments.

Program 92-5—Initializes initial ringing, speaker, and muted ring volume levels of digital telephones.

4.5 Electronic Telephone Interface Unit (PEKU)

The PEKU provides eight ports (circuits) for electronic telephones, an Electronic Direct Station Selectibn Console, an Electronic Door Phone/Lock Control Unit, an external amplifier, and a separate Background Music (BGM) source.

Electronic telephones can be connected to any circuit on the PEKU. The other devices that can interface with the PCB can only be connected to specific circuits, which are noted as follows:

- HDSS console: Circuits 7 and 8 only (Each HDSS console requires two circuits).
- HDCB: Circuit 5 only (ports 004, 012, 020, and 028).
- BGM source: Circuit 3 only.
- External amplifier: Circuits 2 and 3 only (ports *09* and 10, 17 and 18, 25 and 26, 33 and 34) (Each external amplifier requires two circuits.)

Table 4-12
PEKU Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
Off-hook Call Announce P10	10-pin connector	Interface connector for optional Off-hook Call Announce subassembly connector (used in conjunction with P20, P40, P50, and P60).
Off-hook Call Announce P20	10-pin connector	Interface connector for optional Off-hook Call Announce subassembly connector (used in conjunction with P10, P40, P50, and P60).
Off-hook Call Announce **P40**	10-pin connector	Interface connector for optional Off-hook Call Announce subassembly connector (used in conjunction with P10, P20, P50, and P60).
Off-hook Call Announce P50	10-pin connector	Interface connector for optional Off-hook Call Announce subassembly connector (used in conjunction with P10, P20, P40, and P60).
Off-hook Call Announce P60	10-pin connector	Interface connector for optional Off-hook Call Announce subassembly connector (used in conjunction with P10, P20, P40, and P50).
DSS/EKT HDSS Console/ Electronic Telephone SW1 Switch	2-position slide switch	Configures PEKU for operation with an HDSS console or electronic telephones.
Door Phone W9 Jumper Wire	White jumper wire	When cut, configures PEKU for installation of an optional HDCB.
BGM source connection W5 Jumper Wire	White jumper wire	When cut, configures PEKU for BGM source connection.

DK0269

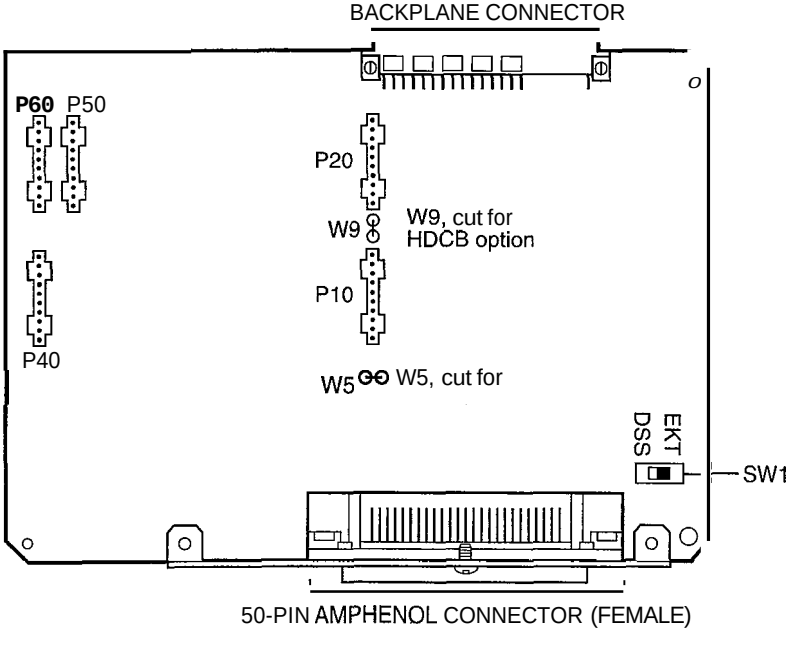


Figure 4-16
PEKU Controls, Indicators, and Interface Connectors

PEKU controls and interface connectors are shown in Figure 4-16 and described in Table 4-12.

4.5.1 PEKU Hardware Options

The PEKU supports the following hardware options:

Internal Options

- Speaker Off-hook Call Announce Unit (EOCU)

Install the EOCU in accordance with the following steps:

1. Remove the EOCU and the PEKU from their protective packages.

   Note:
   PEKU connectors P10, P20, P40, P50, and P60 are positioned to allow installation of the EOCU only in the proper position (Figure 4-17).

2. Mate EOCU connectors J10, J20, J40, J50, and J60 (Figure 4-17) with PEKU connectors P10, P20, P40, P50, and P60.

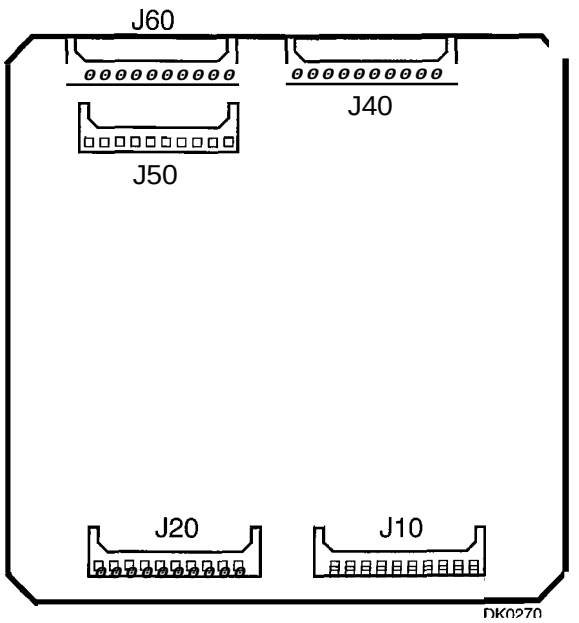


Figure 4-17
Off-Hook Call Announce Unit (EOCU) Installation

3. Apply firm, even pressure to EOCU to ensure proper mating of connectors.

4. Use a three-pair cable for making connections between the PEKU and the speaker OCA electronic telephone. Refer to Chapter 7—Wiring Diagrams for wiring/interconnecting details.

5. Refer to Section 5.2 of Chapter 5 — Station Apparatus for procedures to upgrade electronic telephones for Speaker OCA.

   Note:
   Electronic telephones do not support handset OCA.

External Options

Note:
Refer to Chapter 5—Station Apparatus and Chapter 6 — Peripheral Installation for installation of electronic telephones (including the following upgrades: HVSU2 or HVSU/HVSI for Off-hook Call Announce and HHEU for headset and/or loud ringing bell interface) and external options, respectively.

- HDSS Console

Configure the PEKU to support an HDSS console in accordance with the following steps:

1. Remove the PCB from its protective packaging.

2. Set the SW1 switch to DSS.

3. Refer to Section 5.2 of Chapter 5 — Station Apparatus for installation procedures for the HDSS console. Each HDSS console requires dedicated use of circuits 7 and 8 of a particular PEKU PCB.

- Door Phone/Lock Control Unit (HDCB)

Configure the PEKU to support a door phone and/or door lock control in accordance with the following steps:

1. Remove the PEKU from its protective packaging.

2. Cut the W9 Door Phone jumper wire on the PEKU PCB.

3. Refer to Section 5.2 of Chapter 5—Station Apparatus for installation procedures for the HDCB and associated Door Phones (MDFBs) and door lock control.

4. Only circuit 5 of a PEKU associated with ports 004,012,020, and 028 can support HDCBs.

- BGM Source Connection

Follow these steps to configure the PEKU to support a separate BGM source.

1. Remove the PCB from its protective packaging.
2. Cut the W5 (BGM) jumper wire on the PEKU PCB.
3. Refer to Chapter 6—Peripheral Installation for installation procedures for BGM connection.
4. In Program 10-2, set LED 09 on to enable the PEKU (Port 002) BGM source to be sent to digital and electronic telephone speakers and/or PIOU, PIOUS, PEPU PCBs. Use Program 19 to identify the slot in which the PEKU supporting the BGM source will be installed.

4.5.2 PEKU Installation Procedures

Install the PEKU in accordance with the following steps:

1. Remove the PCB from its protective packaging.
2. Ensure the PEKU has been configured for the appropriate hardware options (refer to Subsection 4.4.1).

   Note:
   Ensure the PEKU's component side is facing right when installing it in the KSU.
3. Insert the PEKU into the appropriate slot, and apply firm, even pressure to ensure proper mating of connectors.
4. After installing the PEKU, gently pull the PCB outward. If the connectors are properly mated, a slight resistance will be felt.

4.5.3 PEKU Wiring

Refer to Chapter 7—Wiring Diagrams for PEKU wiring/interconnecting details.

4.5.4 PEKU Programming Overview

The following programming parameters may be specified for the PEKU:

Program 03

- Specify Code 21 to indicate a non-optioned station line PEKU.
- Specify Code 22 to indicate a PEKU configured for Speaker OCA.
- Specify Code 23 to indicate a PEKU configured for an HDSS console.
- Specify Code 24 to indicate a PEKU configured for Speaker OCA and an HDSS console.
- Door phones, the BGM source connection, and external amplifiers do not require a special code.

  Note:
  If there are no PEKU options, Program 03 can be skipped, and Program 91 can be run instead.

Programs 10-2 **and** 19—BGM connection.

Programs 10-3—Assigns external amplifiers to ports.

Programs 28 **and** 29—HDSS console assignments.

Programs 77-1, 77-2, 79—HDCB and door phone ringing assignments.

4.6 Standard Telephone Interface Unit (RSTU and PSTU, Versions 1 & 2)

The RSTU and the PSTU both provide an interface between standard telephones, a BGM source, voice mail machines, fax machines, modems, and other two-wire (one-pair) devices and the system. Each RSTU and PSTU adds eight standard telephone lines to the system. There are two versions of the PSTU: the PSTU1 and the PSTU2. These two PSTU versions and the RSTU are identical except for the distinctions noted as follows. Only one telephone (or device) can be connected to a PSTU (1 or 2) or RSTU (1 or 2) port. If more than one telephone or device is connected to a port, ringing or Message Waiting may not function.

- PSTU1 and PSTU2: The PSTU1 itself comes in two versions. V.3 and V.4. The original V.3 version of the PSTU1 has a square wave ring generator that is fixed at 190V P-P, while the later V.4 version has a square wave ring generator that can be set at 190V P-P or 130V P-P with the W1 jumper. The PSTU2 also has the 190V P-P or 130V P-P W1 jumper.

  Note:
  Most standard telephones and two-wire devices require the 190V P-P level; however, some devices may experience ring-trip with 190V P-P and should be set for 130V P-P.

- RSTU: The RSTU does not have the 190V P-P or 130V P-P W1 jumper, like the PSTUI and PSTU2 do. In its standard configuration, the RSTU provides an 80-volt sine wave ring generator. An optional R48S unit can be connected to the RSTU to increase the loop voltage from -24V to -48V, extending the loop length (including the resistance of the phones) from 600 ohms to 1200 ohms.
- RSTU2 only provides a 90-volt square wave message waiting generator to drive standard telephone 90V message waiting lamps. Only one telephone per RSTU2 port.

Standard telephones and other devices, except for the BGM, can be connected to any circuit on the RSTU, PSTU1, and PSTU2. The BGM source can only be connected to circuit 2.

PSTU1 and PSTU2 controls and indicators are shown in Figure 4-19, and RSTU controls, indicators, and interface connectors are shown in Figure 4-20. The controls, indicators, and interface connectors of each of the PSTU versions and the RSTU are described in Table 4-13.

Note:
*For the system to recognize the DTMF tones generated **by** a standard telephone (or any other device connected to a PSTU or RSTU port), a DTMF Receiver Unit (RRCS-4, -8, or -12) must be installed on common control unit (RCTUA, RCTUB, RCTUBA/BB, RCTUC/D).*

4.6.1 RSTU, RSTU2, and PSTU Hardware Options

The RSTU and the PSTU support the following hardware options:

Internal Options

- R48S -48 volt supply (see Subsection 4.6.1)

Install the R48S on the RSTU or RSTU2 in accordance with the following procedure.

1. Remove the R48S from its protective packaging.
2. Remove the RSTU from its protective packaging.

   Note:
   RSTU connectors P6 and P7 are positioned to allow installation of the R48S only in the proper position (Figure 4-18 and 4-20).

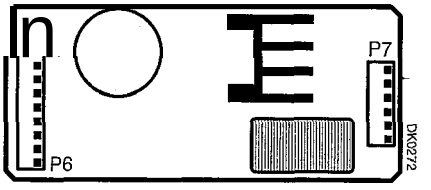


Figure 4-18
R48S Interface Connectors

3. Mate the R48S connectors P6 and P7 (Figure 4-18 and 4-20) with the R48S connectors P6 and P7.

External Options

- W1 ring generator switch (PSTU1 and PSTU2)

Configure the PSTU1 and PSTU2 ring generator for 130V P-P or 190V P-P in accordance with the following procedure:

1. Remove the PSTUI or PSTU2 from its protective packaging.
2. Ensure the W1 switch is set to the "H" (190V P-P) position for initial installation. The "L" (130V P-P) position is used if devices connected to the PSTUI or PSTU2 experience ring trip.

- Standard telephone message waiting lamp control (RSTU2 only with Release 3 and above software)

4.6.2 RSTU, RSTU2, and PSTU Installation Procedures

Install the RSTU, RSTU2 or the PSTU (PSTU1, and PSTU2) in accordance with the following steps:

1. Remove the PCB from its protective packaging.

WARNING !
The protective shield on the back of the RSTU or PSTU is designed to protect the installer from potentially hazardous ring voltage. Do NOT remove this shield.

2. Ensure the SSTS or SSTU subunit is securely attached to the RSTU or PSTU (Figures 4-19 and 4-20).
3. Configure the RSTU or PSTU for options per Subsection 5.5.1.
4. Insert the RSTU or PSTW into the appropriate slot, and apply firm, even pressure to ensure proper mating of connectors.

Control/Indicator/Connector	Type of Component	Description
Ring Voltage W1 Jumper (PSTU1 (V.4) and PSTU2 only)	Three-terminal Jumper	Sets ring generator voltage level for all circuits. H = 190V P-P, L = 130V P-P.
R48S Connector P6 (RSTU or RSTU2 only)	10-pin Connector	Interface connector to P6 of R48S.
R48S Connector P7 (RSTU or RSTU2 only)	6-pin Connector	Interface connector to P7 of R48S.

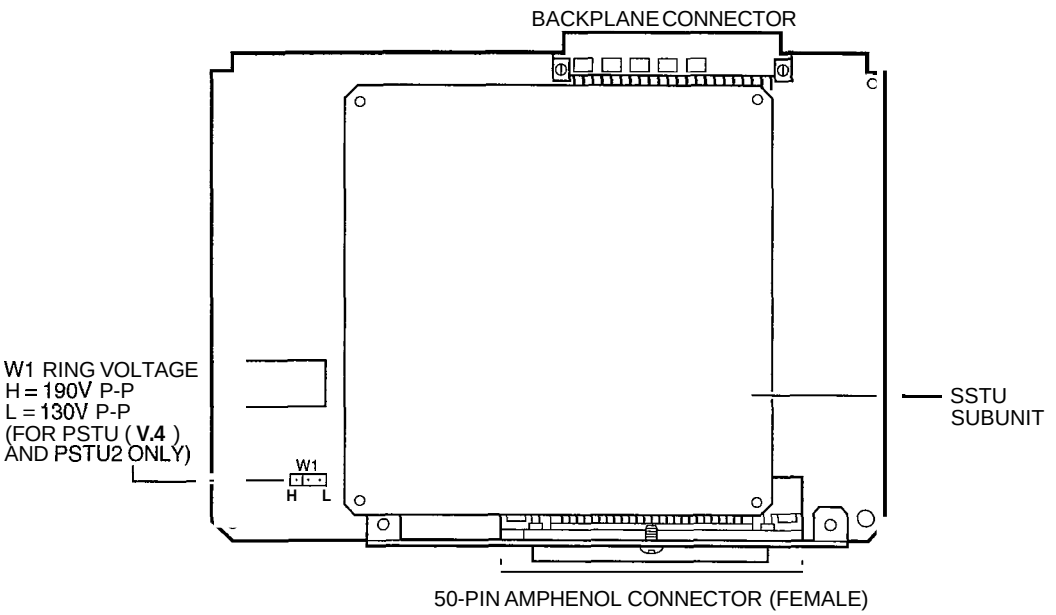


Figure 4-19
PSTU and Subunit (SSTU)

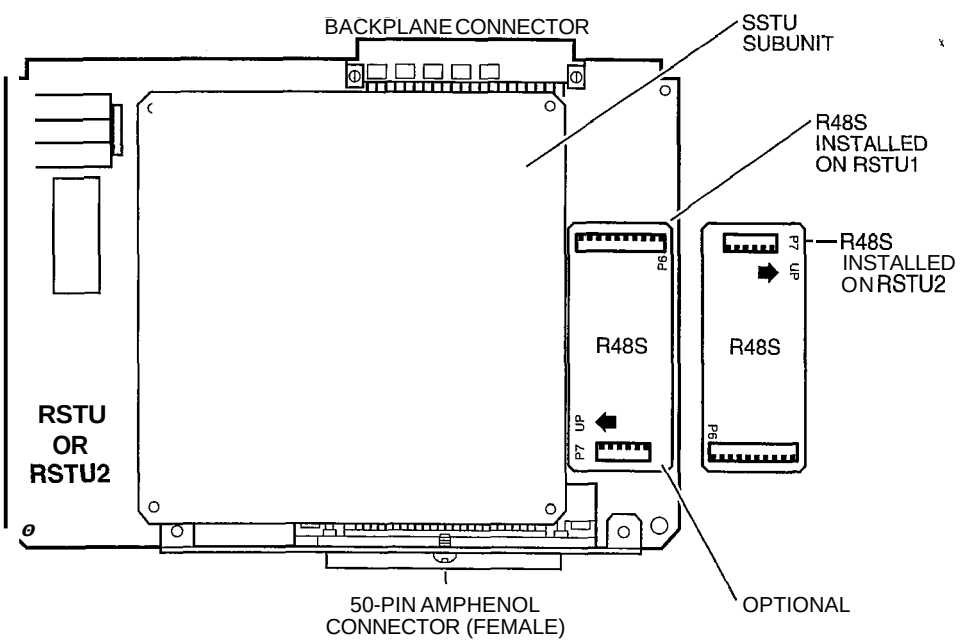


Figure 4-20
RSTU and RSTU2 Controls and Interface Connectors

5. After installing the RSTU or PSTU, gently pull the RSTU or PSTU outward. If the connectors are properly mated, a light resistance will be felt.

4.6.3 RSTU, RSTU2, and PSTU Wiring

Refer to Chapter 7—Wiring Diagrams for PSTU and RSTU wiring/interconnecting and secondary protectors details.

The RSTU and RSTU2 are registered for use with OL13A, OL13B, or OL13C type lines for off-premises stations per information in Table 7-3, Chapter 7—Wiring Diagrams (PSTU is registered for OL13A OPS only).

4.6.4 RSTU and PSTU Programming Overview

The following programming parameters may be specified for the RSTU, RSTU2 or PSTU (PSTU1, PSTU2):

Program 03—Specify code 31 for all slots that have RSTUs and PSTUs installed.

Note:
If there are no RSTU, RSTU2 or PSTU options, Program 03 can be skipped, and Program 91-1 or 91-9 can **be** *run instead.*

Program 10-2—Sets standard telephone ringing option.

Programs 19—Used for BGM connection.

Program 21—Assigns standard telephone ports to modem pools.

Program 10-3, 23, 24, 25, 26— Integrated Auto Attendant Digital Announcer assignments.

Program 31— Configures all RSTU, RSTU2 and PSTU ports connected to voice mail or external Auto attendant devices.

Program *34, LED Ol—Standard telephone Camp-ON/Busy Override tone option (Release 3 and above).

Program 35, LED 03—Standard telephone message waiting lamp control option (RSTU2 only Release 3 and above).

4.7 Digital/Standard Telephone Interface Unit (RDSU)

The RDSU in its basic configuration provides two standard telephone ports (Circuits 1 and 2) and four digital telephone ports (Circuits 5 - 8). An optional Standard Telephone Interface Subunit (RSTS) can be attached to the RDSU to provide two more standard telephone ports (Circuits 3 and 4).

The RDSU digital telephone circuits can support any of the devices that the PDKU can, except for the DDSS console. The RDSU standard telephone circuits (including the RSTS circuits) can support all of the devices that the RSTU and PSTU can. (Alternate Background Music (BGM) source can be connected to circuit 2.)

Digital telephones and other devices—except for the DDCB—that can interface with the RDSU digital telephone circuits can be connected to any of the circuits. The DDCB can only be connected to Circuit 5 associated with ports 004, 012, 020 and 028. Standard telephones and other devices that can interface with the RDSU standard telephone circuits (including the RSTS circuits) can be connected to any of the circuits:

Only the following slots support data interface or OCA units: S11 ~ S16, S21 - S26, S31 ~S32, S41 - S42, S51 - S52, and S61 - S62. (See Table 1-8 Worksheet 2 of Chapter I—Configuration).

RDSU and RSTS controls and interface connectdrs are shown in Figure 4-21. RDSU interface connectors are described in Table 4-14.

Note:
For *the **system** to recognize the DTMF tones generated by a standard telephone (or any other device connected to a standard telephone port), a DTMF Receiver Unit (RRCS-4, -8, or -12) must **be** installed on common control unit (RCTUA, RCTUB, RCTUBA/BB, RCTUC/D).*

4.7.1 RDSU Hardware Options

The RDSU supports the following hardware options:

Internal Options

- R48S Ring Generator

An optional R48S unit can be connected to the RDSU or RSTU (see Subsection 4.5.1) to change the

Table 4-14
RDSU Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
RSTS Connector P2/P3	10-pin Connector	Connector for RSTS subassembly that provides two standard telephone circuits.
RSTS Connector P4/P5	10-pin Connector	Connector for RSTS subassembly that provides two standard telephone circuits.
R48S Connector P6	8-pin Connector	Interface connector for R48S.
R48S Connector P7	6-pin Connector	Interface connector for R48S.

3

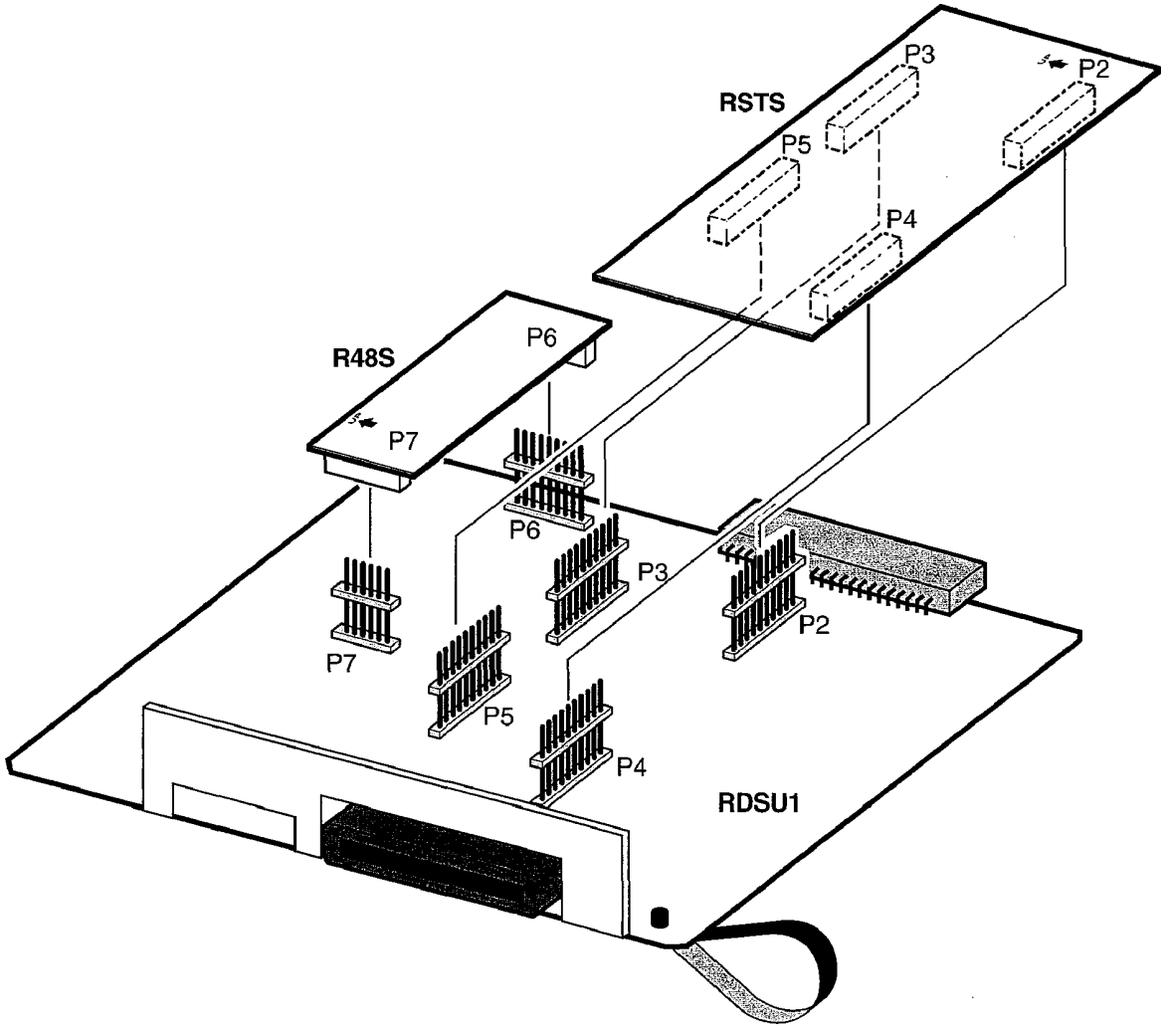


Figure 4-21
RSTS/RDSU Controls, Indicators, and Interface Connectors

standard telephone loop voltage from -24V to -48V, extending the standard telephone circuit loop length (including the resistance of the phone) from 600 ohms to 1200 ohms. The features provided by the R48S apply to the RSTS circuits as well as the basic RDSU standard telephone circuits. Install the R48S on the RDSU in accordance with the following procedure.

1. Remove the R48S from its protective packaging.
2. Remove the RDSU from its protective packaging.

   Note:
   RDSU connectors P6 and P7 are positioned to allow installation of the R48S only in the proper position (Figure 4-21).

3. Mate the R48S connectors R6 and R7 with the RDSU connectors R6 and R7.

■ RSTS

Install the RSTS to add two standard telephone circuits to the RDSU in accordance with the following procedure.

1. Remove the RSTS from its protective packaging.
2. Remove the RDSU from its protective packaging.

   Note:
   RDSU connectors P2 - P5 are positioned to allow installation of the RSTS only in the proper position (Figure 4-21).

3. Mate the RSTS connectors P2 - P5 with the RDSU connectors P2 - P5.

External Options

■ None

4.7.2 RDSU Installation Procedures

Install the RDSU in accordance with the following steps:

1. Remove the RDSU from its protective packaging.

WARNING!
The protective shield on the back of the PSTU is designed to protect the installer from potentially hazardous ring voltage. Do not remove this shield.

2. Configure RDSU for options per Subsection 5.6.1.
3. Ensure the SSTU subunit and optional subassemblies are securely attached to the RDSU (Figure 4-21).
4. Insert the RDSU into the appropriate slot, and apply firm, even pressure to ensure proper mating of connectors.
5. After installing the RDSU gently pull the RDSU outward. If the connectors are properly mated, a light resistance will be felt.

4.7.3 RDSU Wiring

Refer to Chapter 7 — Wiring Diagrams for RDSU wiring/interconnecting and secondary protector details.

The RDSU is registered for use with OL13A, OL13B, or OL13C, type lines for off-premises stations (see Table 7-2 of Chapter 7 — Wiring Diagrams).

4.7.4 RDSU Programming Overview

Enter Code 27 in Program 03 for a non-optioned RDSU, or enter Code 28 for an RDSU that support off-hook call announce and data interface units. To program the RDSU standard telephone ports (including the RSTS), see Subsection 5.5.4 (PSTU and RSTU Programming Overview). To program the RDSU digital telephone ports, see Subsection 5.3.4 (PDKU Programming Overview).

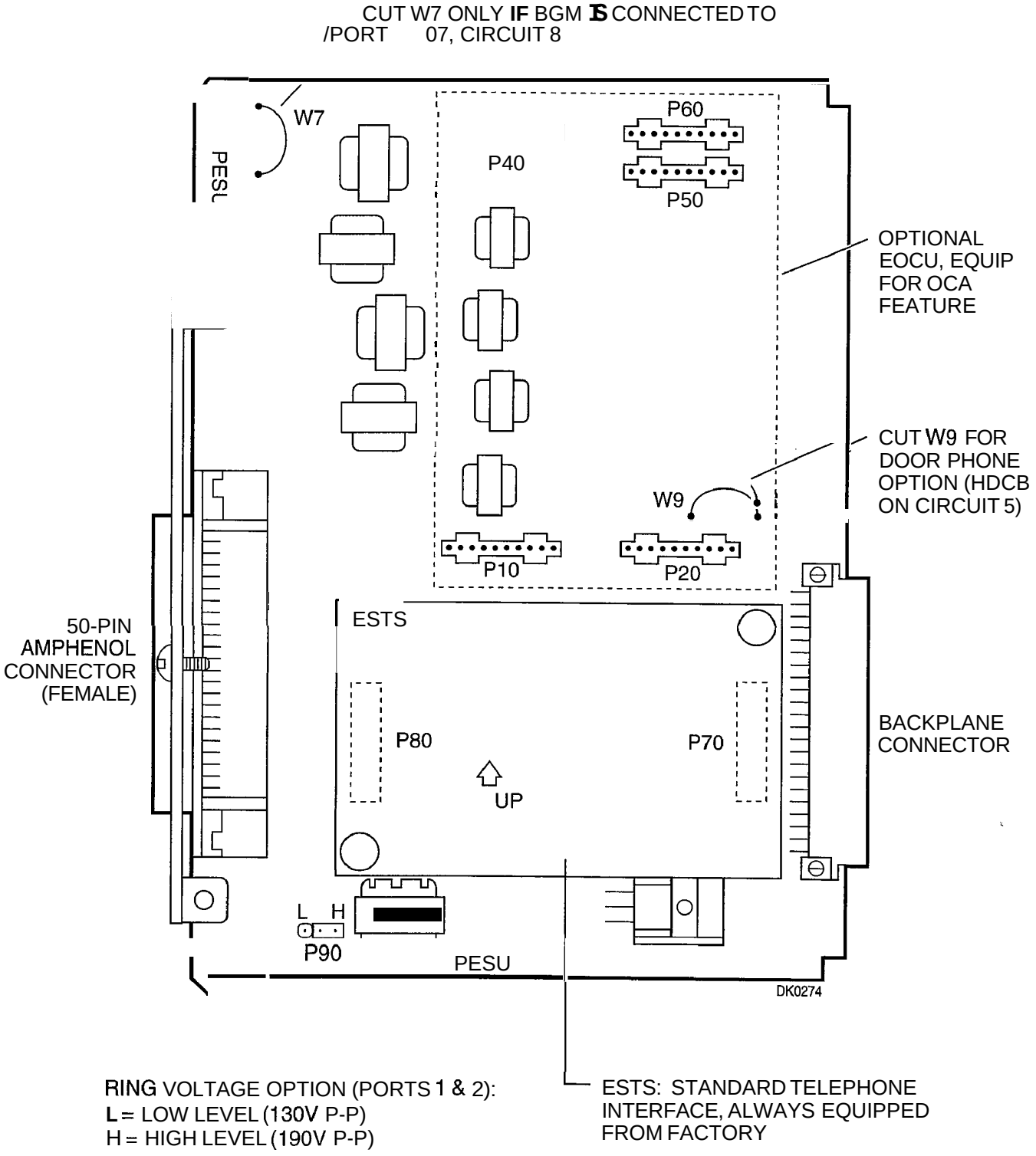
Note:
If there are no RDSU options, Program 03 can be skipped, and Program 91 can be run instead.

4.8 Standard/Electronic Telephone Interface Unit (PESU)

The PESU) provides two standard interface circuits (Circuits1 and 2) identical to PSTU circuits for connection between standard telephones, or two-wire devices, and the system. It also provides four electronic telephone interface circuits (5 - 8) identical to PEKU circuits for connecting electronic telephones and other peripherals. The PESU provides a ring generator that can be set for either 130V P-P or 190V P-P for the two standard interface circuits.

□ The PESU does not support an HDSS console connection or an external amplifier.

■ The PESU provides connectors to mount the EOCU for Speaker Off-hook Call Announce (OCA) to electronic telephones.



General Note: Connect two ringers maximum per port (H or L).

Figure 4-22
PESU PCB Option Location and Identification

- PESU Circuits 3 and 4 are nonfunctional, but they are each assigned a port in system programming.

  Note:
  For the system to recognize the DTMF tones generated by a standard telephone (or any other device connected to a standard telephone port), a DTMF receiver unit (RRCS4, 8, or 12) must be installed on common control unit (RCTUA, RCTUB, RCTUBA, or RCTUC/D).

Electronic telephones can be connected to any of the PESU electronic telephone circuits. The HDCB can only be connected to circuit 5 associated with Ports 004, 012, 020 and 028. The BGM source can only be connected to circuit 8 of a PESU. Standard telephones and other devices that can be connected to the PESU standard telephone circuits can be connected to any of these circuits.

PESU controls and interface connectors are shown in Figure 4-22 and described in Table 4-15.

4.8.1 PESU Hardware Options

The PESU supports the following hardware options:

Internal Option

- Speaker Off-hook Call Announce Unit (EOCU)

Install the EOCU in accordance with the following steps:

1. Remove the PESU and the EOCU from their protective packages.

   Note:
   PESU connectors P10, P20, P40, P50, and P60 are positioned to allow installation of the EOCU only in the proper position.

2. Mate the EOCU connectors J10, J20, J40, J50, and J60 (Figure 4-17) with the PESU connectors P10, P20, P40, P50, and P60.

3. Apply firm, even pressure to the EOCU to ensure proper mating of connectors.

4. Use three-pair cable for connecting the PESU and the Speaker OCA electronic telephone. Refer to Chapter 7 — Wiring Diagrams for wiring/ interconnecting details.

5. Refer to Section 5.2 of Chapter 5 — Station Apparatus for procedures to add required speaker OCA upgrade (HVSU2 or HVSU/HVSI) to electronic telephones.

External Options

Note:
Refer to Chapter 5 — Station Apparatus to connect electronic telephones (including the following upgrades: HVSU2 or HVSU/HVSI for Off-hook Call Announce and HHEU for headset and/or Loud Ringing Bell interface), standard telephones, and HDCBs to the PESU. See Chapter 6 — Peripheral Installation to connect peripherals.

- Door Phone/Lock Control Unit (HDCB) Jumper Wire

Configure the PESU to support an HDCB in accordance with the following steps:

1. Remove the PESU from its protective packaging.

2. Cut the W9 door phone jumper wire on the PESU PCB.

3. Refer to Section 5.2 of Chapter 5—Status Apparatus for installation procedures for the HDCB and associated door phones (MDFBs) and door lock control.

4. Each HDCB requires dedicated use of circuit 5 of a particular PESU PCB.

- Background Music (BGM) source jumper wire

Configure the PESU to support a separate background music source in accordance with the following steps:

1. Remove the PESU PCB from its protective packaging.

2. Cut the W7 (BGM) jumper wire on the PESU.

3. Refer to Chapter 6 — Peripheral Installation for BGM installation procedures.

- P90 Ring Generator Switch

Configure the PESU ring generator for 130V P-P or 190V P-P in accordance with the following procedure:

1. Remove the PESU from its protective packaging.

2. Ensure the P90 jumper plug is set to the "H" (190V P-P) position for initial installation. The "L" (130V

1. Loosen the four captive screws securing the telephone base (Figure 5-1), and remove the base.
2. Depending on the telephone, refer to Figure 5-7, 5-8, or 5-9 and locate the ex.pow straps, W101 and W102. Cut these straps.
3. Reinstall the telephone base, and secure it with its four captive screws.

Note:

Refer to Chapter 7—Wiring Diagrams for external AC/DC power supply ordering information and installation instructions.

5.3.10 DKT2000 ADM Installation

See Section 5.7 in this chapter.

5.4 Electronic Telephone Upgrades

This section describes how to upgrade and configure electronic telephones for features and options.

5.4.1 Off-hook Call Announce Upgrade (HVSU2 or HVSU/HVSI)

Electronic telephones must be equipped with either the HVSU2 subassembly or the combined HVSU and HVSI subassemblies to receive Speaker Off-hook Call Announce (OCA) calls. These telephones also require three-pair wiring to receive speaker **OCA,** instead of the standard two-pair. Telephones making speaker **OCA** calls do not require an upgrade or extra wire pair.

Notes:

1. *See Notes 1, 2, 3 in Subsection 5.3.3.*
2. *Handset **OCA** is not available on electronic telephones.*

HVSU2 Upgrade Installation

Install the HVSU2 in accordance with the following steps:

1. Loosen the four captive screws securing the telephone base (Figure 5-1), and remove the base.
2. Position the HVSU2 on the standoffs inside the base, and secure with the two provided screws (Figure 5-12).
3. Connect the HVSU2 wire plug to the **P2** connector on the printed circuit board (PCB) in the telephone (Figure 5-13).

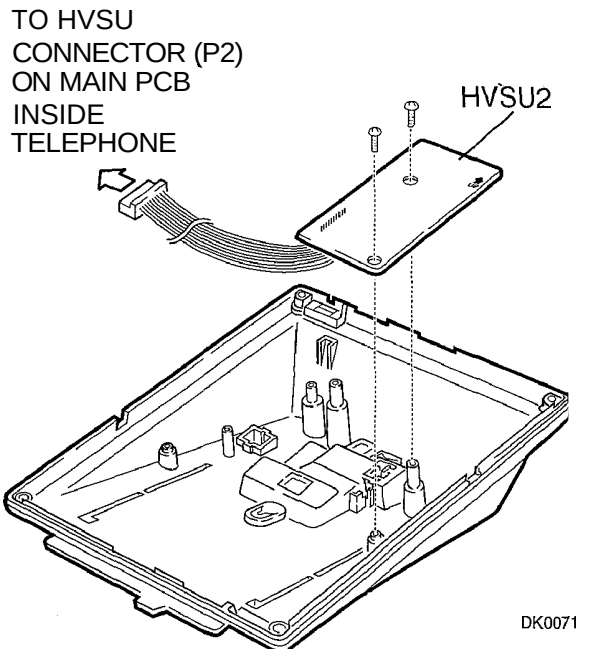


Figure 5-12
HVSU2 Installation for Electronic Telephones

HVSU/HVSI Upgrade Installation

Install the HVSU/HVSI subassemblies in accordance with the following steps:

1. Loosen the four captive screws securing the telephone base (Figure 5-1), and remove the base.
2. Align the P5 connector on the HVSI subassembly with the receptacle on the HVSU subassembly (Figure 5-14). Apply firm, even pressure to the PCBs to ensure that the connectors mate properly (they should click).

   Note:

   Exercise care when assembling the HVSU to the HVSI to prevent damage to the connector pins; also, verify that the HVSU is aligned with the silk-screened image on the HVSI.
3. Position the HVSU/HVSI subassembly on the standoffs inside the base, and secure with the two screws provided (Figure 5-14).
4. Connect the HVSU/HVSI subassembly wire plug to the P2 connector on the electronic telephone PCB (Figure 5-13).

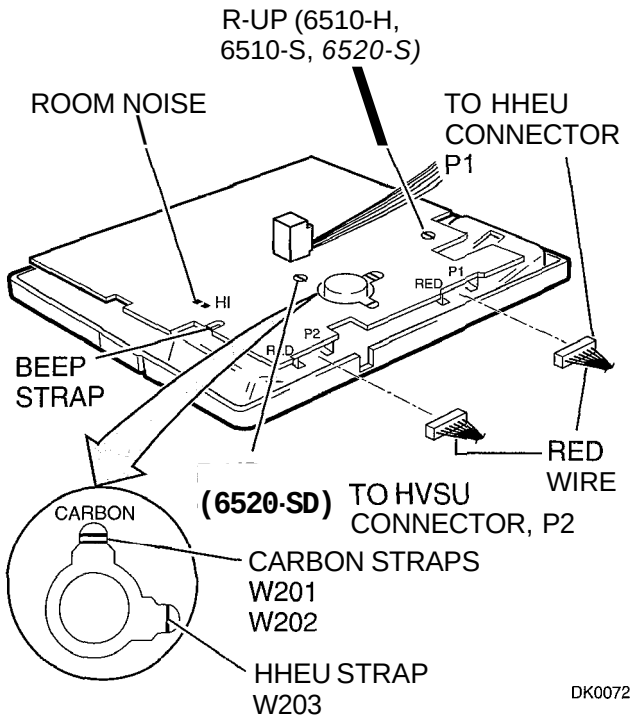


Figure 5-13
Electronic Telephone PCB Connections

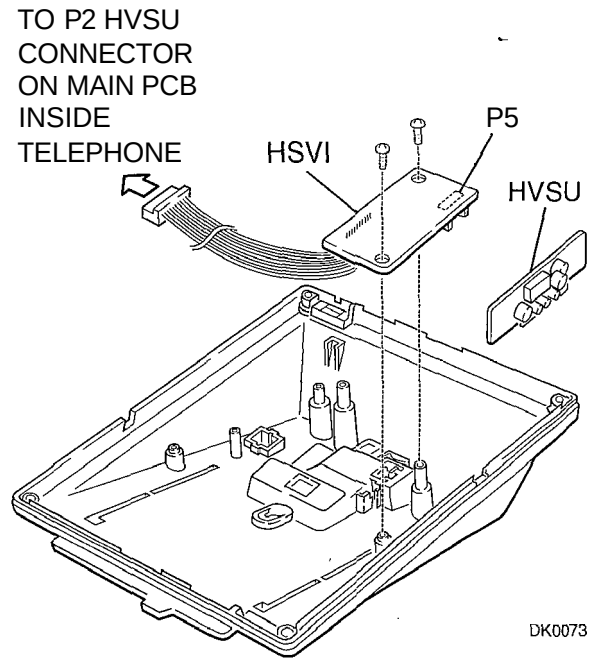


Figure 5-14
HVSI/HVSU Installation for Electronic Telephones

5. Reinstall the electronic telephone base, and secure it with its four captive screws.

5.4.2 Ioud Ringing Bell/Headset Upgrade (HHEU)

The Loud Ringing Bell/Headset upgrade (HHEU) enables an external speaker (HESB) and/or a headset to be connected to the electronic telephone. The HESB serves as a loud ringing bell when connected to a telephone.

Notes:

1. *There are two types of HHEU: the HHEU1 (which has four versions, V.1 - V.4) and the HHEU2.*
2. *Only electronic telephones equipped with an HHEU2 can be wall mounted. The HHEU2 is identical to the V.4 HHEU1, except that the HHEU2 has longer wires to accommodate wall mounting.*
3. *A Toshiba HESC-65 or HESC-65A cable is required to connect the HHEU in an electronic telephone to the HESB. Refer to Chapter 6—Peripheral Installation for HESB installation procedures.*
4. *All HHEU versions and types, except for V.I HHEU1, are compatible with the Speaker Off-hook Call Announce upgrades (HVSU2 and HVSU/HVSI).*

HHEU Upgrade Installation

Install the HHEU upgrade in accordance with the following steps:

1. Loosen the four captive screws securing the telephone base (Figure 5-1), and remove the base.
2. Using a screwdriver or other suitable tool, remove the plastic tab located on the back of the base (Figure 5-1). The HHEU modular connector for the headset will be accessed through this opening.
3. If using a V.3 or earlier HHEUI, set the SW601 switch to the HEADSET position for HESB and/or headset connection (Figure 5-15). This switch is not on either the V.4 HHEUI or the HHEU2, because the operation is automatic with these subassemblies.

Table 4-15
PESU Controls, Indicators, and Interface Connectors

Control/Indicator/Connector (Figure 4-22)	Type of Component	Description
Off-hook Call Announce P10	10-pin connector	Interface connector for optional Off-hook Call Announce subassembly connector (used in conjunction with P20, P40, P50, and P60).
Off-hook Call Announce P20	10-pin connector	Interface connector for optional Off-hook Call Announce subassembly connector (used in conjunction with P10, P40, P50, and P60).
Off-hook Call Announce P40	10-pin connector	Interface connector for optional Off-hook Call Announce subassembly connector (used in conjunction with P10, P20, P50, and P60).
Off-hook Call Announce P50	10-pin connector	Interface connector for optional Off-hook Call Announce subassembly connector (used in conjunction with P10, P20. P40. and P60).
Off-hook Call Announce P60	10-pin connector	Interface connector for optional Off-hook Call Announce subassembly connector (used in conjunction with P10, P20, P40, and P50).
Ring Voltage Jumper Plug P90	3-terminal jumper	Sets ring generator voltage level for circuits 1 and 2. H = 190V P-P (factory setting) L = 130v P-P
Door Phone W9 Jumper Wire	White jumper wire	When cut, configures PESU, circuit 5 for installation of an optional HDCB.
BGM W7 Jumper Pack	White jumper wire	When cut, configures PESU, port 07, circuit 8, for BGM source connection (slot 01 only with PCTU2 and PCTUS1).

P-P) position is used if devices connected to the PSTU1 or PSTU2 experience ring trip.

4.8.2 PESU Installation Procedures

Install the PESU in accordance with the following steps:

1. Remove the PESU from its protective packaging.

WARNING!
The protective shield on the back of the PESU is designed to protect the installer from potentially hazardous ring voltage. Do not remove this shield.

2. Ensure that the PESU subunit (ESTS) is securely attached to the PESU (Figure 4 -14).
3. Ensure the PESU has been configured for the appropriate hardware options. (Refer to Subsection 4.7.1).
4. Insert the PESU into the appropriate slot, and apply firm, even pressure to ensure proper mating of connectors.
5. After installing the PESU, gently pull it outward. If the connectors are ,properly mated, a slight resistance will be felt.

4.8.3 PESU Wiring

Refer to Chapter 7—Wiring Diagrams for PESU wiring/interconnecting details.

4.8.4 PESU Programming Overview

Enter Code 25 in Program 03 for a non-optioned PESU or Code 26 for a PESU supporting Off-hook Call Announce. To program the PESU standard telephone ports, see Subsection 4.5.4 (RSTU and PSTU Programming Overview). To program the **PESU** electronic telephone ports, see Subsection 4.4.4 (PEKU Programming Overview).

Note:
If there are no PESU options, Program 03 can be skipped, and Program 91 can be run instead,

4.9 Four-Circuit loop Start CO line Interface Unit (RCOU)

The standard RCOU PCB provides circuits for four Loop Start CO lines. **An** RCOS PCB can be installed on the RCOU for four more loop start lines (for a total of eight lines—the RCOS circuits provide the same options as the RCOU). The RCOU also provides ring detection, dial outpulsing, and hold circuitry. Each RCOU line can be programmed for DTMF or dial pulse signaling. Each RCOU/RCOS circuit has gas tube secondary protection.

RCOU controls, indicators, and interface connectors are shown in Figure 4-23 and described in Table 4-16. RCOS controls, indicators, and interface connectors are shown in Figure 4-24 and described in Table 4-17.

4.9.1 RCOU Hardware Options

The RCOU supports the following hardware options.

Internal Option

- RCOS

Install the RCOS PCB in accordance with the following procedure:

1. Remove the RCOS and the RCOU from their protective packages.

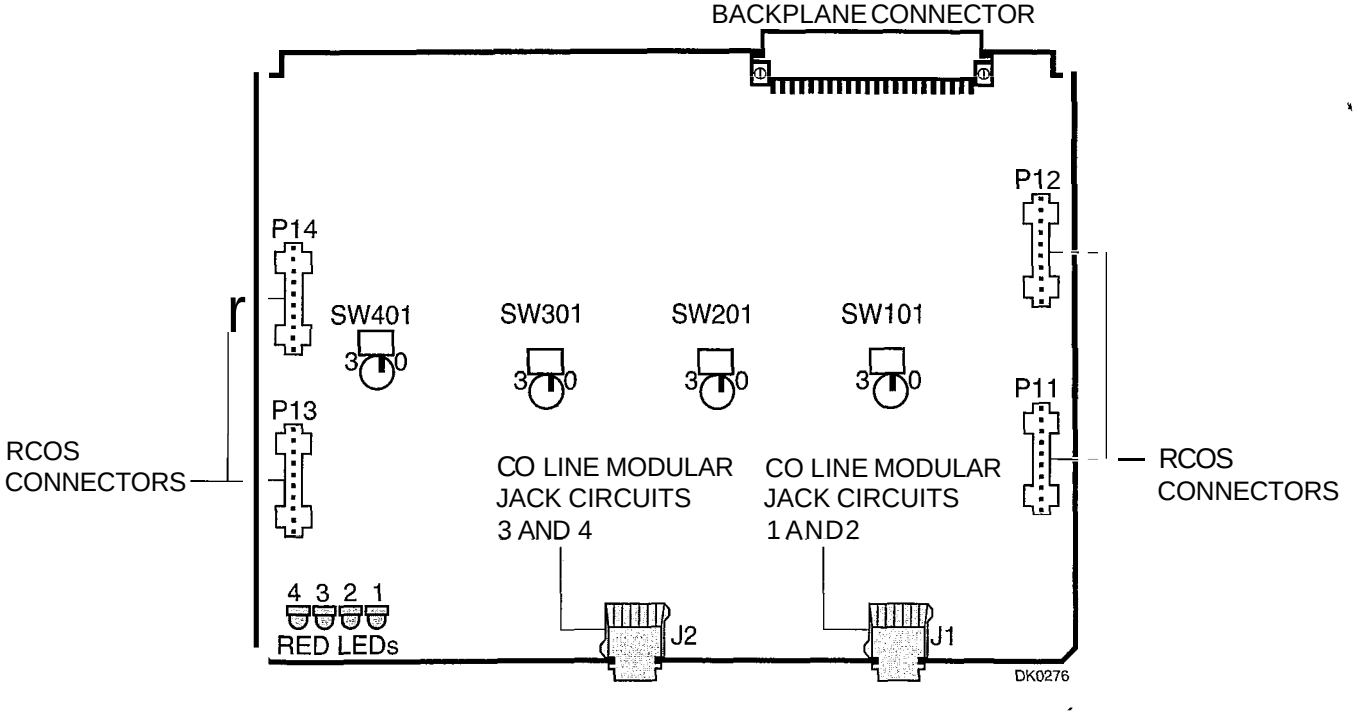


Figure 4-23
RCOU Controls, Indicators, and Interface Connectors

Table 4-16
RCOU Controls, Indicators, and Interface Connectors

Control/Indicator/Connector (Figure 4-23)	Type of Component	Description
CO Line Circuit 1 Indicator (1)	Red LED	Lights to indicate line circuit 1 is in operation. (Trunk indicator will not light unless RCOU is connected to a CO line).
CO Line Circuit 2 Indicator (2)	Red LED	Lights to indicate line circuit 2 is in operation. (Trunk indicator will not light unless RCOU is connected to a CO line).
CO Line Circuit 3 Indicator (3)	Red LED	Lights to indicate line circuit 3 is in operation. (Trunk indicator will not light unless RCOU is connected to a CO line).
CO Line Circuit 4 Indicator (4)	Red LED	Lights to indicate line circuit 4 is in operation. (Trunk indicator will not light unless RCOU is connected to a CO line).
J1 Connector	Modular connector	Interface connector for CO line circuits 1 and 2.
J2 Connector	Modular connector	Interface connector for CO line circuits 3 and 4.
PAD Switch SW101	2-position slide switch	Enables -3dB signal level drop for CO line circuit 1.
PAD Switch SW201	2-position slide switch	Enables -3dB signal level drop for CO line circuit 2.
PAD Switch SW301	2-position slide switch	Enables -3dB signal level drop for CO line circuit 3.
PAD Switch SW401	2-position slide switch	Enables -3dB signal level drop for CO line circuit 4.
RCOS Connector P11	10-pin male connector	Interface connector for RCOS 4-circuit loop start CO line unit.
RCOS Connector P12	10-pin male connector	Interface connector for RCOS 4-circuit loop start CO line unit
RCOS Connector P13	10-pin male connector	Interface connector for RCOS 4-circuit loop start CO line unit.
RCOS Connector P14	10-pin male connector	Interface connector for RCOS 4-circuit loop start CO line unit.

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Note:
The RCOS decibel (db) PAD switches (SW501, SW601, SW701, and SW801) and the RCOU db PAD switches (SW101, SW201, SW301, and SW401) control excessive loudness resulting from close proximity to a Central Office or PBX telephone office by providing a -3db signal level drop to, or from, the PBX or Central Office when set to the 3 position. Switches are factory-set to the 0 (0db signal level drop) position.

2. If the DK280 cabinets (DKSUB280 and DKSUE280 or DKSUE424) are within one mile of the PBX or Central Office, set the RCOS db PAD switches SW501, SW601, SW701, and SW801 to the 3 (-3db signal level drop) position. Set the RCOU db PAD switches to the 3 position also.

   Note:
   RCOU male connectors P11, P12, P13, and P14 are positioned to allow installation of the RCOS only in the proper position.

3. Mate the RCOS female connectors J11, J12, J13, and J14 (Figure 4-24) to the RCOU male

Table 4-17
RCOS Controls, Indicators, and Interface Connectors

Control/Indicator/ Connector	Type of Component	Description
CO Line Circuit 5	Red LED	Lights to indicate line circuit 5 is in operation. (CO line indicator will not light unless RCOS is connected to a CO line).
CO Line Circuit 6	Red LED	Lights to indicate line circuit 6 is in operation. (CO line indicator will not light unless RCOS is connected to a CO line).
CO Line Circuit 7	Red LED	Lights to indicate line circuit 7 is in operation. (CO line indicator will not light unless RCOS is connected to a CO line).
CO Line Circuit 8	Red LED	Lights to indicate line circuit 8 is in operation. (CO line indicator will not light unless RCOS is connected to a CO line).
J3 Connector	Modular connector	Interface connector for CO line circuits 5 and 6.
J4 Connector	Modular connector	Interface connector for CO line circuits 7 and 8.
PAD Switch SW501	2-position slide switch	Enables -3dB signal level drop for CO line circuit 5.
PAD Switch SW601	2-position slide switch	Enables -3dB signal level drop for CO line circuit 6.
PAD Switch SW701	2-position slide switch	Enables -3dB signal level drop for CO line circuit 7.
PAD Switch SW801	2-position slide switch	Enables -3dB signal level drop for CO line circuit 8.
RCOU Connector J11	Female connector	Interface connector for RCOU 4-circuit loop start CO line unit.
RCOU Connector J12	Female connector	Interface connector for RCOU 4-circuit loop start CO line unit.
RCOU Connector J13	Female connector	Interface connector for RCOU 4-circuit loop start CO line unit.
RCOU Connector J14	Female connector	Interface connector for RCOU 4-circuit loop start CO line unit.

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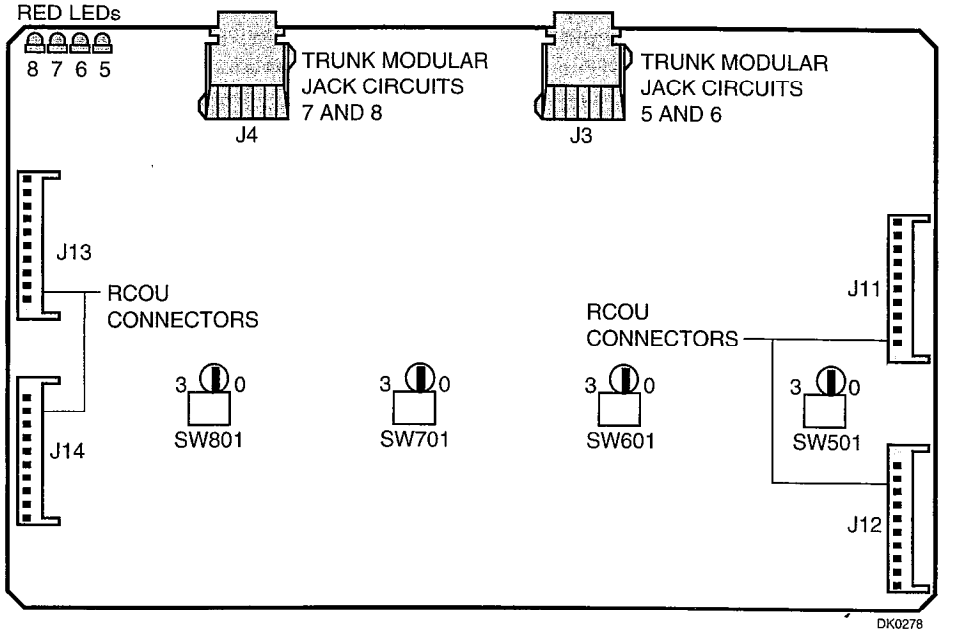

Figure 4-24
RCOS Controls, Indicators, and Interface Connectors

3. Mate the RCOS female connectors J11, J12, J13, and J14 (Figure 4-24) to the RCOU male connectors P11, P12, P13, and P14 (Figure 4-23).

4. Apply firm, even pressure to the RCOS to ensure proper mating of connectors.

External Option

- None

4.9.2 RCOU Installation Procedure

Install the RCOU in accordance with the following steps:

1. Remove the RCOU from its protective packaging.

2. If installing the RCOS to the RCOU, see Subsection 4.8.1.

   Note:
   The decibel (db) PAD switches SW101, SW201, SW301, and SW401 control excessive loudness resulting from close proximity to a Central Office or PBX telephone office by providing a -3db signal level drop to, or from, the PBX or Central Office when set to the 3 position. Switches are factory-set to the 0 (0db signal level drop) position.

3. If the DK280 cabinets (DKSUB280 and DKSUE280 or DKSUE424) are within one mile of the PBX or Central Office, set the RCOU db PAD switches SW101, SW201, SW301, and SW401 to the 3 (-3db signal level drop) position.

   Note:
   Ensure that the RCOU component side is facing right when installing it in a cabinet.

4. Insert the RCOU into the appropriate slot and apply firm, even pressure to ensure proper mating of connectors.

5. After installing the RCOU, gently pull the PCB outward. If the connectors are properly mated, a slight resistance will be felt.

4.9.3 RCOU Wiring

Refer to the RCOU wiring diagram in Chapter 7—Wiring Diagrams for wiring/interconnecting details.

4.9.4 RCOU Programming Overview

The following programming parameters may be specified for the RCOU (along with RCOS).

Program 03—Specify Code 11 for each slot that will support an a four-circuit RCOU (without an RCOS). Specify Code 17 for each slot that will support an RCOU equipped with an RCOS.

Note:
Program 03 can be skipped, and Program 91 can be run instead. Program 91 recognizes the RCOS.

Program 10-1—Enables or disables line-to-line Conference and Direct Inward System Access (DISA).

Program 15—Assigns DTMF/Dial Pulse dialing, DISA, and additional attributes to each line. Automatic Release (AR) assignments only need to be made for loop start lines; AR is automatically enabled for ground start CO lines.

Program *15—Makes tenant assignments.

Program 16—Assigns lines to line groups.

Program 39—Assigns line access buttons to digital and electronic telephones.

Program 40—Assigns station access to lines (incoming and outgoing).

Program 41—Assigns station access to lines (outgoing only).

Program 42-0, 1~8—Assigns behind PBX/Centrex operation to each line.

Programs 45 ~ 48—Defines Toll Restriction for any line.

Programs 50 ~ 56—Defines Least Cost Routing assignments.

Program *50—Assigns Caller ID circuits (RCIU/RCIS) to CO lines.

Program *52—Caller ID line owner station assignment.

Program 78—Assigns special ringing of lines: includes Night Ring Over Page, DISA, Remote Maintenance via the Internal Maintenance Modem (IMDU), and Integrated Auto Attendant.

Programs 81 ~ 89

- Assigns lines to ring selected stations and DH groups.

- Assigns Delayed Ringing to any line.

Programs *81, *84, *87—Assigns which [DN] will flash when the CO line rings a telephone.

Program 93—Assigns names to lines.

4.10 Four-Circuit CO Line Interface Unit (PCOU: Versions 1 & 2)

Each PCOU PCB adds four loop start CO lines to the system. The PCOU provides Ring Detection, Dial Outpulsing, and Hold, as well as Automatic Busy Redial circuitry. Each line can be programmed for DTMF or dial pulse signaling and gas tube secondary protection. There are two PCOU versions: the PCOU1 and the PCOU2. They are identical in fit/form/function and are interchangeable in all DK system models.

PCOU controls, indicators, and interface connectors are shown in Figure 4-25 and described in Table 4-18.

4.10.1 PCOU Hardware Options

There are no hardware options supported by the PCOU.

4.10.2 PCOU Installation Procedures

Install the PCOU in accordance with the following steps:

1. Remove the PCOU from its protective packaging.

   Note:
   The decibel (dB) PAD switches SW101 through SW401 control excessive loudness resulting from close proximity to a CO or PBX telephone office by providing a -3 db signal level drop to, or from, the PBX or CO when set to the 3 position. Switches are factory-set to the 0 (0 dB signal level drop) position.

2. If the KSU is located within one mile of the PBX or CO telephone office, set dB PAD switches SW101 through SW401 to the 3 (-3 dB signal level drop) position.

   Note:
   Ensure the PCOU's component side is facing right when installing it in the KSU.

3. Insert the PCOU into the appropriate slot and apply firm, even pressure to ensure proper mating of connectors.

4. After installing the PCOU, gently pull the PCB outward. If the connectors are properly mated, a slight resistance will be felt.

4.10.3 PCOU Wiring

Refer to the PCOU wiring diagram in Chapter 7—Wiring Diagrams for wiring/interconnecting details.

4.10.4 PCOU Programming Overview

See Subsection 5.8.4 (RCOU Programming Overview) for an overview of PCOU programming (as well as RCOU programming).

Table 4-18
PCOU Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
CO Line Circuit 1 Indicator CD112	Red LED	Lights to indicate CO line circuit 1 is in operation *(Note: CO line indicator will not light unless PCOU is connected to a CO).*
CO Line Circuit 2 Indicator CD212	Red LED	Lights to indicate CO line circuit 2 is in operation *(Note: CO line indicator will not light unless PCOU is connected to a CO).*
CO Line Circuit 3 Indicator CD312	Red LED	Lights to indicate CO line circuit 3 is in operation *(Note: CO line indicator will not light unless PCOU is connected to a CO).*
CO Line Circuit 4 Indicator CD412	Red LED	Lights to indicate CO line circuit 4 is in operation *(Note: CO line indicator will not light unless PCOU is connected to a CO).*
J1 Connector	Modular connector	Interface connector for CO line circuits 1 and 2.
J2 Connector	Modular connector	Interface connector for CO line circuits 3 and 4.
PAD Switch SW101	2-position slide	Enables -3dB signal level drop for CO line circuit 1.
PAD Switch SW201	2-position slide	Enables -3dB signal level drop for CO line circuit 2.
PAD Switch SW301	2-position slide	Enables -3dB signal level drop for CO line circuit 3.
PAD Switch SW401	2-position slide	Enables -3dB signal level drop for CO line circuit 4.

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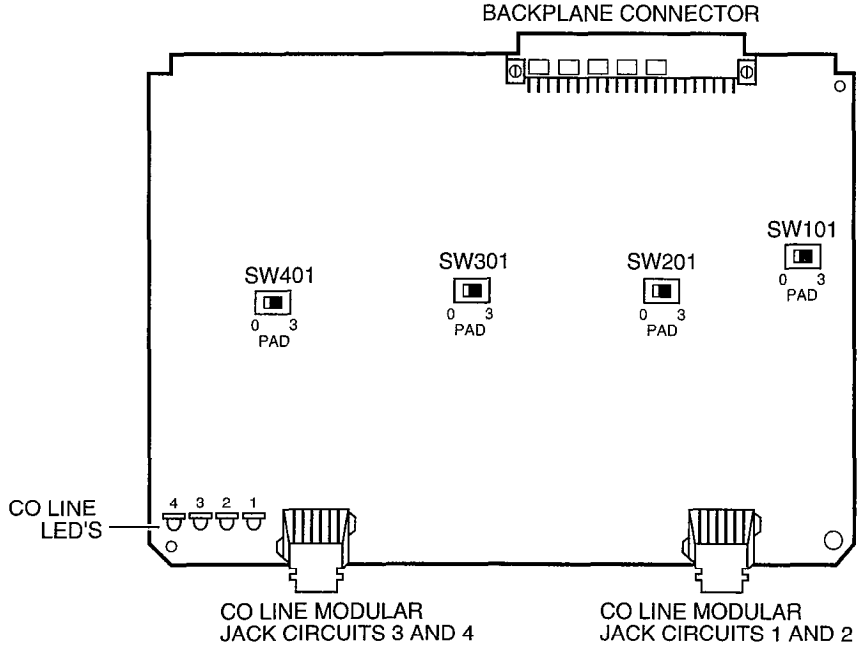

Figure 4-25
PCOU Controls, Indicators, and Interface Connectors

4.11 Loop/Ground Start CO Line Interface Unit (RGLU)

The RGLU provides four CO line circuits which can be configured individually for Loop Start or Ground Start. The RGLU also provides ring detection, dial outpulsing, and Hold. Each RGLU line can be programmed for DTMF or dial pulse signaling and gas tube secondary protection.

RGLU controls, indicators, and interface connectors are shown in Figure 4-26 and described in Table 4-19.

4.11.1 RGLU Hardware Option

There are no hardware options supported by the RGLU.

4.11.2 RGLU Installation Procedures

Install the RGLU in accordance with the following procedure:

1. Remove the PCB from its protective packaging.

   Note:
   The decibel (db) PAD switches SW101, SW201, SW301, and SW401 control excessive loudness resulting from close proximity to a Central Office or PBX telephone office by providing a -3db signal level drop to, or from, the PBX or Central Office when set to the 3 position. Switches are factory-set to the 0 (0db signal level drop) position.

2. If the DK280 cabinets (DKSUB280 and DKSUE280 or DKSUE424) are within one mile of the PBX or Central Office, set the db PAD switches SW101 (SW201, SW301, and SW401 to the 3 (-3db signal level drop) position.

3. Set each line for Ground Start (GND) or Loop Start (LOOP) by setting the following jumper plugs: SW103 for line 1, SW203 for line 2, SW303 for line 3, and SW403 for line 4.

   Note:
   Ensure that the RGLU component side is facing right when installing it in a cabinet.

4. Insert the RGLU into the appropriate slot and apply firm, even pressure to ensure proper mating of connectors.

5. After installing the RGLU, gently pull the PCB outward. If the connectors are properly mated, a slight resistance will be felt.

4.11.3 RGLU Wiring

Refer to the RGLU wiring diagram in Chapter 7—Wiring Diagrams for wiring/interconnecting details.

4.11.4 RGLU Programming Overview

See Paragraph 5.8.4 (RCOU Programming Overview) for an overview of RGLU programming (as well as RCOU programming).

Table 4-19
RGLU Controls, Indicators, and Interface Connectors

Control/Indicator/ Connector	Type of Component	Description
Line Circuit 1 Indicator 1	Red LED	Lights to indicate line circuit 1 is in operation. (Line indicator will not light unless RGLU is connected to a line.)
Line Circuit 2 Indicator 2	Red LED	Lights to indicate line circuit 2 is in operation. (Line indicator will not light unless RGLU is connected to a line.)
Line Circuit 3 Indicator 3	Red LED	Lights to indicate line circuit 3 is in operation. (Line indicator will not light unless RGLU is connected to a line.)
Line Circuit 4 Indicator 4	Red LED	Lights to indicate line circuit 4 is in operation. (Line indicator will not light unless RGLU is connected to a line.)
J1 Connector	Modular connector	RJ14 modular Interface connector for trunk circuits 1 and 2.
J2 Connector	Modular connector	RJ14 modular interface connector for trunk circuits 3 and 4.
PAD Switch SW101	2-position slide switch	Enables -3dB signal level drop for line circuit 1.
PAD Switch SW201	2-position slide switch	Enables -3dB signal level drop for line circuit 2.
PAD Switch SW301	2-position slide switch	Enables -3dB signal level drop for line circuit 3.
PAD Switch SW401	2-position slide switch	Enables -3dB signal level drop for line circuit 4.
LOOP/GND Jumper SW103	3-terminal jumper	Along with jumper SW103, used to configure line 1 for loop or ground start.
LOOP/GND Jumper SW203	3-terminal jumper	Along with jumper SW203, used to configure line 2 for loop or ground start.
LOOP/GND Jumper SW303	3-terminal jumper	Along with jumper SW303, used to configure line 3 for loop or ground start.
LOOP/GND Jumper SW403	3-terminal jumper	Along with jumper SW403, used to configure line 4 for loop or ground start.

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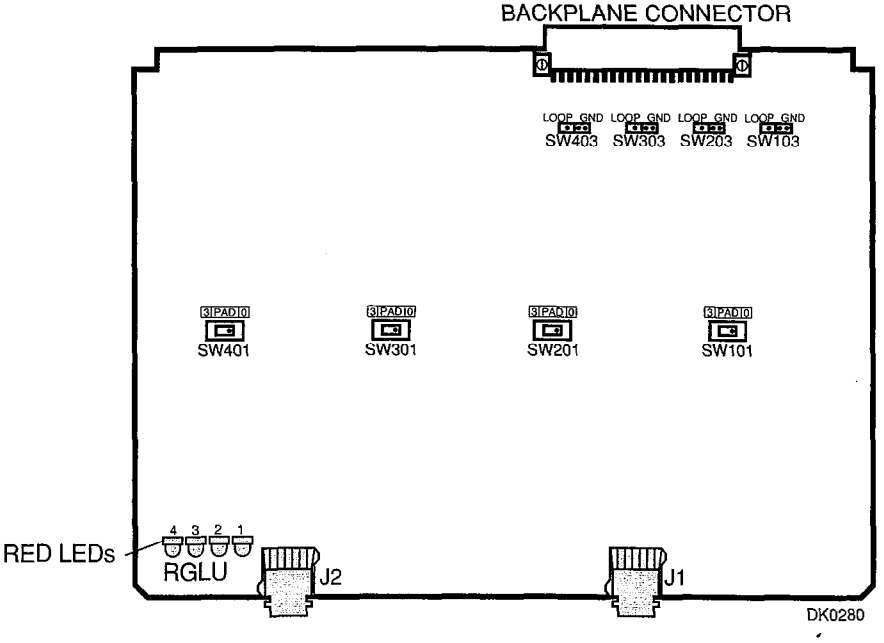

Figure 4-26
RGLU Controls, Indicators, and Interface Connectors

4.12 E & M Tie Line Unit (PEMU/REMU)

Each PEMU and REMU PCB provides four tie line interface circuits. With DK280R3, tie lines can route per Program 04 **[DN]** assignments or Program 71 and 72 DNIS/ANI assignments (see Program 17). The differences between the REMU and PEMU are noted as follows:

- REMU tie lines may be individually configured with Type 1 or Type 2 signaling. PEMU tie lines are fixed at Type I signaling.
- The REMU has four decibel (dB) PAD* switches which can be set to reduce excessive loudness resulting from close proximity to a Central Office or PBX by providing a -3dB signal level drop to the PBX or Central Office. The PEMU does not provide these PAD switches.

  *PAD is for Transmit and Receive for 2W operation, and Transmit only is for 4W operation.
- The REMU can be programmed for Wink or Immediate Start signaling. The PEMU1 is fixed for Immediate Start signaling.

Both REMU and PEMU may be configured for either 2- or 4-wire transmission.

Note:
For the system to recognize the DTMF tones generated by incoming tie lines, an RRCS (-4, -8, or -12) must be installed on the RCTUA, RCTUB, RCTUBA or RCTUC/D. RRCS is not required for REMU/PEMU dial pulse operation (see Program 30, LED 11).

PEMU1 controls, indicators, and interface connectors are shown in Figure 4-28 and described in Table 4-20. REMU controls, indicators, and interface connectors are shown in Figure 4-27 and described in Table 4-21.

4.12.1 PEMU/REMU Hardware Options

There are no hardware options supported by the PEMU or REMU.

4.12.2 PEMU/REMU Installation Procedures

Install the PEMU or REMU in accordance with the following steps:

1. Remove the PCB from its protective packaging.
2. Determine if the E & M tie lines will be configured for 2- or 4-wire transmission on PEMU. Set the 2W/4W jumper plugs P103, P203, P303, and P403 to the appropriate positions on REMU set SW103 ~ SW403.
3. For the PEMU1 only: Set the FG jumper plug P3 to the "2-3" position. The REMU does not have this jumper plug.
4. For the PEMU only: Set all GND/BAT jumper plugs to the "BAT" position for connection to the telephone network. The REMU does not have these jumper plugs.

   Note:
   The "GND" position is used to connect PEMU circuits back-to-back on premises only, 1000 feet maximum (E & M lead wires must be crossed).
5. For the REMU only: set the P102/104, P202/204, P302/304, and P402/404 jumper plugs for Type 1 or Type 2 signaling. The PEMU is fixed at Type 1 signaling and does not have these jumper plugs.
6. For the REMU only: If the DK280 cabinets (DKSUB280 and DKSUE280 or DKSUE424) are within one mile of the PBX or Central Office, set the REMU db PAD switches SW101, SW201, SW301, and SW401 to the "3" (-3db signal level drop) position. The PEMU1 does not have these switches.
7. Insert the REMU or PEMU into the appropriate slot (refer to Subsection 4.1.2), and apply firm, even pressure to ensure proper mating of connectors.

IMPORTANT !
Each PEMU or REMU decreases the maximum system CO line and Station Ports by four each. See Worksheet 2 of Chapter 1—Configuration for recommended REMU/PEMU slot assignments.

8. After installing the REMU or PEMU, gently pull it outward. If the connectors are properly mated, a slight resistance will be felt.

Table 4-20
REMU Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
Tie Trunk Circuit 1 Indicator CD102	Red LED	Lights to indicate tie line 1 is in operation.
Tie Trunk Circuit 2 Indicator CD202	Red LED	Lights to indicate tie line 2 is in operation.
Tie Trunk Circuit 3 Indicator CD302	Red LED	Lights to indicate tie line 3 is in operation.
Tie Trunk Circuit 4 Indicator CD402	Red LED	Lights to indicate tie line 4 is in operation.
E & M Tie Trunk Connector J101	Modular connector	Interface connector for E & M tie line Circuit 1.
E & M Tie Trunk Connector J201	Modular connector	Interface connector for E & M tie line Circuit 2.
E & M Tie Trunk Connector J301	Modular connector	Interface connector for E & M tie line Circuit 3.
E & M Tie Trunk Connector J401	Modular connector	Interface connector for E & M tie line Circuit 4.
PAD Switch SW101	2-position slide switch	Enables -3dB signal level drop for line Circuit 1.
PAD Switch SW201	2-position slide switch	Enables -3dB signal level drop for line Circuit 2.
PAD Switch SW301	2-position slide switch	Enables -3dB signal level drop for line Circuit 3.
PAD Switch SW401	2-position slide switch	Enables -3dB signal level drop for line Circuit 4.
TYP1/TYP2 Jumper Plugs P102/104	3-terminal jumper plugs	Enables line Circuit 1 to be set for Type 1or Type 2 signaling.
TYP1/TYP2 Jumper Plugs P202/204	3-terminal jumper plugs	Enables line Circuit 2 to be set for Type 1 or Type 2 signaling.
TYP1/TYP2 Jumper Plugs P302/304	3-terminal jumper plugs	Enables line Circuit 3 to be set for Type 1 or Type 2 signaling.
TYP1/TYP2 Jumper Plugs P402/404	3-terminal jumper plugs	Enables line Circuit 4 to be set for Type 1or Type 2 signaling.
2W/4W Switch 102	2-position slide switch	Selects 2- or 4-wire configuration for E&M tie line Circuit 1.
2W/4W Switch 202	2-position slide switch	Selects 2- or 4-wire configuration for E&M tie line Circuit 2.
2W/4W Switch 302	2-position slide switch	Selects 2- or 4-wire configuration for E&M tie line Circuit 3.
2W/4W Switch 402	2-position slide switch	Selects 2- or 4-wire configuration for E&M tie line Circuit 4.

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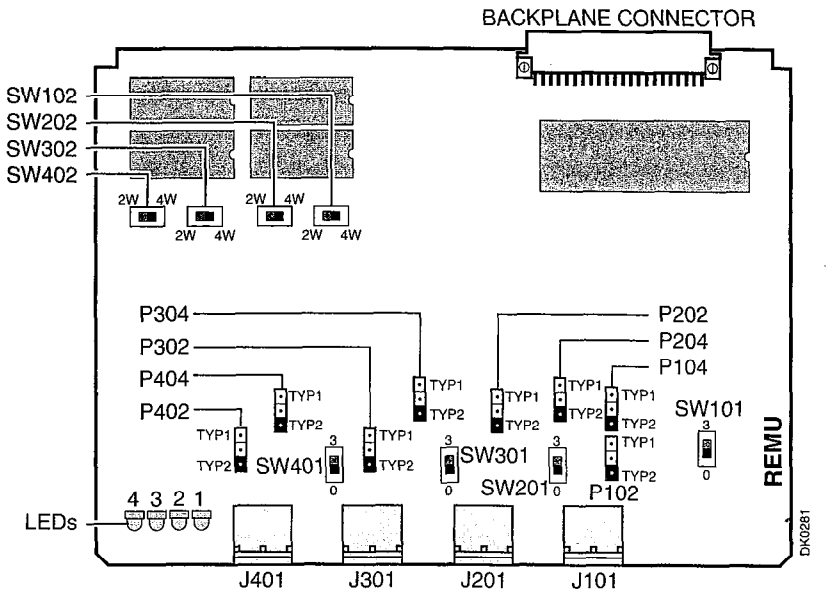

Figure 4-27
REMU Controls, Indicators, and Interface Connectors

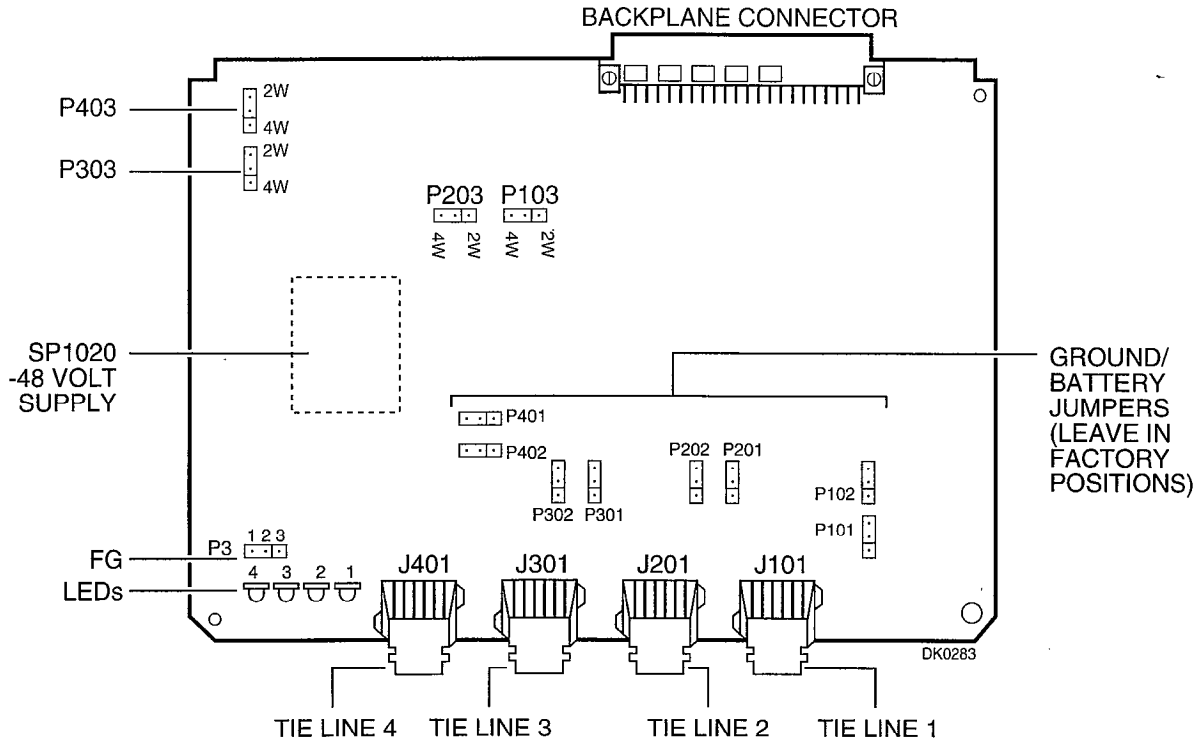

Figure 4-28
PEMU1 Controls, Indicators, and Interface Connectors

4.12.3 PEMU/REMU Wiring

Refer to Chapter 7—Wiring Diagrams for the PEMU diagrams, showing wiring/interconnecting details, and to the secondary protector diagram.

4.12.4 PEMU/REMU Programming Overview

The following programming parameters may be specified for the PEMU/REMU:

Program 03—Specify Code 13 for slots that will support PEMUs and make sure RRCS is enabled for DTMF operation.

Note:
If there are no options for any of the cabinet PCBs: Program 03 can be skipped, and Program 91 can be run instead.

Program 04—Specifies **[PDNs]**. These are also the numbers that must be received by incoming tie lines to route calls to the proper telephones (see Program 17, LED 05).

Program 10-1—Allows or denies Two-line Conference.

Program 15—Assigns tandem connections and Dial Pulse option to tie lines.

Program 17

- Assigns Immediate or Wink start to REMU tie lines.

IMPORTANT !

Also used to turn on tie line Dial tone return.

Note:
When a PEMU or REMU is installed in a system, it automatically assumes the next four consecutive CO line and station port numbers.

- Assigns tie/DID lines to route per DNIS and ANI options (Program 71 and 72) or **[PDNs]** (Program 04).

Program 30—Disables RRCS for Dial pulse operation.

Program 71 (1 ~ 5)—Tie/DID DNIS assignments.

Program *71 ~ *73—DH/tie/DID to **[DN]** ringing assignments.

Table 4-21
PEMU1 Controls, Indicators, and Interface Connectors

Control/Indicator/Connector (Figure 4-28)	Type of Component	Description
Tie Line Circuit 1 Indicator CD102	Red LED	Lights to indicate tie line 1 is in operation.
Tie Line Circuit 2 Indicator CD202	Red LED	Lights to indicate tie line 2 is in operation.
Tie Line Circuit 3 Indicator CD302	Red LED	Lights to indicate tie line 3 is in operation.
Tie Line Circuit 4 Indicator CD402	Red LED	Lights to indicate tie line 4 is in operation.
E & M Tie Line Connector J101	Modular connector	Interface connector for E & M tie line circuit 1.
E & M Tie Line Connector J201	Modular connector	Interface connector for E & M tie line circuit 2.
E & M Tie Line Connector J301	Modular connector	Interface connector for E & M tie line circuit 3.
E & M Tie Line Connector J401	Modular connector	Interface connector for E & M tie line circuit 4.
FG Jumper P3	Three-terminal jumper	Enables or disables -48V ground to FG.
GND/BAT Jumper P101	Three-terminal jumper	M-lead origination for tie line 1 (must be in BAT position per FCC requirements).
GND/BAT Jumper P102	Three-terminal jumper	M-lead origination for tie line 1 (must be in BAT position per FCC requirements).
GND/BAT Jumper P201	Three-terminal jumper	M-lead origination for tie line 2 (must be in BAT position per FCC requirements).
GND/BAT Jumper P202	Three-terminal jumper	M-lead origination for tie line 2 (must be in BAT position per FCC requirements).
GND/BAT Jumper P301	Three-terminal jumper	M-lead origination for tie line 3 (must be in BAT position per FCC requirements).
GND/BAT Jumper P302	Three-terminal jumper	M-lead origination for tie line 3 (must be in BAT position per FCC requirements).
GND/BAT Jumper P401	Three-terminal jumper	M-lead origination for tie line 4 (must be in BAT position per FCC requirements).
GND/BAT Jumper P402	Three-terminal jumper	M-lead organization for tie line 4 (must be in BAT position per FCC requirements).
2W/4W Jumper P103	Three-terminal jumper	Selects 2-wire or 4-wire configuration for E & M tie line circuit 1.
2W/4W Jumper P203	Three-terminal jumper	Selects 2-wire or 4-wire configuration for E & M tie line circuit 2.
2W/4W Jumper P303	Three-terminal jumper	Selects 2-wire or 4-wire configuration for E & M tie line circuit 3.
2W/4W Jumper P403	Three-terminal jumper	Selects 2-wire or 4-wire configuration for E & M tie line circuit 4.

DK0282

Program 93—Assigns a name to a tie line.

4.13 Direct Inward Dialing Line Interface Unit (RDDU)

The RDDU provides four Direct Inward Dialing (DID) lines, each of which can have a single office code along with a block of extensions. If an RDDU is installed, an RRCS must be installed on the RCTU for DTMF operation, but not for dial pulse operation. Each extension can be assigned to ring a station **[DN]** that appears on one or multiple stations, Distributed Hunt or ACD Group, or an external telephone number selected in system programming when using Release 3 software. This allows calls over the same line to be routed to different stations or groups of stations. An extension can also be assigned to ring the DK280 maintenance modem. Each RDDU can be set for either Wink Start or Immediate. All RDDU lines support DNIS and ANI features.

RDDU controls, indicators, and interface connectors are shown in Figure 4-29 and described in Table 4-22.

4.13.1 RDDU Hardware Options

There are no hardware options supported by the RDDU.

4.13.2 RDDU Installation Procedures

Install the RDDU in accordance with the following steps:

1. Remove the RDDU from its protective packaging.

   Note:

   The decibel (dB) PAD switches SW101 through SW401 control excessive loudness resulting from close proximity to a PBX or CO telephone office by providing a -3 dB signal level drop to, or from, the PBX or CO when set to the 3 position. Switches are factory-set to the 0 (0 dB signal level drop) position.

2. If the KSU is located within one mile of the PBX or CO telephone office, set dB PAD switches SW101 through SW401 to the 3 (-3 dB signal level drop) position.

   Note:

   Ensure the RDDU's component side is facing right when installing it in the KSU.

3. Sensitivity jumpers P101 ~ P401 are used mostly for dial pulse operation, to adjust for dial pulsing at different loop lengths. If close to the Central Office, the sensitivity should be set for low (L); as the loop length increases, it should be set to medium (M), then high (H).

4. Insert the RDDU into the appropriate slot and apply firm, even pressure to ensure proper mating of connectors.

IMPORTANT !

Each RDDU PCB uses four station ports in software, see WorkSheet 2 of Chapter 1—Configuration for recommended RDDU slot assignments.

5. After installing the RDDU, gently pull the PCB outward. If the connectors are properly mated, a slight resistance will be felt.

4.13.3 RDDU Wiring

Refer to the RDDU wiring diagram in Chapter 7—Wiring Diagrams for wiring/interconnecting and secondary protector details.

4.13.4 RDDU Programming Overview

The following programming parameters may be specified for the RDDU:

Program 03—Specify Code 16 for slots that will support RDDUs and make sure RRCS is enabled for DTMF operation.

Note:

Program 03 can be skipped, and Program 91 can be run instead.

Program *09—Assigns DID line extensions to route to station **[PDNs]** and IMDU or RMDS Remote Maintenance (see Program 17 below).

Program 10-1—Enables or disables Two-line Conference.

Program 15—Assigns DTMF/Dial Pulse dialing, and additional attributes to each line.

Program *15—Makes tenant assignments.

Program 16—Assigns lines to line groups.

Program *17—Assigns intercept port for DID calls to wrong or vacant numbers.

Table 4-22
RDDU Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
Pad Switch SW101	3-position slide switch	Enables -3dB signal level drop for line Circuit 1
Pad Switch SW201	3-position slide switch	Enables -3dB signal level drop for line Circuit 1
Pad Switch SW301	3-position slide switch	Enables -3dB signal level drop for line Circuit 1
Pad Switch SW401	3-position slide switch	Enables -3dB signal level drop for line Circuit 1
J1 Connector	Modular Connector	Interface Connector for DID Line circuits 1 & 2
J2 Connector	Modular Connector	Interface Connector for DID Line circuits 3 & 4
DID Line Circuit 1 Indicator (1) (CD122)	Red LED (Top)	Lights to indicate line circuit 1 is in operation. (Trunk indicator will not light unless RDDU is connecteed to a DID line.)
DID Line Circuit 2 Indicator (2) (CD222)	Red LED	Lights to indicate line circuit 2 is in operation. (Trunk indicator will not light unless RDDU is connecteed to a DID line.)
DID Line Circuit 3 Indicator (3) (CD322)	Red LED	Lights to indicate line circuit 3 is in operation. (Trunk indicator will not light unless RDDU is connecteed to a DID line.)
DID Line Circuit 4 Indicator (4) (CD422)	Red LED (Bottom)	Lights to indicate line circuit 4 is in operation. (Trunk indicator will not light unless RDDU is connecteed to a DID line.)
Jumper Plug P101	3-terminal jumper plug	Adjusts for dial pulsing at different loop lengths.
Jumper Plug P201	3-terminal jumper plug	Adjusts for dial pulsing at different loop lengths.
Jumper Plug P301	3-terminal jumper plug	Adjusts for dial pulsing at different loop lengths.
Jumper Plug P401	3-terminal jumper plug	Adjusts for dial pulsing at different loop lengths.

DK0296

Program 17

- Assigns Immediate or Wink start to DID lines. Also used to assign Auto camp-on and no-dial tone return for DID lines.
- Assigns DID lines to route per DNIS and ANI options (Program 71 and 72) or DID numbers (Program *09).

Program 30—Disables RRCS for dial pulse operation.

Program 39—Assigns line access buttons to digital and electronic telephones.

Program 40—Assigns station access to lines (incoming and outgoing).

Program 41—Assigns station access to lines (outgoing only).

Program 42-0, 1~8—Assigns behind PBX/Centrex operation to each line.

Programs 45 ~ 48—Defines Toll Restriction for any line.

Programs 50 ~ 56—Defines Least Cost Routing assignments.

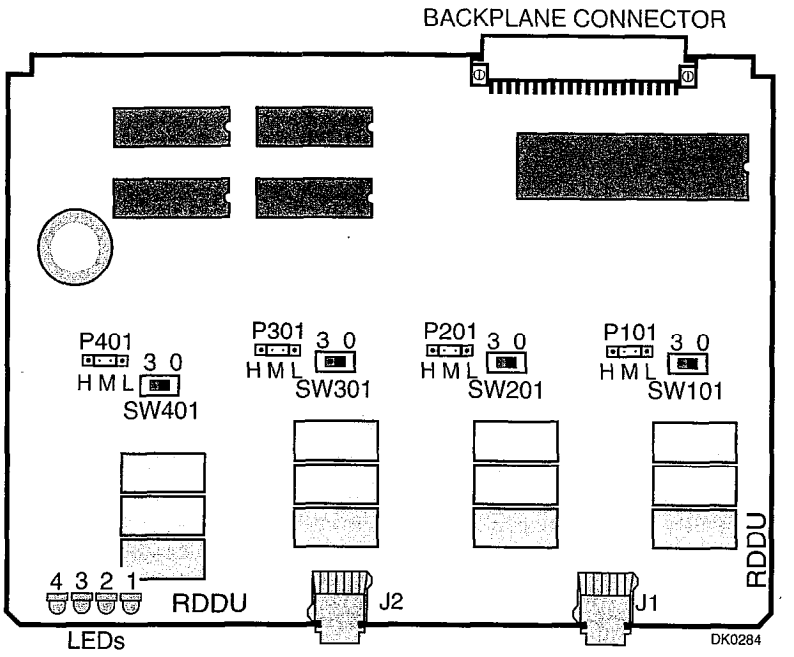

Figure 4-29
RDDU Controls, Indicators, and Interface Connectors

Programs 71 (1 ~ 5)—Assigns DNIS or ANI option to DID lines.

Programs *71 ~ *73—Assigns telephone to ring called Directory Number.

Program 93—Assigns names to lines.

4.14 T1 Interface Unit (RDTU)

The RDTU provides either 8, 16, or 24 channels, each of which can be individually configured for Ground start CO line operation, loop start CO line operation, DID operation, or tie line operation.

Notes:

1. *RDTU is configured for tie or DID lines, an RRCS must be installed for DTMF operation. Also, each tie or DID line decreases the system's station port and CO line capacity by one.*
2. *RDTU tie lines can route per Program 04 **[DN]** assignment or Program 71 and 72 DNIS assignments (see Program 17, LED 05).*
3. *RDTU DID lines can route per Program *09 assignments or Program 71 and 72 DNIS assignments (see Program 17, LED 05).*

Use system programming to select the number of channels supported by the RDTU and to assign line operation for the individual channels.

The RDTU requires installation of a customer-provided Channel Service Unit (CSU). Refer to Chapter 11—T1 Interface for CSU installation.

LEDs on the RDTU show a continuous status of RDTU operation. Fault Finding procedures are in Chapter 12—Fault Finding and testing procedures (Local Loop Back and Remote Loop Back) are in Chapter 11—T1 Interface.

A Strata DK280 system operating with an RCTUC/D common control unit can support up to six RDTU PCBs. A system with an RCTUB, RCTUBA/BB common control unit can have up to two RDTU PCBs. The RDTU cannot be installed in a system operating with the RCTUA common control unit.

The RDTU controls, indicators, and interface connectors are shown in Figure 4-30, Table 4-23 and are described in Chapter 11—T1 Interface.

Table 4-23
RDTU Controls, Indicators, and Interface Connectors

Control/Connector	Type of Component	Description*
SW1 Equalizer Setting Switch	Eight two-position slide switches	Sets line length between RDTU and Channel Service Units or other T1 (max 655 ft).
P3 (Not Used)	3-terminal jumper plug	This jumper plug is reserved for future use.
P4 Remote Loop Remote Mode Jumper Plug	3-terminal jumper plug	Sets RDTU for Remote Loop Back mode test procedure.
P1 and P2 Loop back Jumper Plug	3-terminal jumper plug	Sets RDTU for self check or Network/CSU loop back check.

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See T1 section for more information about RDTU switches, jumper options, and indicators.

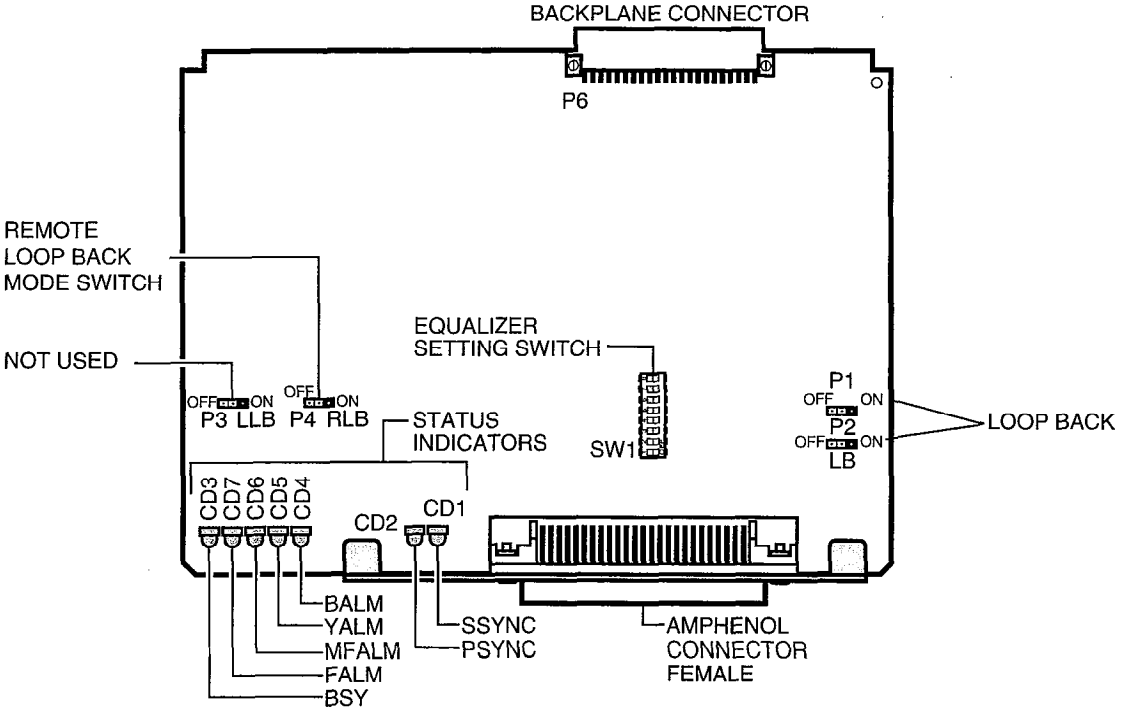

Figure 4-30
RDTU Controls, Indicators, and Interface Connectors

4.14.1 RDTU Hardware Options

The RDTU supports the following hardware options.

Internal Option

- SW1 Equalizer switch and loop back jumpers

The distance between the DK280 cabinets and the CSU (or other customer premise T1 circuit) determines the setting of the SW1 Equalizer Switch. The SW1 Switch consist of a bank of smaller switches, S1 ~ S7. Set the SW1 switch as follows:

- Short Mode (CSU distance from DK280 is 0 ~ 150 feet): S1 must be ON. S2 ~ S7 must be OFF.
- Medium Mode (distance is 151 ~ 450 feet): S2, S4, and S6 must be ON. S1, S3, S5, and S7 must be OFF.
- Long Mode (distance is 450 ~ 655 feet): S3, S5, and S7 must be ON. S1, S2, S4, and S6 must be OFF. The maximum distance between the RDTU and the CSU or other T1 circuits can not be more than 655 feet (see Chapter 11—T1 Interface).

External Option

- None

4.14.2 RDTU Installation Procedures

Install the RDTU in accordance with the following steps:

1. Remove the RDTU from its protective packaging.
2. Set jumper wire plugs P1 (LB), P2, P3, and P4 to the off position. See Chapter 11—T1 Interface for loop back testing procedures.
3. Refer to Subsection 4.13.1 for the appropriate SW1 equalizer switch setting.

   Note:
   Ensure the RDTU's component side is facing right when installing it in the KSU.
4. Insert the RDTU into the appropriate slot and apply firm, even pressure to ensure proper mating of connectors. (See Chapter 11—T1 Interface and Chapter 1—Configuration Worksheet 2 for RDTU slot assignment recommendations.)
5. After installing the RDTU, gently pull the PCB outward. If the connectors are properly mated, a slight resistance will be felt.

4.14.3 RDTU Wiring

Refer to Chapter 11—T1 Interface or RDTU wiring diagram in Chapter 7—Wiring Diagrams for wiring/interconnecting details.

4.14.4 RDTU Programming Overview

The following programming parameters may be specified for the RDTU:

Program 03—Specify Code 71 for an 8-channel RDTU, Code 72 for a 16-channel RDTU, or Code 73 for a 24-channel RDTU. (The 8-channel RDTU is the default.) Make sure RRCS is enabled for DTMF operation when using tie and DID lines.

Note:
If the T1 is 8 channels, Program 03 can be skipped, and Program 91, 91-1 or 91-9 can be run instead.

Program 04—Tie line digit translation (if T1 channel is tie). Also see Program 17 and 71 ~ 73.

Program *09—DID line digit translation (if T1 channel is DID). Also see Program 17 and 71 ~ 73.

Program 10-1—Enables or disables Two-Line Conference and Direct Inward System Access (DISA).

Program 15—Assigns DTMF/Dial Pulse dialing, DISA, and additional attributes to each line. Automatic Release (AR) assignments only need to be made for loop start lines; AR is automatically enabled for ground start lines.

Program *15—Makes tenant assignments.

Program 16—Assigns lines to line groups.

Program 17—Tie/DID line options.

Program *17—DID Intercept assignments (if T1 is DID).

Program 30—Disables RRCS for tie/DID dial pulse operation.

Program 39—Assigns line access buttons to digital and electronic telephones.

Program 40—Assigns station access to lines (incoming and outgoing).

Program 41—Assigns station access to lines (outgoing only).

Program *41 Series—Assigns RDTU channel line operation, as well coding and framing modes.

Program 42-0, 1~8—Assigns behind PBX/Centrex operation to each line.

Program *42 Series—Assigns timing reference for RDTUs.

Programs 45 ~ 48—Define Toll Restriction for any line.

Program *50, *51, *52—Caller ID/ANI assignments.

Programs 50 ~ 56—Defines Least Cost Routing assignments.

Program 71 (1 ~ 5)—Tie/DID DNIS assignment (optional see Program 04/*09).

Program *71 ~ *73—Tie/DID telephone/**[DN]** ring assignments.

Program 78—Assigns special ringing of lines: includes Night Ring Over Page, DISA, Remote Maintenance via the Internal Maintenance Modem (IMDU), and built-in Auto Attendant.

Program 81 ~ 89—Ground/loop start lines DAY, DAY2, and NIGHT ringing assignments.

Program *81, *84, *87—Assigns **[DN]** LEDs to flash when CO line rings a telephone.

4.15 Option Interface Units (PIOU and PIOUS)

The PIOU and PIOUS both provide a circuit interface with the system peripheral options. A maximum of three PIOU or PIOUS PCBs can be installed in the system. The PIOU and PIOUS support the same options, except the PIOUS does not support a built-in amplifier or Zone Paging. (See Chapter 6—Peripheral Installation, Section 6.12)

PIOU controls, indicators, and interface connectors are shown in Figure 4-32 and described in Table 4-24. PIOUS information is provided in Figure 4-33 and Table 4-25.

4.15.1 PIOU and PIOUS Hardware Options

The PIOU and PIOUS support the following hardware options:

Internal Option

- Remote Maintenance Modem Unit (IMDU)

Install the IMDU on the PIOU or PIOUS PCB in accordance with the following steps:

1. Remove the PIOU or PIOUS from its protective packaging. Remove the IMDU from its protective packaging.

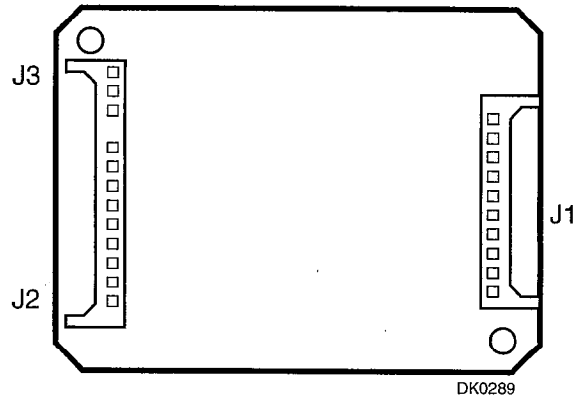

Figure 4-31
Remote Maintenance Modem (IMDU) Installation

2. Set the SW3 switch to the "MODEM" position for IMDU operation.
3. Set the P13 jumper plug on the PIOU to the "BELL" position; or, cut the W4 jumper wire on the PIOUS for "BELL" operation.
4. Mate IMDU connectors J1, J2, and J3 (Figure 4-31) with PIOU or PIOUS connectors P1, P2, and P3.

   Note:
   PIOU or PIOUS connectors P1, P2, and P3 are positioned to allow installation of the IMDU only in the proper position.
5. Refer to Programming Part and turn LED 14 on in Program 77-1 to enable IMDU operation.

   Note:
   The IMDU default station intercom or directory number is #19.
6. Apply firm, even pressure to the IMDU to ensure proper mating of connectors.
7. Set the SW2 baud rate switch on the front panel to 300 or 1200, as appropriate, after the PCB has

Table 4-24
PIOU Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
SMDR/TTY Interface Connector J3	Dual modular connector	Interface connector for SMDR printer/call accounting device and maintenance terminal/modem.
IMDU Connector P1	10-pin connector	Interface connector for Remote Maintenance Modem piggy-back module.
IMDU Connector P2	9-pin connector	Interface connector for Remote Maintenance Modem piggy-back module.
IMDU Connector P3	3-pin connector	Interface connector for Remote Maintenance Modem piggy-back module.
M/B Make/Break Jumper Plug P10	3-terminal jumper plug	External Page/Door Lock Control Relay MAKE or BREAK jumper plug.
M/B Make/Break Jumper Plug P11	3-terminal jumper plug	Night/Hold Relay MAKE or BREAK jumper plug.
Alarm Sensor N.O./N.C. Jumper Plug P12	3-terminal jumper plug	Alarm sensor normally open or normally closed jumper plug.
CCITT/BELL Jumper Plug P13	3-terminal jumper plug	IMDU or external modem operating specification jumper plug.
SMDR Baud Rate Switch SW1	2-position slide switch	Selects baud rate (300 or 1200 bps) for SMDR printer or call accounting device.
TTY Baud Rate Switch SW2	2-position locking push-button switch	Selects baud rate (300 or 1200 bps) for Remote Maintenance Modem piggy-back module (IMDU) or external TTY jack.
Modem/TTY Switch SW3	2-position slide switch	Enables PIOU for operation with IMDU modem or TTY jack.
SPO/SPI Internal/External Amplifier Switch SW4	2-position slide switch	Selects built-in 3-watt amplifier (SPI) or 600-ohm output (SPO) for external page/BGM operation.
Volume Control VR1	Trim potentiometer	Adjusts volume of built-in 3-watt amplifier.

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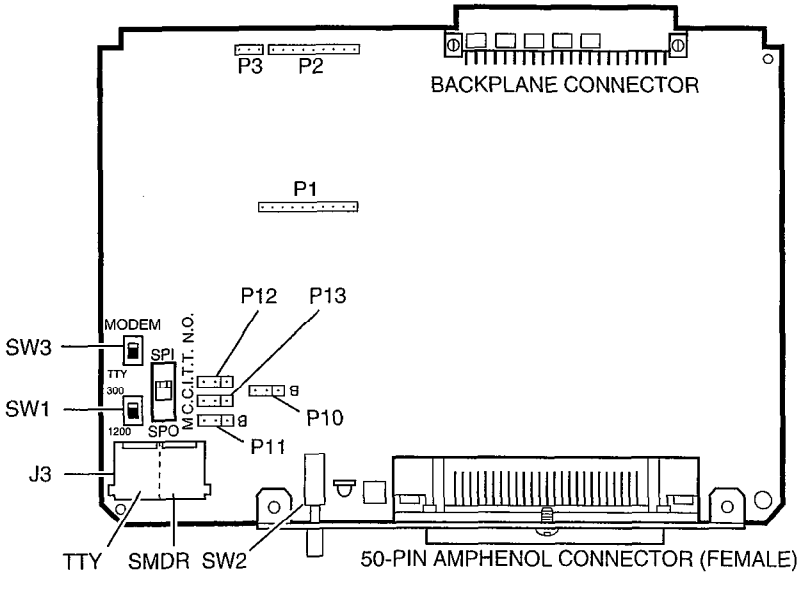

Figure 4-32
PIOU Controls, Indicators, and Interface Connectors

Table 4-25
PIOUS Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
SMDR/TTY Interface Connector J3**	Dual modular connector**	Interface connector for SMDR printer/ call accounting device and maintenance terminal/modem.**
IMDU Connector P1	10-pin connector	Interface connector for Remote Maintenance Modem piggy-back module.
IMDU Connector P2	9-pin connector	Interface connector for Remote Maintenance Modem piggy-back module.
IMDU Connector P3	3-pin connector	Interface connector for Remote Maintenance Modem piggy-back module.
M/B Make/Break Jumper W1	Wire jumper	External Page/Door Lock Control Relay MAKE or BREAK jumper.
M/B Make/Break Jumper W2	Wire jumper	Night/Hold Relay MAKE or BREAK jumper.
Alarm Sensor N.O./N.C. W3	Wire jumper	Alarm sensor normally open or normally closed jumper.
CCITT/BELL Jumper W4*	Wire jumper	IMDU or external modem operating specification jumper plug. (BELL = NO W4)
SMDR Baud Rate Switch SW1	Two-position slide switch	Selects baud rate (300 or 1200 bps) for SMDR printer or call accounting device.
TTY Baud Rate Switch SW2	Two-position locking push- button switch	Selects baud rate (300 or 1200 bps) for Remote Maintenance Modem piggy-back module (IMDU) or external TTY jack.
Modem/TTY Switch SW3	Two-position slide switch	Enables PIOUS for operation with IMDU modem or TTY jack.

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* *Most modems in USA require BELL specification: W4 not factory-installed.*
** *Top modular is TTY and bottom modular is SMDR.*

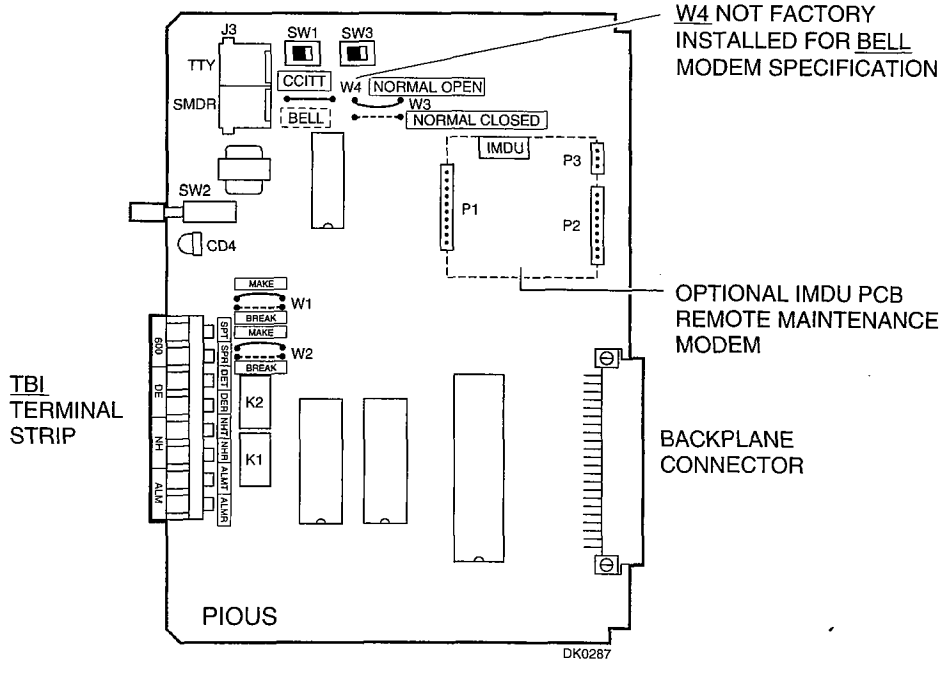

Figure 4-33
PIOUS Controls, Indicators, and Interface Connectors

been installed in the KSU (in for 300 bps, out for 1200 bps).

Note:
Refer to Remote Administration & Maintenance Part for more detailed information about the IMDU.

External Options

- Built-in paging amplifier (PIOU only)
- Door lock control or external amplifier control
- Alarm sensor
- External paging 600 ohm (duplex) interface
- Zone page, four zones (PIOU only)
- Local maintenance terminal or modem
- MOH or night relay control
- SMDR printer or call accounting port
- TTY port (terminal, modem, ACD/MIS, or SMDI)

Note:
Refer to Chapter 6—Peripheral Installation for external option installation procedures.

4.15.2 PIOU and PIOUS Installation Procedures

Install the PIOU or PIOUS in accordance with the following steps:

1. Ensure that the PIOU or PIOUS has been configured for the appropriate hardware options. (Refer to Subsection 4.14.1 and Chapter 6—Peripheral Installation for more details.).

   Note:
   Ensure the component side of the PCB is facing right when installing it in the KSU.

2. Insert the PIOU or PIOUS into the last slot ("S16") of the base cabinet if the system only has a base cabinet and no expansion cabinets. If there are expansion cabinets, install the PIOU or PIOUS in the highest slot number in any cabinet. Apply firm, even pressure to ensure proper mating of connectors.

3. After installing the PIOU or PIOUS, gently pull the PCB outward. If the connectors are properly mated, a slight resistance will be felt.

4.15.3 PIOU and PIOUS Wiring

Refer to Chapter 6—Peripheral Installation and Chapter 7—Wiring Diagrams for PIOU and PIOUS wiring/interconnecting details.

4.15.4 PIOU and PIOUS Programming Overview

The following programming parameters may be specified for the PIOU and PIOUS:

Program 03

- Specify Code 41, 42, or 43 for the slot that will support a PIOU or PIOUS (see Chapter 6—Peripheral Installation for multiple PIOU/PIOUS installation information).

  Note:
  Program 76 assignments for RSIU/RSIS/RMDS will override Program 03 assignments (41, 42, and 43) for SMDI, SMDR, TTY, and maintenance modem.

Program 10-2—Activates External Page with All Call Page (with access code #39 only, not with All Call Page button).

Program 60—Assigns SMDR options.

Program 77-1—Assigns relay control and IMDU options.

Program 78—Sets Night Ringing over External Page.

4.16 External Page Interface Unit (PEPU)

The PEPU is similar to the PIOU and PIOUS, but supports fewer peripherals than both PCBs. In general, PEPU-supported peripherals are paging and relay control related.

PEPU controls, indicators, and interface connectors are illustrated in Figure 4-34 and described in Table 4-26.

4.16.1 PEPU Hardware Options

The PEPU supports the following hardware options:

External Options

- Built-in paging amplifier
- Door lock control or external amplifier control

Table 4-26
PEPU Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
M/B Make/Break Jumper Plug P10	3-terminal jumper plug	External Page/Door Lock Control Relay MAKE or BREAK jumper plug.
M/B Make/Break Jumper Plug P11	3-terminal jumper plug	Night/Hold Relay MAKE or BREAK jumper plug.
SPI/SPO Internal/External Amplifier Switch SW4	2-position slide switch	Selects built-in 3-watt amplifier or 600-ohm output for External Page/BGM operation.
Volume Control VR1	Trim potentiometer	Adjusts volume of built-in 3-watt amplifier.

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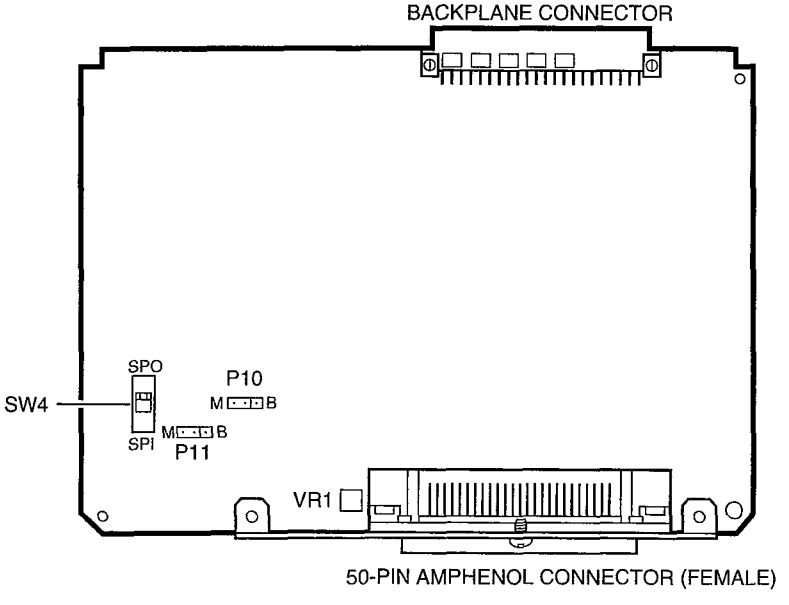

Figure 4-34
PEPU Controls, Indicators, and Interface Connectors

- External paging 600 ohm (duplex) interface (one zone)
- MOH Control or Night Relay Control

  Note:
  Refer to Peripheral Equipment Installation, Chapter 6—Peripheral Installation, and Wiring Diagrams, Chapter 7—Wiring Diagrams, for installation of external options.

PEPU does not support the following PIOU and PIOUS options:

- Alarm sensor
- Four-zone page
- SMDR port
- Remote maintenance modem or ASCII terminal connector
- IMDU connection

4.16.2 PEPU Installation Procedure

Install the PEPU in accordance with the following steps:

1. Remove the PEPU from its protective packaging.

2. Ensure the PEPU has been configured for the appropriate hardware options. (Refer to Chapter 6—Peripheral Installation.)

   Note:
   Ensure the PEPU's component side is facing right when installing it in the KSU.

3. Insert the PEPU into the last slot ("S16") of the base cabinet if the system has only a base cabinet and no expansion cabinets. If there are expansion cabinets, install the PEPU in the highest slot number of the highest numbered cabinet. Apply firm, even pressure to ensure proper mating of connectors.

4. After installing the PEPU, gently pull the PCB outward. If the connectors are properly mated, a slight resistance will be felt.

4.16.3 PEPU Wiring

Refer to Chapter 6—Peripheral Installation for external option installation; see Wiring Diagrams, Chapter 7—Wiring Diagrams, for wiring/ interconnecting details.

4.16.4 PEPU Programming Overview

The following programming parameters may be specified for the PEPU:

Program 03—Specify Code 41 for the slot that will support a PEPU.

Program 10-2—Activates External Page with All Call Page (with access code #39 only, not with All Call Page button).

Program 77-1—Assigns relay control options.

Program 78—Sets Night Ringing over External Page.

4.17 Attendant Console Interface Unit (RATU)

The RATU PCB provides interface circuits for up to four DK280 conventional and/or personal computer attendant consoles. Common control cards RCTUB2 or RCTUBA/BB (two consoles max.) or RCTUC/D2 or C3/D3 (four consoles max.) are required to support RATU/attendant console operation (RCTUA1 or 3) does not support attendant consoles).

RATU controls and indicators are illustrated in Figure 4-35 and described in Table 4-27.

4.17.1 RATU Installation Procedure

Install the RATU in accordance with the following steps:

1. Remove the RATU from its protective packaging.

   Note:
   Ensure the RATU's component side is facing right when installing it in the KSU.

2. Insert the RATU into the slot following the last station PCB. (Consoles will assume the next four station port numbers.) Apply firm, even pressure to ensure proper mating of connectors. (See Worksheet 2, Chapter 1—Configuration for RATU slot assignment recommendations.)

3. After installing the RATU, gently pull the PCB outward. If the connectors are properly mated, a slight resistance will be felt.

4.17.2 RATU Wiring

Refer to Chapter 7—Wiring Diagrams, for wiring/interconnecting details.

4.17.3 RATU Programming Overview

The following programming parameters may be specified for the RATU:

Program 03 or 91—Specify Code 51 for the slot that will support a RATU.

Program 59—Assigns Console flexible keys.

Program 58

- 58-1—Sets Attendant overflow time.
- 58-2—Enables Conventional Console EL or CRT (EGA) Display option. (This option does not apply to the PC console monitor which must be a VGA or SVGA.)

4.18 RCIU/RCIS PCB

The Caller ID Interface (RCIU) PCB is required to provide the Caller ID feature, also known as Calling Number Delivery (CND), in Release 3 of the DK280 system. Caller ID can be provided on analog loop start lines (PCOU, RCOU/RCOS PCBs) and analog ground start lines (RGLU PCB) only. It is not available on any other type of analog lines (RDDU/DID and/or REMU/PEMU tie) or any type of digital lines (RDTU-T1, including ground start, loop start, DID and tie lines).

Table 4-27
RATU Controls, Indicators, and Interface Connectors

Control/Indicator/Connector	Type of Component	Description
Console 1 Indicator CD3	Red LED	Lights when a PC or conventional Console 1 is not operating.The LED will turn OFF when the console is operational (see note).
Console 2 Indicator CD4	Red LED	Lights when a PC or conventional Console 2 is not operating.The LED will turn OFF when the console is operational (see note).
Console 3 Indicator CD5	Red LED	Lights when a PC or conventional Console 3 is not operating.The LED will turn OFF when the console is operational (see note).
Console 4 Indicator CD6	Red LED	Lights when a PC or conventional Console 4 is not operating. The LED will turn OFF when the console is operational (see note).

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Note: The LED will flash temporarily when the console is first installed and the DK280 RCTU processor and attendant console or RATI initialize.

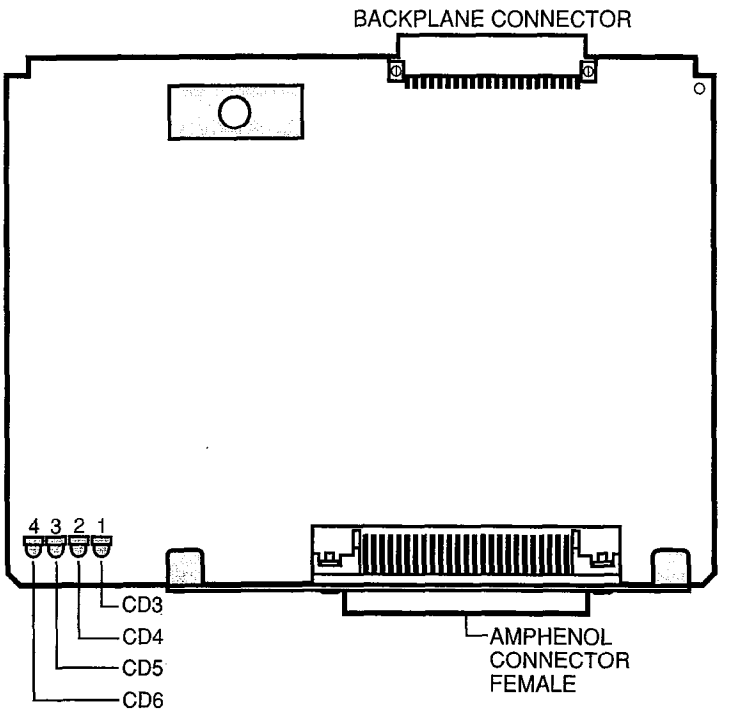


Figure 4-35
RATU Controls, Indicators, and Interface Connectors

An RCIU/RCIS circuit must be available in addition to each RCOU, RGLU, etc., line that is to receive Caller ID. When ordered from the factory, the RCIU PCB comes equipped with four Caller ID circuits; however, an RCIS piggy-back PCB can be installed onto the RCIU to provide an additional four Caller ID circuits. Hence, an installed RCIU/RCIS can provide a maximum of eight Caller ID circuits per cabinet slot.

When installing RCIU/RCIS Caller ID circuits, always install RCIS onto RCIU in order to provide up to eight circuits. Do not install two RCIU PCBs to provide up to eight circuits because Program 03 code 81 always assigns each RCIU slot with eight software Caller ID circuits.

Each RCIU/RCIS Caller ID circuit has a two-wire Tip/Ring interface which must be bridge-wired across its corresponding Ground or Loop Start CO line Tip/Ring on the Main Distribution Frame (MDF) (see Figure 7-36 in Chapter 7—Wiring Diagrams). Each RCIU/RCIS modular jack provides interface for two Caller ID circuits.

4.18.1 RCIU/RCIS Installation

RCIU/RCIS PCBs can be installed in any universal cabinet slot except slot 11 of the base cabinet. However, if the RSIU is installed in slot 11, the RCIU cannot be installed in slot 12. It is not necessary to install the RCIU/RCIS PCBs in slots adjacent to their associated CO lines or the same cabinet as their associated CO line.

Install the RCIS onto the RCIU as required (see Figure 4-36 and 4-37). Then install the RCIU/RCIS into the appropriate cabinet slot. The circuit modular jack numbering and the Tip/Ring cross connect wiring of RCIU/RCIS to RCOU/RCOS, PCOU, or RGLU is shown is shown in Figure 7-36 of the DK280 Installation and Maintenance Manual, Chapter 7—Wiring Diagrams.

4.18.2 RCIU/RCIS Programming

Program 03—Program each RCIU or RCIU/RCIS (4 or 8-Caller ID circuit) slot with code 81.

Note:
RCIU/RCIS Caller ID circuits are numbered automatically in numerical order starting with the RCIU/RCIS installed in the lowest slot number. Slots with code 81 will increment the Caller ID circuit numbers by eight circuits even if RCIS is not installed on RCIU.

Program *50—Assigns CO lines that will receive Caller ID to an associated RCIU/RCIS Caller ID circuit number. This assignment is flexible, i.e., any RCOU/RCOS/PCOU/RGLU Caller ID CO line can be assigned to any RCIU or RCIS Caller ID circuit number.

Note:
*After assigning CO lines to Caller ID circuits, turn system power "Off" for approximately five seconds and then back "On" or run Program 91-2 to activate Program *50 assignments.*

Program *51

- Sets the Caller ID (CLID)/Automatic Dialed Number Identification (ANI) memory allocation for the appropriate stations. This memory is used to save CLID/ANI telephone numbers for calls that are received but not answered (abandoned calls). CLID/ANI numbers are not saved in station memory if they are answered. Stations can be allocated with memory to save up to 100 numbers in 10-number increments.

  The total memory allocated to all stations in a system is:

- RCTU C3/D3 = 1000 numbers
- RCTUBA3/BB3 = 400 numbers
- RCTUA3 = 200 numbers

Note:
*When a CO line rings multiple stations, a station must be the owner of the Caller ID or ANI CO line to be able to save abandoned call (Caller ID and/or ANI) telephone numbers. (See Program *52.)*

Program *52—Assigns stations as owners of Caller ID CO lines. These stations will store the Caller ID telephone numbers received on abandoned (not answered) calls for the lines which they own. Typically all common CO lines are assigned to one designated telephone or attendant console and private lines are assigned to individual private line telephones.

Note:
*A station must also be allocated with Caller ID/ANI storage memory in Program *51 to store abandoned call telephone numbers.*

Program 39, Code 462—Assigns the Caller ID/ANI **Lost Call Auto Dial** button to LCD telephones that store Caller ID and/or ANI abandoned call telephone

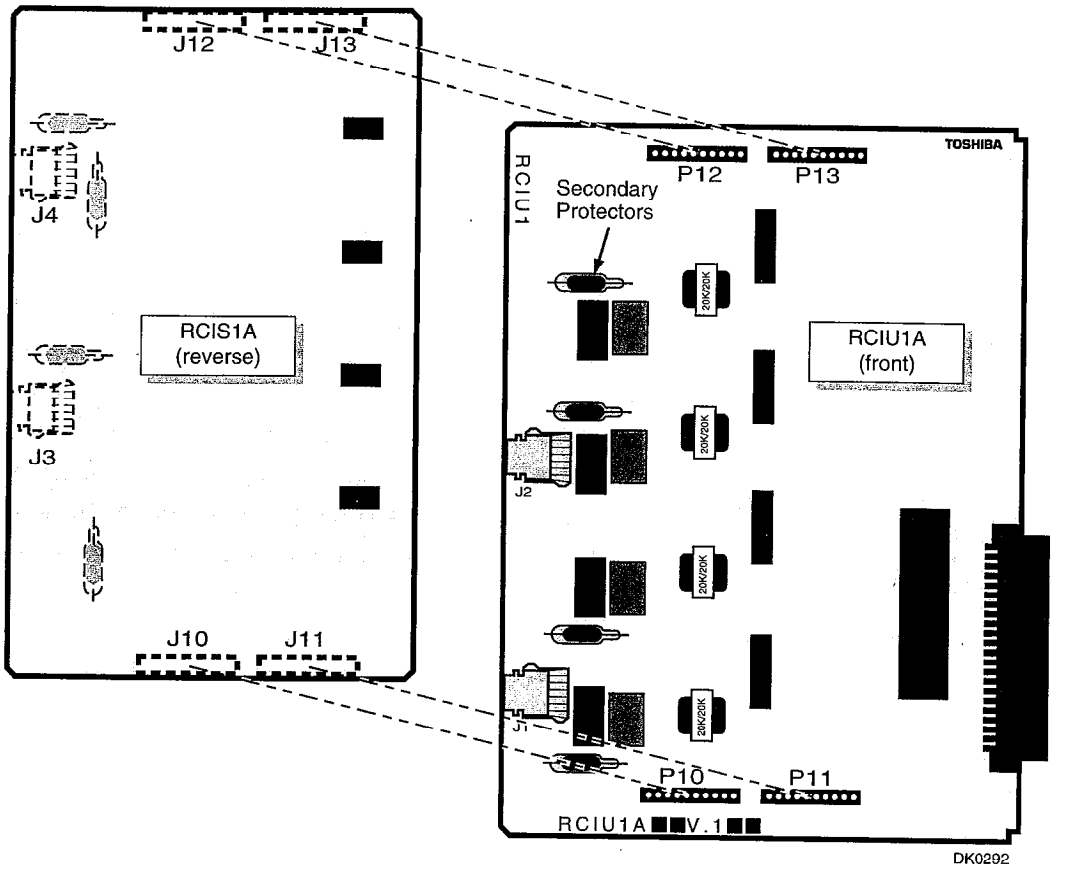


Figure 4-36
RCIU/RCIS PCB Installation

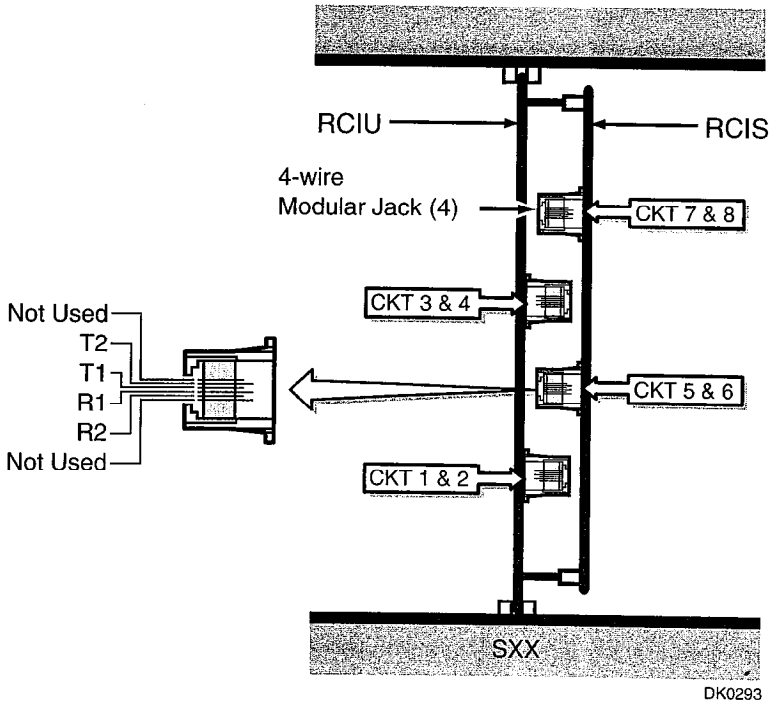


Figure 4-37
RCIU/RCIS PCB Modular Jack Positions

numbers. A user can scroll through the stored abandoned call telephone numbers and auto dial the selected number using this button.

Program 59, Code 462—Assigns the CLID/ANI **Lost Call Auto Dial** button to the attendant consoles that store Caller ID and/or ANI abandoned call telephone numbers. A console user can scroll through the stored abandoned call telephone numbers and auto dial the selected number using this button.

Program 10-3, Key 08

- Determines if CLID and/or ANI telephone numbers will be sent out the system SMDI port:
- Turn LED 08 "On" if the CLID and/or ANI numbers received should be sent out the system SMDI port.
- Turn LED 08 "Off" if the CLID and/or ANI numbers received should not be sent out the system SMDI port.

  Note:
  The system will initialize with LED 01 "Off", i.e., no CLID/ANI information will be sent out the SMDI port.

Program 60-1, Key 01

- Determines which information will be sent out the system SMDR port, i.e., system Account Codes or CLID and/or ANI telephone numbers:
- Turn LED 01 "On" if CLID and/or ANI information should be sent out the system SMDR port.
- Turn LED 01 "Off" if Account Codes information should be sent out the system SMDR port.

  Note:
  The system will initialize with LED 01 "Off", i.e., Account Codes information will be sent out the SMDR port.

Program 77-4, LED 01/LED 02 (DK280 Release 3.2 and above)

- Enables CLID, ANI, and/or Dialed Number Identification Service (DNIS) information to be sent from the RSIU Open Architecture (OA) port on ACD calls only:
- Turn LED 01 "On" if the OA port should send CLID and/or ANI information.
- Turn LED 01 "Off" if the OA port should not send Caller ID/ANI.
- Turn LED 02 on if the off port should send DNIS information.
- Turn LED 02 off if the OA port should not send DNIS information.

  Notes:
  1. *Program 77-4 allows LED 01 and LED 02 to be turned "On" simultaneously to allow CLID, ANI, and DNIS information to be sent from the OA port on ACD calls.*
  2. *The system will initialize with LED 01 and LED 02 "Off", i.e., no CLID, ANI, or DNIS information will be sent from the OA port on ACD calls.*

4.19 RSIU/RSIS/RMDS PCB Installation

4.19.1 PCB

The RS232/Modem Interface (RSIU) PCB provides up to four interface ports that allows the DK280 system to connect to the following hardware devices:

- SMDI or Toshiba Proprietary RS-232 Voice Mail
- ACD SMIS computer
- SMDR printer or SMDR call accounting machine
- 280Admin/280Backup personal computer or maintenance terminal (locally or remotely)
- Open-Architecture application computer system to receive ANI, DNIS, or CLID digits from the DK280 on ACD calls (DK280 Release 3.2 and above).

The RSIU is a standard plug-in type PCB that must be installed into the first universal slot of the DK280 base cabinet. The RSIU PCB provides one standard RS-232 port (modular jack) when ordered from the factory; this port can be configured in system programming to support any one of the hardware options listed above.

The RSIU can be equipped with up to three more optional RS-232 ports (total of four RS-232 ports) or with two optional RS-232 ports and one modem port (total of three RS-232 ports and one modem port). The optional RS-232 ports are provided by installing RSIS piggy-back PCBs onto the RSIU PCB. The optional built-in modem is provided by installing an RMDS piggy-back PCB onto the RSIU (see Figure 7-38 in Chapter 7—Wiring Diagrams).

The RSIS PCB can support any one of the hardware devices listed above via its RS-232 modular jack. The RMDS PCB can function two ways: the RMDS can operate like an RSIS allowing it to support any one of the hardware devices listed above locally from its RS-232 modular jack; or, the RMDS can operate as a 1200 bps (bits-per-second) or 2400 bps system remote maintenance modem. The function of the RMDS PCB (modem or RS-232 port) is set in a system program option. The RMDS can be set for one function only; it cannot support both functions simultaneously. When configured as a modem, the RMDS PCB supports only the DK280 remote maintenance, ASCII terminal, or 280Backup, and 280Admin functions, and does not simultaneously support SMDI, SMIS, SMDR, etc. (See Figure 7-38 in Chapter 7—Wiring Diagrams.)

The total bits-per-second (bps) data rate of the four RSIU/RSIS/RMDS (RS-232/modem) ports combined cannot exceed 9600 bps. The RSIU/RSIS RS-232 ports can be individually set in system programming to operate at 1200 bps, 4 ports max.; 2400 bps, 3 ports max.; 4800 bps, 2 ports max.; or 9600 bps, 1 port max.; or, any other combination that does not exceed 9600 bps. The RMDS modem function can be set to operate at 1200 bps or 2400 bps; however, if the RMDS port is used as a RS-232 port instead of a modem, it can also be set for 4800 bps or 9600 bps.

The TTY and modem function cannot operate on separate RSIU/RSIS/RMDS ports simultaneously. If both functions are programmed at the same time on separate ports, the function of the lowest numbered RSIU/RSIS/RMDS port (TTY or modem) will be active.

The communication parameters for all RSIU/RSIS/RMDS port function types except the SMDR are:

- Data word bits = 7
- Parity = even
- Stop bits = 1

The communication parameters for an RSIU/RSIS SMDR port is:

- Data word bits = 8
- Parity = none
- Stop bits = 1

Only one RSIU can be installed per DK280 system. When the RSIU PCB is installed, the RSSU, PIOU, PIOUS, IMDU modem, and PEPU PCBs can still be installed with all of their respective paging, modem, and RS-232 port functions available; however, five RS-232/modem ports can be installed in one DK280 system. When installed together in the same DK280 system, the RSIU/PIOU/PIOUS/RSSU port functions are identified and enabled (turned On/Off) in system programming. If the same function is programmed for an RSIU port and a PIOU, PIOUS, RSSU port, the only RSIU port will function.

4.19.2 RSIS/RMDS Piggy-Back Installation

Install all RSIS and RMDS PCBs on the RSIU PCB before installing the RSIU into the DK280. Each RSIS or RMDS piggy-back PCB is installed on the RSIU PCB as shown in Figure 4-38. Up to three RSIS PCBs can be installed on the RSIU PCB; only one RMDS PCB can be installed on the RSIU. The function and bit-per-second (bps) data rate of each RSIS and RMDS circuit port is set in Program 76 as described in the Programming Part that follows.

After installing all RSIS/RMDS PCBs, install the RSIU into the DK280 per the following instructions.

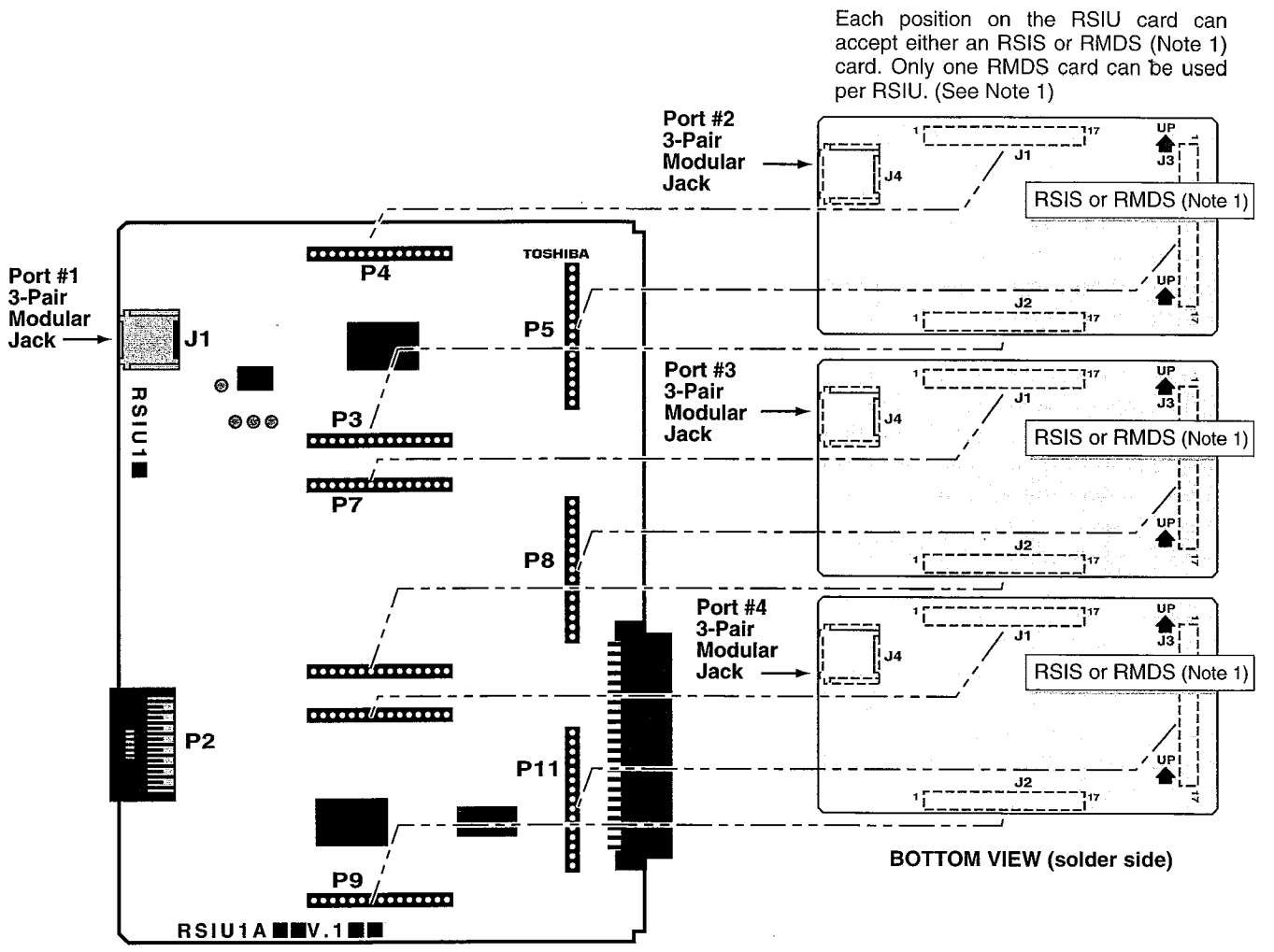
4.19.3 RSIU Cabinet Slot Installation

- RSIU installed into a new system:

  The RSIU is compatible with DK280, Release 3, RCTU PCBs and above only. The RSIU must be installed only in slot 11 of the base cabinet (see Figure 4-39 to install the RSIU PCB). When RSIU is installed in slot 11, a PDKU or PEKU PCB must be installed in slot 12 of the base cabinet to support the programming telephone. When RSIU is installed in slot 11, the first 8-station ports (000-007) will appear on the PDKU or PEKU as installed in slot 12. The programming telephone will then be on the 6th circuit (port 005; or, 013 until Program 03 Code 49 is set for slot 11) of the PDKU in slot 12. The function and bit-per-second (bps) data rate of the RSIU or RMDS, RS-232 circuit port is set in Program 76 as described in the Programming Part that follows.

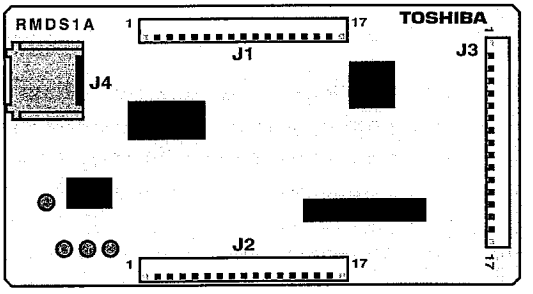
- RSIU installed into an existing system without DID and/or tie lines:

  All information provided in the first paragraph regarding RSIU installation in a new system applies to installing an RSIU in an existing system. Hence, most PCBs must be moved to the next highest slot using the following steps.

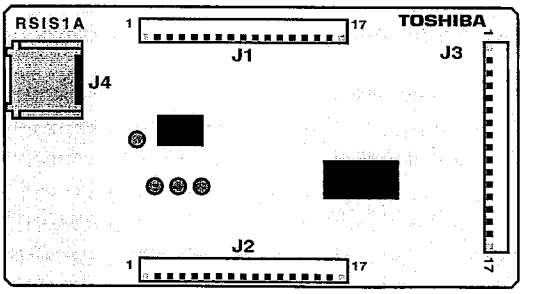


CAUTION:
Do not connect telephone circuit Tip/Ring to J4 (See Note 2)

RMDS Top View



RSIS Top View



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Notes:

1. *Maximum of one RMDS per RSIU, maximum of three RSIS per RSIU.*
2. *On RMDS, J4 is not used for modem operation, it is used when RMDS is configured for TTY, SMDI, SMDR, or MIS operation like RSIS.*

Figure 4-38
RSIU/RSIS/RMDS PCB Installation

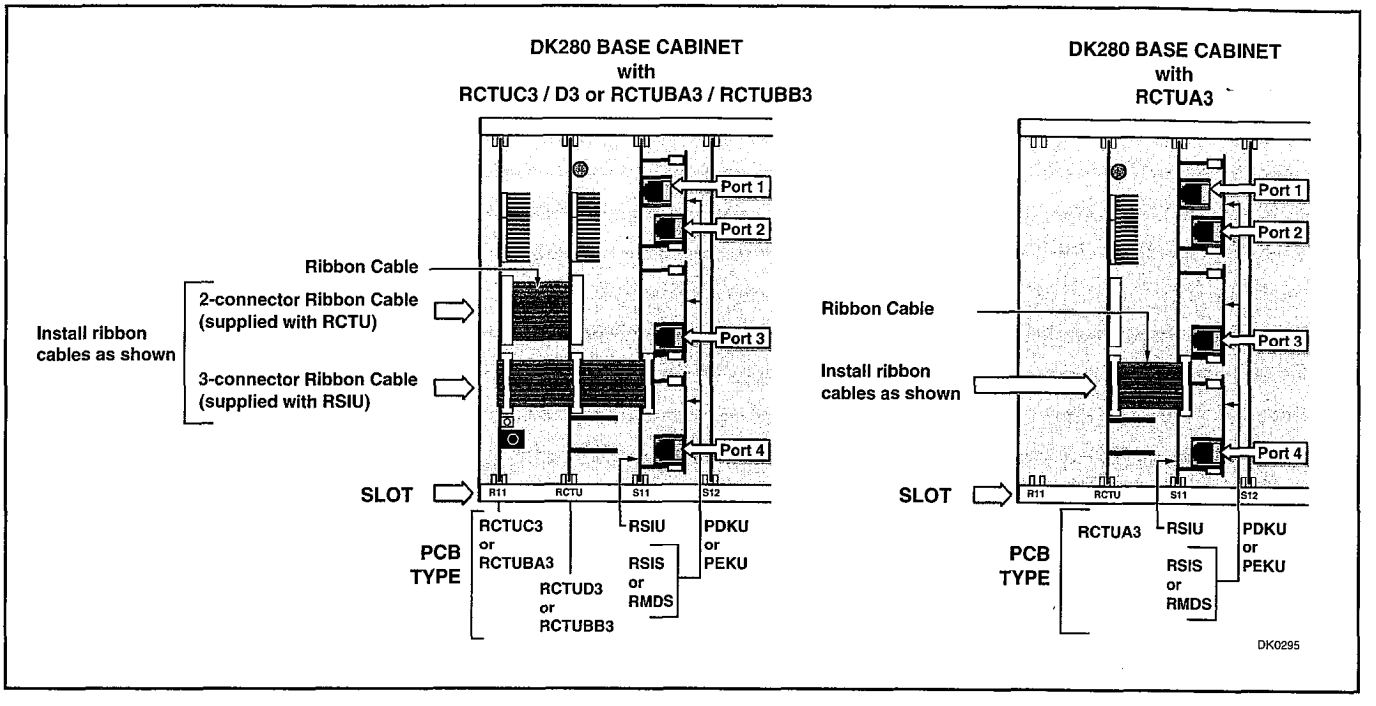


Figure 4-39
RSIU PCB Installation

1. Identify (mark) the attendant console and all station PCB wiring connectors so they can be removed and then reinstalled on the same PCB later (Console Station PCBs include: PDKU, RDSU, PEKU, PESU, RSTU, PSTU and RATU PCBs).
2. Turn system power off.
3. Disconnect the connectors from the Attendant Console and all Station PCBs listed in Step 1.
4. Remove all Station PCBs listed in Step 1.
5. Install each PCB that was removed in Step 4 into the next highest empty station PCB slot number. Skip over all other types of PCBs that were not removed. Example: If a PDKU was originally in slot 11 and a PSTU was in slot 12, the PDKU is moved to slot 12 and the PSTU is moved to slot 13. The programming telephone will then be on the 6th circuit (port 005; or, 013 until Program 03 Code 49 is set for slot 11) of the PDKU in slot 12.
6. Connect all PCB connectors that were removed back into the same PCBs they were removed from in Step 3.
7. Turn the system power on and note that the programming telephone is on port 13 and all other ports are shifted up by eight ports. Program slot 11 with Code 49 and all other slots with the appropriate codes using Program 91-1 and/or 03. Then cycle system power off (five seconds) and on, or, run Program 91-2 to transfer Program 03 data from temporary to working memory. At this time the programming telephone changes from port 13 to port 005 and all other ports shift down by eight ports.

■ RSIU installed into an existing system with DID and/or tie lines:

All information provided in the first paragraph regarding RSIU installation into a new system applies to installing an RSIU into an existing system. Hence, most PCBs must be moved to the next highest slot using the following steps.

1. Identify (mark) all PCB wiring connectors so they can be removed and then reinstalled onto the same station PCB later.
2. Turn system power off.

3. Disconnect the connectors from all PCBs except PIOU, PIOUS, RSSU, PEPU, RCIU, and RCIS.
4. Remove all PCBs except PIOU, PIOUS, RSSU, PEPU, RCIU, and RCIS.
5. Each PCB that was removed must be installed into the next highest empty PCB slot number. Skip over all other types of PCBs that were not removed.

Note:

This step may have to be modified for the RDTU PCB, depending on the configuration to meet the requirements of RDTU slot assignments per Tables 11-1, 11-2, and 11-3 of Chapter 11—T1 Interface of the DK280 I/M manual.

6. Connect all PCB connectors that were removed back into the same PCBs from which they were removed.
7. Turn the system power on and note that the programming telephone is on port 13 and all other ports are shifted up by eight ports. Program slot 11 with Code 49 and all other slots with the appropriate codes using Program 91-1 and/or 03. Then cycle system power off (5 seconds) and on or, run Program 91-2 to transfer Program 03 data from temporary to working memory. At this time the programming telephone changes from port 13 to port 005 and all other ports shift down by eight ports.

4.19.4 RSIU/RSIS/RMDS Programming

Program 03—Programs slot 11 with code 49 to identify that the RSIU PCB is installed in slot 11.

Program 76-1X-Y—Assigns each installed RSIU port to a function. Where X identifies the RSIU port No. 1-4 (see Figure 3 for RSIU port number configuration) and Y identifies the RSIU port function:

Y=1, RS-232 TTY (Program 77-1, LED 14 OFF)

Y=1, RMDS modem (Program 77-1, LED14 ON)

Y=2, SMDR

Y=3, MIS or SMIS

Y=4, SMDI

Y=5, Open Architecture

Y=0, No function - this should be used for any of the four RSIU/RSIS/RMDS ports that are not used.

Notes:

1. *Function codes set in Program 76-1X-Y will override RSSU, PIOU, and/or PIOUS function codes (41, 42, 43) set in Program 03.*
2. *The TTY and modem function cannot operate on separate RSIU/RSIS/RMDS ports simultaneously. If both functions are programmed at the same time on separate ports, the function of the lowest numbered RSIU/RSIS/RMDS port (TTY or modem) will be active.*
3. *When uploading Program 76-1 with 280Admin or Backup, the data will not change until the system power is cycled.*

Program 76-2X-Z

- Assigns each installed RSIU port to operate at a specified transmission rate. Where X identifies the RSIU Port No. 1-4 (see Figure 3 for RSIU port number configuration) and Z identifies the RSIU/RSIS/RMDS port transmission rate in bits-per-second (bps).

Notes:

1. *The sum of the used RSIU/RSIS/RMDS ports transmission rates cannot exceed 9600 bps. Ports assigned as "non-function" (code 0) in Program 76-2X-Y will not be included in the transmission rate sum. The RMDS will only function at 1200 or 2400 bps.*
2. *When uploading Program 76-2 with 280 Admin or 280Backup, make sure that Program 76-2 bps rate for the TTY/ modem port is set the same in: 280 Admin communications setup, 280Admin customer database, and the DK280 RCTU. If the bps rate is not the same in all three areas, uploading will fail on Program 76.*

Program 77-1, LED 14—Enables the RMDS modem function. If the RMDS should function as a modem, turn "On" LED 14. If the RMDS should function as a RS-232 port, turn "Off" LED 14.

Program 77-1, LED 15—Sets the RMDS communications standard type to CCITT/V.22bis (2400 bps) or Bell 212A (1200 bps). The standard set in this program must match the standard of the modem communicating with the DK280 RMDS. If the RMDS modem standard should be CCITT/V.22bis, turn LED 15 "On". If the RMDS standard should be Bell 212A, turn LED 15 "Off". Most Hayes compatible modems will function with either standard. Check with the modem manufacturer's documentation to verify which protocol should be used. When the system is initialized the Bell 212A standard is set (LED 15 Off).

Program 77-4, LED 01/LED 02

- Enables CLID, ANI, and/or DNIS information for ACD calls to be sent from the RSIU OA port.
- Turn LED 01 "On" if the OA port should send CLID and/or ANI information for ACD calls.
- Turn LED 02 "On" if the OA port should send DNIS information for ACD calls.

Notes:

1. *Program 77-4 allows LED 01 and LED 02 to be turned On simultaneously, allowing CLID, ANI, and DNIS information to be sent from the OA port for ACD calls.*
2. *The system will initialize with LED 01 and 02 "Off" – no CLID, ANI, or DNIS information will be sent from the OA port for ACD calls.*

Station Apparatus

5

This chapter provides instructions on how to connect telephones to the Strata DK280 system and how to configure and upgrade them for optional features. Procedures for installing direct station selection consoles, PC and conventional attendant consoles, and door phones also appear in this chapter.

5.1 Types of Telephones

The Strata DK280 systems can support the following telephones.

- **Digital Telephones:** Installation instructions for digital telephones in this chapter and elsewhere in this manual apply only to the Toshiba 2000- and 1000-series digital telephones. The 2000-series digital telephones consist of four models: the DKT2010-H, DKT2010-SD, DKT2020-S, and DKT2020-SD. There are two 1000-series digital telephone models, the DKT1020-H and DKT1020-SD.
- **Electronic Telephones:** The electronic telephone instructions here apply to the Toshiba 6500-series electronic telephones, although there are other electronic telephones (the 2000-, 3000-, 6000-, and 6500-series) that are compatible with the Strata DK280. The 6500-series electronic telephones consist of four models: the EKT6510-H, EKT6510-S, EKT6520-H, and EKT6520-SD.
- **Standard Telephones:** 500- and 2500-type standard telephones apply whenever standard telephones are mentioned in this manual.

5.2 Telephone Installation

This section describes the wiring required to connect telephones to the system. Before installing any telephone wiring, read the following warning and caution notes:

WARNING !

1. ***Never install the telephone wiring during a lightning storm.***
2. ***Never install the telephone jacks in wet locations, unless the jack is specifically designed for wet locations.***
3. ***Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.***
4. ***Use caution when installing or modifying telephone lines.***
5. ***If telephone, DSS console, door phone control box, or door phone wiring exits the building, external secondary protection is required. See Chapter 7— Wiring Diagrams.***

CAUTION !

When installing the station cable, do not run the cables parallel if they are within three feet of an AC power line. AC power lines should be crossed at right (90°) angles only. In particular, avoid running station wire pairs near devices that generate electrical noise, such as neon or fluorescent light fixtures.

5.2.1 Connecting Digital Telephones to the System

The following provides information on how to connect digital telephones to the DK280 system.

Note:
Before proceeding, see warning and caution notes in Section 5.2.

Digital telephones connect to the digital telephone ports via the main distribution frame (MDF) with standard twisted-pair jacketed telephone cable. Single-pair wiring is sufficient in most cases for digital telephones to operate effectively at up to 1000 feet from the key service unit, if using 24 AWG cable. But digital telephones that are equipped with Integrated Data Interface Units or ADMs should have two-pair (or external power) to function effectively at this distance. This also applies to digital telephones that are supported by systems that must operate with battery reserve power—see Chapter 7—Wiring Diagrams, for loop limits (see Table 7-4).

To accommodate the digital telephone line cord, the cable should be terminated in a modular station connector block (RJ-11) at the station location. The standard single-pair, modular digital telephone cord that is sent with the telephone is 7 feet (the maximum allowed is 25 feet).

Notes:

1. *Digital telephone cable runs must not have the following:*
   - *Cable splits (single or double)*
   - *Cable bridges (of any length)*
   - *High resistance or faulty cable splices*
2. *See Chapter 7—Wiring Diagrams for secondary protector information.*

5.2.2 Connecting Electronic Telephones to the System

The following provides information on how to connect electronic telephones to the DK280 system.

Note:
Before proceeding, see warning and caution notes in Section 5.2.

Electronic telephones are connected to electronic telephone circuits in the DK280 Expansion Unit on the Electronic Telephone Interface Unit (PEKU) and the Standard/Electronic Telephone Interface Unit (PESU) via the main distribution frame (MDF) with standard twisted-pair jacketed telephone cable. Two-pair wiring, as a minimum, is required for telephone connection. However, three-pair wiring is recommended to permit future upgrades, such as Off-hook Call Announce.

To accommodate the electronic telephone line cord, the cable should be terminated in a modular station connector block (RJ-11) at the station location. The standard two-pair modular electronic telephone cord length is seven feet (the maximum allowed length is 25 feet). See Wiring diagrams, Chapter 7—Wiring Diagrams—for more details.

Note:
See Chapter 7—Wiring Diagrams, Figure 7-1, for secondary protector information.

The overall length of the station cable run from the DK280 key service unit (KSU) to the telephone must not exceed 1,000 feet (305 meters), if using 24 AWG cable.

5.2.3 Connecting Standard Telephones to the System

The following provides information on how to connect standard telephones to the DK280 system.

Note:
Before proceeding, see warning and caution notes in Section 5.2.

Standard telephones connect to standard telephone circuits of the Standard Telephone Interface PCBS: RSTU, RSTU2, RDSU/RSTS, PSTU, and PESU. Standard telephone connect to RSTU, RDSU/RSTS, PSTU or PESU via the main distribution frame (MDF) with standard twisted-pair jacketed telephone cable. Single-pair wiring Chapter 7—Wiring Diagrams, for more details.)

Note:
See Chapter 7—Wiring Diagrams, Figure 7-1, for secondary protector requirements.

The standard telephone cable's overall loop resistance, connected on- or off-premises, is 300 ohms maximum, (for PSTU or PESU), 600 ohm for RSTU and RDSU/RSTS with -24 volt loop (NO R48S), and 1200 ohms for RSTU and RDSU/RSTS with 48 volt loop—(R48S installed on RSTU, RSTU2, or RDSU PCB) including the telephone resistance. This also applies to all devices connected to standard telephone circuits. A standard telephone connected

off-premises via the telephone network should interface with OL13A, OL13B, or OL13C lines (or equivalent) and connect to an RJ21X, FIC jack or equivalent, (see Chapter 7—Wiring Diagrams, Table 7-3).

5.2.4 Telephone Wall Mounting

This section provides instructions on how to mount digital telephones and electronic telephones to a wall or other vertical surface. Instructions on mounting standard telephones are not provided here; refer to the manufacturer's documentation for those instructions.

Mount digital and electronic telephones in accordance with the following steps:

Notes:

1. *Digital telephones equipped with Integrated Data Interface Units (PDIU-DIs, RPCI-DIs or PDIU-DI2s) cannot be wall mounted.*
2. *Electronic and older digital telephones equipped with an HHEU1 can be wall mounted. 2000-series digital telephones with headsets can only be wall mounted with an HHEU2.*

1. Loosen the captive screws, and remove the telephone base (Figure 5-1).
2. Using a suitable cutter, remove the handset hanger from the base (Figure 5-1). Insert the handset hanger in the slot provided on the front of the telephone (Figure 5-2). The hanger fits in the notch on the handset cradle.
3. Rotate the telephone base 180 degrees and secure it to the telephone with its four captive screws (Figure 5-3).
4. Connect the telephone to the wall modular connector with a cord approximately four inches long (available at most telephone supply companies). Route the cord into the hollow portion of the base.
5. Mount the telephone on the wall mounting modular connector plate.

5.3 Digital Telephone Upgrades

This section describes how to upgrade and configure 2000- and 1000-series digital telephones for features and options.

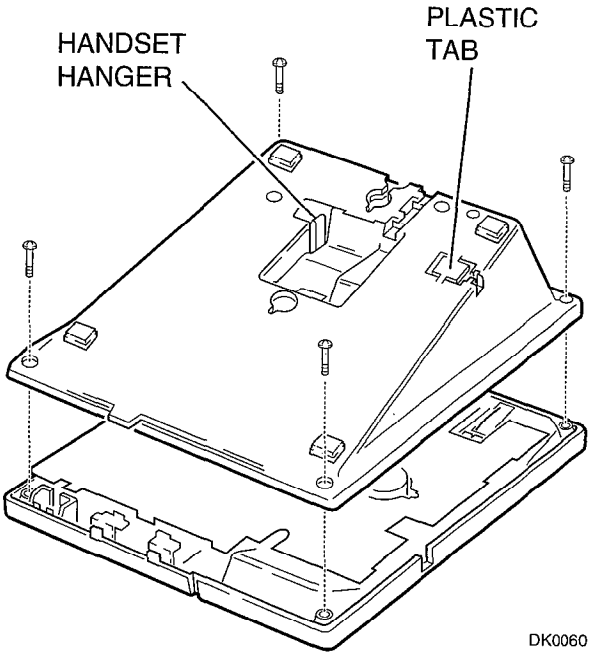


Figure 5-1
Removing the Telephone Base

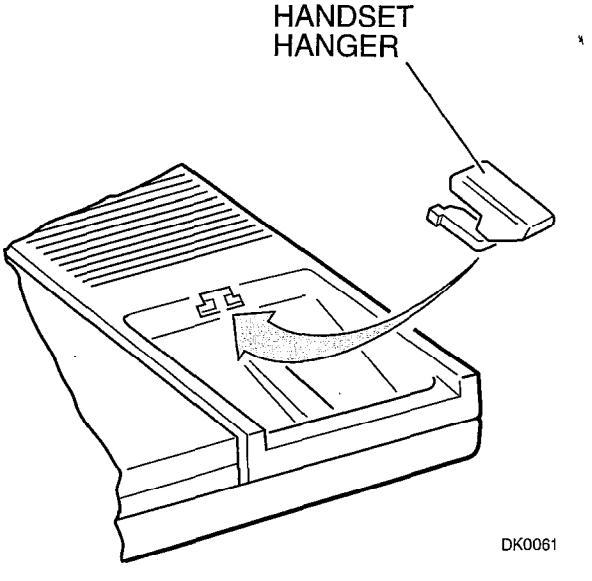


Figure 5-2
Handset Hanger

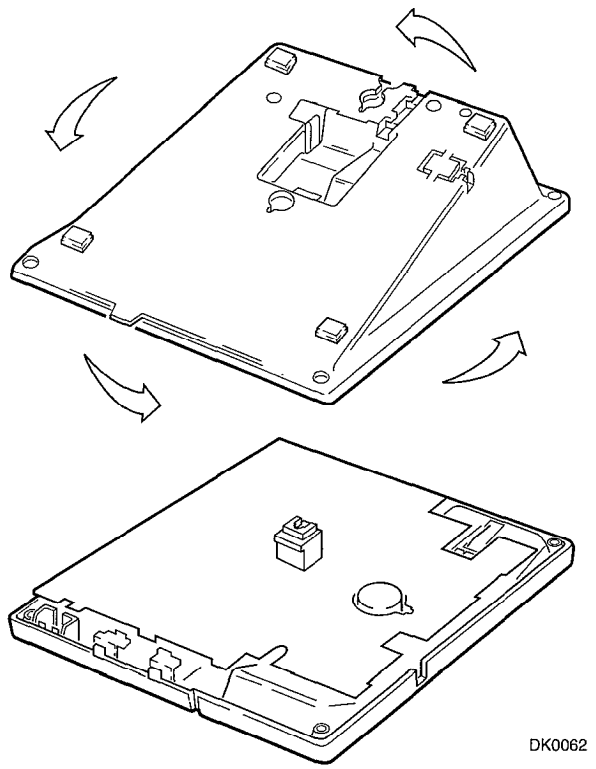


Figure 5-3
Wall Mounting Base Rotation

5.3.1 Application Program Interface (API) and Simultaneous Voice and Data Upgrade (RPCI-DI, PDIU-DI2 and PDIU-DI)

Both the 2000- and 1000-series digital telephones can be upgraded with an integrated data interface unit to transmit and receive simultaneous voice and data calls. There are three versions of the integrated unit: the RPCI-DI, PDIU-DI2 and the PDIU-DI. The 2000-series telephones can only be equipped with a RPCI-DI or PDIU-DI2, and the 1000-series telephones can only be equipped with a PDIU-DI. Asynchronous devices, such as personal computers (PC) and terminals, can be connected to the standard RS-232 connector of the RPCI-DI or PDIU-DI2. Station users are able to transmit and receive RS-232 data over the single wire pair of the RPCI-DI or PDIU-DI2-equipped telephone.

The RPCI-DI can operate in two modes: The API or the data communications mode. The mode is changed by sending the appropriate control signal to the RPCI-DI from the personal computer to which the RPCI-DI is connected.

In the API mode, the PC connected to the RPCI-DI can control the RPCI-DI telephone to place calls. The PC can also receive Caller ID, ANI, and DNIS information received by the RPCI telephone. When in the API mode, the RPCI-DI is designed to be compatible with Microsoft TAPI application programs.

In the data communications mode, data calls can be manually dialed with a **Data Call** button and disconnected with a **Data Release** button on the telephone; or, data and voice calls can be dialed from the keyboard of the terminal or PC using standard "AT" commands. Digital telephones may also be assigned a **Modem** button to reserve a modem or monitor modem availability and status. Assign feature buttons to telephones with Program 39.

Notes:

1. *1000-series digital telephones equipped with a RPCI-DI or PDIU-DI2 cannot be wall-mounted or equipped with an Add-On-Module (ADM), or DVSU for Speaker OCA. A 2000-series digital telephone equipped with a PDIU-DI2 or RPCI-DI can support an HHEU at the same time, but cannot support a DVSU or ADM and can be wall-mounted.*
2. *Only PDKU1 circuits 1 ~ 7 can support RPCI-DI or PDIU-DI2s; all PDKU2 and base unit digital circuits can support PDIU-DI2 and RPCI-DIs.*

RPCI-DI/PDIU-DI2 Installation

Install the integrated data interface unit (PDIU-DI for 1000-series and PDIU-DI2 for 2000-series) in accordance with the following steps:

1. Loosen the four captive screws securing the digital telephone base and remove it (Figure 5-1).
2. Refer to Figure 5-4 for 2000-series telephones or Figure 5-5 for 1000-series telephones, and insert the two integrated unit wire plugs into the connectors on the printed circuit board (PCB) in the telephone (observing the red wire for correct positioning).
3. Attach the integrated unit to the bottom of the telephone and secure with the four captive screws.

4. Remove the telephone number directory tray from the original telephone base and install it on the integrated unit telephone base. Bend the tray by squeezing its sides so it bows slightly to remove and re-install (Figure 5-4 or 5-5).

5. Check Table 7-4 in Chapter 7—Wiring Diagrams; install two-pair house cable (or external power) and two-pair modular cord (supplied with PDIU-DI) if required to achieve maximum distance.

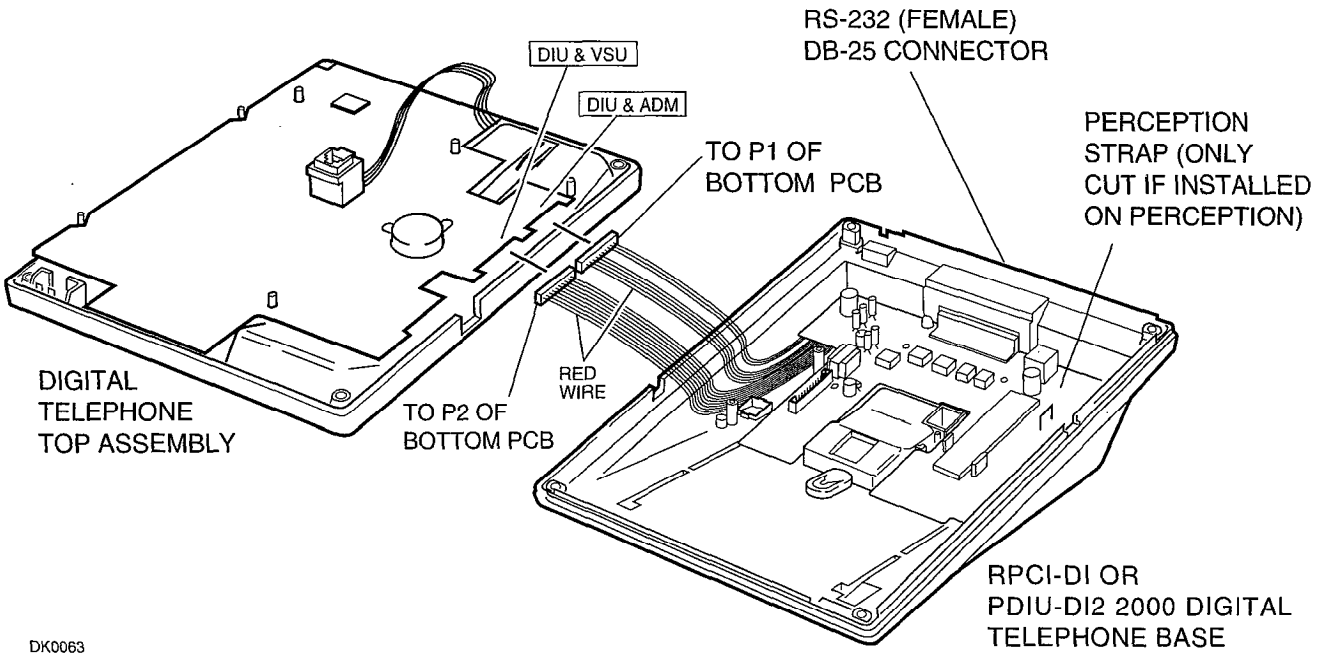
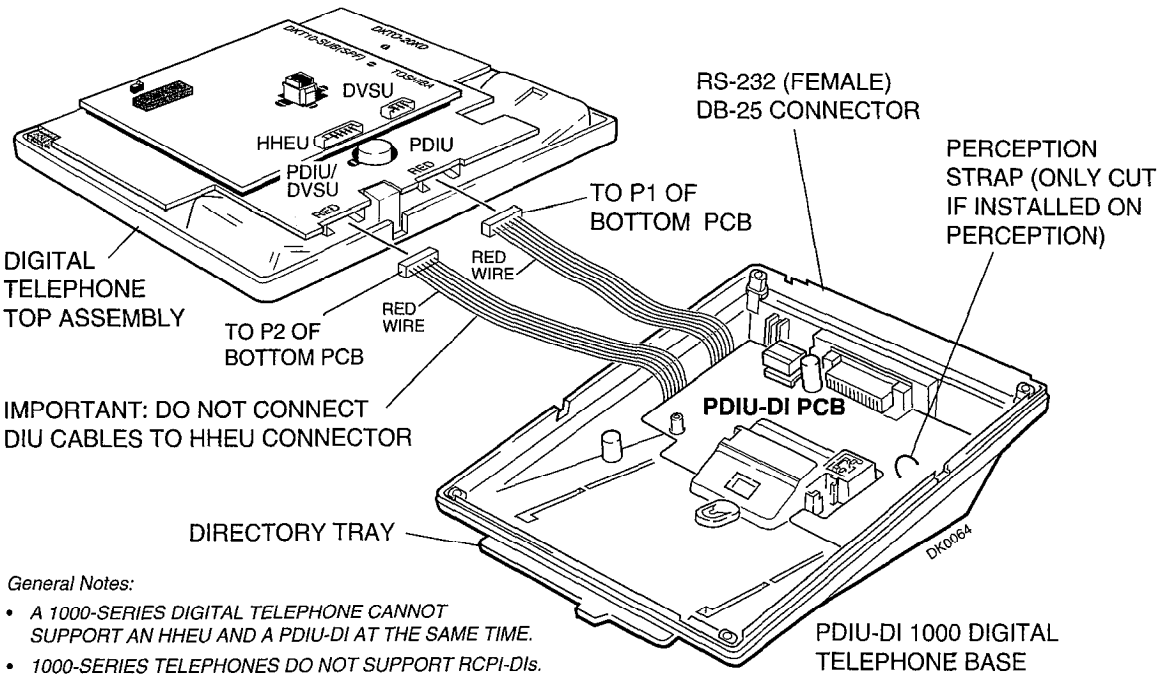


Figure 5-4
RPCI-DI or PDIU-DI2 Installation Into 2000-Series Digital Telephone



General Notes:

- *A 1000-SERIES DIGITAL TELEPHONE CANNOT SUPPORT AN HHEU AND A PDIU-DI AT THE SAME TIME.*
- *1000-SERIES TELEPHONES DO NOT SUPPORT RCPI-DIs.*

Figure 5-5
PDIU-DI Installation Into 1000-Series Digital Telephone

5.3.2 Integrated RPCI Data Interface Unit Programming Overview

Program 39—Assigns the **Data Call**, **Data Release**, and **Modem** buttons.

Programs 20 and 22—RPCI and data interface unit assignments.

5.3.3 Telephone Speaker Off-hook Call Announce Upgrade (DVSU)

To receive Speaker Off-hook Call Announce (OCA) calls over the digital telephone speaker, a digital telephone must be upgraded with a DVSU; the telephone making the call does not require a DVSU. In DK280 release 3 and above, a DVSU is not required to receive Speaker OCA in the telephone handset or headset. An additional wire pair is not required for digital telephones that receive Speaker OCA calls. The DVSU is compatible with both 2000-series and 1000-series digital telephones.

Notes:

1. *Digital telephones cannot be equipped with a DVSU and integrated data interface unit (PDIU-DI, RPCI-DI or PDIU-DI2) at the same time.*
2. *To receive Speaker OCA Program 03, Code 62 or 64 must be set for the PDKU and Code 28 for the RDSU for telephones that are to receive Speaker OCA and Program 31 LED03 must be turned ON for telephone ports.*
3. *DVSU is not necessary to receive handset OCA.*

DVSU Upgrade Installation. Install the DVSU upgrade in accordance with the following steps.

1. Loosen the four captive screws securing the telephone base (Figure 5-1) and remove the base.
2. Loosen the four captive screws securing the metal plate to the standoffs inside the base where the DVSU will be installed (Figure 5-6). Remove the plate, which can be discarded.
3. Position the DVSU PCB on the standoffs (Figure 5-6), and secure with the four provided screws.
4. If installing the DVSU into a 2000-series digital telephone, refer to Figure 5-7 (DKT2010-H) or Figure 5-8 (DKT2010-SD, DKT2020-S, DKT2020-SD), and then connect the DVSU wire plugs to the DVSU connectors on the printed circuit board (PCB) inside the telephone.

   - or -

   If installing the DVSU into a 1000-series digital telephone, refer to Figure 5-9, and connect the DVSU wire plugs to the DVSU connectors on the PCBs inside the telephone.
5. Reinstall the telephone base and secure it with its four captive screws.

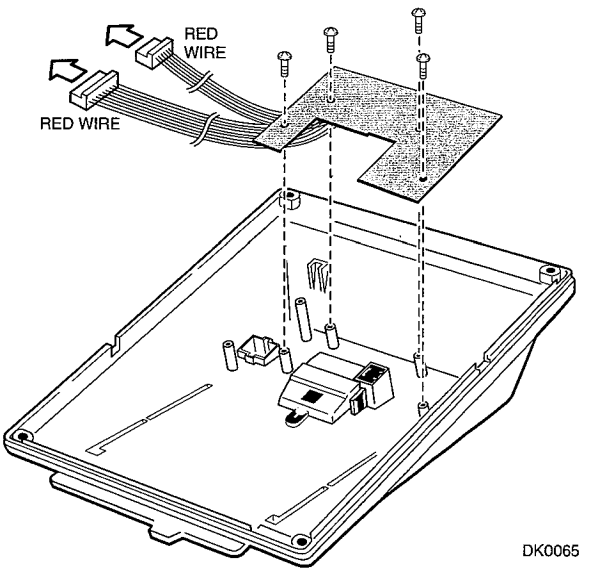


Figure 5-6
DVSU Installation for Digital Telephones

5.3.4 Loud Ringing Bell/Headset Upgrade (HHEU)

The Loud Ringing Bell/Headset upgrade (HHEU) enables an external speaker (HESB) for the Loud Ringing Bell feature and/or a headset to be connected to both series of digital telephones.

Notes:

1. *There are two types of HHEU: the HHEU1 (which has four versions, V.1 ~ V.4) and the HHEU2.*
2. *Both 2000- and 1000-series digital telephones require either an HHEU2 or a V.3 or V.4 HHEU1 for HESB operation; earlier HHEU1 versions are only sufficient for headset operation only.*

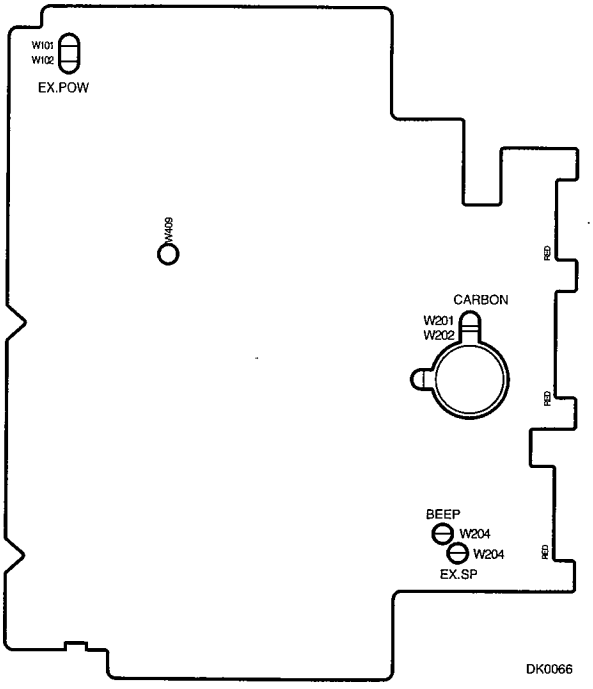


Figure 5-7
DKT2010-H Strap and Connector Locations

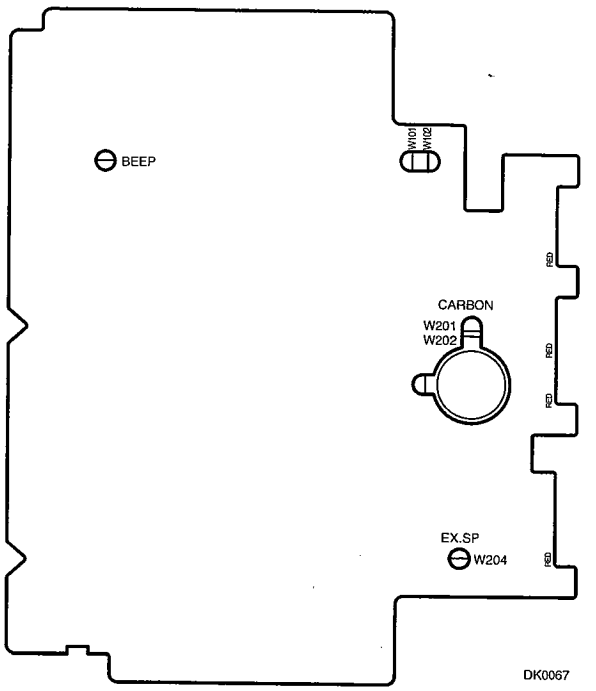


Figure 5-8
DKT2010-SD, DKT2020-S, and DKT2020-SD Strap and Connector Locations

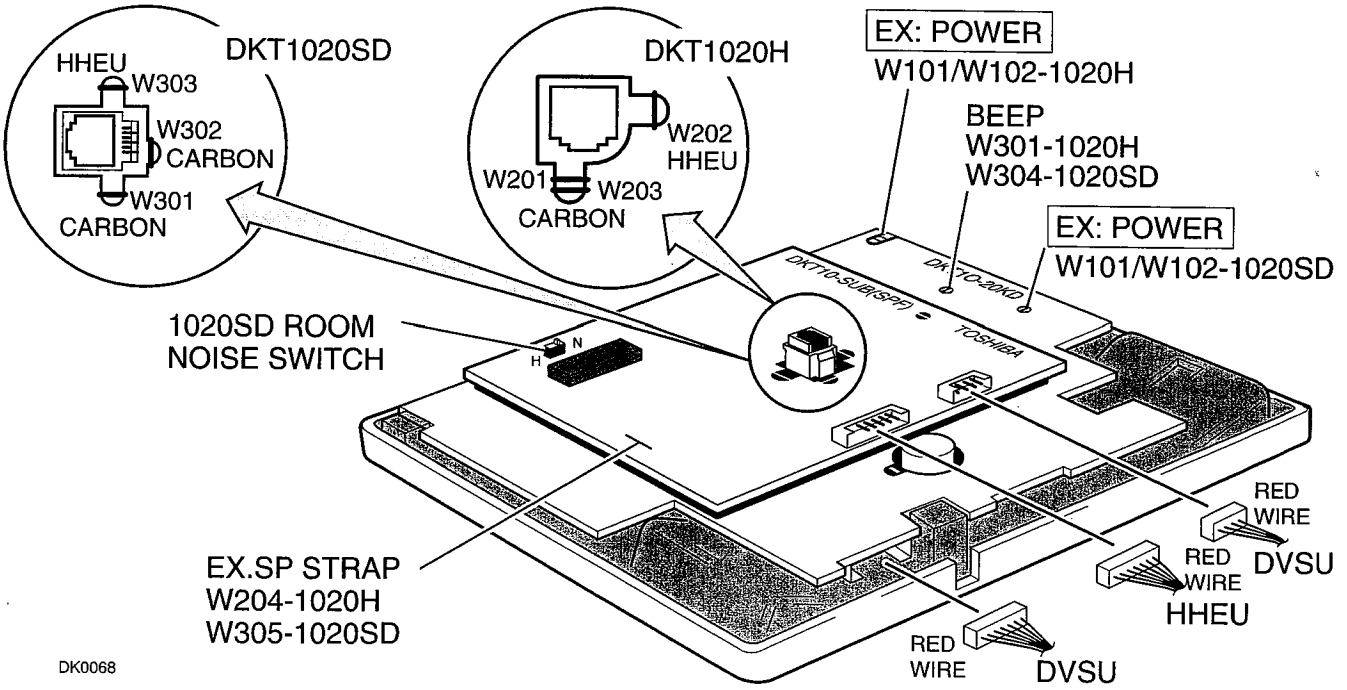


Figure 5-9
1000-Series Digital Telephone Strap and Connector Locations

3. *Only digital telephones equipped with an HHEU2 can be wall mounted. The HHEU2 is identical to the V.4 HHEU1, except that the HHEU2 has longer wires to accommodate wall mounting.*
4. *A Toshiba HESC-65A cable is required to connect the HHEU in a digital telephone to the HESB.*
5. *1000-series digital telephones cannot be equipped with the HHEU (any type or version) and the integrated data interface unit (PDIU-DI) at the same time, but 2000-series digital telephones can support an HHEU and a RPCI-DI or PDIU-DI2 at the same time.*

HHEU Upgrade Installation

Install the HHEU in accordance with the following steps.

1. Loosen the four captive screws securing the telephone base (Figure 5-1), and remove the base.
2. Using a screwdriver or other suitable tool, remove the plastic tab located on the back of the base (Figure 5-1); the HHEU modular connector for the headset will be accessed through this opening.
3. If installing a V.3 HHEU1, set the SW601 switch on the HHEU to headset for the headset or loud bell application (Figure 5-10). V.4 HHEU1 and HHEU2 do not have this switch, because both of these upgrades are automatically set for the headset/loud bell application.
4. Connect the HESC-65A cable to P601 of the HHEU (both HHEU1A versions and the HHEU2 have P601) if the Loud Ringing Bell option is required (Figure 5-11). Refer to Chapter 6—Peripheral Installation for HESB installation procedures.
5. For the V.3 HHEU1: If only the headset is connected to the HHEU, cut both sides of the R607 resistor (Figure 5-10), then remove the resistor to eliminate electrical contact.

   Note:
   Do not cut the R607 resistor if connecting an HESB to the HHEU for the Loud Ringing Bell—even if a headset is also installed on the HHEU.

   - or -

   For the V.4 HHEU1 and the HHEU2: if only the headset is connected to the HHEU, cut the speaker OCA strap (Figure 5-10).

   Note:
   Do not cut the speaker OCA strap if connecting an HESB to the HHEU for the Loud Ringing Bell—even if a headset is also installed on the HHEU.
6. Position the HHEU PCB on the standoffs inside the base (Figure 5-10), and secure with the two screws provided.
7. For 2000-series digital telephones, refer to Figure 5-7 (DKT2010-H) or Figure 5-8 (DKT2010-SD, DKT2020-S, DKT2020-SD). Connect the wire plug of the HHEU PCB to the HHEU connector on the printed circuit board (PCB) of the telephone.

   - or -

   For 1000-series digital telephones, refer to Figure 5-9, and connect the wire plug of the HHEU to the HHEU connector on the PCB of the telephone.
8. For 2000-series digital telephones, refer to Figure 5-7 (DKT2010-H) or Figure 5-8 (DKT2010-SD, DKT2020-S, DKT2020-SD), and locate the EX.SP strap on the PCB in the telephone. Cut the strap if an HESB will be connected to the HHEU.

   - or -

   For 1000-series digital telephones, refer to Figure 5-9, and locate the EX.SP strap on the upper PCB in the telephone. Cut the strap if an HHEU will be connected to an HESB for the Loud Ringing Bell option.
9. For 2000-series digital telephones, refer to Figure 5-7 (DKT2010-H) or Figure 5-8 (DKT2010-SD, DKT2020-S, DKT2020-SD), and locate the HHEU strap on the PCB in the telephone. Cut the strap if a headset will be connected to the HHEU.

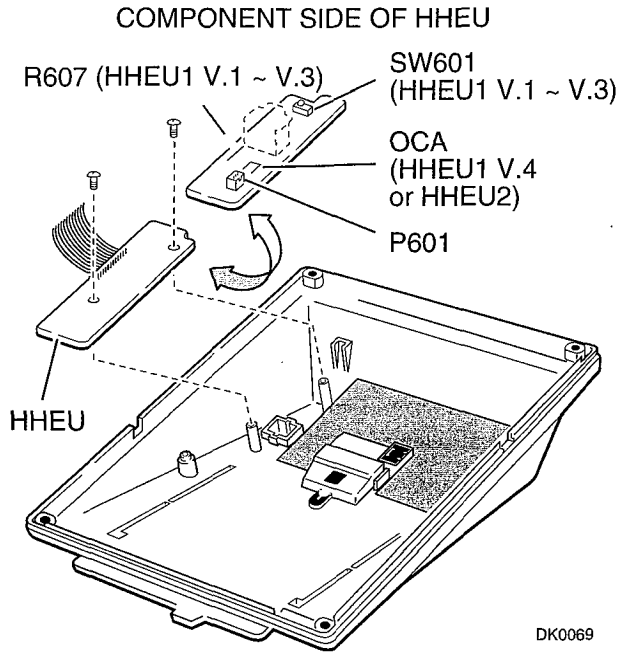


Figure 5-10
HHEU Installation for Digital Telephones

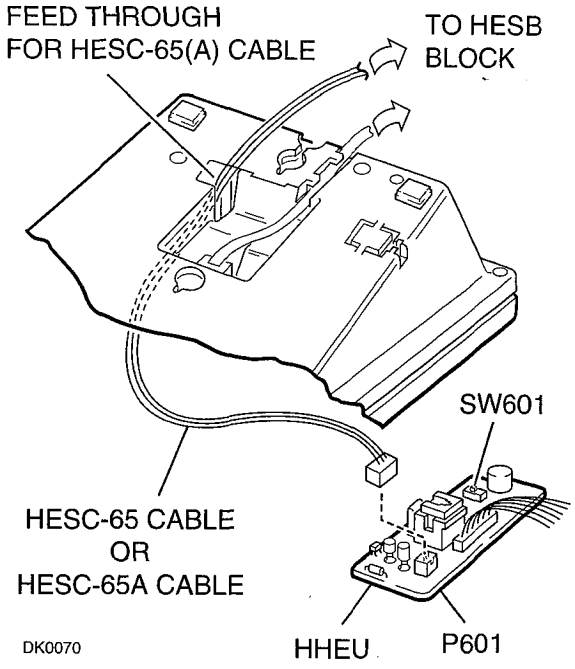


Figure 5-11
HESC-65A Cabling

- or -

For 1000-series digital telephones, refer to Figure 5-9, and locate the HHEU strap on the upper PCB in the telephone. Cut the strap if an HHEU will be connected to a headset.

Note:
If the HHEU PCB is removed from the telephone, the HHEU strap must be replaced for proper telephone operation.

10. Reinstall the telephone base, and secure it with its four captive screws.

11. To adjust the volume of the HESB Loud Ringing Bell: call the telephone connected to the HESB, and adjust the volume control on the back of the HESB and the ring volume control on the telephone.

5.3.5 Carbon Headset/Handset Straps

If a carbon-type handset or headset is connected to the handset jack on the side of the telephone, two jumper straps inside the telephone must be cut. Cut the straps in accordance with the following steps:

Note:
It is not necessary to cut these straps if the headset is connected to the HHEU.

1. *Loosen the four captive screws securing the telephone base (Figure 5-1), and remove the base.*
2. *For 2000-series digital telephones refer to Figure 5-7 or 5-8, and cut the carbon straps, W201 and W202.*

   - or -

   For 1000-series digital telephones, refer to Figure 5-9, and cut the carbon straps, (W301 and W302 on the DKT1020-SD; W201 and W203 on the DKT1020-H).
3. *Reinstall the telephone base, and secure it with its four captive screws.*

5.3.6 Beep Strap

A "beep" sounds whenever a dialpad button or feature button is pressed on a digital telephone. To eliminate this beep follow the procedure below:

1. Loosen the four captive screws securing the telephone base (Figure 5-1), and remove the base.

2. For 2000-series digital telephones, refer to Figures 5-7 or 5-8, and cut the beep strap.

   - or -

   For 1000-series digital telephones, refer to Figure 5-9, and cut the beep strap.

3. Reinstall the telephone base, and secure it with its four captive screws.

5.3.7 Microphone/Speaker Sensitivity Adjustment (Speakerphones Only)

High ambient noise levels may cause the speaker on some digital telephone speakerphone models to cut off frequently. To prevent this for the 1000-series digital telephone models, perform the following procedure to make the telephones less sensitive to the noise: (The 2000-series telephones are adjusted per the instructions in the note after the procedure.)

1. Loosen the four captive screws securing the 1000-series digital telephone speakerphone base (Figure 5-1), and remove the base.

2. For the 1000-series speakerphone model (DKT1020-SD), refer to Figure 5-9, and locate the room noise switch. Push the switch carefully to the H (high) position (for low sensitivity) when there is high background noise in the area surrounding the telephone.

3. Reinstall the telephone base, and secure it with its four captive screws.

   Notes:

   1. *To make the 2000-series digital telephone speakerphone models less sensitive to loud surrounding noise, hold down* **Mic** *button, then press the* **Vol▲** *button. The less-sensitive level will be set after the third flash of the Mic LED. To reset the sensitivity back to the normal level, hold down the* **Mic** *button, then press the* **Vol ▼** *button. The normal level will be set after the third flash of the Mic LED.*
   2. *On 2000-series digital telephone speakerphone models that are set for low sensitivity, the Mic LED will flash at the in-use rate when using the speakerphone. When set to normal sensitivity, the Mic LED will be on steady when using the speakerphone.*

5.3.8 Busy Override and Camp-on Ring Tone Over Handset/Headset Option

The busy override and camp-on ring tones can be sent over the telephone handset or headset, in addition to the speaker, with 2000-series digital telephones. The tones only sound over the speaker with 1000-series digital telephones. Perform the following procedure to have these tones sent over the handset of the DKT2010-H model. (For the DKT2010-SD, DKT2020-S, and DKT2020-SD models, see the note following the procedure.)

1. Loosen the four captive screws securing the telephone base (Figure 5-1), and remove the base.

2. Refer to Figure 5-7, and install a strap in the HS-BOV W409 location.

3. Reinstall the telephone base, and secure it with its four captive screws.

   Notes:

   1. *To enable busy override tone and camp-on ring tones over the handset or headset of a DKT2010-SD, DKT2020-SD, DKT2020-S model, hold down the* **Redial** *button and press the* **Vol▲** *button. To block the tone, hold down the* **Redial** *button and press the* **Vol▼** *button.*
   2. *For this to function properly with headsets, make sure the speaker OCA strap or R607 is cut on the HHEU PCB and the HHEU strap is cut on the telephone (see Subsection 5.3.4, paragraph 2).*

5.3.9 External Power Straps

Digital telephones equipped with options such as integrated data interface units and ADMs require two-pair wiring or external power to operate efficiently at the maximum-allowed distance from the key service unit (KSU). Two-pair wiring or external power is also necessary for maximum cable run lengths for digital telephones that are connected to systems that must operate with reserve power. (See Table 7-4 in Chapter 7—Wiring Diagrams for reference.)

Each digital telephone has two external power straps which must be cut for external power when the cabling of the telephone is connected to an external AC/DC power supply. Cut these straps in accordance with the following procedure:

4. Connect either the HESC-65 or HESC-65A cable to P601 of the HHEU if the Loud Ringing Bell option is required (Figure 5-11). Refer to Chapter 6—Peripheral Installation for HESB installation procedures.

5. For the V.3 or earlier HHEU1: if only the headset is connected to the HHEU, cut both sides of the R607 resistor on the HHEU (Figure 5-15) and remove the resistor to eliminate electrical contact.

   Note:
   Do not cut the R607 resistor if connecting an HESB to the HHEU for the Loud Ringing Bell—even if a headset is also installed on the HHEU.

   - or -

   For the V.4 HHEU1 or the HHEU2: if only the headset is connected to the HHEU, cut the speaker OCA strap (Figure 5-15).

   Note:
   Do not cut the speaker OCA strap if connecting an HESB to the HHEU for the loud ringing bell—even if a headset is also installed on the HHEU.

6. Position the HHEU subassembly on the standoffs inside the base (Figure 5-15), and secure with the two screws provided.

7. Connect the HHEU subassembly wire plug to the P1 connector on the electronic telephone PCB (Figure 5-13).

8. Cut the HHEU strap on the telephone PCB (Figure 5-13).

   Note:
   The HHEU strap must be replaced if the HHEU PCB is removed from the telephone.

9. Reinstall the telephone base, and secure it with its four captive screws.

10. To adjust the volume of the HESB loud ringing bell: call the telephone connected to the HESB, and adjust the volume control on both the back of the HESB and the ring volume control on the telephone.

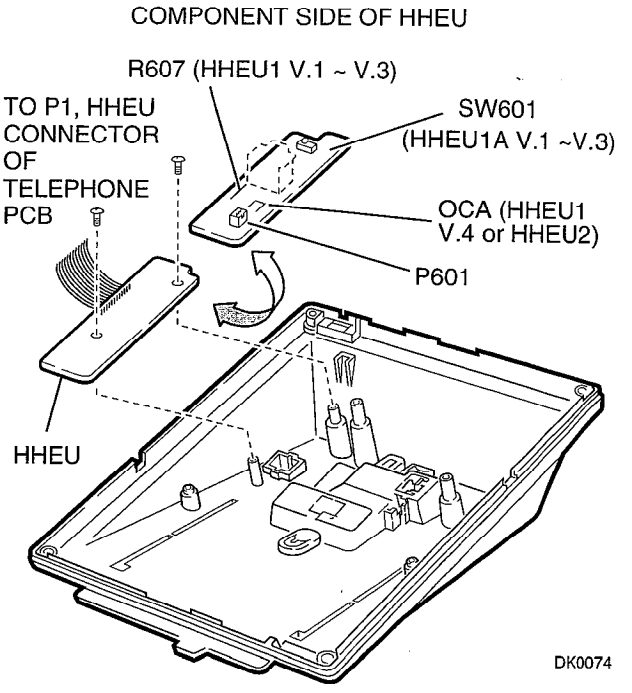


Figure 5-15
HHEU Installation for Electronic Telephones

5.4.3 Carbon Headset/Handset Straps

If a carbon-type handset or headset is connected to the handset jack on the side of the 6500-series electronic telephone, two straps inside the telephone must be cut. Cut the straps in accordance with the following steps:

Note:
It is not necessary to cut these straps if the headset is connected to the HHEU.

1. Loosen the four captive screws securing the telephone base (Figure 5-1), and remove the base.

2. Refer to Figure 5-13, and locate the carbon straps, W201 and W202. Cut both straps.

3. Reinstall the telephone base, and secure it with its four captive screws.

5.4.4 Beep Strap

A "beep" sounds whenever a dialpad button or feature button is pressed on an electronic telephone. This beep can be eliminated with the following procedure:

1. Remove the four captive screws securing the telephone base to the telephone (Figure 5-1), and remove the base.
2. Locate and cut the beep strap on the telephone printed circuit board (PCB) (Figure 5-13).
3. Reinstall the electronic telephone base, and secure in place using the four captive screws.

5.4.5 Microphone/Speaker Threshold (Speakerphones only)

High ambient noise levels may cause the speaker on the electronic telephone speakerphone models (the EKT6510-S, EKT6520-S, and EKT6520-SD) to cut off frequently. To make these telephones less sensitive to noise and to prevent the cut-off, follow the steps below:

1. Remove the four captive screws securing the base to the telephone, and remove the base (Figure 5-1).
2. Locate the room noise switch on the printed circuit board (PCB) inside the telephone, and push it carefully to the HI (high) position (Figure 5-13).
3. Reinstall the telephone base and secure in place using the four captive screws.

5.4.6 Handset Receiver Volume-up Strap (Version 2 6500-series Telephones Only)

For Version 2 (V.2) 6500-series electronic telephones only, the handset receiver volume can be increased six decibels (db) by cutting a strap inside the telephone. Cut the strap in accordance with the following steps:

1. Remove the four captive screws securing the telephone base to the telephone, and remove the base (Figure 5-1).
2. Locate the R-UP strap on the printed circuit board (PCB) inside the telephone, and cut it (Figure 5-13).
3. Reinstall the telephone base, and secure in place using the four captive screws.

5.5 Direct Station Selection (DSS) Console/System Connection

Strata DK280 systems configured with RCTUA can support up to three DSS consoles, RCTUB up to four DSS consoles, and systems with the RCTUC/D up to eight consoles. There are two types of consoles: the DDSS console and the HDSS console. The DDSS console can be connected to designated digital telephone circuits, and the HDSS console can only be connected to designated PEKU circuits. This section provides instructions on how to install both types of consoles.

5.5.1 DDSS Console Connections

The DDSS console, which can operate with a digital telephone (preferably an LCD model), can connect only to circuit 8 of a PDKU digital telephone circuit. Standard twisted single-pair or two-pair jacketed telephone cable (maximum 1000 feet, 303 meters) is used for the connection.

To accommodate the DDSS console connection, the instrument end of the cable should be terminated in a modular station connector block (RJ-11). Refer to Wiring Diagrams, Chapter 7—Wiring Diagrams, for wiring/interconnecting details, including cable length limitations (see Table 7-4).

Notes:

1. *DDSS console cable runs must not have the following:*
   - *Cable splits (single or double)*
   - *Cable bridges (of any length)*
   - *High resistance or faulty cable splices*
2. *See Chapter 7—Wiring Diagrams for secondary protection information.*

CAUTION !

When installing the DDSS cable, do not run the cables parallel if they are within three feet of an AC power line. AC power lines should be crossed at right (90°) angles only. In particular, avoid running station wire pairs near devices that generate electrical noise, such as neon or fluorescent light fixtures.

DDSS Console Configuration

The following considerations should be made when installing DDSS consoles:

- DDSS consoles can connect only to circuit 8 of the PDKU.
- The maximum number of DDSS consoles depends on the system control PCB as follows: RCTUA-3DSS, RCTUB-4DSS, RCTU C/D-8DSS per system equipped with an Expansion Unit.
- An RDSU will not support a DDSS.

DDSS Programming Overview

Program 03—Code 64 identifies the slots that support DDSS consoles.

Program 28—Assigns DDSS console(s) to telephones.

Program 29—Assigns button functions for DDSS consoles.

5.5.2 HDSS Console Connections

The HDSS console must be connected to the data pairs of circuits 7 and 8 on a PEKU with standard two-pair twisted, jacketed telephone cable. To accommodate the connection, the instrument end of the HDSS console cable should be terminated in a modular station connector block (RJ-11). Refer to Chapter 7—Wiring Diagrams, for wiring/interconnecting details. If using 24 AWG cable, the overall length of the cable run from the Expansion Unit (KSU) to the HDSS console must not exceed 500 feet (152 meters). The HDSS console can operate with either an electronic or digital telephone (preferably an LCD model).

CAUTION !

When installing the HDSS console cable, do not run the cables parallel if they are within 3 feet of an AC power line. AC power lines should be crossed at right (90°) angles only. Avoid running HDSS console wire pairs near devices that generate electrical noise, such as neon or fluorescent light fixtures.

HDSS Console Configuration

The following considerations should be made when installing an HDSS console:

- A PEKU PCB is required.
- Two PEKU ports are required for the HDSS console (always Circuits 7 and 8).
- The PESU does not support the HDSS console.

HDSS Programming Overview

Program 03—Codes 23 and 24 identify the slot that supports a PEKU that interfaces with the HDSS console.

Program 28—Assigns HDSS console to a telephone.

Program 29—Assigns individual button functions for the HDSS console.

5.6 Door Phone/Lock Control Unit and Door Phone Installation

This section provides installation instructions for the Digital Door Phone/Lock Control Units (DDCB or HDCB). It also includes installation instructions for the Door Phone (MDFB). Each DDCB or HDCB can support as many as three MDFBs or two MDFBs and one door lock.

The Strata DK280 system can be equipped with up to 12 MDFBs.

DK280, DDCBs or HDCBs can only connect to slot 11/port 004, slot 12/port 012, slot 13/port 020 and slot 14/port 028. DDCBs can only connect to circuit 5 (a PDKU or RDSU PCB and HDCBs can connect only to circuit 5 of a PEKU or PESU PCB).

Note:
DDCBs and HDCBs cannot connect to the RSTU, PSTU.

5.6.1 DDCB/HDCB and MDFB Cabling

Refer to Chapter 7—Wiring Diagrams for DDCB, HDCB, and MDFB wiring/interconnecting details. For door lock control installation procedures, refer to Chapter 7—Wiring Diagrams. If using 24 AWG cable, the length of the cable run from the key service unit (KSU) to the MDFB (via the DDCB or HDCB) must not exceed 1,000 feet (305 meters) (see Table 7-4).

Notes:

1. *DDCB or HDCB cable runs must not have the following:*
   - *Cable splits (single or double)*
   - *Cable bridges (of any length)*
   - *High resistance or faulty cable splices*
2. *See Chapter 7—Wiring Diagrams for secondary protector information.*

5.6.2 DDCB and HDCB Wall Mounting

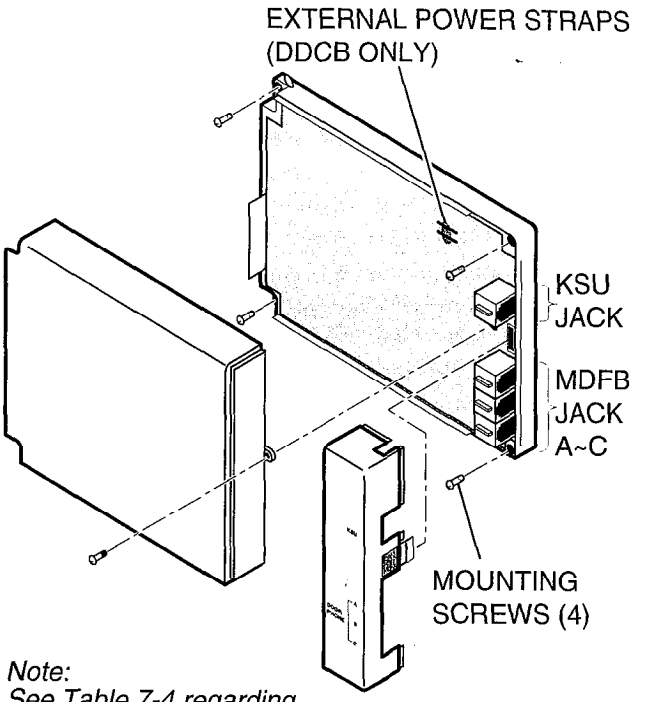
The DDCB and HDCB is designed to be mounted on a wall or other vertical surface. Mount the units in accordance with the following steps:

1. Locate the two mounting holes on the right-hand side on the DDCB or HDCB (Figure 5-16).
2. Remove the side cover from the DDCB or HDCB to expose the two left-hand mounting holes (Figure 5-16).
3. Position the DDCB or HDCB adjacent to the key service unit (KSU) with regard to wiring needs.
4. Secure the DDCB or HDCB to the mounting surface with four one-inch panhead wood screws.

5.6.3 MDFB Wall Mounting

Mount MDFBs to a wall or vertical surface in accordance with the following steps:

1. Remove the screw from the bottom of the cover. Detach the cover from the base and metal frame (Figure 5-17).
2. Position the metal frame and base to the mounting surface and secure with two one-inch panhead wood screws (Figure 5-17).
3. Attach cover to the metal frame and base and secure with the screw which was removed in Step 1.



Note:
See Table 7-4 regarding external power requirements.

Figure 5-16
Door Phone (DDCB or HDCB) Installation

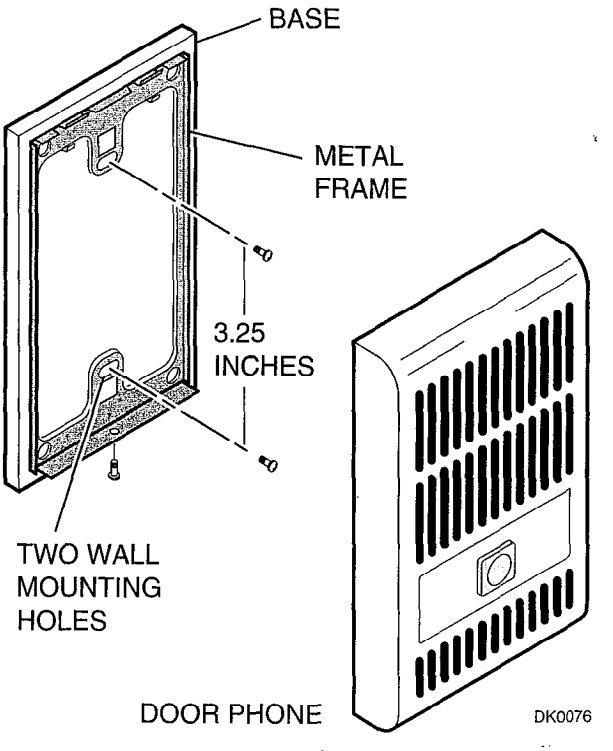


Figure 5-17
Door Phone (MDFB) Installation

Door Phone Volume Control

Adjust the ring and voice volume to the MDFB in accordance with the following procedure:

1. Remove the screw from the bottom of the MDFB cover. Detach the cover from the base and metal frame (Figure 5-17).
2. The volume level is changed by a screw adjustment on the back of the MDFB. Turn the screw with a flat-headed screwdriver while ringing the MDFB or while on a call with it. The volume level will change as the screw is turned.

5.6.4 Door Phone/Lock Programming Considerations

The following programs should be considered when programming the system for door phones:

Program 39—Assigns door phone and door lock buttons to digital telephones.

Program 77-1—Assigns DDCBs or HDCB to ports, door phone ringing over External Page during the NIGHT mode, and door lock activation time.

Program 77-2—Busy out unused MDFB positions, identifies which DDCBs support the door lock option, and sets the door phone to ring one or five times.

Note:
Each DDCB/HDCB door lock assignment will reduce the system door phone capacity by one (see Chapter 6—Peripheral Installation for HDCB, DDCB, and PIOU/PIOUS door lock installation information).

Program 79—Assigns door phone-to-station ringing assignments.

Program *79—Assigns which Directory Number **[DN]** will flash on telephones assigned in Program 79.

5.7 Digital Add-on-Module Installation

Install one or two DADM 2020s to a 2000-series digital telephone (only). The number of DADMs allowed depends on the common control PCB installed: RCTUA-12 DADMs, RCTUB-40 DADMs, and RCTUC/D-120 DADMs. Install DADMs according to the steps that follow:

1. Loosen the four captive screws securing the 2000-series digital telephone base (Figure 5-1) and remove the base.
2. Remove the base handset hanger (Figure 5-1).
3. Loosen two captive screws securing DADM and remove bases.
4. Put on DADM cable (supplied with DADM) through telephone and DADM bases as shown in Figure 5-18.
5. Connect DADM cable connectors to P1 of DADM and P1 of DKT2000 telephone as shown in Figure 5-18.
6. Install base of DADM and telephone – tuck DADM cable into DADM and telephone base as necessary for proper length.
7. Secure DADM to telephone base with DADM connecting Plate (using four screws).
8. Check Table 7-4 in Chapter 7—Wiring Diagrams; install 2-pair house cable (or external power) and 2-pair modular cord (supplied with DADM) if required to achieve maximum distance.
9. If a second DADM should be installed, follow the drawing in Figure 5-18 to connect P1 of the second DADM to P2 of the first DADM with the DADM connecting cable.

ADM Programming

ADMs are programmed in Program No. *29.

IMPORTANT !
*To activate the ADM, Program *29 must be entered for each telephone port equipped with an DADM.*

The DADM provides DSS buttons (Figure 5-19), speed dial buttons and CO line buttons (see Figure 5-19 for initialized button assignments).

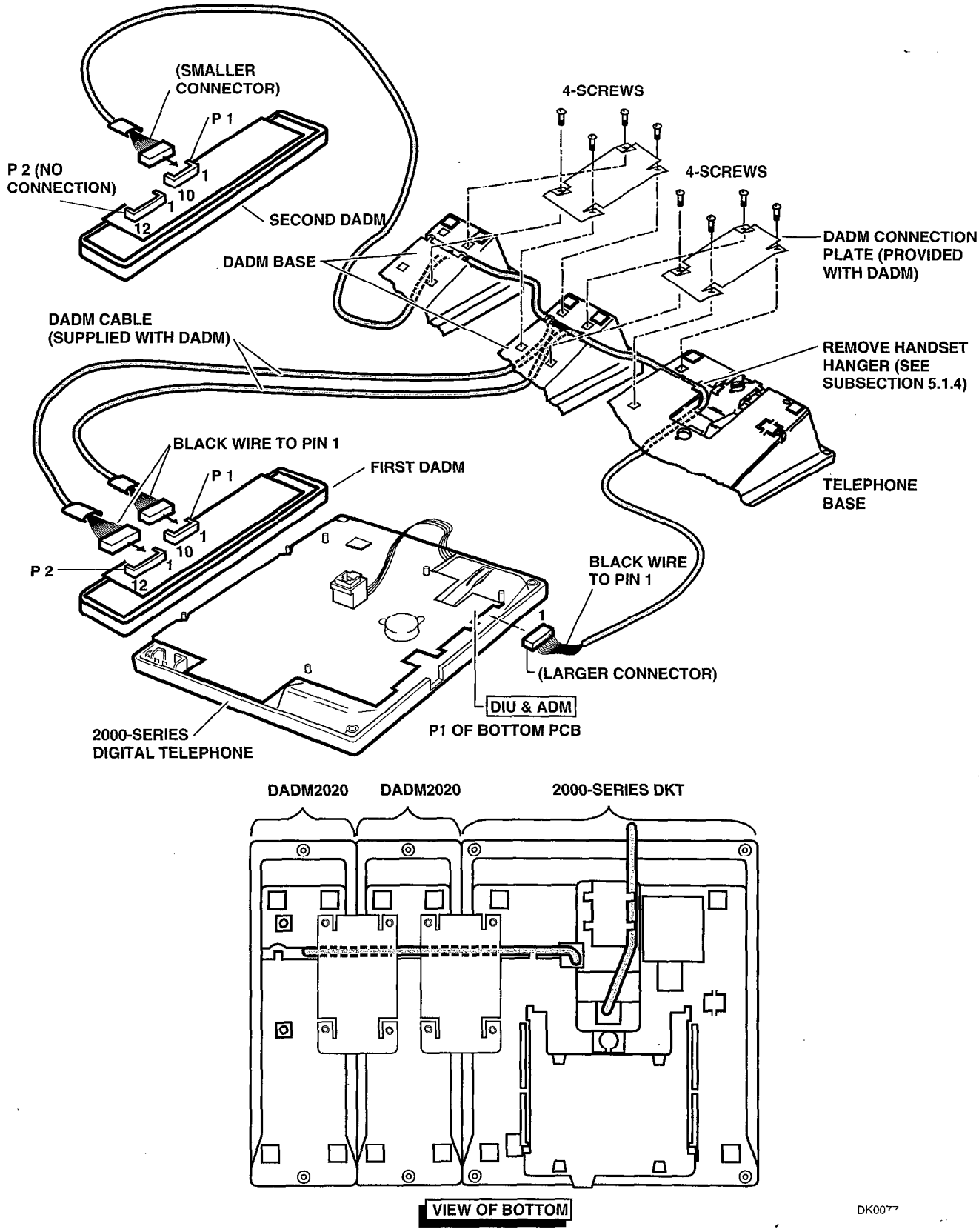
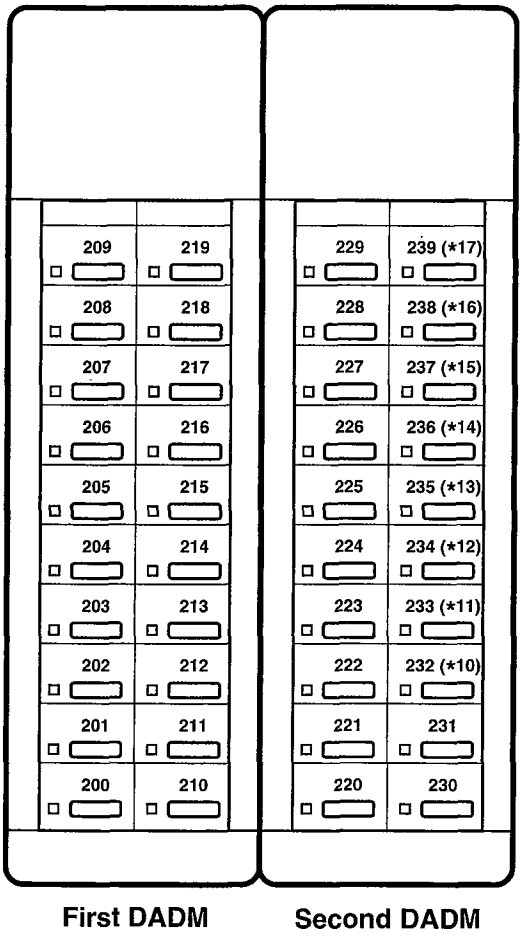


Figure 5-18
Digital Add-on-Module Installation



General Notes:

- *If only one Digital Add-on-Module is connected to the telephone, then the button assignments are the same as those shown on the first DADM.*
- *For RCTUA (1 or 3), (*XX) indicates the speed dial numbers assigned to keys in place of 232 ~ 239. There are only 32 stations on RCTUA processors.*

Figure 5-19
DK280 Digital Add-on-Module(s) Button Assignments

5.8 Personal Computer Attendant Console and Conventional Attendant Console Connection

A Strata DK280 system configured with RCTUB2 or RCTUBA/BB can support two attendant consoles, and systems with RCTUC1/D2 or RCTUC3/D3 can support four attendant consoles (RCTUA, RCTUA3, RCTUB1, or RCTUC/D1 do not support attendant consoles).

The conventional attendant consoles can be configured with a Toshiba supplied base and an Electroluminescent (EL) or EGA Color CRT. The personal computer attendant console requires a customer supplied IBM compatible personal computer.

The PC must have a VGA or SVGA monitor and a COM port to dedicate to the PC console. A mouse is also recommended. The minimum PC requirements are: 486 processor/25 MHz, 4 MB RAM, 1.44 MB floppy drive, 500 MB hard drive. Microsoft® Windows™ 3.1 software or higher must be resident on the PC.

5.8.1 Attendant Console Connections

The attendant console (base) or the PC attendant console RATI (see figure 5-20) can connect only to an RATU PCB (see Figure 7-34 for conventional attendant console, and Figure 7-35 for PC attendant console in Chapter 7—Wiring Diagrams). The RATU PCB can support up to four attendant consoles in any combination (see Chapter 4—Printed Circuit Boards for RATU installation information).

The conventional attendant console EL or CRT display plugs into the base with a 9-pin cable which is supplied with the display. Either display must be plugged into a commercial three-prong AC, 117V outlet. The PC attendant console RATI or the conventional attendant console base connects to the RATU with a standard, twisted pair (24 AWG, jacketed telephone cable). The conventional console requires two-pair wiring from the MDF to an RJ11 jack at the attendant console location; the PC console only requires 1-pair.

The maximum distance from the DK280KSU to either attendant console is 1000 feet (303 m). See Chapter 7—Wiring Diagrams for Attendant Console wiring, loop length, and secondary protection requirements.

Notes:

1. *Attendant console cable runs must not have the following:*
   - *Cable splits (single or double)*
   - *Cable bridges (of any length)*
   - *High resistance or faulty cable splices*
2. *See Chapter 7—Wiring Diagrams for secondary protection information.*

CAUTION !

When installing the PC or conventional attendant console cable, do not run the cables parallel if they are within three feet of an AC power line. AC power lines should be crossed at right (90°) angles only. In particular, avoid running station wire pairs near devices that generate electrical noise, such as neon or fluorescent light fixtures.

5.8.2 PC and Conventional Attendant Console Programming Overview

- PC and conventional attendant console requires RCTUB2 or RCTUC/D2, Release 2 processor PCBs or RCTUBA/BB, RCTUC3/D3 (Release 3).

  Note:

  RCTUA1 or RCTUA3 does not support either Attendant Console type.

Program 03—Code 51 assigns the attendant console, RATU PCB, cabinet slot number.

IMPORTANT !

The RATU PCB takes up four station ports in software; each attendant console will be assigned one of the ports in consecutive order. It is recommended that the RATU PCB be installed in the next highest slot number following the last station PCB installed—do not skip slots. The first port number will be the next consecutive port number following the last station port installed.

Program 15—If the attendant console is used to set-up trunk-to-trunk (two CO-line or tandem) connections with loop start lines, set Program 15-5 appropriately; if the central office sends the AR-Hold signal, set 15-0 and 15-3 Detect. If the CO does not send the AR signal, set 15-0 and 15-3 Ignore. Loop start trunk-to-trunk calls remain on attendant hold loops only if AR-Ignore is set.

Program 58

- 58-1—Sets the attendant console overflow time for each console.
- 58-2—Sets the Console Display for EL or CRT (EGA) and enable or disable console call waiting tone for each console.
- 58-4—Sets console answer key priority for each console.
- 58-5—Sets the console overflow destination for each console.

Program 59—Assigns Attendant Console Flexible Buttons (Keys) for each console.

Distributing Incoming Calls (Console Load Sharing) Between Multiple Attendant Consoles

Program 81 ~ 89—Assigns CO lines (loop, ground, and DID) that should load share between individual consoles on incoming calls. (tie lines load share on Dial "0" calls only, without the use of Programs 81 ~ 89.) All incoming CO lines (including DID lines) to be distributed between two or more attendant consoles should be assigned to ring each console in Programs 81 ~ 89.

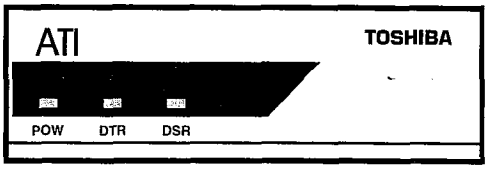
Note:
Delay ring assignments do not apply to DID lines.

Program *09—Assigns the user's company's main listed Directory Number **[DN]** (last four digits) to the attendant console if DID lines should ring the console. If the DID lines are assigned to ring multiple Attendant Console ports in Programs 81 ~ 89, DID calls will be distributed between the consoles. Only one console (any one) should be assigned with the main listed **[DN]** in Program *09.

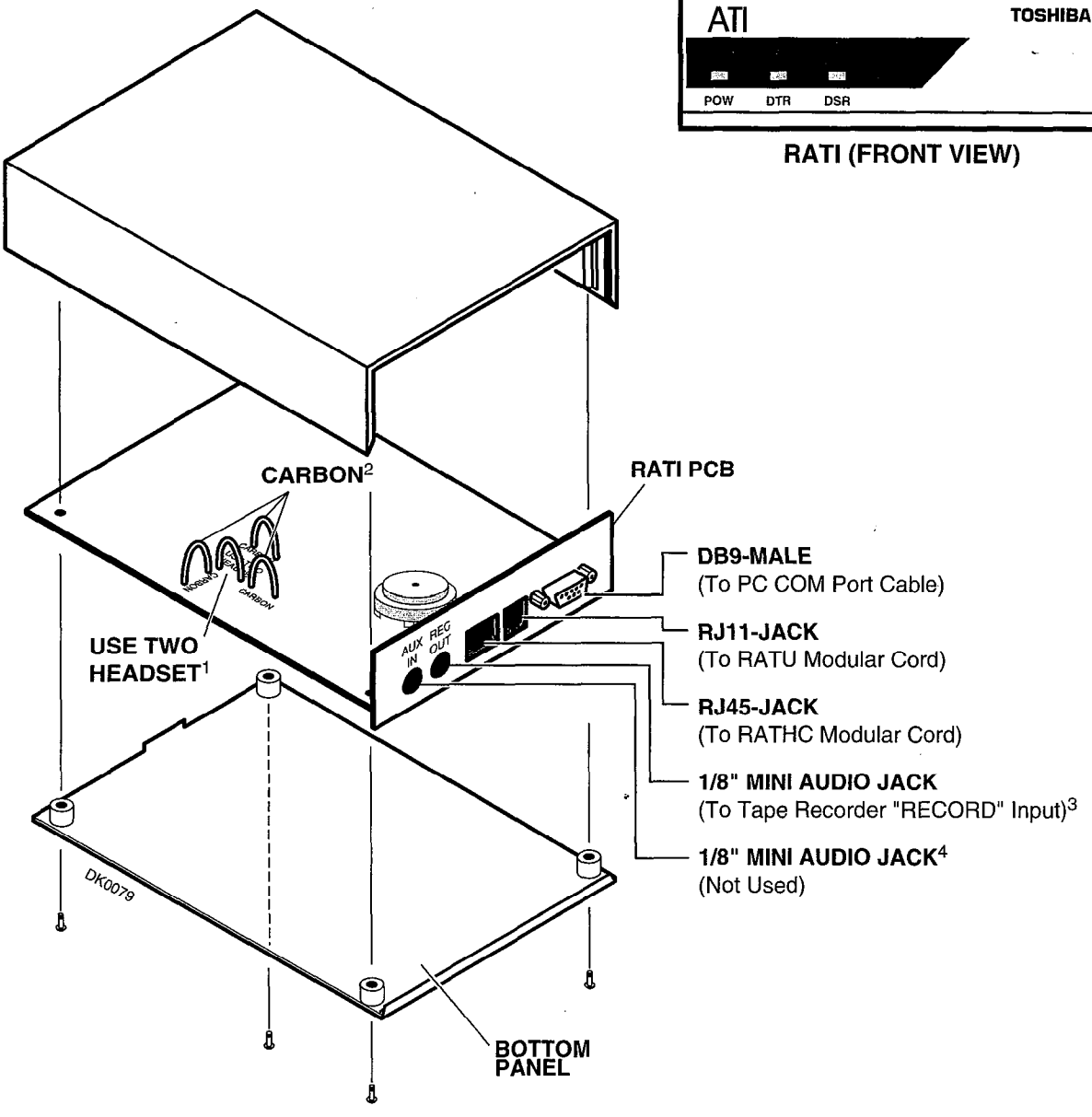
Program *17—Assigns each CO line to an attendant console as the DID line intercept position as required. (Intercept calls do not load share.)

Attendant Console Load Share Programming Example:

- The user's company DID line **[DN]** is 583-3700; this number and other loop start lines should ring in a load sharing manner to each of the Company's two Attendant Consoles in the Day, Day 2, and Night modes.
- Attendant consoles one and two are connected to RATU ports 024 and 025 respectively and should load share 583-3700 calls and other CO line calls. Program the DK280 as in (a) and (b) below:
  (a) In Programs 81, 84, and 87, assign all CO and DID lines to ring ports 024 and 025.
  (b) In Program *81, *84 and *87, assign all CO lines to flash the **[PDN]** of port 024.
  (c) In Program *09 or 71, assign digits 3700 to port 024, and assign any other selected DID extension number(s) to port 025—note that when the DID extension number assigned to either console is dialed, calls will load share between consoles.



RATI (FRONT VIEW)



Notes:

1. *Do not cut HEADSET jumper.*
2. *Cut CARBON jumpers if a carbon handset is connected to the RATCH handset cradle.*
3. *"REC OUT" can be used to monitor or record the attendant console talkpath. Both the attendant and connected party will be monitored or recorded. The record level output from the attendant handset or headset is approximately 3 dB below the connected party record level.*
4. *"AUX IN" can be used to send audio to the attendant and connected party. The audio level to the attendant is approximately 10 dB below the audio level sent to the connected party. Audio sent to the outside party is limited to -15dBv (CO Tip/Ring).*

General Note:

- *See Figure 7-34 in Chapter 7—Wiring Diagrams for RATI cable wiring information.*

Figure 5-20
RATI Assembly/Disassembly

Peripheral Installation 6

This chapter provides connection procedures for optional peripheral equipment to Strata DK280 systems. The instructions for each option include hardware requirements, printed circuit board (PCB) configuration, interconnection/wiring requirements, and programming considerations.

Peripheral equipment is connected to system PCBs. Refer to PCB Installation, Chapter 4—Printed Circuit Boards for PCB installation and configuration information.

6.1 Power Failure Options

Strata DK280 systems offer two options to protect system operation in the event of a power failure: the Reserve Power option and the Power Failure Emergency Transfer option. Reserve power installation is described in Chapter 3—Cabinet Installation; power failure transfer installation is described below.

6.1.1 Power Failure Emergency Transfer Option

The Power Failure Transfer Unit (DPFT) provides a means of automatically connecting up to eight selected CO lines directly to designated standard telephones in the event of a power failure. The DPFT allows normal operation of the selected CO lines and standard telephones when the system is in service. When power is restored, each telephone is independently reconnected to the system after that telephone is finished with its direct CO line call. The DPFT is normally installed on the Main Distribution Frame (MDF).

Figure 6-1 provides a circuit diagram of the DPFT.

Power Failure Emergency Transfer Installation

Install the DPFT in accordance with the following steps:

1. Mount the DPFT on or near the MDF.

   Note:
   Refer to Chapter 7—Wiring Diagrams, DPFT/MDF interconnecting tables.

2. Using 25-pair cables with amphenol-type connectors (female for DPFT connector J1, male for DPFT connector J2), connect the DPFT to two 66-type quick-connect blocks.

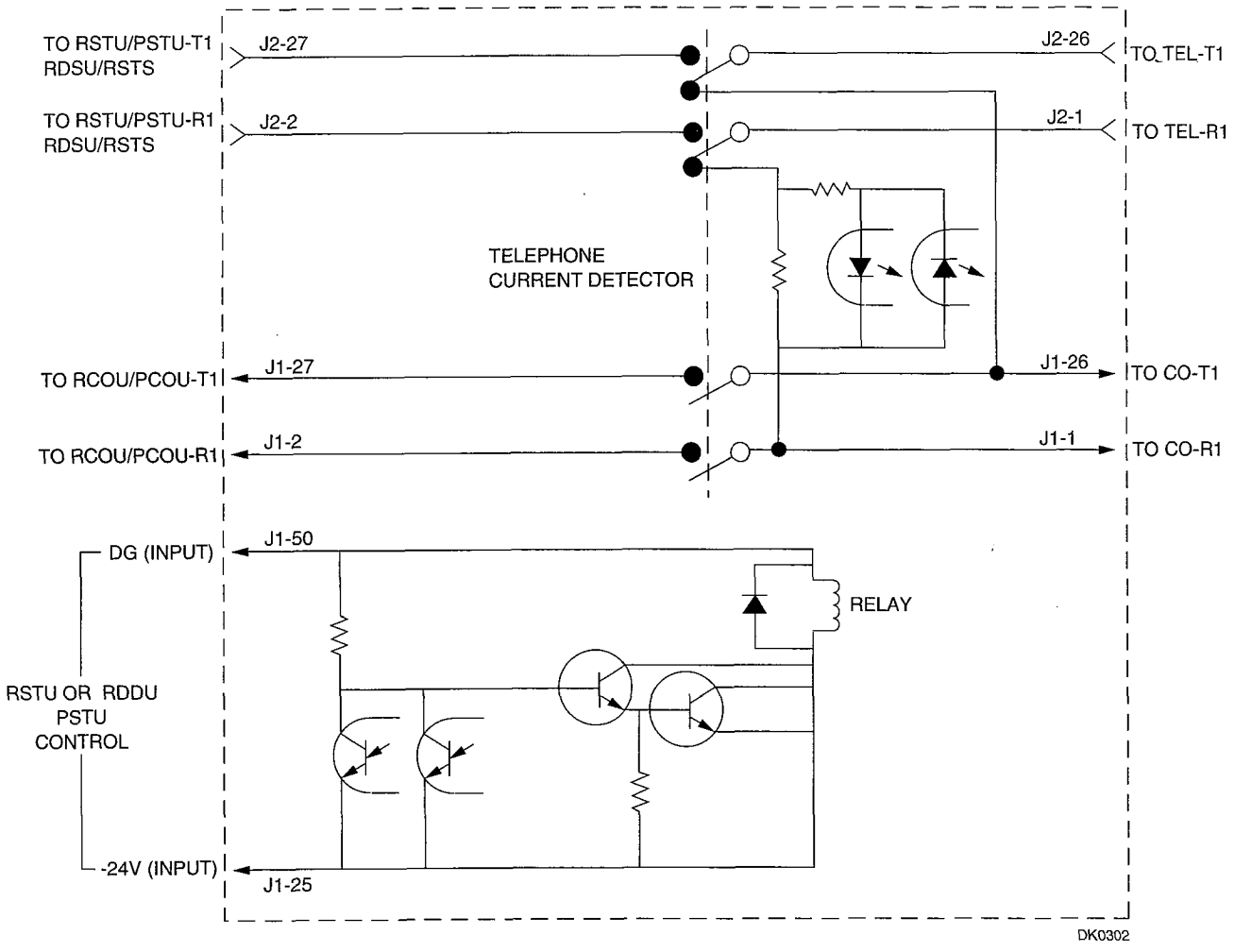
3. Connect the CO lines selected for emergency use to the DPFT J1-block "CO-TIP" and "CO-RING" terminals.

4. Connect the RCOU (or PCOU) circuits related to the emergency CO lines to the DPFT J1-block "RCOU-TIP" and "RCOU-RING" terminals.

5. Connect the standard telephone stations selected for emergency use to the DPFT J2-block "TEL-TIP" and "TEL-RING" terminals.

6. Connect the RSTU, RDSU/RSTS or PSTU standard telephone circuits related to the emergency standard telephones to DPFT J2-block "PSTU/ RSTU-TIP" and "PSTU/RSTU-RING" terminals.

7. Connect the DPFT to the RDSU/RSTU/PSTU DG and -24V terminals (refer to Chapter 7—Wiring Diagrams for RSTU/PSTU and RCOU/PCOU wiring/interconnecting details).



General Notes:

- *Representation of first of eight circuits.*
- *Conditions shown with AC power (-24VDC) off.*

Figure 6-1
DPFT Circuit Diagram

Note:

The -24V (Pin 25) and DG (Pin 50) ground terminals are available on the RSTU, RDSU, or PSTU only, not on the PESU.

8. To test the operation of the DPFT, turn the system power switch OFF, and verify that CO dial tone is available at each standard telephone connected to the DPFT. Also, call back to each telephone using an outside line.

6.2 Music-on-Hold (MOH)/ Background Music (BGM) Options

Strata DK280 systems provide an MOH option for CO, E&M tie and DID lines and telephones connected to the system. A variety of BGM options are also provided. (Refer to Figure 6-2.)

6.2.1 MOH Option

The RCTU supports an external, customer-provided music source—such as a tuner, compact disc player, or tape player—for MOH. The PIOU, PIOUS, and PEPU each has a relay contact on it that can be configured to automatically turn the source on when a CO line or station is placed on hold. MOH source and MOH relay contact specifications are as follows:

- BGM or MOH Source Specifications
  - Input Impedance: 600 ohms or 8 ohms
  - Input Voltage (recommended levels)
    - Minimum: 0.14 VRMS (-15 dBm)
    - Maximum: 0.77 VRMS (0 dBm)
- Relay Contact Specifications
  - Voltage: 24VDC maximum
  - Current: 1 ampere maximum

IMPORTANT !

In accordance with U.S. Copyright Law, a license may be required from the American Society of Composers, Authors, and Publishers (ASCAP), or other similar organization, if copyrighted music is transmitted through the Music-on-Hold feature of this telecommunications system. Toshiba America Information Systems, Inc., hereby disclaims any liability arising out of the failure to obtain such a license.

MOH Installation

Install the MOH option in accordance with the following steps: (Refer to Figure 6-2.)

1. Connect the external music source to the RCTU RCA Jack.
2. Rotate the RCTU volume control (VR1) to adjust MOH volume: clockwise increases volume; counterclockwise decreases volume. Listen to the CO line on-hold when setting MOH to the proper volume.
3. If MOH relay control is required, access Program 77-1. Set LED 05 to ON to configure the MOH/Night Transfer Control relay for the MOH function. This feature requires the installation of a PIOU, PIOUS, or PEPU PCB.
4. If using the MOH control feature with a PIOU or PEPU, set PIOU or PEPU jumper plug P11 to the MAKE or BREAK position as required:
   - **MAKE (M)**—Shorts the normally open contacts (pins 9 and 34) when MOH is activated.
   - **BREAK (B)**—Opens the normally closed contacts (pins 9 and 34) when MOH is activated.

   - or -

   If using the MOH Control feature with a PIOUS, solder PIOUS jumper W2 to the MAKE or BREAK position as required:
   - **MAKE (M)**—Shorts the normally open contacts (NHT and NHR) when any CO line is in the hold condition.
   - **BREAK (B)**—Opens the normally closed contacts (NHT and NHR) when any CO line is in the hold condition.
5. MOH (CO line or intercom hold) is applied from the RCTU through the KSU cabinet's backplane to DID lines, tie lines, CO lines, electronic, digital, and standard telephones on hold.
6. MOH is also applied through the RCTU Page/BGM control to provide BGM to electronic/digital telephone speakers and external page. (Refer to Subsection 6.2.2.)

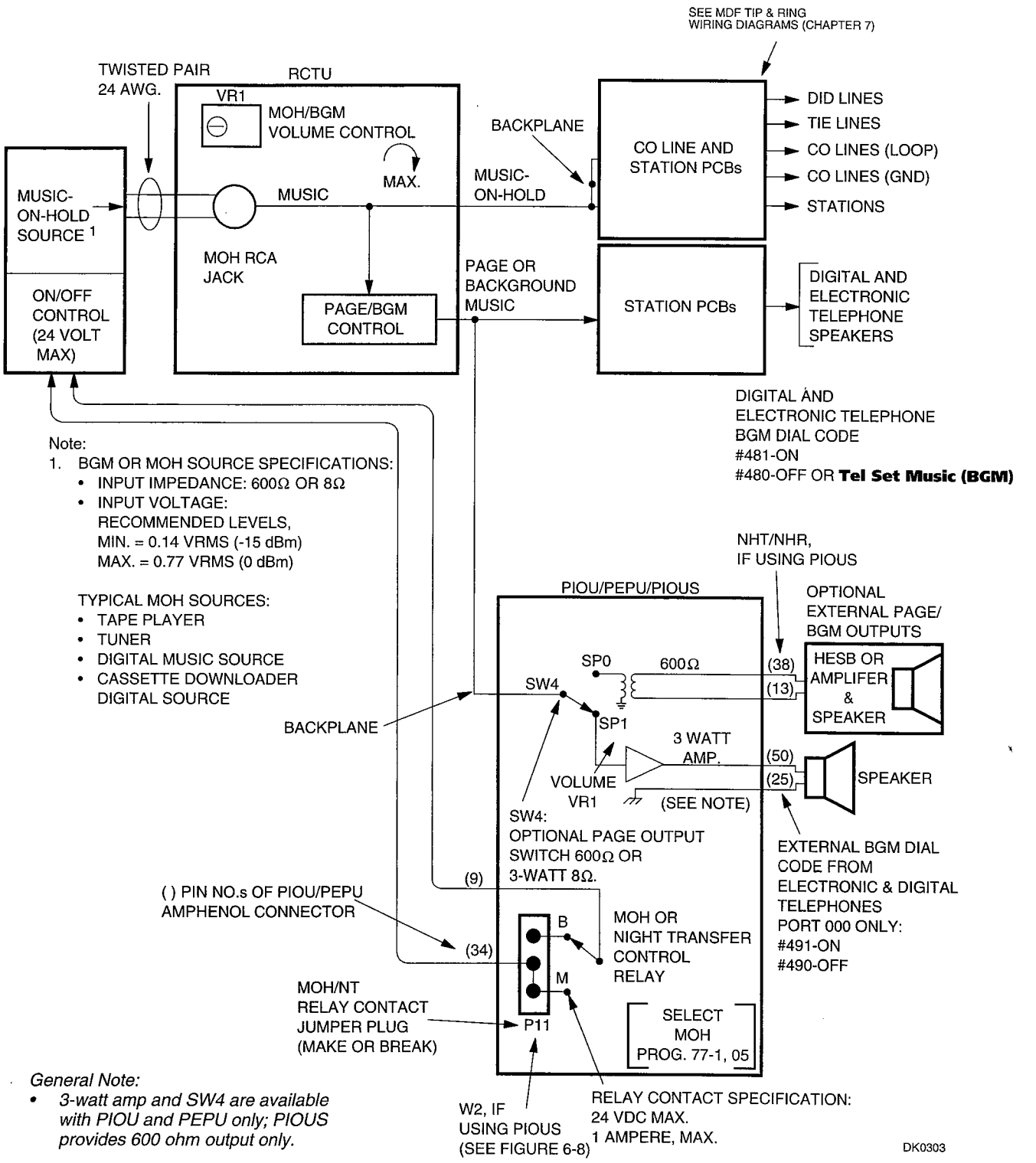


Figure 6-2
Music-on-Hold and Background Music (same source) Functional Diagram

6.2.2 BGM Options

The BGM options allow music to play over optional external speakers (external page system) and/or digital and electronic telephone speakers. BGM can be configured in three ways:

- **Configuration A**—one music source: This configuration allows BGM and MOH to share the same music source. (See Figure 6-3.) With this configuration, the MOH/BGM music source is connected to the RCA Jack on the RCTU PCB. The music source is sent to CO lines/stations on hold, to electronic/digital telephone speakers, and to the external page system via either the PIOU, PIOUS, or PEPU optional PCB.

  Note:

  Telephone users can turn on BGM at their station by pressing the **Tel Set Music (BGM)** *button; or by pressing the* **Intercom (INT)** *button and dialing* **# 4 8 1**. *(***# 4 8 0** *turns BGM OFF).*

- **Configuration B**—two music sources: This configuration allows the MOH source to be connected to the RCA Jack of the RCTU PCB (as in Configuration A) and a separate BGM source to be connected to a PEKU (Circuit 3), PESU (Circuit 8), RSTU, RSTU2, RDSU, or PSTU (Circuit 2) PCB (see Figures 6-4 and 6-5). With this configuration, the MOH source is sent only to CO lines/stations on hold, while the BGM source is sent directly to electronic/digital telephone speakers and to the external page system via the PIOU, PIOUS, or PEPU.

- **Configuration C**—three music sources: This configuration allows the MOH source to be connected to the RCA Jack of the RCTU (as in Configuration A). The digital or electronic telephone BGM source is connected to a PEKU, PESU, RSTU, RSTU2, RDSU or PSTU PCB (as in Configuration B), and a separate BGM source is sent to the external page speakers via the PIOU PCB (see Figure 6-6). When a separate BGM source is connected to the PIOU, two customer-supplied amplifiers are required to drive the external speakers.

  One amplifier drives the speakers for BGM when page is idle and the other amplifier drives the speakers during page. The PIOU switches BGM or page to the external speakers via zone relays. (The PIOUS and PEPU do not provide zone relays; therefore Configuration C is not possible with these PCBs.)

6.2.3 MOH Source as BGM Installation

Install the MOH/BGM option in accordance with the following steps: (Refer to Figure 6-2.)

1. Ensure that the MOH option is installed in accordance with Subsection 6.2.1, paragraph 2.

2. The output of the RCTU page/BGM control is applied through the backplane to the output select switch (SW4) on the PIOU or PEPU.

   Note:

   The PIOUS provides non-amplified BGM/page output only (SPT and SPR). See Figure 6-8.

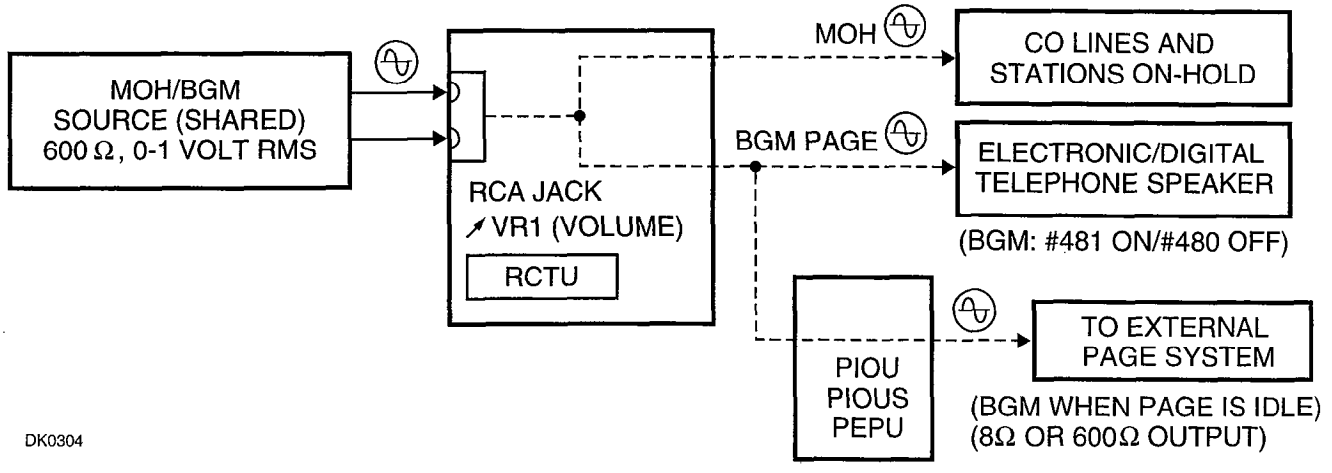


Figure 6-3
Music Source Configuration A

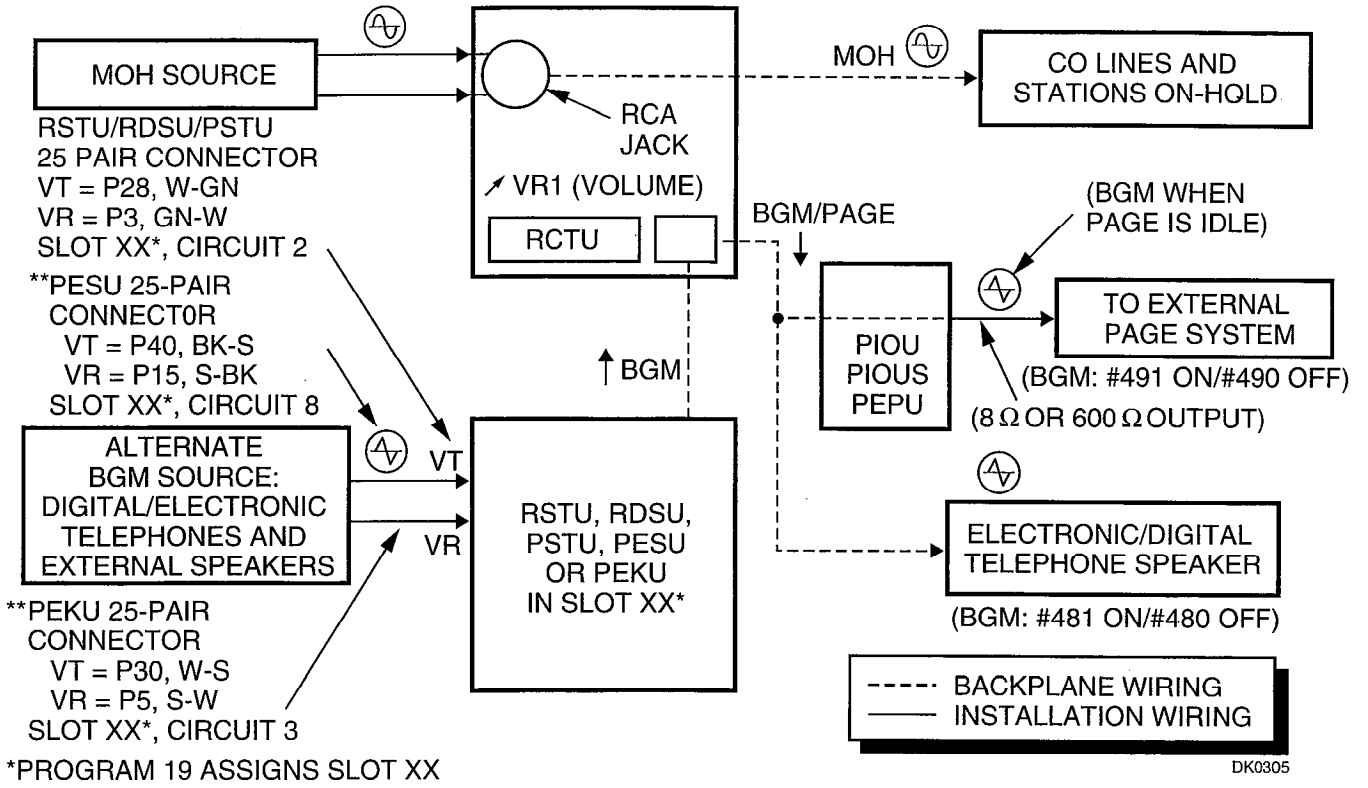
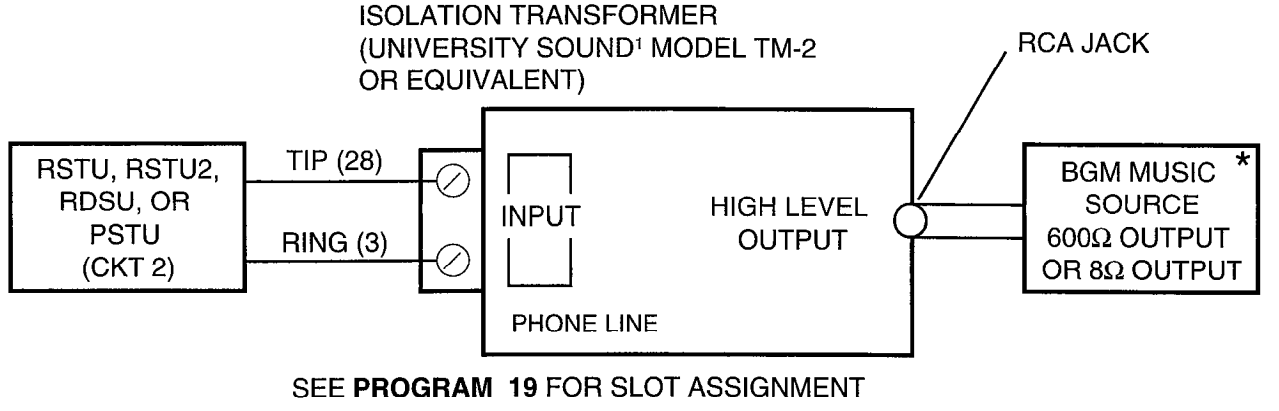


Figure 6-4
Alternate BGM Source Configuration B



Note:
1. *UNIVERSITY SOUND*
   10500 W. Reno Ave.
   Oklahoma City, OK 73128
   Phone: (800) 444-9516

***BGM SOURCE SPECIFICATIONS:**
- INPUT IMPEDANCE: 600 OR 8 ohms
- INPUT VOLTAGE:
  RECOMMENDED LEVELS,
  MIN. = 0.14 VRMS (–15 dBm)
  MAX. = 0.77 VRMS (0 dBm)

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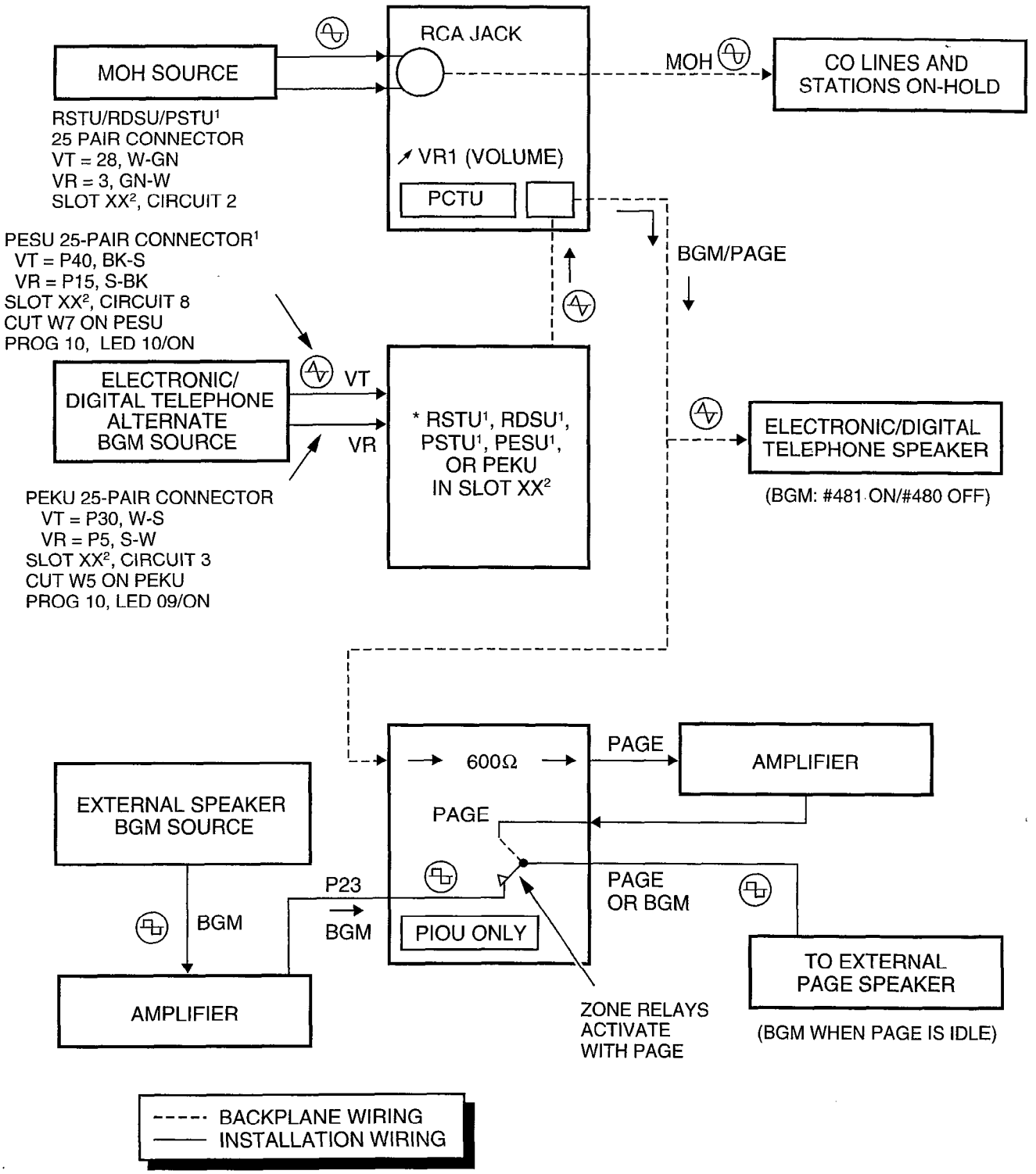
Figure 6-5
Alternate BGM Source to Standard Telephone Port Connection



Notes:

1. *An isolation transformer may be required if connecting BGM source to a standard telephone port.*
2. *Program 19 assigns BGM Slot number.*

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Figure 6-6
Alternate Music Source Configuration C

3. Set the SW4 switch to either SPO or SPI, as required:
   - **SPO**—Directs external page and non-amplified BGM to the HESB or external amplifier (pins 13 and 38).
   - **SPI**—Directs external page and BGM through the on-board 3-watt amplifier to the external speaker output (pins 25 and 50).
4. When using an HESB or external amplifier for paging/BGM, adjust volume using the HESB or amplifier volume control.
5. When using the internal amplifier for paging/BGM, adjust the volume using the volume control (VR1) on the PIOU/PEPU PCB.

6.2.4 Alternate BGM Source to RSTU, RDSU, PEKU, PESU, or PSTU Installation

A BGM source can be connected to a station PCB to send music to all electronic/digital telephone speakers and to the external page system via a PIOU, PIOUS, or PEPU. The BGM source is separated from the MOH source connected to the RCTU PCB. Connect the BGM source to the RSTU, RDSU, PEKU, PESU, or PSTU in accordance with the following steps (Figure 6-4):

1. Access Program 10-2. Set LED 09 to ON, if the BGM source will be connected to circuit 3 on a PEKU. If the source will be connected to circuit 8 on a PESU, set LED 10 to ON. If connecting BGM to RSTU, RDSU or PSTU, LED 09 and 10 should be off.
2. Identify (assign) the BGM slot with Program 19.
3. If connecting the BGM source to a PEKU or PESU: Connect the PEKU tip and ring of circuit 03 to the 600Ω or 8Ω output of the BGM source per Figure 6-4, or connect the BGM output to circuit 8 of a PESU.

   - or -

   If connecting the BGM source to a RSTU, RDSU or PSTU: Connect circuit 2 of the RSTU, RDSU or PSTU to a customer-supplied isolation transformer and BGM source per Figure 6-5.

   Note:
   The isolation transformer protects the BGM source from potentially damaging RSTU, RDSU or PSTU voltage. Some music sources which are designed for telephone system applications may have this protection built-in and do not require the transformer. (Consult the documentation provided with the music source.)
4. If the BGM source is connected to either a W5 on the PEKU or W7 on the PESU PCB, cut the strap (see Figure 6-6). There is no strap to cut on the PSTU, RDSU or RSTU.
5. Using the BGM source's volume control, adjust the BGM volume to the desired level while listening to BGM via a telephone speaker and/or the external page speakers. When BGM is sent to external speakers via a PIOU or PIOUS or PEPU PCB, use the external amplifier volume control to balance the BGM and page volume levels.

6.2.5 External BGM Installation

The external BGM options are closely associated with the external paging options. Refer to Subsection 6.5.1 for external paging amplifier installation.

6.3 Relay Control Options and Door Lock Control

Two relays are provided on the PIOU, PIOUS, and PEPU PCBs to control the operation of peripheral equipment (see Figures 6-7 and 6-8):

Note:
Only the PIOU/PIOUS/PEPU with the lowest Program 03 code (41, 42, or 43) will provide the relay control function.

- External Page/Door Lock Relay (DET/DER)
- Night Transfer/Music-on-Hold Relay (NHT/NHR)

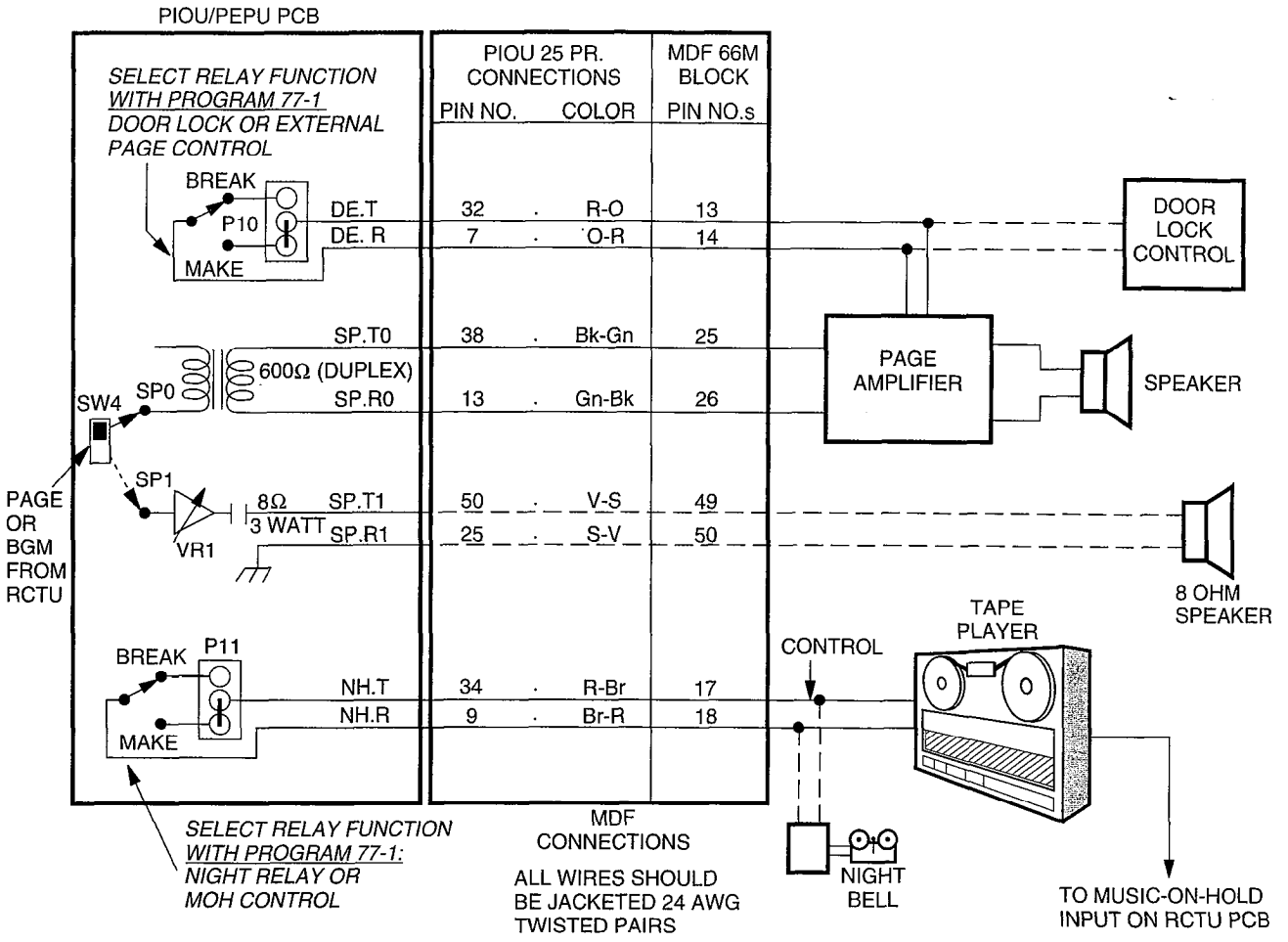
Each relay may be configured to provide one of two possible control functions and as normally open (MAKE) or normally closed (BREAK). Electrical specifications for the relay contacts are as follows:

Voltage:

- 24VDC maximum

Current:

- 1 ampere maximum



General Note:
- *Dotted lines and solid lines differentiate optional connections where applicable; do not connect both options simultaneously.*

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Figure 6-7
PIOU/PEPU Relay Control Functional Wiring Diagram

CAUTION !
Do not connect relays directly to 120VAC power source.

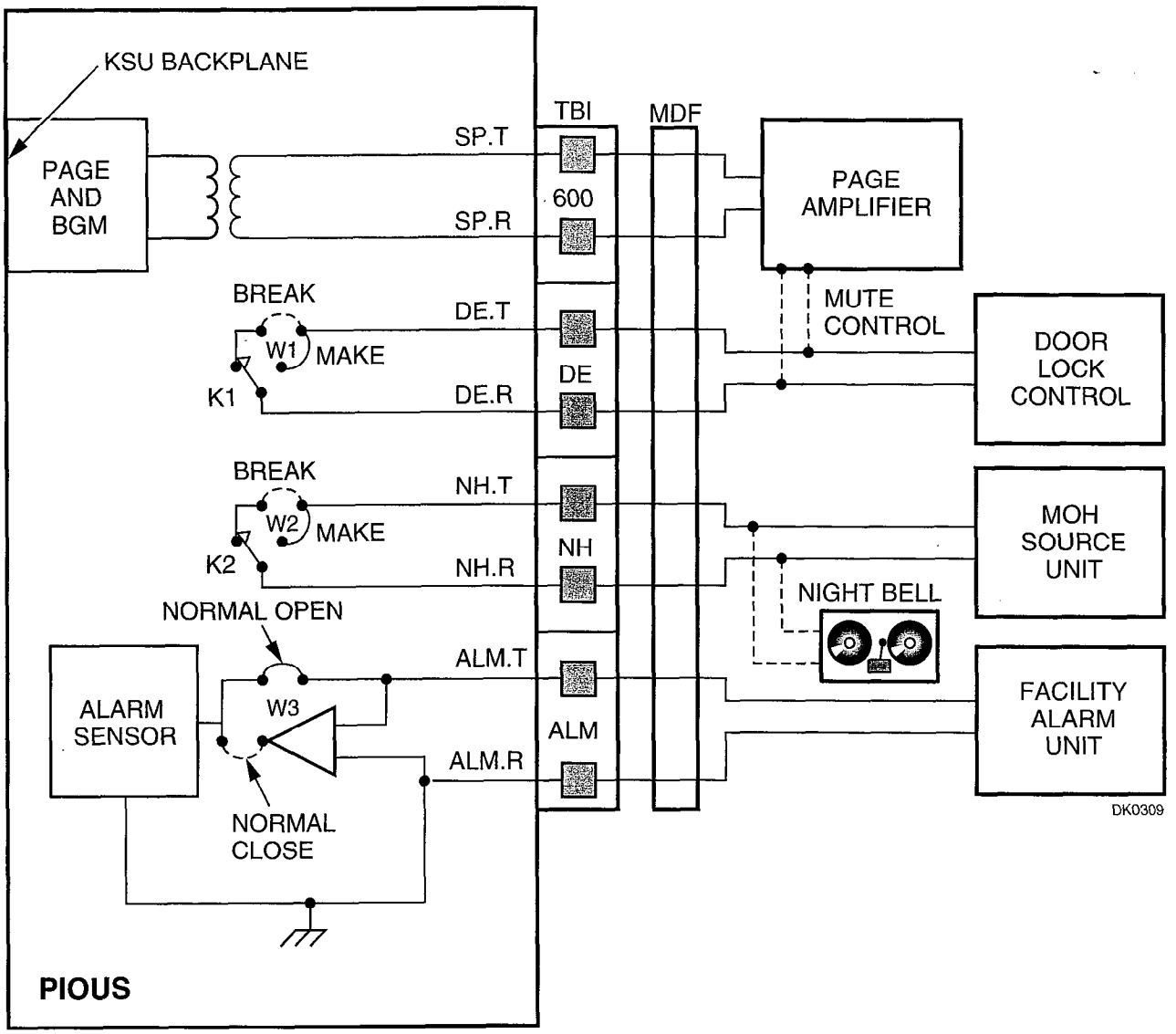
Note:
Refer to the Programming Part in this manual, as necessary when instructed to program the PIOU, PIOUS, or PEPU in the following paragraphs.

6.3.1 External Page/Door Lock Relay Options with PIOU, PIOUS, or PEPU

The DET/DER may be programmed for either the external page function or the door lock control function. (Refer to Figures 6-7 and 6-8.)

When configured in Program 77-1 for the external page function, the relay controls an external music source connected to the PIOU, PIOUS or PEPU to provide BGM over external speakers. When a paging announcement is made over the external speakers, the external page relay mutes the BGM.

When configured in Program 77-1 for the door lock control function, the relay controls an external door



General Notes:

- *All wiring connections must be 24 AWG twisted pairs.*
- *Dotted lines and solid lines differentiate optional connections where applicable; do not connect both options simultaneously.*

RELAY OPTIONS:

- K1 (DE): DOOR LOCK OR AMP MUTE CONTROL; PROGRAM 77-1, LED 07
- K2 (NH): NIGHT RELAY OR MUSIC-ON-HOLD CONTROL; PROGRAM 77-1, LED 05
- K1 & K2: 24VDC, 1 AMP MAXIMUM

Figure 6-8
PIOUS Relay Control Functional Wiring Diagram

lock. When a door lock button at a digital or electronic telephone is pressed, the door lock control relay unlocks the door for three or six seconds, as specified in Program 77-1 (LED 20).

External Page Control

Configure the PIOU, PIOUS, or PEPU for the external page mute function in accordance with the following steps: (Refer to Figure 6-7 or 6-8.)

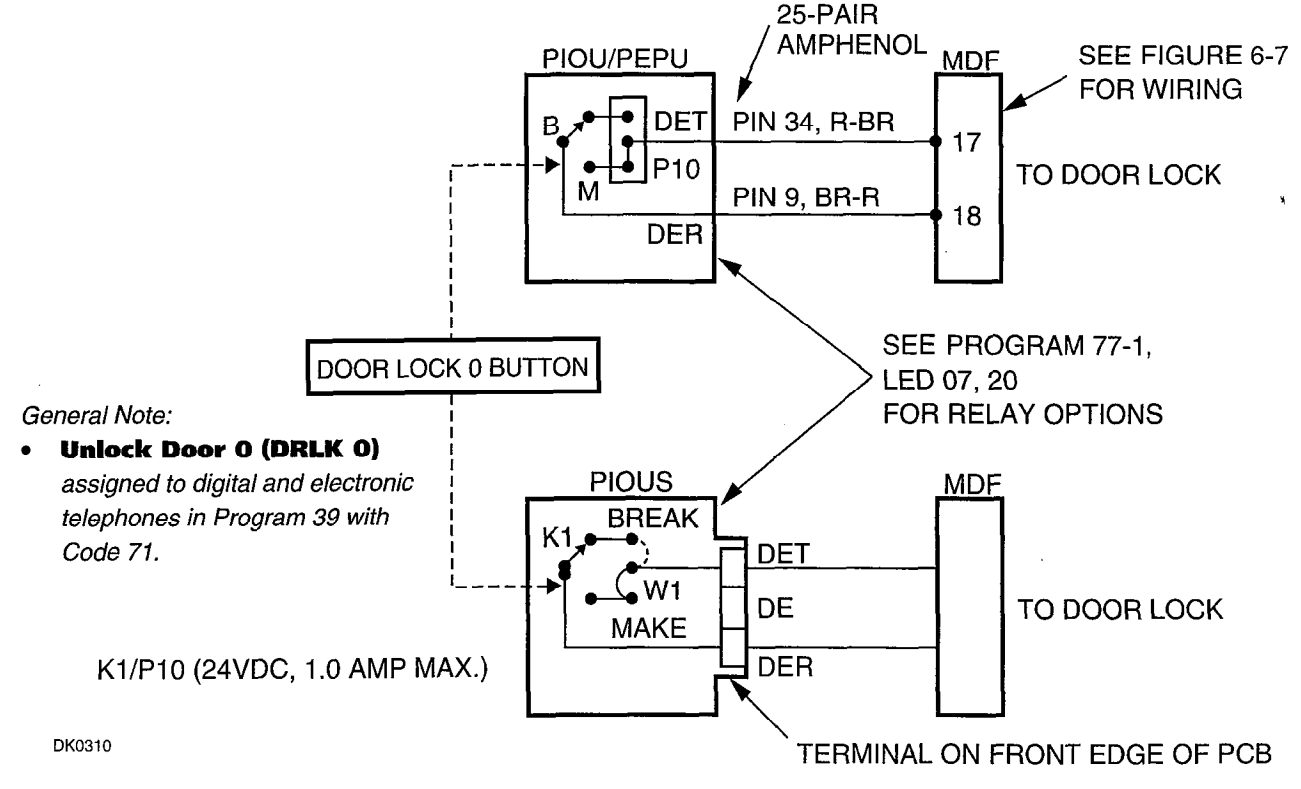
1. Access Program 77-1. Set LED 07 to OFF to configure the DET/DER for the external page function.
2. If using a PIOU or PEPU, set the jumper plug P10 on the PIOU or PEPU jumper plug to the MAKE or BREAK position as required:
   - **MAKE**—Shorts the normally open contacts (pins 7 and 32) when external page is activated.
   - **BREAK**—Opens the normally closed contacts (pins 7 and 32) when external page is activated.

   - or -

   If using a PIOUS, solder the jumper W1 on the PIOUS to the **MAKE** or **BREAK** position as required:
   - **MAKE**—Shorts the normally open contacts (DET and DER) when external page is activated.
   - **BREAK**—Opens the normally closed contacts (DET and DER) when external page is activated.
3. Refer to Figures 6-7 or 6-8 for wiring/ interconnecting details. Connect the PIOU, PIOUS, or PEPU to the MDF as required for the external paging function.

Door Lock Control (PIOU or PIOUS or PEPU)

Configure the PIOU, PIOUS, or PEPU for the door lock control function in accordance with the following steps: (Refer to Figure 6-9.)



General Note:

- **Unlock Door 0 (DRLK 0)** *assigned to digital and electronic telephones in Program 39 with Code 71.*

Figure 6-9
Door Lock Control Option (PIOU/PIOUS/PEPU)

Note:
Only one door lock control is available using an option interface PCB (PIOU, PIOUS, or PEPU). Only the PIOU, PIOUS, or PEPU with the lowest Program 03 Code (41, 42, or 43) will provide the door lock function.

1. Access Program 77-1. Set LED 07 to ON to configure the DET/DER for the door lock control function.
2. Access Program 77-1. Set LED 20 to OFF for a 3-second door lock activation time, or set LED 20 to ON for a 6-second door lock activation time.
3. If using a PIOU or PEPU, set the P10 jumper plug on the PIOU or PEPU to the MAKE or BREAK position, as required:
   - **MAKE**—Shorts the normally open contacts (pins 7 and 32) when a station's door lock button is pressed.
   - **BREAK**—Opens the normally closed contacts (pins 7 and 32) when a station's door lock button is pressed.

   - or -

   If using a PIOUS, solder the W1 jumper plug on the PIOUS to the MAKE or BREAK position, as required:
   - **MAKE**—Shorts the normally open contacts (DET and DER) when a station's door lock button is pressed.
   - **BREAK**—Opens the normally closed contacts (DET and DER) when a station's door lock button is pressed.
4. Refer to Figure 6-9 for wiring/interconnecting details. Connect the PIOU, PIOUS, or PEPU to the MDF as required for the door lock control function.

Door Lock Control with DDCB and HDCB

In addition to the option interface PCB (PIOU, PIOUS, PEPU), each digital door phone/lock control unit (DDCB) and electronic door phone/lock control unit (HDCB) can provide one door lock control. This capability enables as many as four DDCB/HDCB door lock controls to be provided with RCTUB and RCTUC/D, or three with RCTUA. DDCBs connect only to digital circuits (always Circuit 5 on a PDKU or RDSU) associated with ports 004, 012, 020, and 028; HDCBs connect only to electronic circuits (always circuit 5 on a PEKU or PESU) associated with ports 004, 012, 020, and 028.

It is important to note that each DDCB/HDCB door lock control reduces the maximum door phone capacity by one. Configure each DDCB/HDCB for the door lock control function as follows:

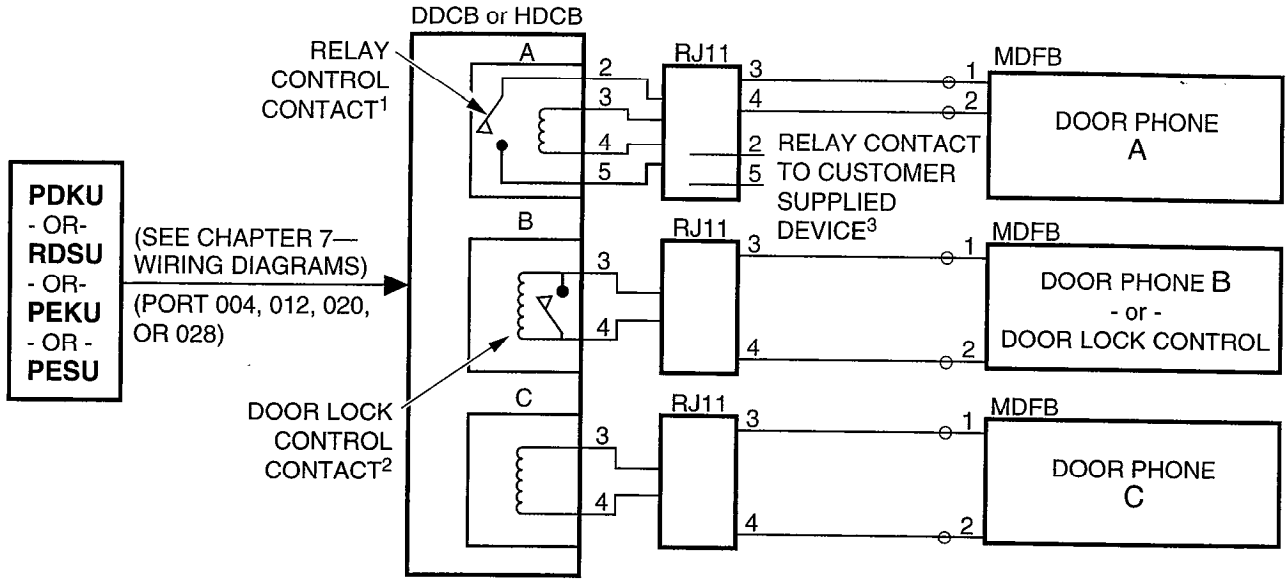
DDCB Installation

See figure 6-10 and Chapter 7—Wiring Diagrams—DDCB Wiring Diagram and follow these steps:

1. Connect PDKU circuit 5 (T/R and PT/PR) to the DDCB HKSU modular jack.
2. Connect the door lock wire pair to the DDCB modular B-jack (pins 3 and 4).
3. On the DDCB, set SW1 to the DOOR position.
4. On the DDCB, set SW2 to the LOCK position.
5. SW3 inside the DDCB can be set to open or close the door lock relay whenever a door lock button is pressed: if SW3 is in the "1-2" position, the relay will provide a closure when the button is pressed; if in the "2-3" position, the door lock relay will open when the door lock button is pressed.

   Note:
   SW3 comes from the factory in the "1-2" position.
6. In Program 77-1, set the door lock activation for three or six seconds and enable the PDKU or RDSU ports for DDCB connection.
7. In Program 77-2, enable the DDCB B-jack for door lock operation.
8. In Program 39, assign door lock buttons to stations per the customer's record sheet.
9. Check each telephone door lock button from each station: the DDCB modular B-jack (pins 3 and 4) will momentarily open or close (three or six seconds) when the button is pressed.

   Note:
   The DDCB SW4 strap is not used with Strata DK280 systems. The strap provides an alarm function with other Strata systems.



HDCB WIRING CHART

PEKU or PESU	TO	HDCB KSU JACK
VT (34) / VR (9)	TO	PIN 3 / 4
DT (35) / DR (10)	TO	PIN 5 / 6

DDCB WIRING CHART

PDKU OR RDSU	TO	DDCB KSU JACK
DT (34) / DR (9)	TO	PIN 3 / 4
PT (35) / PR (10)	TO	PIN 5 / 6

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See Chapter 7—Wiring for PEKU, PESU, PDKU or RDSU pin-out information.

Notes:

1. *Relay control contact will close when the door phone is in the ringing, talk, or monitor state.*
2. *See Subsection 6.3.1, paragraph 5, and Subsection 6.3.2.*
3. *Relay contact specifications are -24VDC at 1.0 amp. max. Do not connect relay contacts to 120 AC commercial power.*

Figure 6-10
Multiple Door Lock Control Options (DDCB/HDCB)

HDCB Installation

See figure 6-10 and HDCB Wiring Diagram in Chapter 7—Wiring Diagrams and follow these steps:

1. Cut jumper W9 of the particular PEKU or PESU that will connect to the HDCB.
2. Connect the Circuit 5 VT/VR and DT/DR pairs to the HDCB HKSU modular jack.
3. Connect the door lock wire pair to the HDCB modular B-jack (pins 3 and 4).
4. On the HDCB, set SW1 to the DOOR position.
5. On the HDCB, set SW2 to the LOCK position.
6. W3 inside the HDCB can be set to open or close the door lock relay whenever a door lock button is pressed: if W3 is in the "solid-line" position, the relay will provide a closure when the button is pressed; if in the "dotted-line" position, the door lock relay will open when the door lock button is pressed.
7. In Program 77-1, set the door lock activation for three or six seconds, and enable the PEKU and PESU ports for HDCB connection.
8. In Program 77-2, enable the HDCB B-jack for door lock operation.
9. In Program 39, assign door lock buttons to the desired stations per the customer's record sheet.

10. Check each door lock button from each station: The HDCB modular B-jack (pins 3 and 4) will momentarily close (three or six seconds) when the appropriate door lock button is pressed.

    Note:
    The HDCB W2 strap is not used with Strata DK280 systems. The strap provides an alarm function with other Strata systems.

6.3.2 DDCB and HDCB/DRLK Assignments Guide

Table 6-1
DDCB and HDCB/DRLK Assignments Guide

RDSU/PDKU/ PEKU/PESU	Port No.	DDCB/ HDCB No.	Program 39 Button Assignments
First (fifth circuit, slot 11)	004	1	Unlock Door 1 (DRLK 1), Code 72
Second (fifth circuit, slot 12)	012	2	Unlock Door 2 (DRLK 2), Code 73
Third (fifth circuit, slot 13)	020	3	Unlock Door 3 (DRLK 3), Code 74
Fourth (fifth circuit, slot 14)	028	4	Unlock Door 4 (DRLK 4), Code 75

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Notes:

1. *See Programs 39, 77-1, and 77-2 to program assignments.*
2. *DDCB and HDCB hardware option settings for door lock control operation:*
   - *Set **SW1** (jumper) to DOOR position.*
   - *Set **SW2** (switch) to LOCK position.*

6.3.3 NHT/NHR Options with PIOU, PIOUS, or PEPU

The NHT/NHR may be programmed for either the Night Relay or the MOH relay function. (Refer to Figures 6-7 and 6-8.)

Note:
Only the PIOU/PIOUS, or PEPU with the lowest Program 03 code (41, 42 or 43) will provide the NT or MOH relay control function.

When configured for the NT function with Program 77-1, the relay activates if the system is in the NIGHT mode. The relay may be programmed to activate continuously when the Night Transfer button (only) is set for the NIGHT mode (for indirect answering machine control), or to pulsate at one-second ON/three-seconds OFF (for a night bell) when incoming CO lines ring (NT1 = tenant 1 CO lines ~ NT4 = tenant 4 CO lines) per Program *15 and 77-3.

When configured for the MOH function with Program 77-1, the relay activates any time a CO line is on hold. In this configuration, the relay is normally used to control the MOH source.

NHT Control

Configure the PIOU, PIOUS, or PEPU for the NHT function in accordance with the following steps (refer to Figures 6-7 and 6-8):

1. Access Program 77-1. Set LED 05 to OFF to configure the Night/Hold Relay for the NHT function.
2. Access Program 77-1. Set LED 06 to provide continuous or pulsating relay activation as follows:
   - OFF—Programs the relay for continuous activation when the **Night Transfer** (**NT**) button (only) is set in the NIGHT mode.
   - ON—Programs the relay for pulsating activation when the **Night Transfer** (**NT**) button for tenant 1 ~ 4 is set to the NIGHT mode and a CO line rings.

   Note:
   CO lines must be enabled in Program 78 for the NT pulsating relay function.
3. Access Programs 87, 88, and 89 to set the CO lines that will activate the relay (when the system is in the NIGHT mode).
4. Access Program 39 to assign Night Transfer (NT) buttons to telephones that should be able to set the Strata DK280 system into the NIGHT mode.
5. Access Programs 29-1 ~ 29-4 to program a Night Transfer button on all direct station selection consoles that are to transfer the Strata DK280 system into the NIGHT mode.
6. If tenant operation is required, access Program *15 to set the CO lines for tenant 1 ~ tenant 4 operation. RCTUA and RCTUB provides two tenant assignments, RCTUC/D provides four.
7. If using a PIOU or PEPU, set the P11 jumper plug on the PIOU or PEPU to the MAKE or BREAK position, as required:

- **MAKE**—Shorts the normally open contacts (pins 9 and 34) when the night relay is activated.
- **BREAK**—Opens the normally closed contacts (pins 9 and 34) when the night relay is activated.

- or -

If using a PIOUS, solder the jumper W2 on the PIOUS to the MAKE or BREAK position, as required:

- **MAKE**—Shorts the normally open contacts (NHT and NHR) when the night relay is activated.
- **BREAK**—Opens the normally closed contacts (NHT and NHR) when night relay is activated.

8. Refer to Figures 6-7 and 6-8 for wiring/interconnecting details. Connect the PIOU, PIOUS, or PEPU to the MDF as required for the night relay function.

   Note:
   Door phones programmed to ring over external page in the NIGHT mode (Program 77-1) do not activate the NHT.

MOH Relay Control

Configure the PIOU, PIOUS, or PEPU for the MOH relay function in accordance with the following steps: (Refer to Figures 6-7 and 6-8.)

1. Access Program 77-1. Set LED 05 to ON to configure the Night/MOH relay for the MOH relay function.
2. If using a PIOU or PEPU, set the P11 jumper plug on the PIOU or PEPU to the MAKE or BREAK position, as required:
   - **MAKE**—Shorts the normally open contacts (pins 9 and 34) when any CO line is on hold.
   - **BREAK**—Opens the normally closed contacts (pins 9 and 34) when any CO line is on hold.

   - or -

   If using a PIOUS, solder the W2 jumper on the PIOUS to the MAKE or BREAK position, as required:
   - **MAKE**—Shorts the normally open contacts (NHT and NHR) when any CO line is on hold.
   - **BREAK**—Opens the normally closed contacts (NHT and NHR) when any CO line is on hold.
3. Refer to Figures 6-7 and 6-8 for wiring/interconnecting details. Connect the PIOU, PIOUS, or PEPU to the MDF as required for the MOH Relay function.

6.4 External Speaker Unit (HESB) Options

Strata DK280 systems provide three options utilizing an HESB:

Loud Ringing Bell Option

The loud ringing bell option allows the voice first or ringing signal tone to be amplified without the use of other manufacturers' equipment. The voice first and signal tone can be amplified on all electronic and digital telephones equipped with HHEU PCBs and HESB. (Refer to Chapter 5—Station Apparatus.) The HESB automatically turns off once the ringing call or voice first has been manually answered from the electronic or digital telephone. This turn-off feature prevents audio feedback problems.

Amplified Speaker Option

The amplified speaker option allows the HESB to be configured as a paging speaker. The HESB is connected to the PIOU, PIOUS, or PEPU 600-ohm page output to provide an amplified external speaker.

Talkback Amplified Speaker Option

The talkback amplified speaker option allows a talkback speaker to be provided in areas where a telephone is not needed. In this configuration, the HESB is connected to the PIOU, PIOUS, or PEPU 600Ω (duplex) output and is used as the amplifier and speaker. A door phone unit (MDFB) is connected to the HESB, and serves as a microphone to provide talkback operation (the MDFB push-button is inoperative, and the unit serves only as a microphone for talkback and not as the normal door phone).

Note:
The PIOU, PIOUS, and PEPU 600Ω is a two-way (duplex) page output compatible with most commercially available talkback amplifiers—door phone not required for talkback.

6.4.1 System Hardware Requirements

System hardware requirements vary depending on the HESB option selected. Refer to the following installation procedures for the system hardware requirements for each option.

6.4.2 HESB Option Installation

Loud Ringing Bell Installation

Install the HESB loud ringing bell option in accordance with the following procedures:

HESB Installation for Digital Telephone (Figure 6-11):

1. Connect a jumper between terminals 2 and 10 on the HESB TB1 terminal block.
2. Connect a jumper between terminals 4 and 5 on the HESB TB2 terminal block.

   Notes:

   1. *HESB connections made in Steps 3 ~ 5 may be accomplished using the HESB VOICE modular jack instead of the TB1 terminal block.*
   2. *Install an HHEU PCB and HESC-65A cable in the telephone per Chapter 5—Station Apparatus before proceeding with Step 3.*
3. Connect terminal 1 of the HESB TB1 terminal block to the red (+) wire of the HESC-65A using a modular block.
4. Connect terminal 2 of the HESB TB1 terminal block to the green (-) wire of the HESC-65A using a modular block.
5. Connect terminal 8 of the HESB TB1 terminal block to the yellow (L2) wire of the HESC-65A cable using a modular block.
6. Connect the HACU-120 power supply's +12V lead to terminal 1 of the HESB TB2 terminal block, and connect the power supply's 0V lead to terminal 2.
7. Plug the provided power cord into the power supply and to a 117VAC, 60Hz power source.

HESB Installation for Electronic Telephone (Figure 6-12):

1. On the HESB TB1 terminal block: connect a jumper between terminals 6 and 7, and connect another jumper between terminals 5 and 8.
2. On the HESB TB2 terminal block, connect a jumper between terminals 4 and 5 .

   Notes:

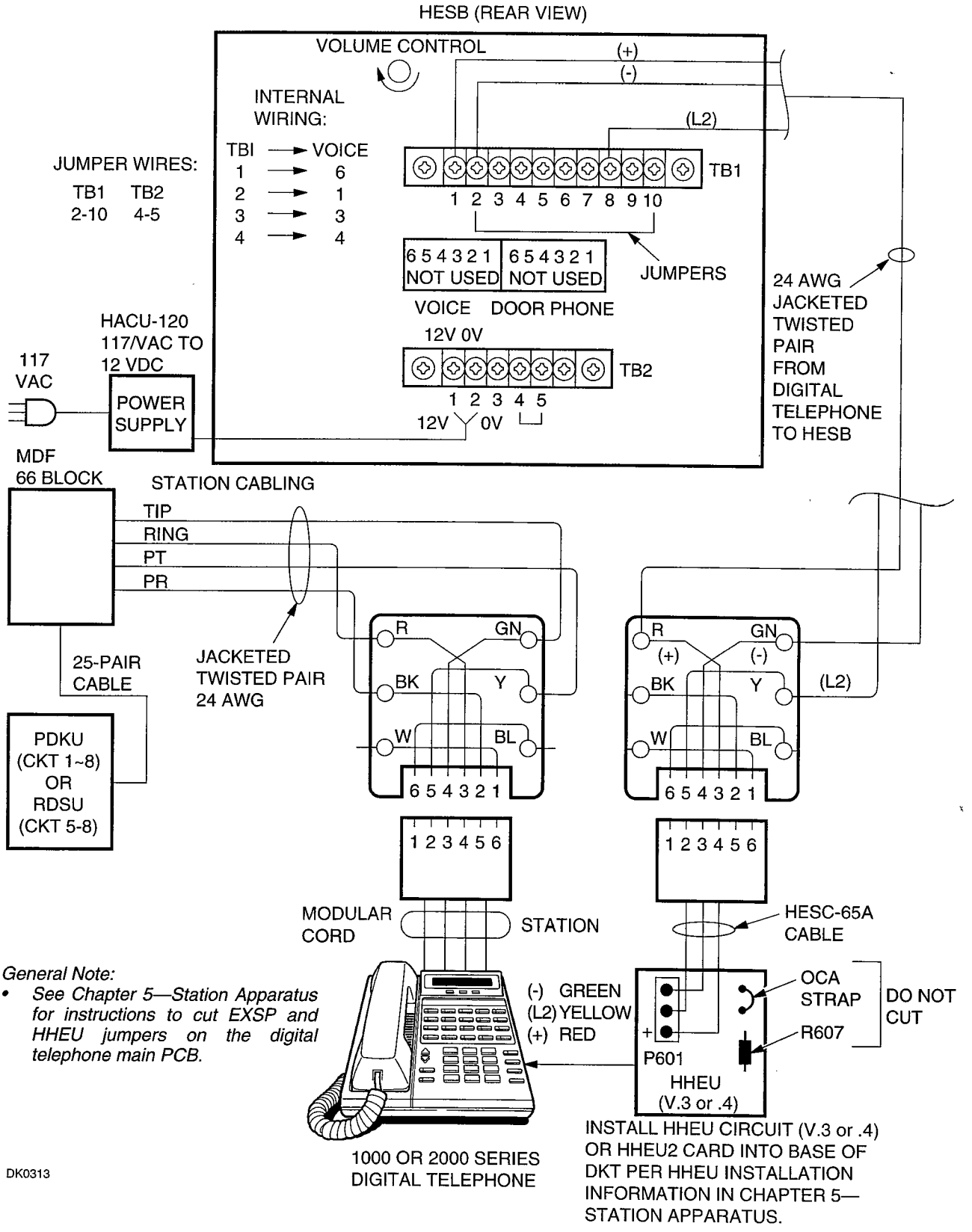
   1. *HESB connections made in Steps 3~ 6 may be accomplished using the HESB VOICE modular jack instead of the TB1 terminal block.*
   2. *Install an HHEU PCB and HESC-65 (or HESC-65A) cable in the telephone per Chapter 5—Station Apparatus before proceeding with Step 3.*
3. Connect terminal 1 of the HESB TB1 terminal block to the red (+) wire of the HESC-65 cable using a modular block.
4. Connect terminal 2 of the HESB TB1 terminal block to the green (-) wire of the HESC-65 cable using a modular block.
5. Connect terminal 3 of the HESB TB1 terminal block to pin 3 of the electronic telephone's modular block (VOICE TIP).
6. Connect terminal 4 of the HESB TB1 terminal block to Pin 4 of the electronic telephone's modular block (VOICE RING).
7. Connect the HACU-120 power supply's +12V lead to terminal 1 of the HESB TB2 terminal block, and connect the power supply's 0V lead to terminal 2.
8. Plug the provided power cord into the power supply and to a 117VAC, 60Hz power source.

Loud Ringing Bell Test

Test the loud ringing bell installation in accordance with the following steps:

1. Make a CO or station call to the station configured for the loud ringing bell. Ringing will be heard over the HESB.
2. Using a small slotted screwdriver, adjust the HESB volume control to the desired level by turning the volume control on the back of the HESB and adjusting the ring volume control on the telephone.
3. If ringing is heard at the station, but not over the HESB, perform the following check while the station is ringing:

   Using a suitable voltmeter, measure voltage across terminals 1 (+) and 2 (-) of the HESB TB1



General Note:

- *See Chapter 5—Station Apparatus for instructions to cut EXSP and HHEU jumpers on the digital telephone main PCB.*

Figure 6-11
HESB/Digital Telephone with Loud Ringing Bell Wiring

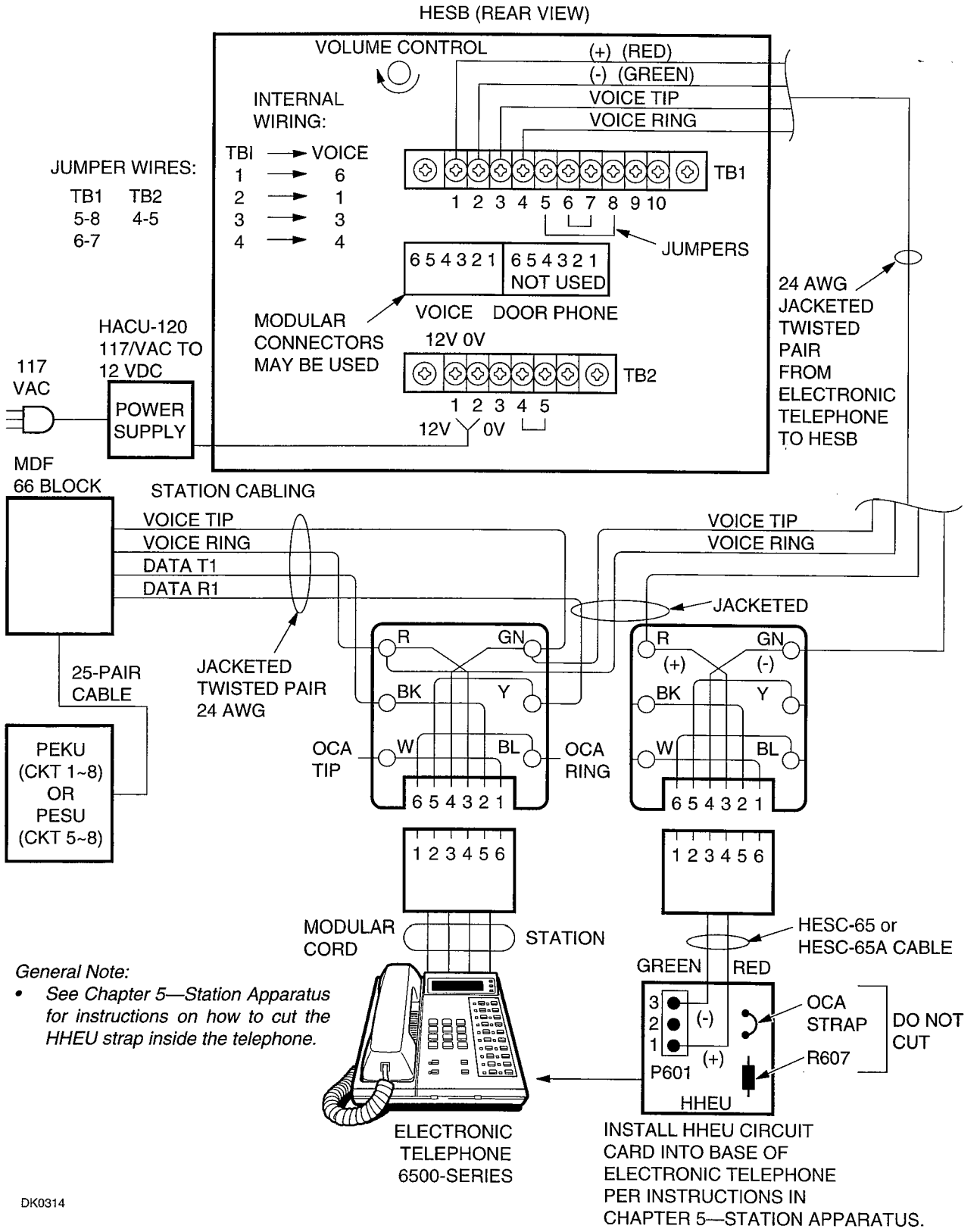


Figure 6-12
HESB/Electronic Telephone with Loud Ringing Bell Wiring

terminal block. Voltage indication should be 4.5 ~ 5 VDC.

Note:
Ringing stops once the call is manually answered. There should be NO voltage potential across terminals 1 and 2.

B. If voltage is not as specified during ringing, check that the telephone wiring connections to the HESB have been made properly (wires to terminals 1 and 2 of the HESB TB1 terminal block may have been reversed).

Amplified Speaker Installation

Install the HESB amplified speaker option in accordance with the following steps (refer to Figure 6-13):

1. Connect a jumper between terminals 1 and 2 of the HESB TB1 terminal block.
2. Connect a jumper between terminals 6 and 7 of the HESB TB1 terminal block.
3. Connect a jumper between terminals 5 and 8 of the HESB TB1 terminal block.
4. Connect a jumper between terminals 3 and 4 of the HESB TB2 terminal block.
5. Connect a jumper between terminals 5 and 6 of the HESB TB2 terminal block.
6. If using a PIOU or PEPU, connect the PIOU or PEPU 600-ohm page output (Pins 13 and 38) to terminals 3 and 4 of the HESB TB1 terminal block.

   - or -

   If using a PIOUS, connect the PIOUS 600-ohm page output (SPT and SPR) to terminals 3 and 4 of the HESB TB1 terminal block.
7. Connect the power supply's +12V lead to terminal 1 of the HESB TB2 terminal block, and connect the 0V lead to terminal 2.
8. Plug the provided power cord into the power supply and to a 117VAC, 60Hz power source.
9. Set the PIOU or PEPU SW4 switch to the SPO position.

Amplified Speaker Test

Test the Amplified Speaker installation in accordance with the following steps:

1. Make an external page. The page should be heard over the HESB.
2. Adjust the HESB volume control to the desired level.

Talkback Amplified Speaker Installation

Install the HESB talkback amplified speaker option in accordance with the following steps (refer to Figure 6-14):

1. Connect a jumper between terminals 1 and 2 of the HESB TB1 terminal block.
2. Connect a jumper between terminals 3 and 4 of the HESB TB2 terminal block.
3. Connect a jumper between terminals 5 and 6 of the HESB TB2 terminal block.

   Note:
   HESB connections made in Steps 4 ~ 7 may be accomplished using the HESB VOICE and door phone modular jack instead of the TB1 terminal block.
4. Connect terminal 7 of the HESB TB1 terminal block to Pin L1 of the MDFB.
5. Connect terminal 8 of the HESB TB1 terminal block to Pin L2 of the MDFB.
6. Connect terminal 9 of the HESB TB1 terminal block to Pin 1 of the MDFB.
7. Connect terminal 10 of the HESB TB1 terminal block to Pin 2 of the MDFB.
8. If using a PIOU or PEPU, connect the PIOU or PEPU 600-ohm page output (Pins 13 and 38) to terminals 3 and 4 of the HESB TB1 terminal block.

   - or -

   If using a PIOUS, connect the PIOUS 600-ohm page output (SPT and SPR) to terminals 3 and 4 of the HESB TB1 terminal block.
9. Set the PIOU or PEPU SW4 switch to the SPO position.
10. Connect the HACU-120's +12V lead to terminal 1 of the HESB TB2 terminal block, and connect the 0V lead to terminal 2.
11. Plug the provided power cord into the power supply and to a 117VAC, 60Hz power source.

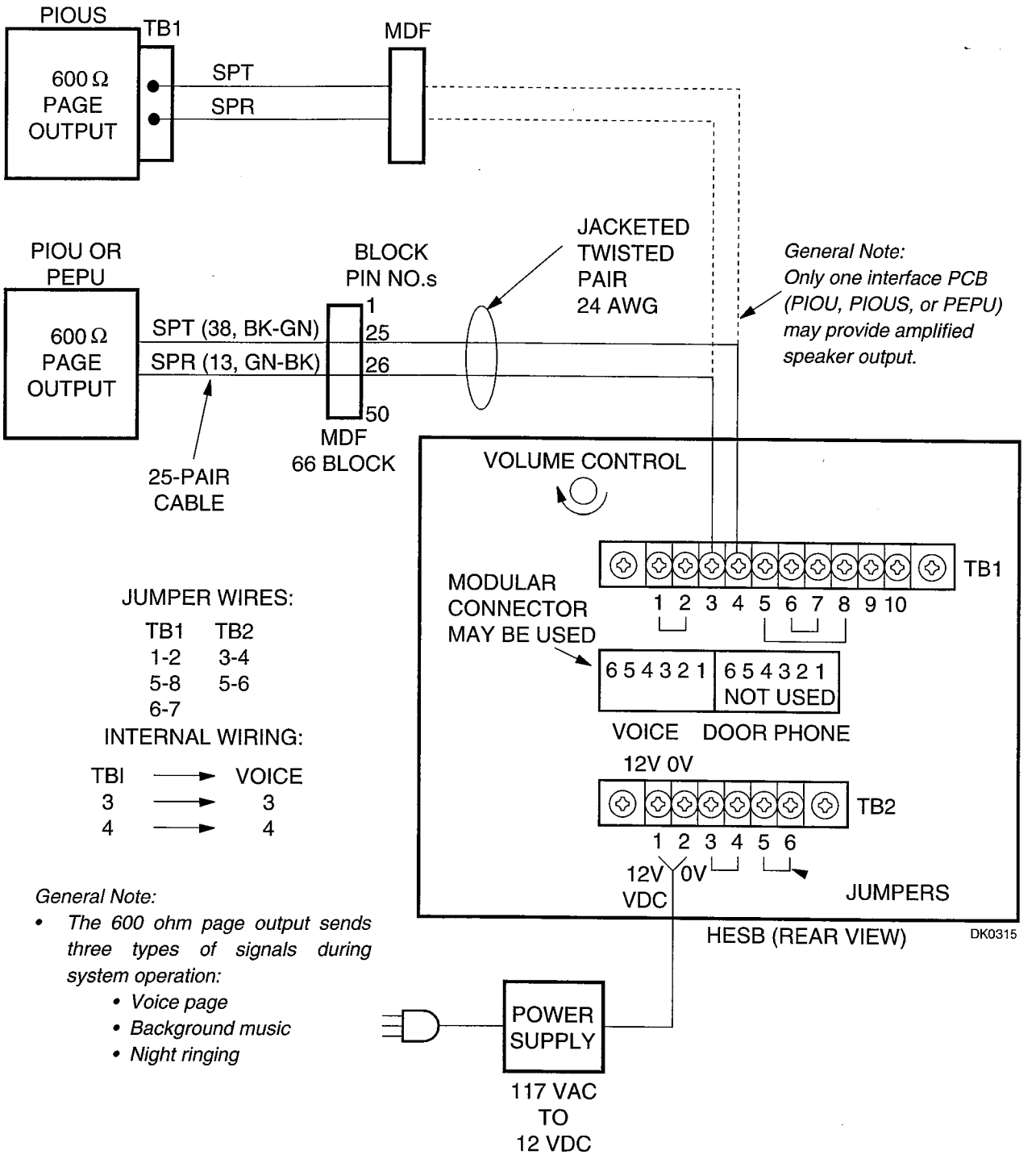
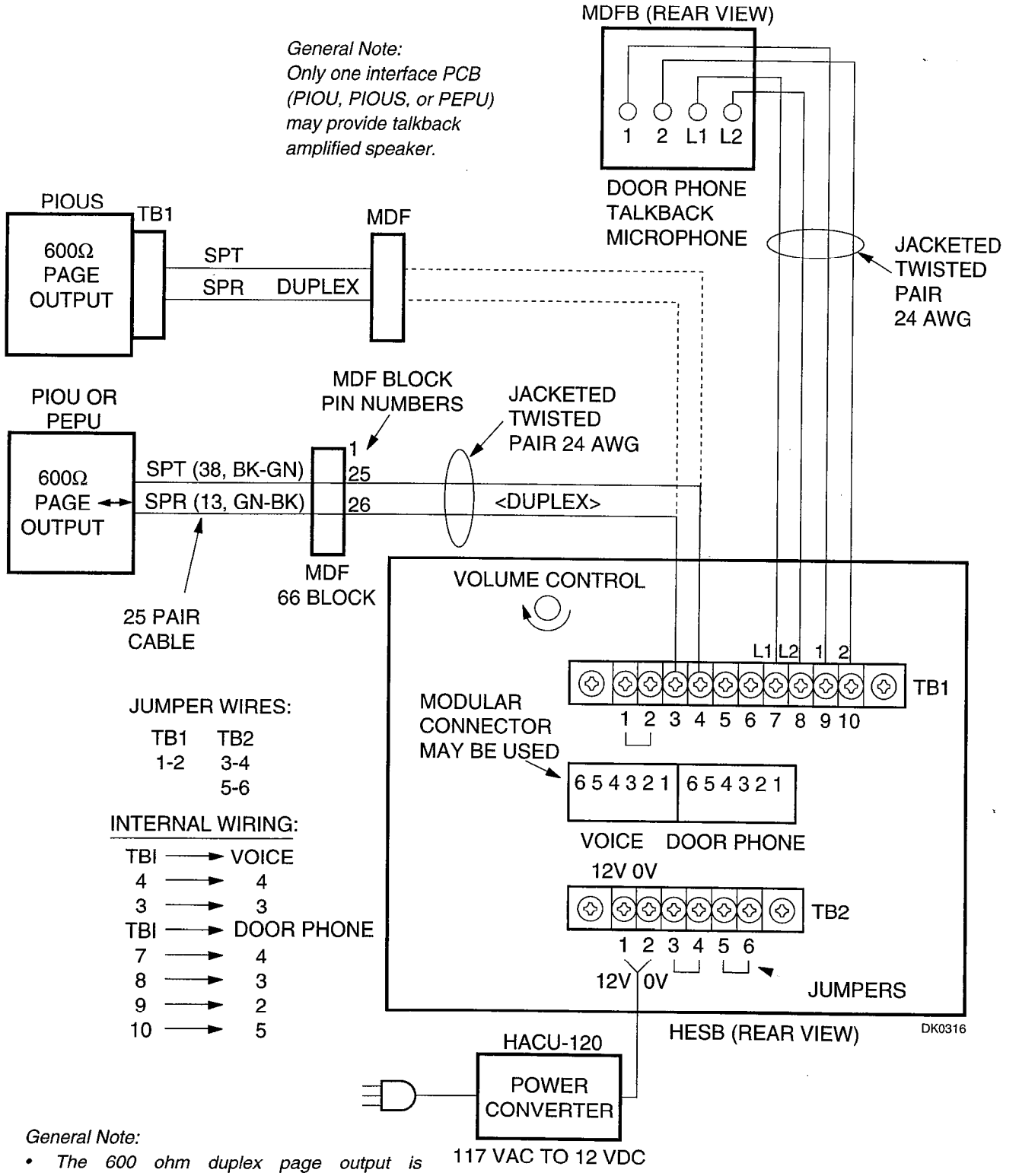


Figure 6-13
HESB/Amplified Speaker Wiring



General Note:

- *The 600 ohm duplex page output is compatible with most commercially available talkback amplifiers. – MDFB not required.*

Figure 6-14
HESB/Talkback Amplified Speaker Wiring

Talkback Amplified Speaker Test

Test the talkback amplified speaker installation in accordance with the following steps:

1. Make an external page.
   - Page will be heard over the HESB.
2. Verify that someone speaking into the door phone can be heard at the paging station. (With this application, pressing the door phone button is not required to talk back through the door phone.)

HESB Wall Mounting

Some applications may require that the HESB is mounted on a wall or other vertical surface. Mount the HESB in accordance with the following steps (Figure 6-15):

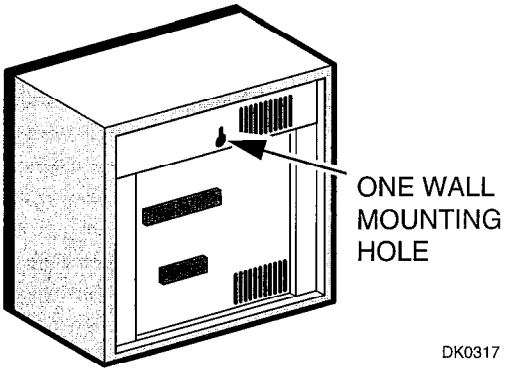


Figure 6-15
HESB Wall Mounting

1. Find a suitable location on the mounting surface for the HESB.
2. Screw a 1.25-inch panhead wood screw into the mounting surface.
3. Hang the HESB from the screw.

6.5 External Page Options

6.5.1 System Hardware Requirements

Strata DK280 systems offer a variety of external page options. Additionally, a BGM option is available with each external page option. DK systems support:

- Paging with BGM (same amplifier)
- Zone Paging with BGM (separate amplifiers)
- Zone Paging with BGM (multiple amplifiers)

Notes:

1. *The PIOU PCB only is equipped with Zone Paging.*
2. *The PIOU/PIOUS/PEPU with the lowest Program 03 code (41, 42, or 43) will provide the External Page options.*

A PIOU, PIOUS, or PEPU PCB is required to support the external paging/BGM options. The PIOU will support any of the paging/BGM options. The PEPU and PIOUS will support only the paging with BGM (same amplifier, no zone page) option.

6.5.2 External Page Option Installation

All paging connections are made via the PIOU or PEPU amphenol connectors or the PIOUS TB1 terminal to the Main Distribution Frame (MDF).

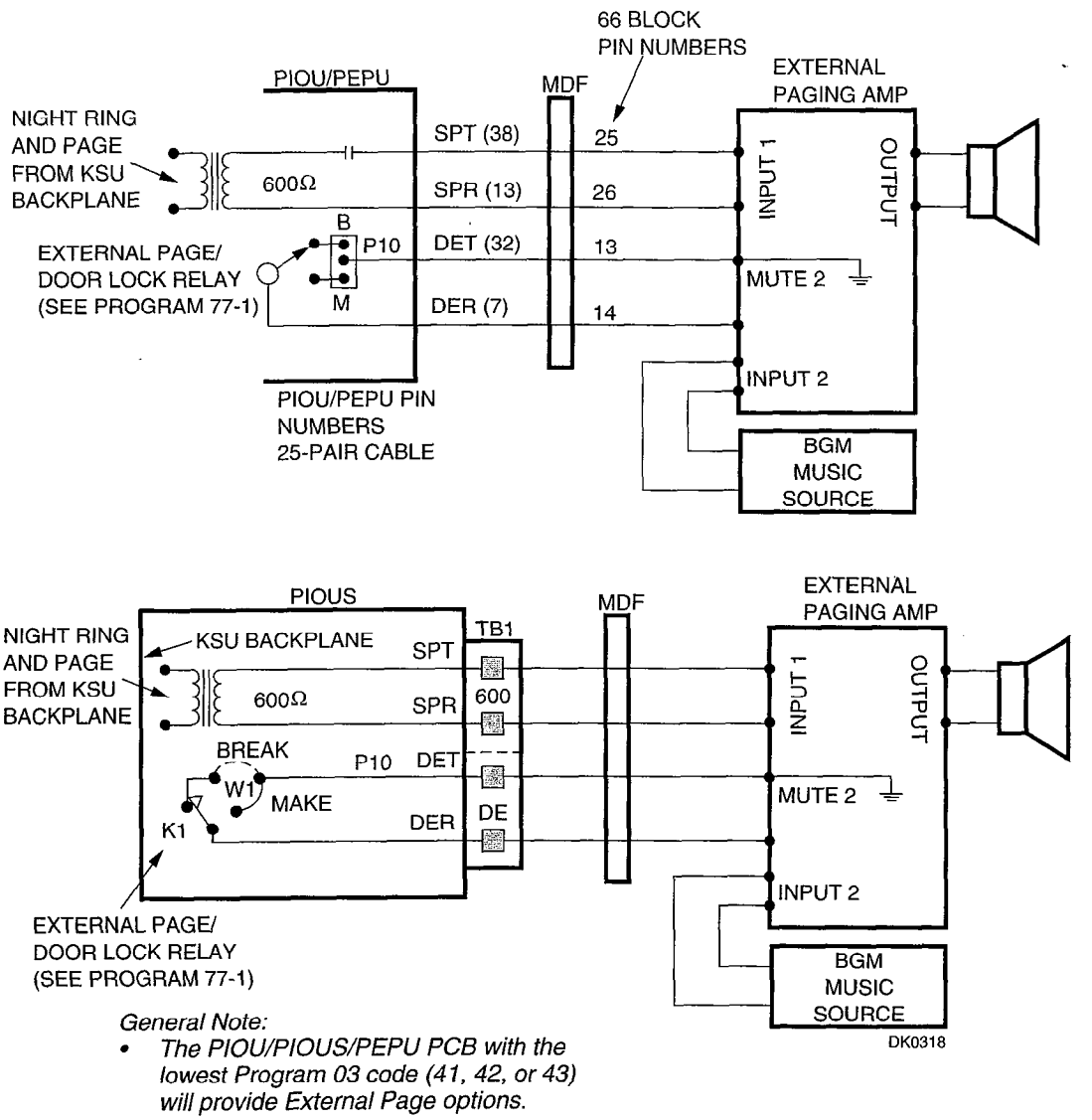
Page (single zone) with BGM (same amplifier)

In this configuration, paging and BGM are amplified by a common customer-supplied paging amplifier. When the external page access code is dialed, the external page control relay is activated, which applies a short (or opens the contacts) to the amplifier mute control to mute the music. Install this option in accordance with the following steps: (Refer to Figure 6-16.)

1. Connect input 1 from the paging amplifier to pins 13 (SPR) and 38 (SPT) of the PIOU or PEPU; or connect to SPT and SPR of the PIOUS.
2. Connect the paging amplifier mute terminal to pins 7 and 32 of the PIOU or PEPU; or connect to DET and DER of the PIOUS.
3. Connect the music source to the input 2 of the paging amplifier.
4. Connect the speaker to the paging amplifier output.
5. Verify that the PIOU or PEPU P10 jumper plug is in the MAKE position or that the PIOUS W1 jumper wire is in the MAKE position.

Zone Page with BGM (separate amplifiers)

This configuration provides multiple-zone paging capability. The output of the paging amplifier is routed back to the PIOU, where it is switched to one of four sets of speakers by PIOU Relays K1 through K4. The relay selected is determined by the access code dialed by the station user. Default access codes are:



General Note:

- *The PIOU/PIOUS/PEPU PCB with the lowest Program 03 code (41, 42, or 43) will provide External Page options.*

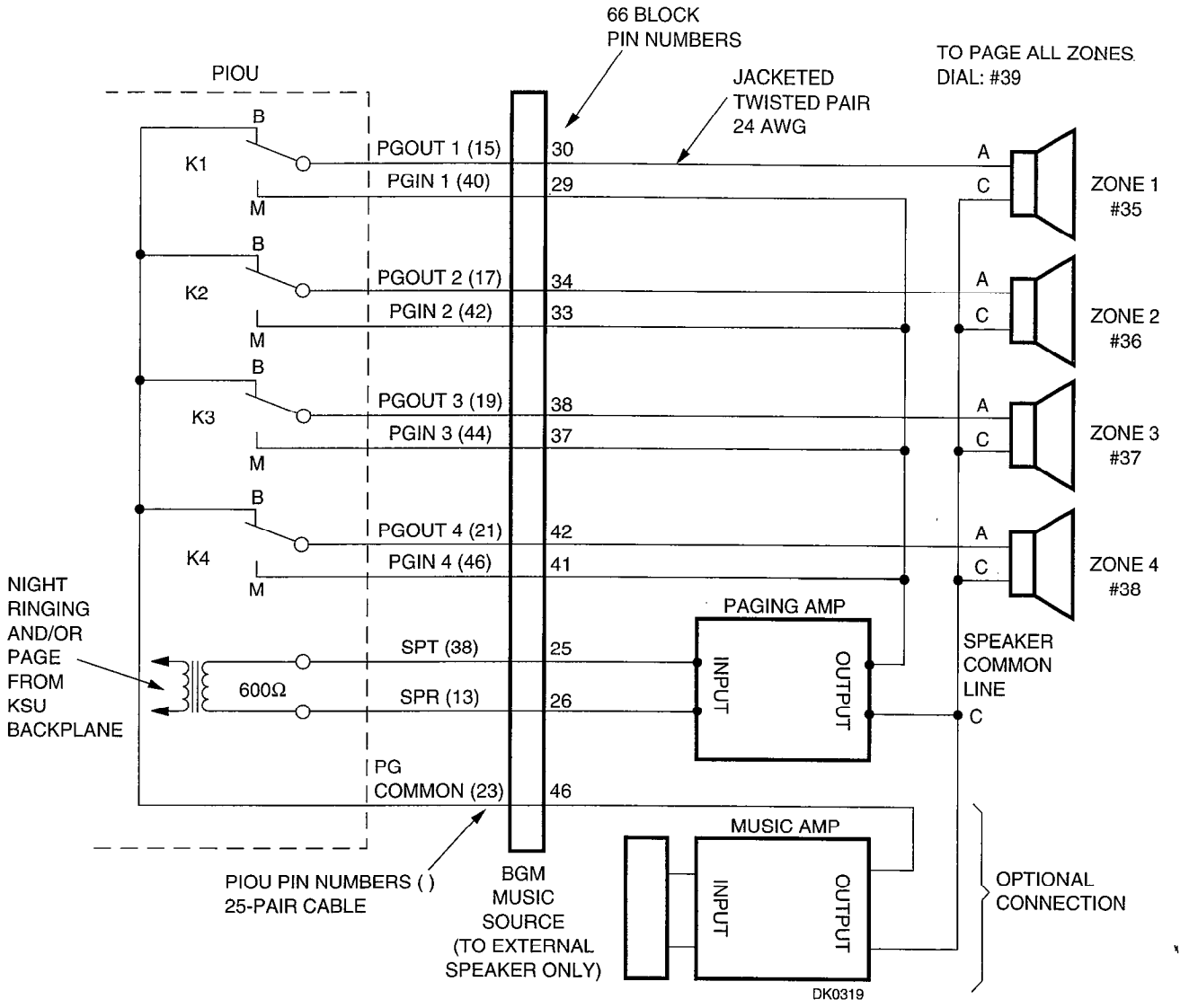
Figure 6-16
Page and BGM Using the Same Amplifier (PIOU/PIOUS/PEPU)

PIOU Relay:	DKT LCD Display:
K1/zone 1 = #35	External Paging A
K2/zone 2 = #36	External Paging B
K3/zone 3 = #37	External Paging C
K4/zone 4 = #38	External Paging D
All zones = #39	EXT + ALL CALL PAGE

Note:
Multi-zone page output rating is 30W/maximum at 300 ohms.

An all zone page code (#39) is also available as an option (see Program 10-2). When the All Page code is dialed, all four relays are activated to permit simultaneous paging to all speaker zones and all digital and electronic telephone speakers. Install this option in accordance with the following steps: (Refer to Figure 6-17.)

1. Connect the input from the paging amplifier to pins 13 (SPR) and 38 (SPT) of the PIOU.
2. Connect the BGM music source to the music amplifier input.



General Notes:

- *See Programs 78-1, *15 and 77-3 for Night Ringing CO line and Tenant (1-4) assignment options.*
- *Dial Intercom + #59 to pick-up night ringing CO lines.*
- *The PIOU with the lowest Program 03 code (41, 42, or 43) will provide the External Page and Night Ring options.*

Figure 6-17
PIOU Zone, Page/BGM/Night Ring (Separate Amplifiers)

3. Connect the paging amplifier output to the "M" contact's PIOU relays K1 ~ K4 and the "C" terminal of zone 1 ~ zone 4 speakers.

4. Connect the BGM music amplifier output to terminal 23 (PG COMMON) of the PIOU, and to "C" of zone 1 ~ zone 4 speakers.

Zone Page with BGM (multiple amplifiers)

This configuration also provides multiple-zone paging capability, as in Subsection 6.5.2, paragraph 3. However, separate amplifiers are used for each zone. Install this option in accordance with the following steps: (Refer to Figure 6-18.)

1. Connect the inputs from the paging amplifiers to Pins 13 (SPR) and 38 (SPT) of the PIOU.

2. Connect the music source to the music amplifier input.

3. Connect the paging amplifier outputs to "M" of the PIOU Relays K1 ~ K4 and to "C" of Zone 1 ~ Zone 4 speakers.

4. Connect the music amplifier output to terminal 23 (PG COMMON) of the PIOU, and to the "C" terminal of zone 1 ~ zone 4 speakers.

5. Connect zone 1 ~ zone 4 speakers "A" terminal to the "B" contact of the PIOU relays K1 ~ K4, respectively.

Night Ringing Over Selected Page Zones.

In systems shared by 1 ~ 4 tenants, each tenant's CO lines can be assigned to night ring separate PIOU external page zones. This feature can also be used in one-tenant systems.

With shared systems, for example, Tenant 1's night ringing CO lines could be programmed to ring PIOU external page Zones 1 and 2, while Tenant 2's lines could be programmed to ring Zones 3 and 4. In non-shared systems, night ringing CO lines can be assigned to ring all of the zones or just selected zones.

RCTU A, RCTU B, and RCTU C/D provides four tenants.

The following programs must be used to assign CO lines to ring selected PIOU page zones:

Program 78-1—Assigns CO lines, Tenant 1 thru Tenant 4, that will night ring over PIOU external page zones.

Program *15—Assigns CO lines to Tenant 1 thru Tenant 4. Lines are initialized as Tenant 1. RCTUA and RCTUB provides two tenants, RCTUC/D provides four.

Program 77-3—Assigns Tenant 1 thru Tenant 4 CO lines to night ring specific PIOU external page zones.

Program 39—Assigns appropriate Night Transfer and Tenant Pick-up (for Tenant or Non-Tenant systems) buttons to electronic and digital telephones.

Notes:

1. *See Subsection 6.5.2, paragraph 4 and Figure 6-17 for PIOU zone paging installation instructions.*

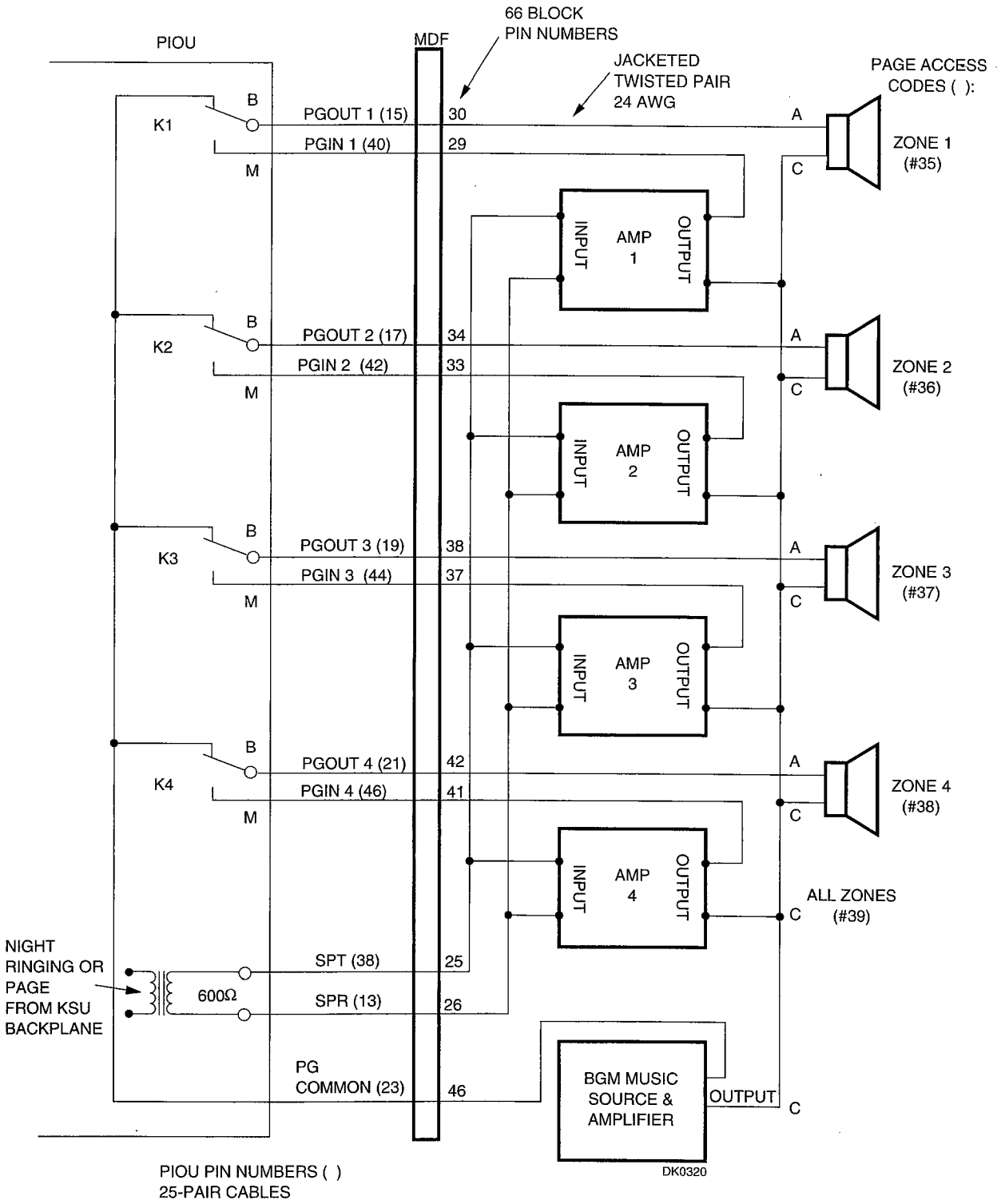
2. *Any station can pick up CO lines that night ring over external page zones by pressing the* **Intercom (INT)** *button and dialing* **# 5 9**.

6.6 Two-CO Line External Amplified Conference

Customer-supplied two-way amplifiers can be installed to amplify two-CO line tandem (DISA, External Call Forward) and/or conference calls. As many as four amplifiers (4-RCTUB, and C/D; 3-RCTUA) can be installed to support up to four of these calls occurring simultaneously. If three amplifiers are installed, three simultaneous calls can be supported, and so on. If all amplifiers are in use, then subsequent two-CO line tandem calls and/or conference calls will be unamplified. Each amplifier is connected to two designated PEKU station ports and will automatically be switched into a two-CO line connection established between any CO lines in the system.

Amplified Talk Path

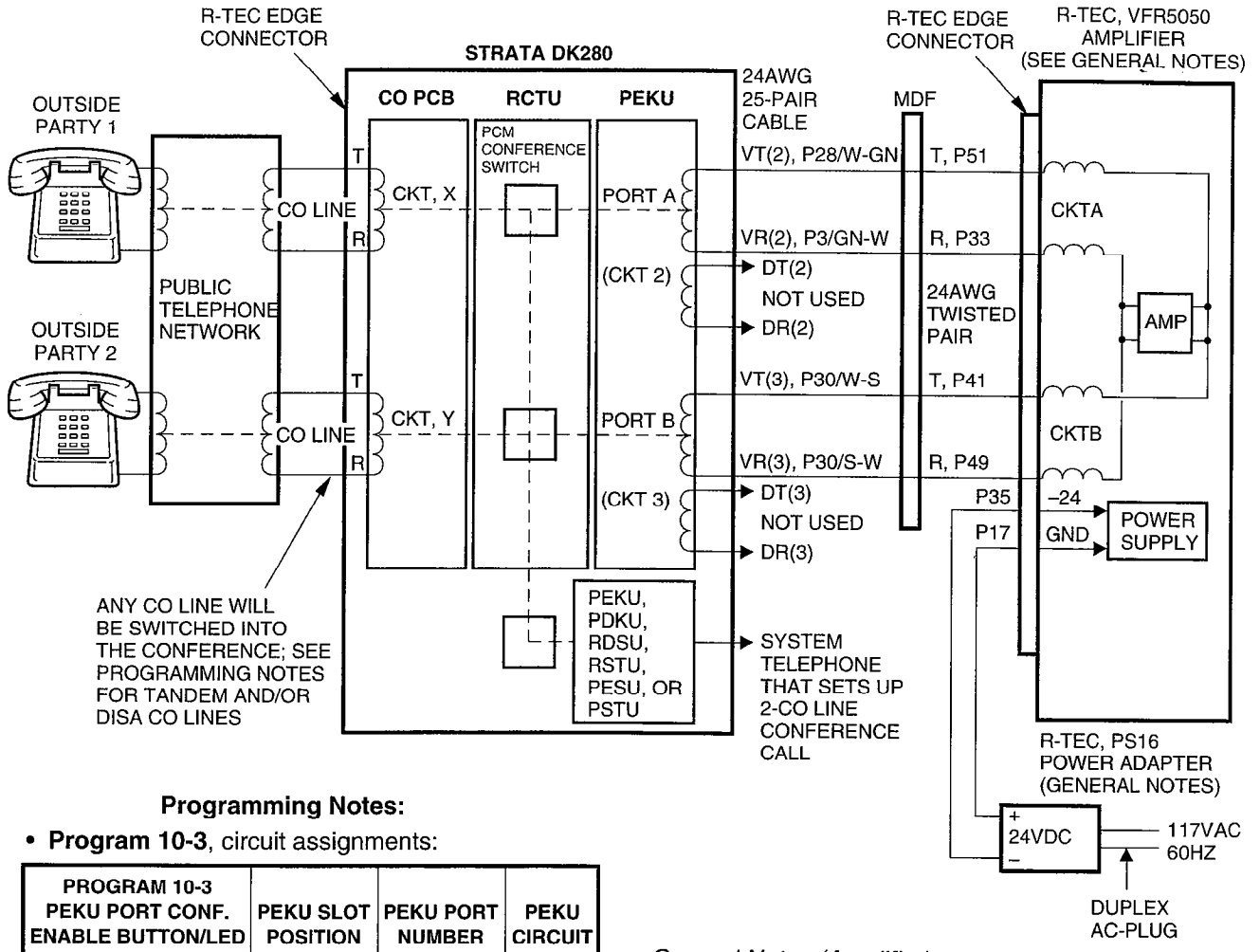
Figure 6-19 provides a functional diagram of a two-CO line amplified conference connection. (An R-TEC VFR5050 amplifier is used here.) The talk path for the connection is as follows: outside party 1—public telephone network—CO PCB, CKTX—RCTU—PEKU, port A—into AMP, CKTA—Out AMP, CKTB—PEKU, port B—RCTU—CO PCB, CKTY—public telephone network—outside party 2. This path is two-way so when outside party 2 talks, the talk level is amplified in the reverse direction.



General Notes:

- *See Programs 78-1, *15 and 77-3 for Night Ringing CO line and Tenant (1-4) zone assignment options.*
- *Dial Intercom + #59 to pick-up night ringing CO lines.*
- *The PIOU with the lowest Program 03 code (41, 42, or 43) will provide the External Page and Night Ring options.*

Figure 6-18
PIOU Zone Paging and Night Ringing with Multiple Amplifiers



Programming Notes:

- **Program 10-3**, circuit assignments:

PROGRAM 10-3 PEKU PORT CONF. ENABLE BUTTON/LED	PEKU SLOT POSITION	PEKU PORT NUMBER	PEKU CIRCUIT
LED 01, **ON**	12	A = 009 B = 010	CKT2 CKT3
LED 02, **ON**	13	A = 017 B = 018	CKT2 CKT3
LED 03, **ON**	14	A = 025 B = 026	CKT2 CKT3
LED 04, **ON**	15	A = 033 B = 034	CKT2 CKT3

- **Program 10-1**, LED 19 and 20 ON.
- **Program 15-5**, enable appropriate CO lines for tandem connection.
- **Program 78-2**, enable appropriate CO lines if amplified DISA is required.
- **Program 10-2**, LED 18 and 19 ON.

DK0321

General Notes (Amplifier):

- *All amplifier equipment is customer or dealer-supplied.*
- *Use a 2-way, telephone CO line amplifier that is FCC Part 68 registered and provides automatic gain control; the above example is with a Reliance Electric Co., R-TEC VFR5050 (VVSG) Repeater, with 500-X or 500-X-CT mounting assembly and a PS16 power adapter.*
- *Recommended switch settings for VFR5050 are:*
  - *FLAT GAIN (1, 2, 4, 8): all ON*
  - *Equalizer (1 ~ 5): all OFF*
  - *Sensitivity: NORM*
  - *S1 screw: down = Data DIS OFF*
- *The above R-TEC options may be different for some installations; see R-TEC VFR5050 installation Practice before installing VFR5050.*

Figure 6-19
External Amplified Two-CO Line Call Functional Wiring Diagram

Note:
Only the outside party 1 talk path is amplified to/from a system telephone when it is connected into a two-CO line conference.

6.6.1 Amplifier Requirements

- Customer-supplied (four maximum).
- Must be FCC-registered, Part 68, and provide automatic gain control.
- Each amplifier requires two PEKU station ports.
- Refer to the amplifier manufacturer's installation documentation for amplifier grounding instructions.

Installation: Connect a two-way amplifier to the Strata DK280 system in accordance with the following steps (see Figures 6-19 and the Amplified Two-CO Line Conference wiring diagram in Chapter 7—Wiring Diagrams).

1. At the main distribution frame (MDF), connect the voice pair (VT, VR, port A) of Circuit 2 on the designated PEKU PCB to one input of the customer-supplied two-way amplifier. In the example in Figure 6-19, this is CKTA (Central Office Side A) of the VFR5050.
2. At the MDF, connect the voice pair (VT, VR, port B) of circuit 3 on the designated PEKU PCB to the other input of the amplifier. In the Figure 6-19 example, this is CKTB (subscriber side B) of VFR5050.
3. Plug the amplifier's power cord into the 117VAC (standard) wall outlet.
4. Set the gain and other amplifier parameters options per the amplifier manufacturer's installation documentation.
5. Program the Strata DK280 system as follows:
   - **Program 10-3**—Enables the appropriate PEKU PCB ports for amplifier connection. Only enable the ports that will be connected with the amplifier(s).
   - **Program 15-5**—Enables appropriate CO lines for Two-CO line tandem connection.
   - **Program 10-1**—LEDs 19 and 20 must be ON.
   - **Program 10-2**—LED 18 must be ON.

   Note:
   LED 19 in Program 10-1 should be ON if it is certain that an amplifier will always be available for two-CO line conference connections (four maximum, simultaneously). If this LED is ON and a two-CO line connection is established without an external amplifier, the Strata DK280 station may be unbalanced and receive a hum noise. LED 19 provides additional station amplification when external amplifiers are switched into two-CO line connections.

6.7 Station Message Detail Recording (SMDR) Printer/Call Accounting Device Options

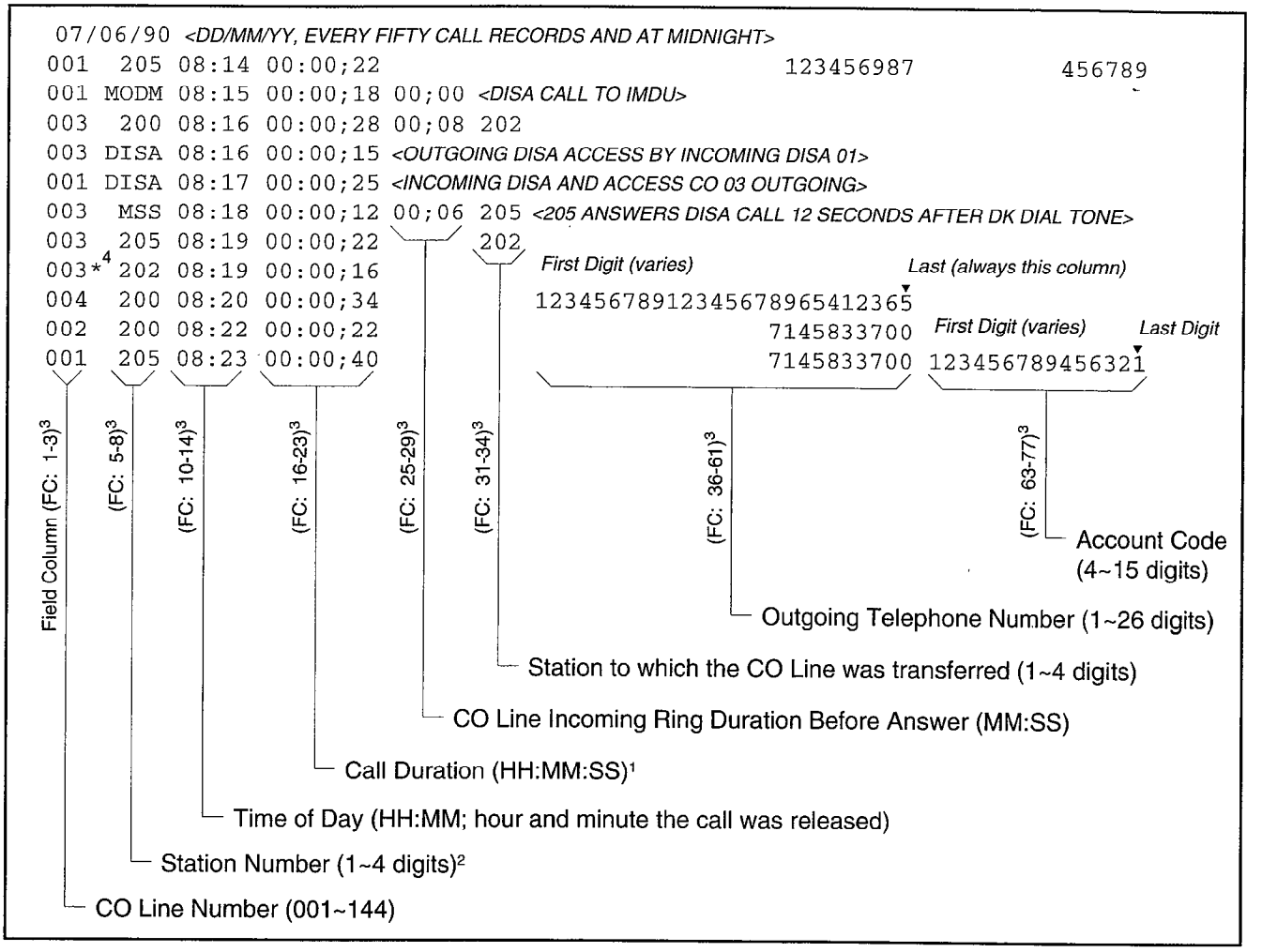
An SMDR printer or call accounting device may be connected to the system to provide a hard-copy record (Figure 6-20 and 6-21) of station activity. The Strata DK280 system can record incoming, outgoing, and transferred calls, as well as Account Code entries. Call record data is printed out at the completion of each eligible call. SMDR format is ASCII-formatted, 8-bits, no parity, 1-stop bit. PIOU/PIOUS will be 300 or 1200 bps (see Chapter 4—Printed Circuit Boards) and RSIU or RSIS can be 1200~9600 bps (see Program 76).

Program SMDR with Program 60—The SMDR port will be active only on the PIOU or PIOUS with the lowest Program 03 code (41, 42, or 43). or the RSIU or RSIS Port programmed with code x2 in Program 76-1.

Note:
If PIOU/PIOUS and RSIU/RSIS are assigned as SMDR simultaneously in programming, RSIU/RSIS will operate as SMDR–not PIOU/PIOUS. A display of the customer data base (Figure 6-22) can also be printed using the SMDR RS-232 port by running Program 97.

SMDR will send out special names for the following types of calls:

- MSS: Prints on Direct Inward System Access (DISA) and External Call Forward calls to stations (see Note 2).
- MODM: Prints on calls to the RMDS or IMDU remote maintenance modem (Station #19).
- DISA: Prints on DISA and External Call Forward calls in which CO lines are accessed for trunk-to-trunk outside calling.



DK0322

Notes:

1. *Call Duration (incoming, outgoing, or transfer) must be 1 or 10 seconds (minimum) to generate a call record printout. It can be set to 1.0 or 10 seconds using Program 60-2.*
2. *"MSS": designates a Direct Inward System Access (DISA) or External Call Forward CO call to a station that is not answered; or, answered after 1 or 10 seconds per Program 60-2. The call will register as a normal incoming call if answered before the threshold time (1.0 or 10 seconds depending on Program 60-2). DISA calls always register 05 ~ 06 seconds ring before answer duration time.*
3. *Field column information is provided for SMDR output formatting purposes.*
4. *The "*" indicates that the call was disconnected by the Central Office Calling Party Control (CPC) or Automatic Release (AR) signal. Loop start CO lines must have Programs 15-0 and 15-3 enabled to be dropped by the CPC signal.*

General Notes:

- *"MODM": designates a call to the IMDU, Remote Maintenance Modem.*
- *"DISA": designates a DISA or External Call Forward call thru the system via CO to CO connection.*
- *The call record data is ASCII-formatted, 8 bits; no parity, 1-stop bit.*
- *Special dial printout:*
  Tone = "T"
  Long pause = "L"
  Flash = "F"
  Pause = "P"

Figure 6-20
SMDR Printout Examples for DK280 Release 1 and 2

Notes:

1. *The call threshold time—the length of time that a call must be in progress before it is registered by SMDR—can be set for either 1.0 or 10 seconds in Program 60-2.*
2. *MSS will print only on DISA calls that are answered after the threshold time (set in Program 60-2). If the call is answered before the threshold time, the call will register as a normal incoming call and the MSS/transfer portion of the call will not print out.*

Figure 6-20 (Release 1 and 2) and 6-21 (Release 3 and above) shows a sample SMDR printout and describes the contents of each column of the printout. The following examples show several call record samples and describe the sequence of events which occurred to generate the call records.

Note:

SMDR printout "time of day" and day/month/year (DD/MM/YY) is the same as the system clock time/date set by the station connected to Port 000. SMDR DD/MM/YY will print out each time 50 call records are generated and at midnight each day.

SMDR Printout Examples

Direct Inward System Access (DISA) CO Lines

Note:

DISA station calls print out as MSS or DISA.

Example 1—Ring, No Answer DISA Call

Call Sequence A

- Outside caller rings CO line 003. (CO line 003 is programmed as a DISA line.)
- Line 003 returns internal dial tone to caller after one or two ring cycles (five ~ six seconds).
- Caller does nothing. DH 200 rings but is not answered.
- After 32 seconds, call is disconnected.
- Printout A prints after disconnect at 4:59.

Printout A (Release 1 and 2)

```
003 MSS 04:59 00:00;32 00;06
```

Printout A (Release 3 and above)

```
003 MSS     04:59 00:00;25 00;05
```

Example 2—DISA Internal Station Call

Call Sequence B

- Outside caller rings CO line 003. (CO line 003 is programmed as a DISA line.)
- Line 003 returns intercom dial tone to caller after two ring cycles (5 ~ 6 seconds).
- Caller dials 203.
- After 48 seconds from start of call, station 203 answers.
- Printout B prints after station 203 answers the call at 4:32.

Note:

MSS will not print if the call is answered before the threshold time set in Program 60-2.

Printout B (Release 1 and 2)

```
003 MSS 04:32 00:00;48 00;05 203
```

Printout B (Release 3 and above)

```
003 MSS   04:32 00:00;48 00;05 203
```

Example 3—DISA Outgoing CO Line Call

Note:

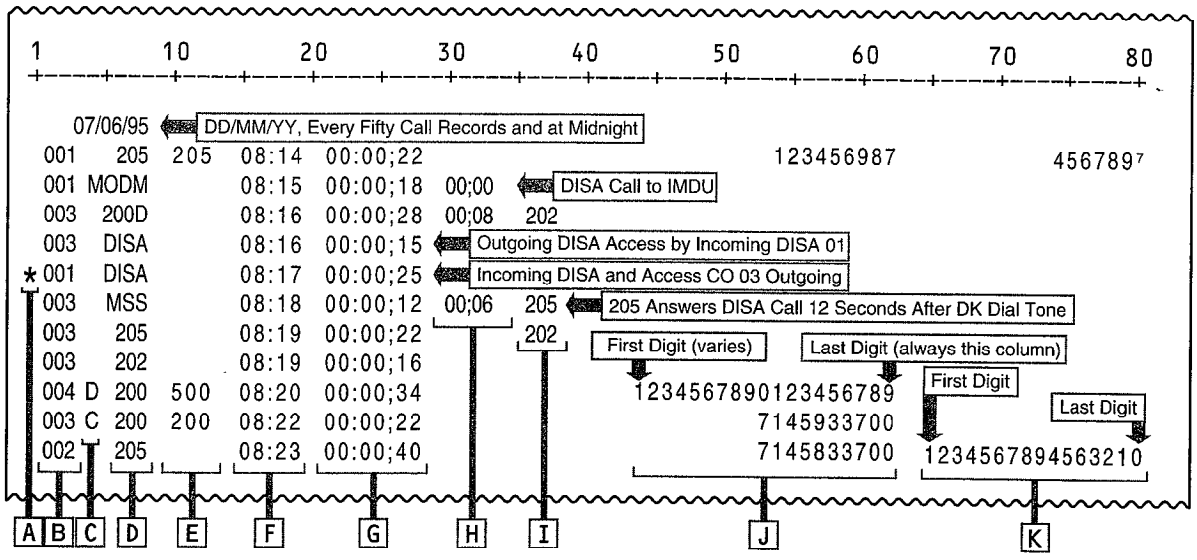
DISA CO line calls print out as DISA.

Call Sequence C

- Outside caller rings CO line 001. (Line 001 is programmed as DISA.)
- Line 001 returns intercom dial tone after two ring cycles (5 ~ 6 seconds).
- Caller dials #7003 to access CO line 003 (outgoing).
- Caller dials the DISA security code and receives CO dial tone.
- Caller dials the telephone number and converses when the call is answered.
- Caller hangs up.
- The call releases, and Printout C prints after the call disconnects at 12:22.

Notes:

1. *If the CO provides the Calling Party Control or Auto Release (AR) signal (see Program 15-0 and 15-3), the call disconnects when either party hangs up. A "*" will follow the CO line number in Release 1 and 2 and precede the CO line number in Release 3 on the printout if the call is disconnected by the CPC or AR signal.*



A	* Indicates a disconnected call.[4]	Field Number 1
B	CO Line Number (001 ~ 144).	Field Number (2 ~ 4)[3]
C	C = Caller ID Call; D = ANI or DNIS Call.	Field Number 5
D	**[PDN]** of the Station (1 ~ 4 digits)[2] making/answering a call.	Field Number (7 ~ 10)[3]
E	Primary, Secondary, or Phantom Directory Number which made/ answered the call (1 ~ 4 digits). Blank if call is made from a CO line button.	Field Number (12 ~ 15)[3]
F	Time of Day (HH:MM; hour and minute the call was released).	Field Number (17 ~ 21)[3]
G	Call Duration (HH:MM;SS).[1]	Field Number (23 ~ 30)[3]
H	CO Line Incoming Ring Duration Before Answer (MM:SS).	Field Number (32 ~ 36)[3]
I	Station to which the CO line was transferred (1 ~ 4 digits).	Field Number (38 ~ 41)[3]
J	Outgoing Telephone Number ◆ Incoming Calls (1 ~ 20 digits).[5] ANI Number (10 digits) DNIS Number (2 ~ 5 digits) Caller ID Number or ID Code ◆ Outgoing Calls (1 ~ 20 digits).	Field Number (43 ~ 63)[3] DNIS/ANI Format: * 7145833730 * 3846 * ANI DNIS
K	DNIS NAME[5] (0 ~ 16 characters) Caller ID NAME[5] (0 ~ 16 characters) or Account Code[6] (4 ~ 15 digits).	Field Number (65 ~ 80)[3]

Notes:

1. *Call Duration (incoming, outgoing, or transfer) must be 1 or 10 seconds (minimum) to generate a call record printout. It can be set to 1.0 or 10 seconds using Program 60-2.*
2. *"MSS": designates a Direct Inward System Access (DISA) or External Call Forward CO call to a station that is not answered; or, answered after 1 or 10 seconds per Program 60-2. The call will register as a normal incoming call if answered before the threshold time (1.0 or 10 seconds depending on Program 60-2). DISA calls always register 05 ~ 06 seconds ring before answer duration time.*
3. *Field column information is provided for SMDR output formatting purposes.*
4. *A "*" in the first column indicates that the call was disconnected by the Central Office Calling Party Control (CPC) or Automatic Release (AR) signal. Loop start CO lines must have Programs 15-0 and 15-3 enabled to be dropped by the CPC signal.*
5. *ANI, DNIS, and Caller ID information is sent out the SMDR port for Answered Calls only. Abandoned calls; ANI, DNIS, and Caller ID information is not sent out the SMDR port, but it can be stored in station memory. See **Program *51** and ***52**.*
6. *See Program 60-1.*
7. *DK will send a Carriage Return (CR) and Line Feed (LF) ASCII symbol after each line of data.*

General Notes:

- *"MODM": designates a call to the IMDU, Remote Maintenance Modem.*
- *"DISA": designates a DISA or External Call Forward call thru the system via CO to CO connection.*
- *The call record data is ASCII-formatted, 8 bits; no parity, 1-stop bit.*
- *Special dial printout: Tone = "T", Long pause = "L", Flash = "F", Pause = "P"*

DK0323

Figure 6-21
SMDR Printout Examples for DK280 Release 3

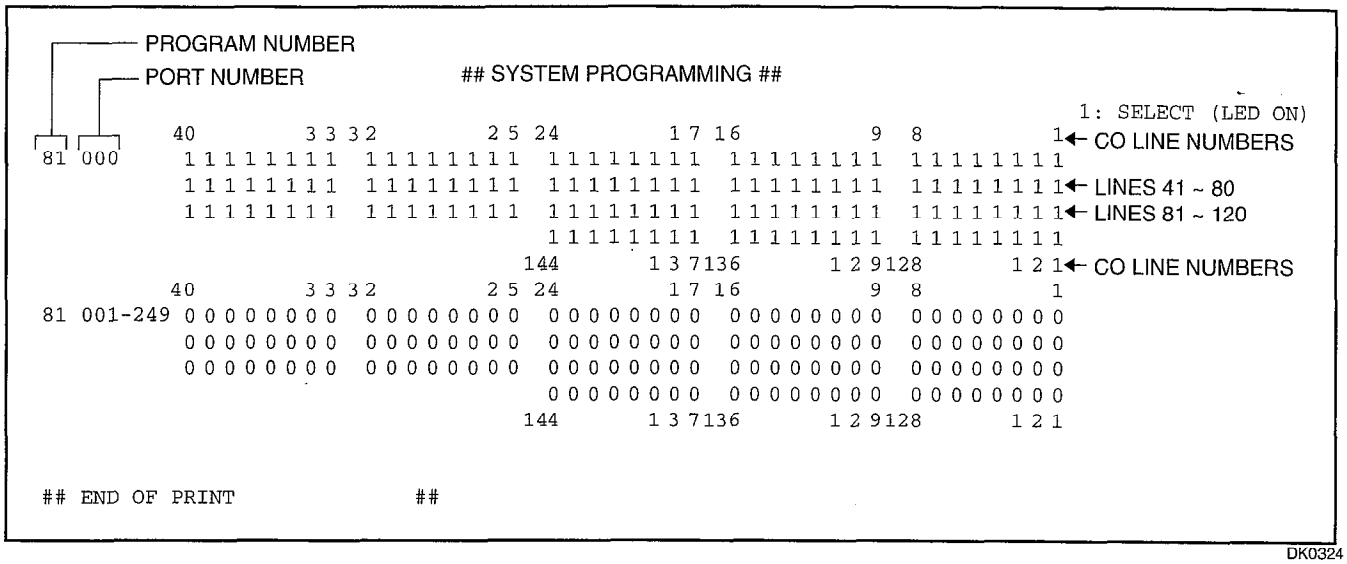


Figure 6-22
PIOU/PIOUS RSIU/RSIS SMDR Port (Program 97) Data Dump Example

2. *If the CPC or AR signal is not sent, the CO lines will remain seized until the DISA disconnect timer releases the call (see Program 12).*

Printout C

Auto Release signal: (Release 1 and 2)

```
003  MSS 12:20 00:00;02 00:06
   (outgoing)
003* DISA 12:22 00:02;01 (outgoing)
001  DISA 12:22 00:02;01 (incoming)
```

Auto Release signal (Release 3 and above)

```
 003 MSS   12:20 00:00;03 00:05 DISA
   (outgoing)
*003 DISA   12:22 00:02;01 (outgoing)
 001 DISA   12:22 00:02;01 (incoming)
```

Disconnect Timer (Release 1 and 2)

```
001 DISA 12:24 00:04;57 (incoming)
003 DISA 12:24 00:04;57 (outgoing)
```

Disconnect Timer (Release 3 and above)

```
001 DISA   12:24 00:04;57 (incoming)
003 DISA   12:24 00:04;57 (outgoing)
```

Note:
The "MSS" entry will print out only if the call was connected after the SMDR threshold, 1.0 or 10 seconds. The threshold is set in Program 60-2.

System Program Data Printout

If a printer is connected to the SMDR port, customer program information stored in the RCTU RAM may be printed out for reference by using Program 97 (see Subsection 6.7.1, paragraph 3).

6.7.1 SMDR Hardware Requirements

A Strata DK280 system must be equipped with a PIOU, PIOUS or RSIU (RSIS) PCB to support the SMDR printer/call accounting device option. Connection of the printer or call accounting device to the PIOU, PIOUS or RSIU (RSIS) PCB is accomplished with a 3-pair modular cord (7 feet maximum) and a PPTC connector adapter (Figure 6-23). Call record data is ASCII-formatted, 8 bits, no parity, 1-stop bit.

The PIOU, PIOUS or RSIU (RSIS) contains a call record buffer which stores call record data (for up to 50 calls) when the printed or call accounting device is turned off, or when no device is connected to the SMDR port. No further call records are stored after the buffer is filled. When the printer or call accounting device is made operational, an "ERROR BUFFER OVERFLOW" message is printed to indicate that the buffer was full, and that some call information may have been lost.

SMDR Programming Considerations

Selectable programming options for the SMDR printer or call accounting device are as follows:

Program 03

- The SMDR output will be provided by the PIOU or PIOUS with the lowest code assigned (41, 42, or 43).
- If using RSIU or RSIS PCB in slot 11 for SMDR, set Program 03 code 49 for slot 11.

  Note:
  RSIU/RSIS Program 76-1 code x2 will override PIOU/PIOUS SMDR assignments and code 49 for RSIU/RSIS.

Program 60

- Item 1—Selects Caller ID, ANI and DNIS or Account Code to be sent out the SMDR Port.
- Item 2—Selects the minimum duration (1.0 or 10 seconds) of calls that will be registered by SMDR . Any call that lasts less than the set time will not be recorded.
- Item 3—Selects the records of outgoing calls or outgoing and incoming calls to be printed.
- Item 4—Selects the digit length of Account Codes (4 to 15 digits).
- Item 5—Allows only long distance call records to be printed.
- Item 6—DISA security code.
- Item 7—Credit card calling digit length.

Program 76—If RSIU or RSIS is used to interface to the SMDR device use Program 76 to make the appropriate RSIU/RSIS SMDR programming assignments.

Program 97—Allows system program data to be printed via the SMDR port (See Program 97 record sheet and Figure 6-22).

Notes:

1. *An SMDR printer must be connected to the SMDR port to use the printout option selected by Program 97.*
2. *Call record data is lost when program data is printed out using Program 97.*

6.7.2 SMDR Printer/Call Accounting Device Installation

Install the SMDR printer/call accounting device option in accordance with the following steps: (Refer to Figure 6-23 and related drawings in Chapter 7—Wiring Diagrams.)

1. Connect the interface cable and the PPTC or PPTC9 adapter from the PIOU, PIOUS, RSIU, or RSIS SMDR port to the SMDR printer or call accounting device DB25 or DB9 connector.
2. Set the PIOU or PIOUS SW1 switch to the appropriate bps rate (300 or 1200 bps), as determined by the baud rate of the printer or call accounting device (Program 76 set RSIU/RSIS bps rate).
3. Set the printer or call accounting device to 8-bits/no parity/one stop bit.
4. Use Program 60 to set the system for the required SMDR printer/call accounting device options (refer to Subsection 6.7.1, paragraph 3 and the Programming Part).

6.8 Voice Mail Options

6.8.1 System Hardware Requirements

Strata DK280 systems can support a Toshiba VP or Stratagy voice mail messaging system or a customer-supplied voice mail system.

Voice mail systems connect to standard telephone circuits (RSTU, RSTU2, RDSU/RSTS, PSTU or PESU). The number of circuits required by each device depends on the customer's voice mail requirements, such as the number of voice mail users. The RCTU must be equipped with a RRCS to support voice mail.

Voice mail integration is provided by Strata in-band tones and/or the Simplified Message Desk Interface (SMDI) output of the PIOU, PIOUS, RSSU, RSIU, or RSIS SMDI port. The PIOU/PIOUS/RSSU must be set with Program 03, code 43 or for RSIU/RSIS Program 03, code 49 and Program 76-1 must be set with code x4 to provide SMDI output. See the SMDI section for more details about SMDI installation and operation.

6.8.2 Toshiba VP Voice Messaging System

Strata DK280 systems are designed to support the full range of features offered by the Toshiba VP and/or Stratagy. It provides various call routing, message handling, and information management features, including:

- Auto Attendant

- Call Forward to Voice Mailbox
- Message Waiting Indication
- Voice Mail Control from Digital and Electronic Telephones
- System Monitoring
- Feature Integration

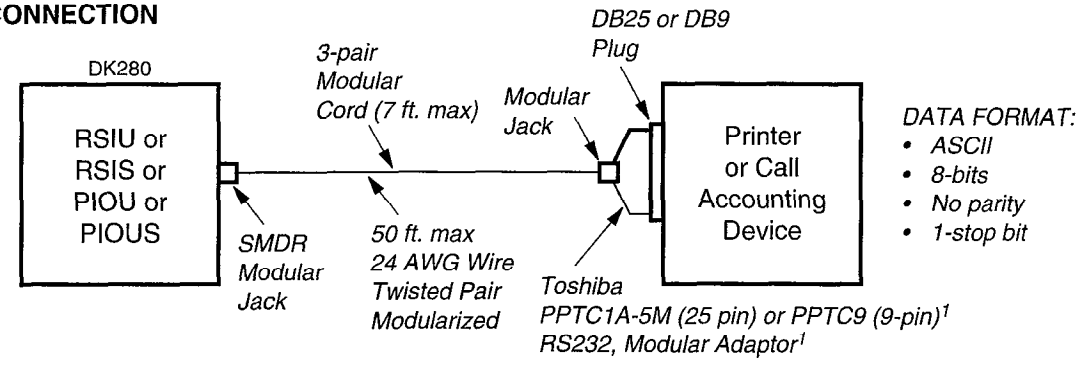
A block diagram of voice mail-to-RSTU, RDSU/RSTS RSTU2 PSTU or -PESU connection is shown in Figure 6-24. See Chapter 4—Printed Circuit Boards for RSTU, RSTU2 RDSU/RSTS, PSTU and PESU installation.

Strata DK280/Toshiba VP or Stratagy Programming Considerations

Some features of Strata DK280 system programming were designed for Toshiba VP or Stratagy systems, and do not necessarily apply to customer-supplied voice mail messaging systems. These programming features are as follows:

- **Answer (A) Tone**. The Strata DK280 stations will send an answer tone to Toshiba VP or Stratagy when the station answers a Toshiba VP or Stratagy call.
- **Disconnect (D) Tone**. The Strata DK280 stations will send a disconnect tone to Toshiba VP or Stratagy when the station hangs up while connected to Toshiba VP or Stratagy. (D Tone is also sent to release the Toshiba VP or

BASIC CONNECTION



Note:
1. *If the call accounting device has a DB9 male connector, use PPTC-9.*

General Note:
- *Only the PIOU/PIOUS with the lowest code in Program 03 (41, 42, or 43) or RSIU/RSIS with Program 76-1 code X2 will provide the SMDR output.*

BASIC WIRING (See PIOU, PIOUS, RSIU, or RSIS TTY and SMDR Wiring in Chapter 7—Wiring for more details)

PIOU, SMDR Jack Modular Pin No.	PPTC1A-5M Adaptor		RS-232 Lead Name
	Modular Pin No.	DB25 Pin No.	
1 To →	6 To →	3	RD
2 To →	5 To →	2	TD
3 To →	4 To →	6	DSR
4 To →	3 To →	20	DTR
5 To →	2 To →	8	CD
6 To →	1 To →	7	SG
		4 Jumper to 5	RTS to CTS

DK0325

Figure 6-23
HESB/Electronic Telephone with Loud Ringing Bell Wiring

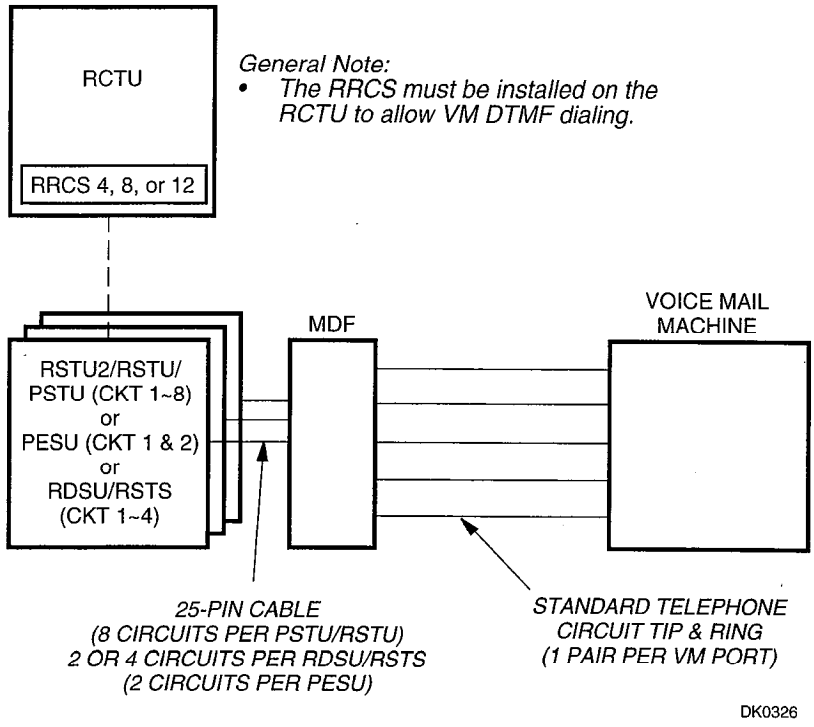


Figure 6-24
HESB/Electronic Telephone with Loud Ringing Bell Wiring

Stratagy/Auto Attendant port when an outside loop start CO line caller hangs-up and the CO provides a Calling Party Control (CPC) or Auto Release (AR) disconnect signal per Program 15-0 and 15-3. Ground start CO lines will send "D" tone to VM ports anytime an outside caller hangs up.

Notes:

1. *D Tone will not operate in all areas, because some Central Offices fail to provide the CPC or AR signal on loop start lines.*
2. *Both A and D Tones provide more efficient Toshiba VP or Stratagy port use. Always enable these options. Both options are enabled by accessing Program 31, and setting LED 15 ON.*
3. *The CPC or AR signal of some Central Offices (COs) is not reliable and may occur during a CO line voice connection, causing the call to disconnect. If this occurs, disable CPC /AR Hold and CPC/AR Voice Mail calls on all CO loop start lines with Programs 15-0 and 15-3.*

- **B Tone Signals**. Stations send a recall (B) tone to Toshiba VP or Stratagy whenever VP or Stratagy answers a transfer (camp-on) recall from stations that did not answer a Toshiba VP or Stratagy blind transfer. (The B tone notifies Toshiba VP that the call is a recall and not a new call, allowing Toshiba VP or Stratagy to respond with the appropriate greeting.) For this feature to operate, PSTU, RSTU, RSTU2, RDSU/RSTS RSTU2, or PESU voice mail ports must have LEDs 19 and 20 turned ON in Program 31.

See Subsection 6.8.4 for general voice mail programming information.

6.8.3 Customer-Supplied Voice Mail Messaging Systems

Strata DK280 systems are designed to support a wide range of customer-supplied voice mail messaging systems. Depending on the voice mail system used, some of the features available with Toshiba VP or Stratagy (refer to Subsection 6.8.2) may be available with the customer-supplied system.

6.8.4 General Voice Mail (Standard Telephone Port) Programming Considerations

Voice mail (VM) RSTU, RSTU2 RDSU/RSTS, RSTU2 PSTU or PESU port programming is accomplished using Programs 31 and 10-2. (Refer to Programming Part for more details.) VM programming features are as follows:

- VM Groups—This feature groups VM RSTU, RSTU2, RDSU/RSTS, PSTU or PESU ports together so that message waiting set/cancel signals appear to originate from the lowest port in the VM group. All VM ports connected to a particular VM machine should be set in the same VM group (Program 31, LEDs 05 ~ 08).

- Message Waiting (MW) Set/Cancel—If the VM machine has the ability to dial a code and the appropriate station numbers to set or cancel the message waiting LEDs on digital and electronic telephones, program the VM machine to dial the following sequences (Program 10-2, LED 04):

  1. To set a MW LED, the VM machine must dial **# 6 3** + **[PDN]**, **[PhDN]** or Intercom Number.
  2. To cancel a MW LED, the VM machine must dial **# 6 4** + **[PDN]**, **[PhDN]** or Intercom Number.

  Note:
  Only dial codes # 6 3 and # 6 4 are set in the VM device configuration; the VM device will dial the station number automatically to set/cancel the MW LED.

  - No Conference VM—Prevents undesired three-party connections during VM call transfers. All VM ports should be set for No Conference (Program 31, LED 09).
  - Privacy Override Deny—Prevents stations from overriding (breaking in) in-progress VM calls (Program 31, LED 18).
  - End-to-End Signaling—Allows VM port Dual-tone Multi-frequency (DTMF) operation. All VM ports should be set for end-to-end signaling (Program 31, LED 17).

  Note:
  The RRCS 4, 8, or 12 must be installed on the RCTU to allow End-to-End Signaling.

- Receive Auto Call Forward ID Codes—Provides auto digits from call forwarded stations to direct callers to station mailboxes. All VM ports should be set to receive auto ID code (Program 31, LED 16).

Voice Mail Program Checklist

The following items should be verified before programming voice mail:

1. Set Toshiba VP Maintenance Menu system parameters to "D" = Strata DK (any model). See Toshiba VP or Stratagy documentation for other parameter settings.

2. Strata DK programs:

Program 92—Initialization clears voice mail auto dial codes.

Program 03—Verifies that a RRCS is installed on the RCTU to allow the VM device to send DTMF tones. Also sets PIOU/PIOUS (code 43) or RSIU/RSIS (code 49) to enable the SMDI port (see Program 76 if installing RSIU or RSIS SMDI port).

Program 04—Assigns station Intercom or Directory numbers **[DN]** to VM ports (initialized numbers recommended).

Program 05—First digit of special codes # 6 3 and # 6 4 (initialized numbers recommended).

Program *09—Sets DID extensions to ring VM Auto Attendant Ports if Program 71 is not used.

Program 10-1—If the system is first set for voice, program the VM device to dial the suffix "1" after station numbers.

Program 10-2—If LED 04 ON for set/cancel operation and LED 06 ON for the VM to detect 80 millisecond tones. Also set DTMF Tone return or No DTMF return options (LED 11 and 20).

Program 10-3—Sets SMDI options.

Program 13—If the VM device is the message center, set the lowest VM port as the message center.

Program 31—Turns LEDs 04, 05, 09, and 15 ~ 20 ON for the RSTU, RSTU2, RDSU/RSTS, PESU or PSTU ports that are connected to the Toshiba VP and Stratagy VM ports. Do not set these options for telephone station ports.

Note:
A, D, and B Tones should be enabled only for VM devices that respond to these tones.

Program *32—Sets lowest VM port as message center for stations using VM.

Program 33—Sets the RSTU, RSTU2, RDSU/RSTS, PESU and PSTU ports that are connected to the VM ports to a hunting sequence, starting with the lowest port hunting to the next highest port, etc. The last hunt should be to an attendant station.

Program *34—Turns off LED 01 to disable camp-on BOV tone to a VM port.

Program 35—LEDs 01 and 02 must be ON for stations to receive the message waiting indication (flashing LED) from a VM device. Also, turns on LED 03 for standard telephone ports that must support standard telephone message waiting lamps. It is advisable to turn Busy Station Transfer (LED 20) ON for all VM/Auto Attendant ports, and to turn Busy Station Ringing (LED 19) ON for all stations that must never be detected as busy when called by the VM/Auto Attendant port. Also turn LED 03 off to disable standard telephone MW signal to VM ports.

Program 36—Sets Fixed Call Forward to VM **[DN]** per customer requirements.

Program 37—Sets the transfer recall timer for the VM ports to 11 ~ 999 seconds minimum to allow Call Forward-No Answer to work on VM transferred calls. Station users can individually set CF-NA ring time from 8 ~ 60 seconds.

Program 39—Sets the VM-related buttons on the digital and electronic telephones that will be used to communicate with the VM device.

Program *40—Sets VM standard ports into a Distributed Hunt Group.

Program 71 (1-3)—Sets tie/DID/DNIS extensions to ring VM Auto Attendant Ports if Program *09 is not used.

Program 71-4—Sets the DNIS VM ID code.

Program 76—Sets RSIU or RSIS SMDI port.

Programs 81 ~ 89—Verifies that the ringing assignments to the VM devices are set per customer requirements.

Programs 16, 40, 41, 45 ~ 48 and 50 ~ 56—Verifies that outgoing CO line access is allowed on VM ports to allow the VM beeper notification feature to operate.

6.8.5 Voice Mail System Installation

Install the voice mail (VM) system in accordance with the following steps:

1. Ensure that the RSTU, RDSU/RSTS, PSTU or PESU PCB is installed in the system per Chapter 4—Printed Circuit Boards.
2. Connect the VM system to the selected RSTU, RDSU/RSTS, RSTU2, PSTU or PESU standard telephone port. (Refer to Chapter 7—Wiring Diagrams for RSTU, RDSU/RSTS, PSTU and PESU wiring/interconnecting details.)
3. Program the Strata DK280 system for the required VM features. (Refer to Subsection 6.8.2, paragraph 3 and Subsection 6.8.4.)
4. Ensure that an RRCS 4, 8 or 12 is installed on the RCTU, and verify that the RCTU code in Program 03 is for RRCS operation.
5. Perform additional VM system programming as applicable (refer to customer-supplied installation/ programming manuals).

   Note:
   Some VM devices may ring trip when called; in this case, set the square-wave ring voltage jumper to L (low position) on the PESU or PSTU2 PCB connected to the VM device. This is not necessary on RSTU, RSTU2 and RDSU/RSTS PCBs because they have a sine-wave ring generator.

6.9 PC/Data Communications Interface Unit Installation

The Strata DK280 supports two types of Data Interface Units (DIUs) that enable digital telephone users to simultaneously transmit and receive data on the same digital station port and wire pair while communicating on a voice call. One unit, called the integrated DIU (RCPI-DI, PDIU-DI/PDIU-DI2), becomes part of the digital telephone, replacing the telephone's base; the other unit, is a small self-contained unit called the stand-alone DIU (PDIU-DS). Each RPCI or PDIU is powered by the digital port to which it is connected (see Table 7-4 for wiring requirements). The RPCI-DI can operate in two modes: Application Program Interface Mode (API) or

Data Communication mode. The RCPI operating mode is controlled by the PC connected to the RPCI-DI. Section 6.9 only covers the RCPI-DI data communications mode. The RCPI-DI Operating Instructions and User Guide provides RPCI-DI mode changing information

Notes:

1. *"Digital Ports" include the DK280, PDKU and RDSU digital station ports. This applies wherever the term "Digital Ports" is used in the text and figures in this chapter.*
2. *2000-series digital telephones require RPCI-DI or PDIU-DI2 and 1000-series telephones require PDIU-DI and are not compatible with RPCI-DI or PDIU-DI2.*

Both RPCIs and DIUs can be connected to standard Electronic Industries Association (EIA) RS-232 asynchronous serial data devices. EIA devices are divided into two categories: data communication equipment (DCE) and data terminal equipment (DTE). Common DCE devices are modems and some printers; common DTE devices are personal computers, ASCII terminals, and some printers. The RPCI-DI and PDIU-DI operate like a DCE and connects directly to DTE devices using standard RS-232 cables. Depending on how its internal jumper plugs are configured, the PDIU-DS can either operate like a DTE and connect to DCE devices; or operate like a DCE device and connect to a DTE device. In most applications, DTE and DCE devices exchange data between each other via the standard RS-232 cable connection.

When in the data communications modes, RPCIs and DIUs can function with DCE and DTE devices at data speeds of up to 19.2 kbps. However, keyboard dialing using AT commands (from a PC or terminal connected to a RPCI or DIU) is limited to 9600 bps. A speed of 19.2 kbps can be achieved when dialing from a RPCI-DI or PDIU-DI equipped digital telephone dialpad, but many PC software programs do not yet handle 19.2 kbps in an error-free manner. Also for a 19.2 kbps operation the computer or terminal's COM port must be specified to function at 19.2 kbps. Some computer COM ports, like those used in older IBM XT type computers (25-pin RS-232), will not operate at 19.2 without errors. RPCI or DIU data transmission speed is set by the first AT command that the RPCI or DIU receives once it is in the command state; if manual dialing or receiving calls in the auto answer (default) mode, the transmission speed is transparent.

IMPORTANT !

To use the RPCI-DI, PDIU-DI or PDIU-DS with AT commands, communications software or a PC program that performs terminal emulation must be used. AT commands cannot be issued from the computer's operating system prompt.

RPCI-DI Dual Mode

RPCI-DI can operate in the data communication or Telephone Application Program Interface (TAPI) mode.

- When in the TAPI mode, send the HEX (**£Ø**), decimal 240 (or the ≡ ASCII character) to the RPCI to switch it to the Data Communications mode. (Unplugging the telephone cord and then reconnecting it also resets the RPCI to the Data Communications mode.)
- When in the Data Communications mode, send (**ATCØ**) to the RPCI to switch it to the TAPI mode. In the TAPI mode, a constant stream of data is sent from the RPCI to the PC COM port.
- RPCI-DI mode switching should be performed automatically by the application programs running on the PC connected to the RPCI-DI.

(See Section 6.14 for instructions on configuring your PC for TAPI software.)

6.9.1 Common DIU Connections

The block diagram in Figure 6-25 illustrates common RPCI and DIU data communications connections. In this example, RPCI-DIs or PDIU-DIs are connected to personal computers (PC1 and PC2), and PDIU-DSs are connected to a serial printer and modems. The personal computer users can transfer files internally, print files on the same printer, and access the modem pool to send/receive data to/from an external personal computer or dial up data service.

To access these devices, a data call connection must be established between the RPCIs and DIUs. This is accomplished by dialing the destination DIU from a digital telephone dialpad or from a PC keyboard using standard AT dial commands. RPCI-DIs and PDIU-DIs share the same intercom or Primary Directory numbers [PDN]/ports with the digital telephone to which they are connected, while PDIU-DSs have their own. The intercom and data call LEDs on the digital telephone initiates a voice or data call, respectively. When dialing from a keyboard with AT commands,

A T D is typed for voice calls, and **A T D D** for data calls.

Installation instructions for these devices are provided in Subsections 6.9.4 through 6.9.7. Call paths and scenarios for five types of data test calls are provided in Subsection 6.9.8, paragraph 2 ~ paragraph 6. Step-by-step data calling procedures are provided in the *Data Interface User Guide.*

6.9.2 EIA Interface Leads (Signals)

Both DIUs operate with nine standard EIA RS-232 interface leads (signals) on which signaling data is transmitted and received. RPCIs and DIUs connect to serial data devices with standard RS-232 cables, available from telephone supply stores (see Figures 6-25 ~ 6-31). The RPCI-DI/PDIU-DI/PDIU-DS requires nine signals for some applications, but can function with eight using modular cords and connectors with RJ45/DB25 adapters for other applications. If uncertain which signals are necessary for an application, all nine should be connected.

IMPORTANT !

1. *The RPCI-DI and PDIU-DI is always a DCE device; the PDIU-DS may be a DTE or DCE, depending on how its internal jumpers (1 ~ 9) are configured.*
2. *In the descriptions below, when a signal is ON, its potential is about seven volts positive relative to signal ground (pin 7); when a signal is OFF, it is about 7 volts negative relative to the signal ground (pin 7).*

Frame Ground (FG, Pin 1)

The FG signal (EIA circuit AA) is a protective or safety ground which is bonded to the PDIU-DI/PDIU-DS PCB. If required by local codes, the FG should be connected to external ground.

Signal Ground (SG, Pin 7)

The SG signal (EIA circuit AB) establishes the common ground reference for all other PDIU and data device signals and must be wired for all applications.

Transmit Data (TD, Pin 2)

DTE devices transmit and DCE devices receive data on the TD lead (EIA circuit BA). Before the DTE device can transmit the TD signal, the RTS, CTS, DSR, and DTR signals (all discussed below) must be ON. The TD signal is OFF in the idle state.

Receive Data (RD, Pin 3)

The DCE device transmits data to the DTE device on the RD lead (EIA circuit BB); the DTE receives data on the RD.

Request to Send (RTS, Pin 4)

Some DTE devices send an RTS signal (EIA circuit CA) to the DCE device when they are ready to transmit data on the TD lead. If the DTE device does not generate the RTS signal, the DIU DIP switch SW1-4 should be set ON to inform the RPCI or DIU. Sometimes, the DTE/DCE device may use RTS/CTS for Ready/Busy type flow control, in these cases DIP switch SW1-4 should be OFF (see Figure 6-33 for DIP switch information).

Clear to Send (CTS, Pin 5)

The DCE device sends the CTS signal (EIA circuit CB) which indicates that it is prepared to transmit data to the line side. The DCE device sends this signal only when it receives the RTS signal from the DTE device. Sometimes, the DTE/DCE device may use RTS/CTS for Ready/Busy type flow control; in these cases, dip switch SW1-4 should be OFF (see Figure 6-33 for DIP switch information).

Data Set Ready (DSR, Pin 6)

When connected to the communication channel and prepared to exchange control characters to initiate data transmission, the DCE device sends the DSR signal (EIA circuit CC) to the DTE device. If the PDIU DIP switch SW1-2 is set ON, DSR will be ON continuously; if the switch is set OFF, DSR follows DTR (if DSR is ON, DTR is ON, etc.) SW1-2 should be OFF in most cases (see Figure 6-33 for DIP switch information).

Data Carrier Detect (DCD, Pin 8)

The DCE device sends the DCD signal (DCD, Pin 8) when receiving the carrier signal on the line side. Before transmitting or receiving data, most DTE devices require that the DCD be ON. If the carrier signal is removed by the remote end or lost due to a fault condition on the line, the DCE notifies the DTE device by an OFF condition with the DCD signal. The PDIU dip switch SW1-2 is set ON to set the DCD ON continuously. If set OFF, the DCD signal will only be ON when connection between two DIUs is established and OFF when a connection is not established. SW1-2 is set OFF when the DTE/DCE uses the DTR/DSR signals for Ready/Busy flow control (see Figure 6-33 for dip switch information).

Data Terminal Ready (DTR, Pin 20)

The DTE device sends the DTR signal (EIA circuit CD) to the DCE device, prompting the DCE device to open the communication line. The line is closed and the call disconnected when the DTE device quits sending the DTR signal. DTR may be sent any time to indicate that the DTE is ready to transmit or receive data. DIP switch SW1-2 should be set OFF in most cases (see Figure 6-33 for DIP switch information).

Ring Indicator (RI, Pin 22)

The RI signal (EIA circuit CE) is sent by the DCE device to the DTE device. Whenever the DCE device receives a ringing signal on the line side, it turns the RI signal ON. If RPCI or DIU dip switch SW1-3 is set ON, the RI signal will be continuously ON if ringing; if the switch is set OFF, the RI signal will be one second ON/three seconds OFF when the RPCI or DIU detects ringing signal.

6.9.3 DIP Switch Options

The RPCI-DI, PDIU-DI and the PDIU-DS each have a four-control dip switch which can be configured for signaling options. The switch is located on the bottom of the PDIU-DI, and on the back panel of the PDIU-DS (see Figure 6-33).

SW1-1

Normally this switch is set ON to disconnect devices from RPCIs or DIUs automatically. The connection is maintained if data is exchanged between the device and the RPCI or DIU within eight to nine minute intervals. If SW1-1 is OFF on the called and calling DIU, data calls will remain connected until released manually.

SW1-2

This switch is placed in the ON position when the RPCI-DI or PDIU-DI (or PDIU-DS configured like a DCE) must hold DCD and DSR ON continuously. If SW1-2 is OFF, DSR follows DTR and DCD will be ON only when the DIU is connected on a data call to another DIU. SW1-2 should be OFF on a RPCI DIU when it is connected to a personal computer that uses a communications software program to establish data calls with AT commands; and whenever PDIU-DS is connected to a modem.

SW1-3

The RPCI-DI or PDIU-DI (or PDIU-DS configured as a DCE) sends the Ring Indicate (RI) signal to the computer to tell the computer (DTE) that the RPCI or PDIU is receiving an incoming call. SW1-3 should be ON for the DIU to send RI steady, and OFF to send at one second ON/three seconds OFF intervals.

SW1-4

This switch is placed in the ON position if the computer does not output the RTS signal or when connected to a modem that tracks the DCD signal (modem set with AT&C1). Sometimes, the DTE device may use RTS/CTS for Ready/Busy flow control, in these cases SW1-4 should be OFF. In this case the DCD signal of the calling DTE is used as the RTS lead of the called DTE and the DCD signal of the called DTE is used as the RTS signal of the other DTE. In this case a signal which stops the DTE from transmitting data (usually the CTS lead) should be cross-connected to the RPCI's or DIU's DCD signal. Consult the DTE device or application software documentation to determine which type of flow control is required. If the DIU-DS is connected to a modem that tracks carrier detect (AT&C1) SW1-4 should be ON.

6.9.4 RPCI-DI and PDIU-DI to Personal Computer (PC) Installation

The RPCI-DI and PDIU-DI always functions as a DCE device; it transmits data on the Receive Data lead (RD) and receives data on the Transmit Data lead (TD). Most personal computers function as a DTE device; PCs transmit data on the TD lead and receive data on the RD lead. Follow the steps below to install the RPCI-DI or PDIU-DI to a DTE, PC:

Notes:

1. *Use the steps below when installing an ASCII terminal, personal computer, or any other DTE device to a RPCI-DI or PDIU-DI.*
2. *The RPCI-DI or PDIU-DI can connect to a DCE computer or any other DCE-type device using a specially configured RS-232 cable or adapter; but this application is rarely required.*

1. Install the digital telephone that is to be equipped with RPCI-DI or PDIU-DI per the instructions in Chapter 5—Station Apparatus and the drawing in Chapter 7—Wiring Diagrams.
2. Install the RPCI-DI or PDIU-DI under the digital telephone per the instructions in Chapter 5—Station Apparatus.

Note:
The RPCI-DI or PDIU-DI always operates as a DCE device; therefore, unlike the PDIU-DS, it has no internal jumpers.

3. Connect the appropriate RS-232 cable between the RPCI-DI or PDIU-DI's DB-25 female connector and the PC's appropriate asynchronous serial communications port connector (COM port).

IMPORTANT !
Check the PC manufacturer's serial communication port interface documentation for correct RS-232 pin requirements; requirements vary with each manufacturer. The number of EIA RS-232 signals required (8, 9, or 10 wires) depends on the application. When EIA signal requirements are not known, connect the 10 EIA signals listed in Subsection 6.9.2. Figures 6-26 and 6-31 provide diagrams for connecting RS-232 cables between PDIU-DIs and PCs/Toshiba portables.

---

4. Set the RPCI-DI or PDIU-DI DIP switch (SW1-1 ~ 4) for the desired application. Figure 6-33 shows the DIP switch locations and Subsection 6.9.3 describes switch functions.

5. Access Program 20 to configure the RPCI-DI or PDIU-DI for DTE-type connection and Program 39 for data button assignments of the digital telephone connected to the PDIU-DI.
   - The port number entered for the RPCI-DI or PDIU-DI in Program 20 is the port number of the digital telephone to which the RPCI-DI or PDIU-DI is connected.
   - **LED 01:** Should always be ON for RPCI-DI and PDIU-DI ports.
   - **LED 02:** Should be ON for RPCI-DI or PDIU-DI ports, unless the PC user will never use RPCI or DIU AT commands (other than ATDD, ATDT, and ATD) and never require the RPCI-DI or PDIU-DI to send result codes to display on the PC display screen. Frequently, it is difficult to determine the full extent of these requirements; so it is recommended to turn LED 02 ON. See the Data Interface User Guide for information regarding DIU AT commands and result codes.
   - **LEDs 03 and 04:** Should be OFF for RPCI-DI or PDIU-DI ports.
   - **LED 05:** Should be ON if the system is installed behind a PBX or Centrex that uses access codes to make external calls or to insert a pause following RPCI DIU access of an outside line.
   - **LED 10:** Enables Caller ID and ANI information to be sent from RCPI-DI to the connected PC.
   - **LED 11:** Enables DNIS information to be sent from the RCPI-DI to the connected PC.
   - **LEDs 17 ~ 20:** Used to establish data security groups. RPCI and PDIU stations are only allowed to make calls to RPCI and PDIUs in the same assigned data group.

Program 39—The following data call buttons can be assigned digital telephones equipped with PDIU-DIs: Data Call, and Modem. Assign SD buttons to data devices as required. Do not assign DSS buttons to data devices; DSS buttons are used for voice calls only.

6.9.5 PDIU-DS to Printer Installation

Strata DK280 enables serial printers (laser, dot matrix, or other types) to be connected to stand-alone data interface units (PDIU-DSs). Digital telephones equipped with RPCI or PDIU-DIs can share access to these printers. Serial printers operate as DCE or DTE devices, depending on the vendor; the PDIU-DS can be connected to either type, since it can be configured as a DTE or DCE device. (The PDIU-DS comes from the factory configured as a DCE device.) Follow the steps below to install the PDIU-DS to a serial printer.

Notes:
1. *Only serial printers (not parallel) that conform to EIA RS-232 signaling requirements can be connected to PDIU-DSs.*
2. *In rare applications, it may be desired to connect printers to PDIU-DIs. Refer to the printer's installation instructions.*

1. Consult the serial printer's documentation and determine if the printer operates as a DCE or DTE device:
   - If the printer is a DCE device: Disassemble the PDIU-DS and configure it to operate like a DTE device by placing the jumper plugs (P1 ~ P9) in the "B-C" (MODEM) position. Reassemble the PDIU-DS, and mark "B-C" on the bottom identification label for future reference. (Subsection 6.9.7 provides PDIU-

DS disassembly/assembly instructions, and Figure 6-32 provides jumper plug information.)

- If the printer is a DTE device: It may not be necessary to disassemble the PDIU-DS, since it comes direct from the factory configured as a DCE device. However, if uncertain, disassemble the PDIU-DS and verify that jumper plugs (P1 ~ P9) are in the "A-B" (DTE) position. Reassemble the PDIU-DS and mark "A-B" on the bottom identification label for future reference. (Subsection 6.9.7 provides PDIU-DS disassembly/assembly instructions, and Figure 6-32 provides jumper plug information.)

2. Connect the PDIU-DS to the appropriate digital telephone circuit per wiring diagrams in Chapter 7—Wiring Diagrams and information provided in Chapter 5—Station Apparatus.

3. Connect the appropriate RS-232 cable between the printer and the PDIU-DS (see Figure 6-28 and 6-30 for an example printer cable connection).

4. If Steps 2 and 3 are done properly, the Power and Ready LEDs on the PDIU-DS should light when the printer is turned on and ready.

5. Set the PDIU-DS DIP switch (SW1-1 ~ 4) for the desired application. Figure 6-33 shows the DIP switch locations and Subsection 6.9.3 describes switch functions.

   Note:
   If using Toshiba computers and printers with X-On/X-OFF flow control, set SW1-(4) "ON" on the DIU connected to the computer and DIU connected to the printer.

IMPORTANT !
Check the printer's serial documentation for correct RS-232 pin requirements. The requirements vary with each manufacturer.

---

6. Use Program 20 to configure the PDIU-DS to connect to a serial printer (see Chapter 9—Instructions for instructions and record sheets).
   - **LED 01**: Should always be ON for PDIU-DS ports.
   - **LED 02**: Should be OFF for PDIU-DS ports connected to printers.
   - **LED 03**: Should be OFF for PDIU-DS ports that connect to DTE- or DCE-type printers.
   - **LED 04**: Should always be ON for PDIU-DS ports.
   - **LED 05**: Should be OFF for PDIU-DS ports connected to printers.
   - **LEDs 17 ~ 20**: Data security groups can be used to allow or deny digital telephones equipped with PDIU-DIs access to PDIU-DS ports connected to a printer. DIU stations can only make data calls to DIUs in the same data security group.

7. Program 22 should be used to configure PDIU-DSs to hunt if more than one PDIU-DS connected to the same printer/server.

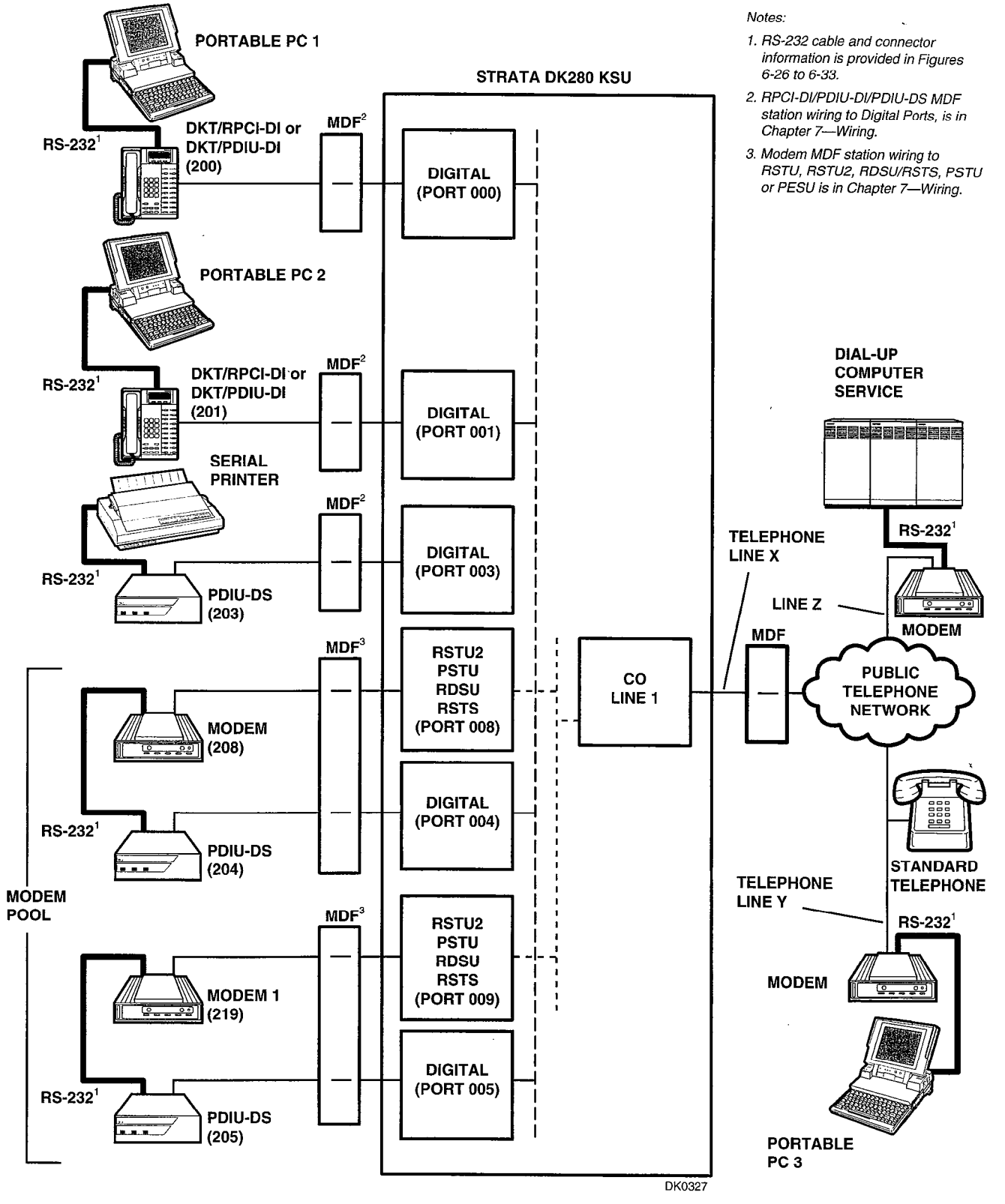
6.9.6 PDIU-DS to Modem Installation

Strata DK280 enables asynchronous-type (not synchronous) modems to be connected to PDIU-DSs. This allows RPCI-DI or PDIU-DI equipped digital telephones that are connected to personal computers, terminals, and other devices to share access to a modem or modem pool.

IMPORTANT !
Modems must be "smart modems" that respond to AT commands and return result codes. Modems are customer-supplied.

A modem(s) can be accessed internally for outgoing data calls or externally for incoming data calls. Modems operate as DCE devices; so PDIU-DSs that are connected to them must be configured to operate like a DTE device. In the example installation in Figure 6-25, the line side of the two modems are connected to RSTU/RDSU/RSTS/RSTU2/PSTU/PESU ports to establish a modem pool; however, the line side of modems could be connected directly to a dedicated CO line.

If modems are connected directly to telephone network CO lines, automatic transfer of CO line voice calls to system modems (data call) will not function as described in the *Data Interface User Guide*. For best operation and utilization of CO lines and modems, it is recommended to connect modems to RSTU, RSTU2, PSTU or RDSU/RSTS standard station ports in a modem pool configuration. The RS-232 side of the modem connects to the PDIU-DS with standard RS-232 cables; the PDIU-DS line side (RJ-11 connector) always connects to its own individual digital port. Use the following instructions to install modems to PDIU-DSs.



Notes:

1. *RS-232 cable and connector information is provided in Figures 6-26 to 6-33.*
2. *RPCI-DI/PDIU-DI/PDIU-DS MDF station wiring to Digital Ports, is in Chapter 7—Wiring.*
3. *Modem MDF station wiring to RSTU, RSTU2, RDSU/RSTS, PSTU or PESU is in Chapter 7—Wiring.*

Figure 6-25
DK280 Data Communications Installation Example Block Diagram

PERSONAL COMPUTER OR TOSHIBA PORTABLE (DTE) PIN DESIGNATIONS

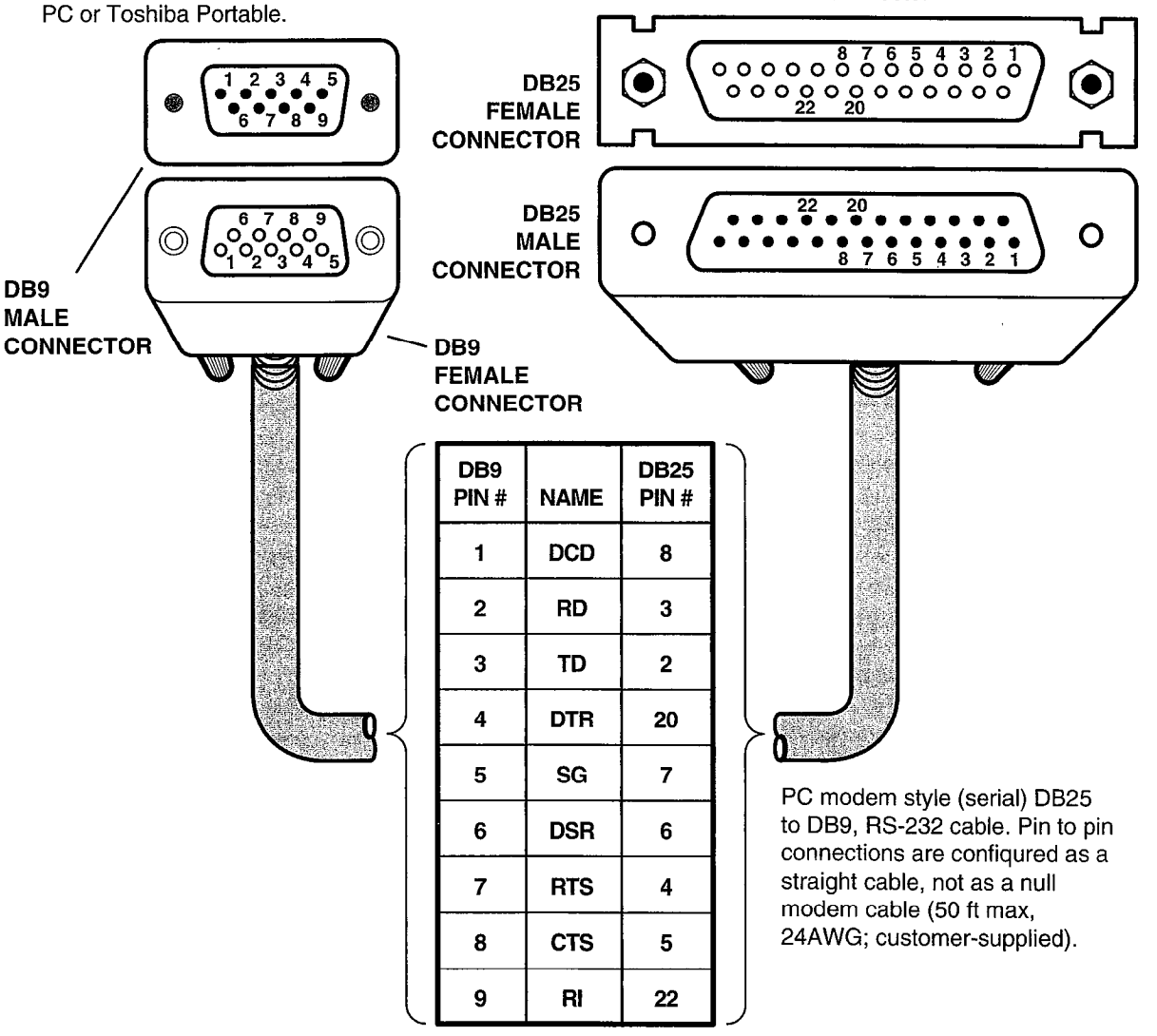
COM PORT PIN #	1	2	3	4	5	6	7	8	9
NAME	DCD	RD	TD	DTR	SG	DSR	RTS	CTS	RI

RPCI-DI or PDIU-DI (FUNCTIONS LIKE A DCE) PIN DESIGNATIONS

PDIU-DI PIN #	1	2	3	4	5	6	7	8	20	22
NAME	FG	TD	RD	RTS	CTS	DSR	SG	DCD	DTR	RI

Rear view of asynchronous (serial) communication interface connector (DB9) of PC or Toshiba Portable.

Rear view of RPCI-DI or PDIU-DI DB25, RS-232 female connector



DB9 PIN #	NAME	DB25 PIN #
1	DCD	8
2	RD	3
3	TD	2
4	DTR	20
5	SG	7
6	DSR	6
7	RTS	4
8	CTS	5
9	RI	22

PC modem style (serial) DB25 to DB9, RS-232 cable. Pin to pin connections are configured as a straight cable, not as a null modem cable (50 ft max, 24AWG; customer-supplied).

General Notes:

- *Some RS-232 EIA leads may be called by other names by some manufacturers.*
- *The computer receives data on Pin 2 (RD) and sends data on Pin 3 (TD).*

DK0328

Figure 6-26
DK280 RPCI-DI to 25-Pin to 9-Pin COM Port

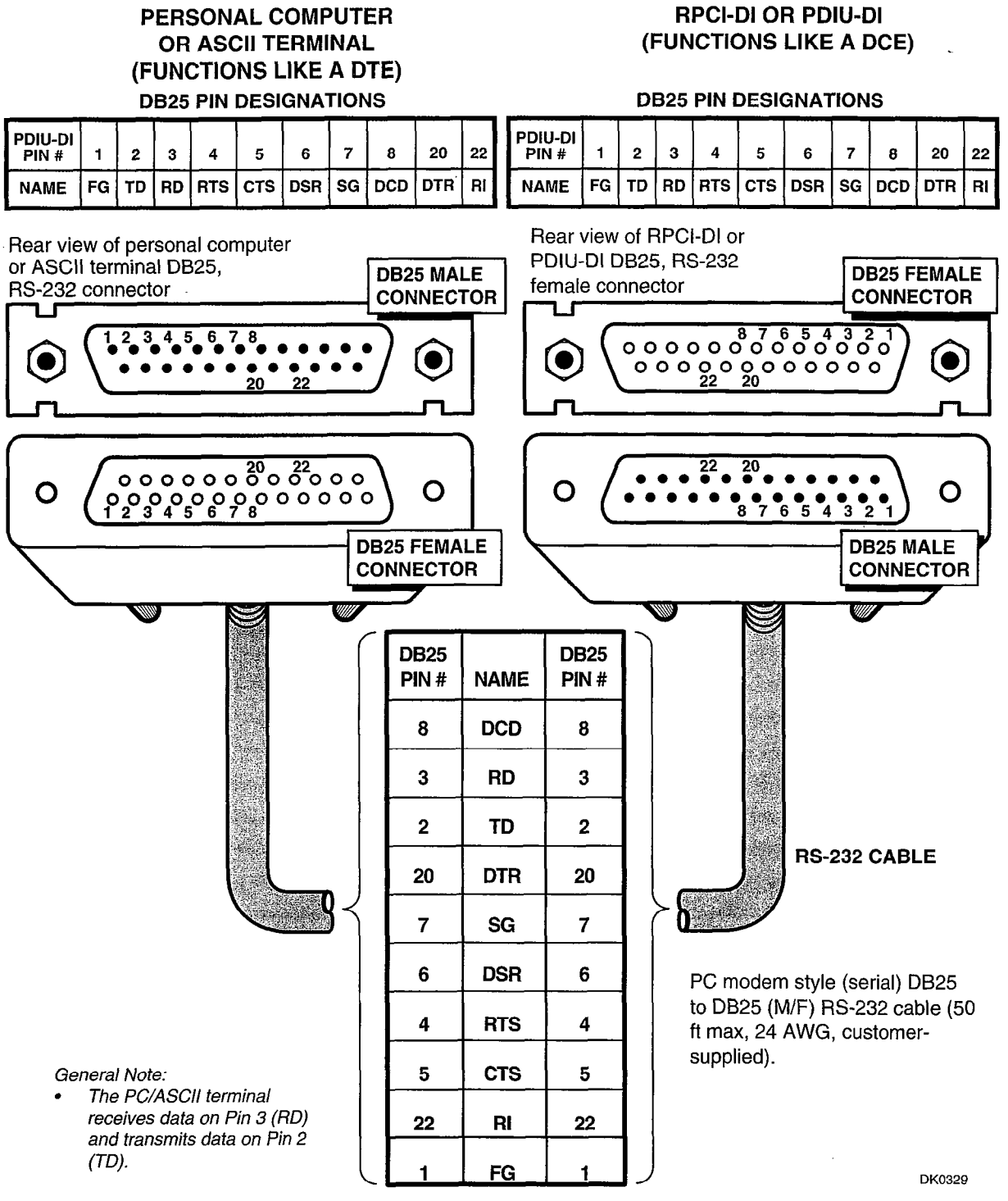


Figure 6-27
DK280 RPCI-DI or PDIU-DI to 25-Pin to 25-Pin COM Port

TOSHIBA SERIAL PRINTER (FUNCTIONS LIKE A DTE)

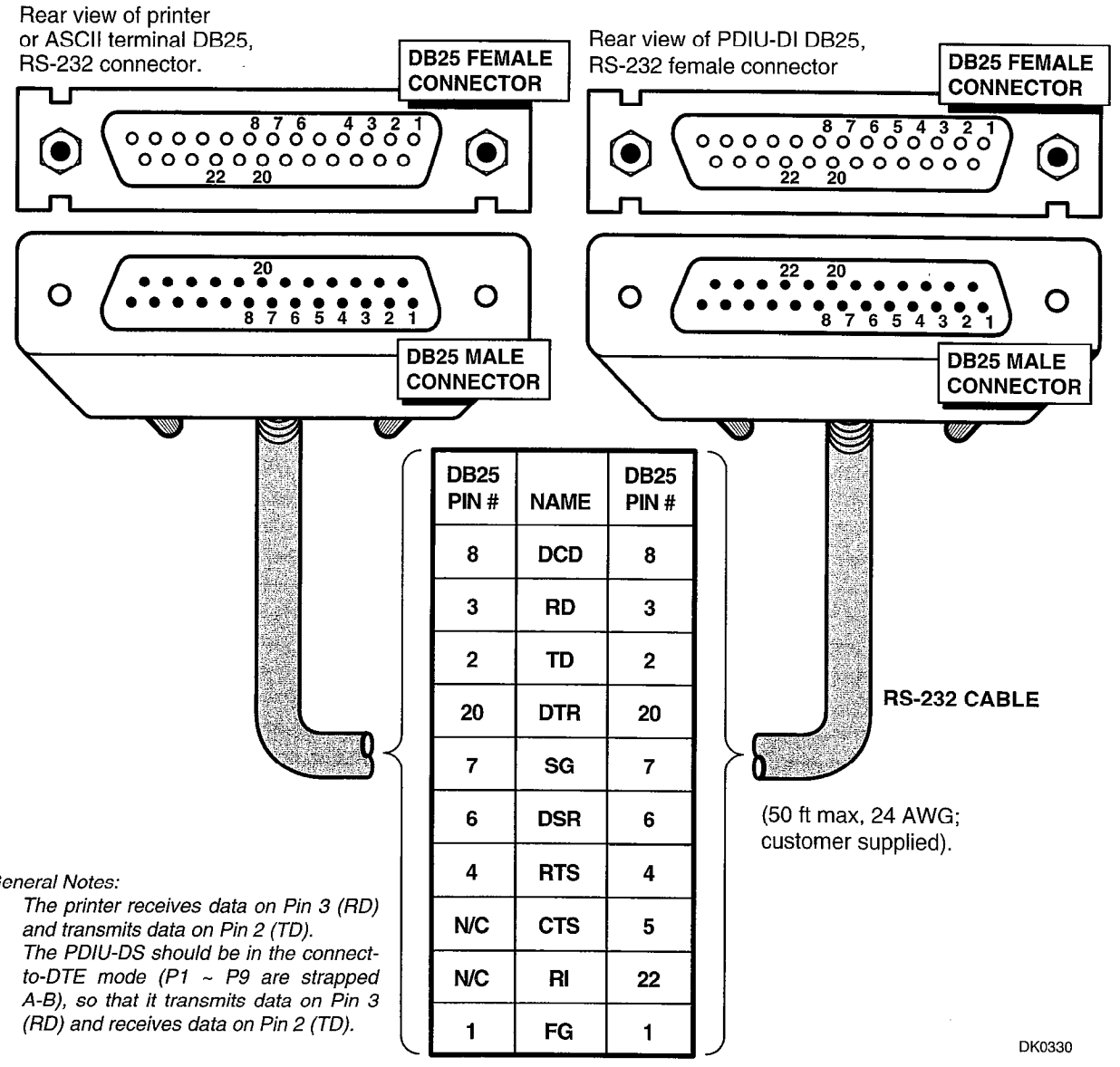
DB25 PIN DESIGNATIONS

PRINTER PIN #	1	2	3	4	5	6	7	8	20	22
NAME	FG	TD	RD	RTS	N/C	DSR	SG	DCD	DTR	RI

PDIU-DS (CONFIGURED IN THE "CONNECT TO DTE" MODE: P1 ~ P9 = A-B SO PDIU FUNCTIONS LIKE A DCE)

DB25 PIN DESIGNATIONS

PDIU-DS PIN #	1	2	3	4	5	6	7	8	20	22
NAME	FG	TD	RD	RTS	CTS	DSR	SG	DCD	DTR	RI



DB25 PIN #	NAME	DB25 PIN #
8	DCD	8
3	RD	3
2	TD	2
20	DTR	20
7	SG	7
6	DSR	6
4	RTS	4
N/C	CTS	5
N/C	RI	22
1	FG	1

General Notes:

- *The printer receives data on Pin 3 (RD) and transmits data on Pin 2 (TD).*
- *The PDIU-DS should be in the connect-to-DTE mode (P1 ~ P9 are strapped A-B), so that it transmits data on Pin 3 (RD) and receives data on Pin 2 (TD).*

DK0330

Figure 6-28
DK280 PDIU-DS to Toshiba Printer, RS-232 Connector/Cable Connections

HAYES-COMPATIBLE SMART MODEM (FUNCTIONS LIKE A DCE)

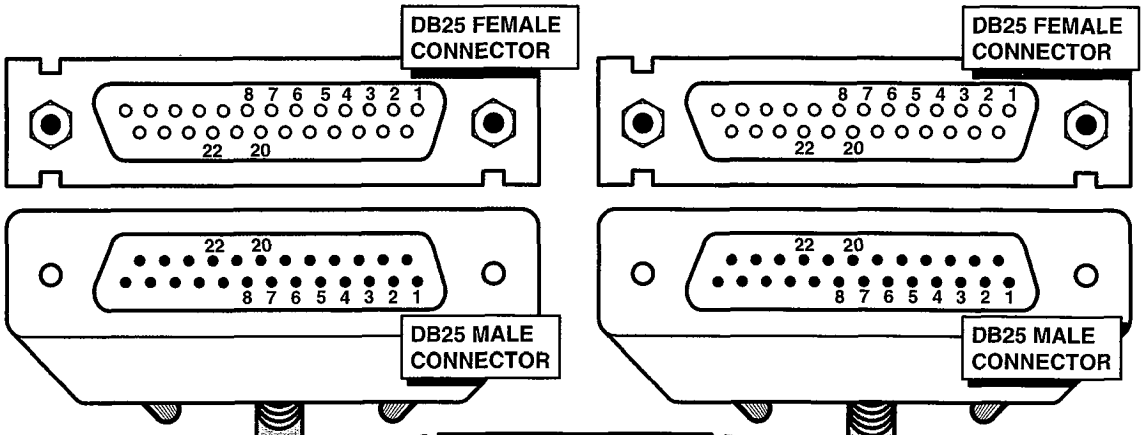
MODEM PIN #	1	2	3	4	5	6	7	8	20	22
NAME	FG	TD	RD	RTS	CTS	DSR	SG	DCD	DTR	RI

PDIU-DS (CONFIGURED IN THE "CONNECT TO MODEM" MODE, P1 ~ P9 = B-C, SO IT FUNCTIONS LIKE A DTE)

PDIU-DS PIN #	1	2	3	4	5	6	7	8	20	22
NAME	FG	TD	RD	RTS	CTS	DSR	SG	DCD	DTR	RI

Rear view of modem DB25 connector

Rear view of PDIU-DS DB25, connector



DB25 PIN #	NAME	DB25 PIN #
8	DCD	8
3	RD	3
2	TD	2
20	(Open) DTR	20
7	SG	7
6	(Open) DSR	6
4	RTS	4
5	CTS	5
22	RI	22
1	FG	1

RS-232 CABLE

(50 ft max, 24 AWG; customer supplied)

For PDIU-DS port:

DK280-Program 20: LEDs 01, 02[1], 04, 17 "On".

All other LEDs "Off".

The following commands should be sent to the modem:

- ATS0=1: Auto Answer
- ATE0: Disable character echo in command state
- ATQ0: Modem returns result codes
- AT&C1: Track presence of data carrier
- AT&D2: Hang up and assume command state with DTR on to off transition

Note:

1. *In Program 20, for the PDIU-DS port, LED 02 should be set "ON" after the AT commands shown above are sent to the modem.*

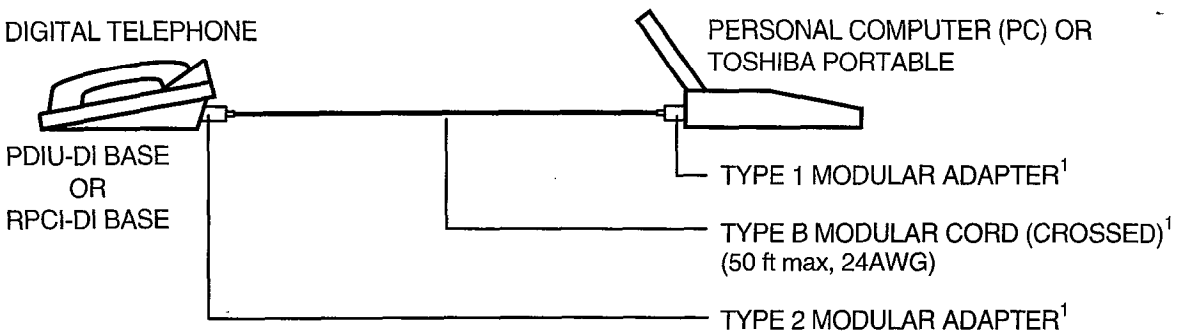
General Notes:

- *Modem receives data on pin 2 (TD) and transmits data on pin 3 (RD).*
- *The PDIU-DS must be in the connect to modem mode (P1 ~ P9 strapped B-C) so that it transmits data on pin 2 (TD) and receives data on pin 3 (RD).*
- *The above cable modifications, modem AT commands, and Program 20 settings are required for proper call release when modems disconnect. With this configuration, the PDIU-DS "READY" light will not light until modems at both ends establish communication (DCD is detected).*
- *See Subsection 6.9.6, paragraph 3 for more details.*

DK0331

Figure 6-29
DK280 PDIU-DS to Hayes-Type Smart Modem, RS-232 Connector/Cable Connections

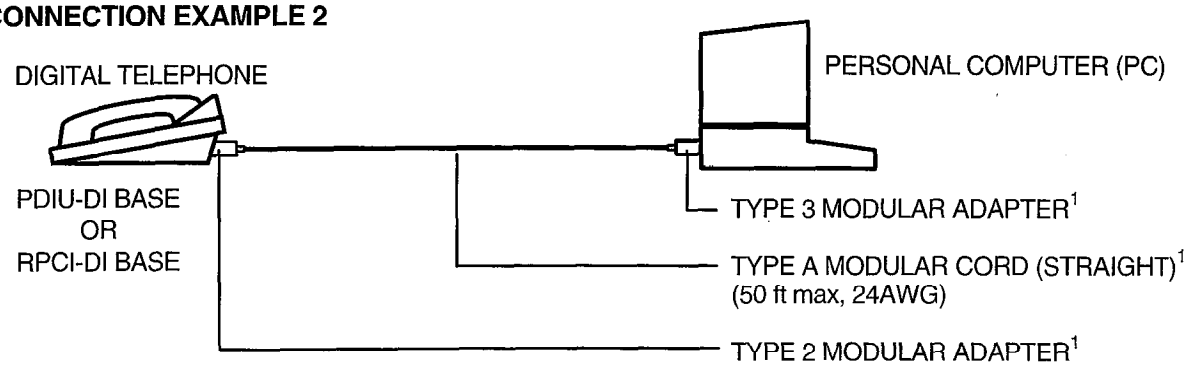
CONNECTION EXAMPLE 1



IMPORTANT!

Will not function with applications that require the RI signal to PC.

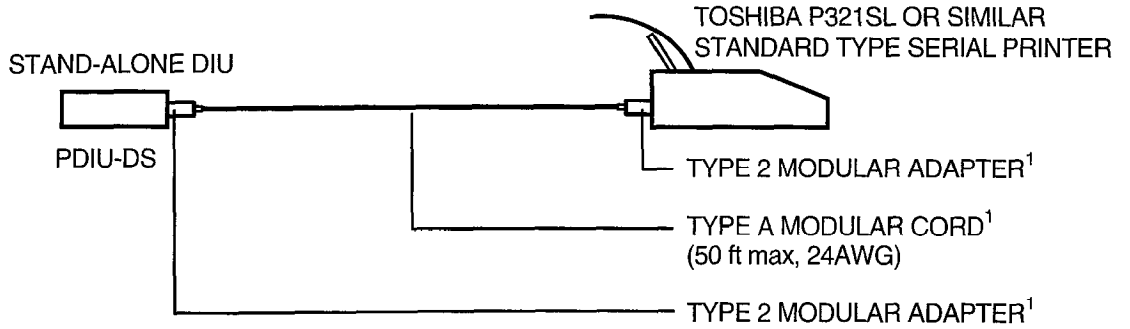
CONNECTION EXAMPLE 2



IMPORTANT!

Will not function with applications that require the RI signal to PC.

CONNECTION EXAMPLE 3



Note:

1. *See Figure 6-31 for detailed pin out information of modular cords and adapters.*

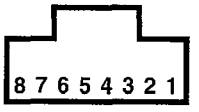
General Notes:

- *Never use modular cords and adapters when connecting a RPCI-DI/PDIU-DI/PDIU-DS to a modem.*
- *Connection examples 1 and 2 work when using the RPCI-DI or PDIU-DI to make calls with personal computer applications (auto-dialers, printer sharing, outgoing modem calls, etc). If the PC RPCI-DI or PDIU-DI must receive calls, the RI lead is normally required; therefore, a standard RS-232 cable must be used (see Figures 6-25 and 6-28).*
- *In Connection Example 3, PDIU-DS must be in the connect to DTE mode (P1 ~ P9, strapped A-B).*
- *All modular cords and adapters are customer-supplied.*

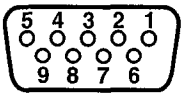
DK0332

Figure 6-30
DK280 RPCI-DI/PDIU-DI/PDIU-DS Modular Cable/RJ-45 Adapter Connections

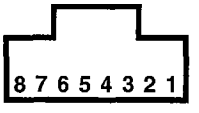
TYPE 1
RJ45 TO DB9 (FEMALE) ADAPTER



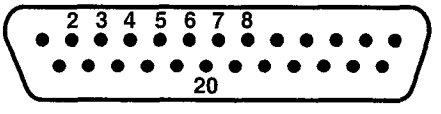
8	7	6	5	4	2	1	N/C	RJ45
DSR	RTS	RD	DCD	TD	GND	CTS	RI	LEAD NAME
6	7	2	1	3	5	8	9	DB9



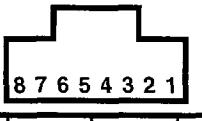
TYPE 2
RJ45 TO DB25 (MALE) ADAPTER



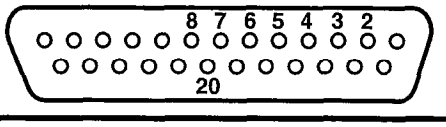
8	7	6	5	4	3	2	1	N/C	RJ45
CTS	SG	DTR	TD	DCD	RD	RTS	DSR	RI	LEAD NAME
5	7	20	2	8	3	4	6	22	DB25



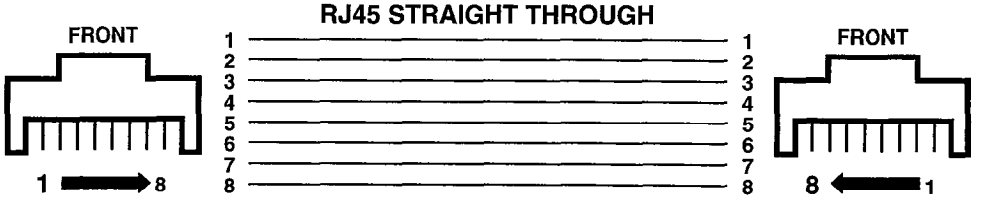
TYPE 3
RJ45 TO DB25 (FEMALE) ADAPTER



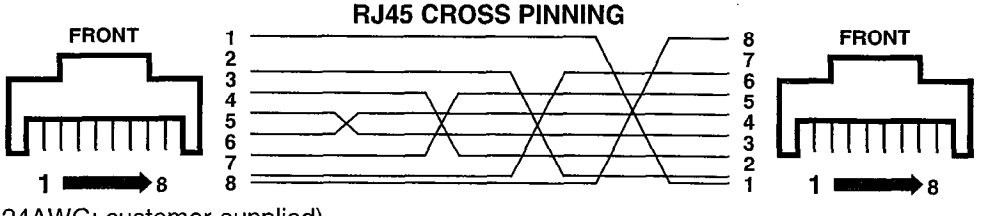
8	7	6	5	4	3	2	1	N/C	RJ45
CTS	SG	DTR	TD	DCD	RD	RTS	DSR	RI	LEAD NAME
5	7	20	2	8	3	4	6	22	DB25



TYPE A
RJ45 FLAT MODULAR CORD (STRAIGHT)



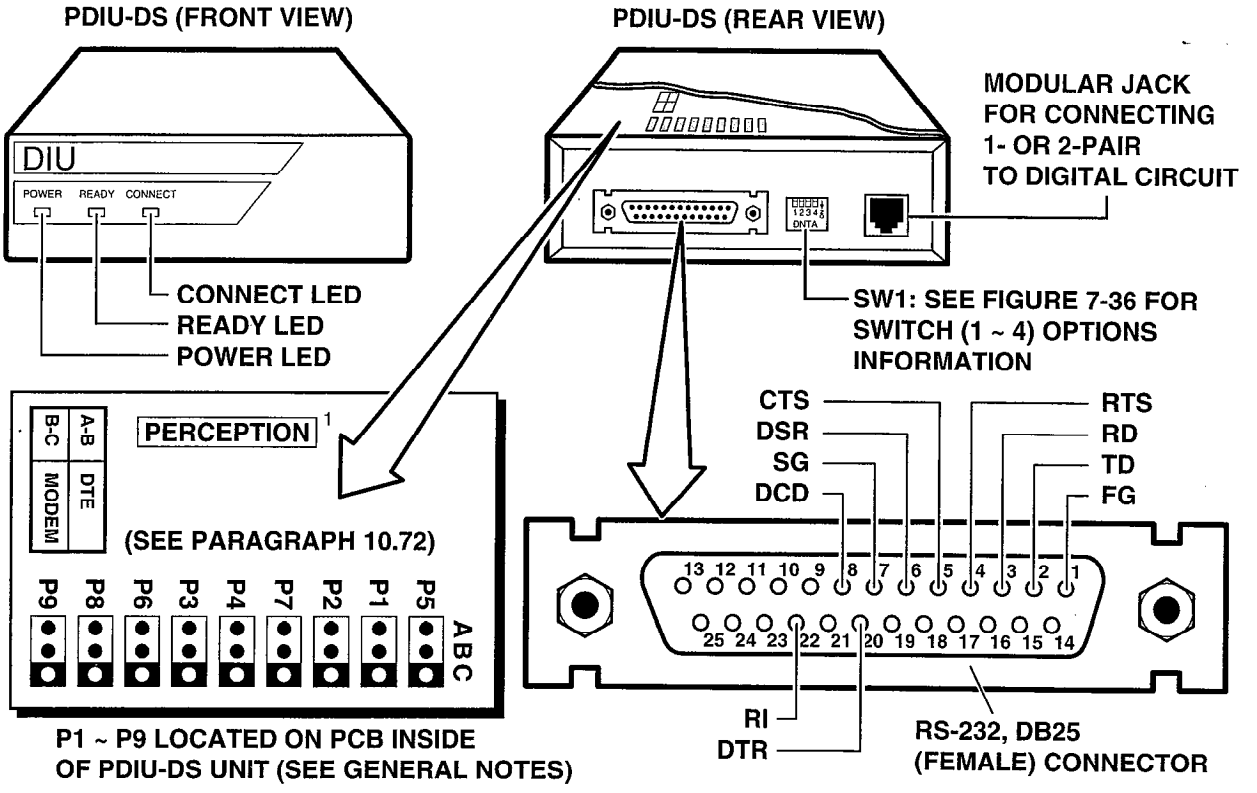
TYPE B
RJ45 FLAT MODULAR CORD (CROSSED)



Modular Cords (50 ft max, 24AWG; customer-supplied)

DK0333

Figure 6-31
DK280 RPCI-DI/PDIU-DI/PDIU-DS Modular Cords and RJ-45/RS-232 Adapter Pin Connections



			SIGNAL DIRECTION AND FUNCTION OF P1 ~ P9			
			PDIU-DS CONNECTED TO DTE		PDIU-DS CONNECTED TO DCE	
SIGNAL ABBREVIATON	SIGNAL NAME/ FUNCTION	PDIU-DS PIN NO.	SIGNAL DIRECTION	FUNCTION: A-B (DTE MODE)	SIGNAL DIRECTION	FUNCTION: B-C (MODEM MODE)
FG	FRAME GROUND	1				
SG	SIGNAL GROUND	7				
TD	TRANSMIT DATA	2	DTE ➡ DIU	P1	MODEM ⬅ DIU	P1
RD	RECEIVE DATA	3	DTE ⬅ DIU	P2	MODEM ➡ DIU	P2
RTS	REQUEST TO SEND	4	DTE ➡ DIU	P6	MODEM ⬅ DIU	P6
CTS	CLEAR TO SEND	5	DTE ⬅ DIU	P7/P5	MODEM ➡ DIU	P7/P5
DSR	DATA SET READY	6	DTE ⬅ DIU	P4	MODEM ➡ DIU	P4
DTR	DATA TERMINAL READY	20	DTE ➡ DIU	P3	MODEM ⬅ DIU	P3
DCD	DATA CARRIER DETECT	8	DTE ⬅ DIU	P8	MODEM ➡ DIU	P8
RI	RING INDICATOR	22	DTE ⬅ DIU	P9	MODEM ➡ DIU	P9

DK0334

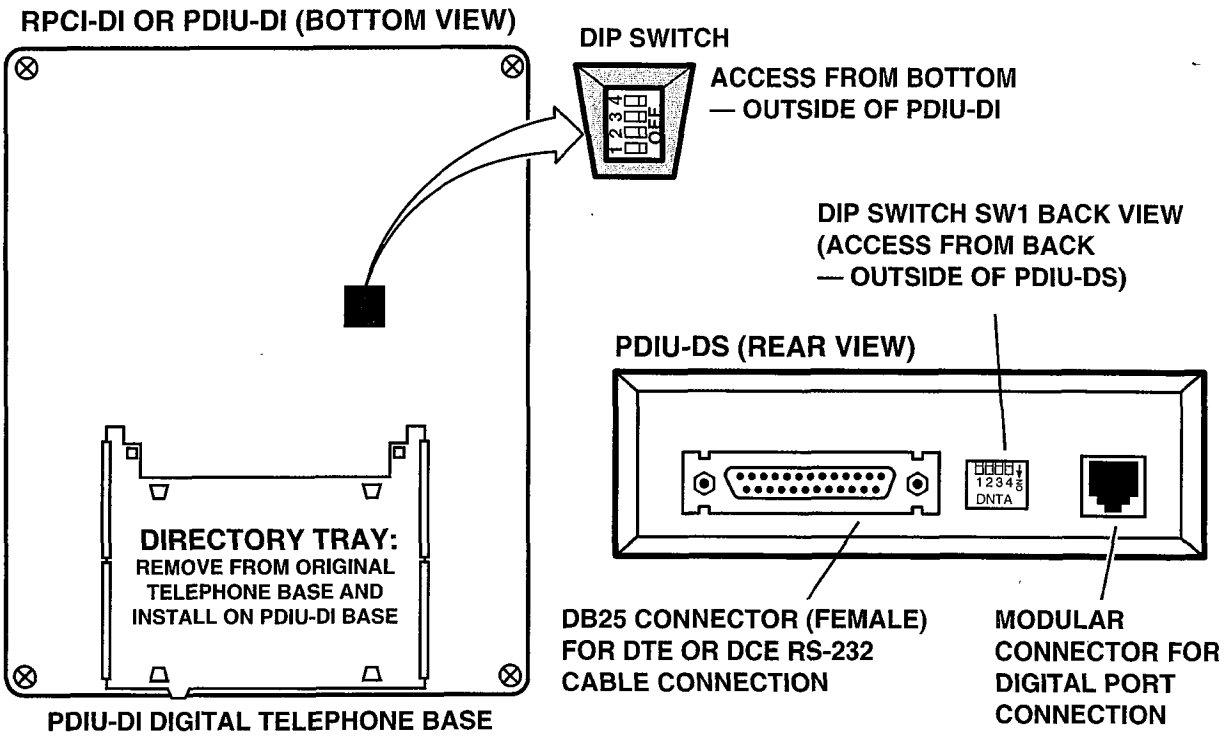
Note:

1. *Do not cut the Perception strap when installing a PDIU-DS in Strata DK systems.*

General Notes:

- *Mode select (P1 ~ P9) "A-B" if PDIU-DS is connected to a terminal-type device (DTE).*
- *Mode select (P1 ~ P9) "B-C" if PDIU-DS is connected to a modem-type device (DCE).*
- *See Figure 6-34 to disassemble/assemble PDIU-DS.*
- *Some RS-232 leads go by different names depending on the equipment manufacturer.*

Figure 6-32
DK280 PDIU-DS Jumper Plug Options/RS-232 Connector Information



PDIU-DI AND -DS SW1 DIP SWITCH (1 ~ 4) FUNCTIONS

SWITCH	FUNCTION	INITIAL POSITION
SW1 (1)	Forced hang up when DIU does not detect space signal on TD or RD for about 8 to 9 minutes ON: enable (auto-disconnect)[1] OFF: disable	OFF
SW1 (2)	DCD, DSR control ON: continuous on OFF: DSR depends on DTR (DCD is on during communication state)	OFF
SW1 (3)	RI control ON: RI is on continuously during ringing state OFF: RI is 1 sec ON/3 sec OFF during ringing state	OFF
SW1 (4)	RTS control ON: DTE doesn't have RTS signal OFF: DTE has RTS signal (ready/busy flow control: RTS/CTS:DCD)	OFF

DK0335

Note:

1. *RPCI or DIU port must have LED 02 ON in Program 20 to enable auto disconnect.*

General Notes:

- *See Subsection 6.9.2 and 6.9.3 for more details regarding SW1 option settings.*
- *When a PDIU-DS is connected to a modem that tracks the DCD signal (AT&C1) SW1(4) must be ON.*
- *If using Toshiba Personal Computers and Toshiba Printers using X-ON/X-OFF flow control, set SW1(4) ON on PDIU-DIs and -DSs.*
- *SW1(2) should be off when PDIU-DS is connected to a modem.*

Figure 6-33
DK280 RPCI-DI/PDIU-DI/PDIU-DS SW1 DIP Switch Information

1. Configure the PDIU-DS as a DTE device: Disassemble the PDIU-DS and place jumper plugs P1 ~ P9 in the "B-C" position (MODEM). Reassemble the PDIU-DS and mark "B-C" on the bottom identification label for future reference. (Subsection 6.9.7 provides PDIU-DS disassembly/assembly instructions and Figure 6-32 provides jumper plug information.)

2. Connect the PDIU-DS to the appropriate digital port circuit per the wiring diagrams in Chapter 7—Wiring Diagrams.

3. Connect the appropriate RS-232 cable between the modem and the PDIU-DS. Figure 6-29 shows an example PDIU-DS to "smart modem" RS-232 connection.

IMPORTANT !

All ten PDIU-DS EIA leads (signals) should be connected to the modem. Consult the modem's documentation for correct RS-232 pin requirements; the requirements may vary with each manufacturer.

---

4. Connect the line side of the modem to a RSTU/RSTS, RSTUS2, PSTU, RDSU or PESU standard telephone circuit or a dedicated CO line (consult the modem's documentation to install it to a CO line). Chapter 7—Wiring Diagrams provides RSTU/PESU/PSTU/RDSU/RSTS station port wiring information.

5. Set the PDIU-DS DIP switch (SW1-1 ~ 4) for the desired application. Figure 6-33 shows the DIP switch location and Subsection 6.9.3 describes switch functions.

   Note:

   If the modem tracks carrier detect (DCD, AT&C1), SW1(4) should be "ON," and SW1(2) should be OFF when PDIU-DS is connected to a modem.

6. Use the programs below to configure the PDIU-DS to connect to an asynchronous modem (see Chapter 9—Instructions for explanations and record sheets).

Program 20

- **LED 01:** Should always be ON for PDIU-DS ports
- **LED 02:** Should be ON for PDIU-DS ports connected to modems, enabling the use of AT commands and result codes when incoming calls are made from outside the system to modems connected to PDIU-DSs.
- **LED 03:** Should be set ON for PDIU-DS ports connected to modems.
- **LED 04:** Should always be ON for PDIU-DS ports.
- **LED 05:** Should be OFF if the system is installed behind a PBX/Centrex that uses access codes to place outgoing trunk calls.
- **LED 06:** Should be OFF for DIUs connected to modems. The modem cable must be modified per Figure 6-29 or 6-38; or the PDIU-DS internal jumper plugs must be set per the instructions in the 280 Admin user guide.
- **LEDs 17 ~ 20:** Data security groups can be used to allow or deny digital telephones equipped with PDIU-DIs access to the PDIU-DS ports connected to a modem. DIU stations can only make data calls to DIUs in the same data security group.

Program 21—For each PDIU-DS/modem pair, assign the digital, RSTU, RDSU/RSTS, and PSTU (or PESU) ports that will be connected to the PDIU-DS and modem, respectively.

Program 22/33—If more than one modem/PDIU-DS pair is configured as a system modem pool, the PDIU-DSs should be set to hunt each other in Program 22. The modem RSTU, PSTU, RDSU/RSTS, or PESU ports should be set to hunt each other in Program 33.

Program 31—LED 18 should be turned on for all RSTU, RDSU/RSTS, PESU or PSTU station ports that are connected to modems. This provides data security by preventing executive or privacy override of modem calls.

Modem Setup Recommendations

1. Always make sure the escape sequence of the telephone PDIU-DI is default (+++): Send AT command ATS2=43 to PDIU-DI).

2. Make sure to use a modified modem cable (see Figures 6-29 and 6-38 for more details); or that the PDIU-DS internal jumper plugs must be reset per the instructions of the 280 Admin user guide.

3. Send the following AT commands to the modem pool modem. ATS0=1, ATE0, ATQ0, AT&C1, and AT&D2.

6.9.7 PDIU-DS Disassembly and Assembly

To set the jumper plugs (P1 ~ P9) on the PCB inside the PDIU-DS for DCE or DTE operation, the PDIU-DS must be disassembled. Disassemble the PDIU-DS in accordance with the following steps:

Disassembling the PDIU-DS

1. Remove the four non-captive screws securing the bottom panel to the rest of the unit (see Figure 6-34); these screws will be needed in Step 3 of the assembling procedure.
2. Remove the bottom panel.
3. Remove the PCB inside the PDIU-DS by lifting the back panel from its side grooves.
4. Turn the PCB over and set the jumper plugs (P1 ~ P9) as follows:
   - If the PDIU-DS is connected to a DTE, set the plugs to the "A-B" position.
   - If the PDIU-DS is connected to a DCE device, set the plugs to the "B-C" position.

   Note:
   Do not cut PDIU-DS PERCEPTION jumper wire for Strata DK280 installations.

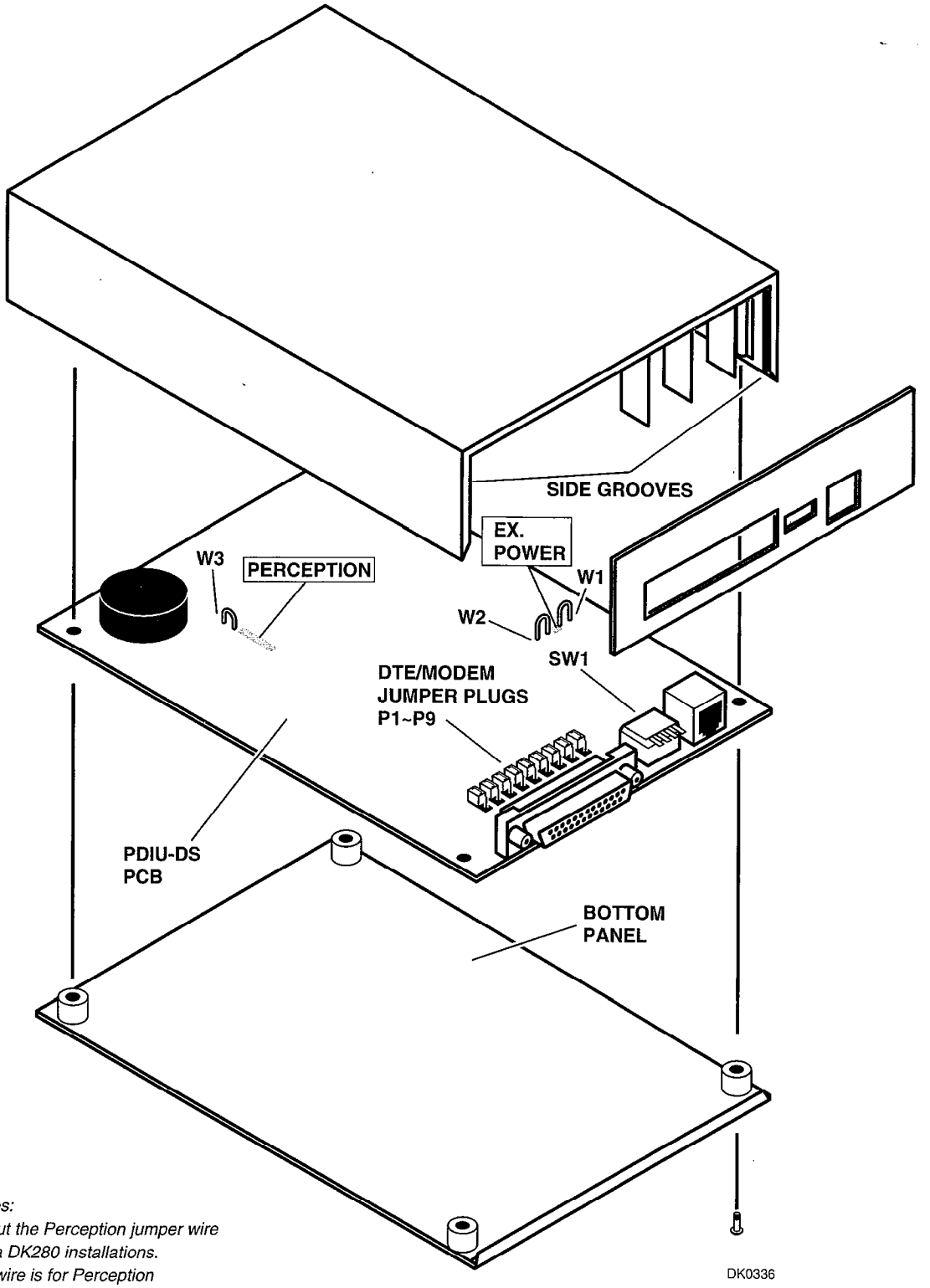
Assembling the PDIU-DS

1. Position the back panel to the PCB (see Figure 6-34).
2. Slide the back panel down into its side grooves.
3. Attach the bottom panel, and secure with the four non-captive screws.

6.9.8 RCPI-DI/PDIU-DI/PDIU-DS Data Communication Installation Tests

Subsection 6.9.8 paragraphs 2 ~ 6 provide tests for five RCPI/DIU data call applications. These test routines only check the data communications mode of the RPCI-DI; they do not check the RPCI-DI API mode. The telephone and port numbers used in these figures are provided for explanation purposes only; when actually testing, use port and telephone numbers appropriate for the system.

Each of these tests can be conducted with manual dialing from a digital telephone's dialpad or AT dialing from a personal computer's keyboard; however, only the preferred method of dialing for application is presented.



General Notes:

- *Do not cut the Perception jumper wire for Strata DK280 installations. Jumper wire is for Perception applications only.*
- *See Table 7-4 regarding external power requirements.*

Figure 6-34
DK280 PDIU-DS Disassembly/Assembly Diagram

PC-to-PC Test Call Using AT Commands (see Figure 6-35)

- RPCI or DIU Programming:
  - **Program 20:** Ports 000 and 01. LEDs 01, 02, 05, and 17 ON; all other LEDs OFF.
  - **Program 39:** Ports 000 and 01. Data Call (456) and Data Release (454) buttons should be provided.
  - Default settings for PDIU-DI S-Registers.
- Make sure PC 1 and PC 2 are on-line with a communications software package and that the communication parameters of each PC and communication software package are set to the same values (data transmission rate, parity, data bits, stop bits, flow control, etc.).

  Note:
  If using an RPCI-DI, it may be necessary to switch the RPCI from the API mode to the Data Communications Mode before proceeding with Step 3. To place the RPCI into the data communications mode from the PC keyboard: Set **Num Lock** *to ON and type* **240** *while holding the* **Alt** *key down (this is HEX F0). If in the data communication mode ATC0 will switch the RPCI-DI back to the API mode.*
- From PC 1's keyboard, type **ATDD201** and press **Enter** (AT commands must be capital letters).
  - The data call LEDs will be lit on DKT 200 and 201
  - PC 1 displays: **CONNECT XXXX**.
  - PC 2 displays: **RING**.
  - PC 1 and PC 2 are connected as shown by the thick solid lines. PDIU-DIs or RPCI-DIs are now in the communication mode.
- Typing from PC 1 keyboard will display on PC 2 display and vice versa.
- To terminate the call: Press **Data Release**, or;
  A. Type **XXX** from either PC keyboard.
     - The PC screen displays, OK.
  B. Type **ATH** from the PC keyboard used in Step A.
     - PC 1 and PC 2 screens both display, **NO CARRIER**.
     - The data call LEDs on each DKT are off.

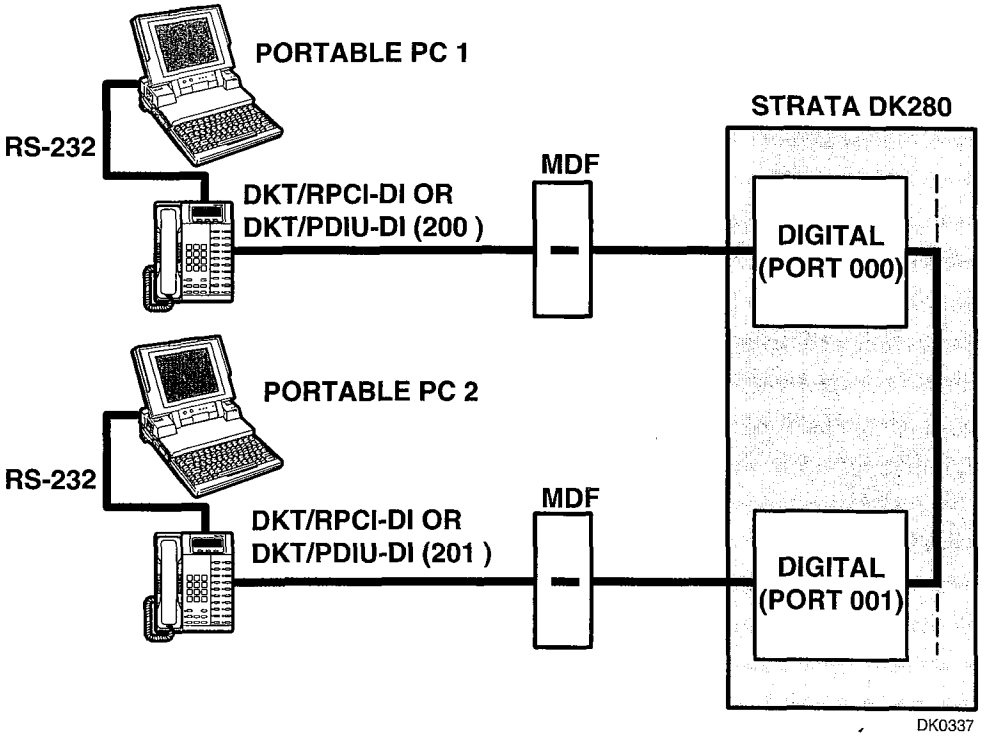


Figure 6-35
DK280 PC to PC Test Call Using AT Commands

xxx = PDIU-DI escape sequence (see Subsection 6.9.6, paragraph 3).

PC to Printer Test Call Using Manual Dialing (see Figure 6-36)

- RPCI or DIU Programming:
  - **Program 20:** Port 001. LEDs 01, 02, 05, and 17 ON; all other LEDs OFF.
  - **Program 20:** Port 003. LEDs 01, 04, and 17 ON; all other LEDs OFF.
  - **Program 39:** Port 001. Data Call (456) and Data Release (454) buttons should be provided.
  - Default settings for PDIU-DI, S-Registers.
- Make sure the PC is configured to print data from its serial COM port (the PC COM port connected to DKT/PDIU-DI or DKT/RPCI-DI port 001). This is normally accomplished using the DOS MODE commands.

  Note:
  If using an RPCI-DI, it may be necessary to switch the RPCI from the API mode to the Data Communications Mode before proceeding with Step 3. To place the RPCI into the data communications mode from the PC keyboard: Set **Num Lock** *to ON and type* **240** *while holding the* **Alt** *key down (this is HEX f0). If in the data communication mode ATC0 will switch the RPCI-DI back to the API mode.*
- Using the manufacturer's documentation, make sure the communication parameters (data speed, parity, data bits, stop bits, etc.) of the PC COM port match the printer's serial interface parameters.
- To connect the PC to the printer, press the DKT's **Data Call** button and dial **2 0 3**.
  - The CONNECT on the PDIU-DS will be lit.
  - The connection between the PC and the printer is completed, as shown by the thick lines above (PDIU-DS 203 is in the communication mode).
  - If busy tone is sent to the DKT, the connection is not complete; press **Data Release** and try Step 4 again.
- Operate the PC to print data as required.
- To terminate the call, press the DKT's **Data Release** button.

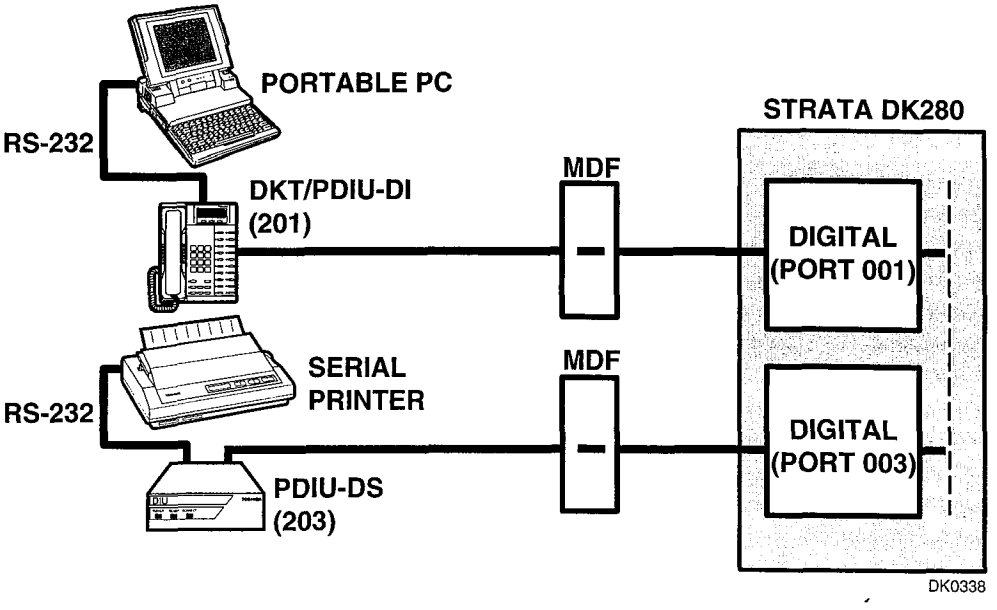


Figure 6-36
DK280 PC to Printer Test Call Using Manual Dialing

General Notes:

- *See Subsection 6.9.6, paragraph 3 and Subsection 6.9.8, paragraph 5 for modem set-up recommendations.*
- *See Figure 6-29 for RS-232 cable modification.*

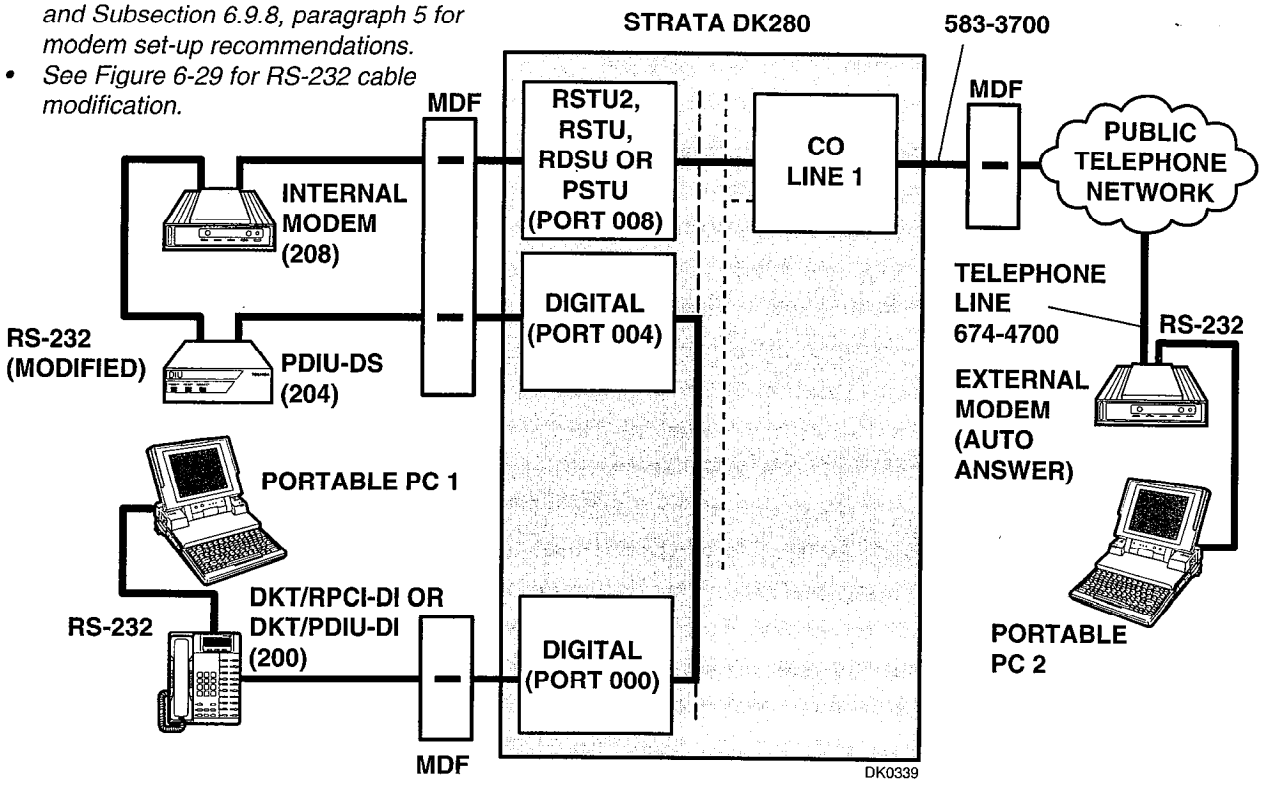


Figure 6-37
DK280 Internal PC to External PC Test Call Using AT Commands

Internal PC to External PC Test Call Using AT Commands (see Figure 6-37)

- RPCI or DIU Programming:
  - **Program 20:** Port 000. LEDs 01, 02, 05, and 17 ON; all other LEDs OFF.
  - **Program 20:** Port 004. LEDs 01, 02, 03, 04, 06, and 17 ON; all other LEDs OFF.
  - **Program 21:** Digital port 004 assigned with KSTU port 008.
  - **Program 39:** Port 000. Data Call (456), Data Release (454), and Modem (455) buttons should be provided.
  - Default settings for PDIU-DI and PDIU-DS S-Registers.
- Make sure PC 1 and PC 2 are on-line with a communications software package and that the communication parameters of each PC and communication software package are set to the same values (data transmission rate, parity, data bits, stop bits, flow control, etc.).

  Note:
  If using an RPCI-DI, it may be necessary to switch the RPCI from the API mode to the Data Communications Mode before proceeding with Step 3. To place the RPCI into the data communications mode from the PC keyboard: Set **Num Lock** *to ON and type* **240** *while holding the* **Alt** *key down (this is HEX F0). If in the data communication mode ATC0 will switch the RPCI-DI back to the API mode.*
- From PC 1's keyboard, type **ATDD204** and press **Enter** (AT commands must be capital letters).
  - The data call LED on DKT 204 will be lit.
  - The CONNECT LED on PDIU-DS 204 will be lit.

- The screen on PC 1 displays, **CONNECT XXXX**, where **XXXX** is the data transmission speed set by the communications software.
- At this time, PC 1 and PDIU-DS 204 are connected as shown by the thick lines above (PDIU-DS 204 is in the communication mode). PC 1 is now linked directly to the RS-232 side of the internal modem and can issue AT commands to the internal modem, which is now in the command mode.
- If Digital/PDIU-DS port 004 is the only DIU port connected to the modem (Program 20, LED 03 ON), the Modem LEDs on all DKTs will be lit.

■ From PC 1's keyboard, type **ATDT#70016744700** and press **Enter**.

- The internal modem (208) goes off-hook, dials #7001 to seize the CO line, and then dials the external modem's telephone number (674-4700).
- The external modem rings and auto answers; the modems handshake and establish communications.
- If the modems send result codes, the screen on PC 1 displays, **CONNECT XXXX**, where **XXXX** is the data transmission speed set by the communication software.

■ At this time PC 1 and PC 2 are connected, as shown by the thick lines above, to exchange data (file transfers, type messages, etc.).

■ To terminate the call: press the telephone Data Release button and;

A. Type **+++** from PC2 keyboard.
   - The PC screen displays, OK.

B. Type **ATH** from the PC keyboard used in Step A.
   - PC 1 and PC 2 screens both display, **NO CARRIER**.
   - The data call LED on DKT 200 will turn off.

External PC to Internal PC Test Call Using AT Commands Over a Direct CO Line (see Figure 6-38)

■ RPCI or DIU Programming:

- **Program 20:** Port 000. LEDs 01, 02, 05, and 17 ON; all other LEDs OFF.
- **Program 20:** Port 004. LEDs 01, 02, 04, and 17 ON; all other LEDs OFF.
- **Program 39:** Port 000. Data Call (456) and Data Release (454) buttons should be provided.
- **Internal modem:** set the following AT commands: Auto answer (ATSØ=1), disable character echo in the command state (ATEØ), modem returns result codes (ATQØ), presence of data carrier (AT&C1), hang up and assume command state with DTR on-to-off transition (AT&D2).
- Settings for PDIU-DS: rear panel switches 1, 2 and 4 ON; internal jumpers P1-P9 set to B-C position.

■ Make sure PC 1 and PC 2 are on-line with a communications software package and that the communication parameters of each PC and communication software package are set to the same values (data transmission rate, parity, data bits, stop bits, flow control, etc.)

Note:

If using an RPCI-DI, it may be necessary to switch the RPCI from the API mode to the Data Communications Mode before proceeding with Step 3. To place the RPCI into the data communications mode from the PC keyboard: Set **Num Lock** *to ON and type* **240** *while holding the* **Alt** *key down (this is HEX F0). If in the data communication mode ATC0 will switch the RPCI-DI back to the API mode.*

■ From PC 2's keyboard, type **ATDT5833700** and press **Enter**.

- The external modem originates the call to internal modem.
- The internal modem rings and auto answers; the modems handshake and establish communications. The ready light on the PDIU-DS turns on.
- If the modems send result codes, the PC's screens display, **CONNECT XXXX**, where **XXXX** is the data transmission speed set by the communications software.
- At this time, PC 2 is connected to PDIU-DS (204), as shown by the thick lines above (PDIU-DS 204 is in the command mode). PC 2 can now issue AT commands to PDIU-DS 204.

General Notes:

- *When PDIU-DS is connected with modified RS-232 cable, the READY LED will not light until the External and Internal modem establish carrier detect.*
- *See Subsection 6.9.6, paragraph 3 and Figure 6-29 for more details.*

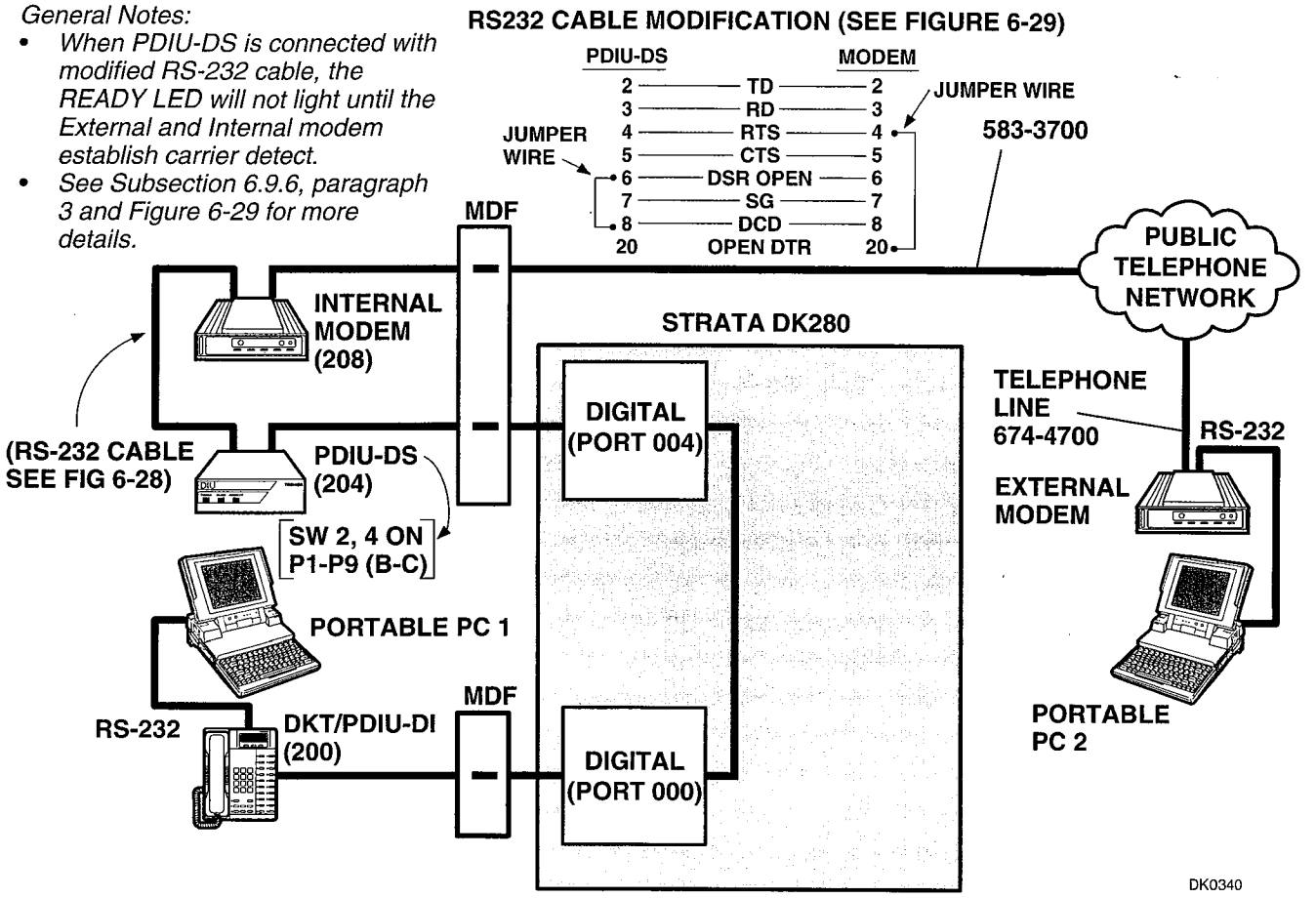


Figure 6-38
DK280 External PC to Internal PC Test Call Using Direct CO Line Connection

- From PC 2's keyboard, type **ATDD200** and press **Enter** (AT commands must be capital letters); this prompts PDIU-DS (204) to dial and connect to PDIU-DI (200).
  - The CONNECT LED on the PDIU-DS (204) will be lit; the Data Call LED on DKT 200 will also be lit.
  - The screens on PC 1 and PC 2 display, **CONNECT XXXX**, where **XXXX** is the data transmission speed set by the communication software.
  - At this time, PC 1 and PC 2 are connected, as shown by the thick lines, to exchange data (file transfers, typed messages, etc.).
- To terminate the call: press the telephone (200) **Data Release** button, or
  - A. Type +++ from PC2 keyboard.
    - The PC screen displays, **OK**.
  - B. Type **ATH** from the PC keyboard used in Step A.
    - PC 1's and PC 2's screens both display, **NO CARRIER**.
    - The DATA and MODEM LEDs on DKT 200 will turn off.

PC Auto Dial Voice Call Test (see Figure 6-39)

There are many off-the-shelf, IBM/MS-DOS compatible, desktop organizer software packages that provide an auto dialer function. One of these is the terminal resident Borland® Sidekick™. It is used in this section for test explanation purposes only. If you choose another auto dialer software package, the detailed response may be different than that shown here.

- RPCI or DIU Programming:
  - **Program 20:** Port 001. LEDs 01, 02, 05, and 17 ON; all other LEDs OFF.
  - **Program 39:** Port 001. Data Call (556) and Data Release (554) buttons are optional. If the PDIU-DI is only used for the PC auto dial application, the Data Call and Data Release buttons are unnecessary.
- Make sure that the auto dial application software is installed on the PC root directory and that the communication parameters of the PC and application software are set to the same values (in this test example, Sidekick "SKINSTAL" program).

  Note:
  If using an RPCI-DI, it may be necessary to switch the RPCI from the API mode to the Data Communications Mode before proceeding with Step 3. To place the RPCI into the data communications mode from the PC keyboard: Set **Num Lock** *to ON and type* **240** *while holding the* **Alt** *key down (this is HEX F0). If in the data communication mode ATC0 will switch the RPCI-DI back to the API mode.*
- Make sure that a dialing directory consisting of names and telephone numbers you wish to auto dial is installed within the application software (include the appropriate Strata CO line access code prefixing each telephone number: #7001 ~ #7144, 801 ~ 816, or 9).
- To auto dial using Sidekick from the PC keyboard:
  A. Press the **Alt** and **Ctrl** keys simultaneously.
     - The PC screen displays the Sidekick menu window.
  B. Press F5 twice (Sidekick prompts "**search for INITIALS:**" to display on the PC's screen).
  C. Type the initials or name of the person or organization you wish to auto dial.
  D. Press **Enter**.
     - Sidekick finds and highlights the desired name/number.
  E. Press **Enter** again.
     - DKT/PDIU-DI 201 seizes the appropriate CO line and auto dials the selected telephone number.
     - The LEDs of the DKT's Data Call and CO line 001 buttons will be lit (if assigned in Program 39).
     - Dial tone, DTMF tones, and ringback or busy tones are audible from the DKT's speaker.

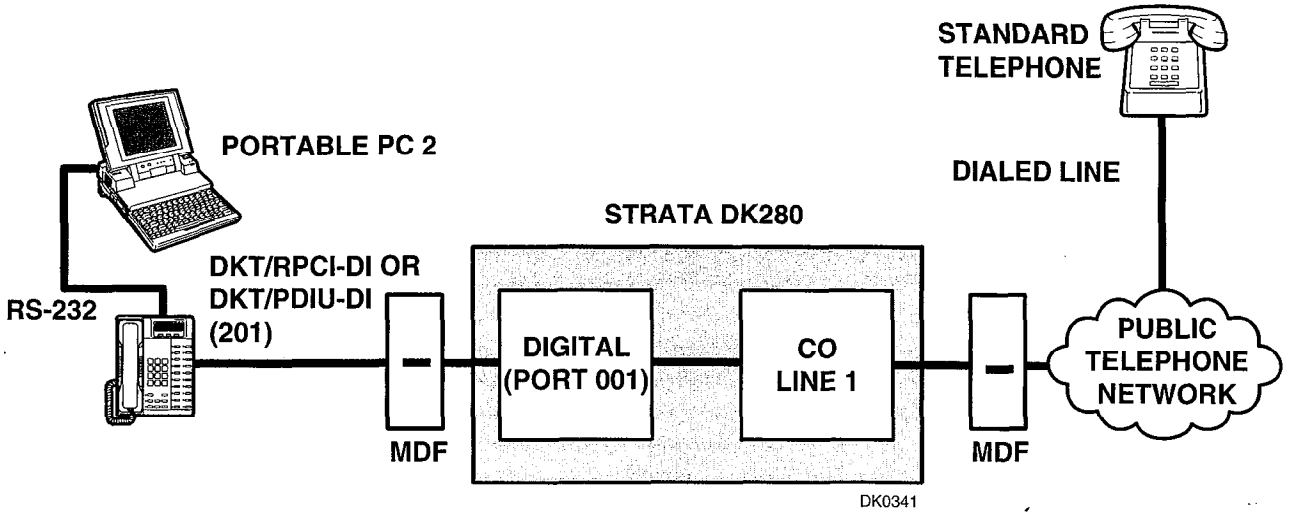


Figure 6-39
DK280 PC Auto Dial Voice Call Test

- Take the DKT's handset off-hook at any time after the telephone number is dialed and press the **Spacebar** to release the **Data Call** button; or, remain on-hook and use the DKT's speakerphone.

  Note:
  Speakerphone model only: pressing the **Spacebar** *when using the speakerphone feature disconnects the call.*

- To terminate the call anytime:
  A. If off-hook, press the **Spacebar** and place the DKT handset on-hook.
  B. If talking via the speakerphone, press the **Spacebar**.

6.10 DK280 Alarm Sensor Installation

The PIOU or PIOUS PCB provides a circuit that can be set to detect a relay open or closed condition from a facility alarm system. When the sensor is activated, all electronic and digital telephones will sound an alarm signal. The electronic/digital telephone alarm signal can be reset by any electronic or digital telephone with an alarm reset button (see Program 39).

Alarm Sensor Options

Jumper plug P12 on the PIOU is used to set the alarm sensor to detect an open or closed condition from the facility alarm system. Set P12 as follows (refer to Figure 6-40):

- To detect a closed condition, set P12 to the N.O. position.
- To detect an open condition, set P12 to the N.C. position.

Jumper W3 on the PIOUS is used to set the alarm sensor to detect an open or closed condition from the facility alarm system. Solder the W3 jumper wire as follows (refer to Figure 6-40):

- To detect a closed condition, solder W3 to the normal open position.
- To detect an open condition, solder W3 to the normal closed position.

Alarm Sensor Wiring

Refer to Figure 6-40, and connect the facility alarm system relay contacts to the PIOU/PIOUS PCB.

6.11 Auto Attendant

Auto Attendant operates like an automatic station attendant or switchboard operator that quickly and efficiently distributes calls to stations selected by callers. Incoming calls are greeted by an external announcement device that offers callers a menu of station locations associated with a number, such as 3 for Sales, 4 for Customer Service, etc. Callers pick the destination just by dialing the single number associated with it. The call is then transferred to the

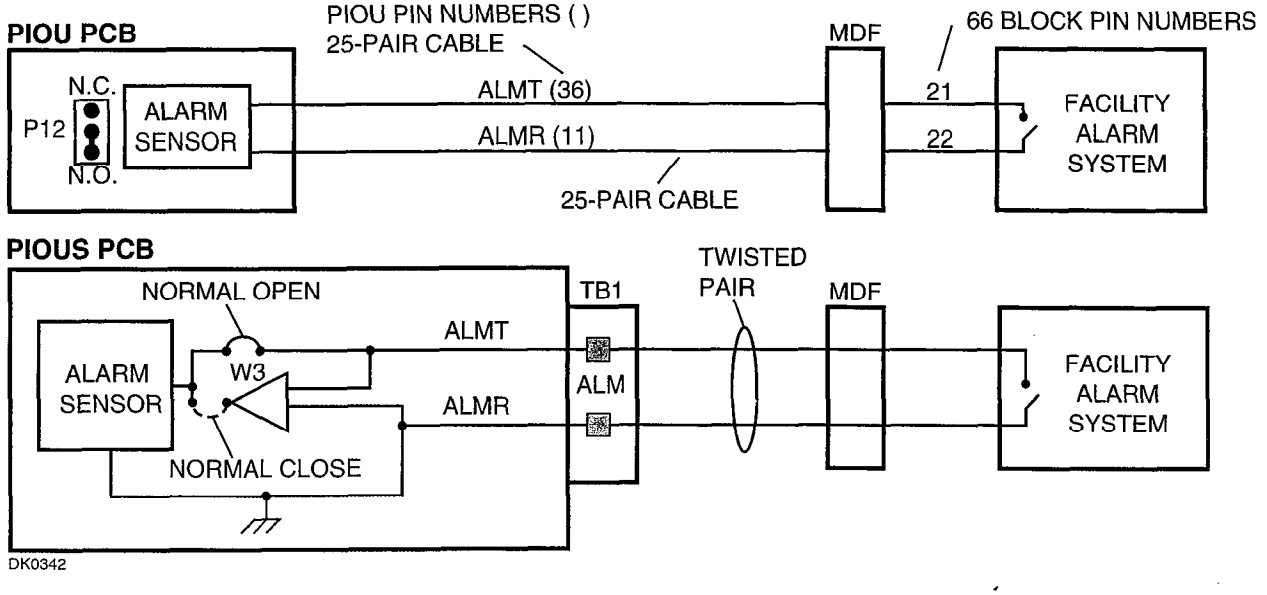


Figure 6-40
DK280 Alarm Sensor Block Diagram (PIOU/PIOUS)

station. Callers can also dial the intercom number directly.

This feature is available from three separate sources.

- Strata DK280 built-in Auto Attendant
- Voice Mail device Auto Attendant
- External Auto Attendant

Note:
Auto Attendant is licensed by Dytel, Inc. under United States Patent No. 4,975,941.

6.11.1 Strata DK280 Built-In Auto Attendant (AA) Overview

A built-in Auto Attendant feature is programmed into the Strata DK280 system software. To enable the built-in Auto Attendant to function, RRCS (4, 8 or 12) DTMF tone receiver PCB and the RKYS (1, 2, or 3) feature key must be installed on the RCTU PCB (see Chapter 4—Printed Circuit Boards for RRCS and RKYS installation instructions).

The customer must provide digital announcement device(s), on which the greeting and menu that the callers hear are recorded. The digital announcement devices must connect to Strata DK280 standard telephone circuits. There is a series of programs (explained later) in Chapter 9—Instructions and Chapter 10—Record Sheets, which are for the built-in Auto Attendant feature exclusively, not the other two Auto Attendant feature applications. Callers must use a DTMF (tone) telephone to select Auto Attendant dialing options.

The built-in Auto Attendant feature offers flexibility in answering calls. Calls follow the basic sequences described below and illustrated in Figure 6-41.

- **Sequence A.** The call is answered directly after being transferred from the Auto Attendant. The caller calls in on CO lines assigned for built-in Auto Attendant, receives a greeting along with a menu of dialing options, and then dials an option of the intercom number. The call is then transferred to a station, which answers the call.
- **Sequence B.** The call is not answered after being transferred from the Auto Attendant and is routed to an optional secondary announcement, where it will receive a new announcement and the same or additional dialing options. Some customers may not configure their Auto Attendant system with a secondary announcement; if so, their unanswered calls would follow sequence C or D.
- **Sequence C.** The call is not answered after being transferred from the Auto Attendant and is routed to an alternate station(s) assigned in system programming, ringing assignments.
- **Sequence D.** The call is not answered after being transferred from the Auto Attendant and is routed back to the primary announcement. This is probably the least desirable of the four sequences, since the caller hears a repeat of the announcement he just received seconds earlier.

Note:
In all of the above sequences, the call can first ring telephones selected in system programming for 12 or 24 seconds, and then be routed to the Auto Attendant if not answered by any of the ringing stations. This is called Auto Attendant delayed ring.

6.11.2 Built-in Auto Attendant Programming

The following describes each of the programs required for the built-in Auto Attendant feature. These descriptions used along with Figures 6-41 ~ 44, provide a comprehensive overview of built-in Auto Attendant.

Program 78 (61, 62, and 63)—CO lines are assigned for built-in Auto Attendant with this program. There is no limit to the number of lines that can be assigned for Auto Attendant, and each line can be set for any or all of the ringing modes (DAY, DAY2, and NIGHT). See Programs 81 ~ 89 record sheet notes and Chapter 9—Instructions) to assign built-in Auto Attendant CO lines for Delayed Ringing.

Programs 81 ~ 89—Assigns stations to ring if Auto Attendant (AA) callers do not dial or AA calls are not answered. Also, if not answered by a station (or stations) set to ring during Immediate Ringing (or delay 2 ring), incoming calls can be set to ring built-in Auto Attendant announcement ports on a Delayed Ringing basis.

Program 03—An RRCS (-4, -8 or -12) must be installed on the RCTU common control unit for the system to interpret DTMF tones generated by the CO. Use this program to tell the system that the common control unit is equipped with an RRCS.

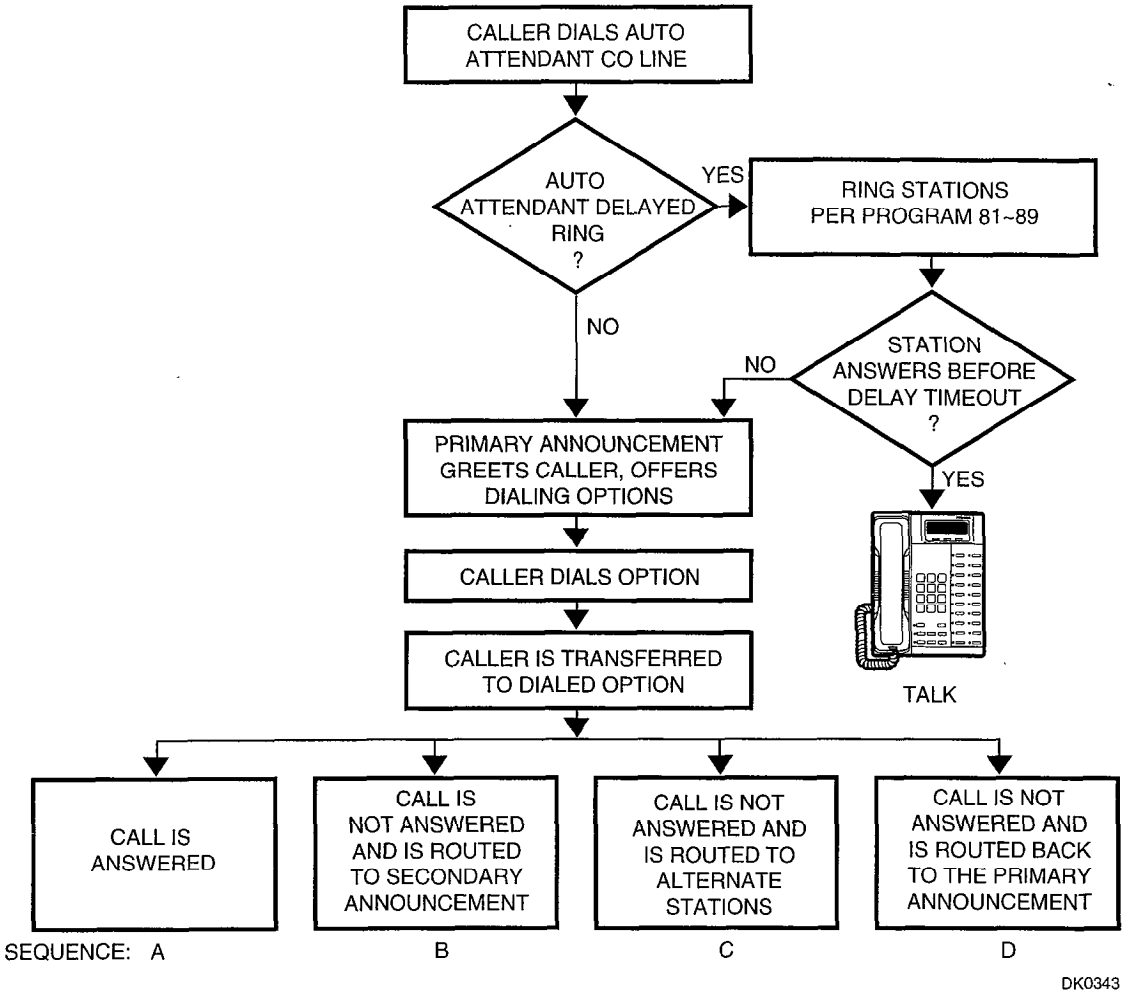


Figure 6-41
Built-in Auto Attendant Basic Call Sequences

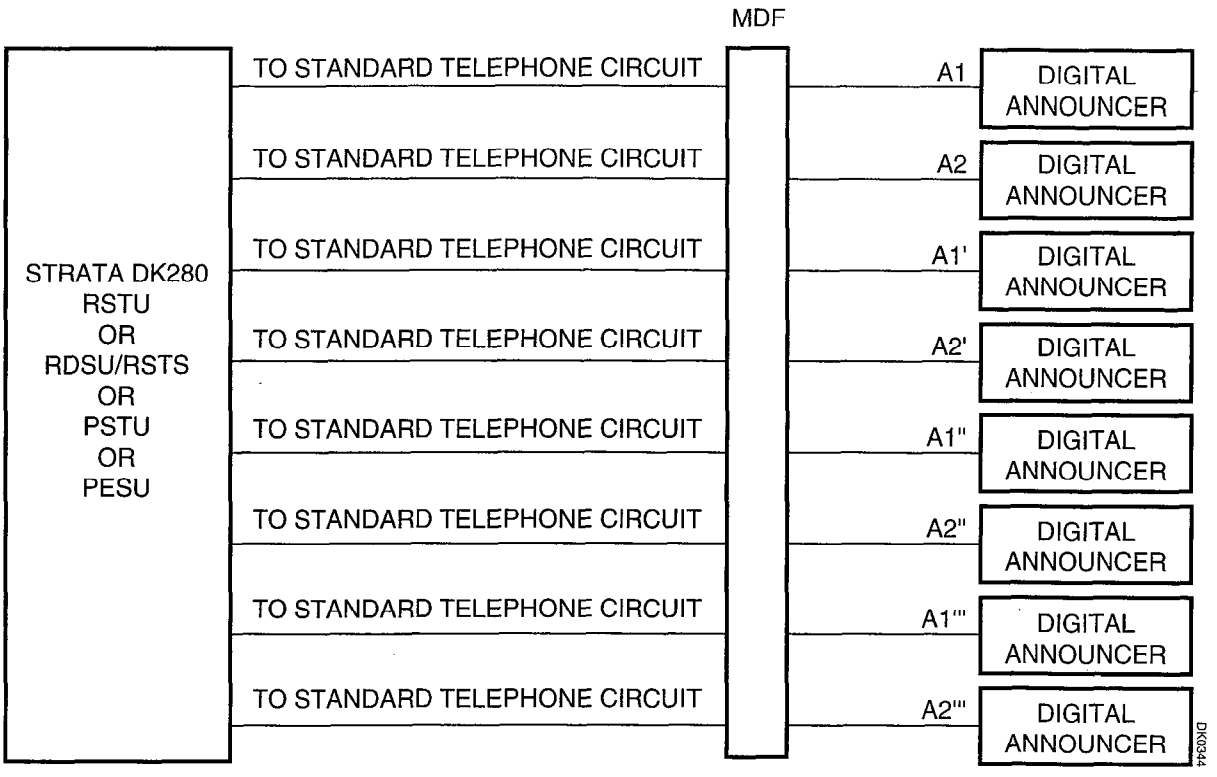
IMPORTANT !

RKYS must also be installed on RCTU, RKYS does not need a Program 03 (or any other) program assignment.

Program 25-1—If there are no RRCS circuits or announcement devices available for an incoming CO line built-in Auto Attendant call, the call will transfer to alternative station(s) (Programs 81 ~ 89) after a time duration assigned with this program.

Program 23—As many as four digital announcement devices for primary announcements, each requiring one standard telephone station port (Figure 6-42), can be assigned. Callers receive primary announcements (60 seconds maximum announcement time)— which consist of the greeting along with the delivery of menu prompts—when they first call (they may also be rerouted back to the announcement after reaching a busy or ring no answer station).

Program 24—Transferred calls that are unanswered at stations can be routed to a secondary announcement device (60 seconds maximum announcement time), which typically first informs the caller that the option they dialed was unavailable and then presents them with either the same options offered by the primary announcement device or some additional ones (Figure 6-42).



SEE PROGRAMS 23 AND 24 FOR DIGITAL ANNOUNCEMENT ASSIGNMENTS
(A1 = PRIMARY AUTO ATTENDANT (AA) ANNOUNCEMENTS, A2 = SECONDARY AA ANNOUNCEMENTS)

Figure 6-42
Announcement Device Block Diagram

Program 09—Tells the system where to transfer built-in Auto Attendant calls after the caller has dialed in response to the delivered menu options.

Program 60-6—Enter a DISA security code to prevent users from making unauthorized external calls via the Auto Attendant DISA access (Dial ✱) feature.

Program 26—There will be times when transferred Auto Attendant calls will not be answered after camping-on to a busy station. This program tells the system when to end the camp-on and to route the call to another destination (it could be a secondary announcement device or alternative stations per program 10-3, LED 18). If a station has Call Forward set, the call will forward to the proper destination instead of routing per AA Program 10-3, LED 18.

Program 10-3

- **LED 18**—Some customers may choose to configure their Auto Attendant without a secondary announcement device. In these arrangements, transferred calls that are unanswered can be routed for normal ringing to some alternative stations set in Programs 81, 84, and 87, or back to the primary announcement device. LED 18 should be on if the calls should be routed to stations assigned in Programs 81, 84, and 87. It should be off for the primary or secondary announcement device option. If LED 18 is selected, see LEDs 16 and 17 for disconnect timing options.
- **LED 15**—If LED15 is ON (and Music-on-Hold (MOH) is installed) the DK280 will send MOH to the caller when the auto attendant routes a call to ring or camp-on a station; if LED 15 is OFF the DK280 will send ring-back-tone to the caller.
- **LEDs 16 and 17**—Set LEDs 16 and 17 to tell the system when to disconnect, as a safeguard, built-in Auto Attendant calls that have not been answered by stations. This feature assures that

the loop start CO line that the call was made on will be free for other calls if the caller hangs up before the call is answered. The initialized disconnect setting is 40 seconds. The other timing options available are 150 seconds and 350 seconds. Set LEDs 16 and 17 for the desired time as follows:

40 seconds: LED 16 = Off. LED 17 = Off.

150 seconds: LED 16 = Off. LED 17 = On.

350 seconds: LED 16 = On. LED 17 = Off.

Ground start lines disconnect automatically with this timer.

Program 15—Selects Automatic Release (AR) on Voice Mail, Auto Attendant or voice calls. This will provide automatic release (if the calling party disconnects) without waiting for the safeguard timer in Program 10-3.

6.11.3 Built-in Auto Attendant Installation

The built-in Auto Attendant feature only requires the installation of a feature key and customer-supplied announcement devices to deliver announcements to callers. The feature does not require the installation of any other devices. Install the customer-supplied digital announcement devices using the following instructions (Figure 6-42).

Note:
In Figure 6-42 and elsewhere in this manual, announcement devices are referred to as A1 and A2. A1 designates a primary announcement device, and A2 a secondary announcement device. The prime marks following the designation distinguishes the multiple announcers from each other.

1. Ensure that the RSTU, PSTU, PESU, or RDSU/RSTS that will connect with the device is installed per Chapter 4—Printed Circuit Boards.
2. Connect the devices to the selected circuit per the RSTU, PSTU, PESU, or RDSU/RSTS wiring diagrams in Chapter 7—Wiring Diagrams.
3. Ensure that the RRCS and RKYS is installed on the RCTU Common Control PCB per Chapter 4—Printed Circuit Boards.
4. Program the system per the instructions in Subsection 6.11.2.
5. Record the message and dialing prompts on the announcement device per the device manufacturer's instructions.

6.11.4 Built-in Auto Attendant ACD Applications

The DK280 built-in Auto Attendant can function with Automatic Call Distribution (ACD) groups in two ways (see Figure 6-43):

1. The DK280 built-in Auto Attendant can function to answer calls and send them to selected ACD groups when the caller dials the digit assigned to an ACD group.
2. A call that is waiting in an ACD queue can overflow to the built-in Auto Attendant to allow the caller to choose another destination.

   Note:

   Options 1 and 2 can be used simultaneously or independently. See ACD Installation manual for ACD/Auto Attendant programming options.

6.11.5 Digital Announcer Auto Disconnect

The DK280 built-in Auto Attendant automatically disconnects digital announcers immediately after the caller(s) dials a digit and are routed to a selected destination. This feature provides maximum efficient use of digital announcement devices because the announcement device does not have to play to the end before it is released. For this feature to operate, the Digital announcer must recognize a 100 milliseconds open circuit on the (RSTU, RSTU2, PDSU/RSTS) loop, and hang-up when it detects the open on the loop.

6.11.6 Built-in Auto Attendant Block Diagram

A detailed block diagram which includes call flow patterns and associated programs is provided in Figures 6-44 and 6-45.

6.11.7 Non-Built-In Auto Attendant Overview

Some customers may not utilize the Strata DK280 built-in Auto Attendant feature. They may decide, instead, to use the Auto Attendant feature offered with a voice mail system, such as Toshiba VP. Or they can have a more sophisticated non-voice mail Auto Attendant as a stand-alone device.

Non-built-in Auto Attendant Programming

The Auto Attendant programs described in Subsection 6.11.2 do not apply to the Non-integrated Auto Attendant feature sources, but Strata DK280 programs listed below should be considered for proper operation: 03, 04, 10-1, 13, 16, 31, 33, 36, 37, 39, and 81 ~ 89.

Non-built-in Auto Attendant Installation

Non-integrated Auto Attendant sources, such as voice mail devices and stand-alone units, connect to

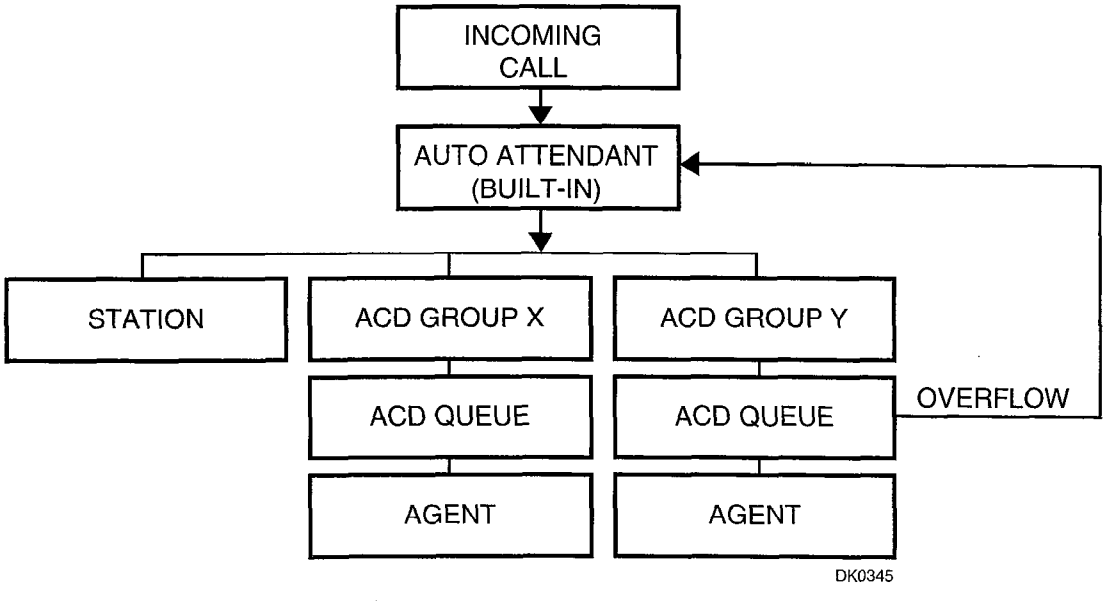


Figure 6-43
Auto Attendant/ACD Application Flow Diagram Example

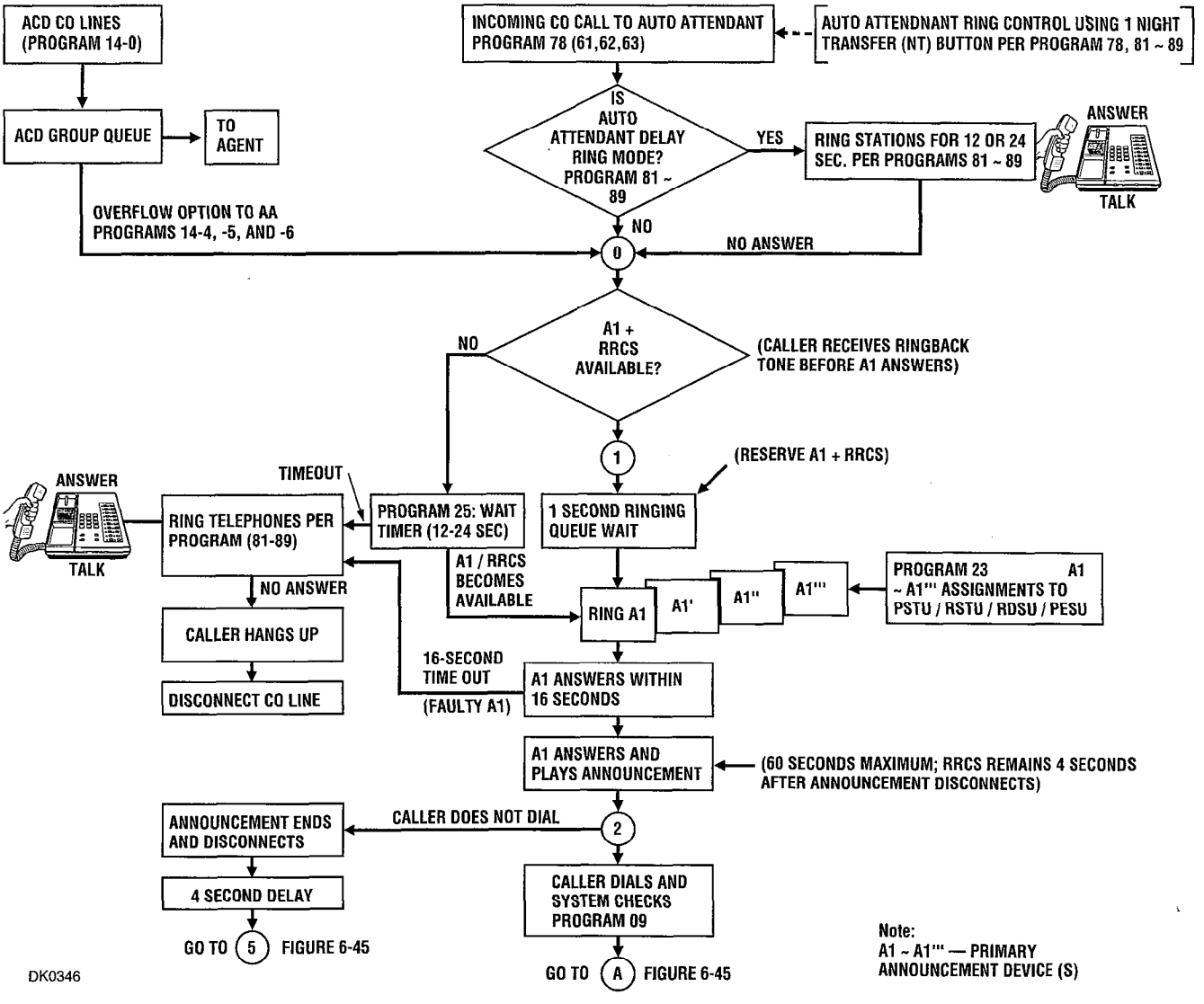


Figure 6-44
Built-in Auto Attendant Flowchart

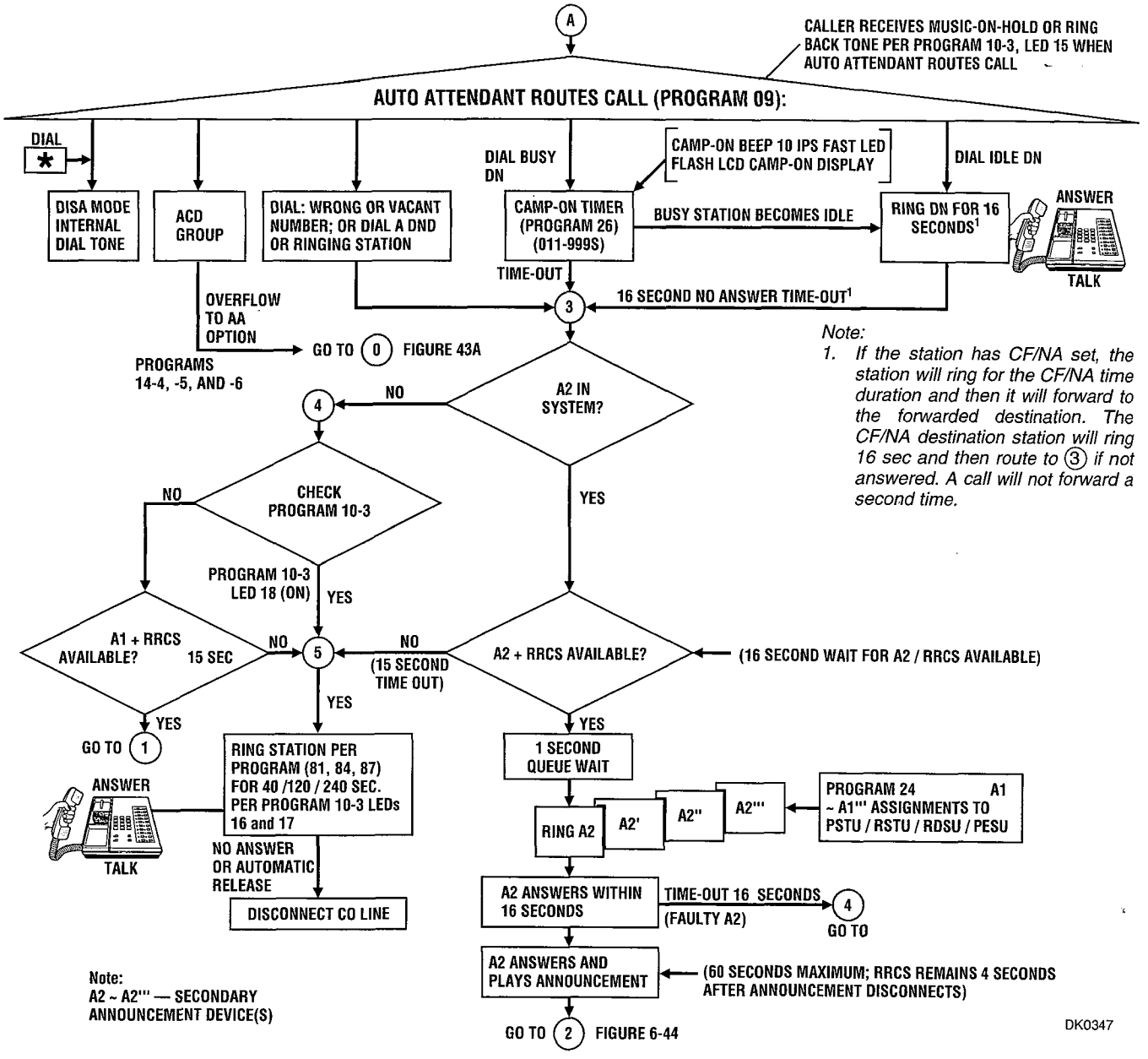
standard telephone circuits (ports). See Chapter 7—Wiring Diagrams for RSTU, PSTU, PESU, and RDSU/RSTS PCB standard telephone circuit interconnecting/wiring details.

6.12 Multiple PIOU/PIOUS/RSSU/RSIU Installation

This installation is for Remote Maintenance, MIS for ACD, SMDI or Toshiba Proprietary RS-232 VM Integration, and Open Architecture Port.

Up to three PIOU, PIOUS, or RSSU PCBs can be installed in a system to simultaneously provide: maintenance terminal (or modem) interface, Management Information System (MIS) for ACD interface, and RS-232 voice mail interface (Toshiba proprietary or Simplified Message Desk Interface, SMDI).

Each of these interfaces are provided by the modular jacks on a separate PIOU, PIOUS, RSSU (see Figure 7-37). Interface assignments are made in Program 03 (Code 41, 42, and 43). PIOU and PIOUS Paging,

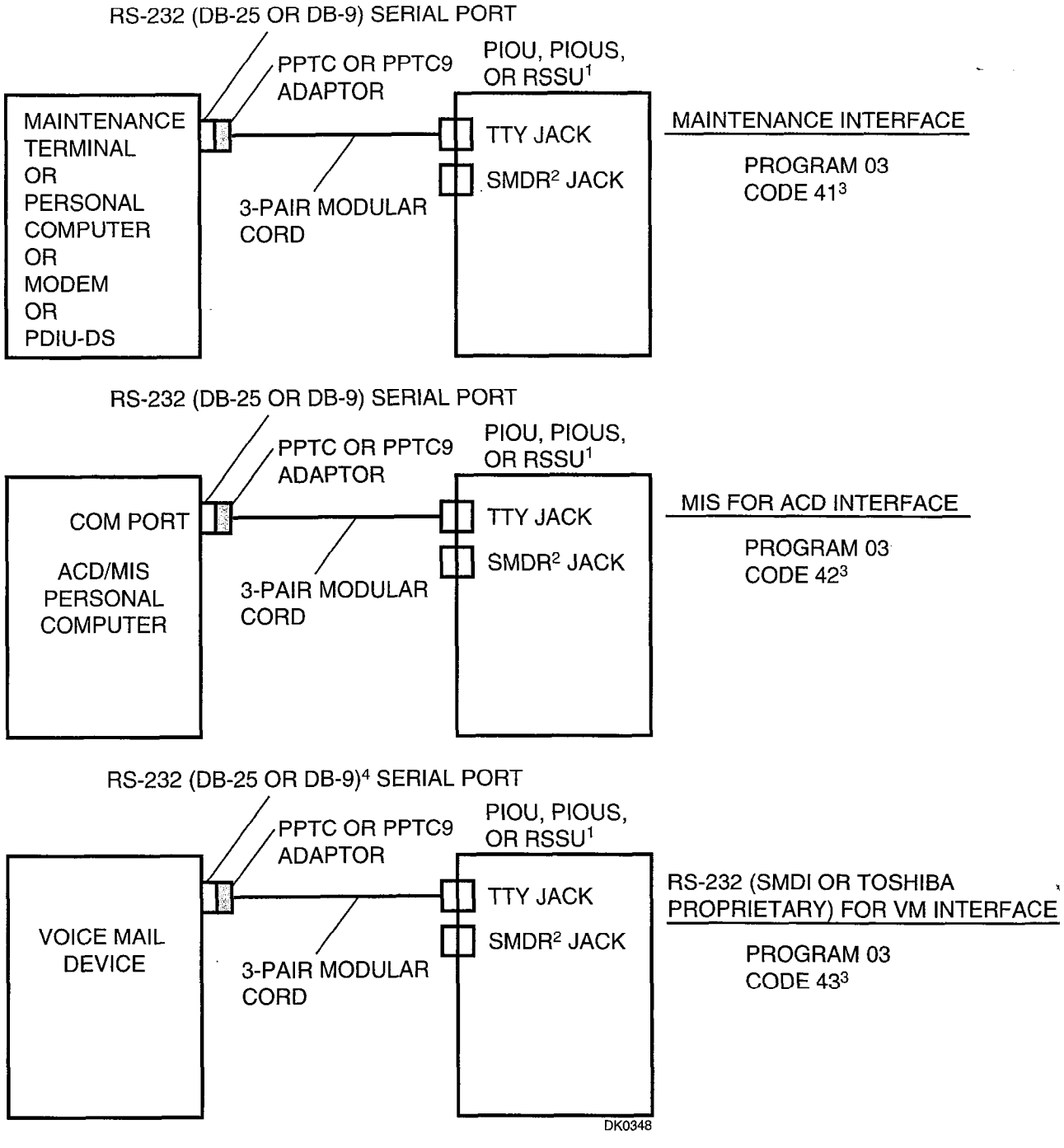


Note:
1. *If the station has CF/NA set, the station will ring for the CF/NA time duration and then it will forward to the forwarded destination. The CF/NA destination station will ring 16 sec and then route to (3) if not answered. A call will not forward a second time.*

Figure 6-45
Built-in Auto Attendant Flowchart (continued)

SMDR, relay control, alarm sensor, and door lock functions will be active only on the PIOU or PIOUS PCB which is assigned the lowest Program 03 code (41, 42, or 43). RSSU only provides the TTY interface for SMDI, local maintenance, or ACD MIS but not for SMDR, built-in maintenance modem or system OA.

With DK280 Release 3 and above an RSIU with RSIS and/or RMDS can be installed to provide the same RS-232/modem functions as PIOU/PIOUS/RSSU PCBs plus the open architecture port which is not available on any other interface PCB. If RSIU/RSIS/RMDS is installed, Program 76 assignments will override Program 03 (Code 41, 42, and 43) assignments for SMDR, TTY, SMDI, and built-in maintenance modem. For more detailed information regarding RSIU/RSIS/RMDS installation, see RSIU installation in Chapter 4—Printed Circuit Boards and refer to Figure 7-38 in Chapter 7—Wiring.



Note:

1. *Install PIOU, PIOUS, or RSSU PCBs in the last (highest numbered) slot in any cabinet(s).*
2. *SMDR, Page Outputs, Relay controls, Alarm Sensor, and other miscellaneous options on PIOU or PIOUS will be active on the installed PIOU/PIOUS that is programmed with the lowest Program 03 code (41, 42, or 43). RSSU does not provide these features.*
3. *If set, RSIU/RSIS Program 76 will override Program 03 code 41, 42, and 43.*
4. *VP100 and Stratagy use stratight cables, VP200/300 require "null modem" connection. PPTC (25-pin) requires a "male-to-female" gender changer.*

Figure 6-46
Multiple PIOU/PIOUS (Remote Maintenance, MIS for ACD, RS-232 Voice Mail Integration)

6.13 RS-232 SMDI and Toshiba Proprietary Voice Mail Interface Installation

1. SMDI and Toshiba Proprietary interface requires RCTUB2 RCTUBA/BB, RCTUC/D2 or RCTUC3/D3 or above software.

2. Connect the DK280 Voice Mail interface PCB (PIOU, PIOUS, RSSU) TTY jack or the RSIU/RSIS RS-232 jack to the voice mail device as shown in Figure 7-37 or 7-38 in Chapter 7—Wiring.

3. Program DK280 as follows:
   - If Installing SMDI with an RSSU, PIOU, or PIOUS PCB set Program 03, code 43 for the cabinet slot in which the Voice Mail interface PIOU, PIOUS, or RSSU PCB is installed (for SMDI or Toshiba Proprietary).

     – or –

   - If installing SMDI with an RSIU or RSIS PCB, set the appropriate RSIU/RSIS port with code x4 in Program 76-1; and code 49 for slot 11 in Program 03 (see Figure 7-37 and 7-38 in Chapter 7—Wiring for wiring).
   - Program 10-2, LED 04 "ON" (SMDI or Toshiba Proprietary).
   - Program 10-3
     - ♦ If installing SMDI interface, see Program 10-3 Chapter 9—Instructions

       - or -

     - ♦ If installing Toshiba Proprietary interface, set Program 10-3, LED 09, 10, 11, 12, 13 and 14 OFF. Toshiba Proprietary RS-232 integration is designed for use with VP voice mail machines having Release 7 or higher software. The VP machine should be configured for DK280 integration with the RS-232 option selected.
   - Program 13, program the lowest RSTU or RSTU2 port connected to the VM system as the message center (for SMDI or Toshiba Proprietary).
   - Program 31, LED 04, 09, 15, 16, 17 and 18 (for SMDI or Toshiba Proprietary RS-232).
   - Program *32, assign the lowest RSTU port connected to the voice mail system to all station ports using voice mail. This is the same port assigned in Program 13. This assignment is used in place of VM groups (Program 31) which are assigned when not using SMDI or Toshiba Proprietary VM integration.

4. Voice mail machine configuration will vary depending on the machine. Refer to the VM machine installation documentation or call the Toshiba and/or VM machine Vendor Technical Support group for assistance.

IMPORTANT !

When RS-232 Voice Mail Interface (VMID) is used, clear (remove) all station VMID codes using #656 and #657 dial codes from each telephone or use 280ADMIN to clear the VMID codes.

6.14 TAPI PC Configuration

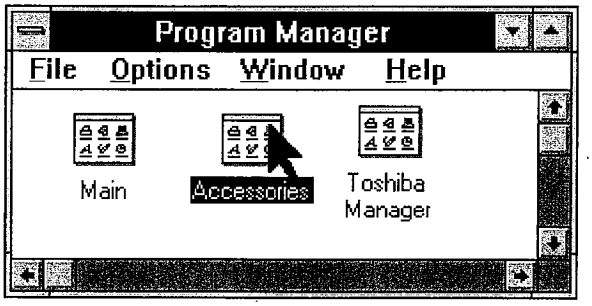
The following procedures require an IBM-compatible personal computer with 8 MB RAM running Microsoft® Windows® 3.1 or later that has had Microsoft TAPI installed. Most TAPI applications automatically install TAPI as part of the normal install process. TAPI is also integrated within Windows 95.

6.14.1 Test Your COM Port with Terminal

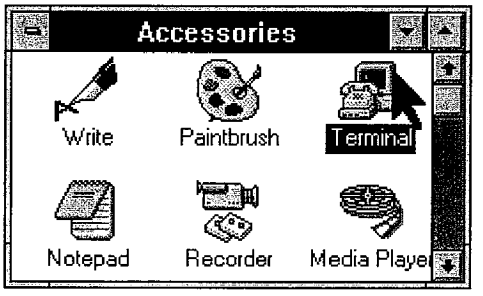
If you are not sure which COM port the RPCI-DI is connected to, use the Microsoft Windows Terminal program to verify the COM port. Before starting this test, make sure the DKT phone is connected to the DK280 and is working. Check the cable between the PC and the RPCI-DI; it should be a straight-through DB-25 male to a DB-9 female.

Follow these steps to verify the COM port:

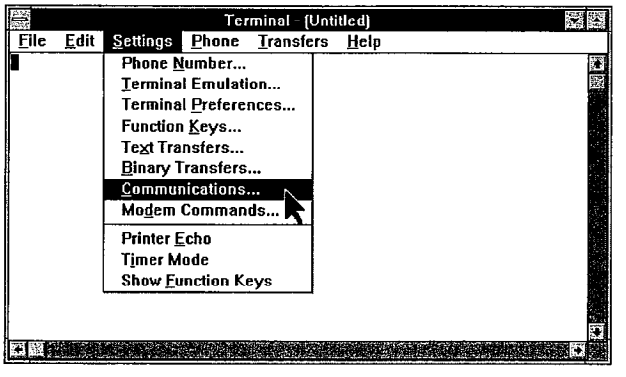
1. From Window's Program Manager, double-click the Accessories Group.



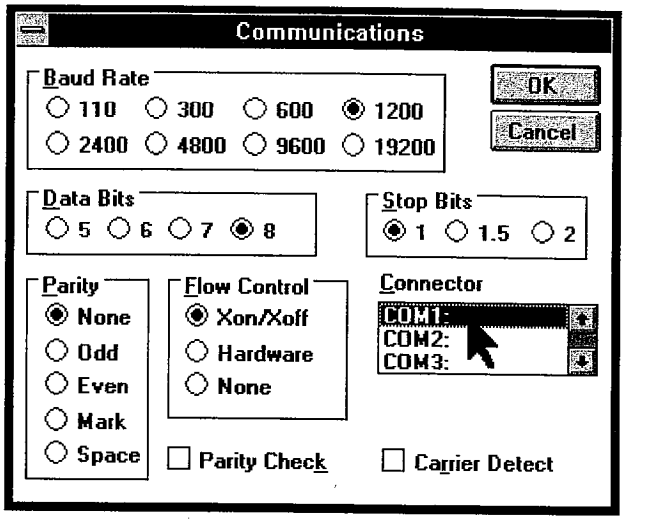
2. The Accessories Group window opens. Double-click the Terminal icon.



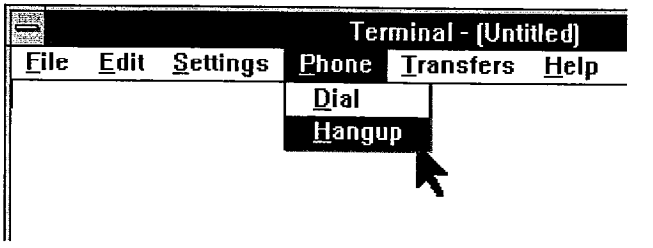
3. The Terminal screen appears. From the Settings pull-down menu, select Communications...



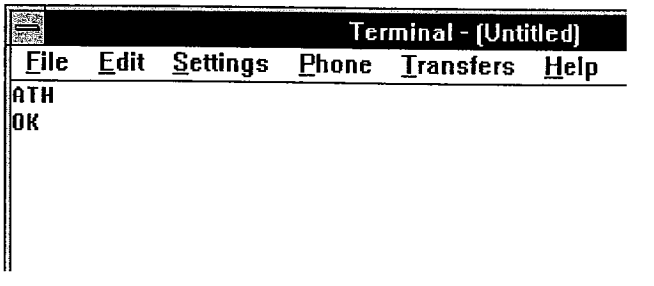
4. The Communications dialog box appears. Under Connector, select a COM port (e.g., COM1, COM2). Click OK.



5. From the Phone pull-down menu, select Hangup.



6. If after a few moments ATH followed by OK appears, the selected COM port is either the RPCI or a modem. At the cursor prompt type: ATCØ. If the RPCI-DI is connected to the selected COM port, the RPCI-DI returns a continuous stream of data. To stop the continuous data, reset the telephone by unplugging the DKT modular connection to the Strata telephone system.

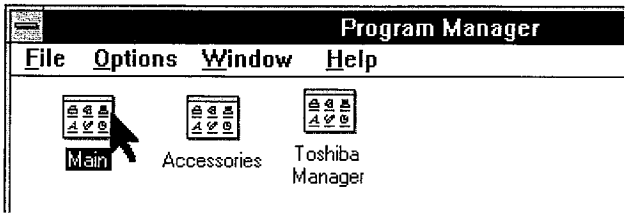


Note:
If after a few moments the cursor returns to the normal blinking state with no apparent change, the PC does not see a connection to the selected COM port. Repeat the process for the next COM port until all have been tested. If none of the COM ports return an ATH followed by OK, check or change the cable between the PC and the RPCI-DI and repeat Step 5. If none of the COM ports respond this time, open the DKT2000 telephone and check the RPCI connections.

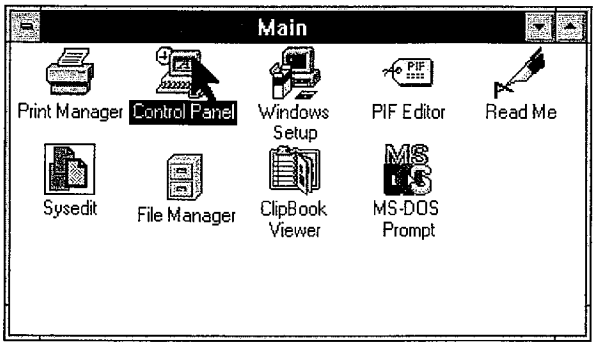
6.14.2 Install the DKT Service Provider

IMPORTANT !
TAPI must be installed on the PC prior to installing the DKT Service Provider.

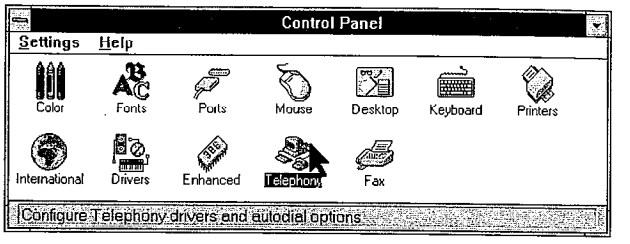
1. From the Windows Program Manager, double-click the Main group icon.



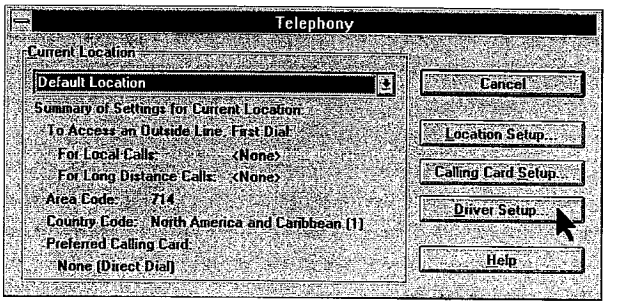
2. The Main group window opens. Double-click the Control Panel icon.



3. From the Control Panel group window, double-click the Telephony icon.

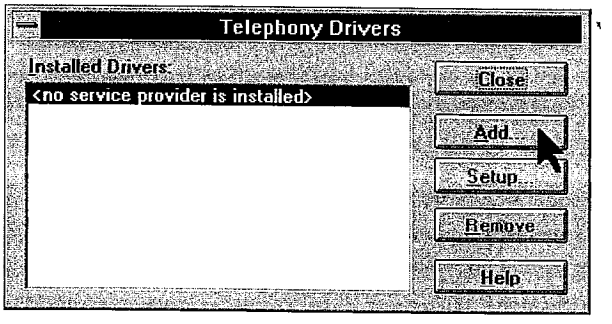


4. Click the Driver Setup button.

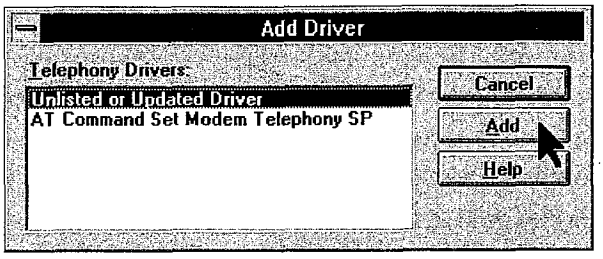


Note:
If TAPI is not installed, the telephony icon will not appear in Control Panel.

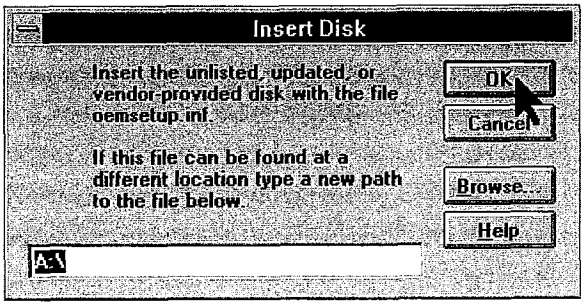
5. Click the Add button.



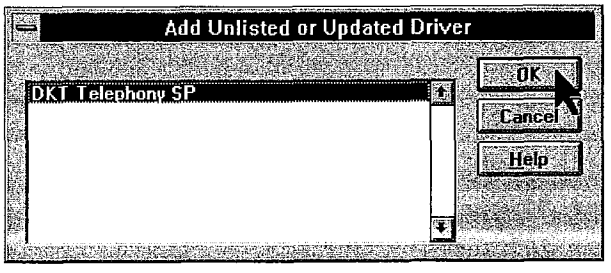
6. Select Unlisted or Updated Driver and click the Add button.



7. Insert the ACT! Phone Link disk in Drive A. Select the OK button.



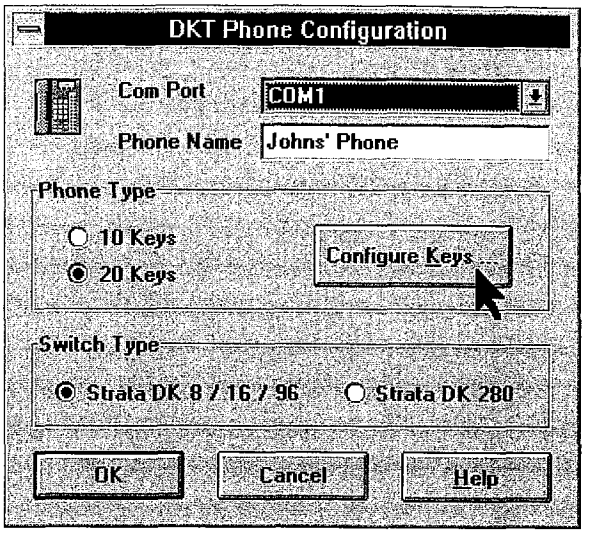
8. Select DKT Telephony SP and click the OK button.



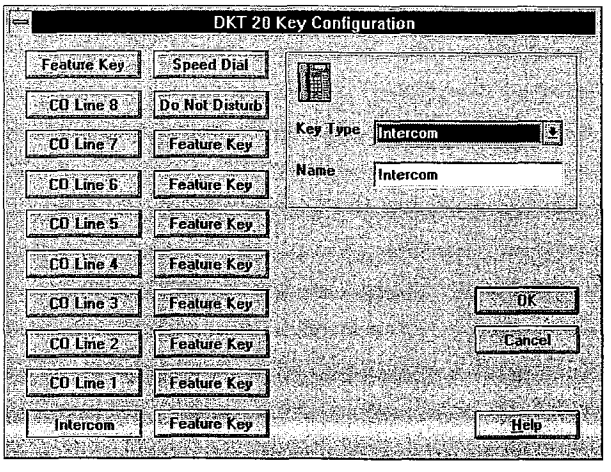
9. From the DKT Phone Configuration screen, select the following:

   - COM port.
   - Phone Name.
   - Phone Type (10 Keys or 20 Keys).
   - Switch Type (Strata DK 8 /16/ 96 or Strata DK280).

   When finished selecting, click the Configure Keys button.



10. Select the Intercom button. Click the two OK buttons then two Close buttons.



Installation is complete.

Note:
More information is available in the Help files throughout the remainder of the Service Provider installation procedure.

Wiring Diagrams

7

This chapter contains point-to-point wiring diagrams for connection of telephones, lines, peripheral equipment, and power supplies to the Strata DK280 systems. Wiring diagrams are divided into groups according to the printed circuit board (PCB) which provides the interface for, or controls the operation of, the associated equipment.

7.1 Wiring Diagrams

The following paragraphs list and identify the wiring diagrams provided in this chapter.

7.1.1 Station Wiring Diagrams

- Figure 7-1—Secondary Protector Diagram
- Figure 7-2—MDF Wiring/Electronic Telephone to PEKU
- Figure 7-3—MDF Wiring/HDSS Console and Associated Electronic Telephone Wiring to PEKU
- Figure 7-4—MDF Wiring-Door Phone/Lock to PEKU/PESU
- Figure 7-5—PEKU Background Music Connection
- Figure 7-6—PEKU Station/MDF Cross Connect Record
- Figure 7-7—MDF Wiring/Standard Telephone, Voice Mail, DPFT to RSTU/PSTU/PSTU2
- Figure 7-8—RSTU/PSTU Station/MDF Cross Connect Record
- Figure 7-9—PESU Wiring Diagram
- Figure 7-10—PESU Station/MDF Cross Connect Record
- Figure 7-21—MDF Wiring for Digital Telephones (DKTs) and DDSS Console to PDKU
- Figure 7-22—MDF Wiring for Digital Telephones with PDIU-DI and PDIU-DS to PDKU
- Figure 7-23—PDKU Station/MDF Cross Connect Record
- Figure 7-24—MDF Wiring/PEKU Amplified Two-CO Line Conference
- Figure 7-25—MDF Wiring-DDCB/Door Phone/Lock to PDKU
- Figure 7-26—External Power for Digital Telephone Connection
- Figure 7-31—RDSU Wiring
- Figure 7-35—Personal Computer (PC) Attendant Console MDF Wiring Diagram

7.1.2 CO/Tie Line Wiring Diagrams

- Figure 7-11—MDF Wiring/CO Lines to PCOU
- Figure 7-12—MDF Wiring/2-Wire Tie Line to PEMU
- Figure 7-13—MDF Wiring/4-Wire Tie Line to PEMU
- Figure 7-14—CO Line (RCOU/RCOS,RGLU, RDDU, PEMU, REMU, RDDU, RDTU) MDF Cross Connect Record
- Figure 7-27—MDF Wiring/CO Lines to RGLU or PCOU
- Figure 7-28—RDTU Cable Connections

- Figure 7-29—MDF Wiring REMU 2/4 Wire Type I / II
- Figure 7-30—MDF Wiring/CO to RCOU/RCOS
- Figure 7-32—RDSU Station/MDF Cross Connect Record
- Figure 7-33—MDF Wiring/DID CO Lines to RDDU
- Figure 7-36—RCIU/RCIS MDF Wiring Diagram

7.1.3 Power Failure Cut-through (DPFT) Wiring Diagrams

- Figure 7-15—DPFT Connector J1/Terminal Sequence & Designations/Central Office Line Connection & DPFT Control
- Figure 7-16—DPFT Connector J2/Terminal Sequence & Designations/Station Line Connection

7.1.4 Option Interface PCBs

- Figure 7-17—MDF Wiring/PIOU or PEPU Peripherals (25-pair)
- Figure 7-18—PIOU/TTY and SMDR Wiring
- Figure 7-19—PIOUS Page/Relay/Alarm Connections
- Figure 7-20—PIOUS SMDR/TTY Options and Wiring
- Figure 7-37—Multiple PIOU/PIOUS (Remote Maintenance, MIS for ACD, RS-232 Voice Mail Integration)
- Figure 7-38—RSIU/RSIS/RMDS Wiring Diagrams

7.1.5 Attendant Console Wiring Diagrams

- Figure 7-34—Attendant Console MDF Wiring Diagram

Table 7-1
DK280 FCC Registration Numbers

Manufacture Country	Key System	Hybrid System
Made in Japan	CJ69XA-10242-KF-E	CJ69XA-10243-MF-E

DK0001

Table 7-2
Loop Requirements

Device Description	Interface PCB	Max Loop Resistance (Including Device)	Max Distance from KSU to Device	Number of Wire Pairs[1]
Digital telephone	PDKU (ckts 1 ~ 8) or RDSU (ckts 5 ~ 8)	40 ohms	1000 ft. (303 m)	1-pair
DDSS console	PDKU (ckt 8)	40 ohms	1000 ft. (303 m)	1-pair
Attendant console	RATU (ckts 1 ~ 4)	40 ohms	1000 ft. (303 m)	2-pair
RPCI-DI or PDIU-DI2	PDKU (ckts 1 ~ 8) or RDSU (ckts 5 ~ 8)	40 ohms	1000 ft. (303 m)	Shares digital telephone wire-pair.[3]
PDIU-DS	PDKU (ckts 1 ~ 8) or RDSU (ckts 5 ~ 8)	40 ohms	1000 ft. (303 m)	1-pair
ADM	PDKU (ckts 1 ~ 8) or RDSU (ckts 5 ~ 8)	40 ohms	1000 ft. (303 m)	Shares digital telephone wire-pair.[3]
DDCB	PDKU or RDSU (ckt 5)	40 ohms	1000 ft. (303 m)	1-pair
HDCB	PEKU (ckt 5) or PESU[2] (ckt 5)	40 ohms	1000 ft. (303 m)	2-pair
HDSS consoles	PEKU (ckts 7 & 8)	20 ohms	500 ft. (152 m)	
Standard telephones, voice mail, auto attendant, etc.	RSTU (ckts 1 ~ 8) RDSU/RSTS (ckts 1 ~ 4) PSTU (ckts 1 ~ 8) or PESU[2] (ckts 1 & 2)	• 300 ohms[4] • 600 ohms • 1,200 ohms	• 300 ohms, Approx. 3000 ft. (909 m) • 600 ohms, Approx. 9000 ft. (2,727 m) • 1200 ohms, Approx. 21,000 ft. (6,363 m) (with 150 ohm device. See manufacturer's product specifications for exact resistance of device).	1-pair
EKTs	PEKU or PESU	40 ohms	1000 ft. (303 m)	2-pair OCA Stations need 3-pair.
RATI	RATU (ckts 1 ~ 4)	40 ohms	1000 ft. (303 m)	1 or 2-pair

DK0002+C2

Notes:

1. *Use 24 AWG twisted pairs.*
2. *PESU circuits 3 and 4 are not used.*
3. *Two-pair wire or an optional telephone power supply is required to achieve maximum range.*
4. *300 ohms for PSTU/PESU; 600 ohms for RSTU, RDSU/RSTS/RSTU2 without R48S option, and 1200 ohms for RSTU or RDSU equipped with an optional R48S.*

Table 7-3
Network Requirements

PCB	Facility Interface Code	Network Jack	Ringer Equivalence	Universal Service Order Code
PCOU/RCOU/RCOS (loop start line)	02LS2	RJ14C RJ21X	0.2B (PCOU) 0.3B (RCOU / RCOS)	N/A N/A
PEMU (Type I, tie line)	TL11M, 2 wire TL31M, 4 wire	RJ2EX RJ2GX	N/A	9.OF
PESU/PSTU/RSTU/ RSTU2/RDSU[1] (Off-premises station)	OL13A (PSTU/PESU) OL13B (RSTU/RSTU2, –24V) OL13C (RSTU/RSTU2, -48V)	RJ21X	N/A N/A	9.OF
RGLU (ground or loop start line)	02GS2 02LS2	RJ14C RJ1CX	0.3B	N/A
REMU (Type I or II tie line)	TL11M, 2 wire TL31M, 4 wire TL12—Type II, 2 wire TL32—Type II, 4 wire	RJ1CX	N/A	9.OF
RDTU (DS-1/T1)[2]	(Note 2f)	RJ48C/RJ48X	N/A	6.OP
RDDU (DID line)	02RV2-T	RJ14X/RJ21X	0.0B	AS.2
RCIU/RCIS	N/A	RJ21X RJ14C	0.3B	N/A

DK0003+GD.C7

Notes:

1. *Only PESU circuits 1 and 2, and RDSU circuits 1 ~ 4 provide off-premises-station (OPS) capability. All circuits on PSTU, RSTU, provide OPS. PSTU/PESU must use OL13A or equivalent line conditioning for OPS connection. RSTU and RDSU must use OL13A or OL13B if providing –24 volt loop voltage; or, if equipped with the –48 volt loop option PCB (R48S), OL13A, OL13B, or OL13C may be used for OPS connection.*
2. *When ordering DS-1/T1 circuits, six items must be specified:*
   a. *The number of channels per T1 circuit, fractional increments are normally 8, 12, or 16 channels, full service is 24 channels. Unused channels must be bit-stuffed.*
   b. *The type of CO line assigned to each channel: loop start, ground start, tie (Wink or Immediate Start), DID (Wink or Immediate).*
   c. *Frame Format Type: Super Frame (SF) or Extended Super Frame (ESF). The T1 provider normally specifies the Frame Format to be used, either is adequate for DK280 CO digital voice lines. ESF provides a higher level of performance monitoring, but requires trained personnel and the ESF CSU normally costs more than an SF only CSU.*
   d. *Line Code Type: Alternate Mark Inversion (AMI) or Bipolar 8 Zero Substitution (B8ZS). The T1 provider normally specifies the Line Code to be used, either is adequate for DK280 T1 CO digital voice lines.*
   e. *The customer must provide the Channel Service Unit (CSU) to interface the DK280 T1 circuit to the Telco T1 circuit. (CSUs are a Telco requirement.)*
   f. *RDTU Network Channel Interface Codes: 04DU9-BN, 04DU9-DN, 04DU9-1SN, 04DU9-1KN, 04DU9-1ZN.*

Table 7-4
Digital Telephone/DIU/DDSS Console/ADM/Loop Limits

MODE	RPSU 280 or Battery Backup[1]	Maximum line length (24 AWG)		
		1 Pair	2 Pair	1 Pair plus external power[2]
DKT Ringing (Volume Max)	RPSU 280	1000 ft (303 m)	1000 ft (303 m)	1000 ft (303 m)
	Battery Backup	675 ft (204 m)	1000 ft (303 m)	1000 ft (303 m)
DKT with DVSU (OCA)	RPSU 280	1000 ft (303 m)	1000 ft (303 m)	1000 ft (303 m)
	Battery Backup	495 ft (150 m)	1000 ft (303 m)	1000 ft (303 m)
DKT with HHEU or Carbon Handset	RPSU 280	1000 ft (303 m)	1000 ft (303 m)	1000 ft (303 m)
	Battery Backup	330 ft (100 m)	1000 ft (303 m)	1000 ft (303 m)
DKT with PDIU-DI/ PDIU-DI2/RPCI-DI	RPSU 280	495 ft (150 m)	1000 ft (303 m)	1000 ft (303 m)
	Battery Backup	165 ft (50 m)	675 ft (200 m)	1000 ft (303 m)
PDIU-DS	RPSU 280	1000 ft (303 m)	1000 ft (303 m)	1000 ft (303 m)
	Battery Backup	675 ft (204 m)	1000 ft (303 m)	1000 ft (303 m)
DKT with HHEU and PDIU-DI/PDIU-DI2/RPCI-DI	RPSU 280	495 ft (150 m)	1000 ft (303 m)	1000 ft (303 m)
	Battery Backup	33 ft (10 m)	330 ft (100 m)	1000 ft (303 m)
DDSS2060A	RPSU 280	1000 ft (303 m)	1000 ft (303 m)	1000 ft (303 m)
	Battery Backup	500 ft (151 m)	1000 ft (303 m)	1000 ft (303 m)
DDCB	RPSU 280	1000 ft (303 m)	1000 ft (303 m)	1000 ft (303 m)
	Battery Backup	500 ft (151 m)	1000 ft (303 m)	1000 ft (303 m)
DKT with DVSU and HHEU	RPSU 280	1000 ft (303 m)	1000 ft (303 m)	1000 ft (303 m)
	Battery Backup	165 ft (50 m)	1000 ft (303 m)	1000 ft (303 m)
DKT with ADM	RPSU 280	675 ft (204 m)	1000 ft (303 m)	1000 ft (303 m)
	Battery Backup	165 ft (50 m)	1000 ft (303 m)	1000 ft (303 m)
DKT with two ADMs	RPSU 280	495 ft (150 m)	1000 ft (303 m)	1000 ft (303 m)
	Battery Backup	33 ft (10 m)	330 ft (100 m)	1000 ft (303 m)
RATI to Conventional Attendant Console	RPSU 280	Not Allowed	1000 ft (303 m)	Not Available
	Battery Backup	Not Allowed	1000 ft (303 m)	Not Available
RATI to PC Console	RPSU 280	1000 ft (303 m)	1000 ft (303 m)	Not Available
	Battery Backup	1000 ft (303 m)	1000 ft (303 m)	Not Available

DK0004

Notes:
1. *Battery backup applies to instances when the system is being powered by batteries exclusively.*
2. *See Figure 7-26 for external power wiring.*

General Notes:
- *Digital telephones and other digital devices can operate at maximum lengths with two pair wiring or an external power source.*
- *Digital cable runs must not have the following:*
  - *Cable splits (single or double)*
  - *Cable bridges (of any length)*
  - *High resistance or faulty cable splices*

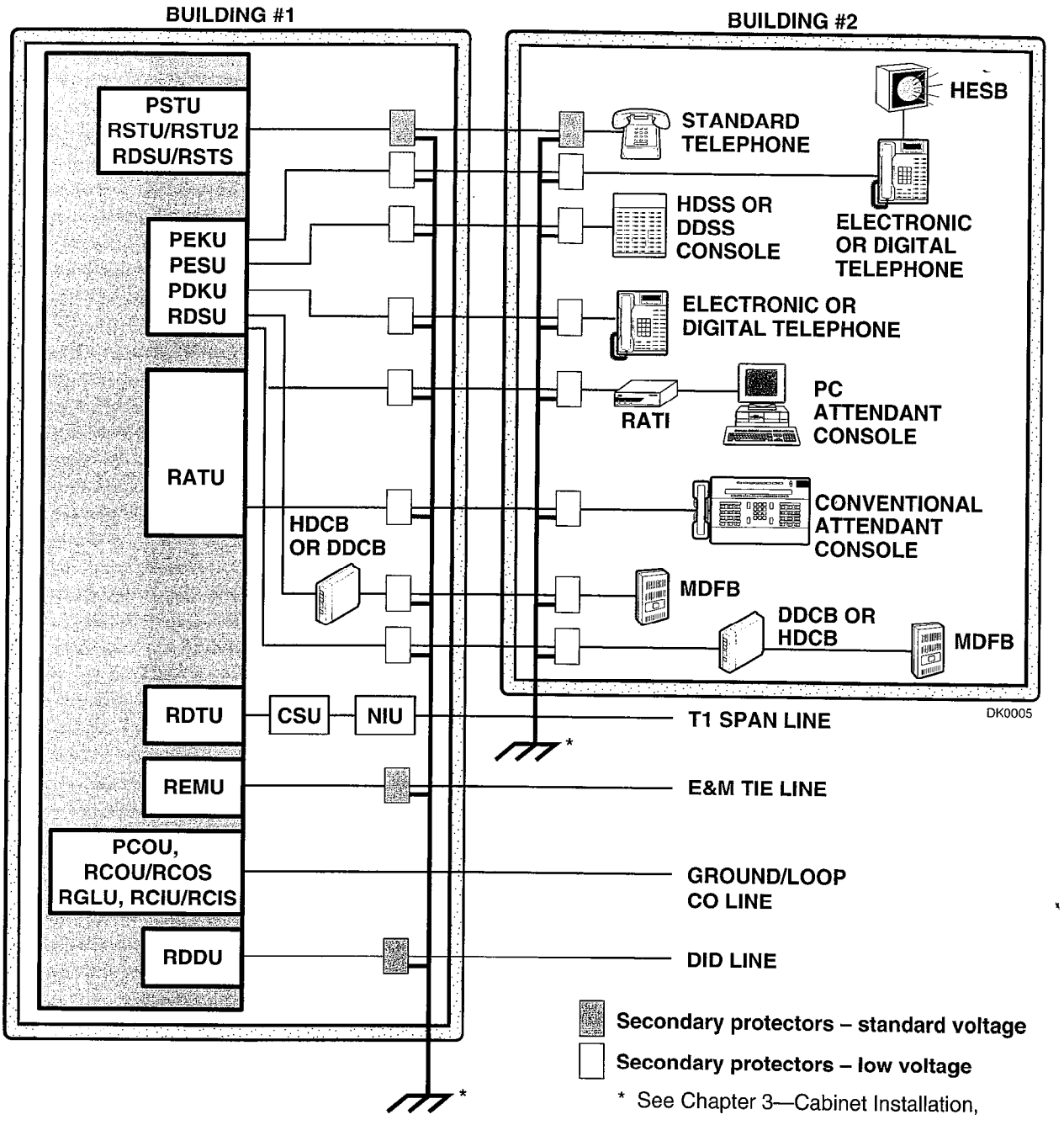
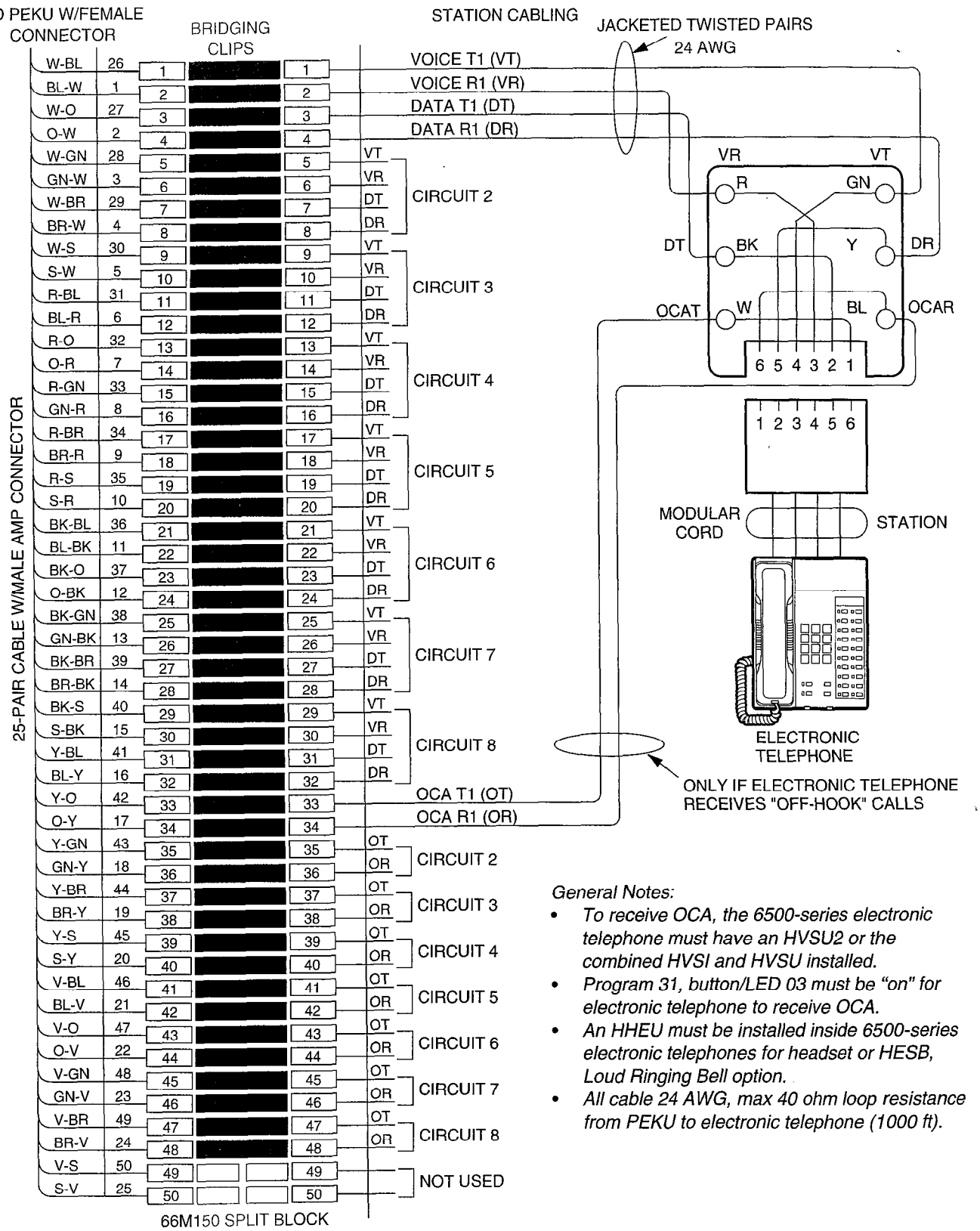


Figure 7-1
Secondary Protector Diagram

IMPORTANT !

To protect against transient voltages and currents, solid state secondary protectors must be installed if there is outside wiring (Figure 7-1), and on all DID and E&M tie lines. These protectors, which contain fast semiconductors in addition to fuses, shall comply with the requirements for secondary protectors for communication circuits, UL 497A. Care must be taken to ensure that they are very well grounded to a reliable earth ground. Recommended protectors are available in the fast Series 6 line from Oneac Corp, Libertyville, Illinois 60048, 800-327-8801. Install and test the secondary protectors precisely to the installation instructions of the manufacturer.



General Notes:

- *To receive OCA, the 6500-series electronic telephone must have an HVSU2 or the combined HVSI and HVSU installed.*
- *Program 31, button/LED 03 must be "on" for electronic telephone to receive OCA.*
- *An HHEU must be installed inside 6500-series electronic telephones for headset or HESB, Loud Ringing Bell option.*
- *All cable 24 AWG, max 40 ohm loop resistance from PEKU to electronic telephone (1000 ft).*

DK0006

Figure 7-2
MDF Wiring/Electronic Telephone to PEKU

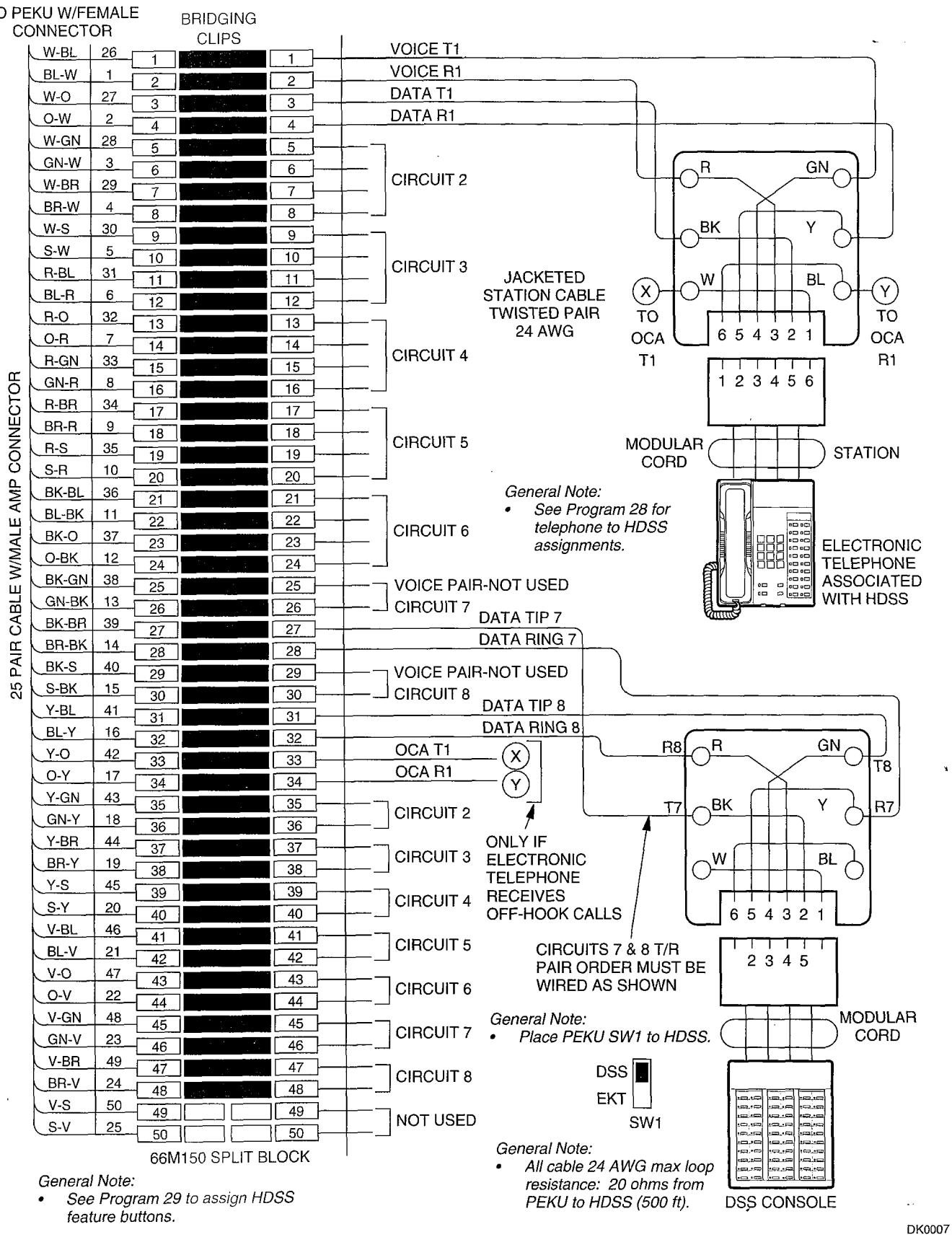
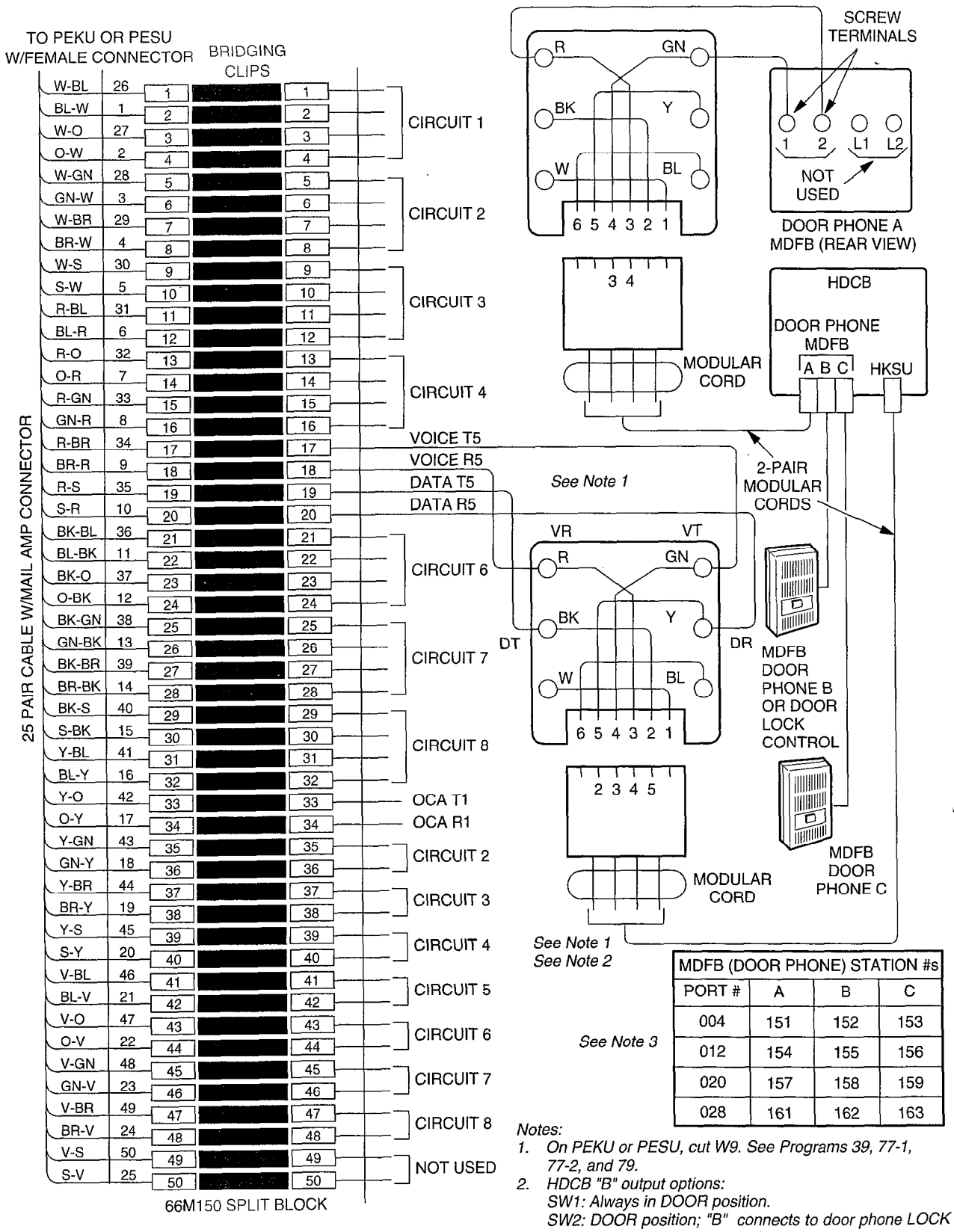


Figure 7-3
MDF Wiring/HDSS Console and Associated Electronic Telephone Wiring to PEKU



MDFB (DOOR PHONE) STATION #s			
PORT #	A	B	C
004	151	152	153
012	154	155	156
020	157	158	159
028	161	162	163

Notes:

1. *On PEKU or PESU, cut W9. See Programs 39, 77-1, 77-2, and 79.*
2. *HDCB "B" output options:*
   SW1: Always in DOOR position.
   SW2: DOOR position; "B" connects to door phone LOCK position; "B" connects to door lock.
3. *Door phones may be connected to Circuit 5 on Ports 004, 012, 020, and 028 only.*

DK0008

Figure 7-4
MDF Wiring-Door Phone/Lock to PEKU/PESU

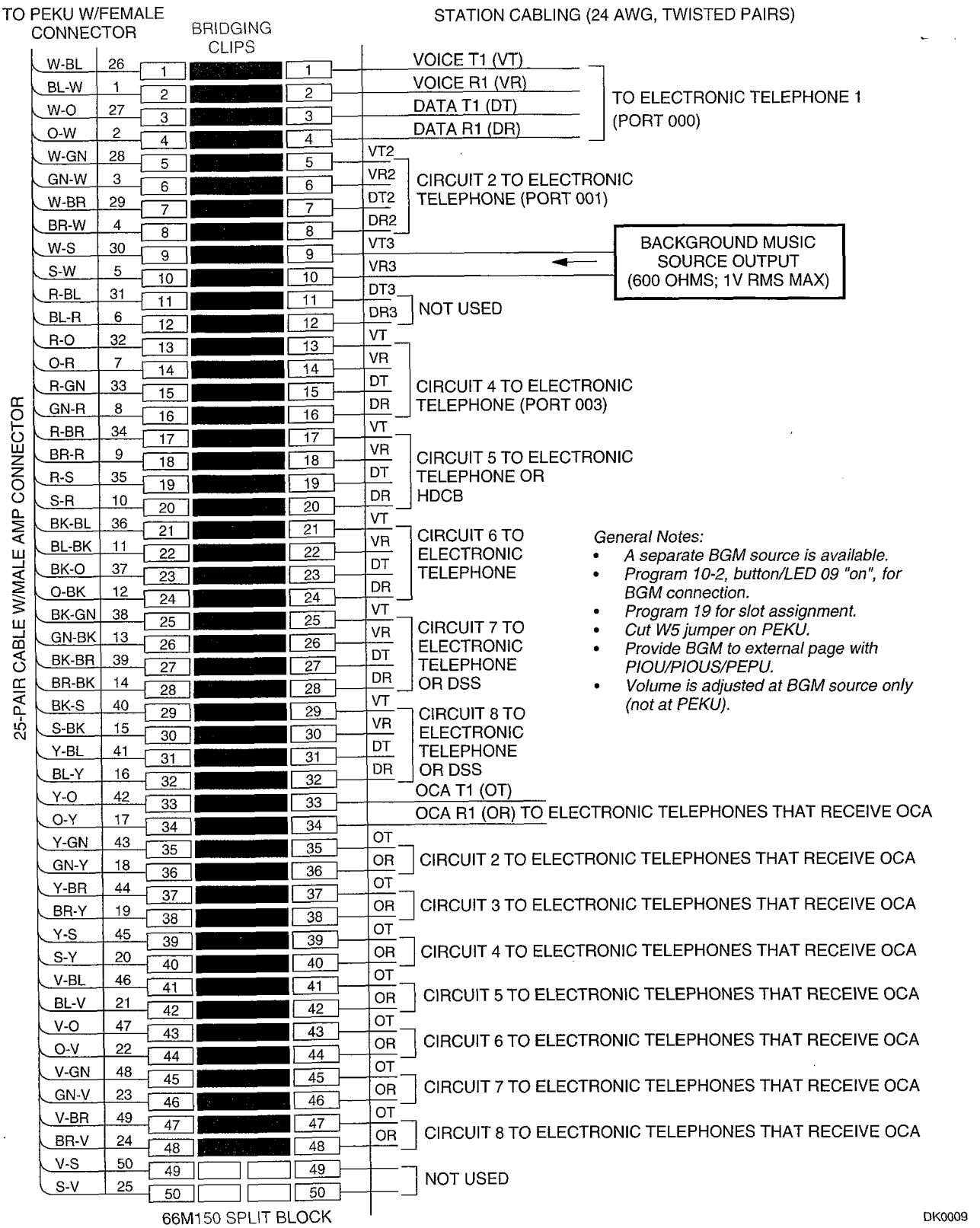


Figure 7-5
PEKU Background Music Connection

MDF BLOCK NO. _____ KSU SLOT NO. _____

Color Code	Designation	CKT Number	Port Number	Intercom Number	Device/Standard Telephone/ Electronic Telephone Location
W-Bl	VT	1			
Bl-W	VR				
W-O	DT				
O-W	DR				
W-G	VT	2			(See Note 1)
G-W	VR				
W-Br	DT				
Br-W	DR				
W-S	VT	3			(See Notes 1 and 2)
S-W	VR				
R-Bl	DT				
Bl-R	DR				
R-O	VT	4			
O-R	VR				
R-G	DT				
G-R	DR				
R-Br	VT	5			(See Note 3)
Br-R	VR				
R-S	DT				
S-R	DR				
Bk-Bl	VT	6			
Bl-Bk	VR				
Bk-O	DT				
O-Bk	DR				
Bk-G	VT	7			(See Note 4)
G-Bk	VR				
Bk-Br	DT				
Br-Bk	DR				
Bk-S	VT	8			(See Note 4)
S-Bk	VR				
Y-Bl	DT				
Bl-Y	DR				

DK0010

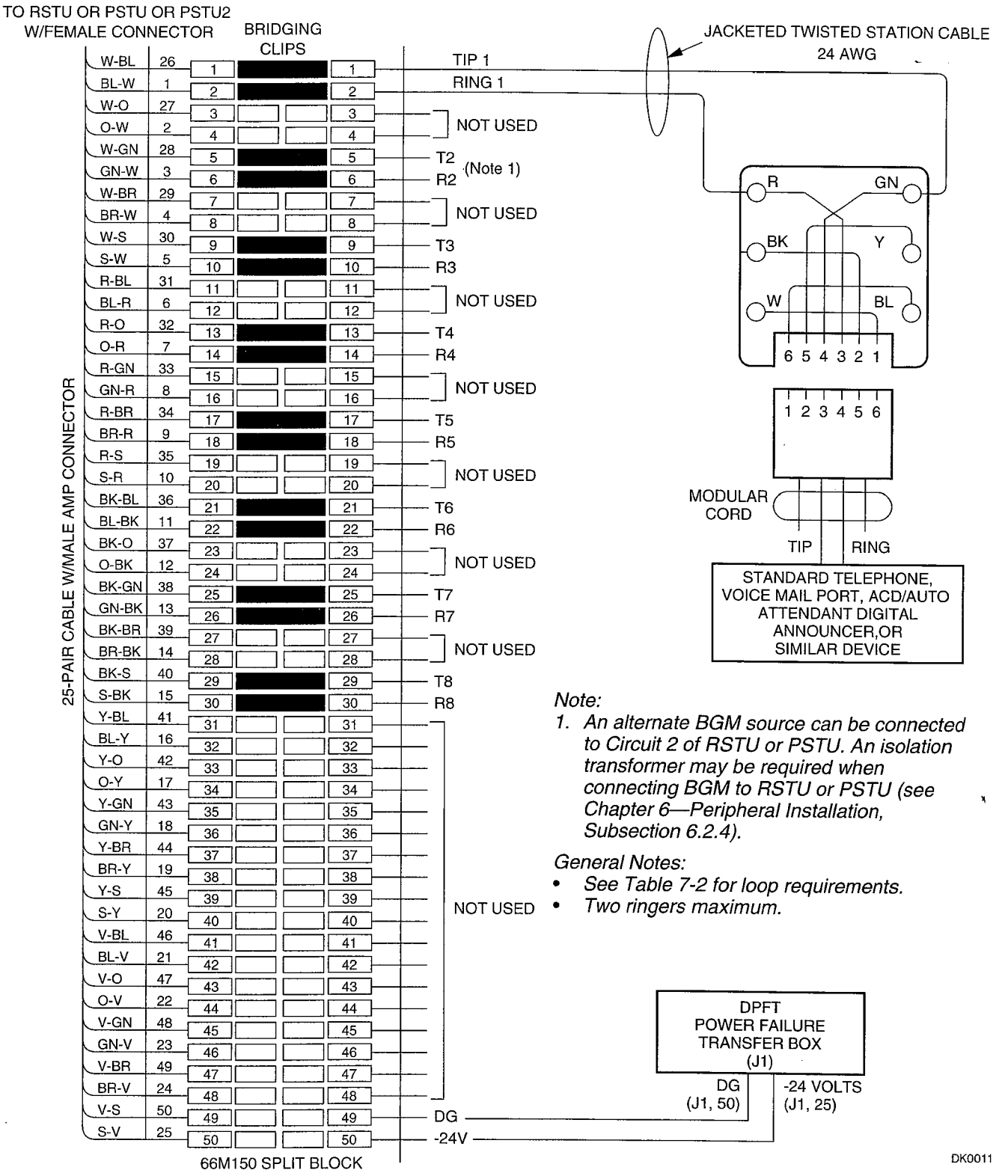
Notes:

1. *Indicate if two-way amplifier or line repeater.*
2. *Indicate if BGM or electronic telephone is connected (see Programs 10-2 and 19); BGM connects to VT and VR, Circuit 3 only (DT and DR not used).*
3. *Indicate if electronic telephone or HDCB (allowed HDCB port numbers: 004, 012, 020, 028).*
4. *Indicate if electronic telephone or HDSS Console number (1 ~ 8).*

General Note:

- *For future use, make as many copies of this form as needed prior to entering any information.*

Figure 7-6
PEKU Station/MDF Cross Connection Record



Note:

1. *An alternate BGM source can be connected to Circuit 2 of RSTU or PSTU. An isolation transformer may be required when connecting BGM to RSTU or PSTU (see Chapter 6—Peripheral Installation, Subsection 6.2.4).*

General Notes:

- *See Table 7-2 for loop requirements.*
- *Two ringers maximum.*

Figure 7-7
MDF Wiring/Standard Telephone, Voice Mail, DPFT to RSTU/PSTU/PSTU2

MDF BLOCK NO. _____ KSU SLOT NO. _____

Color Code	Designation	CKT Number	Port Number	Intercom Number	Device/Standard Telephone/ Electronic Telephone Location
W-Bl	T	1			
Bl-W	R				
W-O	NOT USED				
O-W	NOT USED				
W-G	T	2			(Note 1)
G-W	R				
W-Br	NOT USED				
Br-W	NOT USED				
W-S	T	3			
S-W	R				
R-Bl	NOT USED				
Bl-R	NOT USED				
R-O	T	4			
O-R	R				
R-G	NOT USED				
G-R	NOT USED				
R-Br	T	5			
Br-R	R				
R-S	NOT USED				
S-R	NOT USED				
Bk-Bl	T	6			
Bl-Bk	R				
Bk-O	NOT USED				
O-Bk	NOT USED				
Bk-G	T	7			
G-Bk	R				
Bk-Br	NOT USED				
Br-Bk	NOT USED				
Bk-S	T	8			
S-Bk	R				
Y-Bl	NOT USED				
Bl-Y	NOT USED				

DK0012

Note:
1. Indicate if separate BGM source.

General Notes:
- *For future use, make as many copies of this form as needed prior to entering any information.*
- *Indicate if standard telephone, voice mail port, etc.*

Figure 7-8
RSTU/PSTU Station/MDF Cross Connect Record

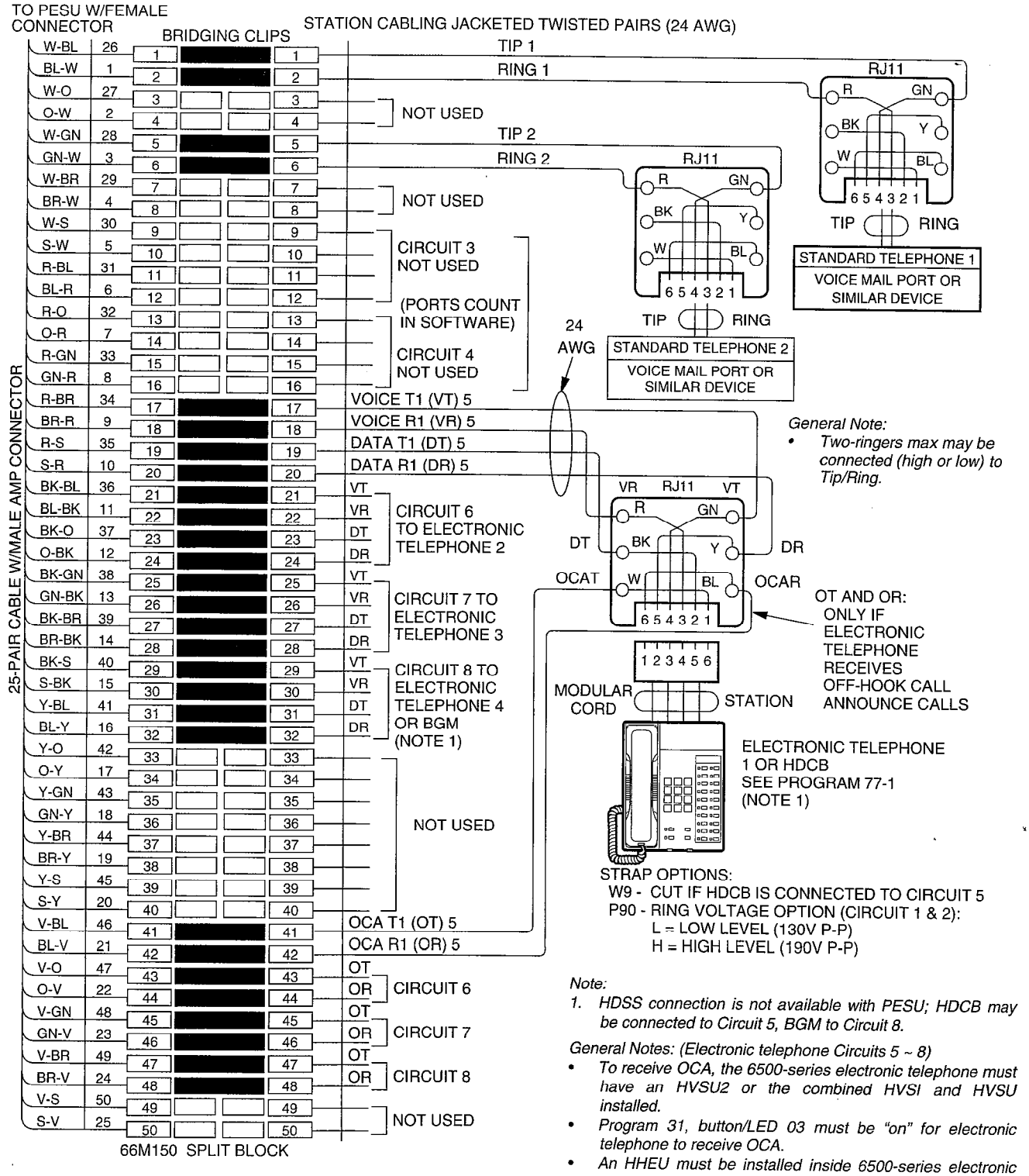


Figure 7-9
PESU Wiring Diagram

MDF BLOCK NO. _____ KSU SLOT NO. _____

Color Code	Designation	CKT Number	Port Number	Intercom Number	Device/Standard Telephone/ Electronic Telephone Location
W-Bl	T	1			
Bl-W	R				
W-O	NOT USED				
O-W	NOT USED				
W-G	T	2			
G-W	R				
W-Br	NOT USED				
Br-W	NOT USED				
W-S	NOT USED	3		N/A	N/A
S-W	NOT USED				
R-Bl	NOT USED				
Bl-R	NOT USED				
R-O	NOT USED	4		N/A	N/A
O-R	NOT USED				
R-G	NOT USED				
G-R	NOT USED				
R-Br	VT	5			(Note 1)
Br-R	VR				
R-S	DT				
S-R	DR				
Bk-Bl	VT	6			
Bl-Bk	VR				
Bk-O	DT				
O-Bk	DR				
Bk-G	VT	7			(Note 2)
G-Bk	VR				
Bk-Br	DT				
Br-Bk	DR				
Bk-S	VT	8			(Notes 2 and 3)
S-Bk	VR				
Y-Bl	DT				
Bl-Y	DR				

DK0014

Notes:

1. *Indicate if HDCB or electronic telephone.*
2. *HDSS Console number 1 ~ 8 is not allowed.*
3. *Indicate if BGM or electronic telephone is connected; BGM connects to VT and VR, Circuit 8 only (DT and DR not used).*

General Notes:

- *For future use, make as many copies of this form as needed prior to entering any information.*
- *Indicate if standard telephone, voice mail port, electronic telephone, HDCB (allowed HDCB port numbers: 004, 012, 020, 028) or separate BGM source.*
- *OCA wiring not shown, see MDF-to-electronic telephone wiring.*

Figure 7-10
PESU Station/MDF Cross Connect Record

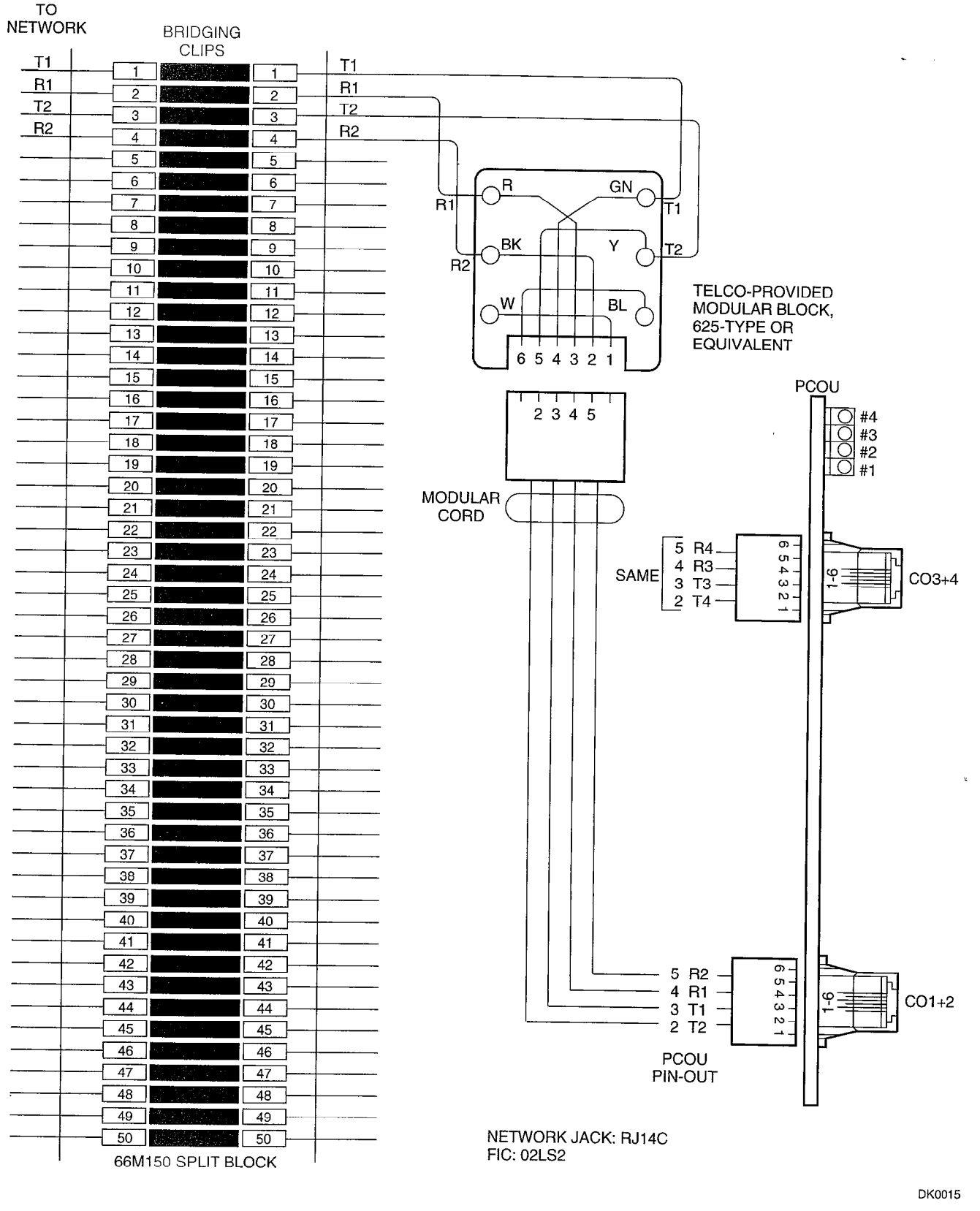


Figure 7-11
MDF Wiring/CO Lines to PCOU

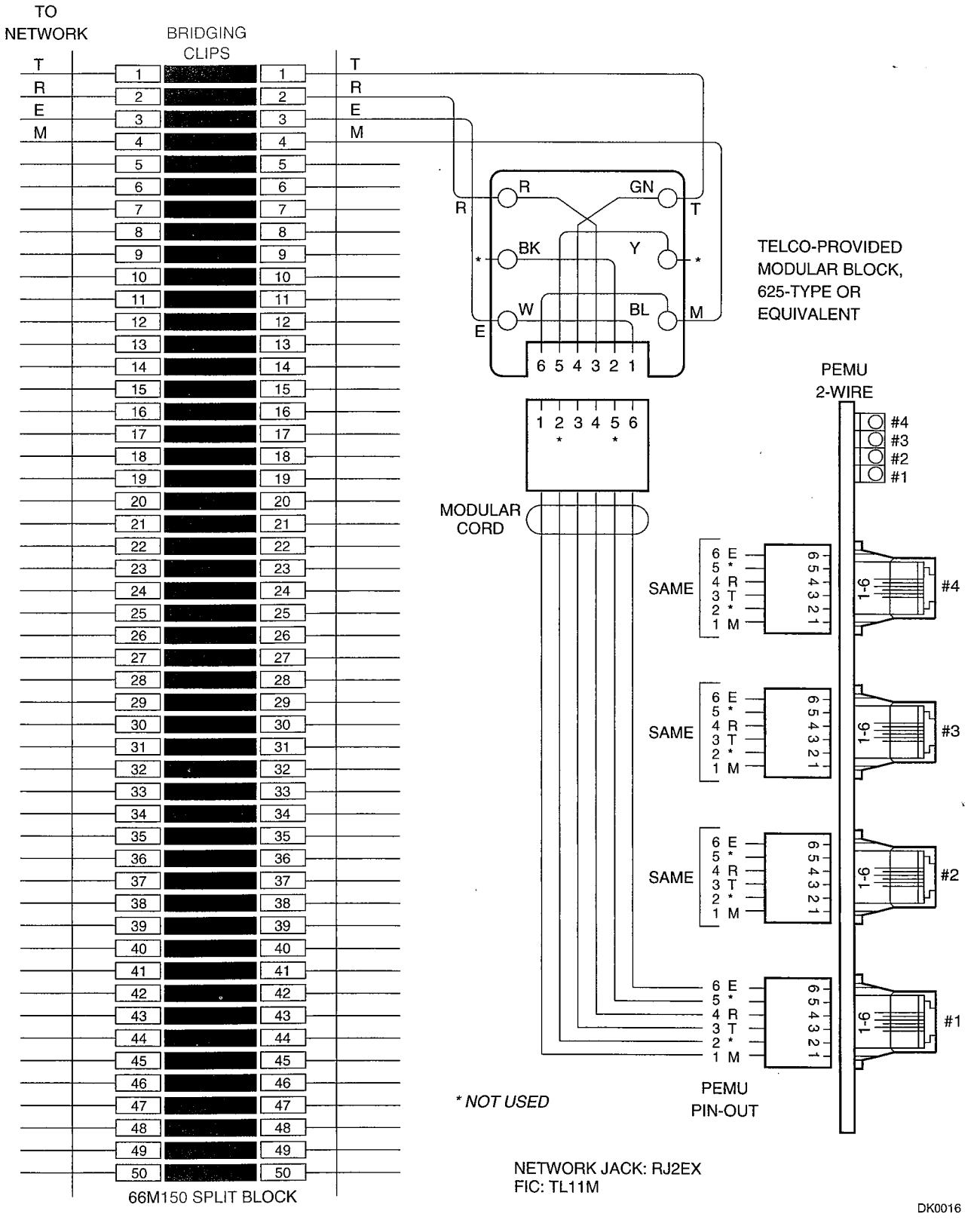
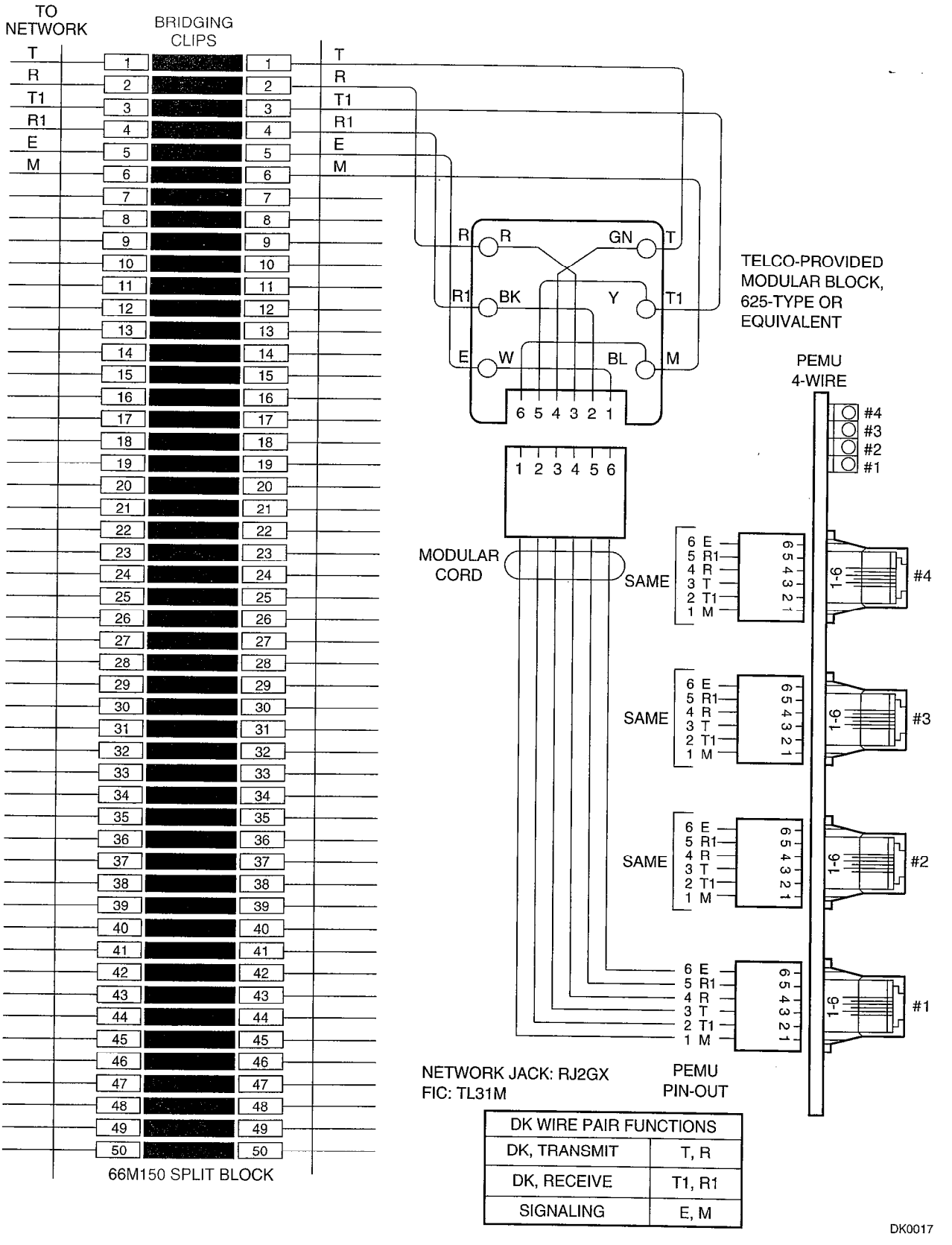


Figure 7-12
MDF Wiring/2-wire Tie Line to PEMU



DK WIRE PAIR FUNCTIONS	
DK, TRANSMIT	T, R
DK, RECEIVE	T1, R1
SIGNALING	E, M

Figure 7-13
MDF Wiring/four-wire Tie Line to PEMU

MDF BLOCK NUMBER	CO LINE NUMBER	PCB TYPE AND CABINET SLOT NUMBER
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
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	47	
	48	

MDF BLOCK NUMBER	CO LINE NUMBER	PCB TYPE AND CABINET SLOT NUMBER
	49	
	50	
	51	
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	56	
	57	
	58	
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MDF BLOCK NUMBER	CO LINE NUMBER	PCB TYPE AND CABINET SLOT NUMBER
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	104	
	105	
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DK0018

Figure 7-14
CO Line (RCOU/RCOS, RGLU, RDDU, PEMU, REMU, RDDU, RDTU) MDF Cross Connect Record

Pair	Pin	Color Code	Lead Designation	Function	PSTU PCB Position
1T	26	W-Bl	T	TIP-CO #1	
R	1	Bl-W	R	RING-CO #1	
2T	27	W-O	T	TIP-PCOU/RCOU #1	
R	2	O-W	R	RING-PCOU/RCOU #1	
3T	28	W-G	T	TIP-CO #2	
R	3	G-W	R	RING-CO #2	
4T	29	W-Br	T	TIP-PCOU/RCOU #2	
R	4	Br-W	R	RING-PCOU/RCOU #2	
5T	30	W-S	T	TIP-CO #3	
R	5	S-W	R	RING-CO #3	
6T	31	R-Bl	T	TIP-PCOU/RCOU #3	
R	6	Bl-R	R	RING-PCOU/RCOU #3	
7T	32	R-O	T	TIP-CO #4	
R	7	O-R	R	RING-CO #4	
8T	33	R-G	T	TIP-PCOU/RCOU #4	
R	8	G-R	R	RING-PCOU/RCOU #4	
9T	34	R-Br	T	TIP-CO #5	
R	9	Br-R	R	RING-CO #5	
10T	35	R-S	T	TIP-PCOU/RCOU #5	
R	10	S-R	R	RING-PCOU/RCOU #5	
11T	36	Bk-Bl	T	TIP-CO #6	
R	11	Bl-Bk	R	RING-CO #6	
12T	37	Bk-O	T	TIP-PCOU/RCOU #6	
R	12	O-Bk	R	RING-PCOU/RCOU #6	
13T	38	Bk-G	T	TIP-CO #7	
R	13	G-Bk	R	RING-CO #7	
14T	39	Bk-Br	T	TIP-PCOU/RCOU #7	
R	14	Br-Bk	R	RING-PCOU/RCOU #7	
15T	40	Bk-S	T	TIP-CO #8	
R	15	S-Bk	R	RING-CO #8	
16T	41	Y-Bl	T	TIP-PCOU/RCOU #8	
R	16	Bl-Y	R	RING-PCOU/RCOU #8	
17T	42	Y-O	SPARE		
R	17	O-Y	SPARE		
18T	43	Y-G	SPARE		
R	18	G-Y	SPARE		
19T	44	Y-Br	SPARE		
R	19	Br-Y	SPARE		
20T	45	Y-S	SPARE		
R	20	S-Y	SPARE		
21T	46	V-Bl	SPARE		
R	21	Bl-V	SPARE		
22T	47	V-O	SPARE		
R	22	O-V	SPARE		
23T	48	V-G	SPARE		
R	23	G-V	SPARE		
24T	49	V-Br	SPARE		
R	24	Br-V	SPARE		
25T	50	V-S	PFT DG	PFT GROUND (INPUT)	RDSU/RSTU/PSTU/PIN 50
R	25	S-V	PFT -24V	PFT -24V (INPUT)	RDSU/RSTU/PSTU/PIN 25

DK0019

Figure 7-15
DPFT Connector J1/Terminal Sequence & Designations/CO Line Connection & DPFT Control

Pair	Pin	Color Code	Lead Designation	Function	PSTU PCB Position
1T	26	W-Bl	T	TIP-TEL #1	
R	1	Bl-W	R	RING-TEL #1	
2T	27	W-O	T	TIP-PSTU/RSTU/RDSU #1	
R	2	O-W	R	RING-PSTU/RSTU/RDSU #1	
3T	28	W-G	T	TIP-TEL #2	
R	3	G-W	R	RING-TEL #2	
4T	29	W-Br	T	TIP-PSTU/RSTU/RDSU #2	
R	4	Br-W	R	RING-PSTU/RSTU/RDSU #2	
5T	30	W-S	T	TIP-TEL #3	
R	5	S-W	R	RING-TEL #3	
6T	31	R-Bl	T	TIP-PSTU/RSTU/RSTS #3	
R	6	Bl-R	R	RING-PSTU/RSTU/RSTS #3	
7T	32	R-O	T	TIP-TEL #4	
R	7	O-R	R	RING-TEL #4	
8T	33	R-G	T	TIP-PSTU/RSTU/RSTS #4	
R	8	G-R	R	RING-PSTU/RSTU/RSTS #4	
9T	34	R-Br	T	TIP-TEL #5	
R	9	Br-R	R	RING-TEL #5	
10T	35	R-S	T	TIP-PSTU/RSTU #5	
R	10	S-R	R	RING-PSTU/RSTU #5	
11T	36	Bk-Bl	T	TIP-TEL #6	
R	11	Bl-Bk	R	RING-TEL #6	
12T	37	Bk-O	T	TIP-PSTU/RSTU #6	
R	12	O-Bk	R	RING-PSTU/RSTU #6	
13T	38	Bk-G	T	TIP-TEL #7	
R	13	G-Bk	R	RING-TEL #7	
14T	39	Bk-Br	T	TIP-PSTU/RSTU #7	
R	14	Br-Bk	R	RING-PSTU/RSTU #7	
15T	40	Bk-S	T	TIP-TEL #8	
R	15	S-Bk	R	RING-TEL #8	
16T	41	Y-Bl	T	TIP-PSTU/RSTU #8	
R	16	Bl-Y	R	RING-PSTU/RSTU #8	
17T	42	Y-O	SPARE		
R	17	O-Y	SPARE		
18T	43	Y-G	SPARE		
R	18	G-Y	SPARE		
19T	44	Y-Br	SPARE		
R	19	Br-Y	SPARE		
20T	45	Y-S	SPARE		
R	20	S-Y	SPARE		
21T	46	V-Bl	SPARE		
R	21	Bl-V	SPARE		
22T	47	V-O	SPARE		
R	22	O-V	SPARE		
23T	48	V-G	SPARE		
R	23	G-V	SPARE		
24T	49	V-Br	SPARE		
R	24	Br-V	SPARE		
25T	50	V-S	SPARE		
R	25	S-V	SPARE		

DK0020

Figure 7-16
DPFT Connector J2/Terminal Sequence & Designations/Station Line Connection

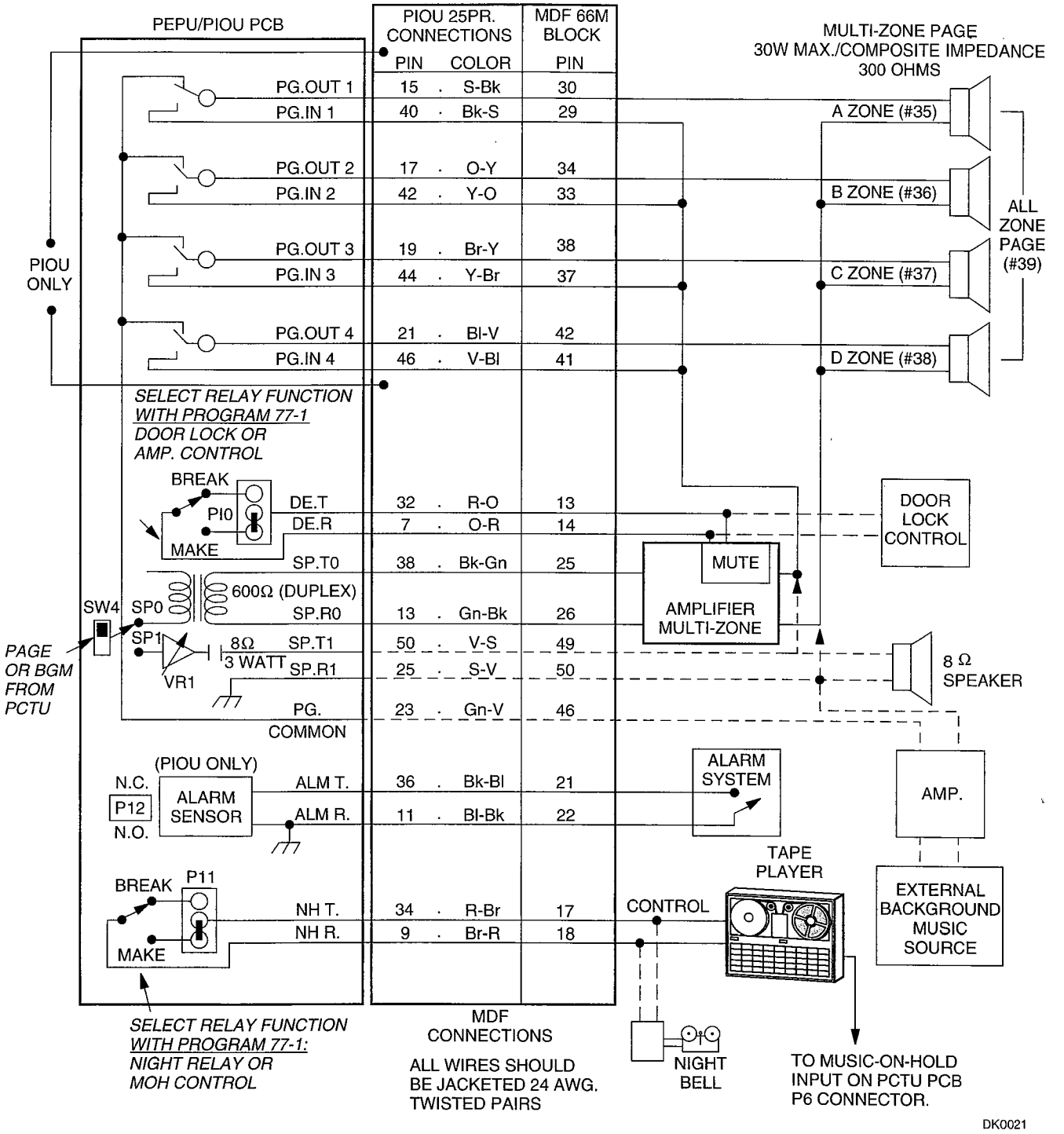
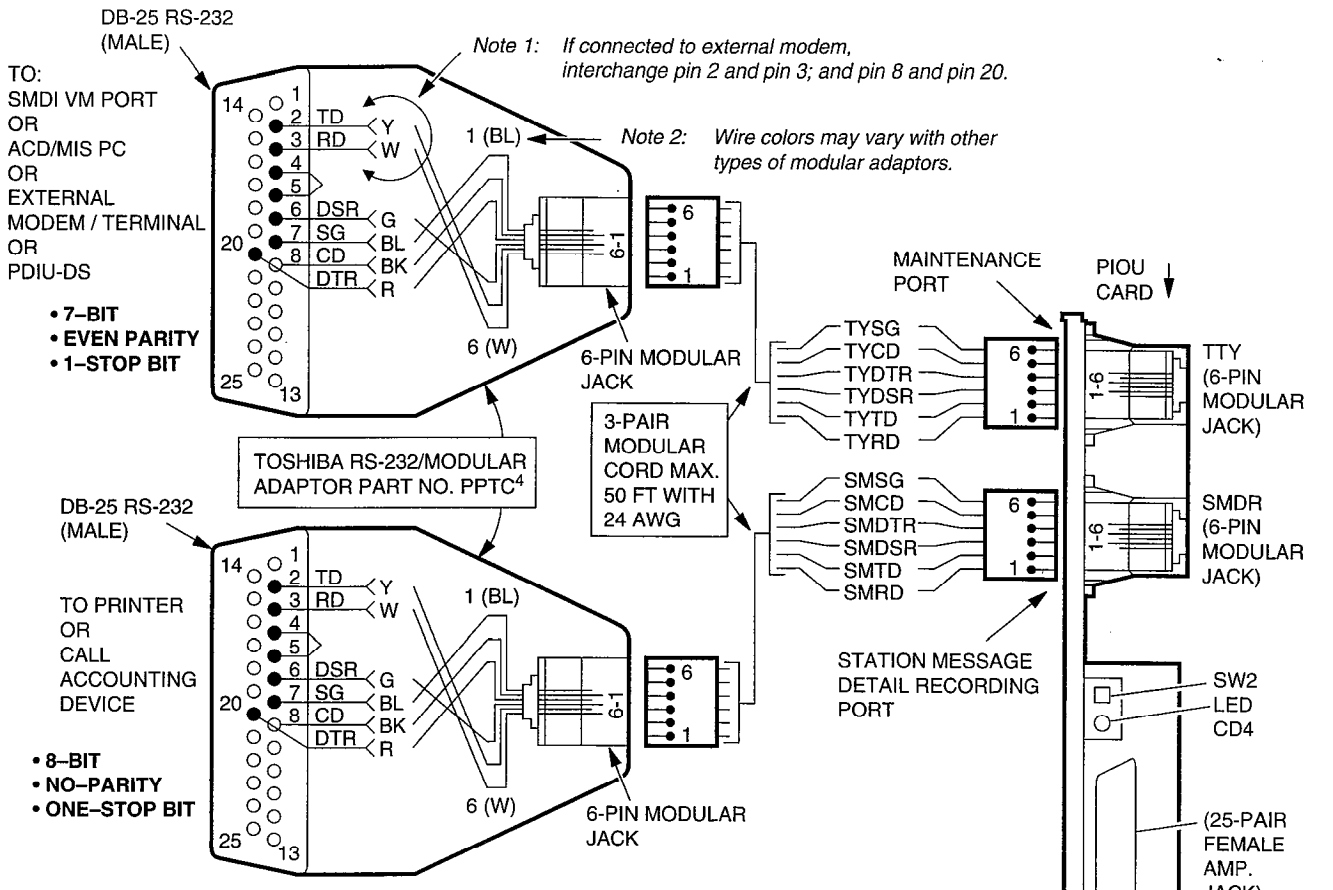


Figure 7-17
MDF Wiring/PIOU or PEPU Peripherals (25-Pair)



General Notes:

- *PIOU option settings:*
  - *SW1 — Sets the SMDR baud rate to be 300 or 1200 BPS.*
  - *SW2 — Sets the PIOU programming speed to be 300 or 1200 BPS (for IMDU or TTY jack). LED CO4 "On" = 300 BPS/SW2 set "In". LED CO4 "Off" = 1200 BPS/SW2 set "Out".*
  - *SW3 — Sets the PIOU to operate with the IMDU or an external device connected to the TTY modular jack.*
    - *MODEM — For IMDU operation.*
    - *TTY — For ASCII terminal or external modem.*
  - *P13 — Sets the IMDU and TTY jack for bell or CCITT specification.*
- *PPTC-9 should be used if device connected to PIOU has a DB-9 RS-232 male connector.*

PIOU MODULAR PIN-OUT

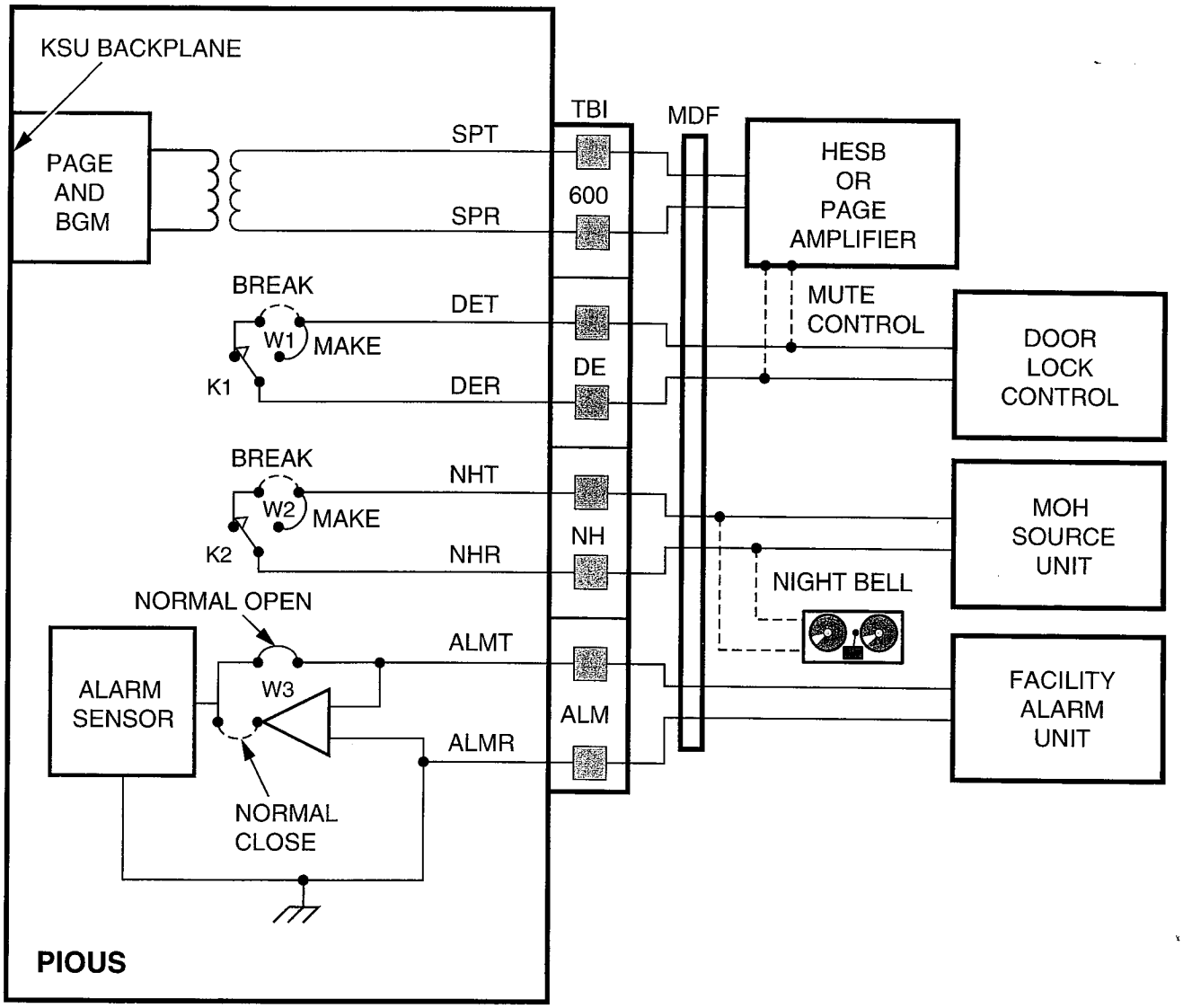
PIN NO.	TTY	SMDR
1	TYRD	SMRD
2	TYTD	SMTD
3	TYDSR	SMDSR
4	TYDTR	SMDTR
5	TYCD	SMCD
6	TYSG	SMSG

PPTC PIN-OUT

LEAD NAME	TD	RD	JUMPER	DSR	SG	CD	DTR
DB25 PINS	2	3	4-5	6	7	8	20
MODULAR PINS	5	6	N/A	4	1	2	3
WIRE COLOR	Y	W	BR	G	BL	BK	R

DK0022

Figure 7-18
PIOU/TTY and SMDR Wiring



General Notes:

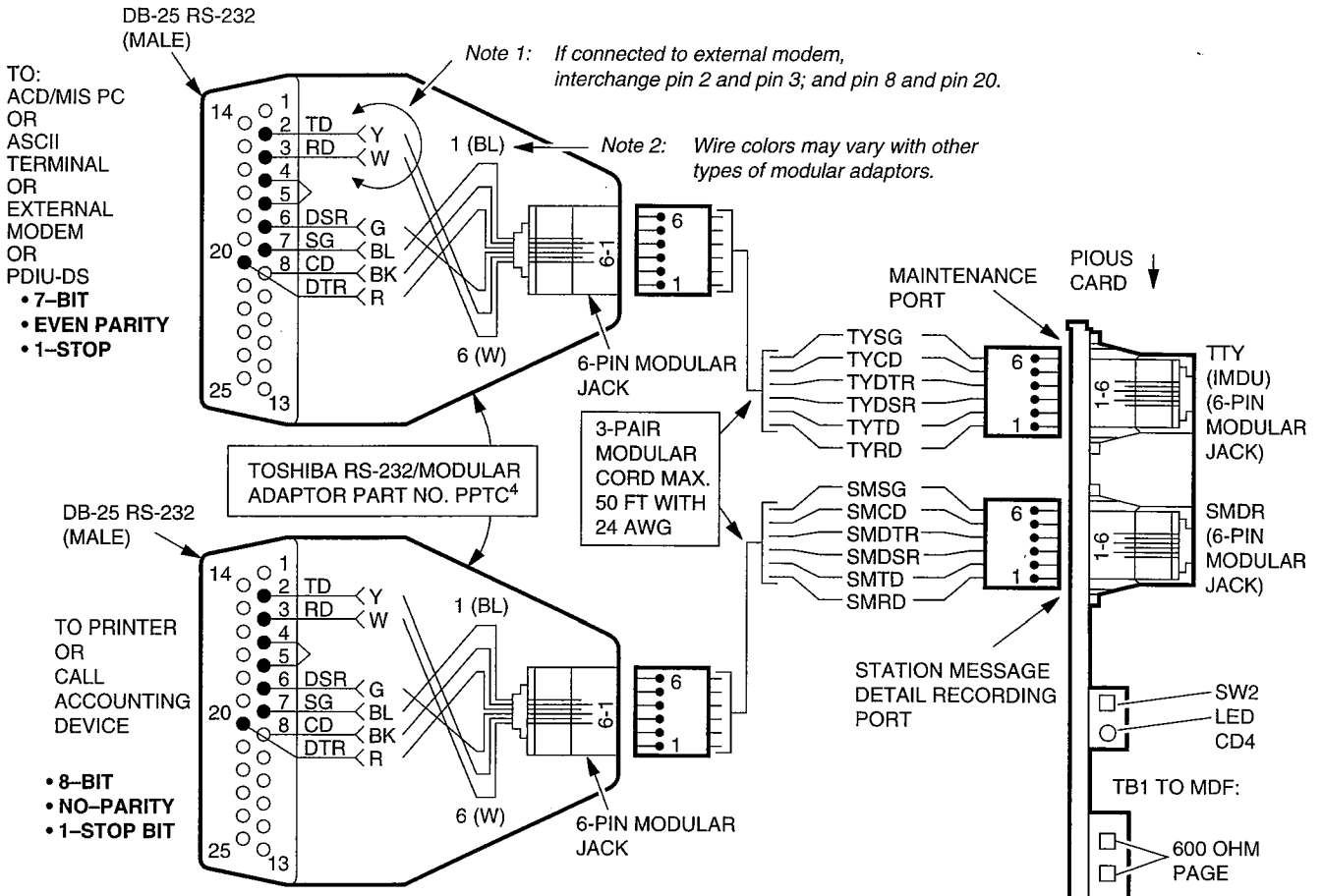
- *All wiring connections must be 24 AWG twisted pairs.*
- *Dotted lines show optional connections; only one optional connection is allowed.*

RELAY OPTIONS:

- K1 (DE): DOOR LOCK OR AMP MUTE CONTROL; PROGRAM 77-1, LED 07
- K2 (NH): NIGHT RELAY OR MUSIC-ON-HOLD CONTROL; PROGRAM 77-1, LED 05
- K1 & K2: 24 VDC, 1 AMP MAXIMUM

DK0023

Figure 7-19
PIOUS Page/Relay/Alarm Connections



General Notes:

- *PIOU option settings:*
  - *SW1 — Sets the SMDR baud rate to be 300 or 1200 BPS.*
  - *SW2 — Sets the PIOU programming speed to be 300 or 1200 BPS (for IMDU or TTY jack).*
    LED CO4 "On" = 300 BPS/SW2 set "In".
    LED CO4 "Off" = 1200 BPS/SW2 set "Out".
  - *SW3 — Sets the PIOU to operate with the IMDU or an external device connected to the TTY modular jack.*
    MODEM — *For IMDU operation.*
    TTY — *For ASCII terminal or external modem.*
  - *W4 — Sets the IMDU and TTY jack for bell or CCITT specification.*
  - *BELL— "W4 not installed."*
- *PPTC-9 should be used if device connected to PIOU has a DB-9 RS-232 male connector.*

PIOU MODULAR PIN-OUT

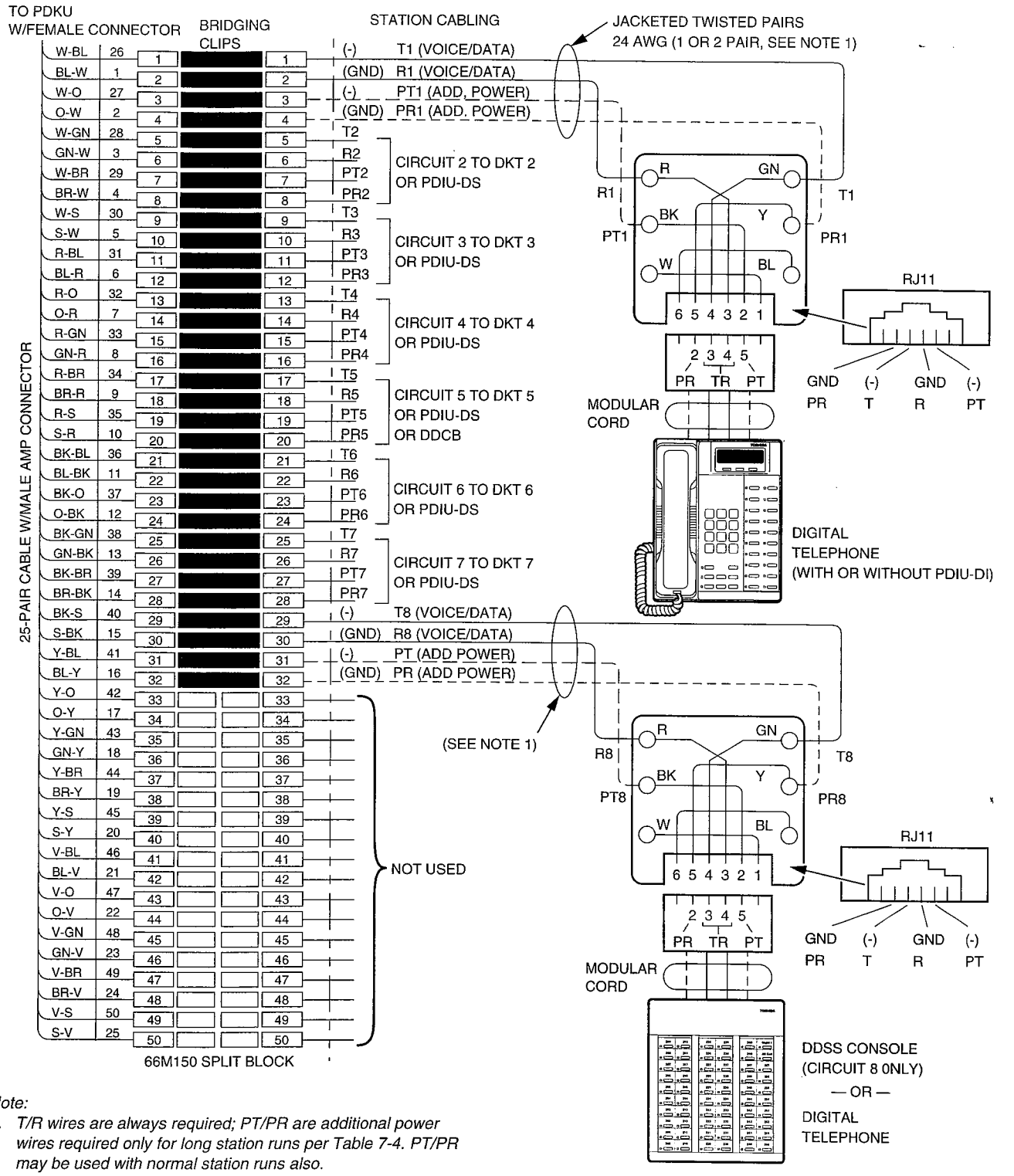
PIN NO.	TTY	SMDR
1	TYRD	SMRD
2	TYTD	SMTD
3	TYDSR	SMDSR
4	TYDTR	SMDTR
5	TYCD	SMCD
6	TYSG	SMSG

PPTC PIN-OUT

LEAD NAME	TD	RD	JUMPER	DSR	SG	CD	DTR
DB25 PINS	2	3	4-5	6	7	8	20
MODULAR PINS	5	6	N/A	4	1	2	3
WIRE COLOR	Y	W	BR	G	BL	BK	R

DK0024

Figure 7-20
PIOUS/SMDR/TTY Options and Wiring



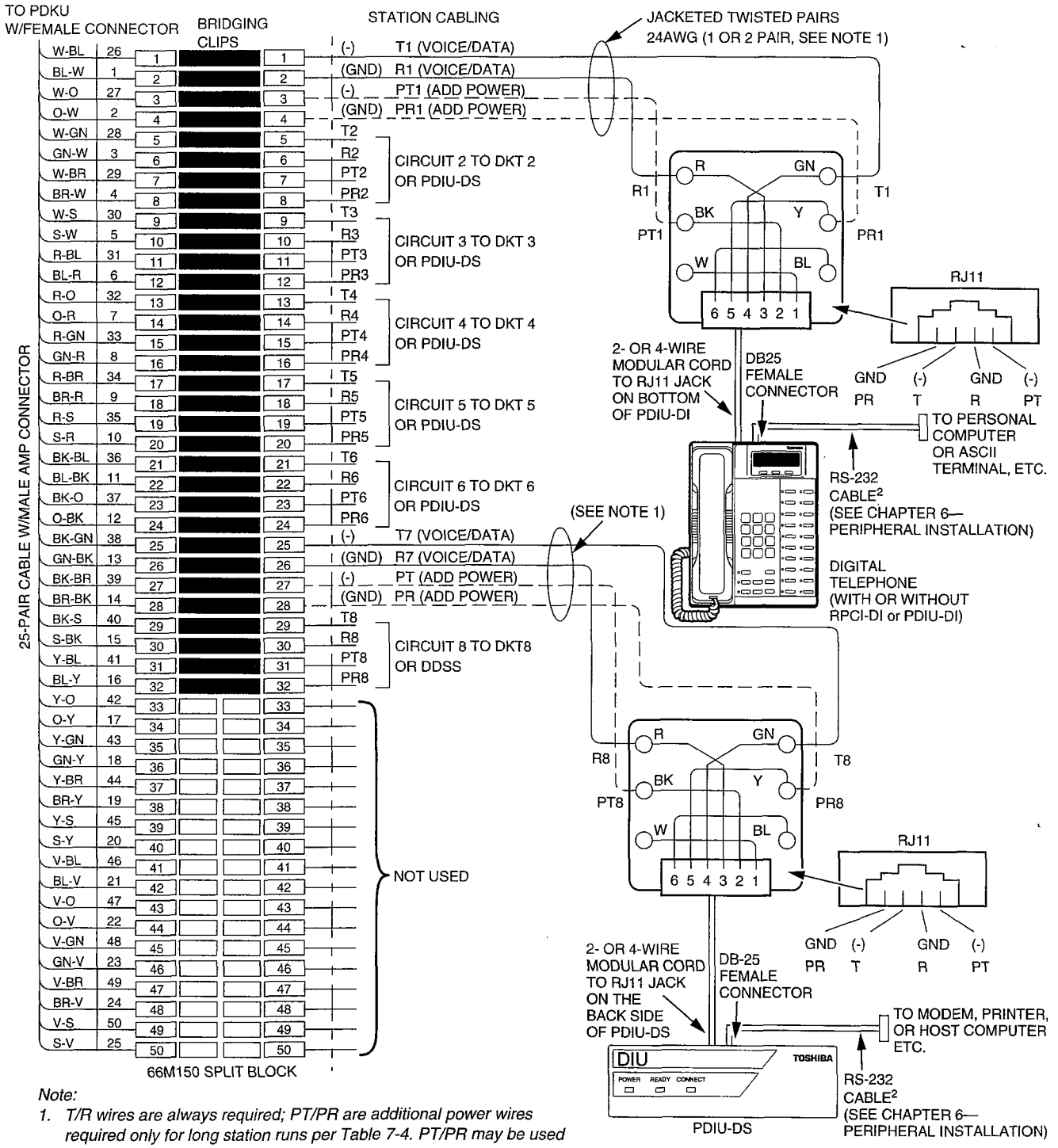
Note:

1. *T/R wires are always required; PT/PR are additional power wires required only for long station runs per Table 7-4. PT/PR may be used with normal station runs also.*

General Note:

- *Voltage levels:*
  T, PT = -26.3 ~ 27.8 VDC
  R, PR = 0.0 VDC (GND)
  (Reference to SG ground)

Figure 7-21
MDF Wiring for Digital Telephones (DKTs) and DDSS Console to PDKU



Note:

1. *T/R wires are always required; PT/PR are additional power wires required only for long station runs per Table 7-4. PT/PR may be used with normal station runs also.*
2. *RS-232 cable length is max 50 ft with 24 AWG wire.*

General Notes:

- *Voltage levels:*
  T, PT = -26.3 ~ 27.8 VDC
  R, PR = 0.0 VDC (GND)
  (Reference to SG ground)
- *DIUs can be connected to Circuits 1 ~ 7 only if connected to PDKU1; or Circuits 1 ~ 8 on PDKU2.*

Figure 7-22
MDF Wiring for Digital Telephones with PDIU-DI and PDIU-DS to PDKU

MDF BLOCK NO. _____ KSU SLOT NO. _____

Color Code	Designation	CKT Number	Port Number	Intercom Number	Digital Telephone/ Device Location
W-Bl	T	1			
Bl-W	R				
W-O	PWR T				
O-W	PWR R				
W-G	T	2			
G-W	R				
W-Br	PWR T				
Br-W	PWR R				
W-S	T	3			
S-W	R				
R-Bl	PWR T				
Bl-R	PWR R				
R-O	T	4			
O-R	R				
R-G	PWR T				
G-R	PWR R				
R-Br	T	5[1]			
Br-R	R				
R-S	PWR T				
S-R	PWR R				
Bk-Bl	T	6			
Bl-Bk	R				
Bk-O	PWR T				
O-Bk	PWR R				
Bk-G	T	7			
G-Bk	R				
Bk-Br	PWR T				
Br-Bk	PWR R				
Bk-S	T	8			
S-Bk	R				
Y-Bl	PWR T				
Bl-Y	PWR R				

DK0027

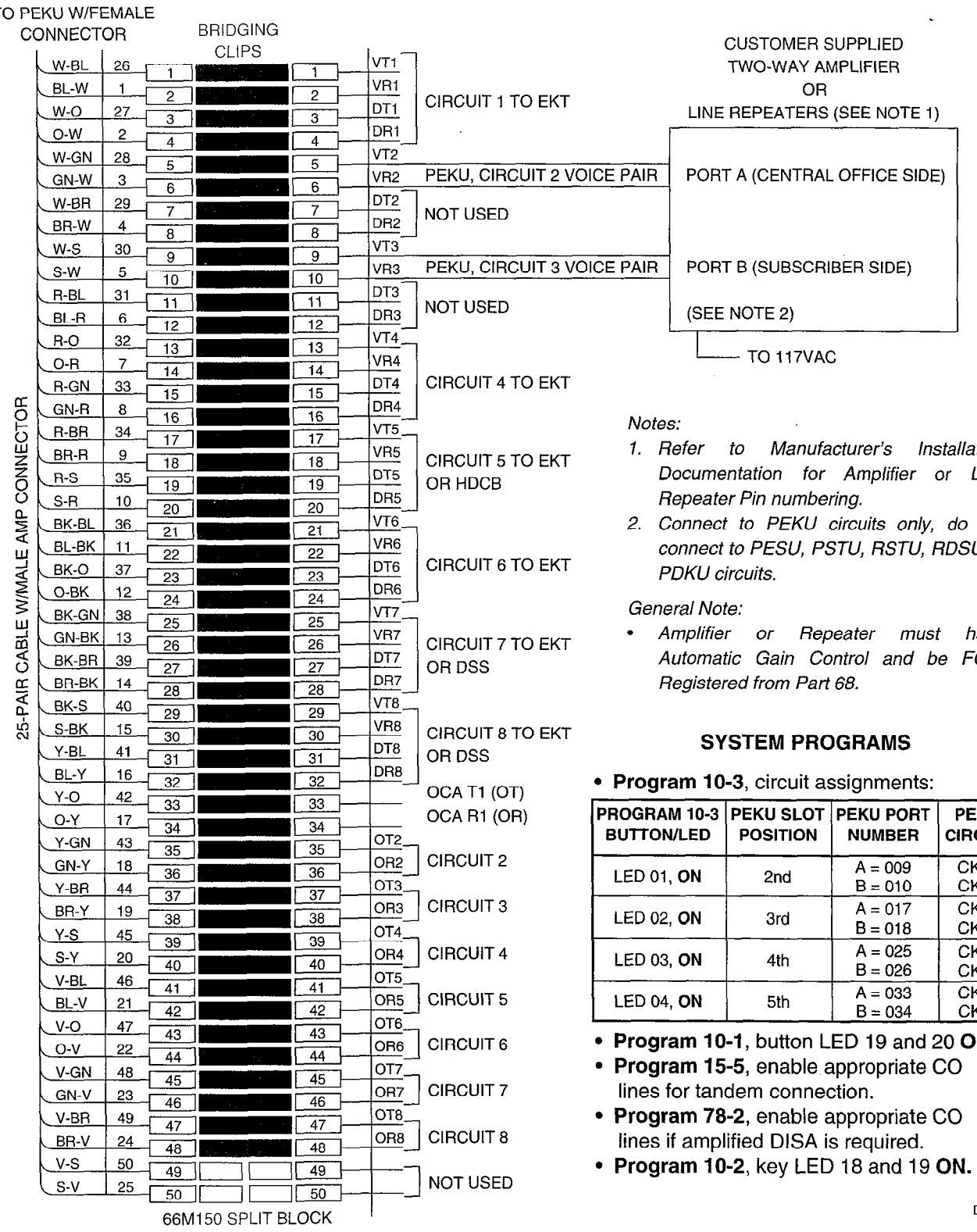
Note:

1. *DDCBs connect only to Circuit 5, Ports 004, 012, 020, and 028.*

General Notes:

- *For future use, make as many copies of this form as needed prior to entering any information.*
- *Indicate if PDIU-DS, digital telephone (with or without PDIU-DI), DDSS console (number 1 ~ 8), or DDCB is connected.*

Figure 7-23
PDKU Station/MDF Cross Connect Record



Notes:

1. *Refer to Manufacturer's Installation Documentation for Amplifier or Line Repeater Pin numbering.*
2. *Connect to PEKU circuits only, do not connect to PESU, PSTU, RSTU, RDSU or PDKU circuits.*

General Note:

- *Amplifier or Repeater must have Automatic Gain Control and be FCC-Registered from Part 68.*

SYSTEM PROGRAMS

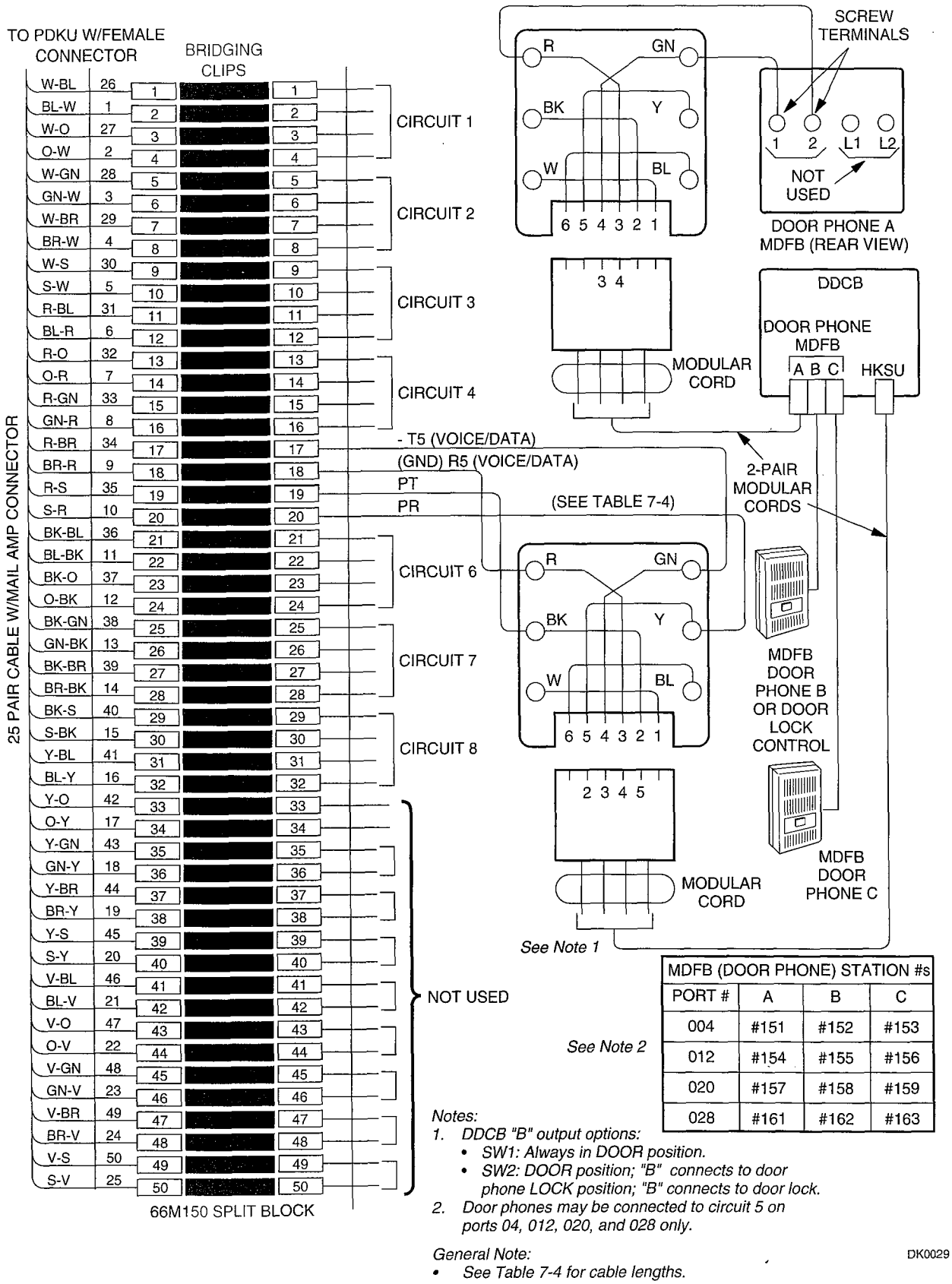
- **Program 10-3**, circuit assignments:

PROGRAM 10-3 BUTTON/LED	PEKU SLOT POSITION	PEKU PORT NUMBER	PEKU CIRCUIT
LED 01, **ON**	2nd	A = 009 B = 010	CKT2 CKT3
LED 02, **ON**	3rd	A = 017 B = 018	CKT2 CKT3
LED 03, **ON**	4th	A = 025 B = 026	CKT2 CKT3
LED 04, **ON**	5th	A = 033 B = 034	CKT2 CKT3

- **Program 10-1**, button LED 19 and 20 **ON.**
- **Program 15-5**, enable appropriate CO lines for tandem connection.
- **Program 78-2**, enable appropriate CO lines if amplified DISA is required.
- **Program 10-2**, key LED 18 and 19 **ON.**

DK0028

Figure 7-24
MDF Wiring/PEKU Amplified Two-CO Line Conference



MDFB (DOOR PHONE) STATION #s			
PORT #	A	B	C
004	#151	#152	#153
012	#154	#155	#156
020	#157	#158	#159
028	#161	#162	#163

Notes:

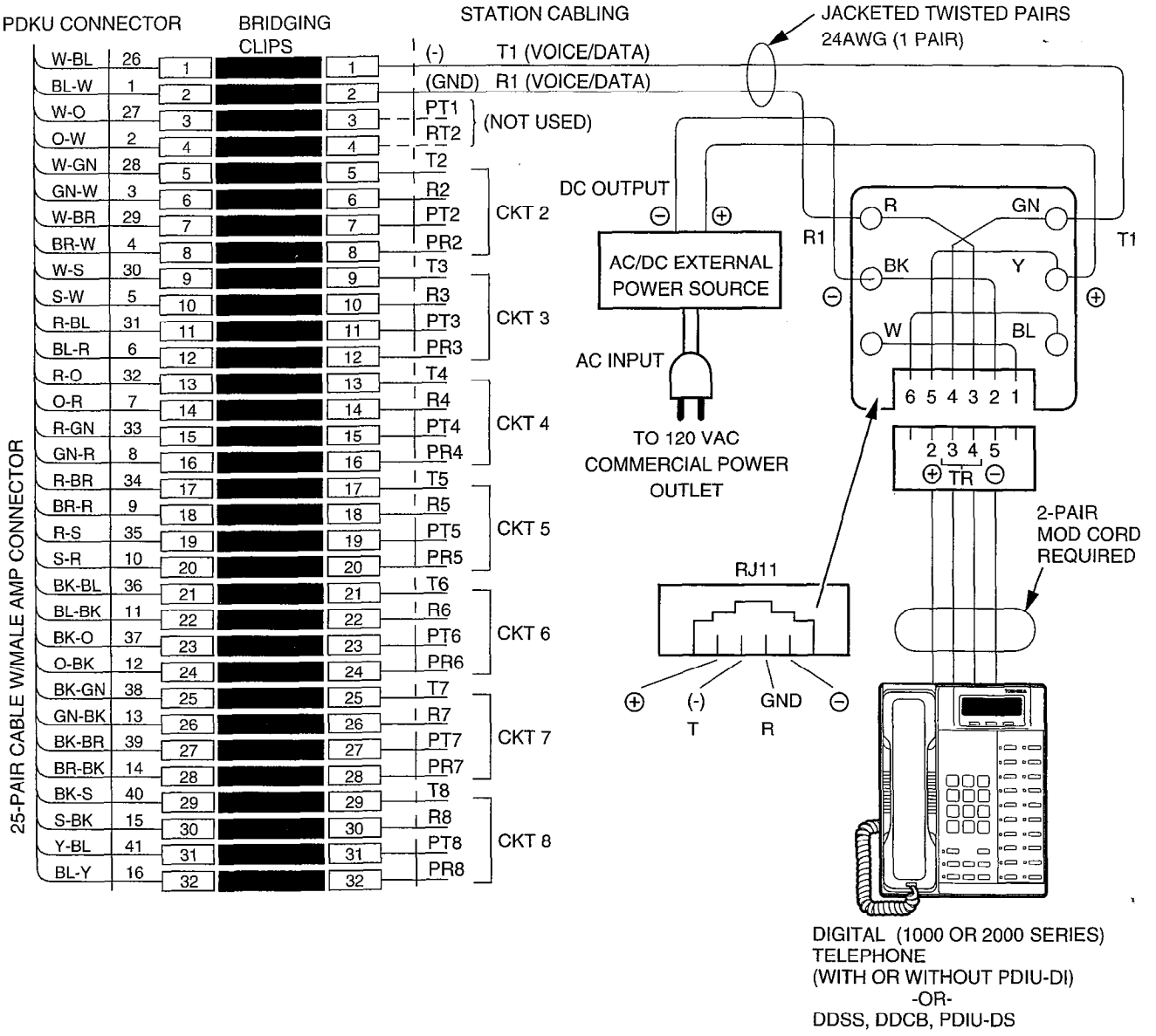
1. *DDCB "B" output options:*
   - *SW1: Always in DOOR position.*
   - *SW2: DOOR position; "B" connects to door phone LOCK position; "B" connects to door lock.*
2. *Door phones may be connected to circuit 5 on ports 04, 012, 020, and 028 only.*

General Note:

- *See Table 7-4 for cable lengths.*

DK0029

Figure 7-25
MDF Wiring-DDCB/Door Phone/Lock to PDKU



AC/DC EXTERNAL POWER SOURCE SPECIFICATIONS:

AC IN: **120 VDC ± 10%**
DC OUT: **24 VDC ± 10%**
160 MA (MIN.) DC CURRENT
200 MV P-P (MAX) AC RIPPLE ON DC OUTPUT

AC/DC power supplies that meet the above requirements are available from most telephone equipment supply houses.

EXTERNAL POWER STRAPS:

If the external power is installed, cut the external power straps located inside the digital telephone DDSS, DDCB, or PDIU-DS.

See Table 7-4 at the front of this section for external power requirements.

DK0030

Figure 7-26
External Power for Digital Telephone Connection

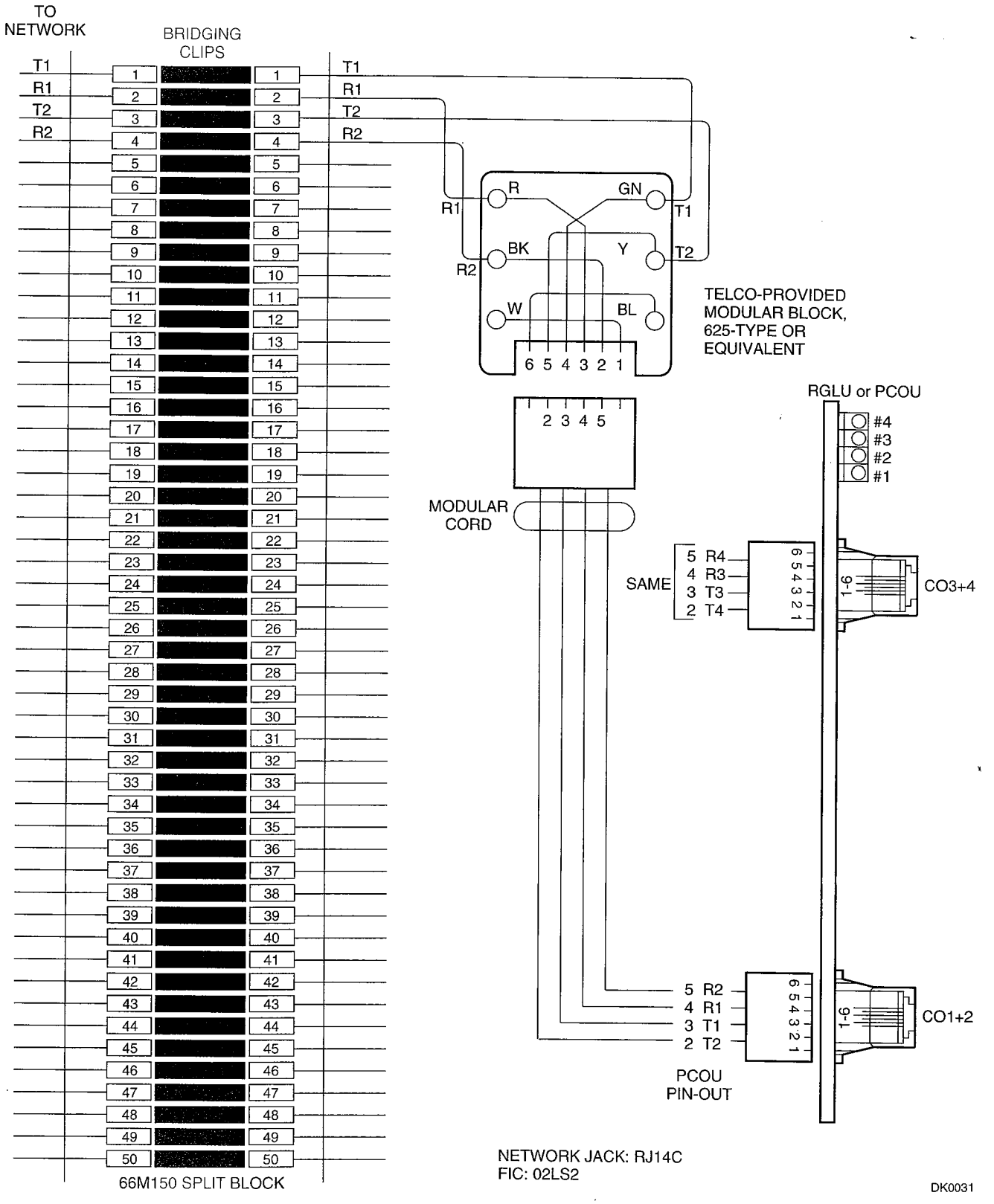
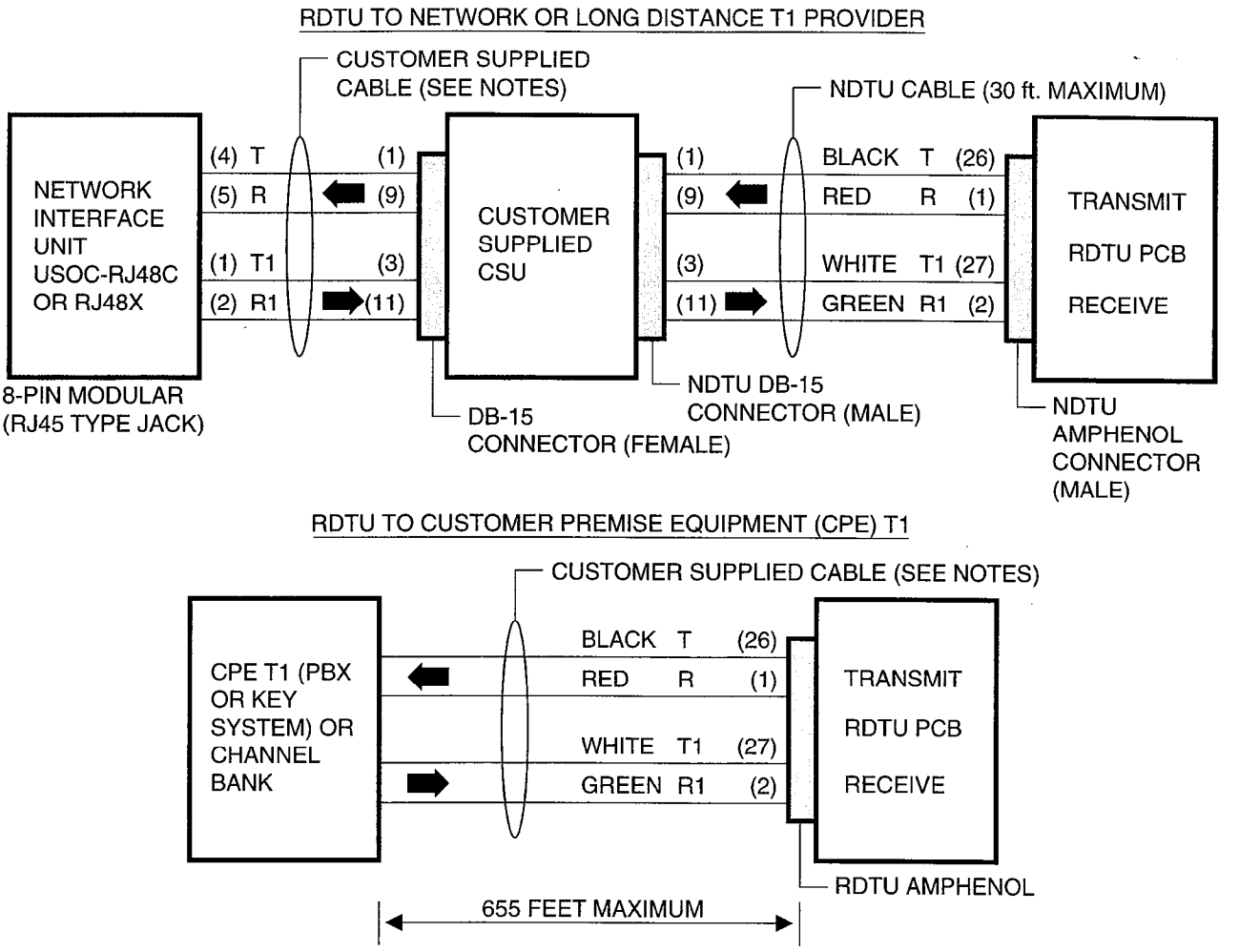


Figure 7-27
MDF Wiring/CO Lines to RGLU or PCOU



General Notes:

- *Pins 2 and 4 of the DB-15 connector in most CSUs are frame ground. No connection is required.*
- *NDTU cable is supplied with RDTU PCB (30 ft maximum).*
- *Set RDTU SW1 switch for proper loop length per T1/DS-1 section.*
- *Customer supplied span cables must be 22 AWG, ABAM cable; or, if using standard 24 AWG twisted pair, the transmit pair must be separated from the receive pair by at least 5-cable pairs. Most CSU manufacturers supply cables to connect the CSU to the Network Interface Unit or other CPE equipment.*

DK0032

Figure 7-28
RDTU Cable Connections

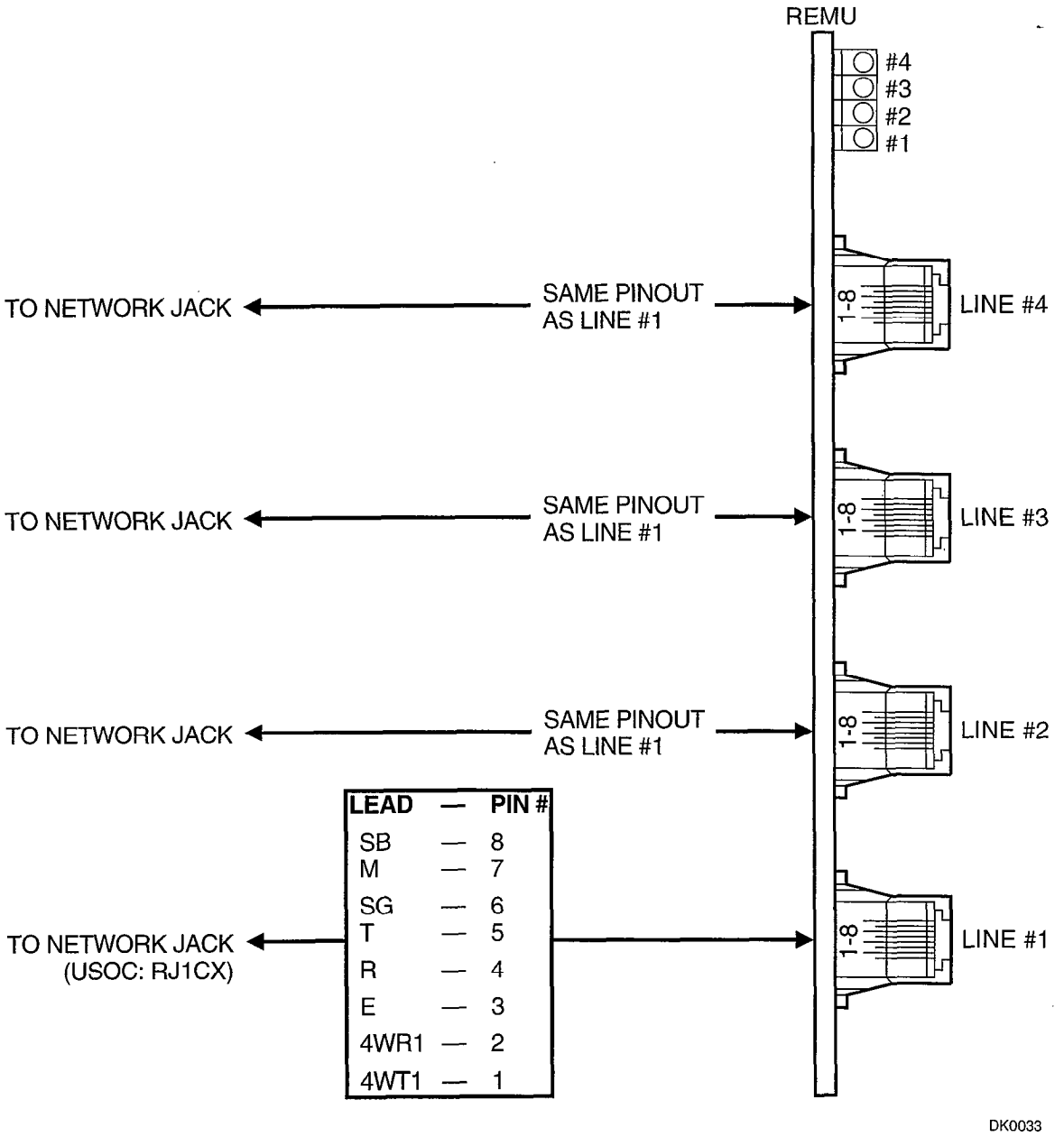


Figure 7-29
MDF Wiring REMU 2/4 Wire Type I/II

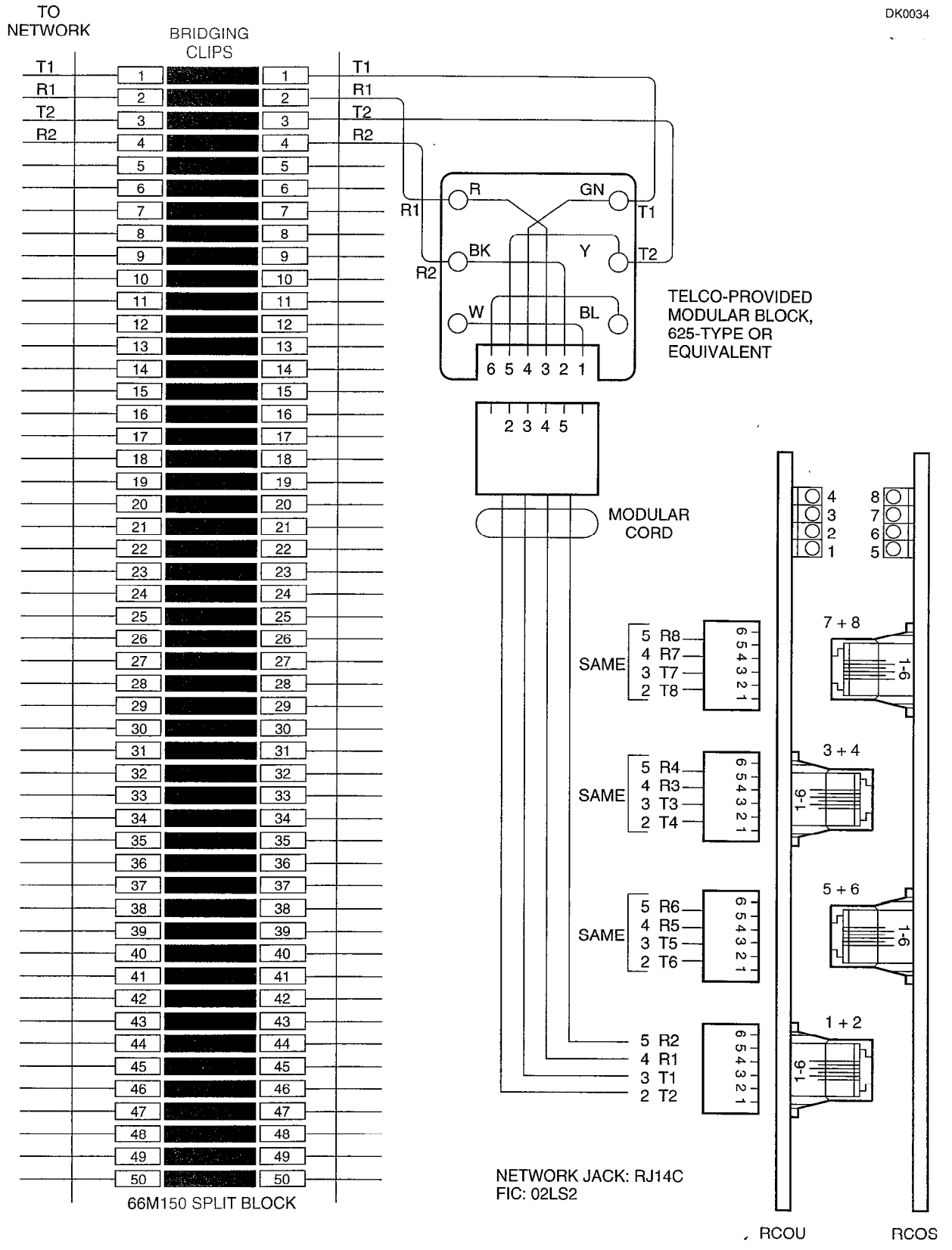
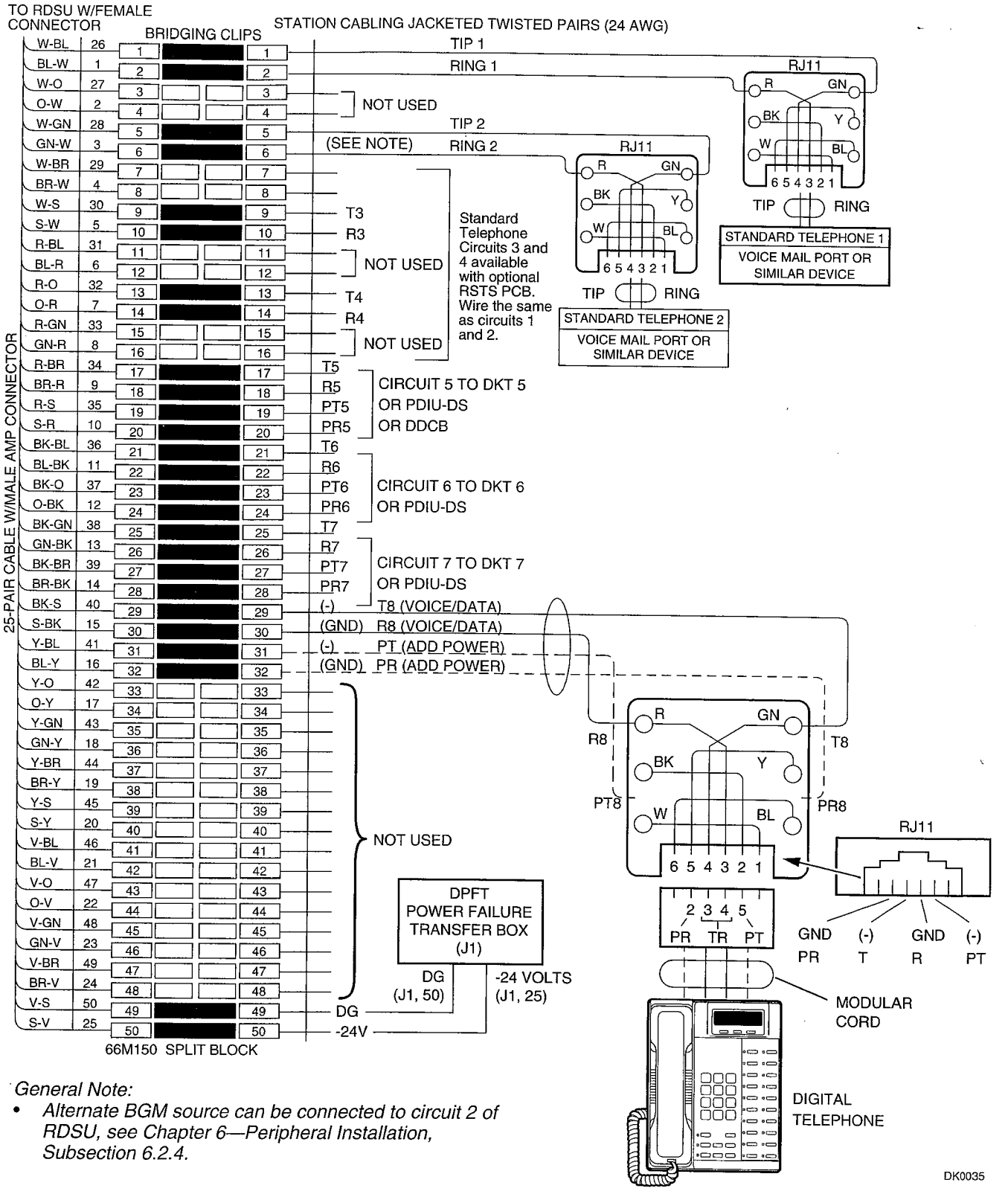


Figure 7-30
MDF Wiring/CO to RCOU/RCOS



General Note:

- *Alternate BGM source can be connected to circuit 2 of RDSU, see Chapter 6—Peripheral Installation, Subsection 6.2.4.*

Figure 7-31
RDSU Wiring

MDF BLOCK NO. _____ SLOT NO. _____

Color Code	Designation	CKT Number	Port Number	Intercom Number	Telephone/Device Location
W-Bl	T	1			
Bl-W	R				
W-O	NOT USED				
O-W	NOT USED				
W-G	T	2			(Note 1)
G-W	R				
W-Br	NOT USED				
Br-W	NOT USED				
W-S	T	3			
S-W	R				
R-Bl	NOT USED				
Bl-R	NOT USED				
R-O	T	4			
O-R	R				
R-G	NOT USED				
G-R	NOT USED				
R-Br	T	5			(Note 2)
Br-R	R				
R-S	PWRT				
S-R	PWRR				
Bk-Bl	T	6			
Bl-Bk	R				
Bk-O	PWRT				
O-Bk	PWRR				
Bk-G	T	7			
G-Bk	R				
Bk-Br	PWRT				
Br-Bk	PWRR				
Bk-S	T	8			
S-Bk	R				
Y-Bl	PWRT				
Bl-Y	PWRR				

DK0036

Notes:

1. *Indicate if separate BGM source connected to circuit 2.*
2. *DDCBs connect only to Circuit 5, Ports 004, 012, 020, and 028.*

General Notes:

- *For future use, make as many copies of this form as needed prior to entering any information.*
- *Indicate if standard telephone, voice mail port, etc.*

Figure 7-32
RDSU Station/MDF Cross Connect Record

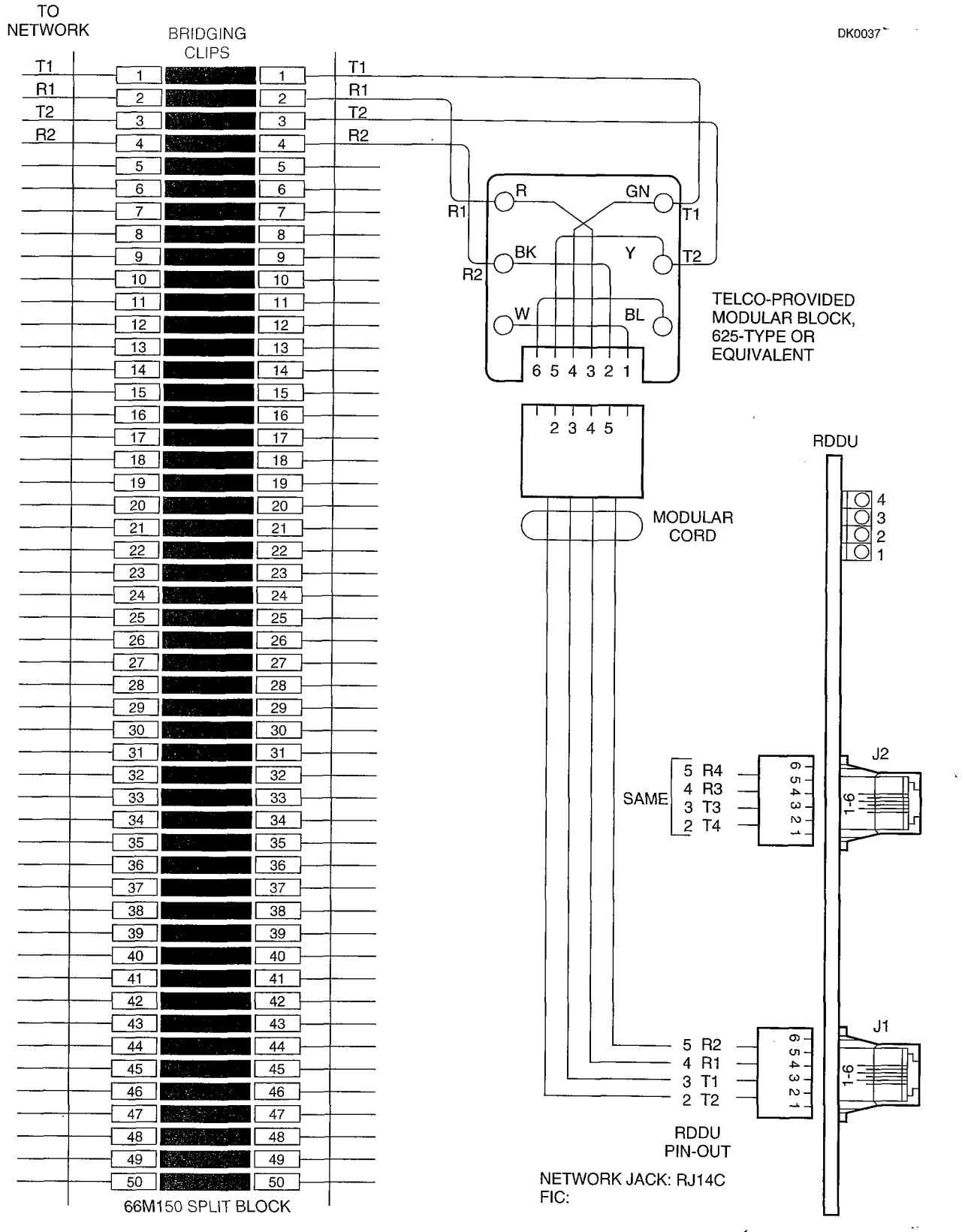
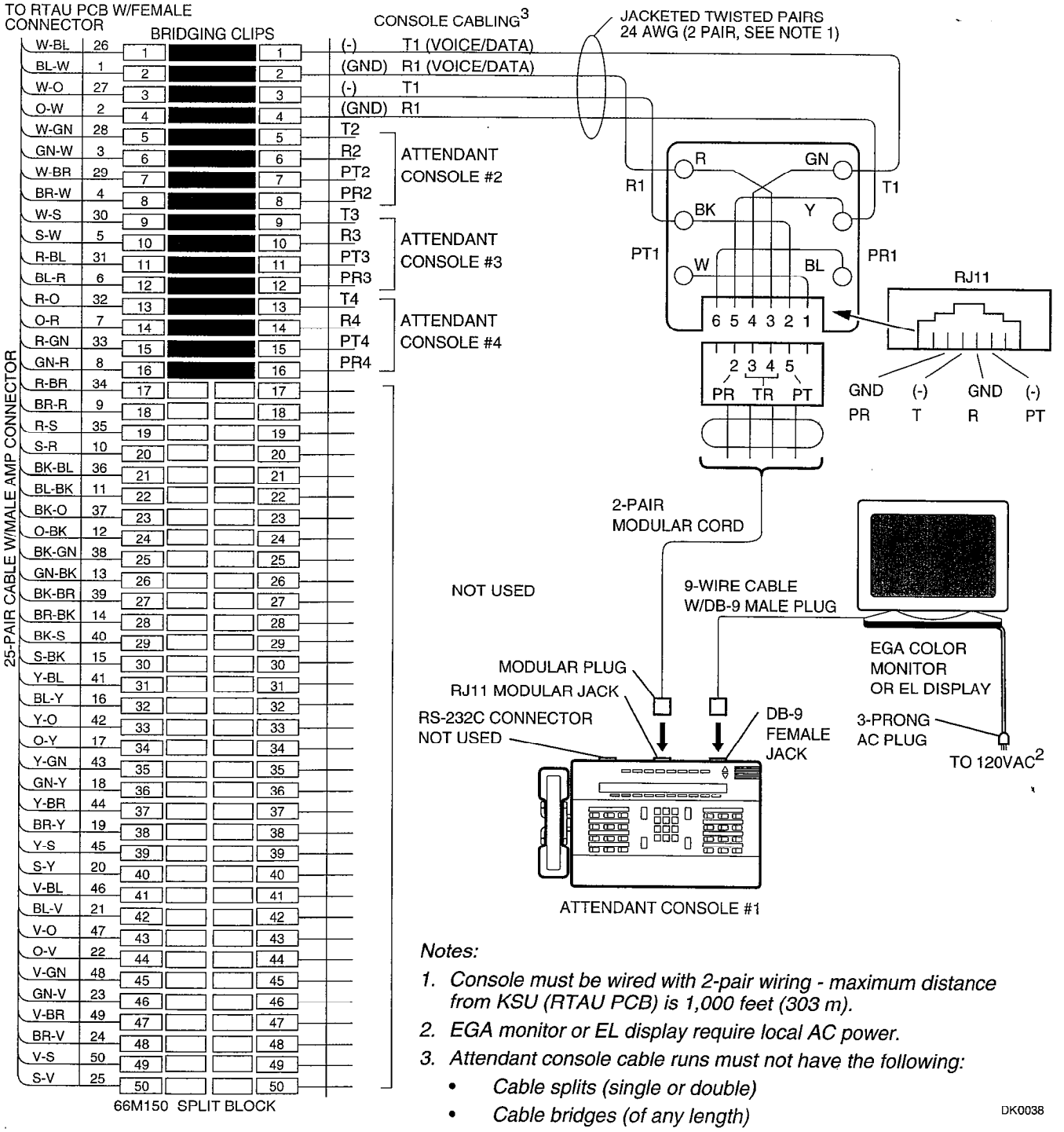


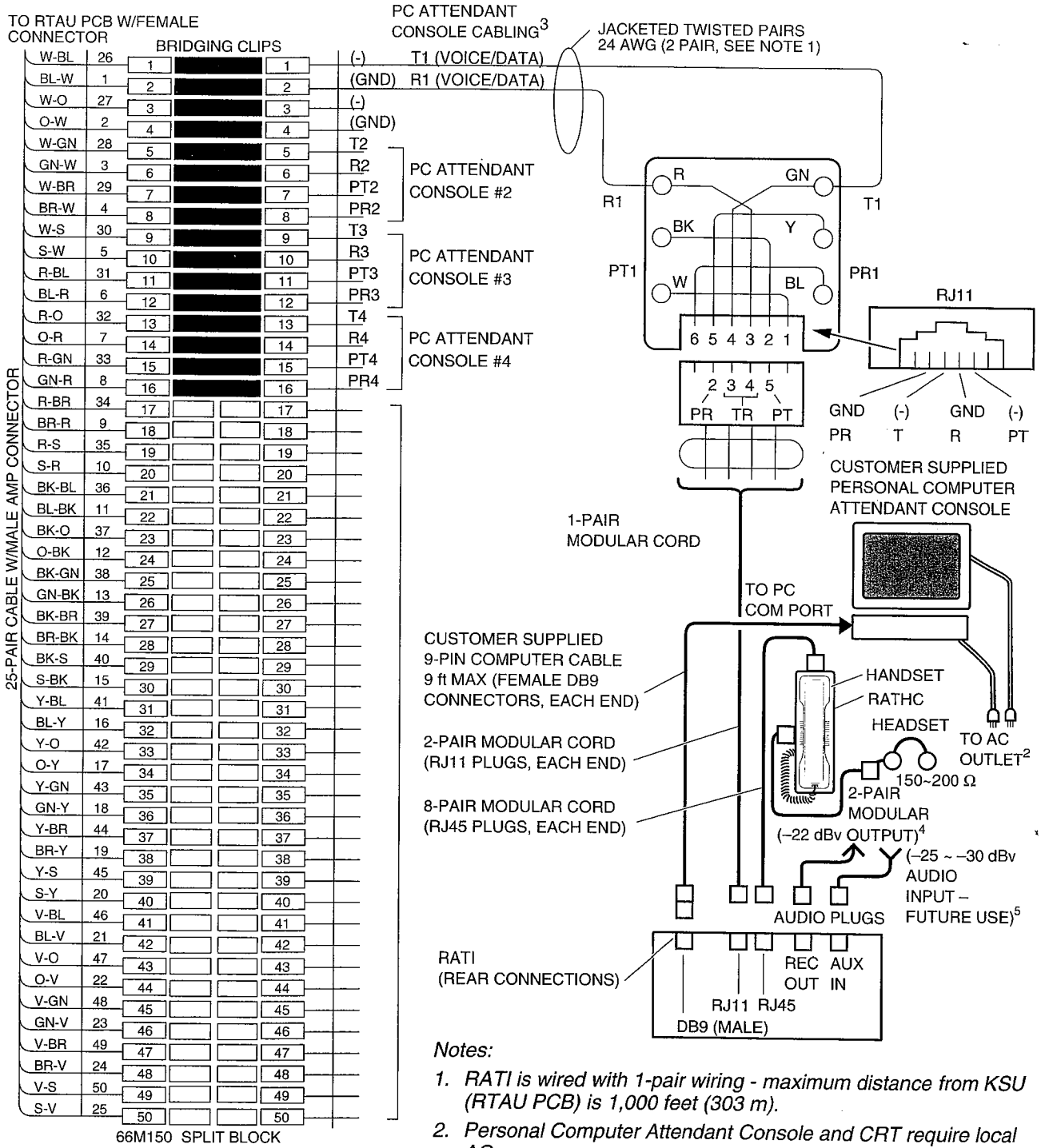
Figure 7-33
MDF Wiring/DID CO Lines to RDDU



Notes:

1. *Console must be wired with 2-pair wiring - maximum distance from KSU (RTAU PCB) is 1,000 feet (303 m).*
2. *EGA monitor or EL display require local AC power.*
3. *Attendant console cable runs must not have the following:*
   - *Cable splits (single or double)*
   - *Cable bridges (of any length)*
   - *High resistance or faulty cable splices*

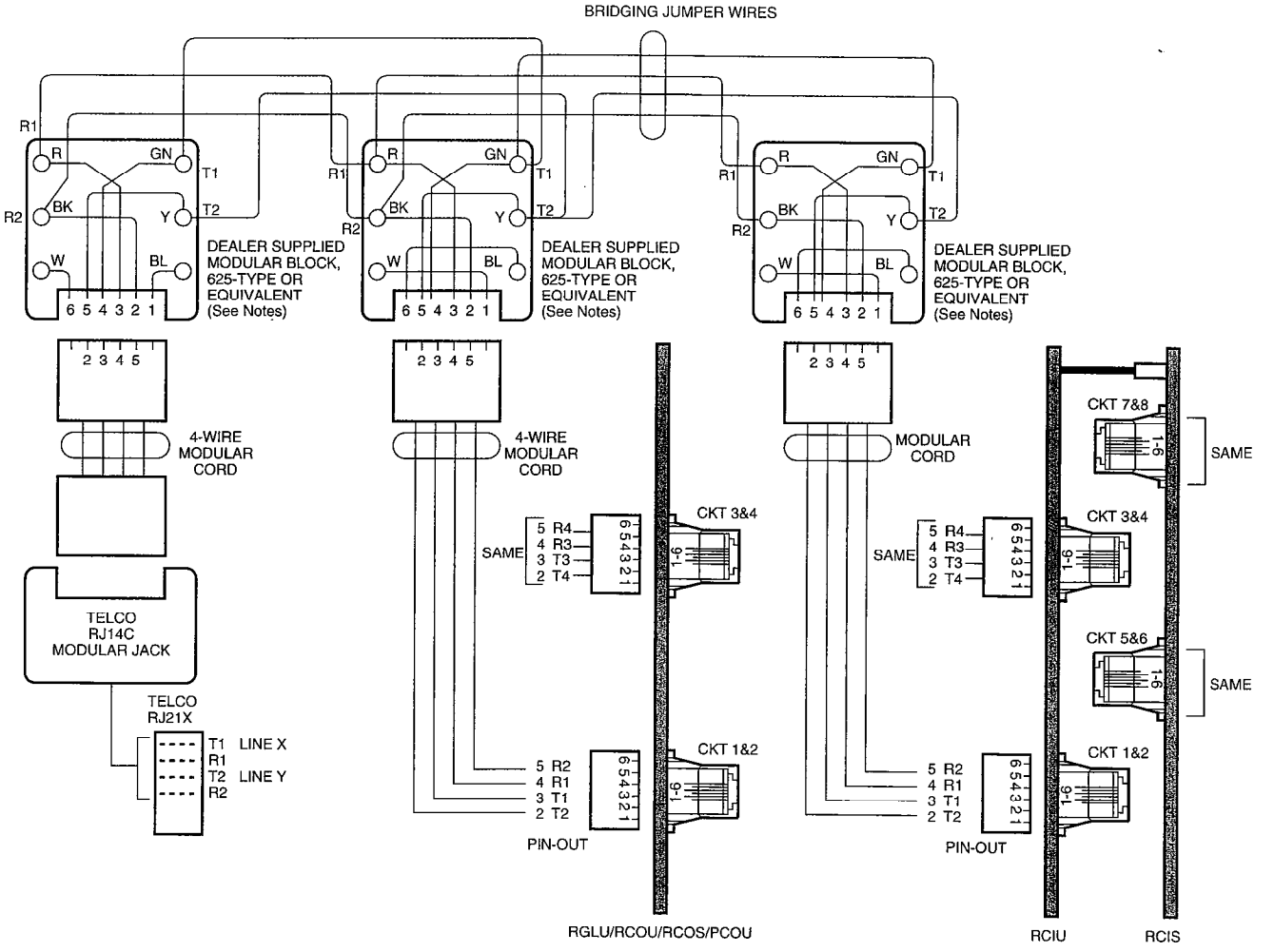
Figure 7-34
Attendant Console MDF Wiring Diagram



Notes:

1. *RATI is wired with 1-pair wiring - maximum distance from KSU (RTAU PCB) is 1,000 feet (303 m).*
2. *Personal Computer Attendant Console and CRT require local AC power.*
3. *Attendant console cable runs must not have the following:*
   - *Cable splits (single or double)*
   - *Cable bridges (of any length)*
   - *High resistance or faulty cable splices*
4. *To tape recorder "REC" input.*
5. *Audio input is for future use.*

Figure 7-35
Personal Computer (PC) Attendant Console MDF Wiring Diagram



NETWORK JACK: RJ14C/RJ21X
FIC: 02LS2 (LOOP START) OR 02GS2 (GROUND START)

Notes:

1. *4-wire modular jacks such as graybar part number AA-104A-4 could be used in place of the two modular jacks; or, a T-connector such as graybar part number 267A2 Adaptor could be used as shown below:*
2. *Assign RCIU/RCIS circuits to the appropriate CO line using Program *50.*

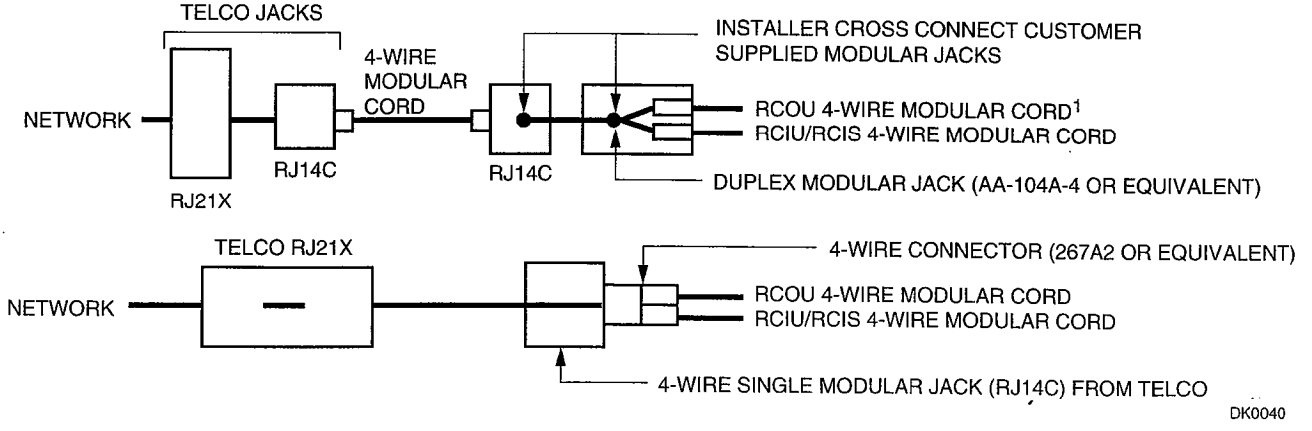
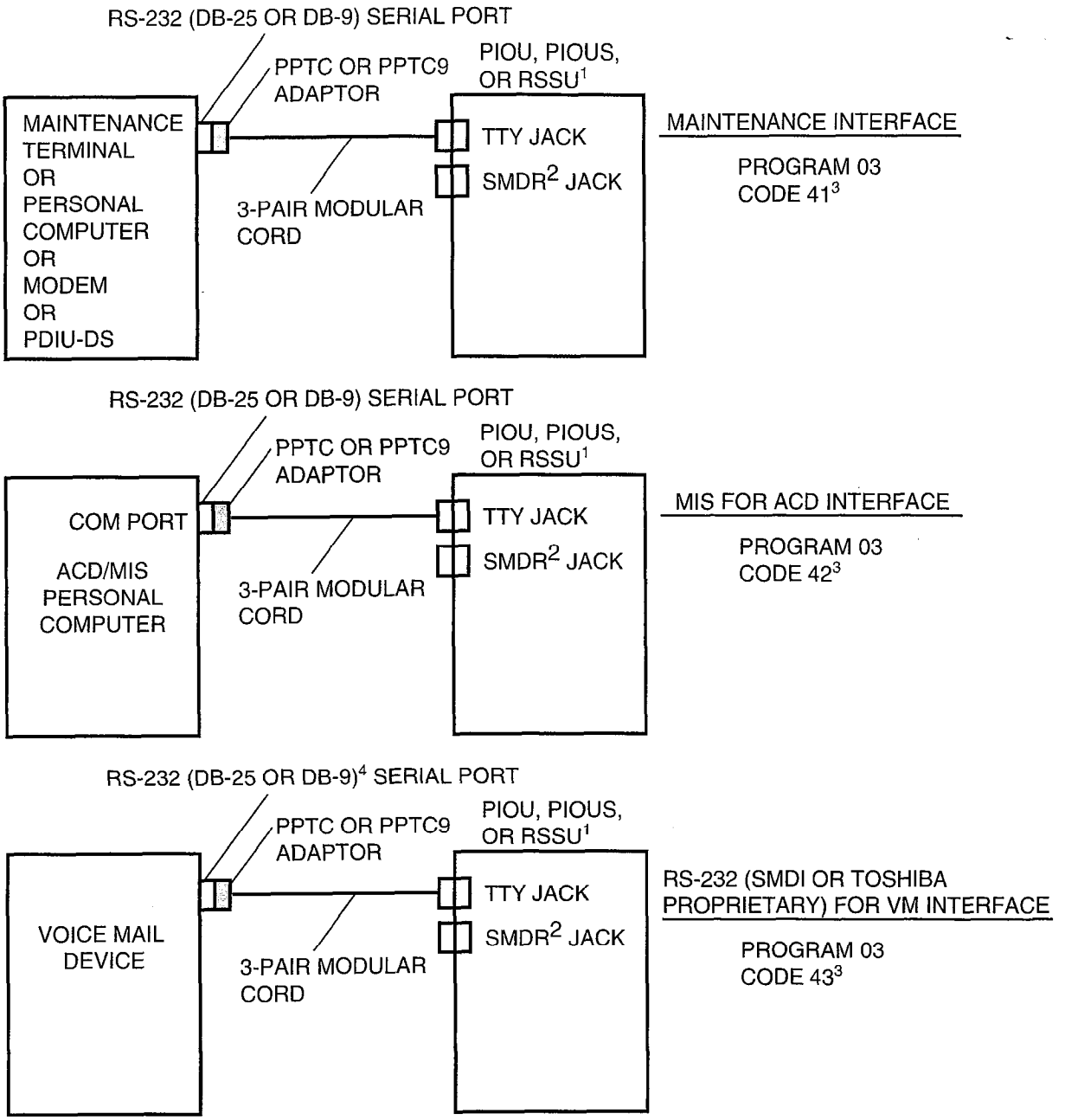


Figure 7-36
RCIU/RCIS MDF Wiring Diagram

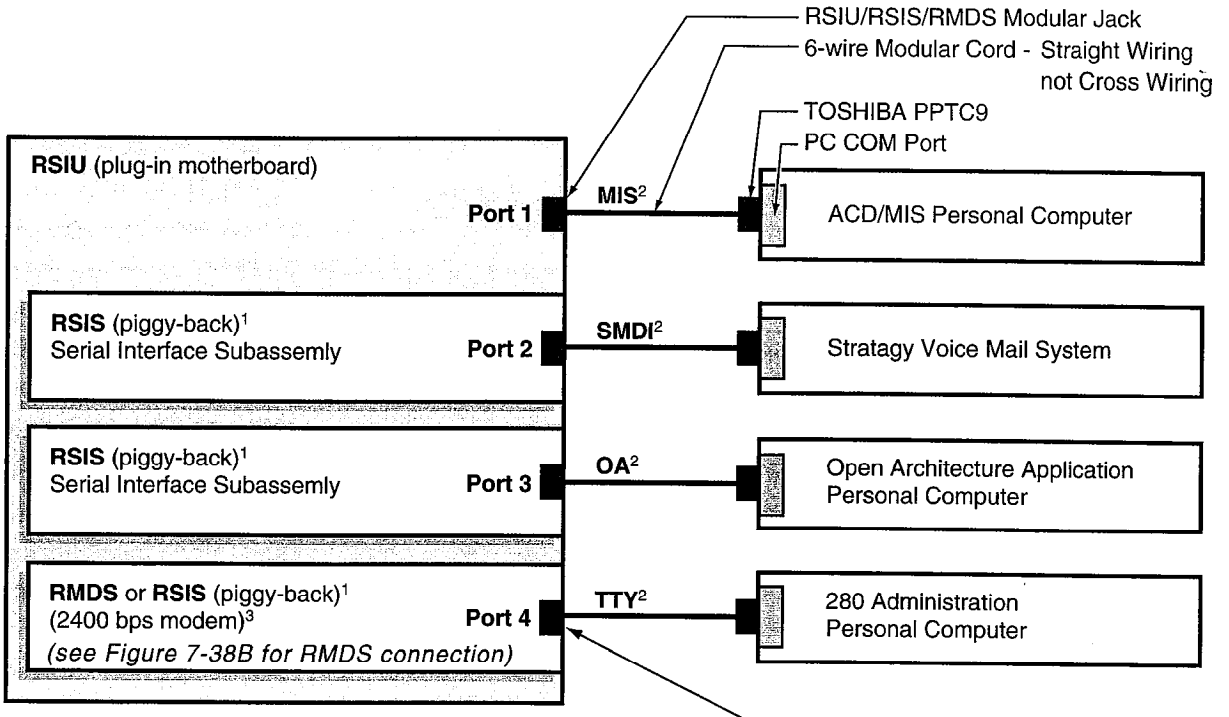


Notes:

1. *Install PIOU, PIOUS, or RSSU PCBs in the last (highest numbered) slot in any cabinet(s).*
2. *SMDR, Page Outputs, Relay controls, Alarm Sensor, and other miscellaneous options on PIOU or PIOUS will be active on the installed PIOU/PIOUS that is programmed with the lowest Program 03 code (41, 42, or 43). RSSU does not provide these features.*
3. *If set, RSIU/RSIS Program 76 will override Program 03 code 41, 42, and 43.*
4. *VP100 and Stratagy use straight cables, VP200/300 require "null modem" connection. PPTC (25-pin) requires a "male-to-female" gender changer.*

DK0041

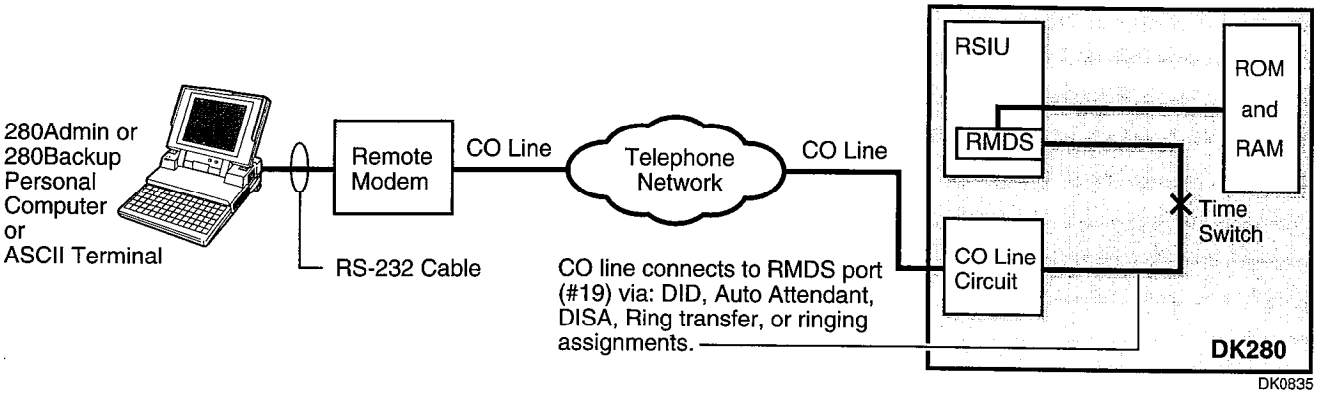
Figure 7-37
Multiple PIOU/PIOUS (Remote Maintenance, MIS for ACD, RS-232 Voice Mail Integration)



Notes:

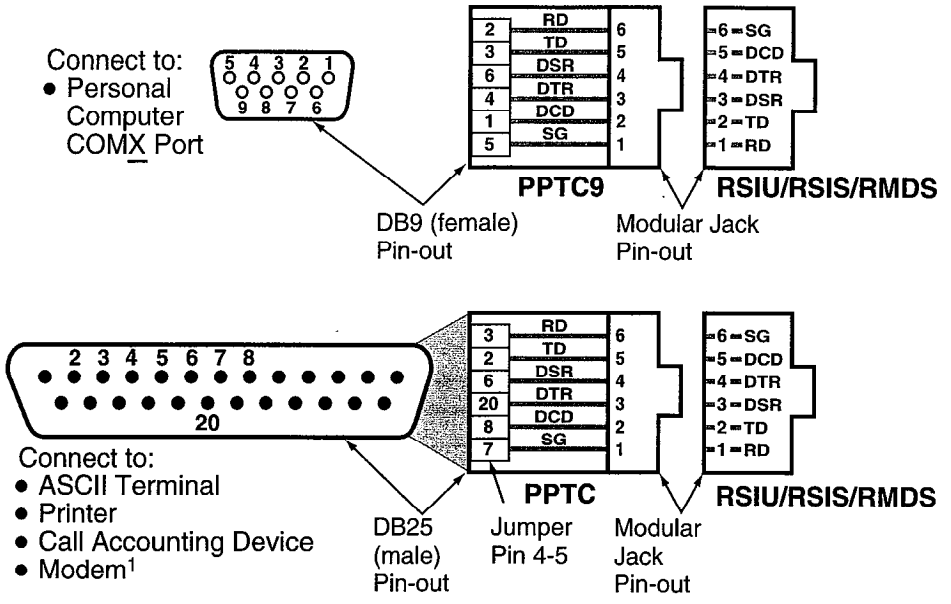
1. *The RSIU can be configured with up to three RSIS, or two RSIS and one RMDS (in any position). Use Program 76 to set RSIU/RSIS/RMDS port types.*
2. *All RSIU/RSIS/RMDS ports are system programmable to allow up to four of any of the functions: SMDR, MIS, SMDI, OA, TTY, and remote modem.*
3. *When the RMDS is used as a modem, the TTY jack is not used.*

7-38A. RSIU/RSIS/RMDS Block Diagram



7-38B. RSIU/RMDS Remote Modem Connection

Figure 7-38
RSIU/RSIS/RMDS Wiring Diagrams



Note:

1. *PPTC must be modified to connect to a modem. Refer to DK280 Installation and Maintenance Manual Chapter 13 for modification of PPTC.*

General Notes:

- *PPTC will not connect directly into a 25-pin personal computer COM port because they are male gender.*
- *PPTC9 is designed to connect directly to a personal computer DB9 male COM port.*

DK0836

7-38C. RSIU/RSIS/RMDS Modular Adaptor Pin Configuration

Figure 7-38
RSIU/RSIS/RMDS Wiring Diagrams (continued)

Strata® DK280

Digital Business Telephone System

Release 3

Programming

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Chapter 10 - System Record Sheets (continued)

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Chapter 10 - System Record Sheets (continued)

Program Number Guide

The following is an alphabetical list of features/topics and the corresponding DK280 program numbers which relate to the topic. This list is provided for your reference in using this manual and specifically for use with Programming Chapters 8 ~ 10.

Program Listing

The following is a numerical list of DK280 program numbers and their corresponding titles and applicable sections. This list is provided for your reference in using this manual and specifically for use with Programming Chapters 8 ~ 10.

Program Number	Title *(Applicable Sections)*
00	Part 1: Software Check/Remote Maintenance Security Code Assignments *(Basic System)*
00	Part 2: RCTU Random Access Memory (RAM) Test *(Basic System)*
01	Station Logical Port Display and/or Change *(Basic System)*
02	Station Physical Port Display and/or Change *(Basic System)*
03	Flexible PCB Cabinet and Slot Assignments *(Basic System)*
04	Station Logical Port Intercom or Primary Directory Number Assignment *(Basic System)*
*04	Phantom Directory Number **[PhDN]** Assignments and Distributed Hunt Group Directory Numbers for Internal and Tie Line Calls *(Basic System)*
05	Flexible Access Code Numbering *(Basic System)*
*05	Call Park Pickup Abbreviated Dialing *(Basic System)*
09	Built-in Auto Attendant Prompt/Station Assignments *(Basic System)*
*09	DID Digit Translation Assignments *(Basic System)*
10-1	System Assignments, Part 1 of 3 *(Basic System)*
10-2	System Assignments, Part 2 of 3 *(Basic System)*
10-3	System Assignments, Part 3 of 3 *(Basic System)*
10-4	ACD – See ACD I/M Manual *(Basic System)*
11	ACD – See ACD I/M Manual *(Basic System)*
12	System Assignments – Basic Timing *(Basic System)*
13	Defining the Message Center *(Basic System)*
14-0	ACD – See ACD I/M Manual *(Basic System)*

Program Number	Title (Applicable Sections)
14-1	ACD – See ACD I/M Manual *(Basic System)*
*14-1	ACD – See ACD I/M Manual *(Basic System)*
14-2	ACD – See ACD I/M Manual *(Basic System)*
*14-2	ACD – See ACD I/M Manual *(Basic System)*
14-3	ACD – See ACD I/M Manual *(Basic System)*
14-4	ACD – See ACD I/M Manual *(Basic System)*
14-5	ACD – See ACD I/M Manual *(Basic System)*
14-6	ACD – See ACD I/M Manual *(Basic System)*
14-71	ACD – See ACD I/M Manual *(Basic System)*
14-72	ACD – See ACD I/M Manual *(Basic System)*
14-73	ACD – See ACD I/M Manual *(Basic System)*
14-8	ACD – See ACD I/M Manual *(Basic System)*
14-9	ACD – See ACD I/M Manual *(Basic System)*
15	Ground/Loop/Tie/DID Line Options *(Basic System)*
*15	CO Line Tenant Assignments *(Basic System)*
16	Assign CO Line Groups (Dial 9 or 801 ~ 816) *(Basic System)*
17	DID/Tie Line Options *(Basic System)*
*17	DID Intercept Port Number *(Basic System)*
18	ACD – See ACD I/M Manual *(Basic System)*
19	Alternate Background Music (BGM) Source Slot Assignment *(Basic System)*
20	Computer Interface Unit and Data Interface Unit Configuration *(Basic System)*
21	Modem Pool Port Assignments *(Basic System)*
22	Computer Interface Unit and Data Interface Unit (DIU) Station Hunting (Data Calls) *(Basic System)*
23	Built-in Primary Auto Attendant Announcement Device Assignments *(Basic System)*
24	Built-in Secondary Auto Attendant Announcement Device Assignments *(Basic System)*
25-1	Incoming Built-in Auto Attendant Call Overflow Time *(Basic System)*
26	Built-in Auto Attendant Camp-on-Busy Time *(Basic System)*
27	Digital Telephone Handset/Headset Receiver Volume Level *(Basic System)*
28	DSS Console/Attendant Telephone Assignments *(Basic System)*

Program Number	Title *(Applicable Sections)*
*51	Station Memory Allocation to Store Caller ID and/or ANI Numbers on Abandoned/ Unanswered Calls *(Basic System)*
2	Least Cost Routing Code Exceptions for Specified Area Code *(Least Cost Routing)*
*52	Caller ID or ANI Ground/Loop/Tie/DID Line Circuit Abandoned Call Number Store Station Owner Assignments *(Basic System)*
53	Least Cost Routing Schedule Assignments for LCR Plans *(Least Cost Routing)*
554	Least Cost Routing Route Definition Tables *(Least Cost Routing)*
55-0	Least Cost Routing Modified Digits Table (Delete) *(Least Cost Routing)*
55-1~2	Least Cost Routing Modified Digits Table (Add) *(Least Cost Routing)*
56	Least Cost Routing Station Group Assignments *(Least Cost Routing)*
58-1	Attendant Console Overflow Timer *(Attendant Console)*
58-2	Attendant Console Display Type, Answer Button Operation, and Call Waiting Tone *(Attendant Console)*
58-4	Attendant Console Answer Button Priority Assignments *(Attendant Console)*
58-5	Attendant Console Overflow Destination Assignments *(Attendant Console)*
59	Attendant Console Flexible Button Codes *(Attendant Console)*
60-1	SMDR Data Output Options *(Basic System)*
60-2 ~ 7	SMDR Output/Account Code Digit Length
60-8	Call Forward External (Remote Change, Security) ID Code *(Basic System)*
69	Verified Account Codes *(Basic System)*
70	Verified Account Code Toll Restriction Assignments *(Basic System)*
71-0	DID/Tie/DNIS/ANI Lines *(Basic System)*
71-(1 ~ 3)	DNIS Number and ANI Line Routing Assignments *(Basic System)*
71-4	DNIS Number and ANI Only Lines Voice Mail (VM) ID Assignments *(Basic System)*
71-5	DNIS Number Name Display *(Basic System)*
*71 ~ *73	[DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments
72	DNIS Network Table Assignments
74	System NT Button Lock Password *(Basic System)*
76-1	RSIU/RSIS/RMDS Port Assignments *(Basic System)*
76-2	RSIU/RSIS/RMDS Port Assignments *(Basic System)*
77-1	Peripheral Options (Door Phones) RSIU/RSIS/RMDS/IMDU/PIOU/PIOUS/ PEPU *(Basic System)*

DK280 Release 3 (R3) Software Guide

The following indicates all the system programming-related additions and changes included in Release 3.

Item Description	Related Programs	Description
Alert Signaling	39	Alert Signal Button Assignments
ANI/DNIS/DID/Tie Lines	10-3	System Assignments—Caller ID/ANI Numbers are sent out the SMDI Port
	17	Telephone LCD Priority is ANI/DNIS DID/Tie Line DTMF Digits with * Tones DID/Tie Line Receives ANI DID/Tie Line Routes per DNIS/Non-DNIS Assignments
	20	Computer Interface Unit and Data Interface Unit Configuration—RPCI-DI for ANI/DNIS/Caller ID
	39	Flexible Button Assignments for Unanswered Caller ID and/or ANI Stored Number Auto Dial
	*51	Station Memory Allocation to Store Called ID and/or ANI Numbers on Abandoned/Unanswered Calls
	*52	Called ID and/or ANI Line Circuit Abandoned Call Number Store Station Owner Assignments
	71-0	DID/Tie/DNIS Line Number Plan
	71-(1 ~ 3)	DNIS/DID/Tie and ANI Line Routing Assignments
	71-4	DNIS/DID/Tie and ANI Only Lines Voice Mail ID Assignments
	71-5	DNIS/DID/Tie Line Name Display Assignments

Item Description	Related Programs	Description
ANI/DNIS/DID/Tie Lines (continued)	*71 ~ *73	**[PDN]** and **[PhDN]** Ringing Assignments
	72	DNIS Number Network Table Assignment
280Admin/280Backup		ANI/Caller ID lost call data can be backed up and restored using 280Admin or 280Backup.
		Call Forward (set/not set) data can be backed up and restored with 280Admin and 280Backup. Call Forward can be set and/or cancelled with 280Admin.
		MW (ON/OFF) data for all stations can be backed up and restored using 280Admin and 280Backup.
Busy Override	31	Station Class of Service for Busy Override Tone-Two or Continuous Muted Rings
	*34	Station Class of Service for Camp-on/BOV Tone to Std. Telephone Handset
Caller ID	03 Code 81	Flexible PCB Cabinet and Slot Assignments for 8 CKT, Caller ID
	10-3	System Assignments—Caller ID/ANI Numbers are sent out SMDI Port
	20	Computer Interface Unit and Data Interface Unit Configuration—RPCI-D1 for Caller ID
	39	Flexible Button Assignments for Unanswered Caller ID and/or ANI Stored Number Auto Dial
	*50	Caller ID RCIU/RCIS Circuit Assignments to CO Line (RCOU/RCOS/RGLU/PCOU)
	*51	Station Memory Allocation to Store Caller ID and/or ANI Numbers on Abandoned/Unanswered Calls
	*52	Called ID and/or ANI Line Circuit Abandoned Call Number Store Station Owner Assignments
Call Park Orbits	05	Flexible Access Code Numbering for Park and Page, Park Pick Up, and Park and Hold
	*05	Call Park Pickup Abbreviated Dialing

Item Description	Related Programs	Description
Call Park Orbits (continued)	*37	Park Recall Timing
	39	Flexible Button Assignments for Call Park, Call Park LCD Display, and Call Park and Page
	59	Attendant Console Flexible Button Codes for Call Park, Call Park LCD Display, Call Park and Page and Park Recall
Directory Numbers: **[DN], [PDN], [PhDN]**	04	Primary Directory Number [PDN] Assignments
	*04	Phantom Directory Number **[PhDN]** Assignments
	05	Flexible Access Code Numbering for default **[PDNs]**, **[PhDNs]**
	09	Built-in Auto Attendant Prompt/Station Assignments for Distributed Hunt **[DNs]**, **[PhDNs]** or ACD Group Number
	*33	Phantom Directory Number **[PhDN]** Owner Telephone Assignment
	39	**[PDN]**, **[SDN]**, and **[PhDN]** Button Assignments
	*71 ~ *73	**[PDN]** and **[PhDN]** Ringing Assignments
	*79	Door Phone to **[DN]** Flashing Assignments
	*81, *84, *87	Ground/Loop Start/CO Line to **[DN]** Button LED Flash Assignments
Distributed Hunt Group (Not operational until Release 3.1)	*04	Distributed Hunt Group Directory Numbers
	09	Built-in Auto Attendant Prompt/Station Assignments for Distributed Hunt [DNs]
	*09	Distributed Hunt Group DID Extension Number Translations
	*40	Distributed Hunt Group Member Assignments

Item Description	Related Programs	Description
Distributed Hunt Group (continued) (Not operational until Release 3.1)	71- (1 ~ 3)	DNIS Number and ANI Line Routing Assignments for Distributed Hunt Groups
Door Phones	*79	Assign which **[PDN]** or **[PhDN]** should flash when the Door Phone button is pressed.
Message Waiting	35	Station Class of Service for Message Waiting Lamp Standard Telephones
Night Transfer/ Night Lock	*36	System NT Button Lock Password Changing Station Assignment
	39	Flexible Button Assignments for Night Transfer Lock Tenant 1 ~ 4. Used to lock system ringing mode: DAY, DAY2, NIGHT.
	59	Attendant Console Flexible Button Codes for Night Transfer Lock Tenant 1 ~ 4. Used to lock system ringing mode: DAY, DAY2, NIGHT.
	74	System NT Button Lock Password
OCA	31	Station Class of Service for Handset OCA, Handset OCA Warning Tone
	35	Station Class of Service for No CF/NA Handsfree or OCA
Open Architecture (OA) (Not operational until Release 3.2)	77-4	RSIU Open Architecture Data Output Assignments
RAM	00 Part 2	RCTU RAM Test
	91-2	Data Transfer from Temporary Memory to Working Memory
Release/Answer Button	39	Release original call and answer ringing call automatically.

Item Description	Related Programs	Description
RMDS Modem Protocol CCITT	77-1	Peripheral Options
RPCI-DI	20	Computer Interface Unit and Data Interface Unit Configuration—RPCI-DI for ANI/DNIS/Caller ID
RSIU/RSIS/RMDS	03 Code 49	Flexible PCB Cabinet and Slot Assignments for RSIU I/O Interface
	76-1, 76-2	RSIU/RSIS/RMDS Port Assignments
SMDI	10-3	System Assignments—Caller ID/ANI Numbers are sent out the SMDI Port
SMDR	60-1	SMDR Data Output Options
Toll Restriction	35	Station Class of Service for Toll Restriction After Answer
	*45-1	Restrict Office Codes in Local and All Other Area Codes
	*45-2	Allow Special Numbers that do not begin with * or # Digits
	*45-3	Allow Special Numbers that begin with * or # Digits
	46-2 ~ 4, 46-6 ~ 8	Allow/Deny Numbers that contain * or # digits (RCTUC/D added)

Programming Introduction

8

The Programming Part of this manual provides the system installer with instructions to set the detailed feature configuration and operation of the system.

8.1 Organization

The Programming Part of this manual contains the following:

Program Number Guide is an alphabetical list of features/topics and the corresponding DK280 program numbers which relate to the topic.

Program Listing is a numerical list of DK280 program numbers, titles and applicable sections.

Chapter 8—Programming Introduction includes general programming information basic instructions on how to program the system with a 20-button LCD digital or electronic telephone, some general programming notes, tutorials and a general programming example.

Chapter 9—Record Sheet Instructions gives Descriptions and detailed information pertaining to the System Record Sheets. The actual record sheets are in the following chapter.

Chapter 10—Record Sheets contains System Record Sheets. Also included are cross-reference tables for the programs in numerical and alphabetical order. This chapter provides a record sheet for every program (00 ~ *99), including Toll Restriction and Least Cost Routing. The system programmer programs the system from the data on the record sheets.

Star (*) programs, which are new programs and program enhancements introduced with the Strata DK280, are listed near the front of Chapter 10. The "*" programs are located behind the program of the same name (e.g., Program * 09 follows Program 09). An Account Code Program Option and Override Option Matrix is included in Chapter 10.

8.2 Programming Tutorials

The list below gives you general program numbers and their tutorial tables. These step-by-step tables will help familiarize you with running these programs.

Program	Table
■ Program 33—Station Hunting	8-1
■ Program 30—Station Class of Service	8-2
■ Program 91-9—System Initialization	8-3
■ Program 91-1—Automatic PCB Recognition and Logical/Physical Port Initialization	8-4
■ Program 90—Initializing Programs 00 ~ *99	8-5
■ Program 92—Initializing Speed Dial Numbers, VM ID Codes, Character Message Memory, Timed Reminders, Digital Telephone Volume, and Call Forward Backup Memory	8-6
■ Program 03—Flexible PCB Slot Assignments	8-7
■ Program 00—Software Check/ Remote Maintenance Security Code Assignments	8-8
■ Program 04—Station Logical Port Primary Directory Intercom or Number Assignment	8-9

For more details on each program, refer to Chapter 9—Record Sheet Instructions.

8.3 General Programming

Data is entered from System Record Sheets at the 20-button LCD digital or electronic telephone connected to Port 005. Port 005 is the sixth station circuit on the PDKU or PEKU installed in cabinet Slot 11; or, the sixth station circuit on the PDKU or PEKU installed in cabinet slot 12 (only when RSIU is in slot 11).

Data can also be entered from an on-site or off-site terminal, using an ASCII keyboard or personal computer with Toshiba 280Admin, Release 3 software. Toshiba recommends the use of 280Admin with Strata DK280 Release 3 and above. See Chapter 13—Remote Maintenance, for more details. System Record Sheets document a specific system's data configuration, including attributes of a feature or group of features. The record sheets are organized by program number.

8.3.1 Programming Data Entry Overview

Keystrokes for entering data from System Record Sheets follow a pattern, consisting of a five-step process described below and illustrated in Figure 8-1. Detailed data entry instructions are on the top of each System Record Sheet. Button (key) sequences that stay the same for every program are shaded on each record sheet. Button sequences that are unique for every program are white.

1. Enter the programming mode by pressing a series of buttons. This is the entry sequence for all programs. These buttons are shaded on every record sheet.
2. Enter the program number. This sequence is unique for every program. The buttons are white on every record sheet.
3. Enter the program data. Again, this sequence is unique for every program. The buttons are white on every record sheet. To make another entry, repeat this step until ready to exit the current program.

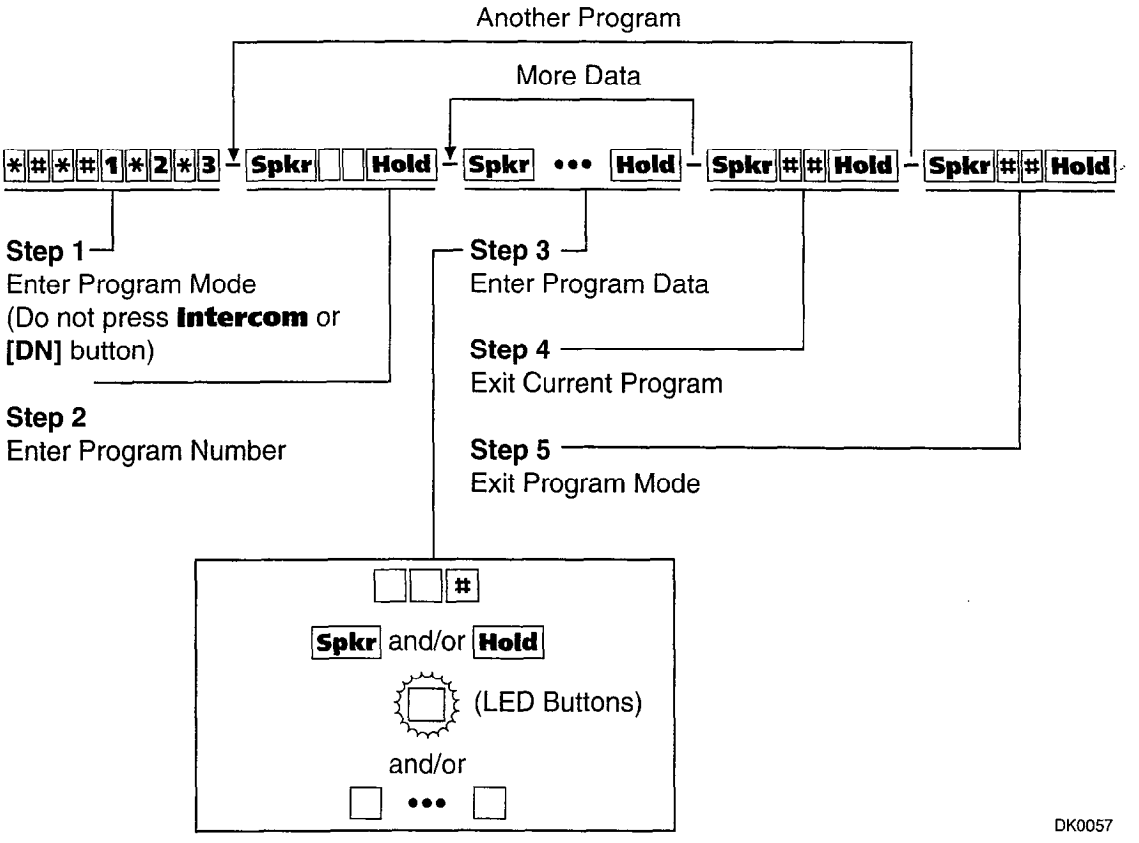


Figure 8-1
Programming Button Sequence Overview

4. Exit the current program. This sequence never changes, and the buttons are always shaded. Upon exiting the current program, repeat Step 2 to enter another program, or continue with Step 5 to exit the programming mode entirely.

5. Exit the programming mode by pressing the same buttons as in Step 4. This sequence also never changes and is always shaded.

8.3.2 Programming Data Variations

There are two different ways to enter data in Step 3 (Figure 8-1) of a program: pressing the buttons on the dialpad and pressing the LED buttons. Many programs are multidimensional and involve both types of entry.

Simple Programs

Simple programs such as Program 00, only require data to be specified through the dialpad. Data entered from the dialpad displays on the programming digital or electronic telephone's LCD, along with prompts and confirmations. See Table 8-8 for step-by-step data entry instructions for Program 00.

Multidimensional Programs

Once a program number is entered, the first dimension (usually a CO line number, a station port number, or a range of ports) must be specified. Upon specifying this first dimension on the dialpad, programming button LEDs 01 ~ 20 light in the default configuration.

The status of each LED can be changed by pressing its associated button. Pressing the button while its LED is lit turns the LED off; pressing the button while its LED is off turns the LED on. Program 30 is a multidimensional program; see Table 8-2 for step-by-step data entry instructions for Program 30.

Range Programming

Data can be entered for a range of stations, **[DN]** reference ports and CO lines with some programs. To enter a range, enter a "*" between the starting point of a range and the ending point of a range. For example, to program the station range of 001 ~ 010 for Program 35, press **0 0 1 * 0 1 0**.

- When programming a range of station ports, the station's programming LEDs indicate whether the data programmed matches for all items in the range:
  - **LED On**: Indicates that all ports in the range are programmed with the data choice that lights the particular LED.
  - **LED Off:** Indicates that all ports in the range are programmed with the data choice that does not light the particular LED.
  - **LED Flashing**: Indicates that data is currently inconsistent for all ports in the range. Some may be programmed with the LED on; some with the LED off.

CO Line Programming

Since the programming telephone only has 20 buttons, data can only be entered for 20 CO lines at a time. To program another range press the Page or **Scroll** button below the LCD. For example, to change from one range to another in Program 15, enter the program code, then press the **Scroll** button to advance or the **Page** button to go back to another range.

- If the programming telephone is a digital telephone, all CO lines within a range can be activated or deactivated for a feature by pressing the Volume buttons. Press the **Vol▲** button to turn all LEDs on; press the **Vol▼** button to turn all LEDs off.

- The status of a particular CO line can be verified. To check the status of a CO line in Program 15, for example, press the **Mode** button below the LCD after entering the program code. Then enter the CO line number to be verified. Use the **#** button to display the status of the CO line and to advance to the next CO line.

Programming Button/LED Keystrip Template

A special buttonstrip template (Figure 8-2) is placed over the 20 flexible feature buttons of the programming telephone. The template assigns a series of numbers to each of the 20 buttons that correspond with tables found on the System Record Sheets for programming purposes.

Since each button represents more than one CO line, depending on the CO line range selected, the template assigns more than one number to each button. Templates are supplied with each DK280 I&M manual.

10 30, 50 90, 110, 130	20 40, 60, 80 100, 120, 140
09 09, 29, 49, 59 89, 109, 129	19 39, 59, 79 99, 119, 139
08 08, 28, 48, 68 88, 108, 128	18 38, 58, 78 98, 118, 138
07 07, 27, 47, 67 87, 107, 127	17 37, 57, 77 97, 117, 137
06 26, 46, 66 86, 106, 126	16 36, 56, 76 96, 116, 136
05 25, 45, 65 85, 105, 125	15 35, 55, 75 95, 115, 135
04 24, 44, 64, 84 104, 124, 144	14 34, 54, 74 94, 114, 134
03 23, 43, 63, 83 103, 123, 143	13 33, 53, 73 93, 113, 133
02 22, 42, 62, 82 102, 122, 142	12 32, 52, 72 92, 112, 132
01 21, 41, 61, 81, 101, 121, 141	11 31, 51, 71 91, 111, 131

2000-series Digital Telephone[1]

16, 36, 56, 76 96, 116, 136	17, 37, 57, 77 97, 117, 137	18, 38, 58, 78 98, 118, 138	19, 39, 59, 79 99, 119, 139	20, 40, 60, 80 90, 110, 130
11, 31, 51, 71 91, 111, 131	12, 32, 52, 72 92 112, 132	13, 33, 53, 73 93, 113, 133	14, 34, 54, 74 94, 114, 134	15, 35, 55, 75 95, 115, 135
06, 26, 46, 66 86, 106, 126	07, 27, 47, 67 87, 107, 127	08, 28, 48, 68 88, 108, 128	09, 29, 49, 59 89, 109, 129	10, 30, 50, 70 90, 110, 130
01, 21, 41, 61 81, 101, 121, 141	02, 22, 42, 62 82, 102, 122, 142	03, 23, 43, 63 83, 103, 123, 143	04, 24, 44, 64 84, 104, 124, 144	05, 25, 45, 65 85, 105, 125

1000-series Digital Telephone[2]

DK0058

Notes:

1. *This keystrip is available for 2000-series Digital telephones only. It is supplied with each Strata DK280 I&M manual and with each Strata DK280 Documentation Package that ships with the system.*
2. *The above 1000 series keystrip is not available from Toshiba, this pattern is provided to show programming button/LED assignment locations only.*

General Note:

- *Electronic (6000-, 6500-series) telephones follow the same programming keystrip pattern as 2000-series Digital Telephones.*

Figure 8-2
Programming Keystrips

8.3.3 Preparing the System for Programming

This section explains how to prepare a system for programming, including minimum hardware requirements and directions to clear the system's memory.

Minimum Hardware Requirements

A system must have the following minimum hardware installed for programming, as described in the Installation Part of this manual.

- The base cabinet power supply must test satisfactorily.
- The common control unit (RCTUA/B, RCTUBA/BB, or RCTUC/D) must be installed and its jumpers must be set for live operation.
- A PDKU or PEKU, must be installed in Slot S11 or S12 in the base cabinet (S11 if RSIU is not installed, S12 if RSIU is installed in S11).
- A 20-button LCD program telephone equipped with programming template must be connected to physical port 005 (PDKU or PEKU - circuit 6/slot 11, or if the RSIU is installed in slot 12).

Minimum Software Requirements

To prepare the system software for programming, clear the memory by initializing its data (with Program 91-9), as specified in Section 8.4—General Programming Guidelines. Next, after installing all of the PCBs, Program 91-1 or 91-9 must be run to inform the software of the system's hardware configuration. After running Program 91-1 or 91-9, run Program 03 for all PCBs that have options. Basic system programming can then begin.

8.4 General Programming Guidelines

The following is a general procedure for programming the system.

1. Run Program 91-9 twice in succession to initialize the system. All PCBs may or may not be installed — it does not matter.

CAUTION !

Program 91-9 will erase all program data and will drop all calls if it is run while the system is in service.

Program 91-9 sets the following elements to initial status:

- Data for Programs 00 ~ *99
- Speed Dial Memory
- Voice Mail Identification Codes
- Character Message Memory
- Timed Reminders
- Digital Telephone Volume Levels
- Call Forward Memory (Power OFF, then ON).

2. After installing all PCBs, run Program 91-1 to inform the software of the system hardware configuration.

8.4.1 After Initialization

Immediately after initializing the system with Program 91-9 and 91-1:

1. Run Programs 03 and 19-1 to inform the software of the system option hardware configuration (see Table 8-7, and the Program 19 record sheet)

2. Run Program 00 to assign remote maintenance security codes (see Table 8-8). With Strata DK280 Release 3 and above, anytime after initialization, the RCTU processor PCB RAM can be tested using Program 00. The RCTU RAM test procedure is provided on the Program 00-Part 2 record sheet in Chapter 10 —Record Sheets.

3. Run additional programs as required.

All programs are entered from the LCD digital or electronic telephone connected to physical Port 005 or, they are uploaded using 280Admin or 280Backup. If uploading with 280Admin or 280Backup, you must download Program 03 first to set the correct PCB slot code data in the 280Admin or 280Backup database.

The time and date can be set anytime after initialization. This is not accomplished from the programming station, but rather from the digital or electronic telephone connected to logical Port 000 (usually station number 200).

Refer to Figures 8-3 for the date, 8-4 for the system time, and 8-5 for the day of the week (Monday, Tuesday, etc.). Program 91-9 does not initialize time and date.

HOW TO SET THE DATE

The date must be set from the electronic or digital telephone assigned to logical Port 000 (station 200) or Attendant Console. Enter the following button sequence with the handset on the hook:

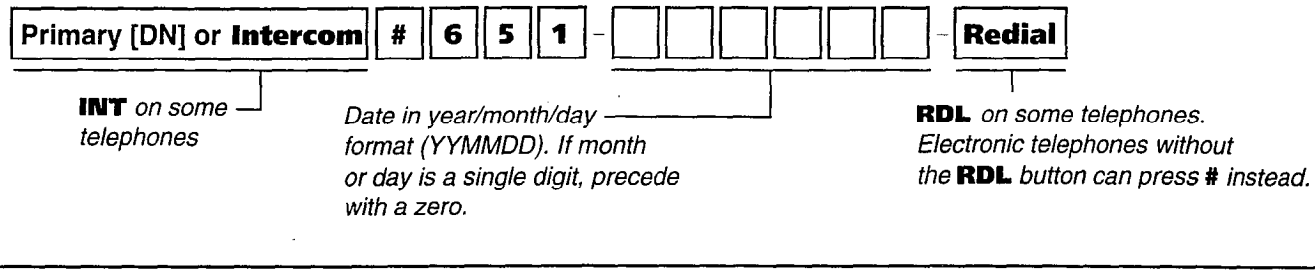


Figure 8-3
Setting Time Date

HOW TO SET THE TIME

The time must be set from the electronic telephone or digital assigned to logical Port 000 (station 200) or Attendant Console. Press the following button sequence with the handset on the hook:

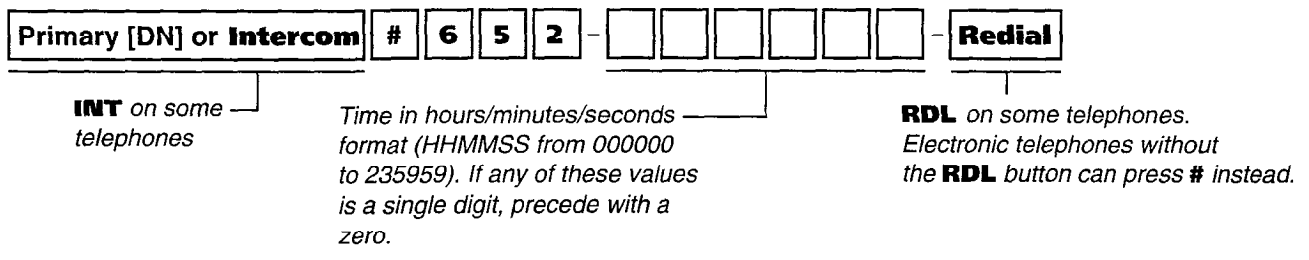
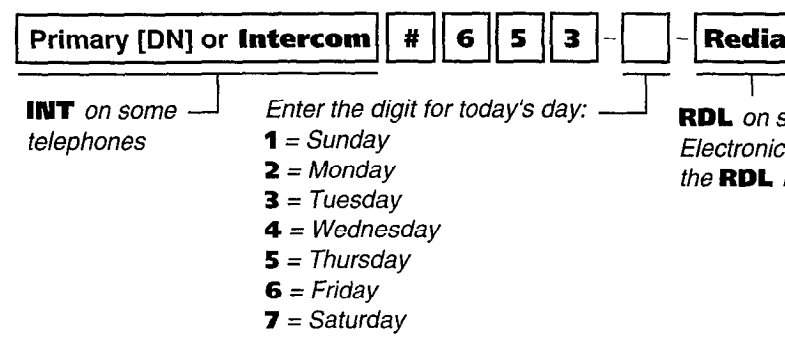


Figure 8-4
Setting System Time

HOW TO SET THE DAY

The day must be set from the electronic or digital telephone assigned to logical Port 000 (station 200) or Attendant Console. Press the following button sequence with the handset on the hook:



DK0059

Figure 8-5
Setting System Day of the Week

Table 8-1
Simple Program: Program 33 — Station Hunting

Step No.	Action: **Buttons** + LED buttons Press	LCD RESPONSE ...
1.	Use the programming LCD electronic or digital telephone connected to physical port 005 - circuit 6. **Make sure the programming button strip template is installed on the programming telephone.** (See the Keystrip Template information in Section 8.2.2).	NO. 205 JAN 20 SUN 06:43
2.	*** # * # 1 * 2 * 3** Enter programming mode. (Do not press **Intercom** or [DN] button.)	PROGRAM MODE
3.	**Spkr (Speaker) 3 3 Hold** Access Program 33. System beeps after **Spkr (Speaker)** is pressed to indicate program number may be entered.	PROGRAM = 33 DATA STORE
4.	**Spkr (Speaker)** Prepare the system for a station port selection.	33 SELECT =
5.	**0 0 0 # ~ 2 3 9 #** Select the port number of the Hunt From station. A range of ports can be entered as specified in on the record sheet. After the Hunt From port is entered, press the # button. Do not press # when entering a range.	33 SELECT = (000 ~ 239) HUNT TO =
6.	**0 0 0 ~ 2 3 9** Enter the port number of the Hunt To point, as recorded on the system record sheet. Press LED button 01 to delete a digit from Hunt To point ports.	33 SELECT = (000 ~ 239) HUNT TO = (000 ~ 239)
7.	**Hold** Secure data in system programming.	33 SELECT = (000 ~ 239) DATA PROGRAMMED
8.	**Spkr (Speaker)** Prepare system for another selection (go back to Step 5), or exit Program 33 (continue with Step 9).	33 SELECT =
9.	**# # Hold** Secure Program 33 data in system memory.	33 SELECT = ## DATA PROGRAMMED
10.	**Spkr (Speaker)** Exit Program 33. Enter another program number or exit programming mode (go to step 11). Speaker beeps to indicate it is exiting Program 33.	PROGRAM =
11.	**# # Hold** Exit programming mode.	NO. 205 JAN 20 SUN 06:58

DK0046

Table 8-2
Multidimensional Program: Program 30 — Station Class of Service

Step No.	Press... **Buttons** + LED buttons Action description	LCD RESPONSE ...
1.	Use the programming 20 button LCD digital or electronic telephone connected to physical port 005 (station 205) - circuit 6. **Make sure the programming keystrip template is installed on the programming telephone** (see the Keystrip Template information in Section 8.2.2).	NO. 205 JAN 20 SUN 06:43
2.	*** # * # 1 * 2 * 3** Enter programming mode. (Do not press **Intercom** or **[DN]** button)	PROGRAM MODE
3.	**Spkr (Speaker) 3 0 Hold** Access Program 30. System beeps after pressing **Spkr (Speaker)** button. You can now enter program number.	PROGRAM = 30 DATA STORE
4.	**Spkr (Speaker)** Prepare system for a port number selection.	30 SELECT =
5.	**0 0 0 # ~ 2 3 9 #** Enter the port number where the station being defined is connected. Use three digits, followed by a **#** button. A range of ports may be entered at once by using the ***** button. (See Note on system record sheet.)	30 SELECT = (000 ~ 239)
6.	**LED buttons 01 ~ 20** LED buttons 01 ~ 20 activate features for each station port or port range. Make the following selections by turning the appropriate button LED ON or OFF for each item (01 ~ 20) for each port, as marked on the system record sheet: LED 01: Speakerphone Enabled LED 02: Microphone Key Lock Enabled LED 03: Microphone ON at Start of Call LED 04: Not Used LED 05: Speed Dial Allowed LED 06: Automatic Busy Redial Access Enabled LED 07: Automatic Off-hook Call Announce LED 08: Forced Account Code Enabled LED 09: Toll Restriction Override Code Revision Authority LED 10: DISA Security Code Change Allowed LED 11: Dial Pulse (DTMF Off) for Standard Telephone	

DK0047

Table 8-2 (continued)
Multidimensional Program: Program 30 — Station Class of Service

Step No.	Press... **Buttons** + LED buttons Action description	LCD RESPONSE ...
6.	*LED buttons 01 ~ 20 (continued)* LED 14: Account Codes Verified LED 15: Verified Account Code Revision Authority LED 16: Traveling Class of Service Code Revision Authority LED 17: Do Not Disturb Override Allowed LED 18: Executive Override Allowed LED 19: Privacy Override Allowed LED 20: Not Used If programming a port range, the LED indications are as follows: • LED-ON, all ports in range are enabled for that item. • LED-OFF, all ports in range are disabled for that item. • LED-FLASHING, some ports in range are enabled and some ports are disabled.	
7.	**Hold** Secure data in system programming.	30 SELECT = (000 ~ 239) DATA PROGRAMMED
8.	**Spkr** (**Speaker**) Prepare system for another selection (go back to step 5), or exit Program 30 (continue with Step 9).	30 SELECT =
9.	**# # Hold** Secure Program 30 data in system memory.	30 SELECT = ## DATA PROGRAMMED
10.	**Spkr** (**Speaker**) Exit Program 30. Enter another program number, or exit programming mode (go to Step 11). System beeps to indicate it is exiting Program 30.	PROGRAM =
11.	**# # Hold** Exit programming mode.	NO. 205 JAN 20 SUN 06:58

DK0048

Table 8-3
Program 91-9 — System Initialization

Step No.	Press... **Buttons** + LED buttons Action description	LCD RESPONSE ...
1.	Use the programming LCD electronic or digital telephone with programming template connected to physical port 005 (station 205) - circuit 6.	NO. 205 JAN 20 SUN 06:30
2.	*** # * # 1 * 2 * 3** Enter programming mode. (Do not press **Intercom** or **[DN]** button.)	PROGRAM MODE
3.	**Spkr (Speaker) 9 1 Hold** Access Program 91. System beeps after **Spkr (Speaker)** is pressed indicating the program number can be entered.	PROGRAM = 91 DATA STORE
4.	**Spkr (Speaker)** Prepare system for the programs to be initialized.	91 SELECT =
5.	Press **9**.	SYSTEM INITIALIZATION
6.	**Press LED buttons 01, 03, 05, 07, and 09** (LEDs turn ON)	SYSTEM INITIALIZATION
7.	**Press Hold** The telephone will exit the programming mode and button LEDs 01, 03, 05, 07, and 09 will go out after a short delay.	NO. 205 (MONTH DAY TIME)
8.	Repeat Steps 1 ~ 7 a second time.	NO. 205 (MONTH DAY TIME)

DK0049

Table 8-4
Program 91-1 — Automatic PCB Recognition and Logical/Physical Port Initialization

Step No.	Press... **Buttons** + LED buttons Action description	LCD RESPONSE ...
1.	Use the programming LCD electronic or digital telephone with programming template connected to physical port 005 (station 205) - circuit 6.	NO. 205 JAN 20 SUN 06:30
2.	*** # * # 1 * 2 * 3** Enter programming mode. (Do not press **Intercom** or **[DN]** button.)	PROGRAM MODE
3.	**Spkr (Speaker) 9 1 Hold** Access Program 91. System beeps after **Spkr (Speaker)** is pressed to indicate the program number can be entered.	PROGRAM = 91 DATA STORE
4.	**Spkr (Speaker)** Prepare system for the programs to be initialized.	91 SELECT =
5.	Press **1**.	91 SELECT = 1 RENUMBER AND RESET
6.	Press **LED** buttons 01 & 02 (LEDs turn ON)	91 SELECT = 1 RENUMBER AND RESET
7.	**Hold** The telephone will exit the programming mode and button LEDs 01 and 02 go out after a short delay.	NO. XXX MONTH DAY TIME

DK0050

Table 8-5
Program 90 — Initializing Programs 00 ~ *99 (See Program 90 System Record Sheets)

Step No.	Press... **Buttons** + LED buttons Action description	LCD RESPONSE ...
1.	Use the programming LCD electronic or digital telephone with programming template connected to physical port 005 (station 205) - circuit 6.	JAN 20 SUN NO. 205 06:30
2.	*** # * # 1 * 2 * 3** Enter programming mode. (Do not press **Intercom** or **[DN]** button.)	PROGRAM MODE
3.	**Spkr (Speaker) 9 0 Hold** Access Program 90. System beeps after **Spkr (Speaker)** is pressed indicating the program number can be entered.	PROGRAM = 90 DATA STORE
4.	**Spkr (Speaker)** Prepare system for the programs to be initialized.	90 SELECT =
5.	**0 0 * * 9 9** + LED keys 01 & 02 Enter program numbers individually, followed by #, or in a range. For a range, separate the low program number and the high program number with an asterisk. *Note:* **0 0 * * 9 9** *will initialize all Programs 00 ~ *99.* *Star "*" Program memory follows Program 97.*	90 SELECT = 00**99 DATA CLR
6.	**Hold** Secure data in system programming. LEDs 01 and 02 flash.	90 SELECT = 00**99 DATA PROGRAMMED
7.	**Spkr (Speaker)** Prepare system for another selection (go back to step 5), or exit Program 90 (continue with step 8).	90 SELECT =
8.	**# # Hold** Secure Program 90 data in system memory.	90 SELECT = ## DATA PROGRAMMED
9.	**Spkr (Speaker)** Exit Program 90. Enter another program number (see Table 8-6), or exit programming mode (go to step 10). System beeps to indicate it's exiting Program 90.	PROGRAM =
10.	**# # Hold** Exit programming mode. *Note:* *The system will not allow the* **Spkr (Speaker)** *LED to light to re-enter the programming mode.*	JAN 20 SUN NO. 205 06:42

DK0051

IMPORTANT !

*Always initialize Programs 00 ~ *99 when installing a Common Control Unit (RCTUA, RCTUB, RCTUC/D) for the first time for a particular configuration. This can also be done by running Program 91-9.*

Table 8-6
Initialization Program 92 — Initializing Speed Dial Numbers, VM ID Codes, Character Message Memory, Timed Reminders, Digital Telephone Volume, and Call Forward Backup Memory

Step No.	Press... **Buttons** + LED buttons Action description	LCD RESPONSE ...
1.	Use the programming LCD electronic or digital telephone with programming template connected to physical port 005 (station 205) - circuit 6.	JAN 20 SUN NO. 205 06:43
2.	*** # * # 1 * 2 * 3** Enter programming mode. (Do not press **Intercom** or **[DN]** button.) System beeps after **Spkr** (**Speaker**) is pressed to indicate when to enter program number.	PROGRAM MODE
3.	**Spkr** (**Speaker**) **9 2 Hold** Access Program 92.	PROGRAM = 92 DATA STORE
4.	**Spkr** (**Speaker**) Prepare system for selection of programs to initialize. For new system installation perform all 1 ~ 4.	92 SELECT =
	Select one of the following.	
5.	**1** + LED buttons 01 & 03 Clears Station Speed Dial, Voice Mail ID codes, and LCD memos assigned to station speed dial numbers.	92 SELECT = 1 EACH DIAL CLR
	- or -	
	2 + LED buttons 01 & 04 Clears System Speed Dial and LCD memos assigned to system speed dial numbers.	92 SELECT = 2 COMMON DIAL CLR
	- or -	
	3 + LED buttons 02 & 03 Clears Character Message Memory (station and system) and user name display.	92 SELECT = 3 MSG CLR
	- or -	
	4 + LED buttons 02 & 04 Clears timed reminders.	92 SELECT = 4 TMR REMINDER CLR
	- or -	
	5 + LED buttons 01 & 05 Presets the Ring, Speaker, Mute Ring, and Intercom Tone, BGM, volume levels of all digital telephones to approximately midrange.	92 SELECT = 5 DKT VR INITIAL
	- or -	
	9 + LED buttons 03 & 04 Clears Call Forward and Message Waiting (R3) Memory except Fixed Call Forward Memory.	92 SELECT = 9 BACK UP RAM CLR
6.	**Hold** Secure data in system programming. **Repeat** steps 4 ~ 6 until Step is completed (see Note 1).	92 SELECT = (1~0) DATA PROGRAMMED
7.	**Spkr** (**Speaker**) Prepare system for another selection (go back to Step 5), or exit Program 92 (continue with Step 8).	92 SELECT =
8.	**# # Hold** Secure Program 92 data in system memory.	92 SELECT = ## DATA PROGRAMMED
9.	**Spkr (Speaker)** Exit Program 92. Enter another program number (see Table 8-3), or exit programming mode (go to step 10). System beeps to indicate it is exiting Program 92.	PROGRAM =
10.	**# # Hold** Exit programming mode.	JAN 20 SUN NO. 205 06:58

DK0052

Note:

1. *If the call forward memory was cleared, cycle system power after Step 6, if it is required to reset LCD Telephone Call Forward displays or Call Forward button LED indications.*

Table 8-7
Program 03- Flexible PCB Slot Assignments

Step No.	Press... **Buttons** + LED buttons Action description	LCD RESPONSE ...
1.	Use the programming LCD electronic or digital telephone with programming template connected to physical port 005 (station 205) - circuit 6.	JAN 20 SUN NO. 205 06:43
2.	*** # * # 1 * 2 * 3** Enter programming mode. (Do not press **Intercom** or **[DN]** button.)	PROGRAM MODE
3.	**Spkr (Speaker) 0 3 Hold** Access Program 03. After pressing **Spkr (Speaker)** button the system beeps to indicate program number may be entered.	PROGRAM = 03 DATA STORE
4.	**Spkr (Speaker)** Prepare system for a selection.	03 SELECT =
5.	Dial a PCB slot number (00~66) using the dial. The system defaults as follows: **0 0** Initialized data assigns slot 00 and 01 to be a non-optioned RCTU without RRCS DTMF receivers. **1 1** Initialized data assigns slot 11 to be a non-optioned PDKU without DSS console or OCA. **1 2 ~ 6 6** Initialized data assigns slots 12 ~ 66 to be empty.	03 SELECT = (00 ~ 66) CARD = (91, 62 or 00) 03 SELECT = 00 CARD = 91 └SLOT NUMBER 03 SELECT = 11 CARD = 62 └SLOT NUMBER 03 SELECT = (12 ~ 66) CARD = 00 └SLOT NUMBER
6.	**0 0 ~ 9 9** Dial the PCB code recorded on the record sheet. Refer to the PCB code reference table on Program 03 System Record Sheet for a definition of the codes.	03 SELECT = (00 ~ 66) CARD = (00 ~ 97)
7.	**Hold** Secure data in system programming.	03 SELECT = (00 ~ 66) DATA PROGRAMMED
8.	**Spkr (Speaker)** Prepare system for another selection (go back to Step 5), or exit Program 03 (continue with Step 9).	03 SELECT =
9.	**# # Hold** Secure Program 03 data in system memory.	03 SELECT = ## DATA PROGRAMMED
10.	**Spkr (Speaker)** Exit Program 03. Enter another program number (see Table 8-5), or exit programming mode (go to Step 11). System beeps to indicate it is exiting Program 03.	PROGRAM =
11.	**# # Hold** Exit programming mode.	NO. 205 JAN 20 SUN 06:58
12.	To secure Program 03 entries, Power OFF for five seconds, then Power ON.	

DK0053

Table 8-8
Program 00 Part 1— Software Check/Remote Maintenance Security Code Assignments

Step No.	Press... **Buttons** + LED buttons Action description	LCD RESPONSE ...
1.	Use the programming LCD electronic or digital telephone with programming template connected to physical port 005 (station 205) - circuit 6.	JAN 20 SUN NO. 205 06:43
2.	*** # * # 1 * 2 * 3** Enter programming mode. (Do not press **Intercom** or **[DN]** button.)	PROGRAM MODE
3.	**Spkr (Speaker) 0 0 Hold** Speaker beeps to indicate when to enter program number. Access Program 00.	PROGRAM = 00 DATA STORE
4.	**Spkr (Speaker)** Prepare system for a selection.	00 SELECT =
5.	Select one of the following attributes:	
	0 View the software version. This attribute is not editable. - or -	00 SELECT = 0 R□AX□□-KEY X (X = 1,2, or 3) NOTE: □□= THE ACTUAL VERSION NUMBER AND LETTER (SEE PROGRAM 00 RECORD SHEET FOR DETAILS)
	1 □□□□ Define the Level 1 remote maintenance security code from the System Record Sheet (four digit max.). Level 1 allows remote access to all programs and data. Default Level 1 security code is "0000." - or -	00 SELECT = 1 PASSWORD = 0000
	2 □□□□ Define the Level 2 remote maintenance security code from the System Record Sheet (four digit max.). Level 2 allows remote entry to Programs 30 ~ 39 and 77 ~ 89 only. Default Level 2 security is "0000." - or -	00 SELECT = 2 PASSWORD = 0000
	8 View the software RAM Checksum. This attribute is not editable. The default checksum may change. - or -	00 SELECT = 8 SUM = XXXXXXXXX
	9 View the RPSU Power Cycle Counter. This attribute is not editable. The counter indicates the number of times power is removed from the system after Program 00 was initialized via Program 90 or 91-9.	00 SELECT = 9 COUNTER = XXXX
6.	**Hold** Secure data in system programming. (Only works for "1" and "2")	00 SELECT = (0,1,2,8 or 9) DATA PROGRAMMED
7.	**Spkr (Speaker)** Prepare system for another selection (go back to Step 5), or exit Program 00 (continue with Step 8).	00 SELECT =

DK0054

Table 8-8 (continued)
Program 00 Part 1 — Software Check/Remote Maintenance Security Code Assignments

Step #	Press... **Buttons** + LED buttons Action description	LCD RESPONSE ...
8.	**# # HOLD** Secure Program 00 data in system memory.	00 SELECT = ## DATA PROGRAMMED
9.	**Spkr** (**Speaker**) Exit Program 00. Enter another program number (see Table 8-4), or exit programming mode (go to Step 10). System beeps to indicate it is exiting Program 00.	PROGRAM =
10.	**# # Hold** Exit programming mode.	NO. 205 JAN 20 SUN 06:58

DK0055

Table 8-9
Program 04 — Station Logical Port Primary Directory Intercom or Number Assignment

Step No.	Press... **Buttons** + LED buttons Action description	LCD RESPONSE ...
1.	Use the programming LCD electronic or digital telephone with programming template connected to physcial port 005 (station 205) - circuit 6.	NO. 205 JAN 20 SUN 06:43
2.	*** # * # 1 * 2 * 3** Enter programming mode. (Do not press **Intercom** or **[DN]** button.)	PROGRAM MODE
3.	**Spkr 0 4 Hold** Access Program 04. System beeps after **Spkr** (**Speaker**) is pressed to indicate a program number may be entered.	PROGRAM = 04 DATA STORE
4.	**Spkr** (**Speaker**) Prepare system for a selection.	04 SELECT =
5.	**0 0 0 # ~ 2 3 9 #** Select the number of the port (use three digits plus #). Initialized data assigns station numbers 200 ~ 439.	04 SELECT = 000 INT = 200
6.	□□□□ Enter the port's station number from the record sheet (four digits max.). *Note:* *Station numbers must not exceed four digits, or conflict with feature access codes listed in Program 05 System Record Sheet.*	04 SELECT = 000 ~ 239 INT = XXXX
7.	**Hold** Secure data in system programming.	04 SELECT = (000 ~ 239) DATA PROGRAMMED
8.	**Spkr** (**Speaker**) Prepare system for another port selection (go back to Step 5), or exit Program 04 (continue with Step 8).	04 SELECT =
9.	**# # Hold** Secure Program 04 data in system memory.	04 SELECT = ## DATA PROGRAMMED
10.	**Spkr** (**Speaker**) Exit Program 04. Enter another program number, or exit programming mode (go to Step 10). System beeps to indicate it is exiting Program 04.	PROGRAM =
11.	**# # Hold** Exit programming mode.	NO. 205 JAN 20 SUN 06:58

DK0056

IMPORTANT!

System Configuration can be complex and time consuming. For best results:

- *Use the software program 280Quote to provide easy, fast, automated configuration. This runs on an IBM compatible 486 PC, or higher, with a hard drive.*
- *If the above software is not available, use all the Worksheets in Chapter 1—Configuration.*

Important Installation Notes:

1. Place the RCTU jumper plug(s) into battery position; otherwise, all programmed data will be lost upon power down. Battery jumper plugs are on: RCTUA, RCTUB, RCTUBA3, RCTUC, and RCTUD3 PCBs.
2. Install RCCS PCBs on RCTU PCBs as required.
3. Install PDKU, PEKU, or RSIU in slot 11.

   - and/or -

   If an RSIU is installed in slot 11, install a PDKU or PEKU in slot 12.
4. Starting with the lowest empty slot (S12 or S13), install all station, attendant console, loop start, ground start, and RCIU/RCIS PCBs from lower to higher numbered slots (left to right). Do not leave empty slots except when installing RDTU PCBs when required per Tables 1-9 and 1-10 of Chapter 1—Configuration.
5. After all station, attendant console, and ground/loop start line, and RCIU/RCIS PCBs are installed, install all DID and tie line PCBs starting from the first numbered empty slot to the highest needed (in left to right order). Do not leave empty slots except when installing RDTU PCBs per Tables 11-1, 11-2, and 11-3 of Chapter 11—T1.
6. Install PIOU, PIOUS, PEPU, or RSSU in any convenient vacant slot.
7. Check power factors for each cabinet and for the entire system as explained in Chapter 1—Configuration.
8. If needed, run Program 91-9 **twice** to initialize program data. Do this if you have just completed Step 1 above. Run Program 03 and turn system power OFF (five seconds) and then ON to activate and identify to Program 03 any subassembly PCBs installed.
9. Perform memory test as in Program 00, Part 2.
10. Program customer database manually or upload customer database using a 280Admin or 280Backup personal computer.
11. Backup the customer database using a 280Admin or 280Backup personal computer.

Record Sheet Instructions 9

This chapter contains instructions on how fill out the System Record Sheets in Chapter 10—Record Sheets. Instructions appear in the same order for both chapters:

- Initialization and Test Programs
- Basic System Records
- Toll Restriction
- Least Cost Routing

The System Record Sheets are used to record the assignment of features or the operation of each program. Each sheet provides space to record data. This data will be referred to when programming the system. The following consists of descriptions of each of the programs available with the Strata DK280.

Initialized data information can be found in the Notes at the bottom of each System Record Sheet.

9.1 Initialization and Test Programs

Use the programs in this section first before using the other programs in this chapter.

Program 91-9 System Initialization

Always initialize a system with Program 91-9 when it is first installed or when its software must be set to the default configuration. Program 91-9 erases all random or programmed data in all Strata DK280 software programs and sets all program data to the default value. Program 91-9 also automatically runs all other initialization programs: 91-1, 90-00 ~ *99, 92-1 ~ 9.

CAUTION !

Program 91-9 will erase all program data and it will drop all calls if it is run while the system is in service.

If only minor programming changes are being added to a system in which the programming is basically correct, skip this section.

To run Program 91-9:

1. Ensure that the system meets minimum hardware requirements specified in Chapter 8—Section 8.2.3 Preparing the System for Programming.
2. Place the system power switch ON.
3. Follow the steps in Table 8-3 and in the Program 91-9 record sheet.

IMPORTANT !

Release 3 and above: when installing RCTU(s) for the first time, after initializing the system, test the RAM: run Program 00—Part 2 (see 9.2—Basic System Records section of this chapter). This test will drop all calls in progress and will interrupt telephone service for approximately 15 seconds. This test will not erase programmed customer data.

Program 90—Initializing Programs

All customer data can be cleared and set to the initialized state for any program or range of programs. This program is normally used to initialize individual programs. If the system is being installed for the first time, you must run Program 91-9 to cause this program to erase random data from RAM which may

have been caused by the common control unit (RCTU: A, B, BA/BB, and C/D) jumper movement to the internal battery.

Initialized data information is at the bottom of each System Record Sheet. If the system is being installed in a new location, all programs should be initialized. Since running Program 91-9 automatically runs Program 90, this program can be skipped if Program 91-9 is run.

Program 91-1—Automatic PCB Recognition and Port Renumber

Automatically makes PCB slot code assignments during an initial installation - after all of the PCBs have been installed . This program only applies to slots in which non-optioned PCBs are installed—such as the PDKU without a Data Interface Unit or Off-hook Call Announce (OCA), the common control unit (RCTU: A, B, BA/BB and C/D) without a Dual-tone Multi-frequency Receiver (RRCS), etc. For slots that have PCBs equipped with options, Program 03 must be run after Program 91-1.

Program 91-1 can be run after PCB option codes have been set with Program 03; it will not erase option codes. Program 91-1 will also set physical port and logical ports to the initialized settings. (See Program 01 and 02 for initialized settings.) If station ports have been relocated, they will be located back to the system default logical to physical assignments after running Program 91-1. Since running Program 91-9 automatically runs Program 91-1, this program can be skipped if Program 91-9 is run.

Program 91-2—Data Transfer from Temporary Memory to Working Memory

Provided with DK280 R3 and above. Data on a few selected DK280 Programs is placed in Temporary Memory when a Data change is made. To transfer the data change information to Working Memory, it is necessary to run Program 91-2 (locally or remotely); or, turn the DK280 power off for 5 sec. and then back on. The Programs that require this data memory transfer process are listed on the Program 91-2 record sheet.

CAUTION !

Running Program 91-2 will drop all calls and interrupt telephone service for about 10 seconds.

Note:

Running Program 91-2 will not change or erase any customer data.

Program 92—Initializing Speed Dial Numbers, VM ID Codes, Character Message Memory, Timed Reminders, Digital Telephone Volume, Called ID, ANI, and Call Forward Backup RAM

All previously entered or random data (of the type listed) is cleared by this program. This program must be run when first installing a system or a common control unit (RCTU: A, B, BA/BB, and C/D). Since running Program 91-9 automatically runs Program 92 (1 ~ 9), this program can be skipped if Program 91-9 is run.

9.2 Basic System Records

Program 00, Part 1—Software Check/Remote Maintenance Security Code Assignments

- **Code 0, ROM Version**—Code 0 displays the software version of the system common control unit (RCTUA, RCUTB, RCTUBA/RCTUBB and RCTUC/RCTUD) and if installed on the RCTU, the RKYS key type. See the Program 00 Record Sheet for an illustration of software displays. This information cannot be altered with this program.
- **Code 1, Level 1 Security Code**—Use this program to assign a Remote Maintenance security code that allows entry to all programs and data.
- **Code 2, Level 2 Security Code**—Use this program to assign a Remote Maintenance security code that allows entry to Programs 30 ~ 39, 77 ~ 89, and *30 ~ *31.

IMPORTANT !

When using a 280Admin PC, either Security Code (1 or 2) enables the 280Admin user full access to all Strata DK280 programs. Always change Security Code 1 and Code 2 to prevent unauthorized programming changes by 280Admin users that may try to log-in remotely with the default security code: 0000.

- **Code 8, Software RAM Checksum**—For factory purposes only.
- **Code 9, Power OFF Counter**—For factory purposes only.

Program 00, Part 2—RCTU RAM Test

Provided with DK280 R3 and above. This Program can be used to test the RAM on the DK280 RCTU processor PCBs. If a RAM test error occurs during this test, the RCTU causing the error should be replaced. In the case of two-PCB processors, isolation of a RAM failure will be indicated on the programming telephone LCD RCTU "C" or RCTU "D". The RAM test procedure "RCTU RAM TEST GUIDELINES" is provided on the Program 00—Part 2 Record Sheet.

CAUTION !

Running each RAM Test will drop all calls and interrupt telephone service for 15 seconds.

Note:

Running Program 00, Part 2 will not change or erase any customer data.

Program 01—Station Logical Port Display and/or Change

Enables you to enter a physical port to display the associated logical port. You then have the option to assign a new logical port to the physical port. (To return ports to their initialized settings, see Programs 90 and 91.)

Program 02—Station Physical Port Display and/or Change

Enables you to enter a logical port to display the associated physical port. You then have the option to assign a new physical port to the logical port. (To return ports to their initialized settings, see Programs 90 and 91.)

Program 03—Flexible PCB Cabinet and Slot Assignments

After installing all PCBs and running Program 91-1 or 91-9, the software must be informed with Program 03 as to what type of optioned PCBs are installed. Use the PCB Code Reference Table on the Program 03 record sheet to determine the proper option code for each PCB with an option.

When entering an option code for the RCTUA, RCTUB, RCTUBA, or RCTUC common control unit, always enter the code representing the number of DTMF receivers for Slot 00. When entering an option code for the RCTUD unit, always enter the code representing the number of DTMF receivers installed for Slot 01.

The Program 03 System Record Sheet provides space to record station ports assigned to the station, tie, and DID line PCBs and line numbers assigned to the ground loop start, CO, tie, and DID line PCBs. When installing RCIU/RCIS, enter the Caller ID circuit numbers (starting with 1 ~ 8) in place of the CO line number. Each RCIU/RCIS slot uses eight Caller ID circuits. Program 03 should be run for the slot of each new PCB when installing a new PCB in an existing installation. This record sheet is the main record for the hardware configuration of the entire system.

CAUTION !

Running Program 91-9 will erase Program 03 option codes. Running Program 91-1 will not.

IMPORTANT !

After the complete entry of Program 03, run Program 91-2 (R3 and above) or turn the KSU power supply switch off and wait five seconds before turning it back on. This will set in memory all of the configuration data entered in Program 03.

Program 04—Station Logical Port Intercom or Primary Directory Number [PDN] Assignment

Initialized station numbers are 200 ~ 439. With Release 3 and above, Intercom numbers are replaced with Primary Directory Numbers **[PDNs]**. Door phone standard numbering is #151 ~ #159 and #161 ~ #163; the internal modem (IMDU or RMDS) is #19. Port 039 (RCTUA), 089 (RCTUB and RCTUBA/BB) or 249 (RCTUC/D) is the DISA class of service port.

Station intercom or **[PDNs]** can be changed using Program 04, but door phone and modem numbering cannot be changed with Program 04. Only the first digit of a feature code can be changed by using Program 05. The system automatically assigns door phone station numbers if a door phone is specified in Program 77-1. Station Intercom number or **[PDN]** assignment is flexible so that each station can have up to four assigned digits.

All Strata DK280 telephone and data interface unit User Guides are written using the standard default access codes and intercom or **[PDNs]**. If desired, a telephone accompanying a DSS console can have an intercom or **[PDN]** of 0 or 01, etc., without conflict.

If no assignment is made in Program 04, the system, upon powering up will automatically assign eight

intercom or **[PDNs]** for each station PCB installed and four for each PEMU, REMU, RDDU, and RATU PCB.

Each RDTU, tie, and DID channel is also assigned a station port. This is done in sequence of ascending slot numbers for station numbers 200 and up. Attendant consoles will ring on the ICI "**0**" button for Dial "0" calls, and on the **Intercom** or **PDN** button when the Intercom number or **[PDN]** assigned to the console (station) port in this program is dialed.

Program *04 - Phantom Directory Number and Distributed Hunt Directory Number Assignments for Internal and Tie Line Calls

Note:
Distributed Hunt is available with DK280 Release 3.1 and above.

This program assigns the system Phantom Directory Numbers **[PhDNs]** and Distributed Hunt (DH) Group Directory Numbers. The DK280 provides:

- 240 **[PhDNs]** with RCTUC3/RCTUD3
- 80 **[PhDNs]** with RCTUBA3/RCTUBB3; and
- 32 **[PhDNs]** with RCTUA3.

All DK280, Release 3, RCTU processors provide 16 DH groups. **[PhDNs]** and DH Group Directory numbers can be from one to four digits in length.

[PhDNs] and DH Group Directory numbers cannot conflict with each other, or be the same as Primary Directory Numbers assigned in Program 04. **[PhDNs]** can not conflict with, or be the same as Distributed Hunt Directory Numbers assigned in this program. Default **[PhDNs]** are:

- RCTUC3/D3, 500-739,
- RCTUBA3/BB3, 500-579, and
- RCTUA3, 500-531.

Default DH Group Directory Numbers are: 850-865 for all Release 3.1, RCTU processors.

Program 05—Flexible Access Code Numbering

The first digit of a feature access code can be changed to a different digit or to two digits. Digits after this prefix cannot be changed. Standard access codes are provided with the Program 05 System Record Sheet. Some access codes cannot be changed (such as the code for Automatic Callback) and are shown with N/A on the record sheet.

Note:
Access code conflicts may exist if new access codes are assigned, and a new system numbering plan will have to be implemented.

Pay particular attention to the internal modem (station number #19) and door phones (#151 ~ #159, #161 ~ #163). Station number assignments may have to be changed using Program 04.

Program *05—Call Park Pickup Abbreviated Dialing

Two Call Park Pickup abbreviated dialing codes can be assigned to pick up parked calls. These codes will replace the lengthy Call Park access codes #331 and #332. These abbreviated codes (one or two digits) are particularly convenient for those digital and electronic phones without the assigned **Park in Orbit** button that must dial the Call Park access codes when picking up a parked call. When parking calls, you must still enter **#331** and **#332** even though pick up codes are changed with Program *05

Program 09—Built-in Auto Attendant Prompt/ Station Assignments

This program tells the system where to direct calls after incoming Auto Attendant Callers dial a digit(s) in response to the menu of dialing prompts offered by one of the Auto Attendant's digital announcers. The exact dialing prompts along with their associated station Intercom numbers, **[PDNs]**, **[PhDNs]**, Distributed Hunt **[DN]** and ACD group numbers are assigned with this program. The actual announcements that are delivered to callers are recorded on customer-supplied digital announcers. The dialing prompts can either be all one-digit or all two-digits (or intercom numbers of 1 ~ 4 digits).

Up to seven one-digit dialing prompts (0 or 1) can be assigned. Digits 2~9 are not used, because they conflict with the system's default intercom and **[DNs]**. To program one-digit dialing prompts, enter the prompt and then its associated intercom number **[PDN]**, **[PhDN]**, Distributed Hunt **[DN]** or #4 plus an ACD group number.

Two-digit dialing prompts are only used when it is necessary to stop the announcement to prevent errors in digit translation or when single digit prompts conflict with Intercom, **[PDN]**, **[PhDN]**, and DH **[DN]** numbering plans. Digit Translation errors occur sometimes when line transmission is low or the

announcement voice frequencies are the same as a DTMF digit and the system RRCS circuit will not dial or misdials.

The first of the two digits can be either digit 0 or 1 and must always be the same number for each of the prompts. Therefore, if the leading digit is assigned as 1, callers could be offered all of the following two-digit dialing prompts: 10, 11, 12, 13, 14, 15, 16, 17, 18, and 19. See the Record Sheet for Program 09 for detailed one-digit and two-digit prompt assignment instructions.

Program *09—DID Digit Translation Assignments

This program assigns the routing destinations for incoming DID line calls. With DK280 Release 1 and 2 RCTU processors, Program *09 DID extension numbers (the digits the DK280 receives on DID lines from the local CO or long distance carrier) can be routed to one telephone only or to an ACD group with Release 2.

With DK280 Release 3, Program *09 DID extension numbers can be routed to Primary/Secondary, or **[PhDN]**, ACD Groups, or Distributed Hunt groups. Each Primary/Secondary **[DN]** and/or **[PhDN]** can appear and ring (immediate, 12 sec. delay or 24 sec. delay with Program *71, *72 and *73) on up to 120 telephones. A DID extension number can ring up to 120 telephones maximum with DK280 Release 3 software.

Also, with DK280 Release 3 software, any DID line can be assigned to route with Program 71 and 72 DNIS routing assignments, instead of Program *09 assignments, to provide all the DNIS call routing features to normal DID lines.

Which program options (Program *09 or Program 71 and 72) DID line call routing will follow is determined for each DID line in Program 17, LED 05 (See Program 17 in the Record Sheet section for more details).

DID calls will alternately ring all or selected Attendant Consoles (in the load share group, assigned in Program 81-89) when a DID Attendant Console extension number is assigned to ring any one of the Attendant Console ports in the load share group (see Chapter 5—Section 5.7.2 for information on Attendant Console Load Share Programming; see the DK280 ACD I&M manual for ACD DID extension assignments).

Program 10-1—System Assignments 1

The following options are available on a system-wide basis: (LEDs 07, 08, 09, 18, 19, and 20 are initialized as ON.)

- **Two-CO Line Conference, LED 20**—Two lines can be conferenced with one or two telephones (digital, electronic, or standard). Conference (see LED 19) in this program must be enabled for this feature to work. Also, Two-line Conference must be allowed for Direct Inward System Access (DISA) use of outgoing lines.
- **Conference, LED 19**—The ability of stations to perform any Conference can be allowed or disallowed system-wide with LED 19.
- **Ring Detect Time, LED 18**—This should be set to "normal" unless connected to Central Office/ Centrex lines that send ring signals less than 120 milliseconds.
- **Station-to-Station Call Volume PAD, LED 17**—ON reduces station-to-station talk path volume (-8 dB). LED 17 should be OFF in all cases except where extreme quiet room noise is expected.
- **Automatic Busy Redial ABR Cycles, LED 12**—If activated from an electronic or digital telephone, Automatic Busy Redial will retry dialing a telephone number on a line if a far end busy signal is detected. Turn LED 12 ON to have the system try up to 10 times; turn OFF for up to 15 attempts. This feature is not available with standard telephones.
- **ABR Redial Time, LED 11**—Upon detection of a far end busy signal on a line, Automatic Busy Redial will retry either once every 30 seconds or once every minute. Turn LED 11 ON for 30 seconds; turn OFF for one minute.
- **System Speed Dial Override, Toll Restriction, LED 10**—System Speed Dial can be chosen to override Toll Restriction if LED 10 is turned ON.
- **Exclusive Hold, LED 09**—Exclusive Hold allows electronic and digital telephones to place calls on hold (by pressing the **Hold** button twice) so that other stations cannot pick up the held call with a CO line button. This feature can be disabled on a system-wide basis. Any station can pick up an Exclusive Hold call by using the call pickup code.

- **Alternate Point Answer/Transfer Privacy, LED 08**—If Transfer Privacy is selected, a ring/blind transferred call can only be answered at the called station upon transfer of that call (after the transferring party releases the call). With Alternate Point Answer, any electronic or digital telephone with the appropriate CO line or **[DN]** button can pick up a call transferred to another telephone. In either case, Call Pickup will function from any station. Station **[DN]** and CO line transferred calls that occur on **[DN]** buttons are always Private (R3).

- **Ring Transfer of CO Line Allowed, LED 07**—This option defines station operation for transferring **[DN]** and CO line calls. If Ring Transfer is allowed, the system will allow "blind" transfers to busy or idle stations. The transferring station may release a transferred call before the called party answers. If not allowed, the system will allow supervised transfers only—the called station must answer before the transferring station releases. If Ring Transfer is not allowed, immediate recall occurs if "blind" transfer is attempted. The system denies Ring Transfer to stations in the Do Not Disturb (DND) mode, and immediate recall will occur if attempted.

- **CO Line Repeat Ringing, LED 06**—If selected, the incoming ringing timing pattern at a station will be the same as the CO line ringing pattern. This is used mainly with Centrex or PBX systems which may vary the ring pattern to distinguish between internal and external incoming calls, etc. If Standard Ringing is chosen, CO line station ringing will be a one second on, three seconds off cycle regardless of the incoming ring pattern. Some Central Offices have ringing characteristics such that this option would not be desirable.

- **Incoming Call Abandon Timing, LED 05**—The amount of time between incoming CO line ring signals determines when the system will discontinue (abandon) sending ringing tones to stations. The choice of six or eight seconds is dependent on the line ring pattern. This assignment has no affect if the Line Repeat Ringing (LED 06) option is used.

- **Dual-tone Multi-frequency (DTMF) Signal Time, LED 04**—DTMF signals sent out to CO lines can be either 80 or 160 milliseconds in length. DTMF to RSTU/RSTU2/RDSU/RSTS/PSTU/PESU ports (including voice mail ports) are not affected by this assignment. See Program 10-2 for standard telephone port DTMF timing. This program pertains to manual dialing or speed dialing from all Toshiba telephones, except when manually dialing from 2000-series digital telephones. When manually dialing from 2000-series telephones, the signals last as long as the buttons are pressed (minimum 80 msec.).

- **Dial Pulse (DP) Make Ratio, LED 03**—Dial Pulse timing sent out to CO lines can be changed from the normal 40% make ratio to 33%. This selection only applies to those CO lines assigned in Program 15 to signal dialing with dial pulse instead of Dual-tone Multi-frequency (DTMF).

- **Line Reseize Guard Time, LED 02**—Should be set for 0.45 seconds for most installations. Set guard time for 1.5 seconds (using Program 10-1, LED 02 ON, and Program 42-0), if CO lines experience the following situations: no dial tone when a line is released and reseized immediately; or, when operating behind Centrex or PBX, false hookflash signals are sent to the Central Office when stations release and reseize the same line immediately.

- **Tone First/Voice First Signaling-Electronic and Digital Telephone, LED 01**—With Voice First, an Intercom or Directory Number call to an electronic or digital telephone will be preceded by a one-second burst of tone, followed by voice communication via the Handsfree Answerback function. For Tone First, repetitive Intercom or Directory Number ring tone is sent in a one-second on, three-seconds off pattern. Conversion from one signaling mode to the other can be made by dialing an additional digit of 1 from the calling station.

Program 10-2—System Assignments 2

The following options are available on a system-wide basis: (LEDs 02, 14, 15, and 16 are initialized as ON.)

- **Padded Tone Return, LED 20**—With some Central Offices, callers may experience clicking or squealing sounds or a loud DTMF tone return during or after dialing. To counteract this, it is recommended that padded tone return or no tone return be enabled: (LED 20 ON; or No DTMF tone return; LED 20 OFF and LED 11 ON). The optional padded DTMF frequency system tone will be returned to callers at a lower-than-normal volume level with each digit dialed from the telephone dial pad or when speed dialing is used. The tones will also be heard by callers routed to

voice mail when DK280 sends VM ID codes. If this option is not selected (LED 20 OFF), Program 10-2, LED 11 will select normal level DTMF Return or No DTMF Return.

- **Stations Use External Amplified Conference, LED 19**—Use this feature only (LED 19 ON) if an external amplifier (Program 10-3) is used for Two-line Conference calls. This will provide additional amplification to the station during a Two-line Conference call. If an external amplifier is not switched into Two-line Conference calls in all cases, LED 19 must be OFF because line unbalance may cause HUM noise on the station talk path during Two-line Conference calls. If two-CO line conference/tandem call volume is low due to CO line loss, it is recommended to test Two-line Conference with LED 19 ON; if it improves the volume level and there is no HUM noise, keep LED 19 ON.

- **Two-CO Line Conference, LED 18**—LED 18 should be OFF whenever Two-line (Tandem, External Call Forward, DISA, tie) connection is allowed (in Program 15-5 and Program 10-1, LEDs 19 and 20) unless Two-CO-line conference amplifiers are connected (Program 10-3, LED 01 ~ 04). This will increase the volume level between the two outside parties on a Tandem (two-line) connection, but it will not affect station volume if conferenced into the tandem connection. If Two-CO line volume is low due to CO line loss, test the volume level with LED18 ON. If it improves without adding HUM noise, keep LED 18 ON.

- **"TRNS" Soft Key Immediate Transfer, LED 17**—If this feature is activated and a transfer is initiated with the "TRNS" Soft Key, the call will ring transfer (Camp-on Busy) immediately after the last digit of the called station (busy or idle) number is dialed. This feature does not apply to transfers initiated with the fixed **Cnf/Trn (CONF/TRNS)** button or "CONF" Soft Key.

- **Executive Override Warning Tone, LED 16**—Executive Override allows a station user (if assigned in Program 30) to break into and listen to an existing station conversation. A warning tone can be set optionally to be heard by the conversing parties.

- **External Page Included with All Call Page, LED 15**—If the All Call voice page access code (#39) is dialed, or if the paging number is dialed on incoming tie, DID or DNIS lines, external page (all zones) may be included with All Call telephone speaker paging. This option does not affect the All Call Page button function, which activates electronic and digital telephone speakers only, never external page (See Program 17, LED 01 and Program 71).

- **Privacy Override Warning Tone, LED 14**—Privacy Override allows a station user to enter an existing CO line conversation by pressing a CO line button (if the called station is assigned in Program 30). A warning tone can be set optionally to be heard by the conversing parties.

- **Auto Callback Camp-on Tone, LED 13**—A busy called digital or electronic telephone user may optionally hear a one-time beep tone (from the speaker) signifying that another station has tried to call and has activated the Automatic Callback feature.

- **CO Line Beep Tone, LED 12**—If this LED is lit, a beep tone will be sent every three minutes to stations on outgoing line calls.

- **Dual-tone Multi-frequency (DTMF) Tone Return, LED 11**—This option deletes DTMF tones that are returned to digital or electronic telephones when manually dialing or speed dialing. It also eliminates auto dial digits returned to callers when digits are automatically sent to voice mail ports on forwarded calls.

- **Background Music/Music-on-Hold Separation, LEDs 10 and 9**—An alternate Background Music (BGM) source can be sent to digital telephone speakers, electronic telephone speakers, and external page speakers, while another Music-on-hold (MOH) source can be sent to lines or internal stations on hold. The alternate BGM source can be connected to either Circuit 3 on a PEKU PCB, Circuit 8 on a PESU PCB, or Circuit 2 on a PSTU, RDSU, RSTU2, or RSTU. LEDs 09 and 10 should be off for RSTU2, RSTU, RDSU, and PSTU alternate BGM. The MOH source always connects to the Common Control Unit (RCTUA, RCTUB, RCTUBA/BB, RCTUC/RCTUD). Also run Program 19 to assign BGM to a PCB slot number.

- **Display Dialed Number Timing, LED 08**—An LCD telephone will display a dialed number on outgoing calls and the CO line (Program 93) ID name, DNIS, ANI, or Caller ID information on incoming calls for either 15 or 60 seconds before the display changes to the elapsed time of the call.

- **Standard Telephone Distinctive Ring, LED 07**—The line call ring pattern to standard telephones can be made distinct from the intercom ring pattern. If Distinctive Ring is enabled, the CO line call ring pattern will be 0.2-seconds on, 0.4-seconds off, 0.2-seconds on, 3.4-seconds off; if Distinctive Ring is not enabled, the pattern will be per Program 10-1, LED 06. Intercom, Transferred, tie, and DID calls, with or without Distinctive Ring enabled, ring with a one-second on and three-seconds off pattern.

- **Voice Mail Identification Code, Dual-tone Multi-frequency (DTMF) Signal Time, LED 06** —DTMF digits automatically sent to RSTU/RDSU/RSTU2/RSTS/PSTU/PESU voice mail ports can be sent in either 80- or 160-millisecond bursts. This applies to digits sent via the voice mail identification code (#656/#657) set at each station. This also applies to manually dialed digits sent to voice mail ports from Toshiba telephones, including 2000-series digital telephones.

- **Voice Mail Message Waiting Cancel Via Dial # 6 4/Automatic, LED 04**—"RS-232 (SMDI or Toshiba proprietary) or Dial # 6 4" should be enabled if the DK280 system is connected to a voice mail (VM) system that sets station Message Waiting (MW) LEDs by RS-232 or by dialing # 6 3 + Station Intercom number, **[PDN]** or **[PhDN]** or RS-232 signal. This ensures the message LED remains flashing until the VM machine cancels the Message LED by sending an RS-232 signal or pressing **# 6 4** + Station Intercom number, **[PDN]** or **[PhDN]**.

  With "RS-232 or Dial # 6 4" enabled, message indications set on a station from VM ports will not automatically be cancelled by the DK280 system when the station calls Voice Mail to retrieve messages. If "Automatic" is selected, the flashing message waiting LED is canceled any time a station calls the VM machine and the VM machine answers.

  Note:
  When using RS-232 Voice Mail Integration (Toshiba or SMDI) LED 16 must be set to ON in Program 31, for PGM 10-2 to function.

- **Ringing Modes, LED 03**—The Strata DK280 system can be set for either two-ringing mode or three-ringing mode operation. The DAY and NIGHT modes are available with the two-mode operation, and the DAY, DAY2, and NIGHT modes are available with the three-mode operation. Each ringing mode has distinct CO line ring assignments (Programs 71 (1 ~ 3), 78; 81 ~ 89 and *81, *84, *87). The three-mode selection is useful for alternate answering positions. Station users can change modes with the Night Transfer button on either a DSS console (Program 29), a telephone (Program 39) and/or Attendant Consoles (Program 59). This feature applies to loop and ground start lines, and also tie, DID, and DNIS lines assigned with Program 17, LED 05 "ON"; these lines will use Program 71 (1 ~ 3) assignments. Tie and DID lines assigned with Program 17, LED 05 "OFF" cannot be routed to different destinations in the Day/Day 2/Night modes.

- **Call Forward/Station Hunt Override From DSS Console, LED 02**—If a station has activated Call Forwarding or Station Hunting, all calls to that station—except for calls from the DSS console position—will forward or hunt to another number. A choice exists of whether to call forward from the console itself or from the digital or electronic telephone assigned to it. If the console calls (using the DSS console station buttons) are forwarded, the attendant telephone will not be forwarded, and vice versa. This allows the console operator flexibility in reaching a station user.

  Note:
  This feature applies to both types of DSS consoles, the DDSS and the HDSS.

- **Tone First/Voice First-DSS Console, LED 01**—The intercom call signal from a DSS console can be set for Tone First Signaling or Voice First Signaling. This setting is independent of the system-wide signal option in Program 10-1. Thus, DSS consoles and their attendant stations can ring with different signaling modes.

Program 10-3—System Assignments 3

The following options are available on a system-wide basis: LEDs 11 and 13 are initialized as ON.

- **Speed Dial Entry Timeout, LED 19**—Station users can either have up to one minute or up to three minutes to store a Speed Dial number or memo. If they fail to store the number or memo within the set time, their station will exit the Speed Dial-storage mode and return to the normal idle state. The timer is required because of the User Programmable Feature Buttons feature, which allows the **Intercom** or **PDN, Hold,** and **Cnf/Trns** button functions to be programmed in

Speed Dial Memory. The three-minute setting is recommended if station users frequently store memos with Speed Dial numbers using the MODE button below the Liquid Crystal Display (LCD).

- **Built-in Auto Attendant Camp-on Busy/Ring No Answer Routing, LED 18** is designed for Auto Attendant configurations that have primary announcement devices, but no secondary ones—tells the system where to route Auto Attendant calls that ring and are not answered or have been camped-on for a designated time (see Program 26). The calls can be sent back to the primary announcement device or to the station or stations assigned to the CO lines' normal ringing pattern (see Programs 81, 84, and 87).

- **Built-in Auto Attendant Disconnect Time, LEDs 16 and 17**—If LED 18 is assigned for normal ringing, set LEDs 16 and 17 to tell the system when to disconnect Built-in Auto Attendant calls that have not been answered by the alternative stations. This feature assures that the loop start CO line that the call was made on will be free for other calls if the caller hangs up before answered. The initialized disconnect setting is 40 seconds. The other timing options available are 150 seconds and 350 seconds. Set LEDs 16 and 17 for the desired time as follows:
  - 40 seconds: LED 16 = Off. LED 17 = Off.
  - 120 seconds: LED 16 = Off. LED 17 = On.
  - 240 seconds: LED 16 = On. LED 17 = Off.

- **Built-in Auto Attendant MOH/RBT for Transfer, LED 15**—Callers can hear ring back tone (RBT) or Music-on-hold (MOH) after being transferred from the Built-in Auto Attendant to a station, depending on the selection made with LED 15.

- **RS-232 Voice Mail Signaling Method (LED 14)**—The DK280 provides two types of RS-232 signaling: Bellcore Standard type (TR-TSY-000283, TR-NWT-000283) or Toshiba Proprietary. Refer to the VM machine installation documentation and contact the Toshiba and/or VM machine manufacturer for VM machine SMDI configuration.

  Notes:

  1. *Toshiba VP products require Release 7 software or above for Toshiba proprietary integration.*
  2. *Toshiba VP products require the "SW-X0042 feature package (C.O. Centrex) for SMDI, but not for Toshiba Proprietary RS-232 Interface.*
  3. *Toshiba Stratagy products support SMDI only in the standard configuration, not Toshiba proprietary RS-232 interface.*

- **SMDI Station Number Digit Length (LED 13-10)**—This refers to the station digit length that the SMDI voice mail system design requires. This parameter is set for the Voice Mail system digit length; not the DK280 station digit length. If the voice mail system SMDI is designed per the Bellcore Standard TR-TSY-000283, 1985 version, set this parameter to seven-digits (LEDs 10, 11, and 12 "On" which is equal to Hex 7). Current VP and Stratagy voice mail SMDI systems are designed for this seven-digit operation. If the voice mail system SMDI is designed per the Bellcore Standard TR-NWT-000283, 1991 version, set this parameter between 1-10 digits with LEDs 10, 11, 12, and 13. (See Program 10-3 record sheet for LED-HEX values.) Digit length setting is not necessary with Toshiba Proprietary Interface (LED 10-13 OFF).

- **(LED 08)**—This option determines if Caller ID (CLID) and/or Automatic Number Identification (ANI) telephone numbers will be sent out the system SMDI port (SMDI only not Toshiba proprietary):
  - Turn LED 08, 10, 11, 12, and 13 "ON" if received Caller ID and/or ANI numbers should be sent out the system SMDI port.
  - Turn LED 08 "OFF" if received Caller ID and/or ANI numbers should not be sent out the system SMDI port.
  - The system will initialize with LED 08 "OFF" - no CLID or ANI information will be sent out the SMDI port.

- **SMDI Bellcore Standard Version (LED 09)**—Bellcore released two versions of the SMDI specification. Contact your voice mail machine vendor to determine which specification to enable with this program – TR-TSY-000283, Issue 1, July 1985 version, or the TR-NWT-000283, Issue 2, May 1991 version. Toshiba VP and Stratagy SMDI products currently use the 1985 version. In either case, the VM station digit length must be set with LED 10-13 as shown above. Also note that the 1985 and 1991 version Bellcore specifications use different space/character parameters for some call types which means the DK280 will not operate

properly if the correct version is not selected. Select the 1985 version (LED 09 OFF) for Toshiba VP and Stratagy products. This selection is not necessary with Toshiba Proprietary Interface (LED 09-OFF).

- **Amplified Conference Assignments (LED 01 ~ 04)**—Light LEDs 01 ~ 04 to identify which PEKU ports should be connected to external amplifiers. External Amplified Conference is provided by customer-supplied two-way amplifiers connected to system PEKU ports to provide amplification of "two-line" calls. Up to four amplifiers can be connected (two PEKU ports for each amplifier) to amplify up to four two-line calls simultaneously with RCTUB, RCTUBA/BB and C/D, three with RCTUA. The amplifier is switched into the call automatically when a two-line call is established. Amplifiers are switched into calls starting from the lowest PEKU ports to the highest (see Program 10-3 System Record Sheet). Skipping PEKU ports is allowed.

  Example: The first amplifier can be connected to PEKU ports 017 and 018, skipping ports 009 and 010. In this case, LED 02 should be ON and LED 01 should be OFF. (See Program 10-1, LEDs 19 and 20; Program 10-2, LEDs 18 and 19; and Program 15-5 for more information regarding Two-line Conference.)

IMPORTANT !

A DK280 system operating with the RCTUB, RCTUBA/RCTUBB or RCTUC common control unit allows up to 10 simultaneous Two-line Conference connections (four with the RCTUA). The amplifiers are switched in automatically starting with the first connection. Calls made when there are no amplifiers available will not be amplified.

Note:

The external amplifiers will also amplify two-line DISA, Call Forward External, DNIS externally routed calls, DID, and tie line trunk to trunk calls.

Program 12—System Assignments - Basic Timing

(Initialized data for Program 12: Code 3 = 1, Code 4 = 2, Code 5 = 0, and Code 9 = 4.)

- **Pause Timing, Code 3**—Short and long pauses may be programmed in Speed Dial numbers by station users. The short pause length can be set system wide for either 1.5 or 3 seconds with this program. The long pause is always 10 seconds.

  Note:

  This program applies to Speed Dial numbers used for both voice and data calls. Data call pause length is determined by the program.

- **Flash Timing, Code 4**—When on a CO line, a station user can press the **Flash** button and the line will open (flash) for a period of either 2 seconds, 0.2 seconds, or 0.5 seconds depending on this assignment. (A flash can also be activated by dial code **Cnf/Trn # 4 5**). In general, this choice reflects whether to disconnect and regain dial tone (two seconds), or to use PBX or Centrex features which require a flash signal (0.5 seconds). This flash timing also applies to flashes inserted when dialing via data interface units (DIUs).

  Note:

  The 0.2 seconds option is not normally used in the United States.

- **Pause After Flash, Code 5**—Some COs or Centrex facilities require a period of time after a flash signal before they can accept dialing signals. A selection of pause timing is available to automatically delay any dialing signals after flash. This timing applies to Speed Dial calls (with flash signals between the telephone number digits) as well as to manual dialing.

- **Auto Attendant, DISA, Call Forward External, and DNIS External Network Routing Disconnect Timer, Code 8**—If any of the call types listed above are made on loop start lines a call could lock-up (keep busy indefinitely) if the CO does not send a disconnect signal (CPC or AR) when the callers hang up. This timer will prevent loop start lines from locking up by disconnecting the call automatically when the timer expires, 4, 10, or 20 minutes from the start of the call. Callers will hear a warning tone and can reset the timer repeatedly by dialing "0". This disconnect feature is only needed for loop start lines.

- **RRCS Seize Time, Code 9**—One channel of the RRCS Dual-tone Multi-frequency (DTMF) receiver/decoder is seized when it is needed for the decoding process, such as with a standard telephone with a DTMF dialpad. When placing outgoing calls with DTMF standard telephones, the talk path to the outside party is not "cut-through" until the RRCS circuit is released. The

release time of the RRCS channel can be programmed for a time between one and nine seconds (initialized timing is four seconds)—this is the time it takes to release the RRCS circuit after the last digit is dialed.

The choice of timing is a trade-off between CO line time to connect and user speed. If the time is too long, the outside called party may answer before the voice path is "cut-through," and the caller will not be heard. If the time is too short, a standard telephone user inputting DTMF tones could be cut off prematurely from using other features, such as Speed Dial or Toll Restriction.

Standard telephones will also be able to defeat Toll Restriction if the seize time is too short and they are not required to dial outgoing calls via Least Cost Routing (LCR). It is recommended that standard telephones always be required to dial outgoing calls via LCR to prevent them from defeating Toll Restriction.

Note:
If no digits are dialed after accessing an outgoing CO line, the RRCS remains seized for 15 seconds and then drops; however, the line remains connected.

Program 13—Defining the Message Center

Each digital, electronic and standard telephone can receive a maximum of four message waiting indications per **[PDN]** and each **[PhDN]** owned by the station. One of these four is reserved for the designated Message Center. Typically, a voice mail device, attendant console or a telephone (digital or electronic) accompanying a DSS console (DDSS or HDSS) will be the Message Center. However, if incoming traffic to a DDSS or HDSS console attendant is heavy, another station may be assigned to be the Message Center.

If the assigned Message Center is a voice mail device, the lowest port of the customer's voice mail device should be the Message Center. (See Program 31 for voice mail group port assignments.) Initialized data assigns no port as the Message Center.

Program 15—Ground/Loop/Tie/DID Line Options

All LEDs are initialized as OFF.

- **Automatic Release (AR) on Voice Mail or Voice Calls, Code 0**—On loop start CO lines, some COs send the AR signal—a 95 or 450-millisecond open of the CO line loop—after an external party hangs up (typically 1 ~ 15 seconds) to disconnect a loop start line. If the CO sends this signal after an external party hangs up and before the VM/auto attendant transfers a call, D tone will be sent to the voice mail port (Program 30, LED 15), releasing and clearing that port for another call. This feature is active on all voice calls.

  When a station is disconnected from a CO line call by the AR signal, its LCD will display "CO LINE HANG UP". The line can be disconnected anytime by the AR signal during the "talk state" of a call. CO line calls disconnected by the AR signal will be represented on the SMDR report by a "*" next to the CO line number. Code 0 does not apply to ground start lines, which automatically disconnect when the external party hangs up.

  IMPORTANT!
  This option cannot always be used because some COs may send unreliable AR signaling or no AR signaling for loop start lines. AR signaling is sometimes referred to as Calling Party Control or Loop Supervision.

- **CO Outgoing Signal, Code 1**—Each line can be independently assigned to have either Dial Pulse (DP) or Dual-tone Multi-frequency (DTMF) signaling.

  Notes:
  1. *If a line is set for DP operation, the Tone Dial Select (TONE) button must be programmed on stations that must send DTMF tones over the lines.*
  2. *If tie or DID lines are programmed for dial pulse, turn LED 11 ON in Program 30 for each station port assigned to the DID or tie line.*

- **Line Pulse (DP) Rate, Code 2**—If a line is assigned DP signaling, the rate can be either 20 or 10 pulses per second. Some Central Offices do not reliably accept 20 pulses per second.

- **Automatic Release (AR) From Hold/Transfer, Code 3**—On loop start CO lines, some Central Offices will send the AR signal—a 95 or 450-millisecond open of the CO line loop—after (typically 1 ~ 15 seconds) an external party hangs up. If the system CO line is on hold (or being transferred to another station or Auto Attendant

port) when this signal occurs, it is automatically disconnected if this option is activated.

Two-CO line DISA calls always release when AR is sent. DISA release via AR is not related to this program. CO line calls disconnected by the AR signal will be represented on the Station Message Detail Recording (SMDR) report by a "*" next to the CO line number. Code 3 does not apply to ground start lines, which automatically disconnect when the external party hangs up.

IMPORTANT!

This preceding option cannot always be used because some COs may send unreliable AR signaling or no AR signaling for loop start lines. AR signaling is sometimes referred to as Calling Party Control or Loop Supervision.

- **Automatic Release (AR) Time, Code 4**—AR signaling timing is different depending on the Central Office equipment. An assignment choice exists between Crossbar or ESS Central Offices.
- **Tandem Line Connection, Code 5**—Once a Two-line Conference call is made by an electronic or digital telephone user, the user may drop out of the conference and leave the two lines connected. The choice exists for each line that may have this capability. This option must be enabled to allow CO lines (ground/loop/tie/DID) to be used for outgoing DISA, Call Forward External, and tie/DID/DNIS External Network routing calls.
- **Forced Account Code (Verified or Non-verified), Code 7**—If the Forced Account Code feature is used, (see Program 30) a station user is required to enter an Account Code before a CO line call can be completed. A choice exists for each line.
- **Operation After CO Line Flash, Code 8**—If a standard telephone user is on an existing CO line call and flashes the hookswitch on their telephone, a Dual-tone Multi-frequency (DTMF) receiver channel may or may not be connected, depending on this assignment. If the CO line is a rotary dial only type, the RRCS must be seized after flash when dialing from DTMF standard telephones. The RRCS will decode the dialed tones and send dial pulses to the line.

Program *15—CO Line Tenant Assignments

A system can be shared by more than one tenant (business). This program assigns lines to the tenants. The RCTUC common control unit can support up to four tenants; RCTUA RCTUB and RCTUBA/RCTUBB units can support two. Initialized data assigns all lines to Tenant 1.

Program 16—Assign CO Line Groups

Lines can be accessed with a dialing code instead of with a CO line button. With DK280 systems operating with an RCTUC/RCTUD common control unit, up to 16 groups may be accessed by dialing 801 ~ 816 (eight groups with the RCTUA or RCTUB, RCTUBA/RCTUBB common control unit). This is useful for WATS lines or other facilities, and is heavily used in Least Cost Routing and Pooled Line Button assignments.

A general group for outside calling is available with a "dial 9" access code, which is the initialized state for all lines. Program 16 is used to assign each line to one of these groups. Do not attempt to assign a line to more than one group. A line need not be assigned to a group. If lines are not used, they should be taken out of all groups, including the "dial 9" group. Automatic Busy Redial (ABR) will not function if unconnected lines are assigned to a line group.

Program 17—DID/Tie Line Options

Program 17 assigns lines for tie and DID operation:

- **Page/Handsfree Answerback, LED 01**—Page/Voice Announce/Handsfree Answer Back. When connecting the DK280 to another Key/PBX system over private tie and DNIS lines, this option allows/denies the following feature calls over the tie and DNIS lines on incoming calls to the DK280:
  - Callers on the Far-End Key/PBX system can access the DK280 system external and/or Station All Call Page over DID and/or tie lines programmed with DNIS assignment (see Program 10-2, LED 15 and Program 71-1, Code #039 for DID/tie DNIS assignments. Tie lines only that route per Program 04 can dial any Page zone or Page Group access code.

- Callers on the far-end Key/PBX system can make voice announce calls to stations on the DK280. This option applies to tie lines only (not DID lines) that route per Program 04 or Program 71. The DK280 must be Programmed as "Voice First" in Program 10-1, LED 01; or, the far end can dial "1" after dialing the **[DN]** on tone first systems.
- Callers on the DK280 can answer tie lines calls (not DID lines) from the Far End Key/PBX in the hands free mode. The DK280 must be programmed as "Voice First" in Program 10-1, LED 01; or, the far-end caller must dial "1" to switch from ring to voice signaling.

IMPORTANT !

1. *Per FCC regulations, Program 17, LED 01 or Program 10-1, LED 01 must be off for all DID or tie lines which receive incoming calls to the DK280 from the Public Telephone network. Program 17, LED 01 or Program 10-1, LED 01 can only be ON for DID or tie lines which receive incoming calls to the DK280 from private tie/DID lines that interconnect the DK280 with another Key/PBX system(s).*
2. *In DK280 Release 1 and 2 software, Program 17, LED 01 applies to tie lines but not to DID lines which are always denied access to Page and voice announce. In Release 3 software, Program 17, LED 01 applies to both tie and DID lines when programmed with Program 71 assignments.*

- **Wink/Immediate, LED 02**—Select Wink Start or Immediate Start for the entered tie or DID line. This option applies to REMU, PEMU, and RDDU tie/DID lines. See Program *41-2 for RDTU tie/DID wink/immediate start assignments or RDTU T1 tie lines configured as DID lines in Program *42-1.

- **DID Camp-on/Busy, LED 03**—Turn LED 03 on if DID (or tie line—see below) callers should hear ringback tone and camp on to busy stations when calling busy stations. Turn the LED off if the DID callers should hear busy tone when calling busy stations. It is recommended to turn LED 03 ON for all DID lines. To provide Camp-on-busy over RDTU tie line calls, configure tie lines as DID lines in Program *41-2; LED 03 must be on for the lines in Program 17. This is allowed because tie and DID signalling is the same for tie and DID T1 lines.

  Also, both tie and DID lines that route per Program 71 DNIS assignments will camp on busy if LED 03 is turned on. Tie lines that route per Program 04 will not camp on busy.

- **DID/Tie Second Dial tone Option, LED 04**—If the second dial tone option is selected (LED 04 off), callers calling in on the DK280 DID or tie lines will hear dial tone after accessing the DK280 tie/DID lines (the office code of DID lines; the tie line access code for tie lines). The tone will not be sent to callers if this option is not selected (LED 04 on).

IMPORTANT !

Normally, tie lines require a second dial tone (LED 04 OFF) and DID lines should not return a second dial tone (LED 04 ON). The initialized data is set for DID lines so this data must be changed when installing tie lines if second dial tone is required.

- **DNIS Line/Non-DNIS Line, LED 05**—This option assigns tie and/or DID lines to follow Dialed Number Identification Service (DNIS) Program assignments.
  - When tie lines are assigned as DNIS lines they follow Program 71 and 72 assignments (LED 05, ON) and no longer follow Program 04 ringing assignments.
  - When DID lines are assigned as DNIS lines they follow Program 71 and 72 assignments (LED 05, ON) and no longer follow Program *09 ringing assignments.

IMPORTANT !

Any tie or DID line may be assigned to use the features of Program 71 and 72. If normal tie/DID lines should be assigned Name Tags, External Routing, selective Day/Day2/Night Routing: In Program 17, Turn ON LED 05 and turn OFF LED 06, 07 and 08 for those lines - then Program the lines as required in Program 71 and 72.

- **Telephone LCD display option—ANI or DNIS, LED 06:** This system-wide option determines if ANI or DNIS information should display on the telephone LCDs when tie/DID lines provide both

ANI and DNIS information together on incoming calls. It is not possible to display both ANI and DNIS information simultaneously on the same call but the Page button on the LCD telephone can be used to toggle between the ANI and DNIS information when an ANI/DNIS line is ringing the telephone. After answering the call it is not possible to toggle the LCD display between ANI and DNIS

- **ANI Receive Line option, LED 07**—If a tie or DID line should receive ANI information, LED 07 should be turned ON for that line. If the tie/DID line receives ANI digits only (no DNIS digits) LED 06, 07, and 08 should be ON and LED 05 should be OFF. (See Program 71-1, address 199, 299, and 499) for tie/DID ANI only call routing assignments.

- **ANI/DNIS Digit Format, LED 08**—Most ANI/DNIS providers, such as MCI and Sprint, send the "*" DTMF tone signal along with ANI and/or DNIS digit information; turn ON LED 08 for all tie/DID lines that receive this type of ANI/DNIS digit signaling. Examples of this signal format are: "*ANI digits*DNIS digits*" and "*DNIS digits*". As of this writing, one exception to this criteria is that Sprint does not send "*" DTMF tones when it sends only DNIS digits - in this case LED 08 should be turned OFF for this line type.

IMPORTANT !

When normal tie/DNIS lines are configured with Program 71 and 72 DNIS assignments, Turn ON LED 05 and turn OFF LED 06, 07 and 08 for those lines - then program the lines as required in Program 71 and 72.

Program *17—DID Intercept Port Number

DID and/or DNIS calls in which callers have dialed a vacant or invalid port can be routed to intercept ports assigned with this program. Each DID and/or DNIS line can have its own intercept port. In all cases, Intercept does not apply to tie lines.

Program 19—Alternate Background Music (BGM) Source Slot Assignment

The printed circuit board (PCB) connected to the alternate BGM source can be in any slot. Use this program to designate that slot. If the source will be connected to a PEKU or PESU, turn LED 9 or LED 10 on in Program 10-2 to tell the system whether the PEKU or PESU will support the source. LEDs 09 and 10 in Program 10-2 should be OFF if the source will be connected to a PSTU, RSTU, RSTU2, or RDSU. (Only Circuit 2 of these PCBs can support the BGM source.)

The alternate BGM source sends BGM to the external speakers and telephone (digital and electronic) speakers. If an alternate BGM source is used, the Music-on-Hold (MOH) source connected to the common control unit (RCTUA, RCTUB, RCTUBA/BB, RCTUC/D) will continue to play for lines and stations that are on hold.

IMPORTANT !

If the alternate BGM source is not connected to a PEKU, PESU or PSTU, RSTU, RSTU2, or RDSU, assign Slot 11 as data in Program 19. This will ensure that all PSTU or RSTU ports function normally. Digital telephones or electronic telephones or RSIU PCBs installed in Slot 11 will not be affected by this assignment.

Program 20—Computer Interface Unit (RPCI) and Data Interface Unit (PDIU-DI and PDIU-DS) Configuration

Identifies the PDKU station ports connected to RPCI/PDIU and the type of DIU connected.

RPCIs have two modes: the Data Switching (DIU mode) and the Application Program Interface (API) mode. In the DIU mode, the RPCI operates as a PDIU-DI Data Interface Unit; in the DIU mode all Program 20 options apply to the RPCI except LED 10 and LED 11; LED 10 and 11 only apply to the RPCI when it is in the API mode. LED 10 and LED 11 are the only LEDs that apply to the RPCI-DI when it is in the API mode.

Notes:

1. *RPCIs and DIUs that mostly do data switching, can be connected to ports associated with PDKU1 circuits 1 ~ 7 only. All PDKU2 circuits, 1 ~ 8, can support RPCIs and DIUs. RDSU digital Circuits 5 ~ 8 can support RPCI and DIUs.*
2. *See Chapter 5 —Station Apparatus to identify which slots can support RPCIs and DIUs.*

- **RPCI and PDIU Connection, LED 01**—Light this LED if there is an Integrated Data Interface Unit (PDIU-DI), an Integrated Computer Interface Unit (RPCI-DI), or a Stand-alone Data Interface Unit

(PDIU-DS) connected to the digital port. Each RPCI-DI or PDIU-DI uses the same digital port as the telephone it is attached to. If an RPCI-DI is used in the Application Program Interface (API) mode only, and not the Data Switching mode, this option is not applicable. Each PDIU-DS requires a separate digital port.

- **AT Commands and Result Codes, LED 02**—If the RPCI or DIU must respond to AT commands and return result codes in the Data Switching command mode, this LED should be lit. RPCI/DIU "AT" dialing commands and "result" codes are listed in the RPCI-DI and "Data Interface User Guide" in the Operating Procedures section of this manual. If LED 02 is not lit, the RPCI/DIU will only respond to AT dialing commands (ATDT, ATD, and ATDD) and will not return result codes. If the DIU is connected to a terminal or a personal computer with communication software, LED 02 should be ON

  If the DIU is connected to a modem, LED 02 should be ON. If the RPCI/DIU is connected to a printer, LED 02 should be OFF. If an RPCI-DI is used in the Application Program Interface (API) mode only, and not the Data Switching mode, this option is not applicable.

- **RPCI/PDIU-DS to Modem Connection, LED 03**—If a PDIU-DS is connected to the digital port, identify whether the RPCI/PDIU-DS is connected to a modem (LED ON) or not connected to a modem (LED OFF). If not connected to a modem (LED OFF), the connected device can be a DCE or DTE. This option is not necessary for RPCI/PDIU-DIs, because they are not normally connected to modems.

- **PDIU-DI or PDIU-DS Connection, LED 04**—Light this LED if a PDIU-DS is connected to the digital port; leave OFF, if a RPCI-DI or PDIU-DI is connected. If a RPCI/RPCI-DI is connected, the digital telephone supporting it may require the **Data Call** (**DATA**), **Data Release** (**DRLS**), and/or **Modem** buttons assigned in Program 39. If an RPCI-DI is used in the Application Program Interface (API) mode only, and not the Data Switching mode, LED 04 should be off.

- **Auto Pause Behind PBX, LED 05**—If the system CO lines are connected to a PBX, Centrex, or a Central Office that is slow to return dial tone after seizure, light this LED to insert a pause before and after the PBX or Centrex access code is dialed by the DIU or RPCI. Also, light LED 05 to automatically insert a pause before network telephone numbers are autodialed by DIUs or RPCIs.

  Note:
  The pause length is set in Program 12-3, and lines behind PBX/Centrex are assigned in Programs 42-0 and 42-1 ~ 8.

- **DTR Pulse, LED 06**—LED 06 should be off for all PDIU-DS, RPCI-DIs, or PDIU-DIs. (Refer to Chapter 6—Peripheral Installation for more PDIU-DS/modem pool information).

- **RPCI-DI Caller ID and ANI to PC Option, LED 10**—Caller ID and ANI information that is sent to a telephone can be sent, or blocked, from the telephone's RPCI-DI, RS-232 output. If Caller ID and ANI information should be sent from the RPCI-DI to the Personal Computer to which it is connected, turn LED 10 ON; if this information should not be sent to the PC, turn LED 10 OFF. This option does not apply to PDIUs because they can not send ANI, Caller ID, or DNIS numbers.

- **RPCI-DI DNIS to PC Option, LED 11**—DNIS Number or NAME tag information that is sent to a telephone can be sent, or blocked, from the telephone's RPCI-DI, RS-232 output. If DNIS information should be sent from the Telephone's RPCI-DI to the Personal Computer to which it is connected, turn LED 11 ON; if this information should not be sent to the PC, turn LED 11 OFF.

- **Data Security Groups, LEDs 17 ~ 20**—Data security groups can be set to block data calls between RPCI/DIUs. RPCI/DIUs can only make data calls to RPCI/DIUs in the same security group. LEDs 17 ~ 20 assign the RPCI/DIU to the appropriate security group: light LED 17 for Group 1; LED 18, for Group 3; LED 19, for Group 2; and LED 20, for Group 4. If an RPCI-DI is used in the Application Program Interface (API) mode only, and not the Data Switching mode, this option is not applicable.

- **Typical LED settings for Program 20—**
  - RCPI-DI/PDIU-DI Connected to a terminal or personal computer—LEDs 01, 02, 05, and 17 ON; all other LEDs OFF.
  - PDIU-DS Connected to a Printer—LEDs 01, 04, and 17 ON; all other LEDs OFF.

- PDIU-DS Connected to a Modem—LEDs 01, 02, 03, 04, and 17 ON; all other LEDs OFF (Refer to Chapter 6—Peripheral Installation for more PDIU-DS/modem pool information).

Program 21—Modem Pool Port Assignments

With this program, identify modems connected to standard telephone ports (line side of modem) and digital/PDIU-DS ports (RS-232 side of modem). Each selection pair assigns the modem to the system modem pool. With data security groups (Program 20, LEDs 17 ~ 20) and the call the blocking feature (Program 31, LED 04), modem access can be denied or allowed to data users.

Notes:

1. *When modems are connected to standard telephone ports (PSTU, RSTU, RSTU2, PESU, RDSU/RSTS) the Executive/ Privacy Override blocking feature (Program 31, LED 18) should be enabled for the modem RSTU, RSTU2, PSTU, PESU, and RDSU ports for data security. The LED 18 feature should be disabled to enable callers to switch from voice to data, or vice versa.*
2. *Digital telephones with RCPI-DIs or PDIU-DIs that must access modems from a pool require a* **Modem** *button assigned in Program 39.*
3. *PDIU-DS ports that are connected to modems in the modem pool should be set with LEDs 01, 02, 03, and 04 in Program 20.*
4. *If a modem connected to PDIU-DS is connected to a telephone network line instead of a standard telephone station port, Program 21 should not be used.*
5. *Use Program 22 to assign modem/PDIU-DS stations to hunt sequences.*
6. *DIUs can be connected to ports associated with PDKU1 Circuits 1 ~ 7 only. All PDKU2 circuits, 1 ~ 8, can support RPCI/DIUs. RDSU Circuits 5 ~ 8 can support RPCI/DIUs.*

Program 22—Computer Interface Unit (RPCI) and Data Interface Unit (DIU) Station Hunting

If a RPCI/PDIU station (printer, modem, etc.) is busy, data station hunting allows the data call to that station to hunt to an alternate RPCI/PDIU station assigned in this program. If the hunted RPCI/PDIU station is busy, the system will ring the next "hunt-to" station, and so on. If all RPCI/PDIU stations in the "hunt-to" sequence are busy, then the data caller will receive a busy tone. It is recommended that all PDIU-DS station ports grouped in a modem pooling or printer pooling/server configuration be placed into a hunt-sequence arrangement with Program 22. Program 22 applies to PDIU-DS and RPCI-DI/PDIU-DI data calls, not telephone stations voice calls.

Note:

When a PDIU-DS is connected to a modem(s) assigned to the system modem pool in Program 21, modem hunting is automatic when the user presses the **Data Call (DATA)** *button to transfer a line call to a modem; however, if the user dials the modem's PDIU-DS's station number, modem hunting will follow the hunt sequence specified in Program 22.*

Programs 23 and 24—Built-in Auto Attendant Announcement Device Assignments

Assign customer-supplied Auto Attendant announcement devices (digital announcers) to standard telephone ports (RSTU, RSTU2, PSTU, PESU, RDSU/RSTS) with these programs. Devices which will deliver primary announcements—dialing options and greeting heard when callers first call in—should be assigned in Program 23, and devices which will deliver secondary announcements—typically options offered to unanswered calls routed back to the Auto Attendant—should be assigned in Program 24. As many as eight devices can be connected to a system, a maximum of four for primary announcements and a maximum of four for secondary announcements.

Notes:

1. *Any combination is allowed within the maximum limitations. For example, three primary announcements and one secondary announcement are allowed.*
2. *Ports assigned in Programs 23 and 24 should never be assigned with External Auto Attendant voice mail options in other programs (30, 31, 81 ~ 89, etc.)*

Program 25-1—Incoming Built-in Auto Attendant Call Overflow Time

Sets the time it takes an unanswered incoming Auto Attendant call to overflow to a preassigned station or stations. The time can be anywhere from 12 to 24 seconds—the default is 20 seconds. The overflow

station or group of stations is assigned in Programs 81 ~ 89.

Note:
Auto Attendant will not answer when all of the RRCS circuits and primary announcements are busy.

Program 26—Built-in Auto Attendant Camp-on Busy Time

Establishes the time it takes for unanswered Auto Attendant calls camped on to busy stations to be routed to other destinations. The time—which is set for the "camped-on to station"—can be set anywhere from 011 seconds to 999 seconds, and the default is 16 seconds. (Ring/No Answer call time to idle stations is fixed at 16 seconds unless Call Forward/No Answer is set at the called station.)

The destination that the call can be rerouted to depends on the Auto Attendant application. In Auto Attendant applications that use just primary announcement devices, the destination is set in Program 10-3, and can be either back to the primary announcement or the normal ringing pattern of the line that the call came in on (Programs 81, 84, or 87—also see Program 10-3, LEDs 15 and 16 for disconnect time options). In applications that utilize secondary announcement devices in addition to primary ones, the rerouted calls will automatically be sent to secondary devices.

Program 27—Digital Telephone Handset/Headset Receiver Volume Level

This program sets the initial off-hook volume level for each digital telephone handset and/or headset. This level can be changed with the digital telephone's volume control button while the handset or headset is off-hook, but it will return to the default level set in this program after the handset is placed on-hook. The volume level range for digital telephone handsets is 0 ~ 8, with 0 as the lowest volume. Anytime a handset is off-hook, the station user can adjust the volume level anywhere between 0 ~ 8. The level setting established in this program, however, can only be from 1 ~ 4.

Program 28—DSS Console (DDSS and HDSS)/Attendant Telephone Assignments

Up to eight DDSS consoles, or eight HDSS consoles, or any combination of the two types of consoles up to eight may be installed with an RCTUC/D common control unit. The RCTUA can support three DSS Consoles, and the RCTUB, RCTUBA/BB can support four.) A DDSS console can only be connected to Circuit 8 of a PDKU, and an HDSS console can only be connected to circuits 7 and 8 of a PEKU. The telephone connected to circuit 1 of the PCB supporting a console is designated as an Attendant telephone. Consoles and telephones are numbered 1 ~ 8 as they are installed from the lowest to highest slot number. For example, if a PDKU in Slot 11 had a DDSS console connected to it, the DDSS console would be Console #1 and the digital telephone connected to Circuit 1 would be Attendant Telephone #1.

As many as four DSS consoles can be assigned to one attendant telephone. Because more than one DSS console can be assigned to an attendant telephone, the detailed arrangement must be programmed. Initialized data assigns one DSS console to one attendant telephone, both connected to the same PDKU or PEKU PCB.

Program 29-(1 ~ 8)—DSS (DDSS and HDSS) Console Button Assignments Console Number

Each button on the DSS consoles may be flexibly assigned as either a **Direct Station Selection** (**DSS**), **Line** (**CO**), or **SD** button. The standard equipped **Night Transfer** (**NT**), and **All Call Page** (**AC**) buttons may be changed to one of these three types, but not vice versa. Station Speed Dial buttons assigned to a DSS console share the associated attendant digital or electronic telephone's Speed Dial memory. The personal Speed Dial numbers of the DSS console circuit port(s) are not available. Initialized data assigns the 60 buttons to be **Direct Station Selection** (**DSS**) 200 ~ 257, **All Call Page** (**AC**), and **Night Transfer** (**NT**). Each of the consoles can be independently programmed.

IMPORTANT!
It is not possible to assign Primary/Secondary/Phantom Directory Numbers to DSS consoles or ADMs.

Program *29—Add-on Module (ADM) Button Assignments

This program allows ADM buttons to be customized. Each ADM button can be programmed as either a Direct Station Selection, CO line, or System and Personal Speed Dial buttons. Only 2000-series Digital Telephones can connect with ADMs, and up to two ADMs can be connected to a telephone. The initialized button assignments are DSS 200 ~ 219 for ADM1 and DSS 220 ~ 239 for ADM 2. The RCTUC/D common

control unit can support up to 120 ADMs; the RCTUB or RCTUBA/BB up to 40; and the RCTUA up to 12.

IMPORTANT !

1) *This Program must be entered for each port assigned an ADM or the ADM will not function.*
2) *It is not possible to assign Primary/ Secondary/Phantom Directory Numbers to DSS consoles or ADMs.*

Program 30—Station Class of Service

- **Privacy Override, LED 19**—Privacy Override allows a station to enter into and listen to an existing CO line conversation by pressing a common CO line button (not a **[DN]** button). A maximum of two stations may override an existing "station-line" conversation. A warning tone may be set optionally (see Program 10-2). The choice with LED 19 is for which station is allowed to override calls with Privacy Override. Privacy Override of Direct Inward System Access (DISA) two-CO line calls is not allowed. This feature is not available on any Call (CO line or internal) that appears on a Primary, Secondary, or Phantom Directory Number button.

  Notes:

  1. *To configure the DK280 system to operate as nonprivate, allow Privacy Override from all stations.*
  2. *Privacy Override can be blocked by a station via a Privacy button (Program 39) or by the Executive/Privacy Override blocking option (Program 31, LED 18).*
  3. *See Table 10-8 in Chapter 10 - Record Sheets.*

- **Executive Override, LED 18**—Executive Override allows a station to break into and overhear an existing station conversation by pressing the digit **3** after the busy station number; or, by pressing the "EXEOVR" LCD soft key. A warning tone may be set optionally (see Program 10-2). The LED 18 option is for which calling station can use Executive Override.

  Note:

  Executive Override can be blocked by stations that have Executive/Privacy Override blocking enabled in Program 31, LED 18; the Privacy on Line (PRIVACY) button does not block Executive Override. See Table 10-X - Record Sheets.

- **DND Override, LED 17**—An electronic or digital telephone can have a button programmed for Do Not Disturb (DND). When called, a station with DND activated will return very fast busy tone (four tones per second). If the caller presses **2** after dialing the station number, a DND Override tone will be heard on the called station's speaker. The LED 17 assignment is for which calling station can use DND Override.

- **Toll Restriction Traveling Class Code Change, LED 16**—If this LED is lit for a port, the station occupying it can change the four-digit Toll Restriction Traveling Class of Service Codes established in Program 44-1 ~ 8. Stations selected for this feature must follow the dialing sequences below to change the codes:

  Class 1: Intercom or **[PDN]** + **# 6 9 1** + the four-digit code + **Redial**

  Class 2: Intercom or **[PDN]** + **# 6 9 2** + the four-digit code + **Redial**

  Class 3: Intercom or **[PDN]** + **# 6 9 3** + the four-digit code + **Redial**

  Class 4: Intercom or **[PDN]** + **# 6 9 4** + the four-digit code + **Redial**

  Class 5: Intercom or **[PDN]** + **# 6 9 5** + the four-digit code + **Redial**

  Class 6: Intercom or **[PDN]** + **# 6 9 6** + the four-digit code + **Redial**

  Class 7: Intercom or **[PDN]** + **# 6 9 7** + the four-digit code + **Redial**

  Class 8: Intercom or **[PDN]** + **# 6 9 8** + the four-digit code + **Redial**

  Note:

  Electronic telephones that do not have the REDIAL button, can use the # button instead.

- **Verified Account Code Change, LED 15**—If selected for this feature, a station can change the Verified Account Codes established in Program

69. Selected stations must dial the the following sequence to change the codes:

Intercom or [PDN] + **# 6 5 9** + **0 0 0 ~ 2 9 9** + Verified Account Code + **Redial**

Note:
Electronic telephones that do not have the **REDIAL** *button, can use the* **#** *button instead.*

- **Verified Account Code, LED 14**—If this feature is selected, all Account Codes (Forced or Voluntary) dialed by the station user (or DISA line user) will be verified per Account Codes set in Program 69. If the station user fails to dial one of these specific Verified Account Codes, the call cannot be executed (Forced), or the Account Code will not be validated for the SMDR call report (Voluntary).

- **Standard Telephone Hookflash Anti-bounce Guard, LED 12**—This feature should be turned on for all PSTU/RSTU/RSTU2/RDSU/PESU standard telephone ports that have standard telephones (with/without message lamps) connected to them to prevent false ring signals. With this option on, a CO line connected to a standard telephone will be disconnected if the standard telephone user hookflashes and then hangs up; if this option is off, the CO line will recall the standard telephone.

- **Dial Pulse (Dual-tone Multi-frequency (DTMF) Off), LED 11**—If any device, DID or tie line station port does not require the RRCS for DTMF decoding, it should be programmed for Dial Pulse (LED 11, ON). When the device goes off-hook or the DID or tie line is seized for an incoming call, the RRCS will not be accessed, thereby reducing unnecessary traffic to the RRCS.

- **Change DISA Security Code, LED 10**—This allows a selected station to change the DISA security code by dialing **Intercom** or **[PDN]** + **# 6 5 8,** + **Security Code** + **Redial.**

- **Change Toll Restriction (TR) Override Code, LED 09**—Two Toll Restriction Override codes are available in the system. When one of these codes is dialed from any station, all Toll Restriction is bypassed. These codes can be changed only by stations assigned in this program by pressing **Intercom** or **[PDN]** + **# 6 5 4** for Code 1, or by pressing **Intercom** or **[PDN]** + **# 6 5 5** for Code 2; press **Redial** to store.

- **Forced Account Code, LED 08**—If this feature is selected, a station or Direct Inward System Access (DISA) CO line user using a line with a Forced Account requirement (Program 15-7) must enter an Account Code before the outgoing CO/tie/DID line call can be completed. If Forced Account Codes should be verified, turn on LED 14 in Program 30. The digit length of Forced Account Codes is determined in Program 60-4.

- **Off-hook Call Announce (OCA) Automatic, LED 07**—A busy digital or electronic telephone can receive a second voice communication over the telephone Handset/Headset or over the telephone Speaker. (See Program 31—LED 03, 13 and 14.) If a calling station does not have the automatic function set in this program, the calling station user must dial extra digits of 21 after hearing busy tone or 12 after hearing ringback tone in order to gain access to OCA. Initialized data makes all stations automatic for OCA. "OCA Automatic" only works on systems with Voice First Signaling (Program 10-1 or 10-2, LED 01, OFF)

- **Automatic Busy Redial (ABR) Access, LED 06**—The ABR feature can be enabled or denied for each station. The system will select the last line in the originating line group each time ABR is initiated (also see Program 10-1). If the ABR access feature is not enabled here, the ABR soft key will not appear on LCD telephones. Note that ABR is not functional for DID or tie line calls.

  Note:
  ABR overrides Program 41. Program 41 is normally used with Least Cost Routing (LCR).

- **Speed Dial, LED 05**—A station may be denied the use of Speed Dial (Station and System) with this program. Initialized data allows Speed Dial for every port.

- **Microphone Button On at Start of Call, LED 03**—The microphone, as well as the **Mic** button LED, can be selected to be on or off at the start of a call if the Push On/Push Off mode (see Mic Button Lock, LED 02) is chosen.

  Note:
  When receiving intercom or internal DN calls, the flexible Microphone Cut-off **MCO** *button (Program 39) can control the microphone to prevent room monitoring and Handsfree Answerback.*

- **Mic Button Operation, LED 02**—An electronic or digital telephone microphone can be turned on or off by using the **Mic** button. Two modes of operation are available. A momentary operation requires that the **Mic** button be continuously pressed to disable the microphone. A Button Lock operation allows an alternate action Push On/Push Off of the **Mic** button.

  LED 02 should be ON if microphone Push on/Push off operation is desired; however, this operation does not apply to Handset OCA. The **MIC** button is always push to talk for Handset OCA.

- **Speakerphone Enabled, LED 01**—Any electronic or digital full speakerphone operation can be disabled by assignment with this program. If disabled, a speakerphone will act as a handsfree electronic or digital telephone. Initialized data enables all speakerphones.

Program *30—Telephone Group Page Assignments

Digital and electronic telephones can be assigned to "internal telephone speaker" page groups with this program. Each group can have as many as 120 stations. The RCTUC/D common control unit can support as many as eight groups, and the RCTUB or RCTUBA/BB and the RCTUA units can support up to four. Telephones can be a member of more than one group. Station users can access each group separately by dialing access codes. (See Program 05 for access codes.)

Program 31—Station Class of Service

This program sets most voice mail (VM) or External Auto Attendant port assignments. Each standard telephone port (RSTU2, RSTU, PSTU, PESU, RDSU) connected to a Toshiba VP or Stratagy voice mail system should have LEDs 04, 05, 09, 15, 16, 17, 18, 19, and 20 turned ON. These LED's should be set ON for VM ports only, not for telephone ports.

Notes:

1. *LED 04 may be ON or OFF, depending on VM device operation. See the LED 04 text that follows.*
2. *Initialized data reads LED 10 is ON for ports (000 ~ 119).*
3. *If LED 15 or 19 is lit, LED 17 must be lit. If LED 20 is lit, LEDs 17 and 19 must be lit.*

IMPORTANT !

Do not assign Program 31 VM/AA options to built-in Auto Attendant digital announcer ports.

- **Toshiba VP or Stratagy (B + Station Number), LED 20**—This feature is designed for Toshiba VP or Stratagy systems connected to a standard telephone port (PSTU, RSTU, RSTU2, PESU, RDSU). DTMF B tone followed by the station number is sent to Toshiba VP or Stratagy in situations in which Toshiba VP or Stratagy would not normally know the location from which a call was coming, such as hold recall or "blind" ring transfer recall. This allows Toshiba VP or Stratagy to respond more intelligently with appropriate voice prompts. LED 20 should be lit for standard telephone ports connected to voice mail devices only, not for station ports connected to telephones. The station number is not returned, it blind transfers to a DND station.

  Note:

  Toshiba VP or Stratagy (B No Station) must be enabled with LED 19 to allow this function.

- **Toshiba VP or Stratagy (B No Station), LED 19**—DTMF "B" tone is sent to Toshiba VP (or INTOUCH with B.06 and higher software) to signify a recall where Toshiba VP or Stratagy already knows the recalling station number. Again, this allows Toshiba VP or Stratagy to respond more intelligently with appropriate voice prompts. This LED should be lit for standard telephone ports (RSTU, RSTU2, PSTU, PESU, RDSU) connected to voice mail devices only, not for station ports connected to telephones.

- **Executive and Privacy Override Blocking (Modem), LED 18**—This feature denies a station user the capability to break in with Privacy or Executive Override to a called station's connection. It should be set for standard telephone ports (RSTU2, RSTU, PSTU, PESU, RDSU) connected to a modem, voice mail/auto attendant or ACD digital announcement device in order to ensure data and voice security. This feature can also be used to deny override of any station.

  Notes:

  1. *The Privacy Release (PRV RLS) button may be used to disable Privacy on a call-by-call basis; this button cannot disable Executive Override blocking.*

2. *If a modem is assigned to the system modem pool in Program 21, use this option to provide data security (LED 18 ON for modem standard telephone ports assigned in Program 21).*
3. *If using the system modem pool for data calls that must be switched between voice and data, LED 18 in Program 31 should be OFF for the modem standard telephone ports assigned in Program 21.*

- **End/End Signal RCV (VM), LED 17**—Activation of this option allows End-to-End Signaling of Dual-tone Multi-frequency (DTMF) tones through the system. It is required on all voice mail ports (RSTU, RSTU2, RDSU/RSTS, PSTU, PESU, RDSU) for proper signaling communication.

- **Receive Voice Mail (VM) ID Code, LED 16**—When a station is call forwarded to a VM system, certain identification (ID) Dual-tone Multi-frequency (DTMF) tones will automatically be sent to direct the call to a specific mailbox (VM ID Code #656 or DNIS VM ID Code). The automatic ID is also sent to the VM device when electronic, digital, or standard telephone users retrieve messages via the Intercom and Message Waiting buttons (VM ID Code #657). The VM port must be programmed for this feature to allow the reception of DTMF digits.

- **Toshiba VP and/or Stratagy Integration (A Tone/D Tone), LED 15**—This option will cause an answer tone (DTMF A tone) to be automatically sent to Toshiba VP (or Stratagy) when a station answers, and a disconnect tone (DTMF D tone) when a station disconnects. This allows Toshiba VP (or Stratagy) to respond quickly rather than waiting a long time in time-out situations. If the Central Office (CO) provides an Automatic Release (AR) signal, D tone is also sent to disconnect voice mail (VM) ports when outside callers hang up (see Program 15-0 and 15-3).

  Note:

  AR signaling is sometimes referred to as Calling Party Control or Loop Supervision.

- **OCA Handset Warning Tone, LED 13**—This option enables/disables a warning-tone (one-second tone burst) for digital telephones that receive Headset OCA—does not apply to speaker OCA.

- **OCA Handset or Speaker, LED 14**—If a station is enabled to receive OCA (Program 31, LED 03 ON), LED 14 defines which type of OCA (Headset/Handset or Speaker) the telephone should receive.

  Note:

  Speaker OCA requires a DVSU (DKT) or HVSU (EKT) installed in the telephone that should receive OCA and a special Program 03 code (DKT) or three-pair wiring (EKT); Headset OCA does not require either of these Hardware/Software options; but only digital telephones can receive Handset OCA (not electronic or standard telephones).

- **Pooled Line Button Operation, Program 31**—No Flash if No Ring, LED 12—If LED 12 is on for a station port, incoming line calls in pooled line groups will only flash on pooled line buttons if the line is also assigned to ring that station in Program 81-89. This option is available with DK280 Release 2 software and above.

- **Busy Override (BOV) Tone Option, LED 11—BOV tone can be two muted rings only or continuously repeated muted rings:** If a Digital or Electronic telephone **[DN]** is busy and it receives a call **on an idle [DN] or CO button** from another station or an outside line, the telephone will receive two muted ring bursts three seconds apart (LED 11 OFF) or continuously repeating muted ring bursts every three seconds (LED 11 ON) on the idle **[DN]** depending on how LED 11 is programmed for its station port. BOV muted ring bursts have a one-second duration. If all the **[DN]** button appearances of the called **[DN]** are busy, the call will camp-on and telephone will receive two camp-on tone bursts three seconds apart.

  Notes:

  1. *This option does not apply to BOV sent to standard telephones - standard telephones will only receive two BOV tone bursts - three seconds apart, regardless of Program 31, LED11 status; and only if it is enabled to receive Camp-on and BOV tone in Program *34, LED 01 - ON.*
  2. *The Busy Override Tone Option does not apply to CO lines that are ring transferred to a busy telephone that has or does not have an idle **[DN]** or CO line button. In this case, the call is a Camped-On call to the busy telephone. Camp-On tone will*

always be only two muted ring bursts - three seconds apart.

3. *Busy Override and Camp-on muted ring tone frequency: Digital and Electronic telephones 1209Hz/modulated by 10Hz on CO line calls; 1209Hz/unmodulated on Station to station calls.*

4. *Standard telephone - Camp-on tone is sent when the busy standard telephone receives a transferred CO line call; and BOV tone is sent when the busy standard telephone receives a direct call from a station or CO line. Camp-on tone is two one-second bursts of 1209Hz/interrupted by 160ms bursts, three seconds apart. BOV tone is a 160ms burst of 1209Hz/unmodulated, twice - three seconds apart.*

- **All Call Page Allowed-Digital and Electronic Telephones, LED 10**—Any station may be allowed to receive an All Call page. This does not alter the station's ability to initiate an All Call Page. A maximum of 120 stations may be paged at one time. See Program *30 for telephone page group assignments and Program 10-2, LED 15 for External Page with All Call Page option.

- **Voice Mail (VM) No Conference, LED 09**—If activated, a station is prohibited from having any Conference calls. It should be used for VM (RSTU, RSTU2, PSTU, PESU, RDSU/RSTS) ports to prevent undesirable Conference calls between two voice mail Auto Attendant ports.

- **Voice Mail (VM) Groups 1 ~ 4, LED 05 ~ 08**—The system allows up to four VM station port groups to be configured for support of up to four VM/auto attendant devices. One group is intended for each different machine. All standard telephone ports (RSTU, RSTU2, PSTU, PESU, RDSU/RSTS) connected to a particular VM machine should be assigned to the same VM group. The purpose of the VM grouping is to allow efficient use of the message waiting (MW) set and cancel operations from the VM machine. Since each digital, electronic, and standard telephone can only have a maximum of four messages waiting, the VM device should set MW only once, regardless of how many messages there are.

IMPORTANT !

*With DK280 Release 3, assign all ports of a VM Group to a unique Program *40 Distributed Hunt (DH) Group — Telephones should Call and/or Call Forward to the DH Group Directory Number to connect to VM.*

- **Voice Mail (VM) to VM Call Blocking, LED 04**—This prevents VM/auto attendant ports from call forwarding to other VM ports during screened or supervised voice mail transfers. If auto attendant calls are screened or supervised, this LED should be ON for all VM/auto attendant ports; if VM/auto attendant calls are ring (blind) transferred, this LED should be OFF for all VM/auto attendant ports.

- **Off-hook Call Announce (OCA) Enabled (Receive), LED 03**—Any digital or electronic telephone equipped for OCA should be assigned this option to receive OCA. This program does not affect the station's ability to originate OCA. See Chapter 2—Site Requirements to identify which slots can support OCA.

  To receive OCA from the telephone speaker, the telephone must be equipped with special hardware: Digital DVSU and Electronic HVSU/HVSI; the PDKU PCB supporting OCA must have code 62 or 64 set in Program 03; and Electronic telephones must have a third pair of wires from the PEKU. Digital telephones: to receive OCA over the handset/headset (R3 and above), no special Hardware or programming options are required except Program 31 LED 03, and 14 must be ON. Digital telephones can receive either speaker or handset OCA. Electronic telephones can receive speaker OCA only. OCA is not available to be received by standard telephones.

- **Handsfree No Warning, LED 02**—Normally, a one-second warning tone is sent to a handsfree digital or electronic telephone to inform its user that someone is calling and that they can be heard. If the warning tone is not desired at the called digital or electronic telephone, this assignment can disable it. This will also prevent ringing the digital or electronic telephone as a ring-first situation, allowing silent room monitoring of the area surrounding the telephone. Initialized data activates the warning tone for all ports.

- **Handsfree Disabled, LED 01**—It is possible to disable the internal call Handsfree Answer Back function on any digital or electronic telephone.

Program *31—Group Pickup Assignments

Stations can be divided into as many as 20 pickup groups. Station users can pick up calls that are ringing any station within their group by dialing a single access code (or with a Pickup button assigned with Code 480 in Program 39), and pick up calls that are ringing stations in other groups by dialing selected access codes. Stations can belong to more than one group. (See Program 05 for access codes.)

Program 32—Automatic Preference

Automatic Preference for digital or electronic telephones (see Note 2) via handset off-hook or the Speaker button is the automatic connection to lines, the intercom, or the Primary Directory Number of a telephone under various conditions. With Ringing Line Preference, a digital or electronic telephone user by going off-hook (or by pressing the **Speaker** button) may be automatically connected to the lowest line ringing in without having to press a CO line button or dial an access code. If no lines are ringing and an electronic or digital telephone goes off-hook, the station can be automatically connected to the Intercom, **[PDN]**, or to a line. The line connected can be the lowest numbered line available on the telephone or the highest idle line from a selected group.

Notes:

1. *This program does not apply to standard telephones. To allow system features to be accessed, standard telephones always receive system internal dial tone when originating calls.*
2. *Initialized data assigns Ringing Code 1 and Automatic Off-hook Code 00 for all ports.*
3. *If ringing line preference is not selected, no auto preference selection will occur when a station goes off hook during an incoming ring condition.*

Program *32—RS-232 (SMDI or Toshiba Proprietary) Voice Mail Message Center Port

When using SMDI voice mail integration, the Voice Mail Port Message Center must be assigned for each station. The voice mail port assigned will be called when the station user presses the telephone MSG button after the MSG LED has been set (flashing) by the voice mail machine. The Message Center port is normally the first voice mail standard telephone port in the Program 31 Voice Mail Group and the Program *40 Voice Mail Distributed Hunt Group. It is normally the same port for all stations.

Program 33—Station Intercom and Directory Number [DN] Hunting (Voice Calls Only)

If a station is busy, Station Hunting allows the ringing of an alternate station **[PDN]** or **[PhDN]** as defined by the assignments in this program. If the "hunt-to" **[DN]** is busy, the system will try to ring the next "hunt-to" **[DN]**, and so on. If a "hunt-to" **[DN]** is in the Call Forward mode, the call forward will have priority over the hunt. A ground/loop start CO line will hunt from a **[PDN]** or **[PhDN]** only if it has been assigned to ring at the owner station of the **[PDN]** or **[PhDN]** exclusively (in Programs 81 ~ 89, *81, *84, or *87). Initialized data does not assign "hunt-to" points for any **[DN]**.

Program *33—Phantom Directory Number "Owner Telephone" Assignments

Each **[PhDN]** must be assigned to a designated "Owner" telephone. If a **[PhDN]** is not assigned to an "Owner" telephone, it cannot receive calls (caller will receive reorder tone) but it can be used to originate calls. A telephone can be assigned as "Owner" of up to 240 **[PhDNs]**, but, a **[PhDN]** can only be "owned" by one telephone. **[PhDN]** "Owner Telephones" will have the following attributes for the **[PhDNs]** that it is assigned to own:

- Set Call Forward for all **[PhDNs]** that the telephone owns.
- Set Call Forward to a VM Mail Box and Message Retrieve ID codes (#656/#657), independent of the telephone's Voice Mail assignments. This "CF to" VM Box can be the same as the Owner telephone's VM Box or any other VM Box, including a dedicated VM Box for the **[PhDN]**.
- Have up to four **[PhDN]** Message Waiting (MW) LEDs (Program 39, flexible Button). This **[PhDN]** MW button will indicate that the **[PhDN]** has a message waiting from voice mail or another **[DN]** - again independent of the Telephone's fixed MSG LED.
- Store ANI and/or Caller ID information for abandon calls directed to the **[PhDN]**. The **[PhDN]** Owner telephone must be assigned "Abandon Call

Memory" in Program *51 if the **[PhDN]** rings on more than one telephone.

- Can receive OCA calls to the **[PhDN]**.

Program 34—Hold Recall Timing

Each station can have a different time (from 011 to 160 seconds) from the point of placing a call on hold to the point of recall. Initialized data assigns a recall time of 032 seconds to all ports.

Program *34—Station Class Of Service: Standard Telephone Camp-On Busy and Busy Override Tone Option, LED 01

A standard telephone can receive (LED 01 ON), or be blocked (LED 01 OFF) from receiving Camp-on and Busy Override tone depending on how LED 01 is programmed for its station port.

When LED 01 is ON for a Standard telephone: Camp-on tone is sent when the busy standard telephone receives a transferred CO line call and BOV tone is sent when the busy standard telephone receives a direct call from a station or CO line. Camp-on tone is two 160ms bursts of 1209Hz, 160ms apart and BOV tone is one 160ms burst of 1209Hz tones occurring twice, three seconds apart.

Program 35—Station Class of Service

- **Busy Station Transfer with LED 20 and Busy Station Ringing with LED 19**—Busy Station Transfer (BST) and Busy Station Ringing (BSR) operate together to ensure that a busy digital or electronic telephone station always receives transferred line calls along with LED and tone indications. The station or Voice Mail(VM)/auto attendant device that transfers the call must be programmed with BST (LED 20 ON) and the station port that receives it must have have BSR (LED 19).

  When a busy station with BSR receives a transfer from a station or VM/auto attendant with BST, there will be a muted repetitive BOV tone (see Program 31, LED 11) at the busy station and the intercom or **[DN]** LED will flash at the ringing rate until the station transferring the call hangs up. When it does hang up, the line call will then camp-on to the busy station. The busy station will be alerted of the camp-on by a camp-on tone (see Program 31, LED 11), the CO line LED will flash at the exclusive hold rate, and a message ("CAMP-ON X", X = the line number) will appear on the LCD (if equipped).

  Among other applications, a VM/auto attendant device that transfers calls to a typically busy answering position station will benefit from this feature. Some auto attendant devices cannot transfer a call to a busy station if BST and BSR are not activated.

  Notes:

  1. *A BST station will receive ringback tone, instead of busy tone, when transferring a call to a busy BSR station.*
  2. *Do not assign BST/BSR to built-in Auto Attendant announcement ports.*
  3. *BST (LED 20 ON) should be assigned to all ACD agent telephones and BSR (LED 19 ON) should be assigned to all ACD supervisor telephones to allow agent assistance calls to supervisor telephones that are busy.*

- **Automatic Hold, LED 18**—If this feature is allowed, station users with CO line buttons can place a CO line or intercom call on hold, then call another line or station just by pressing another CO line, **Intercom** or **[DN]** button and dialing the number. If Automatic Hold is not allowed, users can put calls on hold and place calls, but they will have to press the **Hold** button before accessing another line or the intercom.

  Notes:

  1. *CO line or internal calls that appear on the* **Intercom** *or* **[DN]** *buttons will automatically hold when accessing another line.*
  2. *Toshiba recommends that the* **Release** *and* **Ans (Answer)** *button be provided via Program 39 to telephones programmed for Auto Hold.*

- **Continuous DTMF Tones Off, LED 17**—2000-series digital telephones can send DTMF tones for as long as station users press their buttons (80 msec. minimum). This feature can be disabled with LED 17. If it is disabled, DTMF tones sent by these telephones will be either 80 or 160 milliseconds depending on the selection made with Program 10-1, LED 04 and Program 10-2, LED 06.

  Note:

  PDKU1 does not support continuous DTMF tones on 2000-series digital telephones.

- **No Call Forward/No Answer on Handsfree Answerback, LED 16**—A Handsfree Answerback call to an idle station in the Call Forward No-Answer or Call Forward-Busy/No Answer mode will not forward if this feature is activated. If the system is Programmed for Voice first (Program 10-1 and 10-2, LED 01 OFF), Voice Announce calls will not Call Forward No-Answer; however, calls will call forward busy. This prevents the call from being forwarded 8-60 seconds after the called party has been talking in the Handsfree Answerback mode. Outside calls and busy internal calls to the station will continue to forward with this feature set. If the system is set for Tone First, calls will call forward on Busy and No Answer.

  Note:

  1. *The caller can press the "RING" Soft Key on digital LCD telephones or press 1 on digital or electronic telephones to activate Call Forward on Voice Announce calls.*
  2. *OCA calls do not Call Forward No Answer in any case.*

- **Toll Restriction After Answer, LEDs 13 and 14**—These two LEDs determine whether or not a toll restricted telephone user is allowed to dial additional digits after answering an incoming CO line call (R3).

  LED 13 = OFF, LED 14 = OFF: Not allowed to dial

  LED 13 = ON, LED 14 = OFF: Allowed to dial but subject to toll restriction tables

  LED 13 = OFF, LED 14 = ON: Allowed to dial and not subject to toll restriction.

  Initialized data sets both LEDs 13 and 14 off for all telephone users (not allowed to dial after answering incoming CO line calls).

  LED 13 and 14 should be turned ON for Toll Restricted Telephones that must answer incoming CO line calls and use **SD** (speed dial) buttons programmed to Hold or Park calls and access the page system automatically.

- **LCD Individual Message, LED 05**—This option allows LCD digital and electronic telephones to store up to ten personal messages and offers the option of entering alphanumeric memos for each of the LCD's station speed dial numbers. Up to 96 stations can have this option for systems operating with the RCTUC/D common control unit (32 with the RCTUB, RCTUBA/BB and 16 with the RCTUA). This program defines which ports can have this feature. Initialized data assigns the lowest ports to have this ability. A low port must be disabled before adding a port above the initialized ports.

- **Message Waiting (RCV), LED 04**—If the message waiting indication is not desired on an electronic, digital or standard telephone, this program can be used to deny it. This does not affect that station's ability to send a message waiting indication to another station (**[PDN]** or **[PhDN]**). Do not use this option to enable/disable MW lamps on standard telephones; use LED 03 below for standard telephones.

- **Standard Telephone Message Waiting Lamp Enable, LED 03**—This R3 option is used to identify which station ports are connected to Standard Telephones (2500 or 500 type telephones) that have Message Waiting Lamps. LED 03 should be turned ON for all Standard Telephones ports that should support Standard Telephone Message Waiting lamps; LED 03 must be turned OFF for all other station ports including digital and electronic telephone ports that support Message Waiting LEDs. This also applies to Voice Mail ports.

IMPORTANT!

Standard telephones that require the Message Waiting Lamp functions must be connected to an RSTU2 PCB. Only one standard telephone with Message Waiting Lamp is allowed to be connected to each RSTU2 port.

- **LCD Type 32/12, LED 02**—Digital and 6000/6500-series LCD electronic telephones have 32-character displays. Therefore, assignments should be left in the initialized state of 32 characters. LED 02 must be ON to receive the voice mail message waiting indication.

- **LCD Display, LED 01**—This option should be used (LED 01 ON) for all stations (even non-LCD), unless it is desired to disable the station's LCD and message waiting functions.

Program 36—Fixed Call Forward

Fixed Call Forwarding is different from other station Call Forwarding options. It is fixed in terms of the destination Primary Directory Number which is assigned in this program. The station user cannot

change the Fixed Call Forward destination, unlike the other station Call Forwarding options. This feature is valuable for forwarding to voice mail (VM) devices or to an attendant. If Fixed Call Forwarding is set on a station, the station will not ring and all calls will forward immediately.

Program *36—System NT Button Lock Password Changing Station Assignment

Attendant Consoles and stations selected in this program can change the System Night Transfer Lock Password. Only one station or console can be allowed to change the NT Lock password. System/Tenant CO lines can be locked into the Day, Day2, or Night ringing mode only after the NT Lock password is entered. Locking the system into a particular ringing mode adds security to line call routing which prevents accidental or mischievous changing of the system ringing mode.

Any telephone or an attendant console can lock the system into a ringing mode, the telephone or console must have an NT Button and an NT Lock button assigned to flexible buttons in Program 39 and the person locking the system must know the Night Lock password. Only the station assigned in this program can change the code.

Note:

*Programs related to Program *36 are: Program 39 - NT Buttons and NT Lock Buttons; Program 74 - system ring mode lock password assignment; Program *15 - CO line Tenant assignments; and Program 77-3 - Tenant Night ring over selected External Page Zones.*

Program 37—CO and Tie Line Ring Transfer (Camp-on) Recall Time

If a busy or ringing station does not answer a call sent to it via call transfer (CO lines or over tie lines), the station originating the transfer will be recalled after an amount of time determined with this program. This time (011 ~ 999 seconds) is set independently for each originating station port. Initialized data sets all stations for a 032-second recall time. Ring Transfer must first be enabled for the system with Program 10-1, LED 07 ON.

Program *37—Park Recall Timing

Each station can have a different duration (from 011 to 9990 seconds) from the time of parking a call to the time the parked party recalls the station. Initialized data assigns a park recall time of 032 seconds to all ports.

Program 38—Digital and Electronic Telephone Keystrip Type

Four telephone button arrangements are provided (see the Program 38 System Record Sheet). It is best to start with one of these four, and then move on to Program 39, where individual buttons may be programmed. Initialized data treats all digital telephone ports as 20-button types with 17 CO line buttons, one **Intercom** or **[PDN]** button, one **Do Not Disturb** button, and the **Speed Dial** button. See the System Record Sheet for electronic telephone arrangements.

Program 39—Flexible Button Assignment

Run Program 38 before entering Program 39. Flexible feature buttons are assigned to telephones on a button-by-button basis with Program 39. (See the System Record Sheet for details.)

Programs 40 ~ 48—Toll Restriction

All Toll Restriction program information is provided later in this chapter.

Program *40—Distributed Hunt Group Member Assignments

Note:

Available with DK280, Release 3.1 and above.

This program assigns the members (station primary **[DN]** port numbers and hunting orders [01 ~ 32] of Distributed Hunt (DH) groups [900 ~ 915]). Initialized data assigns no members for any hunt group. When a member of a DH group is added or deleted, all the other members' hunting orders are automatically rearranged to a new sequential order.

If Ground/Loop start CO lines ring DH Group member telephones, use Program 81 ~ 89 to assign the selected CO lines to ring the DH group (900 ~ 915) and use *81, *84, and *87 to assign which **[PDN]** or **[PhDN]** should ring on the DH Group member telephones.

Do not assign DH Group member telephones to ring in Program 81~89. If the CO line that rings the DH Group (in Program 81 ~ 89) appears (CO line or Pooled line button) on the telephones in the DH Group, *81, *84, and *87 assignments should not be used. To assign ANI/DNIS/DID/tie and Internal calls to ring DH groups,

use Program *04, *09, *71 ~ *73, or 71 (1 ~ 3) as required.

Each port assigned to the same Program 31 Voice Mail Group should also be assigned to the same distributed hunt group. Each Voice Mail Group should be assigned to a unique (different) DH group.

Program *41 Series—T1 Span Assignments

T1 parameters and assignments are made with the Program *41 series (along with the Program *42 series). The RCTUC/D common control unit can support up to six RDTUs, and the RCTUB, RCTUBA/BB unit can support up to two; and the RCTUA cannot support the RDTU. (See Chapter 11 —T1 for additional T1 programming information.)

Program *41-1 T1 Span Frame and Coding Assignments

- T1 Span Framing Assignments, LED 01—Each RDTU PCB can be individually assigned for Superframe or Extended Superframe. LED 01 should be off for Superframe, or ON for Extended Superframe.
- T1 Span Line Code Assignments, LED 02—Each RDTU PCB can be individually assigned for B8ZS or AMI coding. LED 02 should be on for B8ZS, or OFF for AMI.

Program *41-2 T1 Channel Assignments

RDTUs provide 8, 16, or 24 channels, each of which can operate independently as CO lines (ground start or loop start), tie lines (Wink or Immediate Start), or DID lines (Wink or Immediate Start). Assign the number of channels for each RDTU with Program 03.

IMPORTANT !

*Program 91-2 must be run or System Power must be momentarily turned OFF (5 seconds) then ON for Program *41-2 to take effect.*

Program *41-3, T1 Span Transmit Level Pad Assignments

The transmission path of each RDTU can be set for one of several PAD settings:

- Enter 1 for +6 decibel (dB) padding
- Enter 2 for +3 dB
- Enter 3 for 0 dB
- Enter 4 for -3 dB
- Enter 5 for -6 dB (initialized setting)
- Enter 6 for -9 dB
- Enter 7 for -12 dB
- Enter 8 for -15 dB

Program *41-4, T1 Span Receive Level Pad Assignments

The receive level of each RDTU can be set for one of several PAD settings

- Enter 1 for +6 decibel (dB) padding
- Enter 2 for +3 dB
- Enter 3 for 0 dB
- Enter 4 for -3 dB (initialized setting)
- Enter 5 for -6 dB
- Enter 6 for -9 dB
- Enter 7 for -12 dB
- Enter 8 for -15 dB

Program *42 Series—T1 Span Timing Reference Assignments

Timing references for T1 RDTU PCBs are made with the Program *42 series. (Other RDTU parameters are made with the Program *41 series and Program 03.) For proper T1 operation, the equipment at each end of a T1 span line must be synchronized. The DK280 is synchronized (as slave) to the equipment on the other end of the T1 line by the RDTU PCB designated as the Primary Reference in Program *42-1.

If a malfunction occurs and Primary Synchronization is lost, the DK280 automatically switches modes and synchronizes to the equipment connected to the RDTU PCB designated as the Secondary Reference. If the equipment on the other end of the DK280 T1 lines should synchronize to the DK280 clock source, then blanks should be entered in Program *42 1 and 2. In this case, the DK280 clock runs free and is considered the Master Synchronization source. The RCTUC/D common control unit can support up to six RDTUs, and the the RCTUB, RCTUBA/BB unit can support up to two. The RCTUA and RCTUA3 cannot support the RDTU. (See the T1 Chapter of this manual for more information on Program *42.)

Program *42-1, Primary Timing Reference Assignment

Assign the Primary Timing Reference with this program.

Program *42-2, Secondary Timing (Backup) Reference Assignment

Assign the Secondary (Backup) Timing Reference with this program.

Note:

*To assign RDTUs as the Master Clock Reference (free run), leave Programs *42-1 and *42-2 blank. Press button/LED 01 to enter blanks.*

Programs 50 ~ 56—Least Cost Routing

All Least Cost Routing program information is provided later in this chapter.

Program *50—Caller ID (RCIU/RCIS) Circuit Assignments to CO Line (RCOU/RCOS/RGLU/PCOU)

Each analog ground/loop start CO line that receives Caller ID information from the local Central Office must be assigned to an RCIU or RCIS circuit using this Program. This is necessary to allow Caller ID information to be recognized by the DK280 system processor. Any RCIU or RCIS circuit can be assigned to any analog ground/loop start CO line circuit.

Each RCIU slot will be allocated eight Caller ID circuits when assigned with Code 81 in Program 03; because of this, you should always install RCIS on RCIU when more than four circuits are required.

Note:

The Tip/Ring leads of RGLU/RCOU/RCOS/PCOU Caller ID CO lines assigned to RCIU/RCIS circuits must be bridged at the MDF. For more information on RCIU/RCIS assignments and Installation, refer to Chapter 4—Printed Circuit Boards and Chapter 7—Wiring Diagrams in the Installation Part of this manual.

Program *51—Station Memory Allocation to Store Caller ID and/or ANI Numbers on Abandoned/Unanswered Calls

Any LCD telephone that must store abandon call information for Caller ID, Ground/Loop start lines and/or ANI, DID/tie lines must be allocated "Abandon-Call-Memory" using this Program.

LCD telephones can be allocated memory to save up to 100 numbers in 10 number increments. The total memory allocated to all stations in a system is: RCTU C3/D3 = 1000 numbers; RCTUBA3/ RCTUBB3 = 400 numbers; RCTUA3 = 200 numbers.

IMPORTANT !

1. *On direct incoming calls that ring on more than one telephone, the Caller ID, Ground/Loop start, line must also be assigned to the designated abandon call storage LCD telephone in Program *52 . If a CO line only direct-rings one telephone, that telephone will store the abandoned call information automatically without being assigned in Program *52; however, Program *51 is still required.*
2. *On direct incoming calls, the ANI abandon call information will be stored in the "Abandon-Call-Memory" of the **[PDN]** owner or **[PhDN]** owner LCD telephone - depending on which **[DN]** rings when the call is received. Do not assign ANI/DNIS lines in Program *52.*
3. *Abandoned ring-transferred calls will store Caller ID and/or ANI information in the "Abandon-Call-Memory" of the "transferred -to-station". The "transferred-to-station" does not have to be assigned as owner of the CO line in Program *52 (Caller ID) or as the owner of the **[PhDN]** in Program *33 (ANI), but it must be assigned memory in this Program.*
4. *Abandoned "Call-forwarded" calls will store Caller ID and/or ANI information in the "Abandon-Call-Memory" of the "first-call-forwarded-from-station". The "first-call-forwarded-from-station" does not have to be assigned as the owner of the CO line in program *52 or as the owner of the **[PhDN]** in Program *33, but it must be assigned memory in this program.*

Program *52 - Caller ID and/or ANI Line Circuit Abandoned Call Number Store Station Owner Assignments

When Caller ID and ANI lines ring into the DK280 system and the caller hangs-up before the call is answered, the call is considered abandoned. In this case, the Caller ID and ANI information received can be stored at a designated LCD telephone. When a Caller ID line rings at more than one telephone (Program 81-89), the LCD telephone that should store

the Caller ID information for that line must be programmed as the owner of that Caller ID line using this program. When a Caller ID line rings only one LCD telephone (Program 81-89), the abandon call Caller ID information will be stored at that LCD telephone regardless of the Program *52 assignment. An LCD telephone can be assigned as owner of any number of Caller ID lines. A Caller ID line can only be assigned to one owner LCD telephone.

If a Caller ID CO line or ANI Tie/DID line is answered by the DK280 built-in Auto Attendant, an ACD group queue, Distributed Hunt group queue, or DISA line, and if this call is abandoned before it is routed to and rings a station, the Caller ID or ANI data will be stored in the abandoned call memory of the station owner assigned to the Caller ID or ANI line assigned in this program.

IMPORTANT !

1. *To enable an LCD telephone to store Caller ID information on direct calls that are abandoned (unanswered), the LCD telephone must also be assigned "Abandon Call Memory" using Program *51.*
2. *Abandoned ring-transferred calls will store Caller ID information in the "abandon-call-memory" of the "transferred-to-station". The "transferred-to-station" does not have to be assigned to the CO line in this program. To store abandoned call information for CO lines, the station must also be allocated "Abandon Call Memory" in Program *51.*
3. *Abandoned "Call-forwarded" calls will store Caller ID information in the "Abandon-Call-Memory" of the "first-call-forwarded-from-station". The "first-call-forwarded-from-station" does not have to be assigned to the CO line in this program. To store abandon call information for CO lines, the station must also be allocated "Abandon Call Memory" in Program *51.*

Program 58-1—Attendant Console Overflow Timer

Incoming CO Line Calls (not recalls) to Attendant consoles will overflow to a designated attendant console or station port (Program 58-5) if the call is not answered within the time (011 ~ 999 seconds) specified by this program. The overflow call will ring on either the **In-Trans** button (assigned in Program 59) of the console that receives the overflow call, or the **Intercom**, [DN] or **CO line** button of a station.

Program 58-2, LED 01—Attendant Console Display Type

Base units can connect to an Electroluminescent (EL) or Extended Graphics Adapter (EGA) Display. This program identifies in software the type of display connected to each console.

Program 58-2, LED 02—Answer Button Operation

The attendant console **Answer** button can be programmed to answer calls on either a First-in, First-out (FIFO) or a Priority basis. With FIFO, new calls or recalls are stacked in queue in the order in which they are received. This is true regardless of the type of call/recall (CO line, Intercom, **[DN]** call or Hold Recall, etc.). The queued calls will ring to the Answer button in the order in which they are received. With Priority operation, each type of incoming call or recall (CO line call, Intercom, **[DN]** call, Hold Recall or Park Recall, etc.) is assigned a specific answering priority ranging from 1 ~ 6. (Call Priority is flexible and is assigned in Program 58-4.) Calls will queue to the attendant in order of their predetermined priority levels. For example, Priority Level 1 calls will ring to the attendant before Priority 2 calls; Priority 2 calls will ring before Priority 3 calls, and so forth.

Program 58-2, LED 03—Attendant Console Call Waiting Tone

Each attendant console can be programmed individually to receive a muted ring signal that will alert the console that a new call is waiting while the console is busy on another call. If call waiting tone is not enabled, new calls will not present an audible indication. The call waiting display always displays the number of calls waiting to be answered.

Program 58-4—Attendant Console Answer Button Priority Assignments

Each incoming call or recall type can be assigned a specific **Answer** button priority level, ranging from 0 ~ 6. If the **Answer** button is assigned Priority answer operation in Program 58-2, then incoming calls/recalls will ring to the **Answer** button based on their assigned priority levels. Priority 1 calls have the highest priority while Priority 6 calls have the lowest.

Program 58-5—Attendant Console Overflow Destination Assignments

When the attendant console has been placed in the Overflow mode (via the **Overflow** button), calls will queue to be answered based on the predetermined FIFO or Priority basis. If a call remains in queue for a period longer than the time period set for the Overflow Timer (set in Program 58-1), then the call will overflow to the destination assigned in this program. The assigned destination can be either a station, voice mail, auto attendant, or another attendant console.

Program 59—Attendant Console Flexible Button Codes

Have 24 flexible buttons (12 on left and 12 on the right side of the dialpad). This program is used to assign each button to an available function or options. Program 59 record sheets define the button options (and codes) available.

IMPORTANT !

Programs 58 and 59 require Release 2 or higher software installed on processor RCTUB, RCTUBA/BB, or RCTUC/D; Release 1 software is not valid for attendant console operation. RCTUA does not provide the attendant console feature.

Program 60-1, LED 01—SMDR Data Output Options

This option determines which information will be sent out the system SMDR port:

System Account codes or Caller ID and/or ANI telephone numbers.

- Turn LED 01 "ON" if received Caller ID and/or ANI information should be sent out the system SMDR port.
- Turn LED 01 "OFF" if Account Code information should be sent out the system SMDR port.
  The system will initialize with LED 01 "Off" - Account Code information will be sent out the SMDR port.

Program 60 (2 ~ 7)—SMDR Output/Account Code Digit Length

- **SMDR Threshold Time, Item 2**—The time that a call must be in progress before it will register with SMDR can be set to 1 or 10 seconds. The default is 10 seconds.
- **SMDR Output, Item 3**—System output to a Station Message Detail Recording (SMDR) device can include information for both incoming and outgoing calls, or only for outgoing calls. Local and long distance call data will be sent out.
- **Forced/Voluntary Account Code Digit Length, Item 4**—The Account Code entered at a station can vary in length from 4 ~ 15 digits. For Forced Account Code use, a call will not be completed unless the specified number of digits is entered by a station user. In the case of Voluntary Account Codes, the Account Code will not be sent to the SMDR call record unless the specified number of digits is dialed. Initialized data assigns a six-digit length for all Account Codes. See Program 60-1 and Program 69 for Verified Account Codes.
- **Station Message Detail Recording (SMDR) Printout Options, Item 5**—This option selectively deletes local call data and allows long distance/toll call data only to be sent out the SMDR port. The type of long distance/toll call data that prints out is selected by long distance prefix codes 0, 1, 00, or 1 or 0.
- **Direct Inward System Access (DISA) Security Code, Item 6**—The optional security code (1 ~ 15 digits) is required for incoming DISA calls to access outgoing CO lines. If the DISA security code is not set in programming, DISA users can access outgoing lines without dialing a security code. This code is not required for DISA internal calls to stations. The DISA security code can also be changed from stations enabled in Program 30. If the DK280 built-in Auto Attendant is installed, make sure to program a DISA security code to prevent Auto Attendant callers from making unauthorized external DISA calls by using the DISA access feature (Dial ✱).
- **Credit Card Call Digit Length, Item 07**—Station users bypassing Toll Restriction with the "0 +" Credit Card Calling feature (Program 43) must dial a predetermined number of digits including the "0." This predetermined number is established with Item 7, and can be 1 ~ 30 digits.

Program 60-8—Call Forward External (Remote Destination Change, Security) ID Code

To change a telephone's External Call Forward destination from outside the system, the person that wishes to change the destination must call into a DISA CO line, enter the telephone's Intercom or

[PDN] + **# 6 7 0** and then enter a security code plus the destination telephone number. The security code (1 ~ 15 digits) for each telephone is set with this program.

Program 69—Verified Account Codes

Up to 300 Verified Account Codes may be added, deleted, or changed with Program 69. Each Verified Account Code can be 1 ~ 15 digits long, but cannot exceed the Account Code length requirement set in Program 60-4. The following programs and options should be considered when establishing Verified Account Codes.

- **Account Code Digit Length**—Program 60-4 sets the digit length that must be dialed for all Account Codes: Forced (Verified/Nonverified) and Voluntary (Verified/Nonverified).
- **Full and Partially Verified Account Codes**—Verified Account Codes can contain the same number of digits (full Verified Account Code) or less (partially Verified Account Code) than the length set in Program 60-4. If partially verified, the first part of the Account Code is verified and the remainder is not. For example, if Verified Account Code 2734 is set in Program 69, but the digit length is set to eight in Program 60-4, then the user must dial 2734 plus any other four digits to enter a partially Verified Account Code. There are many applications for partially Verified Account Codes. For instance, using the code in the example above, the numbers 2734 could be the user's dial restriction code and the remaining four digits could be a customer-client code, a sales order, etc.
- **Verified Account Code Toll Restriction Assignments**—A Toll Restriction Class can be assigned with Program 70 to each of the 300 Verified Account Codes. This feature can be used to change a telephone's Class of Service to allow long distance calls from restricted telephones only when a verified account code is entered before dialing the long distance number. These calls will be recorded with the account code on the system SMDR output.
- **Verified Account Code Dial Requirement**—Assigned on a station-by-station basis in Program 30, LED 14 ON. All Account Codes dialed (Forced or Voluntary) from stations assigned in this program will be verified.
- **Code Change**—Stations selected in Program 30, LED 15 ON, can change Verified Account Codes (VAC) by dialing the following:

  Intercom or [PDN] + **# 6 5 9** + **0 0 0** ~ **2 9 9** + VAC + **Redial**

- **Verified Account Codes: Forced/Voluntary Program Options**—Any station can dial a Voluntary Account Code after accessing a CO line—by pressing the **Speed Dial** button and pressing **5 0** or by pressing the **Account Code** button. Forced Account Code requirements are assigned via station and line program options: stations are assigned in Program 30, LED 08 ON; and lines are assigned in Program 15-7. Stations must dial Verified Account Codes when assigned in Program 30, LED 14 ON. Direct Inward System Access (DISA) callers that access outgoing lines can be required to enter Verified Account Codes with Program 30 (LED 08 ON for Port 99).

Program 70—Verified Account Code Toll Restriction Assignments

A Toll Restriction Class can be assigned with this program to each of the 300 Verified Account Codes assigned in Program 69. Therefore, when a Forced or Voluntary Verified Account Code is dialed at a station, the station temporarily assumes the Toll Restriction Class assigned to the Verified Account Code. When Program 70 is initialized, all Verified Account Codes are assigned as not Toll Restricted (data = 00). Verified Account Code Toll Restriction class assignments are not user programmable; so if the assignments are not known, it is recommended to assign a number (block) of Verified Account Codes to each type of Toll Restriction class. For example:

VACs 000 ~ 050 = no restriction

VACs 051 ~ 100 = total restriction

VACs 101 ~ 150 = Class 1, etc.

Program 71-0—DID/Tie/DNIS/ANI Lines

Defines the DNIS or DID/tie line extension numbers that the system should be able to receive. Each DNIS or DID/tie line extension number can be from 2 to 5 digits; normally the local telephone company and/or the DNIS long distance carrier company will provide a list of these numbers.

Each of the DK280 RCTU, Release 3, processors supports a different quantity of DNIS or DID/tie line extension numbers as follows: RCTUC3/D3 - 500 DNIS numbers, RCTUBA3/B3 - 350 DNIS numbers, and RCTUA3 - 200 DNIS numbers.

To assign a DNIS and/or normal tie/DID line to Program 70-0 assignments: Program 17, LED 05 must be turned ON for the line. In this case, tie lines do not follow Program 04 assignments and DID lines do not follow Program *09 assignments. When this program is used with normal (non-DNIS or non-ANI) tie and/or DID Lines -Program 17, LEDs 06, 07, and 08 must be OFF.

Program 71-(1 ~ 3)—DNIS Number and ANI Line Routing Assignments

Assigns the routing destination of each DNIS and/or normal tie/DID line extension number and/or the routing destination of Automatic Number Identification (ANI) only lines.

IMPORTANT !

Program 71-1 only assigns DNIS numbers to route to selected **[DN]** *buttons and makes them flash when the DNIS number is called. When assigning DNIS numbers to route to Directory Numbers (**[PDNs]**, **[SDNs]**, **[PhDNs]**) using program 71-1, Program *71, *72, and *73 must also be used to assign the telephones, on which the **[DNs]** appear, to ring. When assigning DNIS numbers to route to ACD and DH groups using Program 71, the telephones (and appropriate **[PDN]**, **[SDN]**, or **[PhDN]**) in these groups must also be assigned to ring in Program *71, *72, and *73.*

A DNIS and/or tie/DID extension number and/or ANI only line can be assigned to route one of the following destinations:

- Primary Directory Number **[PDN]** - secondary appearances of this **[PDN]** will also ring if Programmed to ring in Program *71, *72, and/or *73
- Phantom Directory Number
- Distributed Hunt Group
- ACD Group
- Outside telephone number routed externally over the Public Telephone Network
- The DK280 system remote maintenance modem
- Night ringing over the DK280 external page
- The DK280 external voice paging system (Private Network tie lines only)

A DNIS number or ANI only line can be assigned to route to one destination only in each of the three system ringing modes (Day, Day2 and Night); the destination can be unique or different in each ringing mode. For each DNIS tie/DID extension number, the routing destination can be a unique destination or it can be the same destination as that assigned to other DNIS numbers. To assign lines that receive both ANI and DNIS with each call to Program 71-1 assignments: Program 17, LED 05, 07 and 08 must be turned ON for lines that receive DNIS digits only, LED 05 and 08 must be ON.

This program can also be used with non-DNIS or non-ANI tie and/or DID lines to route calls. In this case, the normal Tie digit assignments in Program 04 and DID digit assignments in Program *09 will not be active - Program 17, LED 06, 07, 08 must be OFF and LED 05 must be ON for normal tie/DID lines.

The last address (499, 349, or 199) in Program 71-0 is used to assign ANI only lines to a routing destination. All ANI only lines must be assigned to the same routing destination.

To assign an ANI only tie/DID line to Program 71-1 assignments: Program 17, LED 05 must be turned OFF and LED 07 and 08 must be ON for lines that receive ANI digits only.

Program 71-4 - Dialed Number Identification Service (DNIS) Number and ANI Only Lines Voice Mail ID Assignments

This Program assigns a Voice Mailbox ID (VMID) number to each DNIS/tie/DID extension number and/or ANI only lines. This allows each DNIS/tie/DID extension number and/or ANI only lines to be routed to a unique Voice Mail box when the number directly rings or is Call Forwarded to the Voice Mail system. When a DNIS/tie/DID extension number or ANI line rings a station that has call forwarding set to Voice Mail, the DNIS/tie/DID extension or ANI VMID is sent to the VM machine (if programmed in Program 71-4). If a DNIS/tie/DID extension or ANI VMID is not programmed, the Call Forwarding station's VMID is

sent to the voice mail machine when the DNIS/tie/DNIS extension or ANI call forwards to VM. This program can also be used with non-DNIS tie and/or DID lines to assign VMID digits to normal tie or DID numbers.

The last address (499 for RCTUC3/D3, 349 for RCTUBA3/B3, and 199 for RCTUA3) in Program 71-4 can be used to assign a VMID code to ANI only lines. All ANI only lines will be directed to the same Voice Mailbox.

To assign an ANI only tie/DID line to Program 71-4 assignments: Program 17, LED 05 must be turned OFF and LED 07 and 08 must be ON for lines that receive ANI digits only.

Program 71-5—Dialed Number Identification Service (DNIS) Number Name Display

This program is used to assign names to each DNIS number. The names for each DNIS/tie/DID extension number is normally supplied by the customer. Each DNIS name can be up to 16 alphanumeric characters. The DNIS/tie/DID extension name will display on a telephone's LCD when the DNIS/tie/DID extension number rings the telephone directly or is transferred, Call Forwarded, or Hunted to the telephone.

To assign a tie/DID line to Program 71-5 assignments: Program 17, LED 05 must be turned ON for lines that should display DNIS/tie/DID extension name tags. When a tie/DID line receives both DNIS and ANI digits on the same call, Program 17, LED 06 determines what information, DNIS extension name or ANI number, will display as a priority when the line rings incoming to the DK280.

This program can also be used with non-DNIS or ANI tie and/or DID lines to display names, associated with the tie or DID numbers, on telephone LCDs. In this case, the normal tie digit assignments in Program 04 and/or DID digit assignments in Program *09 will not be active.

IMPORTANT !

1. *An individual telephone user can disable/enable the DNIS name display by using the Mode 60/61 function on his/her LCD telephone.*
2. *The DNIS extension name can be assigned or not assigned to display as a priority over the ANI display (in Program 17, LED06) when both ANI and DNIS digits are received on the same call.*
3. *If a name is not assigned to a DNIS number, DN:XXXX will display on telephone LCDs when the DNIS/tie/DID line rings into the DK280 system (where XXXX = actual DNIS/tie/DID digits received).*

Program *71, *72, *73—[DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments

Primary/Secondary/Phantom Directory Number and DH Group Telephone Ringing assignments:

- This program assigns telephones to ring when a **[PDN]**, **[SDN]**, or **[PhDN]** that appears on the telephone is dialed from another telephone (direct or transferred call).
- This program assigns telephones to ring when a call is routed from a tie, DID, DNIS, DNIS/ANI or ANI only line to a **[PDN]**, **[SDN]**, or **[PhDN]** that appears on the telephone.
- This Program assigns telephones to ring when a **[PDN]** or **[SDN]** that appears on the telephone is included in a Distributed Hunt Group (DK280 Release 3.1 and above).

IMPORTANT !

*120 Telephones (maximum) can be programmed to ring for any given **[PDN]/[SDN]** or **[PhDN]** in Program *71, *72, and *73 combined.*

For the above case:

- Telephones can be programmed to immediately Ring (*71 assignments), delay ring after 12 seconds (*72 assignments), or delay ring after 24 seconds (*73 assignments) for each **[PDN]**, **[SDN]**, or **[PhDN]** button that appears on the telephone.
- The called **[PDN]**, **[SDN]**, or **[PhDN]** button must be programmed to appear (Program 39) on all Telephones that should ring.
- Default (Initialized) assignments are: **[PDNs]** are Programmed to immediately ring their respective telephones in Program *71; no other default ringing assignments are made. Example: **[PDN]**200 will ring the telephone connected to logical Port 000. (Program 04 000 = 200. 200 is the default **[PDN]** for logical Port 000).

Program 72—Dialed Number Identification Service (DNIS) Number Network Table Assignments

This program defines the external Network routing numbers that can be assigned DNIS/tie/DID extension numbers in the Day, Day2, or Night ringing mode. This assignment will cause incoming DNIS/tie/DID calls to route (forward) back out over a public, or private, telephone network to a pre-assigned telephone number.

Each of the DK280 RCTU, Release 3, processors support a different quantity of DNIS Network numbers as follows: RCTUC3/D3 - 300 DNIS Network routing numbers; RCTUBA3/BB3 - 200 DNIS network routing numbers; and RCTUA3 - 100 DNIS Network routing numbers.

To assign a tie/DID line to Program 72 assignments: The DNIS/tie/DID extension number must be assigned to route to the appropriate Network routing number in Program 71-1 (#300 ~ #599).

This program can also be used with non-DNIS or ANI (only), tie and/or DID Lines to assign normal incoming tie/DID calls to route back out over the public, or private telephone network to an external telephone number.

IMPORTANT !

1. *Tie/DID lines used for DNIS network routing must be enabled with tandem (two-CO-line) connection with Program 15, Code 5.*
2. *DNIS Network routing numbers will not be restricted by DK280 Toll Restriction assignments.*
3. *Tie/DID lines must have LED05 ON in Program 17 to use the DNIS routing assignments in Program 71 and 72.*

Program 74—System NT Button Lock Password

DK280 system provides three system ringing modes (Day/Day2/Night). The system ringing modes are controlled by the **NT** button which is programmed on a telephone or attendant console flexible button (Program 39). Each ringing mode allows incoming calls to be routed to different destinations. An NT Lock button can be assigned (Program 39) to lock the system into a ringing mode. To lock the system ringing mode requires a password. The password for each NT(1 ~ 4) button is assigned in this program. Attendant consoles and stations (assigned in Program *36) can also change the **NT Lock** button Password using a special access code. One password is provided for each of the four **Tenant Line** group **NT** buttons.

IMPORTANT !

1. *To lock a system into ringing mode requires two buttons on the telephone/attendant console, the **NT** button and the **NT Lock** button. These buttons can appear on any telephone(s) or attendant console(s). The **NT** button switches the (Tenant/system) lines into the desired ringing mode and the **NT Lock** (used in with the Night Lock password) button locks the **NT** button into that ringing mode.*
2. *Programs related to Program 74 are: Program 39—**NT** Buttons and **NT Lock** Buttons; Program *36—system ring mode locking password change station assignment; Program *15—CO line Tenant assignments; and Program 77-3—Tenant Night ring over selected External Page Zones.*

Program 76-1(X-Y)—RSIU/RSIS/RMDS Port Assignments

Assigns each installed RSIU port to a function. Where X identifies the RSIU/RSIS/ RMDS Port No.1 ~ 4 and Y identifies the RSIU port function as shown below:

- Y=1, TTY or RMDS modem (see Note 4 on next page—Program 77-1, LED 14).
- Y=2, SMDR
- Y=3, MIS or SMIS
- Y=4, SMDI
- Y=5, Open Architecture
- Y=0, No function - this should be used for any of the four RSIU/RSIS/RMDS ports that are not used.

Notes:

1. *Function codes set in Program 76-1X-Y will override RSSU, PIOU, and/or PIOUS function codes (41, 42, 43) set in Program 03.*

2. *The TTY and Modem function cannot operate on separate RSIU/RSIS/RMDS/ RSSU/PIOU/PIOUS ports simultaneously; if both functions are programmed at the same time on separate ports, the function of the lowest numbered RSIU/RSIS/ RMDS port (TTY or Modem) will be active.*
3. *System power must be turned off/on or Program 91-2 must be run to transfer Program 76-1 anytime Program 76-1 is changed.*
4. *If code Y=1 is set to enable the RSIU, RSIS or RMDS to function as a TTY RS-232 maintenance port, turn Program 77-1, LED 14 off. To enable the RMDS remote modem operation, Program 77-1 LED 14 must be ON.*

Program 76-2(X-Z)—RSIU/RSIS/RMDS Port Assignments

Assigns each installed RSIU port to operate at a specified transmission rate. Where X identifies the RSIU/RSIS/RMDS Port No.1 ~ 4 and Z identifies the RSIU/RSIS/RMDS port transmission rate in bits-per-second (bps) as shown below.

- Z=1, 9600 bps
- Z=2, 4800 bps
- Z=3, 2400 bps
- Z=4, 1200 bps

Note:

The sum of the transmission rates of equipped RSIU/RSIS/RMDS ports cannot exceed 9600bps. Ports assigned "no-function" (code 0) in Program 76-2X-Y will not be included in the transmission rate sum. The RMDS will only function at 1200 or 2400 bps (see Program 77-1 LED15).

Program 77-1—Peripheral Options

(Initialized data reads all LEDs OFF.)

- **Door Lock Time, LED 20**—The Door Lock Relay contact may be programmed to operate for either three or six seconds (applies to PIOU, PIOUS, PEPU, DDCB, and HDCB door lock controls).
- **Port Number/Door Phone/Lock Control Units, LEDs 16 ~ 19**—Door phone/lock existence is defined by this program. Door phone/lock controllers (DDCBs and/or HDCBs) can only exist at Ports 004, 012, 020 and 028, and can only be installed on Circuit 5 of a PDKU, RDSU, PEKU and/or PESU. PDKUs and RDSUs support DDCBs, but not HDCBs. PEKUs and PESUs can support HDCBs, but not DDCBs. After assignment of a DDCB or HDCB, door phone numbers (#151 ~ #159, #161 ~ #163) will effectively replace the station number assignment in Program 04. The door lock option is set via Program 77-2.
- **RMDS or IMDU Modem, LED 14**—This program enables the DK280 built-in maintenance modem function: RMDS or IMDU. If the RMDS or IMDU remote modem is used, turn "On" LED 14, if the RMDS or IMDU is not used, turn "Off" LED 14. Only one DK280 built-in modem RMDS or IMDU can be used in the DK280; if both are installed, RMDS will be accessed when a CO line direct rings the modem or is transferred to the modem by dialing **Cnf/Trn+#19**.

  If LED 14 is off, the RSIU Port (1~4) which is set for TTY operation (Code 1 in Program 76-1) will operate as a local RS-232 maintenance port. If RSIU is not configured as TTY, then the PIOU/PIOUS/RSSU that has code 41 set in Program 03, will operate as a local TTY maintenance port.

  Other system Programs that are related to the system modem are: Program 76, RMDS/TTY assignments on RSIU PCB; Program 78-51~53, system CO line to modem ringing assignments; Program 71-1, DNIS line to modem ringing assignments; Program *09, DID line to modem ringing assignments; Program 77-1, LED 15, RMDS modem Protocol/speed assignments.
- **RMDS Protocol, LED 15**—This program sets the RMDS communications standard type to CCITT/V.22bis (2400bps) or Bell 212A (1200bps). The standard set in this program must match the standard of the modem that will be used to communicate with the DK280 RMDS.

  If the RMDS modem standard should be 2400bps/CCITT/ V.22bis, turn LED 15 on; if the RMDS standard is a 1200 bps/Bell 212A, turn LED 15 off. Most Hayes compatible modems will function with either standard; check with the modem manufacturer's documentation to verify which protocol should be used. When the system is initialized the Bell 212A (1200 bps) standard is set (LED 15 off).

Note:
Program 77-1, LED 15 does not apply to the IMDU modem, the IMDU data speed (300bps or 1200 bps) is set on the PIOU or PIOUS PCB using hardware switch SW2.

- **280Admin/Backup, LED 10**—Enables the system to Upload/Download the RCTU RAM data base using Toshiba 280Admin and/or 280Backup software program. 280Admin/Backup will automatically turn LED 10 ON when the 280Admin/Backup PC communicates with the DK280. LED 10 should be OFF if the maintenance PC is using standard communication software (such as Procomm™) to program the DK280.

- **Door Phone Ring On External Page, LED 08**—If a door phone button is pressed, a ring tone can be enabled or disabled to external paging when the system is in the Night mode. Activation of a Tenant 1 **Night Transfer** (**NT**) button is required to activate this feature. The Tenant 2 ~ 4 **Night Transfer** (**NT**) buttons do not apply to door phones.

- **Door Lock Relay/External Page Relay, LED 07**—A relay on the PIOU, PIOUS, or PEPU can be assigned to operate with the Door Lock function or with External Page for mute control. The door lock button is assigned in Program 39; the door lock activation time is assigned in Program 77-1. This door lock function is not associated with the DDCB or HDCB door lock, but is an addition to them.

- **NT Relay, LED 06**—A relay located on the PIOU, PIOUS or PEPU can be assigned to operate in one of two Night Transfer modes (see next item, MOH/NT Relay). In one mode, the relay will activate for one second, then be idle for three seconds when a line rings (incoming) while the system is in the Night mode. The intended application is to control an external ringing device at night. Program 78 or Program 71 (1~3, Code #271) must have Ring Over External Page activated for this feature. In the second mode, the relay will operate continuously while the NIGHT mode is activated. One application for this mode is to control an external answering machine.

- **MOH/NT Relay, LED 05**—A relay on the PIOU, PIOUS, or PEPU can be assigned to operate in one of two applications. A choice must be made between use for Night Transfer application (see NT Relay, LED 06) or Music-on-Hold (MOH). If used for MOH, the relay will activate when any trunk or station is placed on hold. The intended application is to control a tape player which can be used as a Music-on-Hold source.

Program 77-2—Door Phone Busy Signal and Door Lock Assignments

(Initialized data reads all LEDs OFF).

- **Door Phone Ring Count, LED 20**—The number of times that a door phone will ring digital and electronic telephones is set with this LED. Light the LED for one ring; turn it OFF for five rings. The default is five rings. See Program 79 to assign which telephones will be rung by door phones.

- **Door Phone Busy Out, LEDs 01, 02, 03, 05, 06, 07, 09, 10, 11, 13, 14, and 15**—Each door phone controller (DDCB or HDCB) can interface with up to three door phones. The system treats each controller as a station. Therefore, this is quite different from all other station arrangements using telephones. Only one door phone can be in used at one time. The system does not automatically know how many door phones are connected to each DDCB or HDCB, so it must be told. This program is used to enter that information so that a caller will receive fast busy tone if the called door phone does not exist. Door phones 1A, 1B, 1C are numbered #151, #152, #153, respectively, and are connected to the DDCB or HDCB at Port 004. Door phones 2A, 2B, 2C are numbered #154, #155, #156, respectively, and are connected to the DDCB or HDCB at port 012, etc.

- **Door Lock Assignments, LEDs 04, 08, 12, and 16**—Each B-jack on the DDCB and HDCB output can be configured for door lock control. Door lock control buttons for door locks are assigned to electronic or digital telephones in Program 39. Door lock activation time is set in Program 77-1. Each DDCB requires one PDKU or RDSU circuit, and each HDCB requires one PEKU or PESU electronic telephone circuit. These door locks are not associated with, but are in addition to the door lock control provided by the PIOU, PIOUS, or PEPU PCB.

Program 77-3—Night Ringing over PIOU External Page Zones

Each tenant's CO lines can be assigned to ring over selected PIOU external page zones during the NIGHT mode. Lines must be allowed to Night Ring over External Page in Program 78 or Program 71 (1~3,

Code #271) for this feature to work. Tenant assignments are made in Program *15.

Program 77-4, LED 01/LED 02—RSIU Open Architecture (OA) Data Output Assignments (Caller ID/DNIS/ANI/OA Output Options)

This program is used to enable Caller ID, Automatic Number Identification (ANI), and/or Dialed Number Identification Service (DNIS) Numbers (received) to be sent from the RSIU Open Architecture (OA) port. The OA port sends MIS data for ACD calls (only) along with ANI, Caller ID and/or DNIS Numbers received on ACD calls depending on LED 01 and LED 02 option settings. ANI, Caller ID and/or DNIS numbers on non-ACD calls will not be sent out the OA port for non-ACD calls.

Turn LED 01 ON if the OA port should send Caller ID and/or ANI information for ACD calls.

Turn LED 02 ON if the OA port should send DNIS Number (not DNIS NAME) for ACD calls.

Note:

1. *Program 77-4 allows LED 01 and LED 02 to be turned ON simultaneously to allow Caller ID, ANI, and DNIS numbers received on ACD calls to be sent from the OA port.*
2. *The system will initialize with LED 01 and 02 OFF - no ACD Caller ID, ANI, or DNIS information will be sent from the OA port.*

Program 78—Ground/Loop Start CO Line Special Ringing Assignments

- **Ring Over External Page During Night Mode, Feature 1**—This program selects which ground/loop start CO lines will activate ringing over external paging facilities during the NIGHT mode (for Tenants 1 ~ 4). The NT Relay on the PIOU, PIOUS, or PEPU will also be activated if it is in the 1-second ON/3-seconds OFF mode.

- **DISA CO Line Assignment, Feature 2**—This program assigns ground/loop start CO lines to be used with the Direct Inward System Access (DISA) features. These lines may be set for DISA operation during the different system modes of DAY, DAY2, and NIGHT. A line will switch to normal ringing after ten seconds if the outside caller does not use the DISA feature. Normal function of these lines occurs for outgoing calls.

  Note:
  An optional security code for DISA outgoing lines calls is available via Program 60-6.

- **Ring IMDU or RMDS Maintenance Modem, Feature 5**—The IMDU or RMDS Remote Maintenance modem can be directly accessed by incoming ground/loop start CO lines assigned in this Program. Different alternatives are available for the system modes of DAY, DAY2, and NIGHT. If none of these are selected, the IMDU or RMDS can still be reached by dialing a modem **[DN]** with the DISA feature or by a Ring Transfer from the DSS console attendant or any other station. The IMDU or RMDS modem must be enabled with Program 77-1, LED 14-ON.

- **Built-in Auto Attendant CO Line Assignment, Feature 6**—This feature selects ground/loop start CO lines for Auto Attendant operation. There is no limit to the number of lines which can be assigned with Auto Attendant. Different alternatives are available for system modes DAY, DAY2, and NIGHT.

Program 79—Door Phone Ringing

(Initialized data reads all LEDs OFF.)

- **Muted Ring to Busy Electronic and Digital Telephone, LED 20**—If all electronic and digital telephones are busy and a door phone button is pressed, a muted ring tone can be sent to selected digital and electronic telephones, as defined with this program. (Only the lowest port in the appropriate ringing group will mute ring.)

- **Door Phone Ring, LEDs 01 ~ 12**—When a door phone button is pressed, selected digital and/or electronic telephones will ring as assigned with this program. See Program 77-2 for an explanation of the door phone A, B, and C numbering scheme. (See Program *79 for door phone to **[DN]** flashing assignments.)

Program *79—Door Phone to [DN] Flashing Assignments

Door phones can be assigned to ring and flash Directory Number buttons/LEDs (**[PDNs]/[SDNs]**, and **[PhDNs]**). This program assigns which **[DN]** will flash when a door phone button is pressed to ring a . Program 79 must be used in conjunction with Program *79 to cause the telephone (on which the flashing **[DN]** appears) to ring when the door phone button is pressed. Each door phone can be assigned to flash

one **[DN]** - that **[DN]** button can be assigned to appear and ring on up to 120 telephones.

Program 80—Electronic and Digital Telephone Ringing Tones

Distinctive system ringing sends a different ring tone for CO (loop, ground or DID) line ringing than that for Directory Number, intercom, or tie line ringing. In addition, CO line (loop, ground or DID) ringing at electronic and digital telephones can be different from one phone to another. "Ring-transfer" ring tone pitch (frequency) is also changed with this assignment. Three choices are available with Program 80; see the record sheet for the tone frequencies available with each choice.

Programs 81 ~ 89—Ground/Loop Start/CO Line/Station Auto Attendant, Attendant Console, and Distributed Hunt Group Ringing Assignments

These programs assign CO lines to ring station **[PDN]** ports and/or Distributed Hunt group port reference numbers (900 ~ 915). A wide variety of line ringing to stations can be programmed into the system. There are nine categories: Day Immediate, Day Delay1, Day Delay2, Day2 Immediate, Day2 Delay1, Day2 Delay2, Night Immediate, Night Delay1 and Night Delay2. Day, Day2 and Night refer to the **Night Transfer** button's three modes. Delay1 is a 12-second delay of ringing signal to a standard, electronic, or digital telephone; Delay2 is a 24-second ring delay. The delay functions are mainly used in Centrex applications but can be used for other situations. If delayed ringing occurs, the station that initially rings will continue to ring with subsequent delayed ring stations. Initialized data reads all LEDs ON for Port 000 in Program 81 and Port 001 in Program 87; all other LEDs are OFF.

A maximum of 120 telephones per CO line can be assigned to ring simultaneously in any combination of each of the Day, Day2 or Night ringing assignments. In Release 3, Program 81 ~ 89 only assigns telephones or a Distributed Hunt group to each CO line that will ring. Program *81, *84, and *87 must be used to assign which **[DN]**, **[PDN]**, **[SDN]**, or **[PhDN]** should flash when the telephone rings but Program *81, *84, and *87 data should be blank for CO lines that ring VM ports.

- **Built-in Auto Attendant (AA)-Delay Answer Ringing Option**—can be programmed to answer incoming calls on a delayed ringing basis in either the Day, Day2, or Night mode.

  For example, to have a line answered by the AA on a Delay1 or Delay2 basis during the Day mode, first assign the line for the AA feature in Program 78-61.

  To have the line answered by AA on a Delay1 basis, assign the station ports that must immediately ring with Program 81. Also, assign the **[PDN]** or **[PhDN]** that must flash in Program *81. Next, assign the line to ring any other station port with Program 82. To have the line answered by AA on a Delay2 basis, assign the station ports that must immediately ring with Programs 81 and stations that should ring 12 seconds after the Immediate ring stations with Program. Then assign any other station port with Program 83. The stations assigned to delay ring in Program 82 must also be equipped with the **[DN]** button that is assigned to flash in Program *81 (see Program 81 ~ 89 record sheet notes).

- **Attendant Console Load Sharing Option**—Assign all CO lines (Loop, Ground and DID) that should alternately ring between multiple attendant consoles to ring the respective console ports in Program 81, 84 and 87 (see Chapter 5—Station Apparatus, sub-section 5.7.2).

Program *81, *84, and *87 - Ground/Loop Start/CO line to [DN] Button LED Flash Assignments

Ground/loop start CO lines can be assigned to ring and flash Directory Numbers (**[PDNs]**/**[SDNs]** or **[PhDNs]**). This program assigns which **[DN]** will flash when a ground/loop start CO line rings direct incoming to the DK280 system. Program 81-89 must be used (in conjunction with Program *81/*84/*87) to ring the telephone on which the flashing **[DN]** appears. Each ground/loop start CO line can be assigned to flash one **[DN]** (**[PDN]**/**[SDN]** or **[PhDN]**) that **[DN]** button can be assigned to appear and ring on up to 120 telephones.

- Program *81 is used to assign which **[DN]** will flash when the CO line rings during the system Day mode.
- Program *84 is used to assign which **[DN]** will flash when the CO line rings during the system Day2 mode.
- Program *87 is used to assign which **[DN]** will flash when the CO line rings during the system Night mode.

- Programs 81, 82, 83, are used to assign Immediate Ring, 12 Sec. delay Ring, 24 Sec. delay Ring in the Day mode, respectively, to telephones with **[DNs]** assigned to flash in Program *81
- Programs 84, 85, 86, are used to assign Immediate Ring, 12 Sec. delay Ring, 24 Sec. delay Ring in the Day2 mode, respectively, to telephones with **[DNs]** assigned to flash in Program *84
- Programs 87, 88, 89, are used to assign Immediate Ring in the Night mode, 12 Sec. delay Ring, 24 Sec. delay Ring, respectively, to telephones with **[DNs]** assigned to flash in Program *87

IMPORTANT !

1. *A maximum of 120 telephones can be programmed to ring for any given CO line in Programs 81-89.*
2. *Data in Program *81, *84 and *87 must be blank for all CO lines that direct ring VM ports via Program 81 ~ 89.*

Program 93—CO Line Identification

Assigns alphanumeric names (such as "WATS BAND 5", "FX TO NY," "MR JONES," etc.) to lines. The names can be up to 16 characters each, and display when the line is being used by an LCD station. When programmed to display, Caller ID, DNIS, ANI, and ACD call information will display in place of CO line Alpha identification data.

Program 97—Printing Program Data Through SMDR

Contents of each program can be sent to the SMDR port for a hard copy printout.

- **Setting Date, Time and Day**—The current date, time, and day of the week can be set from an electronic or digital telephone connected to logical Port 000 (usually Station 200) or from any attendant console. The programming electronic or digital telephone at physical Port 005 on the 280Admin PC cannot make these settings.

9.3 Toll Restriction

The following provides the programmer with an overview of the Toll Restriction feature and step-by-step instructions to fill in the Toll Restriction System Record Sheets.

9.3.1 Toll Restriction Methods

Toll Restriction screens and selectively restricts outgoing calls using three different methods. Each type of restriction can be programmed for individual stations. Toll Restriction can also be enabled/disabled for each outgoing line in the system.

IMPORTANT !

DK280 requires that a "1" be dialed before an area code to provide simple, three, or six-digit toll restriction.

Simple Toll Restriction

The first method, Simple Toll Restriction, only involves the first digit dialed. The system can be programmed to reject outgoing calls beginning with 0 or 1 (see Program 48).

Three-digit Toll Restriction

The second method, Three-digit Toll Restriction, involves the system analyzing the area code dialed, and selectively allowing/disallowing outgoing calls following the criteria defined in Area Code Tables (see Program 46, Codes 2 ~ 4).

Six-digit Toll Restriction

The third method, Six-digit Toll Restriction, involves the system analyzing the area code and the office code, and selectively allowing/disallowing outgoing calls following the criteria defined in Area Code Tables and Office Code Tables (see Program 46, codes 2 ~ 4 and 6 ~ 8).

Note:

Standard telephones that are Toll Restricted should always be forced to use Least Cost Routing (LCR) to place outside calls. This will prevent Toll Restriction defeat when the RRCS circuit times out.

9.3.2 Toll Restriction Features

For description purposes, Toll Restriction is divided into several components, or subfeatures. The subfeatures operate independently of the restriction methods just described, although they may employ these methods.

Station Priority Classes 1 ~ 8

Eight classes of Toll Restriction can be defined to assign different levels of priority to individual stations with RCTUC/D. Four classes are supported with RCTUA, RCTUBA/BB, and RCTUB. Classes can be defined so each is progressively more restrictive by allowing or denying specific area or office codes, calls to long distance information, international calls, and operator assisted calls (Programs 46-10 ~ 80).

Office Code Exception Tables

Class 1 ~ 8 restrictions can be further modified by defining as many as eight exception tables to allow or deny access to specific office codes that fall within previously restricted area codes (Program 47). Exception office code access is accomplished with the Six-digit Toll Restriction method described earlier.

Emergency, Information, and Toll-free Long Distance Toll Restriction Override

Toll Restricted stations may be allowed to dial special codes such as 911 for emergency response, 1-411 or 411 for information, or 800 prefix toll-free calls (Program 46).

IMPORTANT !

Always be sure to provide access to emergency numbers such as 911.

Toll Restriction Override by System Speed Dial

System Speed Dial numbers can be programmed to override Toll Restriction (see Basic System Features, Program 10-1).

Toll Restriction/Traveling Class Override Codes

Up to two Toll Restriction Override Codes can be defined. When dialed at a toll restricted station, these codes enable the station user to override toll restrictions defined at the station (Program 44-1 ~ 8 or 45-8 ~ 9). Codes may be changed by stations chosen in programming (see Basic System Features, Program 30).

Special Common Carrier Authorization

Toll Restriction can be programmed to recognize Other Common Carrier (OCC) telephone numbers, directory numbers, authorization codes, and Centrex/PBX access codes. The system starts inspecting numbers for Toll Restriction purposes after the recognizable code is dialed (Program 45-3 ~ 6).

9.3.3 Completing the Toll Restriction System Record

The following instructions explain how to complete System Record Sheets used to program the Toll Restriction feature. They are arranged in the same order in which the tables appear in the Toll Restriction System Record Sheets. The following instructions are intended to give a concise general definition of the programming characteristics defined by each record sheet.

Notes:

1. *On each record sheet, mark an X in the space provided to indicate that a choice is selected. Unless otherwise specified, this indicates the LED is lit. When appropriate, indicate digits to be entered using the station dialpad.*
2. *Initialized data and considerations are documented when applicable.*

Program 40—Station CO Line Access

Any station can have access to as many lines as desired. Any station denied access (either to make a call or to answer a call) to a line cannot seize it by dialing either an access or pickup code or by using a CO line button. This also denies access via Least Cost Routing. Use this program to divide lines for Tenant Service. Use Program 40 to deny CO line call pickup. If only outgoing access is to be prevented, use Program 41.

Program 41—Station Outgoing Call Restriction

Each station (or Direct Inward System Access (DISA) CO line) can be restricted from outgoing access to each line. If so restricted, that station can still answer a ringing line or pick up a call on hold. All Call Pickup functions operate normally. This does not deny access via LCR. Automatic Busy Redial (ABR) overrides Program 41.

Program 42-0—CO Line to PBX/Centrex Connection & PBX/Centrex Access Codes

The system recognizes PBX/Centrex access codes via Programs 42-1 ~ 8. Program 42-0 informs the software which lines are connected to a PBX or to Centrex. This combination allows Toll Restriction and Speed Dialing to function properly. Initialized Program 42-0 data reads all LEDs OFF for all lines. Program 42 initialized data assigns no access codes to PBX groups.

Program 43—0 + Credit Card Dialing Option

Selected station users can bypass their normal Toll Restriction assignments by dialing "0" immediately after seizing a CO line. Both the station and the line must be enabled for this feature with this program.

After seizing the line, the station user is required to dial a specific number of digits, which includes the leading 0. This digit-length requirement forces the user to dial a telephone number or a telephone number plus a credit card number. As a result, these calls are billed to the credit card, and operator-placed calls are not billed to the line. The digit length, 1 ~ 30 numbers, is set in Program 60-7. This length is determined by the system's call routing method.

When not dialing via LCR, the digit length should usually be 26 plus the sum of the digits in the telephone (11) and credit card (14) numbers.

IMPORTANT!

More digits than the length set in Program 60-7 are allowed to be dialed; there is no limit to the amount of digits that can be dialed.

Program 44-1 ~ 8—Toll Restriction/ Traveling Class Override Codes

Each of the Toll Restriction classes established in Program 46 can be assigned a code with this program. If one of these codes is entered at a station, the station will assume the code's class for that call. When the call is complete, the station returns to its regular class assigned in Program 48. The Traveling Class code data is not sent out the SMDR port and will not print out on station call records. The RCTUC/D common control unit can support eight Toll Restriction classes, while the RCTUA, RCTUBA/BB and RCTUB, RCTUC/D units can each support four classes.

Note:

Stations selected in Program 30, LED 16 ON, can add, change, or delete the codes set in Program 44-1 ~ 8.

Program 44-91 ~ 93—Emergency Bypass of Forced/Verified Account Codes

This program exempts numbers up to four digits, such as the emergency 911 number, from Verified Account Code dialing restrictions. As many as three of these special numbers can be programmed. When dialed, these numbers will be sent out immediately, bypassing any Verified Account Code dialing restrictions set in Programs 69 and 30, button/LEDs 8 and 14, respectively. If lines are behind Centrex or PBX, program the appropriate one- or two-digit Centrex/PBX line access code in front of the emergency number. Example: If the PBX line access code is 9, then program 9911 in Program 44-91 ~ 93 to allow 911 to bypass Forced Account Code dial requirements.

Notes:

1. *If Verified Account Codes assigned in Program 69 conflict (duplicate) with emergency or other type telephone numbers set in Program 44-91 ~ 93, Program 44-91 ~ 93 has priority.*
2. *Toll Restriction and Direct Inward System Access (DISA) parameters requirements are not affected by this program.*

Program 45-1—LCR/Toll Restriction Dial Plan

A dial plan must be defined for the Toll Restriction software to recognize the typical dialing sequence of long distance/local calls made from the system's home area code, and to identify area and office codes. The dialing plan defines several components of a telephone number for long distance calling:

Before January 1, 1995:

- **Long Distance Prefix 1**—In most areas, a 1 must be the first digit dialed for long distance calling. In such areas, the area code is dialed right away. The dial plan defines whether the prefix 1 is required for a particular installation's long distance calling.

- **Area/Office Code Numbering Schemes**—In most places, the middle digit of an area code is 0 or 1, and the middle digit of an office code is 2 ~ 9. Toll Restriction examines the first three-digit sequence dialed and determines whether it is an area code or an office code.
  - ♦ If the middle digit is 0 or 1, then the sequence is an area code.
  - ♦ If the middle digit does not equal 0 or 1, then the sequence is an office code, and the office code parameters of the selected dialing plan apply.

  An exception to this rule exists. In some places, area and office codes are interchangeable. The middle digit is always 0 or 1 (see Code 3 selection). In such a case, the system only knows that three digits dialed are an area code if 1 is

dialed before them. If 1 is not dialed first, the system knows the three digits are an office code. The dial plan defines the numbering scheme applicable to the installation site.

Office Code elements are defined as follows:

- N = 2 ~ 9
- X = 0 ~ 9
- NXX = interchangeable with area code; 2nd digit may be 0 or 1.
- NNX = not interchangeable with area code; 2nd digit may not be 0 or 1.

Effective January 1, 1995 in North America:

- Prefix 1 is used only when followed by an area code. The area code can be the home area code, depending on the telco's plan in that state.
- Area/Office code numbering schemes – All area codes and office codes will have the format NXX, making the new plan have both interchangeable area codes as well as interchangeable office codes.
- Intra-area code toll calls can be according to a seven-digit only plan in some states. In this case, a seven-digit call may be a local call or a toll call. Therefore, only particular office codes can determine a toll call for a seven-digit call, not the dial plan in 45-1.

Special Common Carrier Number and Digit Length

For SPCC numbers of the form 950-XXXX, this program can allow credit card calling but will restrict the maximum number of digits dialed to prevent defeat of Toll Restriction.

Selections

On the record sheet for Program 45-1, choose one of the following dial plans by marking an X in the space next to the code.

- Select Plan 1 for dialing plan AC+NXX/1+NNX if the installation is in a location where a user places a long distance call to a destination outside the area code without dialing 1 before dialing the area code. The user places a long distance call to a destination in the same area code by dialing 1 directly before the office code.

  Note:

  When using this plan, Strata DK280 Release 3 defaults to Plan 7; Release 1 and 2 software defaults to Plan 1.

  - The first three digits of a ten-digit number is an area code if the middle digit is 0 or 1.
  - Pressing the first three digits immediately after a 1 in an eight-digit string is an office code
  - A seven-digit string starting with an office code is a local call.

- Plan 2 for dialing plan 1+AC+NXX/1+NNX should be selected if the installation is in a location where a user places a long distance call to a destination outside the area code by dialing a 1 before dialing the area code. The user places a long distance call to a destination in the same area code by dialing a 1 directly before the office code

- When using this plan, the system recognizes the following:
  - The first three digits following a 1 in an 11-digit number are an area code, if the middle digit is 0 or 1.
  - The first three digits dialed immediately after a 1 in an eight-digit string is an office code.

- Select Plan 3 for dialing plan 1+AC+NXX/NXX if the installation is in a location where a user places a long distance call to a destination outside the area code by dialing a 1 before dialing the area code. The user places a long distance call to a destination in the same area code by simply dialing the number, without a 1 in front. The office codes are interchangeable. The system differentiates between them whenever it sees the digit 1 dialed.

  When using this plan, the system recognizes the following:
  - If 1 is the first number entered in an 11-digit string, the next three digits are an area code.
  - A ten-digit string is not recognized.
  - The first three digits in a seven-digit string are an office code. (There is no distinction between local call dialing and long distance dialing within the area code.)
  - Digits 5 ~ 7 in an 11-digit string may be an interchangeable office code as well.

- Plans 4, 5 and 6 are not used in the United States.

- Plan 7 for dialing plan 1+NXX+NXX/NXX should be selected if the installation is in a location where a user places a long distance call to a destination outside the area code by dialing a 1 before dialing the area code.

The user places a local code plus distance call to a destination in the same area code by simply dialing the number, without a 1 in front. The area and office codes may be interchangeable. The system differentiates between them whenever it sees the digit 1 dialed. This plan is for the new North American Numbering Plan (NANP), which is mandatory effective January 15, 1995. Plan 7 supports five-digit Carrier Access (CA) codes (10XXX) compared to seven-digit CA codes.

Note:
When using this plan, Strata DK280 Release 3 defaults to Plan 7; Release 1 and 2 software defaults to Plan 1.

When using this plan, the system recognizes the following:

- If 1 is the first number dialed in an 11-digit string, the next three digits are an area code. A ten-digit string is not recognized.
- Digits 2 ~ 4 and 5 ~ 7 in an 11 digit string are of the format NXX and are interchangeable.
- The first three digits in a seven-digit string are an office code. (There is no distinction between local call dialing and long distance dialing within the area code.)

- Plan 8 is same as Plan 7 except a new 7-digit carrier access code, if dialed, must be of the format 101YXXX (where Y is 0, 5 or 6; X is 0 to 9).
- Plan 9 is same as Plan 7 except a new 7-digit carrier access code, if dialed, must be of the format 101XXXX (where X is 0 to 9).

Note:
Program 45-1 must be completed for the Least Cost Routing feature to function properly. See LCR Program 50-1.

IMPORTANT !

Although area codes and office codes of the form XXX (where X is 0 to 9) are allowed to be programmed in the area code and office code tables for Toll Restriction and Least Cost Routing purposes. Only area codes of the form N(0/1)X are valid on call processing for the old dial plans 1, 2, 3. New area codes NXX are valid only in new NANP dialing plans 7, 8, 9. Office codes of the form NNX and NXX are valid on call processing for the old dialing plans 1, 2, 3, and new dialing plans 7, 8, 9, respectively. For international calls, area code 011 and office codes XXX (as country codes) are valid on the call processing for all dialing plans.

Program 45-2—Toll Restriction Disable

Selected lines may be programmed to be exempt from any Toll Restrictions defined in this section. Mark the exempt lines with an X on the record sheet. Initialized data leaves all LEDs OFF, which causes all lines to be affected by Toll Restrictions defined.

Note:
Toll Restrictions disabled in this program override Station Toll Restrictions defined in Program 48.

Program 45-3 ~ 6—Special Common Carrier Numbers and Authorization Code Digit Length

The purpose of this program is to notify the system of how many digits to ignore before it applies Toll Restriction. This enables the system to allow the use of Special Common Carrier authorization codes.

Special Common Carrier (SPCC) telephone numbers may be defined to notify the system to modify restrictions when the station user is dialing a long distance carrier. The user enters a telephone number to access the carriers. Original restrictions re-activate after the carrier number is dialed.

There are two elements Toll Restriction software must verify for a user to successfully complete long distance calling:

- The first five digits of the number dialed to access the long distance special common carrier (SPCC).
- The total number of digits allowed following the SPCC number.

Items 3 and 5: Enter the first five digits of the SPCC

telephone number in the spaces labeled SPCC1 Telephone Number (item 3) or SPCC2 Telephone Number (item 5) on the record sheet. The initialized state assigns "00000" to items 3 and 5.

Items 4 and 6: 00 ~ 99 digits are allowed (following the spec. number). Initialized data assigns "00" to items 4 and 6. Enter two digits on the record sheet.

A restricted station is not able to place a toll call through a long distance carrier by dialing the SPCC1 or SPCC2 telephone number if the station is denied from that number in other toll restriction programs. Upon recognizing the first five digits dialed, Toll Restriction software is notified to allow the number of digits programmed in items 4 or 6 (00 ~ 99, following the including the dialed SPCC1 or 2 number).

The system interprets data to be a seven-digit local call or 1-800 number to an SPCC. Only five digits are entered; therefore, the last digits are "wild card" digits; any number dialed that has the same first five digits as the carrier's SPCC number, the system will assume the SPCC is being called.

IMPORTANT!

For items 4 and 6, do not enter more digits than necessary for the authorization code. If too many digits are allowed, Toll Restrictions may be ignored.

Program 45-8 ~ 9—Toll Restriction Override Code

Two different codes may be dialed by any station user to override station-specific restrictions.

Fill in the codes on the record sheet. They can be from one to four digits each.

Selected stations in the system are able to alter the override code. These stations are defined by Program 30. To change the codes from selected stations:

Code 1: **Intercom** or [PDN] + **# 6 5 4** + code + **Redial**

Code 2: **Intercom** or [PDN] + **# 6 5 5** + code + **Redial**

Note:

Electronic telephone users can use the # button instead of the **Redial** *button.*

Program *45-1—4.xx Toll Restriction for Office Codes (R3; Program 45, Dial Plan 7, 8, or 9 only)

- Up to four office codes can be assigned to be restricted for all area codes. Initialized data assigns the office code "976" (Dial Up Services) to be restricted.
- This program only applies to telephone users which belong to toll restriction classes (assigned via Program 48). If a telephone user does not belong to any class, he/she is not subject to any of the restricted office codes assigned in this program.
- The restricted office codes are verified when a user dials a seven-digit local call (in home area code) or a "1" plus ten-digit long distance call (in any area code).

Program *45-2—21~26 LCR/Toll Restriction Bypass for Special Numbers that Do Not Begin with */# (R3; Program 45, Dial Plan 7, 8, or 9 Only)

Codes programmed in this table will bypass Toll Restriction, and will be sent to the CO local route if using LCR. Calls subject to toll restriction are normally restricted if "*" or "#" is pressed during toll restriction digit analysis. However, in some special applications (e.g., the Strata DK System is connected behind a PBX/Centrex, or assume_9 Centrex dialing), "*" and/or "#" may be required within digits 2, 3, 4 or the last digit.

If the digit string containing */# matches with any of the six programmed digit strings of this program, toll restriction is applied after the matched digit string. This program can also be used for special area code dialing plans where the digit "1" is not dialed before the area code. See example on the Program *45 Record Sheet.

Program *45-3—31~39 LCR/Toll Restriction Bypass for Special Numbers that Begin with */# (R3; Program 45, Dial Plan 7, 8, or 9 only)

Codes programmed in this table will be ignored by Toll Restriction and will be sent to the CO local route if using LCR. Calls started with "*" or "#" as the first digit are normally not allowed. However, in some special applications (e.g., Caller ID blocking), "*" or "#" might be the first digit of a code a user enters before dialing the actual destination's telephone

number. This program assigns up to nine such codes for toll restriction bypass.

Digits dialed after the code starting with "*" or "#" are analyzed for toll restriction depending on the flag assigned following the digit code. The flag value 0 indicates that no Toll Restriction applies after the code is entered. The flag value 1 indicates that Toll Restriction is applied as normal after the code entry. The flag value 2 indicates that the call is restricted when the code is entered.

IMPORTANT !

*To allow */# to be dialed as a first digit, at least one number must be entered in Program *45-3X.*

Program 46-2 ~ 4—Toll Restriction Allowed/Denied Area Codes Assigned by Class

Up to eight Toll Restriction classes can be defined for DK280 Release 1, 2, and 3 systems operating with the RCTUC/D common control unit (four with the RCTUA, RCTUBA/BB, or RCTUB units). Each class area code provides for a different combination of restrictions.

This program defines the area codes allowed or denied for each Toll Restriction class. Area code tables for Classes 1 ~ 8 can each describe area codes that are allowed or denied for the class. The tables (in memory) operate as allow tables. If an area code exists in a table (displays with 4 #), then it is allowed. Anything not displaying is not allowed. Initialized data allows all area codes for each class (all codes are in all tables). All allowed area codes can be displayed (4 #) for each class.

For each class, choose whether the record table is used to record allowed area codes in memory (ALLOWED) or denied area codes not in memory (DENIED). Enter the area codes that define the set.

Program 46-6 ~ 8—Toll Restriction Allowed/Denied Office Codes Assigned by Class for Local Calls

This program defines the office codes allowed or denied for each Toll Restriction Class within the home area code. Office code tables for classes 1 ~ 8 can each describe office codes allowed or denied for the class. The tables (in memory) operate as allow tables. If an office code exists in a table (displays with 8 #), then it is allowed. Anything not displaying is not allowed. Initialized data allows all office codes in the home area code for each class.

For each class, choose whether the record table is used to record allowed office codes in memory (allowed) or denied office codes not in memory (denied). Enter the office codes that define the set.

Programs 46-10 ~ 80 & 46-11 ~ 81—Toll Restriction Class Parameters (Classes 1 ~ 8)

This program defines parameters of each Toll Restriction class, including dialing plan restrictions and exceptions to previous restrictions.

Toll Restriction exceptions and dialing plan restrictions may be defined for each class. Programs 46-10 and 46-11 assign Class 1 restriction exceptions and parameters; Programs 46-20 and 46-21 assign Class 2; Programs 46-30 and 46-31 assign Class 3; etc. This program also relates to Program 47. See Program 47 for more explanation.

Programs 46-10 ~ 46-80

Run these programs for dial 0, 01, */# restriction and long distance information (555) assignments.

- **LED 01**: 0 Restricted—Mark an X next to LED 01 if operator or operator-assisted calls are restricted for the class being defined.

IMPORTANT !

To allow 0 + dialing LED 01 must be OFF. Warning—Allowing 0 + dialing allows operator-assisted toll calls.

- **LED 02:** 01 Restricted—Mark an X next to LED 02 if overseas operator or unassisted overseas operator calls are restricted for the class being defined.
- **LED 03:** 1+AC+555 and AC+555 Allowed—Mark an X next to LED 03 to allow the particular class to call all restricted area codes plus the office code of 555, including out-of-area directory assistance calls. Turning the LED off does not necessarily deny information calls. This may also be accomplished in the office code table and/or the area/office code exception tables.
- **LED 04**—LED 04 should be turned on only if the DK280 CO lines are connected to a CO that absorbs * and # digits. Numbers that contain # and * digits following the first digit can be restricted (LED 04 ON) if they are dialed within the first four digits of the telephone number. If LED 04 is off, the telephone numbers that contain * and # after the first digit will be allowed. (LED 04 is for

use in Strata DK280 Release 3, Program 45 dial plan 7, 8, and 9 only.)

Programs 46-11 ~ 46-81

These programs should be run for area/office code exception table assignments.

- **LEDs 01 ~ 16**—Area Code/Office Code Exception Tables 1 ~ 16—Select the exception tables that apply to the class being defined by marking an X in the box. Exception tables for both area and office codes will be defined in Program 47.

  Note:
  Each class can be assigned any or all of the 16 available office code exception tables.

Program 47—Toll Restriction Exception Office Codes Assigned by Area Codes (Tables 1 ~ 16)

This program defines exceptions to previously defined office code restrictions for up to 16 area codes, allowing six-digit Toll Restriction. Office codes entered in Tables 1 ~ 16 are opposite of what is defined for the area code by Program 46-2 ~ 4. For instance, if Program 46 denies area code 714, entering office codes 530 and 555 into an exception table for area code 714 will allow those office codes. The RCTUC/D common control unit can support up to 16 tables, while the RCTUA, RCTUBA/BB and RCTUB units can support eight.

Each area code with exception office codes requires a table. Each table may hold up to 800 exception office codes.

Enter the area code and required office codes on the record sheet.

Program 48—Station Toll Restriction Classification

This program assigns a combination of two restrictions to each station port defined in the system. The first feature is Digit Restriction and the second is Station Restriction Assignment.

Digit Restrict Code

If Digit Restrict is enabled for a particular station, the station is able to dial the number of digits defined in the Program 45-1 Toll Restriction dialing plan.

- 1: Enable Digit Restriction—Enter 1 in the Digit Restrict Code column, next to the port number to enable the restriction for the station. This is used to prevent a user from dialing a second call when dial tone is returned from a CO after the outside party disconnects.
- 2: Disable Digit Restriction—Enter 0 in the Digit Restrict Code column, next to the port number to disable digit restriction for the station. This allows toll restricted users to dial any number of digits (e.g., to an external voice mail device, computer, etc.).

Station Restrict Code

The second feature assigns Toll Restriction to individual station ports, in addition to previous restrictions. It includes eleven different choices. One of the choices must be entered for each port. Initialized data assigns 0 or no restrictions to all ports. The eleven choices are explained as follows.

Note:
Station restrictions are overridden by lines disabled as defined in Program 45-2. If a station port has appearance of a line with restrictions disabled, the restrictions will be removed from the station on an individual line basis through Program 45-2.

- 0: No Station Toll Restriction—Enter 00 in the Station Restrict Code column, next to the port number, to remove Toll Restrictions from the station.
- 1: Area Code Toll Restriction—Enter 01 in the Station Restrict Code column, next to the port number if the selected station must be restricted from dialing all area codes.
- 2: Area Code Toll Restriction and "0" or "1" as a 1st (or 2nd digit)—Enter 02 in the Station Restrict Code column, in the space available for the port number, if the selected station must be restricted from dialing all area codes and
  - 0 or 1 when used as a first or second digit for the old dial plan 1, 2 or 3 defined in Program 45-1
  - 0 or 1 when used as a first digit for the new dial plan 7, 8 or 9 (with upgraded NANP software) defined in Program 45-1.

  This restriction prevents the station from making any long distance calls or operator-assisted calls, in addition to outgoing calls outside the home area code. In applicable areas, this prevents long distance office codes from being dialed (if 1+NNX).

- 3: Class 1 Toll Restriction—Enter 03 in the Station Restrict Code column in the space provided for the port number, if the selected station will be assigned to the Class 1 level of restriction. Class 1 area and office code restrictions are defined in Program 46, and exception office code tables in 46-10.

- 4: Class 2 Toll Restriction—Enter 04 in the Station Restrict Code column in the space provided for the port number, if the selected station will be assigned to the Class 2 level of restriction. Class 2 area and office code restrictions are defined in Program 46, and exception office code tables in 46-20.

- 5: Class 3 Toll Restriction—Enter 05 in the Station Restrict Code column in the space provided for the port number, if the selected station will be assigned to the Class 3 level of restriction. Class 3 area and office code restrictions are defined in Program 46, and exception office code tables in 46-30.

- 6: Class 4 Toll Restriction—Enter 06 in the Station Restrict Code column in the space provided for the port number, if the selected station will be assigned to the Class 4 level of restriction. Class 4 area and office code restrictions are defined in Program 46, and exception office code tables in 46-40.

- 7: Class 5 Toll Restriction—Enter 07 in the Station Restrict Code column in the space provided for the port number, if the selected station will be assigned to the Class 5 level of restriction. Class 5 area and office code restrictions are defined in Program 46, and exception office code tables in 46-50.

- 8: Class 6 Toll Restriction—Enter 08 in the Station Restrict Code column in the space provided for the port number, if the selected station will be assigned to the Class 6 level of restriction. Class 6 area and office code restrictions are defined in Program 46, and exception office code tables in 46-60.

- 9: Class 7 Toll Restriction—Enter 09 in the Station Restrict Code column in the space provided for the port number, if the selected station will be assigned to the Class 7 level of restriction. Class 7 area and office code restrictions are defined in Program 46, and exception office code tables in 46-70.

- 10: Class 8 Toll Restriction—Enter 10 in the Station Restrict Code column in the space provided for the port number, if the selected station will be assigned to the Class 8 level of restriction. Class 8 area and office code restrictions are defined in Program 46, and exception office code tables in 46-80.

  Note:
  The RCTUC/ RCTUD common control unit can have as many as eight Toll Restriction classes, and the RCTUA, RCTUBA/BB, and the RCTUB units can has as many as four.

9.4 Least Cost Routing

The following provides the programmer an overview of the Least Cost Routing feature and step-by-step instructions to fill in the Least Cost Routing System Record Sheets. The quantities of LCR plans, CO line groups, etc. vary between RCTUA, RCTUC/D and RCTUBA/BB or RCTUB. These quantities vary this way for all DK280 processors. This chapter and the LCR program record sheets note these differences when they exist.

The Least Cost Routing (LCR) feature enables the system to automatically route each outgoing voice and data call over common carriers and selected lines. The customer chooses these lines for the specific time of day, and for system users with varying priorities. If the system is programmed properly, LCR can select the most economical route. If the best routes are unavailable, users with priority can access more expensive outgoing routes. Several elements of LCR must be defined in programming.

Note:
For LCR to function properly, line groups must be created in Program 16; line restrictions set in Programs 40 and 41; and the area dialing plan must be assigned in Program 45-1.

9.4.1 LCR Parameters

Enables LCR features, including a warning tone for last choice route number, a comfort dial tone during LCR processing, and the Long Distance Information dialing plan.

LCR Home Area Code

Notifies LCR software of the area code of the installation site.

LCR Special Codes

Notifies LCR of special emergency and operator codes that will be automatically routed as a local call, without unnecessary delay.

Long Distance Information Plan Number

Notifies LCR software how to route a long distance information call.

Local Call Plan Number

Notifies LCR software which call routing plan is specifically designed to handle local and special calls.

LCR Timeout after 0 (Zero) is Dialed

Notifies the system of the time delay to the user after dialing a 0, before a regular operator is accessed.

LCR Area Codes

Up to 16 separate area code tables can be defined for DK280 systems operating with the RCTUC/D common control unit (eight for systems with the RCTUA or RCTUB units); one for each available call routing plan. Each table defines the area codes that are handled by the particular routing plan.

LCR Office Code Exceptions for Area Codes

Up to 16 LCR office code exception tables can be defined with systems operating with the RCTUC/D common control unit to inform LCR software how to handle specific office codes within area codes. According to the tables defined, specific exception office codes can be routed through a different call plan than the overall area code plan. Up to eight tables can be defined for systems operating with the RCTUA, RCTUBA/BB, or RCTUB common control unit.

LCR Schedule Assignments

Call Routing Plans 1 ~ 16 can send the outgoing calls of different groups of stations according to a time schedule, and call route definitions. The RCTUC/D common control unit can support up to 16 plans, and the RCTUA, RCTUBA/BB, and the RCTUB units can each support eight.

LCR Route Definitions

Groups of CO lines assigned to special common carriers, foreign exchange lines, or other special services can be specified as call routes.

LCR Modified Digit Assignments

Carrier codes can be programmed to dial automatically when a call is placed over the appropriate route. Digits can be added to the front or back of special common carrier codes or other access numbers to make placing calls an invisible process for the user. Digits may also be deleted from the front of the dialed number.

LCR Station Access Priority Assignments

Each station port defined in the system may be assigned to one of four station priority groups. The groups can have varying access to the defined call routes at different times of day. Each group is partitioned from the other groups.

9.4.2 LCR Conditions

A number of conditions apply to LCR assignment. A summary of each is listed here. Section 9.6—Completing the Least Cost Routing Record Sheets, gives more detailed explanations and examples of how the conditions relate to the programming process.

If a station has direct line appearances, or Pooled CO line buttons programmed to allow direct outgoing line access, LCR will be bypassed using the Pooled line or a CO line button.

LCR accommodates special code dialing, such as 911 for emergency response, 1-411 or 411 for information, or 800 area code toll-free numbers. These calls can be directed to the local call route (see Program 50-31 ~ 35).

IMPORTANT !

Always provide emergency service access for numbers such as 911.

Basic System Record programs related to LCR include:

- Program 16 defines which outgoing CO lines are assigned to line groups.
- Program 40 denies a station complete line access. This also applies to LCR.
- Program 41 restricts outgoing line calls to selected stations. These stations may make outgoing calls through LCR. Automatic Busy Redial (ABR) is allowed with this program.

Standard telephones that are Toll Restricted should be required to use Least Cost Routing (LCR) to place

outgoing calls. This prevents Toll Restriction defeat when the RRCS times out.

9.5 Completing the Least Cost Routing Record Sheets

Note:
*All stations using LCR should be **allowed** line access in Program 40, and **denied** line access in Program 41.*

The following instructions explain completion of the System Record Sheets used to program LCR. Instructions are arranged in the same order as the Least Cost Routing System Record Sheets. The instructions give a concise, general definition of LCR characteristics defined by each record sheet.

Notes:
1. *On each record sheet, enter required data in the space provided to make a selection, unless otherwise specified.*
2. *The initialized state and considerations are documented on the record sheet.*

9.5.1 LCR CO Line Programming Reference Table

This table is for reference only. Information relevant to LCR is compiled here from Basic System Programming.

1. Under the column labeled "CO lines in Group (001 ~ 144)," enter the numbers of the lines assigned to groups 801 ~ 816. The RCTUC/D common control unit can support up to 16 line groups. The RCTUB,RCTUBA/BB, and RCTUA units can support up to eight groups.). Refer to the completed record sheet in Program 16 for this information.
2. Under the column labeled "CO Line Type/ Comments," enter the service type, the common carrier name, or the line type for each line group, e.g., local line, Foreign Exchange (FX) to 818 (LA), WATS (out of state), etc.
3. Refer to the Basic System Record, Program 40, to restrict stations from incoming and outgoing access of lines, including using LCR. All stations that must use LCR to make outgoing calls must NOT be restricted in this program. These restrictions do apply to LCR.
4. Refer to Basic System Record, Program 41, to restrict stations from accessing outgoing lines, except through LCR. All stations that must use LCR for outgoing calls must be restricted from line access in this program.

9.5.2 Program 50 Series—LCR Definitions

Program 50-1—LCR Parameters

This program defines general operating parameters for LCR software.

Note:
Mark an X in the column to indicate which programming button LEDs should be lit. Initialized data leaves all LEDs OFF.

LED Button 01

- ON: LCR software is enabled system-wide.
- OFF: LCR software is disabled. None of the LCR programming referred to by this section is recognized. Dial 9 access assigned in Program 16 is enabled.

LED Button 02 Not used.

LED Button 03

- ON: LCR routes long distance information (LDI) calls over the plan number specified in Program 50-4.
- OFF: LCR routes LDI calls using area codes specified in route plans 1~16, as it would for any other call. The RCTUC/D common control unit can support up to 16 route plans, and the RCTUB, RCTUBA/BB, and RCTUA units can support up to eight.)

LED Button 04

- ON: Station users hear a simulated dial tone immediately after dialing the access LCR code (typically 9), until the first digit of the phone number is dialed. The dial tone is simulated to assure the user of the system's proper operation, but it is not a functional dial tone.
- OFF: Station users hear nothing after dialing the LCR access code until the destination rings or issues a busy signal.

LED Button 05

- ON: The user is notified with a warning tone to indicate that LCR has routed the call over the least

desirable route number. The most expensive route is typically programmed to be the least desirable. A user has three choices upon hearing the warning tone:

a) Ignore the tone, LCR places the call using the least desirable route.

b) Hang up and try later to save money.

c) Activate the Automatic Call Back feature. The appropriate line group calls the user back when a more desirable route number becomes available.

- OFF: No warning tone sounds.

Program 50-2—LCR Home Area Code

Enter the local area code in the spaces provided on the record sheet. Initialized data leaves the home area code blank.

- LCR matches the area code entered here with the LCR route plan containing the home area code in its Area Code Table. (The home area code is later entered into one of the available LCR route plans through Program 51). Thus, LCR is informed of how to handle local calls.

- Typically, systems are configured to have the LCR route plan containing the home area code as the same as the local route plan defined in Program 50-5. This is typically programmed by the installer to be Route Plan Number 1, rather than the default Plan 16.

Programs 50-31 ~ 35—LCR Special Codes

Five Special Codes can be entered in spaces provided next to 31 ~ 35. The codes can be a maximum of four digits, and should include items such as 911 for emergency calls, and 411 or 1-411 for local information, etc. Initialized data leaves all codes blank.

- When any of these codes are dialed, LCR is flagged to treat the call as follows:

- The call will be sent over the local call route plan specified in Program 50-5.

- No additional digits need to be dialed. They are not necessary. Therefore, the call is put through immediately.

Program 50-4—LCR Long Distance Information (LDI) Plan Number

Enter the number of the LCR route plan over which long distance information calls will be routed. Typically, long distance information calls are routed over the local call route defined in Program 50-5. The RCTUC/D common control unit can support up to 16 plans, and the RCTUA, RCTUBA/BB, and the RCTUB units can support up to eight.)

- If the long distance information plan is chosen in Program 50-1, the call is routed as defined by this table.

- Initialized data assigns Plan 16 to be the LDI route plan.

Program 50-5—LCR Local Call Plan Number

Of the 16 route plans available for LCR call processing, one must be defined as the Local Call Plan, typically route Plan 1. Enter the number of the plan (1 ~ 16) over which local calls, operator-assisted/0+ calls, and special code calls will be routed.

Program 50-6—LCR Dial 0 (Zero) Time-out

Enter the maximum number of seconds LCR waits for a user to dial additional digits after a 0, before it routes the call to an operator for assistance. LCR will wait this number of seconds to receive additional digits that will indicate charge calls, collect calls or other 0+ calls.

- The allowed range is 04 ~ 10 seconds. Always enter two digits. Initialized data assigns an LCR dial zero time-out value of 06 seconds.

9.5.3 Route Plan Overview

Programs 51 ~ 54 define 16 separate LCR route plans The RCTUC/D common control unit can support up to 16 route plans, and the RCTUA, RCTUBA/BB, and RCTUB units can support up to eight. The purpose of the plan scheme is to provide the system with directions for routing all possible calls, made by all possible users at all possible times of day. Sixteen separate plans provide the customer flexibility enough to route different area codes and exception office codes over different line groups.

Initialized data assigns all calls to Plan 16 with the RCTUC/D common control units (Plan 8 with the RCTUA, RCTUBA/BB, or RCTUB). Any assignments made in Programs 51 ~ 54 for Plans 1 ~ 15 (Plans 1 ~ 7 with RCTUB, RCTUBA/BB, or RCTUA) will exempt the defined call from being made on Route Plan 16

(Plan 8 for RCTUB or RCTUA). Likewise, any phone number not specified in Routes 1 ~ 15 (1 ~ 7 with RCTUA or RCTUB) automatically defaults to route Plan 16 (8 RCTUA, RCTUBA/BB, or RCTUB).

Tables for Programs 51 ~ 54 appear on LCR Route Plan Numbers 1 ~ 16. The following instructions reveal how to fill in individual tables within the plans. Each of the following program tables must be completed for all plans.

Program 51—LCR Area Codes

Every route plan can be assigned to define a set of area codes and/or office codes.

- The purpose of Program 51 is to define which area code calls are placed over which LCR Plan Number (1 ~ 16). Initialized data assigns all possible area codes (000 ~ 999) to LCR Plan 16 for systems with the RCTUC/D common control unit and Plan 8 for systems with the RCTUA, RCTUBA/BB, or RCTUB. Therefore, calls made to all area codes will be routed over route definitions defined in Program 54 for Plan 16, following the time schedule specified by Program 53 for Plan 16 (unless other assignments are made in plans 1 ~ 15).
- For example, any area code entered in a Program 51 LCR area code table for plans 1 ~ 15 is subtracted from Plan 16. An area code cannot be lost. If it is subsequently deleted from Plans 1 ~ 15, LCR software automatically adds it to Plan 16.
- To fill in record sheets for Plans 1 ~ 15:
  - Check the box by Area Code Table.
  - Enter the applicable area codes, three digits per box.

  Note:
  Remember that LCR matches the home area code entered in Program 50-2 with the LCR route plan containing the home area code in its Area Code Table. The home area code must be entered into one of the 16 available LCR route plans through Program 51. Thus, LCR is informed of how to handle local calls. Typically, systems are configured to have the LCR route plan containing the home area code as the same as the local route plan defined in Program 50-5. This usually is programmed by the installer to be Route Plan Number 1, rather than the default Plan 16.

Program 52—LCR Office Code Exceptions for Specified Area Code

The purpose of the Office Code Exception Table is to enable the customer the flexibility of routing specific office codes through a different call plan than other office codes used with that area code.

- Sixteen LCR office code exception tables can be defined for the overall LCR scheme for systems operating with the RCTUC/D common control unit (eight with the RCTUB, RCTUBA/BB, or RCTUA unit). Any number of exception code tables can be assigned to each route plan, although each exception table can only be used once system-wide.
- Every route plan can be assigned to define a set of area codes and office code exceptions or a set of office code exceptions.
- This program applies to both examples listed below. In the first case, an office code exception table does not need to be defined in addition to the area codes in Program 51, but it may. In the second case, the plan only pertains to exception office codes for certain area codes.

Example 1

In the first example, office code exception tables will be defined to the area code table. Use the continuation sheet to define the exception office codes. As many as 16 office code exception tables can be linked to a plan, but each exception table can only be used once. When using the continuation sheet, be sure that the same exception table is not assigned to more than one plan.

- Turn to the continuation sheet (that follows Plan 16 record sheet).
- Determine the plan number where the exception office codes will be routed.
- Fill in the area code of the exception office codes in the spaces provided by the correct plan number. These office codes will be routed differently than the overall area code.
- Enter the specific office codes that are to be routed differently.

Example 2

In the second example, the route plan only applies to office code exceptions. The first office code exception

table may be documented on the LCR Plan record sheet:

- Check the box on the record sheet next to Office Code Exception Table number.
- Enter the number of the exception table (01 ~ 16). Make sure this table number is not entered on any other plan, or on the continuation sheet.
- Enter the applicable area code.
- Enter the specific office codes that are to be routed differently than the area code.

Program 53—LCR Schedule Assignments for LCR Plans

This program assigns up to three time schedules to each plan. Each time schedule consists of four or six different route definition choices (defined in Program 54) available to the eight station groups (defined in Program 56) (see Program 53 record sheet notes). It may be helpful to complete Program 54 portions of the plans and Program 56 before proceeding.

Typical Installation Without Time Scheduling Feature

In most cases, an installation will not require use of the time schedule feature. To reflect this on the record sheets for Plans 01 ~ 16:

1. Enter the same Schedule Start Times for Schedules 1 and 2. Use military time, in the format HH:MM (Hours:Minutes). Fill in all four digits. Initialized data assigns "0000" to all times.
   - If LCR software sees Schedules 1 and 2 have the same start times, then it only looks at Schedule 1 for route definitions.
2. Enter Route Definition numbers for Schedules 1 and 2. Four definitions (route choices) can be entered for each group with RCTUA, RCTUBA/BB, RCTUB. or RCTUC/D.
   - LCR Station (Class) Groups 1 ~ 8 are assigned in Program 56.
   - LCR Route Definition numbers 1~ 6 are defined in Program 54.
   - The order in which the route definitions are entered defines the order of LCR line selection. The most desirable route should be entered in the left-most position, and the least desirable route in the right-most position.
   - If "1" is assigned to Station Group 1, and 1 for route definition only, then those assigned will only be able to use Route Definition 1, thereby restricting them during times that route definition 1 is not allowed.
   - Keep in mind that the route definition number is being entered, not the CO line group number. The definitions are assigned in Program 54.

Installation Requiring Time Scheduling Feature

When an installation requires the time scheduling feature to be programmed, three "shifts" of route definitions can be assigned per station group. To reflect this on the record sheet, substitute Step 1 of the procedure described for the typical customer with the following:

➤ Enter the Schedule Start Times for Schedules 1, 2 and 3. Use military time, in the format HH:MM (Hours:Minutes). Fill in all four digits. Initialized data assigns "0000" to all times.
   - Start time for schedule 2 is the stop time for schedule 1.
   - Start time for schedule 3 is the stop time for schedule 2.
   - Start time for schedule 1 is the stop time for schedule 3.

Program 54—LCR Route Definition Tables

The purpose of this program is to define four (RCTUA, RCTUBA/BB, or RCTUB) or six (RCTUC/D) different ways of routing calls for each of the LCR plans (see Program 54 record sheet notes). Define each route by selecting and entering:

1. **CO Line Group (01 ~ 16):** Refer to the LCR Line Programming Reference Table completed at the beginning of the LCR record sheets.
   - Each line group represents a type of service, e.g., special common carrier, foreign exchange, local line group, etc.
   - Program 16 assigns lines to groups 1 ~ 16 (801 ~ 816).
   - Program 40 denies incoming and outgoing line access to stations, including LCR access.
   - Program 41 allows line access to stations using LCR only for outgoing calls when enabled.

2. **Modified Digits Table (1 ~ 12):** Refer to Programs 55-0, 55-1 and 55-2. The system handles line groups differently, according to which modified digits table was assigned in Program 54.

Program 55 Series—LCR Modified Digits Tables

This program defines 6 or 12 modified digits tables for LCR call handling (see Program 55 record sheet notes.). Each modified digits table assigns editing steps that include:

- Deleting a pre-defined quantity of digits from the front of the number dialed (Program 55-0).
- Adding a pre-defined number to the front of the number dialed (Program 55-1).
- Adding a pre-defined number to the end of the number dialed (Program 55-2).

The purpose of this program is to define call handling so the route definition used by LCR is invisible to the station user. The station user handles all calls the same way. The goal is for LCR to remember the dialing peculiarities of each call route, so the user doesn't need to know.

Program 55-0—LCR Modified Digits-Delete

Enter the quantity of digits that should be deleted from the front of the number dialed for each of the Table Numbers in the Delete Digits Table. The maximum number is ten. Always make the entry two digits.

Program 55-1—LCR Modified Digits-Add to Front of Dialed Number

Enter the digits that must be added to the front of the number dialed in the Add Digits Table. The maximum digits is 22, including pauses.

- Length of pause can be indicated by using codes (P1 ~ P8) specified in the Pause Entry Reference Table. Each pause takes two digits of memory space.
- Try to allow for the longest wait, e.g., make the pause longer, rather than shorter, to accommodate the length of time a carrier may need to access the service tones, etc.

Program 55-2—LCR Modified Digits-Add to End of Dialed Number

Enter the digits that must be added to the end of the number dialed in the Add Digits Table. The maximum digits is 22, including pauses.

- Length of pause can be indicated by using codes (P1 ~ P8) specified in the Pause Entry Reference Table. Each pause takes two digits of memory space.
- Try to allow for the longest wait, e.g., make the pause longer, rather than shorter, to accommodate the length of time a carrier may need to access the service tones, etc.

Program 56—LCR Station Group Assignments

The purpose of this program is to assign all defined station ports to one of four or eight LCR Station Groups (see Program 56, record sheet notes).

- Station groups are completely independent of one another. Therefore, each station group must be defined separately.
- Software does not automatically assign the highest, all-inclusive routing priority to Class 1 stations, making all routes available to Class 2 ~ 8 stations available to Class 1 as well.
- Instead, stations are assigned (partitioned) to independent groups. Flexible assignment of routing definitions to groups is allowed, with no one group's definition affecting another's. Each group's route definitions are specified to activate separately according to the time schedules set by Program 53. Enter the station group number next to the port number.

IMPORTANT!

System Configuration can be complex and time consuming. For best results:

- *Use the software program 280Quote to provide easy, fast, automated configuration. This runs on an IBM compatible 486 PC, or higher, with a hard drive.*
- *If the above software is not available, use all the Worksheets in Chapter 1—Configuration.*

Important Installation Notes:

1. Place the RCTU jumper plug(s) into battery position; otherwise, all programmed data will be lost upon power down. Battery jumper plugs are on: RCTUA, RCTUB, RCTUBA3, RCTUC, and RCTUD3 PCBs.
2. Install RCCS PCBs on RCTU PCBs as required.
3. Install PDKU, PEKU, or RSIU in slot 11.

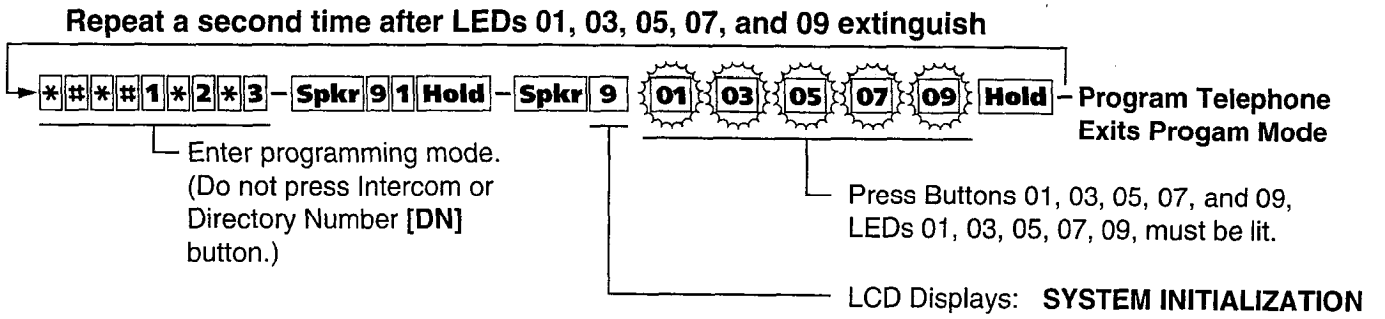
   - and/or -

   If an RSIU is installed in slot 11, install a PDKU or PEKU in slot 12.
4. Starting with the lowest empty slot (S12 or S13), install all station, attendant console, loop start, ground start, and RCIU/RCIS PCBs from lower to higher numbered slots (left to right). Do not leave empty slots except when installing RDTU PCBs when required per Tables 1-9 and 1-10 of Chapter 1—Configuration.
5. After all station, attendant console, and ground/loop start line, and RCIU/RCIS PCBs are installed, install all DID and tie line PCBs starting from the first numbered empty slot to the highest needed (in left to right order). Do not leave empty slots except when installing RDTU PCBs per Tables 11-1, 11-2, and 11-3 of Chapter 11—T1.
6. Install PIOU, PIOUS, PEPU, or RSSU in any convenient vacant slot.
7. Check power factors for each cabinet and for the entire system as explained in Chapter 1—Configuration.
8. If needed, run Program 91-9 **twice** to initialize program data. Do this if you have just completed Step 1 above. Run Program 03 and turn system power OFF (five seconds) and then ON to activate and identify to Program 03 any subassembly PCBs installed.
9. Perform memory test as in Program 00, Part 2.
10. Program customer database manually or upload customer database using a 280Admin or 280Backup personal computer.
11. Backup the customer database using a 280Admin or 280Backup personal computer.

System Record Sheets

10

Initialization Program 91-9 — System Initialization



General Notes:

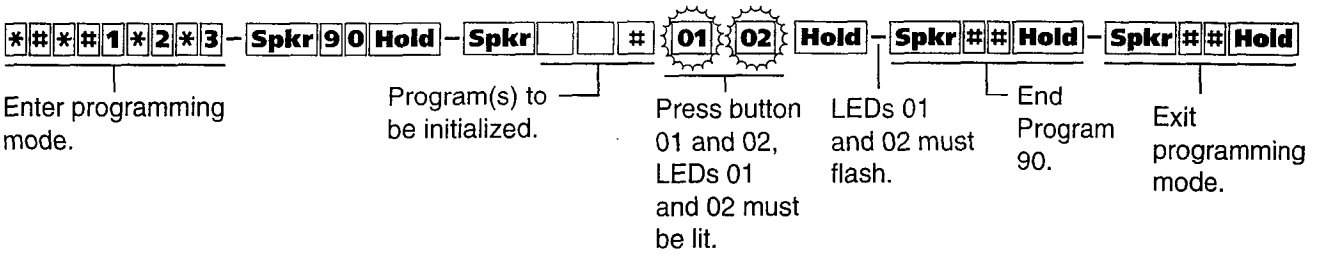
- *Run this program for all new installations – but not while system is in service.*
- *This program will run Program 03 and assigns codes to all PCBs (except options) installed. This program will erase all Program 03 option codes for piggyback PCBs, DSS consoles, RRCS, etc, except the RCOS PCB Code (17). Program 03 should be run (after Program 91-9 is run) for PCBs which have options, such as Dual-tone Multi-frequency Receivers (RRCS), DSS consoles, etc.*
- *Program 91-9 will also bring back logical and physical ports to their initialized settings.*
- *If entering a customer database into RCTU memory before other system PCBs (stations, lines, options) are installed, it will be necessary to run Program 03 after Program 91-9 to identify which option PCBs (e.g., RRCS, etc.) are installed in each cabinet slot.*
- *Running Program 91-9 automatically runs Programs 90, 91-1, and 92.*
- *For Release 3 and above, after running this program go to Part 2 of of Program 00 and run RAM test before proceeding any further.*

CAUTION !

*This program **INITIALIZES** all programs (**00** ~ ***99**) including 01, 02, 03, 90, 91-1, 92. **All calls will be dropped** if this program is run while the system is in service.*

DK0080

Initialization Program 90 — Initializing Programs 00 ~ *99



IMPORTANT !

This Program is primarily used to initialize individual Programs in DK280 software. To initialize one program at a time, just enter the individual program number, then #, then Button 01 and 02 plus Hold.

*Initialize Programs 00 ~ *99 every time[1]:*

- *A new system is installed*
- *To bring a system's programming back to the default setting.*

Specify the range as follows: 0 0 * * 9 9 *(see CAUTION ! note)*

Low Numbered Program — *(For "*" programs, insert the "*" prior to entering the program number.)*

Range Separator

High Numbered Program

Note:

1. *Running Program 91-9 will run this program to initialize Programs 00 * *99.*

General Notes:

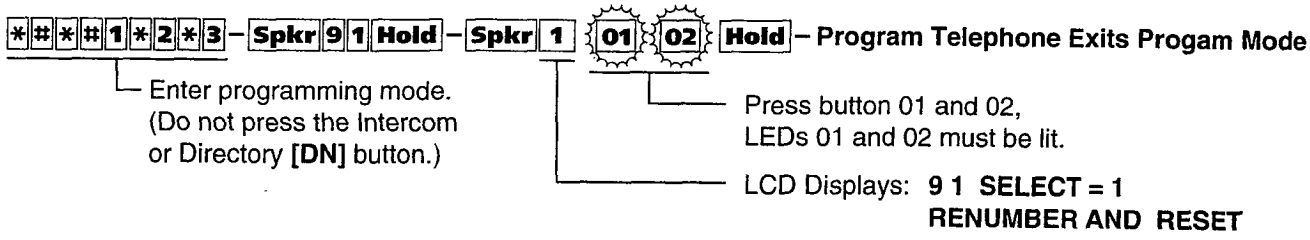
- *Always complete Program 90 at new system installs, before programming anything else. Skipping this step may cause erratic system behavior. If Program 91-9 is completed, it is not necessary to run Program 90 after running Program 91-9.*
- *Follow instructions in Table 8-5 in Chapter 8—Programming Introduction to clear this data.*
- *To initialize all programs, a "**" must be entered between 00 and 99.*
- *Each "*" program record sheet immediately follows the program record sheet having the same number (Example *31 follows 31 record sheet). However in system memory, all "*" programs follow Program 99. Therefore, when initializing star "*" program ranges, they must be initialized separately from non-star programs unless initializing all system Programs (00**99). Example, to initialize Programs 30, *30, 31, *31, and 32, initialize the range (30* 32), for Programs 30, 31, 32; and the range (*30**31), for Programs *30 and *31.*

CAUTION !

*Running this program will **erase** customer data. If Program 01, 02, or 91 is initialized by running Program 90, **calls will be dropped**.*

DK0083

Initialization Program 91-1 — Automatic PCB Recognition/Port Renumber



General Notes:

- *Running Program 91-9 will run Program 91-1. If 91-9 has been completed, it is no longer necessary to run 91-1.*

IMPORTANT !

If the PCBs are installed in the cabinet after the RCTU PCB has been initialized with Program 91-9, run Program 91-1 after all PCBs are installed. This automatically assigns the PCB slot codes in Program 03. Program 03 must still be run to identify PCB options such as RRCS codes 92, 93 and 94 and PDKU codes 62 and 64, etc. Program 91-1 does NOT erase Program 03 option codes previously assigned with Program 03.

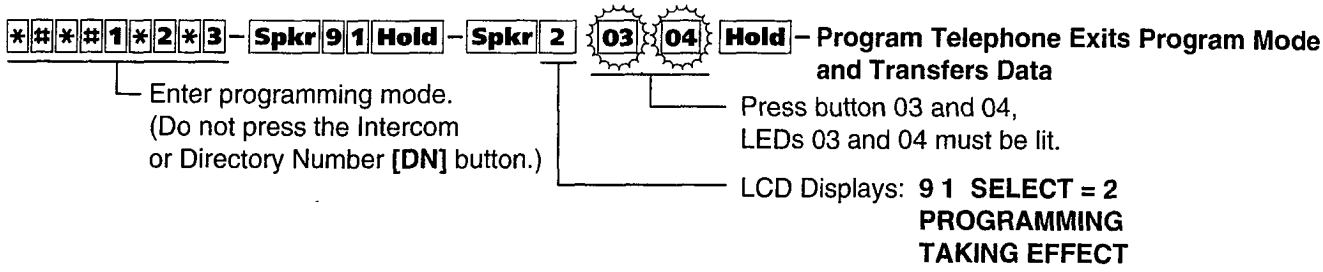
- *Run Program 91-1 to bring back logical and physical ports to their (Programs 01 and 02) initialized settings.*
- *This program does not change numbers set in Program 04, *04, 05, *05, *09, or 71, and does not erase data in other programs.*

CAUTION !

*Running this program (91-1) will drop all calls. This program **INITIALIZES** Programs 01, 02 but not Program 04. This program does not erase Program 03 **option** PCB codes. (Examples: If Slot 00 is assigned code 92, the code will not be erased when Program 91-1 is run. Also, if an RCTU PCB has an RRCS piggyback installed, Program 90-1 will not change a code from 91 to 92 or 93, etc.*

DK0081

Initialization Program 91-2 — Data Transfer from Temporary Memory to Working Memory



General Notes:

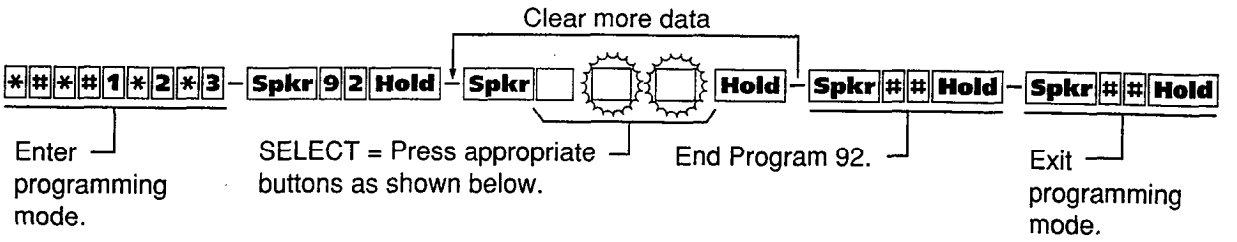
- *This program simulates turning system power OFF (5-seconds) then ON to transfer data from temporary memory to working memory. This sequence is required on a few programs which are listed below:*
  - *When programming with a telephone connected to Port 005; Program 03, *41-2, *50 and 76 data must be transferred from temporary to working memory.*
  - *When programming with 280Backup and/or 280Admin Program 03, *41-2, *50 and 76-1 data must be transferred from temporary to working memory.*
- *This program does not change or erase any programmed data including directory numbers set in Program 04 and *04 or logical/physical port assignments in Program 01 and 02.*

CAUTION !

Running this Program (91-2) will drop all calls and render the system inoperative for up to eight seconds.

DK0082

Initialization Program 92 — Initializing Speed Dial Numbers, VM ID Codes, Character Message Memory, Timed Reminders, Digital Telephone Volume, Called ID, ANI, and Call Forward Backup RAM



1 01 03		*Clears Station Speed Dial, Voice Mail ID Codes, and LCD memos assigned to Station Speed Dial numbers.*
2 01 04		*Clears System Speed Dial and LCD memos assigned to System Speed Dial numbers.*
3 02 03		*Clears Character Message Memory (Station and System) and User Name/Number Display.*
4 02 04		*Clears Timed Reminders.*
5 01 05		*Resets digital telephone volume levels to initialized settings, specifically, speaker volume levels for Internal Call (Intercom or* **[DN]***), Tone/BGM, busy override (muted ring), and ringing volume to approximately mid-range on all DKTs.*[1]
9 03 04	H Power OFF 5 seconds; then Power ON	[2] *Clears Call Forward and Message Waiting (R3) Memory (all stations).*

Notes:

1. *Program 92-5 does not affect digital telephone handset receiver volume levels. Use Program 27 to set off-hook handset receiver volume levels for digital telephones.*
2. *Program 92-9 does not affect Call Forward External or Fixed Call Forward settings.*

IMPORTANT !

It is mandatory to complete all parts of Program 92 at every new system install. If Program 92 is not completed, certain feature operations may cause erratic system behavior. If Program 91-9 was completed, it is no longer necessary to run Program 92 after running Program 91-9.

General Notes:

- *Running Program 91-9 will run all of Program 92 (1 ~ 9) options.*
- *Use the instructions in Table 8-6 in Chapter 8 to clear this data.*
- *Power OFF and ON is required to clear telephone LCD Call Forward Displays and Call Forward button LEDs. Call Forward memory is cleared when Program 92-9 is run, even if system power is not cycled.*

CAUTION !

Running this program will ***ERASE*** *customer data.*

DK0084

Program 00 — Part 1: Software Check/Remote Maintenance Security Code Assignments

[*][#][*][#][1][*][2][*][3] – [Spkr][0][0][Hold] – [Spkr][ ] – [ ][ ][ ][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Select Code
Enter 0 to check software version.[1]
Enter 1 to change 1st level password.
Enter 2 to change 2nd level password.
Enter 8 to check software sum.
Enter 9 to check counter.

Password Codes
Enter the 4-digit password.[2, 3]

Select Code	Item	Password or S/W Check Codes
0	ROM Version	= ☐☐☐☐☐ *See Note 1.*
1	1st Level Password	= ☐☐☐☐
2	2nd Level Password	= ☐☐☐☐
8	Software RAM Checksum	= ☐☐☐☐☐☐☐☐☐ *See Note 4.*
9	Power Cycle Counter	= ☐☐☐☐☐ *See Note 4.*

General Note:

- *See instructions in Table 8-8, Chapter 8—Programming Introduction to program the system with this information.*

Notes:

1. *This selection is not programmable. It identifies the system's software version as follows:*

VER= **R☐A3X**[5] ☐–☐ – **KEY X**[6] (X = 1, 2, 3 or 4)

Indicates RCTU Type — *ROM Version*

Program DKT LCD DISPLAY	RCTU Type
R [A] A3X	RCTUA3
R [B] A3X	RCTUBA3 / RCTUBB3
R [C] A3X	RCTU C3/D3

KEY 1 = AA: Indicates built-in Auto Attendant software.

KEY 2 = ACD: Indicates Automatic Call Distribution software and AA.

KEY 3 = ACD/MIS: Indicates Automatic Call Distribution, Management Information System Software, plus AA and ACD.

KEY 4 = Open Architecture (OA) interface and AA, plus AA, ACD, and ACD/MIS[7].

2. *Initialized passwords are 0000.*
3. *The LCD responds as follows, when a selection is made:*
   - *0 Version =*
   - *1 Password =*
   - *2 Password =*
   - *8 Sum =*
   - *9 Counter =*
4. *These selections are not programmable. They are for factory test purposes only. The Checksum and Counter vary as customer data is entered.*
5. *The "3" in the R☐A3X ROM identifier indicates DK280 Release 3 software; DK280 Release 1 and Release 2 ROMs are identified by R☐AX.*
6. *RKYS feature key must be installed on RCTU PCB to allow AA, ACD, ACD/MIS and Open Architecture (OA) Interface software to be operational; no special program is necessary to activate the RKYS feature key.*
7. *Open Architecture (OA) is available with DK280 Release 3.2 and above.*

DK0085

Program 00 — Part 2: RCTU Random Access Memory (RAM) Test (R3)

General RAM Test[1]

##1*2*3–Spkr 0 0 Hold–Spkr 5 1–"Button 01" "Button 03"–Hold RCTU TESTS RAM (15 seconds downtime)

→ Programming telephone LCD displays:
"GENERAL RAM TEST"

Display General RAM Test Results[2]

##1*2*3–Spkr 0 0 Hold–Spkr 5 2 → Programming telephone LCD displays:

where:
X = Processor A, BA, C or D.
OK = Processor RAM is good.
NG = Processor RAM is defective.

"TEST 1 X=OK X=OK"
-or-
"TEST 1 X=NG X=NG"
X=00000 X=00000[3]

Backup RAM Test[1]

##1*2*3–Spkr 0 0 Hold–Spkr 6 1–"Button 02" "Button 04"–Hold RCTU TESTS RAM (15 seconds downtime)

→ Programming telephone LCD displays:
"BACKUP RAM TEST"

Display Backup Ram Test Results[2]

##1*2*3–Spkr 0 0 Hold–Spkr 6 2 → Programming telephone LCD displays:

where:
X = Processor A, BA, C or D.
OK = Processor RAM is good.
NG = Processor RAM is defective.

"TEST 2 X=OK Y=OK"
-or-
"TEST 2 X=NG Y=NG"
X=00000 X=00000[3]

RCTU RAM TEST GUIDELINES

General Notes:

- RCTU RAM test is provided by DK280 Release 3 RCTUs and above only.
- Run each RCTU RAM test when first installing an RCTU PCB after running initialization Program 91-9. RCTU RAM test can also be performed any time maintenance or trouble shooting is required on an installed system that contains a custom database programmed on the RCTU. The RCTU database programming is not affected (or erased) when the RCTU RAM tests are performed.

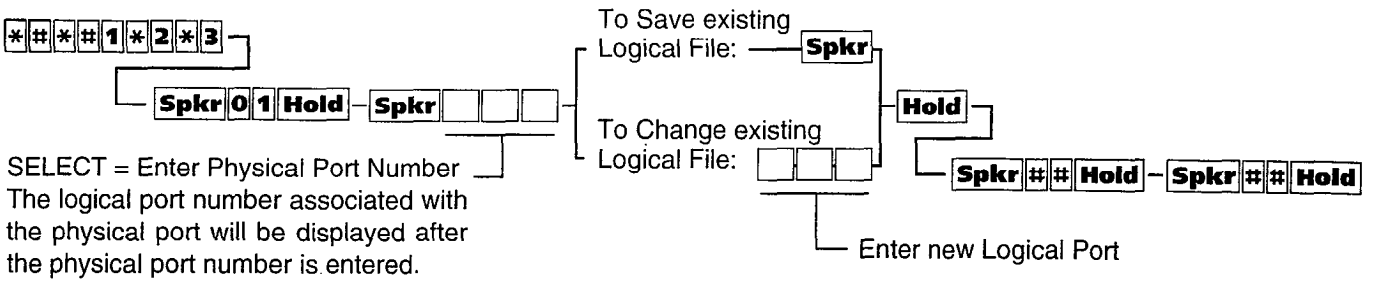
Notes:

CAUTION !

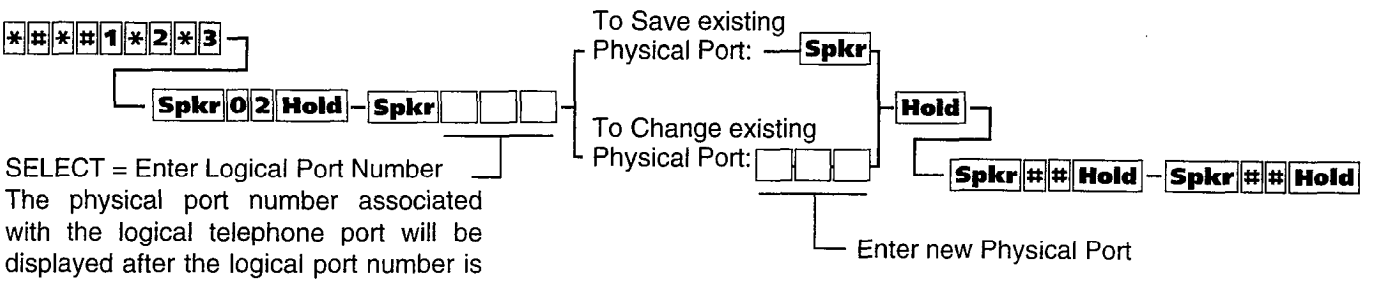
1. When any RCTU RAM test is run, the DK280 will drop all calls in progress and will be inoperable for approximately 15 seconds.
2. Display the RAM test results immediately after running the RAM test; the RAM test results will always display the results of the latest RAM test that was performed.
3. An "X=NG" or "Y=NG" RAM test result indicates a defective RCTU PCB; change the appropriate (X) RCTU PCB and retest RAM on the newly installed RCTU.

DK0086

Program 01 — Station Logical Port Display and/or Change



Program 02 — Station Physical Port Display and/or Change



General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Record port locations on Program 04 System Record Sheet.*
- *Initialized data for Program 01 and 02 is logical port number = physical port number. (Program 90, 91-1, or 91-9 will initialize Program 01 and 02.)*
- *RCTU Station Ports for DK280 Release 1, 2, and 3 are: RCTUA (000~031), RCTUB, RCTUBA/BB, (000~079), and RCTUC/D (000~239).*
- *The system allows only like ports to be reassigned (see below).*

  Allowed:

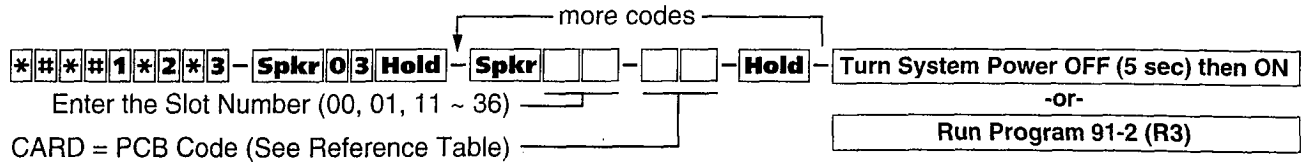
  - *Digital-to-Digital Ports (PDKU-PDKU-RDSU Ports)*
  - *Electronic-to-Electronic Ports (PEKU-PEKU-PESU Ports)*
  - *Standard Tel to Standard Tel Ports (PSTU-RSTU-PESU-RDSU/RSTS)*

  Not Allowed:

  - *Attendant Console, DSS, BGM or Amplified Conference Ports should not be reassigned*
  - *Door Phone Ports (004, 012, 020, 028) should not be reassigned*
  - *Tie/DID Line Ports – should not be reassigned*
  - *PDKU to PEKU – cannot be exchanged*
  - *PSTU to PDKU – cannot be exchanged*
  - *PEKU to PSTU – cannot be exchanged*
- *RCIU/RCIS circuit assignments to CO lines are not affected by Program 01 and 02.*

DK0087

Program 03 — Flexible PCB Cabinet and Slot Assignments



BASE CABINET (CABINET 1)

SLOT NUMBER	R11[1]	RCTU[1]	S11[2]	S12	S13	S14	S15[8]	S16[8]
PCB CODE								
PCB TYPE								
OPTIONS								
STATION/TIE/DID PORT NUMBERS								
CO/TIE/DID LINE NUMBERS								

EXPANSION CABINET (CABINET 2)

SLOT NUMBER	S21	S22	S23	S24	S25	S26	S27[3]	S28[3]
PCB CODE								
PCB TYPE								
OPTIONS								
STATION/TIE/DID PORT NUMBERS								
CO/TIE/DID LINE NUMBERS								

EXPANSION CABINET (CABINET 3)

SLOT NUMBER	S31	S32	S33	S34	S35	S36	S37[3]	S38[3]
PCB CODE								
PCB TYPE								
OPTIONS								
STATION/TIE/DID PORT NUMBERS								
CO/TIE/DID LINE NUMBERS								

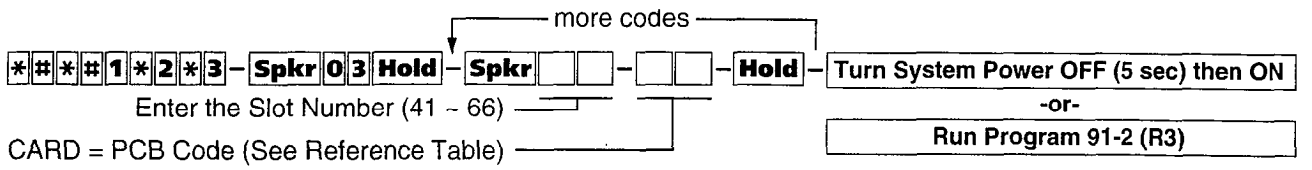
See notes following ***Program 03*** *record sheets.*

REFERENCE TABLE

PCB	CODE	PORTS/TYPE
RCOU, RGLU, PCOU	11[7]	4 GRND/LOOP LINES
RCOU/RCOS	17[7]	8 LOOP CO LINES
RDDU[5]	16[7]	4 DID LINES
PEMU/REMU[5]	13[7]	4 TIE LINES
PEKU	21[7]	8 STATIONS
PEKU (EOCU)	22	8 STATIONS
PEKU w/DSS	23	8 STATIONS
PEKU (DSS, EOCU)	24	8 STATIONS
PESU	25[7]	6 STATIONS
PESU (OCA)	26	6 STATIONS
RDSU (RSTS2)	27[7]	8 STATIONS
RDSU (RSTS2) (OCA, DIU)	28	8 STATIONS
PSTU/RSTU/RSTU2	31[7]	8 STATIONS
PIOU, PIOUS/ RSSU[4], PEPU[3]	41[7]	REMOTE MAINTENANCE (TTY)
PIOU/PIOUS/RSSU[4]	42	MIS FOR ACD (TTY)[9]
PIOU/PIOUS/RSSU[4]	43	RS-232 VM INTERFACE (TTY)[9]
PDKU	61[7]	8 STATIONS
PDKU (OCA, DIU)	62	8 STATIONS
PDKU (DSS, OCA, DIU)	64	8 STATIONS
RDTU[5]	71[7]	8 T1 CHANNELS
RDTU[5]	72	16 T1 CHANNELS
RDTU[5]	73	24 T1 CHANNELS
RCTU	91[7]	NONE
RCTU[1] (4-CKT RRCS)	92	NONE
RCTU[1] (8-CKT RRCS)	93	NONE
RCTU[1] (12-CKT RRCS)	94	NONE
NONE	00[7]	00
RATU[5] (R2)	51[7]	ATTENDANT CONSOLE PCB[9]
RSIU[10] (R3)	49	I/O INTERFACE
RCIU/RCIS[11] (R3)	81	8 CKT, CALLER ID

DK0088

Program 03 — Flexible PCB Cabinet and Slot Assignments (continued)



EXPANSION CABINET (CABINET 4)

SLOT NUMBER	S41	S42	S43	S44	S45	S46	S47[6]	S48[6]
PCB CODE								
PCB TYPE								
OPTIONS								
STATION/TIE/DID PORT NUMBERS								
CO/TIE/DID LINE NUMBERS								

EXPANSION CABINET (CABINET 5)

SLOT NUMBER	S51	S52	S53	S54	S55	S56	S57[6]	S58[6]
PCB CODE								
PCB TYPE								
OPTIONS								
STATION/TIE/DID PORT NUMBERS								
CO/TIE/DID LINE NUMBERS								

EXPANSION CABINET (CABINET 6)

SLOT NUMBER	S61	S62	S63	S64	S65	S66	S67[6]	S68[6]
PCB CODE								
PCB TYPE								
OPTIONS								
STATION/TIE/DID PORT NUMBERS								
CO/TIE/DID LINE NUMBERS								

See notes following ***Program 03*** *record sheets.*

REFERENCE TABLE

PCB	CODE	PORTS/TYPE
RCOU, RGLU, PCOU	11[7]	4 GRND/LOOP LINES
RCOU/RCOS	17[7]	8 LOOP CO LINES
RDDU[5]	16[7]	4 DID LINES
PEMU/REMU[5]	13[7]	4 TIE LINES
PEKU	21[7]	8 STATIONS
PEKU (EOCU)	22	8 STATIONS
PEKU w/DSS	23	8 STATIONS
PEKU (DSS, EOCU)	24	8 STATIONS
PESU	25[7]	6 STATIONS
PESU (OCA)	26	6 STATIONS
RDSU (RSTS2)	27[7]	8 STATIONS
RDSU (RSTS2) (OCA, DIU)	28	8 STATIONS
PSTU/RSTU/RSTU2	31[7]	8 STATIONS
PIOU, PIOUS/ RSSU[4], PEPU[3]	41[7]	REMOTE MAINTENANCE (TTY)
PIOU/PIOUS/RSSU[4]	42	MIS FOR ACD (TTY)[9]
PIOU/PIOUS/RSSU[4]	43	RS-232 VM INTERFACE (TTY)[9]
PDKU	61[7]	8 STATIONS
PDKU (OCA, DIU)	62	8 STATIONS
PDKU (DSS, OCA, DIU)	64	8 STATIONS
RDTU[5]	71[7]	8 T1 CHANNELS
RDTU[5]	72	16 T1 CHANNELS
RDTU[5]	73	24 T1 CHANNELS
RCTU	91[7]	NONE
RCTU[1] (4-CKT RRCS)	92	NONE
RCTU[1] (8-CKT RRCS)	93	NONE
RCTU[1] (12-CKT RRCS)	94	NONE
NONE	00[7]	00
RATU[5] (R2)	51[7]	ATTENDANT CONSOLE PCB[9]
RSIU[10] (R3)	49	I/O INTERFACE
RCIU/RCIS[11] (R3)	81	8 CKT, CALLER ID

DK0089

Program 03 — Flexible PCB Cabinet and Slot Assignments (continued)

Notes:

1. *The RCTUA, RCTUB, RCTUBB or RCTUD PCB must be installed into the RCTU slot in cabinet 1. Enter slot 00 to assign PCB code 91 ~ 94 to RCTUA or RCTUB installed in RCTU slot; enter slot 01 to assign code 91 ~ 94 to RCTUD installed in the RCTU slot. The RCTUBA or the RCTUC PCB must be installed in slot R11 in cabinet 1, enter slot number 00 to assign a PCB code 91 ~ 94 to the RCTUBA or RCTUC PCB installed in the R11 slot.*

IMPORTANT !

RCTUBB code should always be set as follows: Slot 01=91.

---

2. A. *If an RSIU PCB is not installed in slot 11, the programming station (205 ~ Port 005) must be connected to circuit 6 in slot 11. The station must be a 20-button digital or electronic telephone with an LCD. A PDKU or PEKU should be installed in slot 11, if RSIU is not installed (see Note 2B).*
   B. *If RSIU is installed in slot 11, the programming station (005) must be connected to circuit 6 in slot 12. A PDKU or PEKU should be installed in slot 12 (R3); in this case, Station Port Number 000 ~ 007 will be in slot 12.*
3. *Do not install PCBs in slots S27, S28, S37, and S38, they are for future use.*
4. *Code 41, 42, and 43 assigns PIOU/PIOUS RSSU TTY port as Remote Maintenance, MIS for ACD, and SMDI respectively; SMDR, Paging, Relay Control, and other miscellaneous options will be active on the PIOU or PIOUS that has the lowest number code (41, 42 or 43) in the system. Codes set for RSIU/RSIS/RMDS in Program 76 have priority over codes 41, 42, and 43.*
5. *Install RATU and all tie/DID line PCBs in higher numbered slots than station PCB slots whenever practical so station port numbers remain in numerical order (see Chapter 1—Configuration, Worksheet 2).*
6. *Do not install PCBs in slots S47, S48, S57, S58, S67, and S68, they are for future use.*
7. *Program 91-1 and 91-9 will automatically assign PCB codes (marked by footnote "9") if the appropriate Host PCB is installed when Program 91-1 or 91-9 is run; Programs 91-1 or 91-9 do not assign option codes; Program 03 must be run to assign codes for all options except RCOS (codes not marked with "9"). Program 91-9 will erase option codes assigned with Program 03, Program 91-1 does not erase option codes already programmed. After completing all Program 03 data entry, run Program 91-2 (R3 and above) or cycle system power to transfer Program 03 data into working memory.*

CAUTION !

Program 91-2 will simulate turning the system power OFF/ON and will drop all calls in progress.

---

8. *When using RCTUA, Slot 15 and 16 does not support OCA or DIU.*
9. *ACD, ACD/MIS, RS-232 Voice Mail Integration (SMDI or Toshiba Proprietary), and attendant console is for use with Release 2 and above only. RCTUA does not support these features.*
10. *RSIU must be installed in universal slot 11 of the base cabinet (R3). (See Note 2 above.)*
11. *RCIU/RCIS circuit numbers will be assigned automatically in numerical order (001 ~ 144) starting with the lowest RCIU/RCIS slot number, to the highest RCIU/RCIS slot number in 8-circuit increments.* ***Never install RCIU without RCIS if more than 4 circuits are needed****. RCIU/RCIS can be installed in any universal slot except slot 11; they do not have to be installed adjacent to corresponding CO lines. Refer to Program ✱50 to manually assign RCIU/RCIS circuits to CO line circuits (R3).*

General Notes:

- *See Table 8-7 in Chapter 8—Programming Introduction and notes on this page for more details when entering Program 03 Data.*
- *System power must always be cycled or Program 91-2 must be run after running Program 03 to transfer data from temporary memory to working memory.*
- *Program 03 should be run when adding PCBs to an existing system.*

Program 04 — Station Logical Port Intercom (R1/R2) or Primary Directory (R3) Number Assignment (Logical Ports 000 ~ 039)

###1*2*3–Spkr04Hold–Spkr[ ][ ][ ]#[ ][ ][ ][ ]Hold–Spkr##Hold–Spkr##Hold

SELECT = Logical Port Number

INT = Intercom or Primary Directory Number (1 ~ 4 digits) or Key 01[4]

Station Logical Port	Intercom or Primary Directory Numbers (Initialized)	Physical Ports	Physical Record Modular Jack Location and Station Type	Cabinet and Slot Number
000	(200)	(000)	210	CABINET ___ SLOT ___
001	(201)	(001)	11	
002	(202)	(002)	12	
003	(203)	(003)	13	
004	(204)	(004)	14	
005	(205)	(005)	15	
006	(206)	(006)	16	
007	(207)	(007)		
008	(208)	(008)		CABINET ___ SLOT ___
009	(209)	(009)		
010	(210)	(010)		
011	(211)	(011)		
012	(212)	(012)		
013	(213)	(013)		
014	(214)	(014)		
015	(215)	(015)		
016	(216)	(016)		CABINET ___ SLOT ___
017	(217)	(017)		
018	(218)	(018)		
019	(219)	(019)		
020	(220)	(020)		
021	(221)	(021)		
022	(222)	(022)		
023	(223)	(023)		
024	(224)	(024)		CABINET ___ SLOT ___
025	(225)	(025)		
026	(226)	(026)		
027	(227)	(027)		
028	(228)	(028)		
029	(229)	(029)		
030	(230)	(030)		
031[1]	(231)	(031)		
032	(232)	(032)		CABINET ___ SLOT ___
033	(233)	(033)		
034	(234)	(034)		
035	(235)	(035)		
036	(236)	(036)		
037	(237)	(037)		
038	(238)	(038)		
039	(239)	(039)		

DK0090

Notes:

1. *RCTUA provides Station Ports 000~031; Ports 032~039 are reserved for special functions with RCTUA.*
2. *RCTUB and RCTUBA/BB provide Station Ports 000~079; Ports 080~089 are reserved for special functions with RCTUB and RCTUBA/BB.*
3. *RCTUC/D provides Station Ports 000~239, Ports 240~249 are reserved for special functions with RCTUC/D.*
4. *Use BUTTON01 to erase Primary Directory or Intercom numbers. Range programming [Low Port] * [High Port] is OK to erase existing Primary Directory or Intercom numbers but not to add a range of new numbers.*

General Notes:

- *When users relocate telephones, logical Port numbers will move from the assigned physical port to another physical port.*

Program 04 — Station Logical Port Intercom (R1/R2) or Primary Directory (R3) Number Assignment (Logical Ports 040 ~ 079, RCTUB, RCTUBA/BB and RCTUC/D Only) (continued)

##1*2*3 – Spkr 04 Hold – Spkr [ ][ ][ ] # [ ][ ][ ][ ] Hold – Spkr ## Hold – Spkr ## Hold

SELECT = Logical Port Number

INT = Intercom or Primary Directory Number (1 ~ 4 digits) or Key 01[4]

Station Logical Port	Intercom or Primary Directory Numbers (Initialized)	Physical Ports	Physical Record Modular Jack Location and Station Type	Cabinet and Slot Number
040	(240)	(040)		CABINET ____ SLOT ____
041	(241)	(041)		
042	(242)	(042)		
043	(243)	(043)		
044	(244)	(044)		
045	(245)	(045)		
046	(246)	(046)		
047	(247)	(047)		
048	(248)	(048)		CABINET ____ SLOT ____
049	(249)	(049)		
050	(250)	(050)		
051	(251)	(051)		
052	(252)	(052)		
053	(253)	(053)		
054	(254)	(054)		
055	(255)	(055)		
056	(256)	(056)		CABINET ____ SLOT ____
057	(257)	(057)		
058	(258)	(058)		
059	(259)	(059)		
060	(260)	(060)		
061	(261)	(061)		
062	(262)	(062)		
063	(263)	(063)		
064	(264)	(064)		CABINET ____ SLOT ____
065	(265)	(065)		
066	(266)	(066)		
067	(267)	(067)		
068	(268)	(068)		
069	(269)	(069)		
070	(270)	(070)		
071	(271)	(071)		
072	(272)	(072)		CABINET ____ SLOT ____
073	(273)	(073)		
074	(274)	(074)		
075	(275)	(075)		
076	(276)	(076)		
077	(277)	(077)		
078	(278)	(078)		
079[2]	(279)	(079)		

See notes on first page of Program 04.

DK0091

Program 04 — Station Logical Port Intercom (R1/R2) or Primary Directory (R3) Number Assignment (Logical Ports 080 ~ 119, RCTUC/D Only) (continued)

##1*2*3 – Spkr 04 Hold – Spkr [ ][ ][ ] # [ ][ ][ ][ ] Hold – Spkr ## Hold – Spkr ## Hold

SELECT = Logical Port Number

INT = Intercom or Primary Directory Number (1 ~ 4 digits) or Key 01[4]

Station Logical Port	Intercom or Primary Directory Numbers (Initialized)	Physical Ports	Physical Record Modular Jack Location and Station Type	Cabinet and Slot Number
080	(280)	(080)		CABINET ____ SLOT ____
081	(281)	(081)		
082	(282)	(082)		
083	(283)	(083)		
084	(284)	(084)		
085	(285)	(085)		
086	(286)	(086)		
087	(287)	(087)		
088	(288)	(088)		CABINET ____ SLOT ____
089	(289)	(089)		
090	(290)	(090)		
091	(291)	(091)		
092	(292)	(092)		
093	(293)	(093)		
094	(294)	(094)		
095	(295)	(095)		
096	(296)	(096)		CABINET ____ SLOT ____
097	(297)	(097)		
098	(298)	(098)		
099	(299)	(099)		
100	(300)	(100)		
101	(301)	(101)		
102	(302)	(102)		
103	(303)	(103)		
104	(304)	(104)		CABINET ____ SLOT ____
105	(305)	(105)		
106	(306)	(106)		
107	(307)	(107)		
108	(308)	(108)		
109	(309)	(109)		
110	(310)	(110)		
111	(311)	(111)		
112	(312)	(112)		CABINET ____ SLOT ____
113	(313)	(113)		
114	(314)	(114)		
115	(315)	(115)		
116	(316)	(116)		
117	(317)	(117)		
118	(318)	(118)		
119	(319)	(119)		

DK0092

See notes on first page of Program 04.

Program 04 — Station Logical Port Intercom (R1/R2) or Primary Directory (R3) Number Assignment (Logical Ports 120 ~ 159, RCTUC/D Only) (continued)

##1*2*3–Spkr 04 Hold–Spkr ___ # ____ Hold–Spkr ## Hold–Spkr ## Hold

SELECT = Logical Port Number

INT = Intercom or Primary Directory Number (1 ~ 4 digits) or Key 01[4]

Station Logical Port	Intercom or Primary Directory Numbers (Initialized)	Physical Ports	Physical Record Modular Jack Location and Station Type	Cabinet and Slot Number
120	(320)	(120)		CABINET ____ SLOT ____
121	(321)	(121)		
122	(322)	(122)		
123	(323)	(123)		
124	(324)	(124)		
125	(325)	(125)		
126	(326)	(126)		
127	(327)	(127)		
128	(328)	(128)		CABINET ____ SLOT ____
129	(329)	(129)		
130	(330)	(130)		
131	(331)	(131)		
132	(332)	(132)		
133	(333)	(133)		
134	(334)	(134)		
135	(335)	(135)		
136	(336)	(136)		CABINET ____ SLOT ____
137	(337)	(137)		
138	(338)	(138)		
139	(339)	(139)		
140	(340)	(140)		
141	(341)	(141)		
142	(342)	(142)		
143	(343)	(143)		
144	(344)	(144)		CABINET ____ SLOT ____
145	(345)	(145)		
146	(346)	(146)		
147	(347)	(147)		
148	(348)	(148)		
149	(349)	(149)		
150	(350)	(150)		
151	(351)	(151)		
152	(352)	(152)		CABINET ____ SLOT ____
153	(353)	(153)		
154	(354)	(154)		
155	(355)	(155)		
156	(356)	(156)		
157	(357)	(157)		
158	(358)	(158)		
159	(359)	(159)		

DK0093

See notes on first page of Program 04.

Program 04 — Station Logical Port Intercom (R1/R2) or Primary Directory (R3) Number Assignment (Logical Ports 160 ~ 199, RCTUC/D Only) (continued)

##1*2*3–Spkr 04 Hold–Spkr [ ][ ][ ] # [ ][ ][ ][ ] Hold–Spkr ## Hold–Spkr ## Hold

SELECT = Logical Port Number

INT = Intercom or Primary Directory Number (1 ~ 4 digits) or Key 01[4]

Station Logical Port	Intercom or Primary Directory Numbers (Initialized)
160	(360)
161	(361)
162	(362)
163	(363)
164	(364)
165	(365)
166	(366)
167	(367)
168	(368)
169	(369)
170	(370)
171	(371)
172	(372)
173	(373)
174	(374)
175	(375)
176	(376)
177	(377)
178	(378)
179	(379)
180	(380)
181	(381)
182	(382)
183	(383)
184	(384)
185	(385)
186	(386)
187	(387)
188	(388)
189	(389)
190	(390)
191	(391)
192	(392)
193	(393)
194	(394)
195	(395)
196	(396)
197	(397)
198	(398)
199	(399)

Physical Ports	Physical Record Modular Jack Location and Station Type	Cabinet and Slot Number
(160)		CABINET ____ SLOT ____
(161)		
(162)		
(163)		
(164)		
(165)		
(166)		
(167)		
(168)		CABINET ____ SLOT ____
(169)		
(170)		
(171)		
(172)		
(173)		
(174)		
(175)		
(176)		CABINET ____ SLOT ____
(177)		
(178)		
(179)		
(180)		
(181)		
(182)		
(183)		
(184)		CABINET ____ SLOT ____
(185)		
(186)		
(187)		
(188)		
(189)		
(190)		
(191)		
(192)		CABINET ____ SLOT ____
(193)		
(194)		
(195)		
(196)		
(197)		
(198)		
(199)		

See notes on first page of Program 04.

DK0094

Program 04 — Station Logical Port Intercom (R1/R2) or Primary Directory (R3) Number Assignment (Logical Ports 200 ~ 239, RCTUC/D Only) (continued)

[*][#][*][#][1][*][2][*][3] – [Spkr][0][4][Hold] – [Spkr][ ][ ][ ][#][ ][ ][ ][ ][Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Logical Port Number

INT = Intercom or Primary Directory Number (1 ~ 4 digits) or Key 01[4]

Station Logical Port	Intercom or Primary Directory Numbers (Initialized)	Physical Ports	Physical Record Modular Jack Location and Station Type	Cabinet and Slot Number
200	(400)	(200)		CABINET ____ SLOT ____
201	(401)	(201)		
202	(402)	(202)		
203	(403)	(203)		
204	(404)	(204)		
205	(405)	(205)		
206	(406)	(206)		
207	(407)	(207)		
208	(408)	(208)		CABINET ____ SLOT ____
209	(409)	(209)		
210	(410)	(210)		
211	(411)	(211)		
212	(412)	(212)		
213	(413)	(213)		
214	(414)	(214)		
215	(415)	(215)		
216	(416)	(216)		CABINET ____ SLOT ____
217	(417)	(217)		
218	(418)	(218)		
219	(419)	(219)		
220	(420)	(220)		
221	(421)	(221)		
222	(422)	(222)		
223	(423)	(223)		
224	(424)	(224)		CABINET ____ SLOT ____
225	(425)	(225)		
226	(426)	(226)		
227	(427)	(227)		
228	(428)	(228)		
229	(429)	(229)		
230	(430)	(230)		
231	(431)	(231)		
232	(432)	(232)		CABINET ____ SLOT ____
233	(433)	(233)		
234	(434)	(234)		
235	(435)	(235)		
236	(436)	(236)		
237	(437)	(237)		
238	(438)	(238)		
239	(439)	(239)[3]		

DK0095

See notes on first page of Program 04.

Program *04 — Phantom Directory Number [PhDN] Assignments (500 ~ 619)

[*][#][*][#][1][*][2][*][3] – [Spkr][*][0][4][Hold] – [Spkr][ ][ ][ ][#][ ][ ][ ][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

Enter the Phantom Port Reference Number (XXX) of the Phantom Directory Number

Enter the Phantom Directory Number (YYYY) that should be assigned to the selected Phantom Port Reference Number (1 to 4 digits)

Phantom Port Reference Number XXX	Phantom Directory Number (YYYY)
500	(500)
501	(501)
502	(502)
503	(503)
504	(504)
505	(505)
506	(506)
507	(507)
508	(508)
509	(509)
510	(510)
511	(511)
512	(512)
513	(513)
514	(514)
515	(515)
516	(516)
517	(517)
518	(518)
519	(519)
520	(520)
521	(521)
522	(522)
523	(523)
524	(524)
525	(525)
526	(526)
527	(527)
528	(528)
529	(529)
530	(530)
531	(531)
532	(532)
533	(533)
534	(534)
535	(535)
536	(536)
537	(537)
538	(538)
539	(539)

( ) = *Initialized data*

Phantom Port Reference Number XXX	Phantom Directory Number (YYYY)
540	(540)
541	(541)
542	(542)
543	(543)
544	(544)
545	(545)
546	(546)
547	(547)
548	(548)
549	(549)
550	(550)
551	(551)
552	(552)
553	(553)
554	(554)
555	(555)
556	(556)
557	(557)
558	(558)
559	(559)
560	(560)
561	(561)
562	(562)
563	(563)
564	(564)
565	(565)
566	(566)
567	(567)
568	(568)
569	(569)
570	(570)
571	(571)
572	(572)
573	(573)
574	(574)
575	(575)
576	(576)
577	(577)
578	(578)
579	(579)

( ) = *Initialized data*

Phantom Port Reference Number XXX	Phantom Directory Number (YYYY)
580	(580)
581	(581)
582	(582)
583	(583)
584	(584)
585	(585)
586	(586)
587	(587)
588	(588)
589	(589)
590	(590)
591	(591)
592	(592)
593	(593)
594	(594)
595	(595)
596	(596)
597	(597)
598	(598)
599	(599)
600	(600)
601	(601)
602	(602)
603	(603)
604	(604)
605	(605)
606	(606)
607	(607)
608	(608)
609	(609)
610	(610)
611	(611)
612	(612)
613	(613)
614	(614)
615	(615)
616	(616)
617	(617)
618	(618)
619	(619)

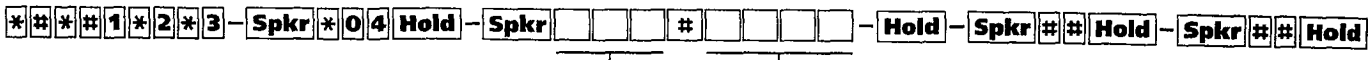
( ) = *Initialized data*

DK0096

General Note:

- *Initialized data: Phantom Port Reference Number = Phantom Directory Number.*

Program *04 — Phantom Directory Number [PhDN] Assignments (620 ~ 739) (continued)



Phantom Port Reference Number XXX	Phantom Directory Number (YYYY)
620	(620)
621	(621)
622	(622)
623	(623)
624	(624)
625	(625)
626	(626)
627	(627)
628	(628)
629	(629)
630	(630)
631	(631)
632	(632)
633	(633)
634	(634)
635	(635)
636	(636)
637	(637)
638	(638)
639	(639)
640	(640)
641	(641)
642	(642)
643	(643)
644	(644)
645	(645)
646	(646)
647	(647)
648	(648)
649	(649)
650	(650)
651	(651)
652	(652)
653	(653)
654	(654)
655	(655)
656	(656)
657	(657)
658	(658)
659	(659)

( ) = *Initialized data*

Phantom Port Reference Number XXX	Phantom Directory Number (YYYY)
660	(660)
661	(661)
662	(662)
663	(663)
664	(664)
665	(665)
666	(666)
667	(667)
668	(668)
669	(669)
670	(670)
671	(671)
672	(672)
673	(673)
674	(674)
675	(675)
676	(676)
677	(677)
678	(678)
679	(679)
680	(680)
681	(681)
682	(682)
683	(683)
684	(684)
685	(685)
686	(686)
687	(687)
688	(688)
689	(689)
690	(690)
691	(691)
692	(692)
693	(693)
694	(694)
695	(695)
696	(696)
697	(697)
698	(698)
699	(699)

( ) = *Initialized data*

Phantom Port Reference Number XXX	Phantom Directory Number (YYYY)
700	(700)
701	(701)
702	(702)
703	(703)
704	(704)
705	(705)
706	(706)
707	(707)
708	(708)
709	(709)
710	(710)
711	(711)
712	(712)
713	(713)
714	(714)
715	(715)
716	(716)
717	(717)
718	(718)
719	(719)
720	(720)
721	(721)
722	(722)
723	(723)
724	(724)
725	(725)
726	(726)
727	(727)
728	(728)
729	(729)
730	(730)
731	(731)
732	(732)
733	(733)
734	(734)
735	(735)
736	(736)
737	(737)
738	(738)
739	(739)

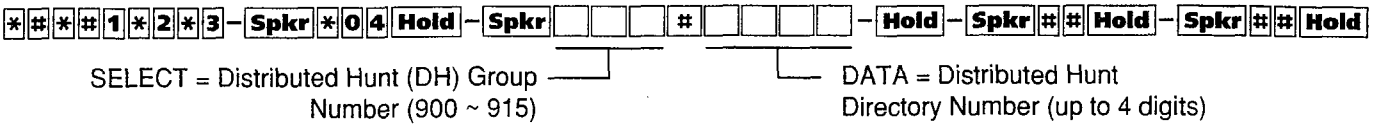
( ) = *Initialized data*

DK0097

General Note:

- *Initialized data: Phantom Port Reference Number = Phantom Directory Number.*

Program *04 — Distributed Hunt Group Directory Numbers for Internal and Tie Line Calls [1]



SELECT =	DATA = 1- to 4-digit Distributed Hunt Group Directory Number
DHG: 900	(850)
DHG: 901	(851)
DHG: 902	(852)
DHG: 903	(853)
DHG: 904	(854)
DHG: 905	(855)
DHG: 906	(856)
DHG: 907	(857)
DHG: 908	(858)
DHG: 909	(859)
DHG: 910	(860)
DHG: 911	(861)
DHG: 912	(862)
DHG: 913	(863)
DHG: 914	(864)
DHG: 915	(865)

( ) = *Initialized data*

Note:

1. Available with DK280 Release 3.1 or higher.

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *When editing the data field, use Button/LED 01 to delete existing data.*
- *Initialized data are blank for all Distributed Hunt Numbers.*
- *See Program *09 or 71 for DID line call routing to DH Groups; see Programs 81 ~ 89 and *81, *84, and *87 for Ground/Loop start CO line call routing to DH Groups.*

DK0098

Program 05 — Flexible Access Code Numbering

[*][#][*][#][1][*][2][*][3] – [Spkr] – [0][5] [Hold] – [Spkr] [ ] – [ ][ ] – [Hold] – [Spkr][#][#] [Hold] – [Spkr][#][#] [Hold]

SELECT = Access Code 1 ~ 9 from the table below

SPECIAL DIAL = New Access Codes[1]

Access Code	Features Affected (N/A = Not Affected/Cannot Change)		New Access Codes
0	Unused		
1	Voice First/Tone First (Dial 1-N/A) Door Phones (#151 ~ #159; #161 ~ #163) IMDU or RMDS Access (#19)	Station LCD Messages (Dial 10~19-N/A) Station Speed Dial Set (Dial 10~49-N/A)	
2	Busy Override (Dial 2-N/A) Do Not Disturb Override (Dial 2-N/A)	Default Station Numbers and Park Orbits (R3) 200 ~ 439[2] – N/A see Program 04 Off-hook Call Announce (Dial 2-N/A)	
3	Executive Override (Dial 3-N/A) All Call Voice Page (#30) All Call Voice Page with External Spkrs (#39)	External Page Zones 1 ~ 4 (#35 ~ #38) Group Page (Internal) (#311 ~ #318) Park + Page Cnf + #331-See Program *05 (R3) Park Pick Up #331-See Program *05 (R3) Park + Hold Cnf + #332-See Program *05 (R3) Park Pick Up #332-See Program *05 (R3)	
4	Automatic Callback (Dial 4-N/A) CO Line Queuing (Dial 4-N/A) Station Number Display (#401) Port Number Display (#402) Hold (#41) Hold Pickup (#42) Automatic Busy Redial (Conf + #44) Automatic Busy Redial Cancel (Int + #44) Message Waiting Answer (#408) from INT, **[PDN]**, or **[PhDN]** Display **[PDN]**, **[SDN]**, or **[PhDN]** on LCD (#407) Emergency Call to Attendant Console (#400)	Flash (Cnf + #45) Account Code Input (Cnf + #46) T.R. Override/T. Class Code Input (Cnf + #47) BGM Over Stations ON (#481) BGM Over Stations OFF (#480) BGM Over External Speakers ON (#491)(Station 200 only) BGM Over External Speakers OFF (#490)(Station 200 only) Cancel Message Waiting at Station (#409) from INT, **[PDN]**, or **[PhDN]** Access Code/Speed Dial Prefix (44 or #)[3] Start Trace #489 (Station 200 only) Stop Trace #488 (Station 200 only) Cancel Auto Call Back (#43)	

DK0099

Notes:

1. *The first digit of access codes can replaced by 2 digits. Standard access codes are shown above for reference.*
2. *The initialized station number sequence of 200 ~ 439 may not be globally changed through Program 05. Make changes through Program 04.*
3. *To store a CO line or feature access code in Speed Dial memory from rotary telephones or telephones without the* **Speed Dial** *and* **Redial** *buttons, enter 44 + 7XXX instead of # + 7XXX.1.*

General Notes:

- *Be sure access code changes do not conflict with existing access code or station numbering schemes. Refer to Program 04 – Port/Station Number Assignment.*
- *To insert a blank, press programming LED/Button 01.*
- *If access codes are being changed to a number that is currently assigned, change the currently assigned code to an unused code first. In the initialized state, the only unused code is zero (0).*

Program 05 — Flexible Access Code Numbering (continued)

[*][#][*][#][1][*][2][*][3] – [Spkr] – [0][5] [Hold] – [Spkr] [ ] – [ ][ ] – [Hold] – [Spkr][#][#] [Hold] – [Spkr][#][#] [Hold]

SELECT = Access Code 1 ~ 9 from the Table Below

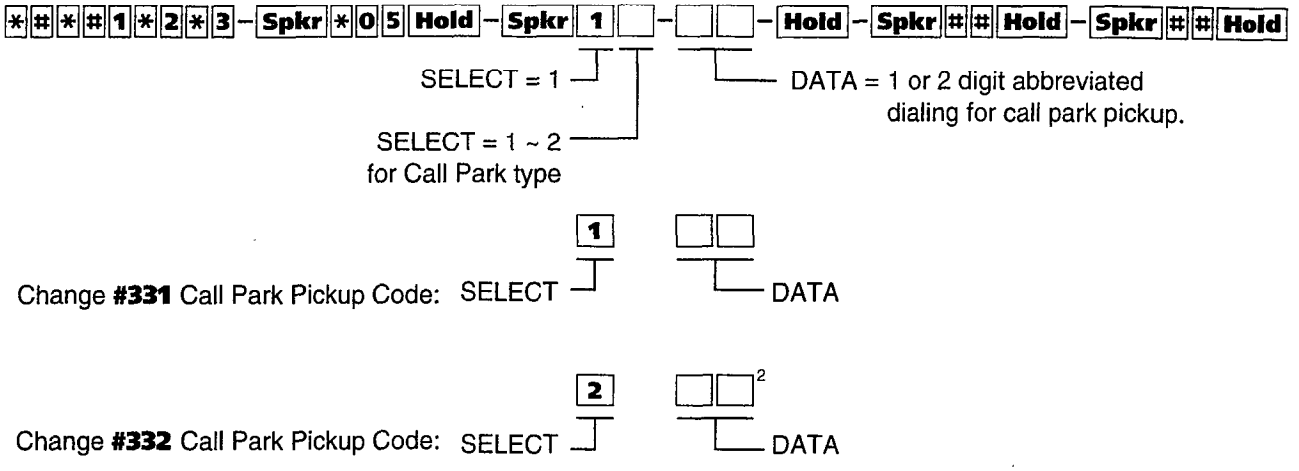
SPECIAL DIAL = New Access Codes[1]

Access Code	Features Affected (N/A = Not Affected/Cannot Change)	New Access Codes
5	Voluntary Account Code: Speed Dial button + 50 Call Pickup Station (#5+Station No.), Ringing CO or DID line (#59), Pick-up Telephone Page (#5+#30) Directed Pickup of CO Line on Hold (#5+#7 □□□, □□□ = 001 ~ 144), Pick-up External Page (#5+#30 or for Zone Page #5+#35 ~ #38) Selected Group Pickup (#5+#320 ~ #339) Own Group(s) Pickup (#5+#34) Default Phantom Directory Numbers (500 ~ 739) N/A. See Prog *04 (R3) Pickup Ringing Line (#59)	
6	Call Forward (#601, #602, #603, #604) Timed Reminder (#605 ~ #609) M/W for Voice Mail ON (#63+Station No.) M/W for Voice Mail OFF (#64+Station No.) Voice Mail ID Code Set (Call Fwd, #656) Voice Mail ID Code Set (Ans. MW, #657) LCD Message Set (#68) DKT Mute Ring Adjust (#6101) DKT Ring Level Adjust (#6102) Port Swap/Station Relocation OFF (#6281) Station Relocation ON (#6282) Logical Port Swap ON (#6283) Call Forward Ext Set or Remote Change Code (#670) Date Set (#651) Time Set (#652) Weekday Set (#653) T.R. Override Code Change (#654, #655) System Speed Dial (N/A 600 ~ 699 RCTUB, RCTUBA/BB, & RCTU C/D) System Speed Dial Set (N/A 60 ~ 99 - RCTUA only) LCD User Name (#621-Set, #620-Reset, TR dial plan Set #650 +6267 +7/8/9 Change DISA Security Code Change (#658) Verified Account Code Change (#659) Set LCD Messages (#68) System LCD Messages (N/A 60-99) Traveling Class Code 1 ~ 8 Change (#691 ~ #698) Logical Port Swap (#627 + Destination Intercom No.) Physical Port Calling (#629 + Physical Port No.) Message Waiting Set/Cancel (N/A) (7) (77) Night Lock Password Change (#622)	
7	CO Line Outgoing Calls (#7001 ~ #7144)[3]	
8	CO Group Outgoing Calls (801 ~ 816) Default Distributed Hunt Directory Numbers (850~ 865) See Program *04 (R3)	
9	Least Cost Routing or CO Group (9), Distributed Hunt Group Prog *04 Port Ref. (900 ~ 915)	

DK0491

See notes on preceeding page.

Program *05 — Call Park Pickup Abbreviated Dialing[1] (R3)



Notes:

1. *Use with RCTUA3, RCTUBA3/RCTUBB3, or RCTUC3/RCTUD3 Release 3 or above only.*
2. *It is only necessary to change one code, but each code can be changed to the same or different Park Pickup dialing codes.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *For dialing convenience, the 1- (or 2-) digit abbreviation for Call Park Pickup replaces the Call Park access codes #331 and #332. To park calls, Code #331/#332 must still be used if the Program 39 Call Park buttons are not available on a telephone. Changing the #331/#332 codes only applies to Call Park Pickup.*
- *Initialized DATA = blank for both Call Park types.*
- *LED 01 blanks out the Call Park abbreviated dialing data.*
- *Example:*

  If Park Pickup code #331 is changed to the digit "1", Park Pickup will function by dialing 1XXX, where XXX is the orbit number in which the call is parked.

DK0100

Program 09 — Built-in Auto Attendant Prompt/Station Assignments

[*][#][*][#][1][*][2][*][3] – [Spkr] – [0][9] [Hold] – [Spkr] [ ] – [ ][ ][ ][ ] – [Hold] – [Spkr][#][#] [Hold] – [Spkr][#][#] [Hold]

SELECT = PROMPT
Select prompt offered to caller.
First or second digit.
(See Notes 1 and 2).

AUTO ATT DIAL = (1 ~ 4 DIGITS)
Select the station intercom numbers, Primary **[DNs]**, Phantom **[DNs]**, Distributed Hunt **[DNs]**, or ACD Group No.[4] which will receive Auto Attendant calls.
Could be * if establishing the first digit.
(See Notes 1, 2, 4 and 5).

Dialed Digit (Menu Prompts)	Station ([DN] or Intercom) Number	Department, Division, Etc.
0		
1		
2 (Note 3)		
3 (Note 3)		
4 (Note 3)		
5 (Note 3)		
6 (Note 3)		
7 (Note 3)		
8		
9 (Note 3)		

DK0101

Notes:

1. *To enter one-digit dialing prompts along with their destination station numbers:*
   - A. *Enter Program 09, and then see "SELECT" on the LCD.*
   - B. *Press the desired digit (prompt), and then see "AUTO ATT DIAL" on the LCD.*
   - C. *Enter the destination station Intercom or **[DN]** (not Port number) number or ACD group (per Note 6) associated with the prompts and then the **Hold** button.*
   - D. *Press **Spkr** and repeat Steps 2 and 3 for more prompt-station entries.*
2. *To enter two-digit dialing prompts along with their destination station numbers:*
   - A. *Enter Program 09,and then see "SELECT" on the LCD.*
   - B. *Press the desired leading digit, and then see "AUTO ATT DIAL" on the LCD.*
   - C. *Press * and then the **Hold** button. The first digit will now be set, and "DATA PROGRAMED" will again appear on the LCD.*
   - D. *Press **Spkr** and press a second digit, and then see "AUTO ATT DIAL" on the LCD.*
   - E. *Enter the destination station Intercom or **[DN]** assigned to the two-digit prompt and then the **Hold** button.*
   - F. *To complete more prompt-station entries, repeat Steps E and F.*
3. *Don't use digits 2 ~ 7 and 9 as a first digit because these numbers conflict with the default station Intercom, **[PDN]**, **[PhDN]** and DH **[DN]** numbers of the system. These digits can be used as the second digits for 2-digit dialing prompts.*
4. *To assign a Digit (Menu prompt) to an ACD Group, enter [#][4][X][X] in place of the Station (Intercom or **[DN]**) Number at "AUTO ATT DIAL" LCD programming prompt, where XX is the ACD Group number 01~16 (R2 and above).*
5. ***[PDN]**, **[PhDN]**, and Distributed Hunt **[DNs]** apply to R3 and above only.*

General Notes:

- *When transmission and DTMF levels are lower than normal or when the digital announcement voice frequencies match DTMF digital frequencies (talk-off), Auto Attendant efficiency may be improved with two-digit dialing options, instead of one-digit dialing options.*
- *Press Button LED 01 to delete data.*

Program *09 — DID Digit Translation Assignments (Logical Ports 000 ~ 119)

##1*2*3 – Spkr * 09 Hold – Spkr [ ][ ][ ] # [ ][ ][ ][ ] Hold – Spkr ## Hold – Spkr ## Hold

SELECT = Telephone Logical Port Number[1] — DIAL = DID Extension Number (1 ~ 4 Digits)

STATION LOGICAL PORT	DID EXTENSION NUMBER (1 ~ 4 DIGITS) INITIALIZED
000	(200)
001	(201)
002	(202)
003	(203)
004	(204)
005	(205)
006	(206)
007	(207)
008	(208)
009	(209)
010	(210)
011	(211)
012	(212)
013	(213)
014	(214)
015	(215)
016	(216)
017	(217)
018	(218)
019	(219)
020	(220)
021	(221)
022	(222)
023	(223)
024	(224)
025	(225)
026	(226)
027	(227)
028	(228)
029	(229)
030	(230)
031	(231)
032	(232)
033	(233)
034	(234)
035	(235)
036	(236)
037	(237)
038	(238)
039	(239)

STATION LOGICAL PORT	DID EXTENSION NUMBER (1 ~ 4 DIGITS) INITIALIZED
040	(240)
041	(241)
042	(242)
043	(243)
044	(244)
045	(245)
046	(246)
047	(247)
048	(248)
049	(249)
050	(250)
051	(251)
052	(252)
053	(253)
054	(254)
055	(255)
056	(256)
057	(257)
058	(258)
059	(259)
060	(260)
061	(261)
062	(262)
063	(263)
064	(264)
065	(265)
066	(266)
067	(267)
068	(268)
069	(269)
070	(270)
071	(271)
072	(272)
073	(273)
074	(274)
075	(275)
076	(276)
077	(277)
078	(278)
079	(279)

STATION LOGICAL PORT	DID EXTENSION NUMBER (1 ~ 4 DIGITS) INITIALIZED
080	(280)
081	(281)
082	(282)
083	(283)
084	(284)
085	(285)
086	(286)
087	(287)
088	(288)
089	(289)
090	(290)
091	(291)
092	(292)
093	(293)
094	(294)
095	(295)
096	(296)
097	(297)
098	(298)
099	(299)
100	(300)
101	(301)
102	(302)
103	(303)
104	(304)
105	(305)
106	(306)
107	(307)
108	(308)
109	(309)
110	(310)
111	(311)
112	(312)
113	(313)
114	(314)
115	(315)
116	(316)
117	(317)
118	(318)
119	(319)

DK0102

Notes:

1. *To range program: Enter port range X X X * Y Y Y, then set DIAL to the first extension number in the range and press* **Hold**. *The extension numbers will automatically be numbered in successive order (XXX = low port, YYY = high port). Do not press # after entering a port range.*

General Notes:

- *RMDS or IMDU modem DID extension numbers are assigned to Port 035 (RCTUA), Port 085 (RCTUB or RCTUBA/BB), and Port 245 (RCTUC/D)*
- *Initialized Data is Port 000= 200, Port 001= 201....Port 239 = 439.*
- *Press Button 01 to blank/erase extension numbers.*

Program *09 — DID Digit Translation Assignments (Logical Ports 120 ~ 245)

##1*2*3 – Spkr *09 Hold – Spkr [ ][ ][ ] # [ ][ ][ ][ ] Hold – Spkr ## Hold – Spkr ## Hold

SELECT = Telephone Logical Port Number[1]

DIAL = DID Extension Number (1 ~ 4 Digits)

STATION LOGICAL PORT	DID EXTENSION NUMBER (1 ~ 4 DIGITS) INITIALIZED
120	(320)
121	(321)
122	(322)
123	(323)
124	(324)
125	(325)
126	(326)
127	(327)
128	(328)
129	(329)
130	(330)
131	(331)
132	(332)
133	(333)
134	(334)
135	(335)
136	(336)
137	(337)
138	(338)
139	(339)
140	(340)
141	(341)
142	(342)
143	(343)
144	(344)
145	(345)
146	(346)
147	(347)
148	(348)
149	(349)
150	(350)
151	(351)
152	(352)
153	(353)
154	(354)
155	(355)
156	(356)
157	(357)
158	(358)
159	(359)

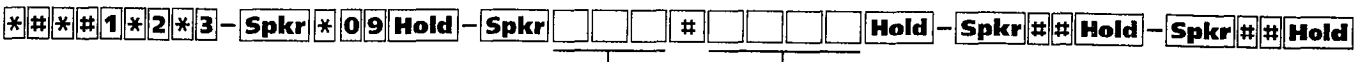
STATION LOGICAL PORT	DID EXTENSION NUMBER (1 ~ 4 DIGITS) INITIALIZED
160	(360)
161	(361)
162	(362)
163	(363)
164	(364)
165	(365)
166	(366)
167	(367)
168	(368)
169	(369)
170	(370)
171	(371)
172	(372)
173	(373)
174	(374)
175	(375)
176	(376)
177	(377)
178	(378)
179	(379)
180	(380)
181	(381)
182	(382)
183	(383)
184	(384)
185	(385)
186	(386)
187	(387)
188	(388)
189	(389)
190	(390)
191	(391)
192	(392)
193	(393)
194	(394)
195	(395)
196	(396)
197	(397)
198	(398)
199	(399)

STATION LOGICAL PORT	DID EXTENSION NUMBER (1 ~ 4 DIGITS) INITIALIZED
200	(400)
201	(401)
202	(402)
203	(403)
204	(404)
205	(405)
206	(406)
207	(407)
208	(408)
209	(409)
210	(410)
211	(411)
212	(412)
213	(413)
214	(414)
215	(415)
216	(416)
217	(417)
218	(418)
219	(419)
220	(420)
221	(421)
222	(422)
223	(423)
224	(424)
225	(425)
226	(426)
227	(427)
228	(428)
229	(429)
230	(430)
231	(431)
232	(432)
233	(433)
234	(434)
235	(435)
236	(436)
237	(437)
238	(438)
239	(439)
245	

See notes on previous page.

DK0103

Program *09 — DID Digit Translation ([PhDN] Reference Ports 500 ~ 619)



SELECT = [PhDN] Ref. Port Number[1]

DIAL = DID Extension Number (1 ~ 4 Digits)

[PhDN] REF. PORT	DID EXTENSION NUMBER (1 ~ 4 DIGITS) INITIALIZED
500	(500)
501	(501)
502	(502)
503	(503)
504	(504)
505	(505)
506	(506)
507	(507)
508	(508)
509	(509)
510	(510)
511	(511)
512	(512)
513	(513)
514	(514)
515	(515)
516	(516)
517	(517)
518	(518)
519	(519)
520	(520)
521	(521)
522	(522)
523	(523)
524	(524)
525	(525)
526	(526)
527	(527)
528	(528)
529	(529)
530	(530)
531	(531)
532	(532)
533	(533)
534	(534)
535	(535)
536	(536)
537	(537)
538	(538)
539	(539)

( ) Initialized

[PhDN] REF. PORT	DID EXTENSION NUMBER (1 ~ 4 DIGITS) INITIALIZED
540	(540)
541	(541)
542	(542)
543	(543)
544	(544)
545	(545)
546	(546)
547	(547)
548	(548)
549	(549)
550	(550)
551	(551)
552	(552)
553	(553)
554	(554)
555	(555)
556	(556)
557	(557)
558	(558)
559	(559)
560	(560)
561	(561)
562	(562)
563	(563)
564	(564)
565	(565)
566	(566)
567	(567)
568	(568)
569	(569)
570	(570)
571	(571)
572	(572)
573	(573)
574	(574)
575	(575)
576	(576)
577	(577)
578	(578)
579	(579)

( ) Initialized

[PhDN] REF. PORT	DID EXTENSION NUMBER (1 ~ 4 DIGITS) INITIALIZED
580	(580)
581	(581)
582	(582)
583	(583)
584	(584)
585	(585)
586	(586)
587	(587)
588	(588)
589	(589)
590	(590)
591	(591)
592	(592)
593	(593)
594	(594)
595	(595)
596	(596)
597	(597)
598	(598)
599	(599)
600	(600)
601	(601)
602	(602)
603	(603)
604	(604)
605	(605)
606	(606)
607	(607)
608	(608)
609	(609)
610	(610)
611	(611)
612	(612)
613	(613)
614	(614)
615	(615)
616	(616)
617	(617)
618	(618)
619	(619)

( ) Initialized

DK0104

Note:

1. *To range program: Enter port range X X X * Y Y Y, then set DIAL to the first extension number in the range and press* **Hold**. *The extension numbers will automatically be numbered in successive order (XXX = low port, YYY = high port). Do not press # after entering a port range.*

General Note:

- *Press Button 01 to blank/erase extension numbers.*

Program *09 — DID Digit Translation ([PhDN] Reference 620 ~ 739)

##1*2*3 – Spkr * 09 Hold – Spkr [ ][ ][ ] # [ ][ ][ ][ ] Hold – Spkr ## Hold – Spkr ## Hold

SELECT = [PhDN] Ref. Port Number

DIAL = DID Extension Number (1 ~ 4 Digits)

[PhDN] REF. PORT	DID EXTENSION NUMBER (1 ~ 4 DIGITS) INITIALIZED
620	(620)
621	(621)
622	(622)
623	(623)
624	(624)
625	(625)
626	(626)
627	(627)
628	(628)
629	(629)
630	(630)
631	(631)
632	(632)
633	(633)
634	(634)
635	(635)
636	(636)
637	(637)
638	(638)
639	(639)
640	(640)
641	(641)
642	(642)
643	(643)
644	(644)
645	(645)
646	(646)
647	(647)
648	(648)
649	(649)
650	(650)
651	(651)
652	(652)
653	(653)
654	(654)
655	(655)
656	(656)
657	(657)
658	(658)
659	(659)

( ) Initialized

[PhDN] REF. PORT	DID EXTENSION NUMBER (1 ~ 4 DIGITS) INITIALIZED
660	(660)
661	(661)
662	(662)
663	(663)
664	(664)
665	(665)
666	(666)
667	(667)
668	(668)
669	(669)
670	(670)
671	(671)
672	(672)
673	(673)
674	(674)
675	(675)
676	(676)
677	(677)
678	(678)
679	(679)
680	(680)
681	(681)
682	(682)
683	(683)
684	(684)
685	(685)
686	(686)
687	(687)
688	(688)
689	(689)
690	(690)
691	(691)
692	(692)
693	(693)
694	(694)
695	(695)
696	(696)
697	(697)
698	(698)
699	(699)

( ) Initialized

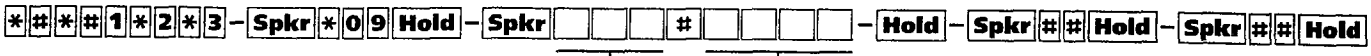
[PhDN] REF. PORT	DID EXTENSION NUMBER (1 ~ 4 DIGITS) INITIALIZED
700	(700)
701	(701)
702	(702)
703	(703)
704	(704)
705	(705)
706	(706)
707	(707)
708	(708)
709	(709)
710	(710)
711	(711)
712	(712)
713	(713)
714	(714)
715	(715)
716	(716)
717	(717)
718	(718)
719	(719)
720	(720)
721	(721)
722	(722)
723	(723)
724	(724)
725	(725)
726	(726)
727	(727)
728	(728)
729	(729)
730	(730)
731	(731)
732	(732)
733	(733)
734	(734)
735	(735)
736	(736)
737	(737)
738	(738)
739	(739)

( ) Initialized

DK0105

See notes on previous page.

Program *09 — Distributed Hunt Group DID Extension Number Translations[1]



SELECT = Distributed Hunt (DH) Group Ref. Number (900 ~ 915)

DATA = Distributed Hunt Group DID Extension Number (up to 4 digits)

SELECT =	DATA = 1- to 4-digit Distributed Hunt Group DID Extension Number
DHG: 900	( )
DHG: 901	( )
DHG: 902	( )
DHG: 903	( )
DHG: 904	( )
DHG: 905	( )
DHG: 906	( )
DHG: 907	( )
DHG: 908	( )
DHG: 909	( )
DHG: 910	( )
DHG: 911	( )
DHG: 912	( )
DHG: 913	( )
DHG: 914	( )
DHG: 915	( )

( ) = *Initialized data is blank*

Note:

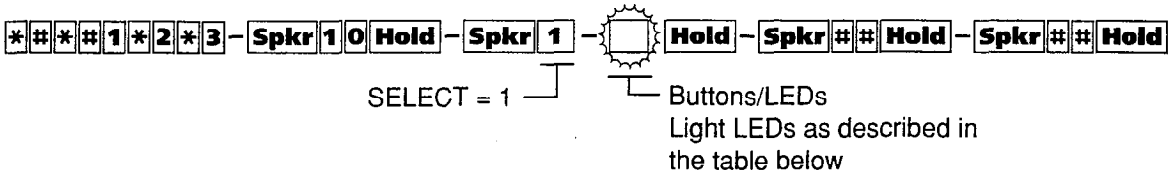
1. *Available with DK280 Release 3.1 or higher.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *When editing the data field, use Button/LED 01 to delete existing data.*
- *Initialized data are blank for all Distributed Hunt Numbers.*
- *See Program *09 or 71 for DID line call routing to DH Groups; see Program 81~89 and *81, *84, and *87 for ground/loop start CO line call routing/ringing to DH Groups.*

DK0106

Program 10-1 —System Assignments, Part 1 of 3



Button/LED	X	LED On	LED Off
20	1	Two-CO line Conference/Allowed[5]	Not Allowed
19	1	Conference/Allowed	Not Allowed
18	1	Ring Detect Time - Normal	Ring Detect Time – Short Rings
17		Station to Station Call Volume PAD (-8 dB)	No Station to Station Call PAD
16		–	–
15		–	–
14		–	–
13		–	–
12		ABR Cycles/10 times	15 times
11		ABR Redial time/30 sec.	1 min.
10		System Speed Dial Override,Toll Restriction	Restricted
09	1	Exclusive Hold/Allowed	Not Allowed
08	1	Alternate Point Answer	Transfer Privacy
07[3]	1	Ring Transfer of CO Line Allowed	Not Allowed
06[4]		CO Line Repeat Ringing	Standard Ring
05		Incoming Call Abandon 8 sec.	6 sec.
04		CO Line DTMF Signal Time 160 msec.	80 msec.[2]
03		Dial Pulse Make Ratio 33%	40%
02[6]		0.45 or 1.5 sec. per Program 42-0	CO line re-seize guard time 0.45
01		Tone First (from DKTs and EKTs)	Voice First (DKTs from EKTs)

DK0107

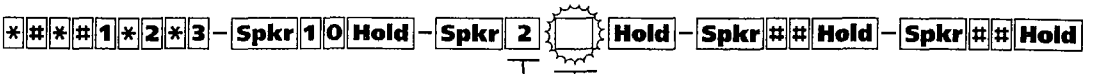
Notes:

1. *Initialized data lights LEDs 07, 08, 09, 18, 19 and 20.*
2. *LED 04 DTMF Signal Time applies to manual and speed dial tones sent out of the system via CO lines. This applies when dialing from any Toshiba telephone, including the 2000-series Digital Telephone. LED 04 does not apply to Call Forward or Voice Mail ID DTMF tones sent to voice mail ports. (See Program 10-2, LED 06, for tones sent to Voice Mail ports.)*
3. *If Ring Transfer is allowed, set Ring Transfer Recall time in Program 37; if ring transfer is not allowed (LED 07 off), the station will recall immediately if transfer is attempted.*
4. *Standard ring pattern is 1 sec. on, 3 sec. off.*
5. *Two-CO line Conference must be allowed for DISA, CF-EXT, and DNIS external routing operation.*
6. *CO line guard time is the time interval the system requires to release a CO line and reseize it. If LED 02 is off, all lines are set with 0.45 second guard time; if LED is on, guard time is 0.45 or 1.5 seconds per Program 42-0.*

General Note:

- *For more information, see the instructions preceding the record sheets.*

Program 10-2 —System Assignments, Part 2 of 3



Light LEDs as defined by the table below.
ALL LEDs with an "X" should be lit when you finish.

BUTTON/ LED	X	LED On	LED Off
20		Padded DTMF Tone Return When Dialing	DTMF/No DTMF Per Prog 10-2, LED 11
19[6]		External Conference Amp Connected to PEKU	No External Amplifier Connected
18[6]		External Conference Amp Connected to PEKU	No External Amplifier Connected
17		"TRNS" Soft Key—Immediate	"TRNS" Soft Key—Normal
16	1	Executive Override Warning Tone/ON	Executive Override Warning Tone/OFF
15[6]	1	External Page included with All Call Page	Not Included
14	1	Privacy Override/Attendant/Supervised Loop Warning Tone/ON	Privacy/Attendant Supervised Loop Override Warning Tone/OFF
13		Send Auto Callback Camp-on Tone[2]	No Callback Tone
12		CO Line 3 min Beep Tone	No Beep Tone
11		No DTMF Tone Return When Dialing[5]	DTMF Tone Return When Dialing
10[3]		BGM connected to PESU, Circuit 8	EKT connected to PESU, CKT 8
09[3]		BGM connected to PEKU, Circuit 3	EKT connected to PEKU, CKT 3
08[8]		Elapsed Time Display 1 min. After Access or Answer a CO line	Elapsed Time Display 15 sec. After Access or Answer a CO Line
07[4]		Standard Tel. CO Ring per Prog. 10-1, LED 06	Standard Tel. CO Ring Distinctive
06		VM ID Code DTMF Signal Time 80 ms	160 ms
05			
04[7]		MW cancel from VM: RS-232 or dial **# 6 4** + **[DN]**	MW cancel from VM: Automatic When Answer
03		3 Ringing Modes	2 Ringing Modes
02	1	Hunt/C.F. override from DSS console's phone	Hunt/C.F. override from DSS console
01		Tone First (from DSS Console)	Voice First (from DSS Console)

DK0108

Notes:

1. *Initialized data lights LEDs 02, 14, 15 and 16.*
2. *Called party receives notification tone when calling party activates Auto Call Back.*
3. *BGM connected to the PEKU or PESU will be sent to electronic and digital telephone speakers and external page (optional). To assign the BGM PCB slot number, see Program 19-1.*
4. *The ring pattern for standard telephone, distinctive ring on incoming trunk calls is: 0.2 sec. on/0.4 sec. off, 0.2 sec. on /3.4 sec. off; intercom ring is always 1 sec. on, 3 sec. off. This does not apply to VM Ports (Program 31, LED 17 on) which are always standard ring.*
5. *Deletes DTMF tones returned to digital and electronic telephones when dialing from dialpad or speed dialing; also deletes auto dial digits from callers that are call forwarded to voice mail. This does not affect the actual DTMF tones sent out to trunks or voice mail devices.*

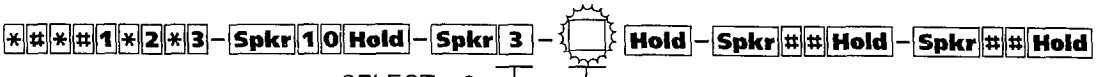
IMPORTANT !

6. *LED 18 and 19 should be OFF unless external amplifiers are used for Two-CO line/Station Conference (see Program 10-3). If LED 18 and 19 are ON, the station may be unbalanced and receive HUM if external amplifier with Auto-Gain-Control is not connected. If volume is low on Two CO line conference because of line loss, it is recommended to test conference with LED 18 and 19 ON. If there is no HUM noise and volume improves, keep LED 18 and 19 ON.*
7. *LED 04 should be on for DTMF or RS-232 VM integration – also see Program 31.*
8. *"Elapsed time of call" will replace CO line Name, DNIS, ANI, or Caller ID information on telephone LCDs, 1 min. or 15 sec. after an incoming call is answered.*

General Notes:

- *External speakers and all electronic and digital telephones are paged by dialing:* **Intercom** *or Directory Number* ***[DN]*** *+* **#39**. *The* **All Call Page** **(AC)** *button is used to page all digital and electronic telephones only; external speakers are not included when using the button.*
- *PESU/PEKU can be in any universal slot assigned in Program 19-1*

Program 10-3 —System Assignments, Part 3 of 3



Button/ LED	X	LED ON	LED OFF
20			
19		Speed Dial Entry Timeout—3 Minutes	Speed Dial Entry Timeout—1 Minute
18		Auto Attd: Normal Ringing Pattern After Camp-On	Auto Attd: Back to Announcement After Camp-On
17[3]		Auto Attd: Ring Before Disconnect Time	Auto Attd: Ring Before Disconnect Time
16[3]		Auto Attd: Ring Before Disconnect Time	Auto Attd: Ring Before Disconnect Time
15		Auto Attd: Sends MOH to Caller	Auto Attd: Sends RBT to Caller
14[5]		SMDI-Bellcore Standard VM Interface, per LED 09 below	Toshiba Proprietary – RS232 VM Interface
13[4]	1	SMDI-Station Number Digit Length (HEX-8)	SMDI-Station Number Digit Length (HEX-0)
12[4]		SMDI-Station Number Digit Length (HEX-4)	SMDI-Station Number Digit Length (HEX-0)
11[4]	1	SMDI-Station Number Digit Length (HEX-2)	SMDI-Station Number Digit Length (HEX-0)
10[4]		SMDI-Station Number Digit Length (HEX-1)	SMDI-Station Number Digit Length (HEX-0)
09[5]		Bellcore Standard 1985 Version (1-space)	Bellcore Standard 1991 Version (2-spaces)
08(R3)		Caller ID/ANI Numbers are sent out the SMDI port[6]	Caller ID/ANI numbers are not sent out the SMDI port
07			
06			
05			
04[2]		PEKU Ports 33, 34 — Amp. 4 Connected	Ports 33, 34 — Stations Connected
03		PEKU Ports 25, 26 — Amp. 3 Connected	Ports 25, 26 — Stations Connected
02		PEKU Ports 17, 18 — Amp. 2 Connected	Ports 17, 18 — Stations Connected
01		PEKU Ports 09, 10 — Amp. 1 Connected	Ports 09, 10 — Stations Connected

DK0109

Notes:

1. *Initialized data: LEDs 11 and 13 ON, all other LEDs OFF.*
2. *Amplifiers are switched into two-CO line calls automatically, one amplifier for each call, starting from the lowest ports enabled to the highest. Skipping ports is allowed. Two-CO line calls established after all amplifiers are in use will not be amplified. RCTUB, RCTUBA/BB, and RCTUC/D allows up to 4 Amplifiers, RCTUA allows up to 3 Amplifiers.*
3. *The time the Auto Attendant will ring stations (per Program 81, 84, 87) after a loop start line caller does not dial and/or a ringing station does not answer. Set ring disconnect time as shown above. If a call is not answered before ring disconnect time period time-out, the call will disconnect. This is to prevent loop start lines from being locked-up when there is no CPC supervision from the central office after the outside caller hangs up.*

Ring Time	LED 16	LED 17
40 sec	OFF	OFF
120 sec	OFF	ON
240 sec	ON	OFF

[3]

4. *Set LED 10-13 ON so that their HEX values add up to the Voice Mail station digit length for SMDI VM interface. (Example: For VP100 or Stratagy SMDI interface, set LEDs 10, 11, and 12 on for 7 digits (1+2+4=7). LEDs 10-13 should be off for Toshiba proprietary VM interface.*
5. *Toshiba Proprietary and SMDI is available with RCTUB2 or RCTUC/RCTUD2 Release 2 and above only and is only for use with Toshiba VP systems, not with Toshiba Stratagy systems.*
6. *When sending Call ID/ANI numbers to voice mail via SMDI, LED s 08, 09, 10, 11, 12, 13, and 14 must be turned ON.*

General Notes:

IMPORTANT !

Only enable the PEKU and PESU ports that are actually connected to amplifiers.
Do not install TIE/DID lines or the RATU PCB in slots with lower slot numbers than amplified conference PEKU slots.

- *See Chapter 6—Peripheral Installation for connecting up to four two-way amplifiers for use on tandem, DISA, External Call Forward, DNIS external routing, and conference telephone calls.*
- *See Program 10-2, LED 18 and 19; Program 10-1, LEDs 19 and 20; and Program 15-5 for more information regarding Two-CO line conference/tandem.*

Program 12 — System Assignments — Basic Timing

[*][#][*][#][1][*][2][*][3] – [Spkr][1][2][Hold] – [Spkr][ ] – [ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = 3 ~ 9 — Enter program code, 3 ~ 9, from table below.

SELECT CODE = Enter required code for the time listed in the table below. See Note 1.

Program Code	Function	Code	Time	Required Code
3[4]	Pause Timing (Speed Dial)	1	1.5 sec.	
		2	3.0 sec.	
4[2]	Flash Timing[3]	1	0.5 sec.	
		2	2.0 sec.	
		4	0.2 sec.[3]	
5	Pause After Flash (Voice Path Delay)	0	no pause	
		1	1.5 sec.	
		2	3 sec.	
8[5]	DNIS Ext. Network External Call Forward and DISA Disconnect Timer for Loop Start Lines	0	No disconnect timer	
		1	4 minute disconnect	
		2	10 minute disconnect	
		3	20 minute disconnect	
9	RRCS Inter-digital Release Time (Standard Phone)	1 through 9	1 sec. through 9 sec.	

Notes:

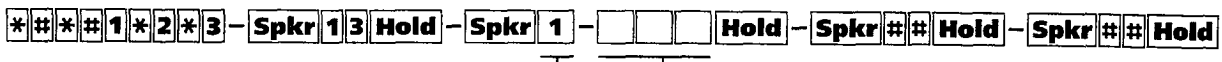
1. *When programming Code 8 and 9, the LCD responds with LINE TIME =, instead of SELECT CODE =.*
2. *The duration of time the RCOU/RCOS or PCOU circuit opens Tip & Ring when the* **Flash** *or* **MW/FL** *button is pressed, or hookflash code* **Cnf/Trn (CONF/TRANS) # 4 5** *is dialed.*
3. *This timing is not used in the United States.*
4. *This timing applies to voice calls originated from telephones and data calls orginated by system Data Interface Units.*
5. *DISA, Call Forward External and/or DNIS Telephone Network routed calls made on loop start lines will be automatically disconnected when the DISA/CF-EXT/DNIS ext. Network timer expires. Callers will hear a warning tone and can Dial "0" to reset this timer repeatedly. This is to prevent loop start line lock up if no CPC disconnect signal is provided by the central office when outside caller hangs up.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data programs timing as follows: Code 3 = 1, Code 4 = 2, Code 5 = 0, Code 8 = 1, Code 9 = 4.*

DK0110

Program 13 — Defining the Message Center



SELECT = 1

PORT = Station Logical Port Number
Enter the station logical port number of the station to be defined as the Message Center.

Port Number [1]

Note:

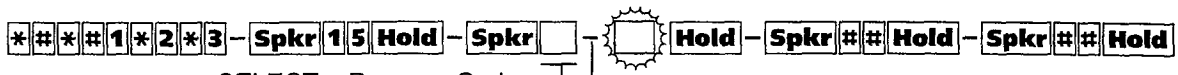
1. *For RS-232 (SMDI or Toshiba Proprietary) and/or In Band (DTMF) voice mail integration, enable the RSTU (or equivalent) port connected to the lowest VM port; or if VM ports are in a Distributed Hunt (DH) Group, enter the DH Group Directory Number **[DN]** as the message center in Program 13 and *32.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Any electronic or digital telephone may receive (and store) up to 3 message waiting indications per **[PDN]** or **[PhDN]** owned by the telephone, from any other electronic or digital telephone. A fourth message waiting indication may be set by the Message Center electronic or digital telephone only.*
- *The Message Center is allowed to perform "Message Waiting," even if disallowed on all other stations.*
- *Initialized data = no port assigned.*
- *The message center feature should be assigned to the customer's main answering position: a station or the lowest port (in VM group) of the customer's voice mail device (see Program 31 for VM group port assignment), whichever the customer specifies.*
- *When using RS-232 (SMDI or Toshiba Proprietary) voice mail interface, all stations must also be assigned to the message center port in Program *32.*

DK0111

Program 15 — Ground/Loop/Tie/DID Line Options



Copy this page for more lines.

Check off the line range covered by this table.

Range	001 ~ 020 __	021 ~ 040 __	041 ~ 060 __	061 ~ 080 __	081 ~ 100 __	101 ~ 120 __	121 ~ 140 __	141 ~ 144 __

Program Code	Program	LED Status		LINE
		ON	OFF	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 LED
0	CPC on AR VM Calls[3] and voice calls	Detect	Ignore	
1	CO/DID/Tie Line Signal[5]	DP	DTMF	
2	CO/DID/Tie Dial Pulse Rate (Pulse per sec.)	20 PPS	10 PPS	
3	AR Hold[3,6]	Detect	Ignore	
4	AR Timing[3]	Crossbar 95 msec.	ESS (Electronic) 450 msec.	
5	Tandem CO Line Connection with Station Dropout[4]	Enabled	Not Enabled	
7	Forced Account Code	Enabled	Not Enabled	
8	Operation After Flash	No RRCS after flash	RRCS after flash	

DK0112

Notes:

1. *To advance the CO line range, press the* **Scroll** *button beneath the LCD. Press the* **Page** *button for a lower range.*
2. *To turn all CO LEDs on or off, after the Program code is entered, press the* **Vol▲** *(all LEDs on) or* **Vol▼** *(all LEDs off). To check a particular CO line, after the Program code is entered, press Mode and enter the CO line number, then use the* **#** *key to display and advance.*
3. *The Automatic Release (AR) signal is called Calling Party Control (CPC) or Supervised Loop Control. This signal consists of a momentary open of the loop start CO line provided by some Central Office (CO)—the duration of the open depends on the CO. If a CO line is programmed (Programs 15-0 and 15-3) to detect the AR signal, the DK system will drop the line when the CO sends the signal (typically 1 ~ 15 seconds after the outside party hangs up). The system will send D Tone to voice mail (VM) ports to drop the ports when AR is detected. The Strata DK system will disconnect a loop start CO line voice call anytime that the AR signal is detected and the CO line has Programs 15-0 and 15-3 enabled. "CO LINE HANG UP" will display on the station's LCD when this happens.*
4. *(Tandem CO line) must be equipped for all CO lines that must provide two-CO line conference, DISA, CF-External, or DNIS External Telephone Network routing.*
5. *See Program 30, LED 11, for tie/DID Dial Pulse operation.*
6. *If loop start lines are programmed to detect the AR-Hold signal, they will not remain on the attendant console loop keys when the attendant console sets up trunk-to-trunk connection. If programmed to ignore AR-Hold, they will remain on the attendant console* **Hold** *loop keys. Enable AR-Hold detect on loop start lines only after testing that the CO sends the AR-Hold signal.*

General Note:

- *Initialized data is all LEDs OFF.*

Program *15 — CO Line Tenant Assignments

##1*2*3 – Spkr *15 Hold – Spkr [ ][ ][ ] # [ ] Hold – Spkr ## Hold – Spkr ## Hold

SELECT = CO Line Number (001 ~ 144)

TENANT = Assign the CO line to a tenant (1 ~ 4).

CO Line Range: [ ][ ][ ]*[ ][ ][ ]

CO LINE	TENANT GROUP			
	1	2	3	4
001				
002				
003				
004				
005				
006				
007				
008				
009				
010				
011				
012				
013				
014				
015				
016				
017				
018				
019				
020				
021				
022				
023				
024				
025				
026				
027				
028				
029				
030				
031				
032				
033				
034				
035				
036				
037				
038				
039				
040				
041				
042				
043				
044				
045				
046				
047				
048				
049				
050				

CO LINE	TENANT GROUP			
	1	2	3	4
051				
052				
053				
054				
055				
056				
057				
058				
059				
060				
061				
062				
063				
064				
065				
066				
067				
068				
069				
070				
071				
072				
073				
074				
075				
076				
077				
078				
079				
080				
081				
082				
083				
084				
085				
086				
087				
088				
089				
090				
091				
092				
093				
094				
095				
096				
097				
098				
099				
100				

CO LINE	TENANT GROUP			
	1	2	3	4
101				
102				
103				
104				
105				
106				
107				
108				
109				
110				
111				
112				
113				
114				
115				
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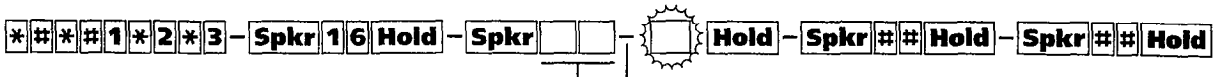
141				
142				
143				
144				

DK0113

General Note:

- *Initialized all CO lines assigned to Tenant 1.*

Program 16 — Assign CO Line Groups (Dial 9 or 801 ~ 816)



SELECT = CO Line Group
Only enter the last two digits of the trunk group (01 ~ 16) to be defined, or enter 00 for Dial 9 group.

Press: **Scroll** to advance or **Page** to go back[2]

Buttons/LEDs
Specify which trunks are assigned to the group by setting LEDs as defined by the table below. All LEDs with an "X" should be lit when finished.
See Note 1 to turn line ranges (ON/OFF).

Check off the CO line range covered by this table.

Range	001 ~ 020 ___	021 ~ 040 ___	041 ~ 060 ___	061 ~ 080 ___	081 ~ 100 ___	101 ~ 120 ___	121 ~ 140 ___	141 ~ 144 ___

Copy this page for more trunks

LED	Line No.	CO Line Groups																
		801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	Dial 9(00)
20																		
19																		
18																		
17																		
16																		
15																		
14																		
13																		
12																		
11																		
10																		
09																		
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07																		
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08																		
07																		
06																		
05																		
04																		
03																		
02																		
01																		

DK0114

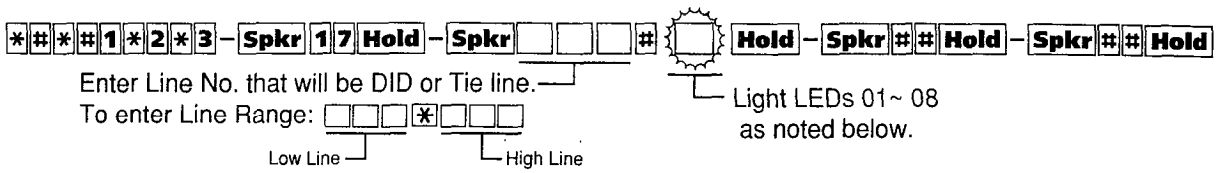
Notes:

1. *To turn all CO LEDs on or off, after the Line Group is entered, press the* **Vol▼** *(all LEDs on) or* **Vol▼** *(all LEDs off). To check a particular CO line, after the Line Group is entered, press and enter the CO line number, then use the* **#** *button to display and advance.*
2. *To advance the CO line range, press the* **Scroll** *button beneath the LCD. Press the* **Page** *button for a lower range.*

General Notes:

- *Initialized data assigns all CO lines to the Dial 9 group.*
- *With DK280 Release 1, 2, and 3, RCTU C/D provides 16 CO line Groups, RCTUA, RCTUB, and RCTUBA/BB provide 8 CO line Groups.*

Program 17 — DID/Tie Line Options



Line Numbers:[6]			
LED/ Button	**X**	**LED ON**	**LED OFF**
20			
19			
18			
17			
16			
15			
14			
10			
09			
08		DID/tie line DTMF digits with * tones[5]	DID/tie DTMF digits without * tones[5]
07		DID/tie line receives ANI (Prog 71 and 72)	DID/tie line does not receive ANI (DID Prog *09 and tie Prog *04)
06		Telephone LCD priority is ANI[4]	Telephone LCD priority is DNIS[4]
05		DID/tie line routes per DNIS assignments: (Prog 71 and 72)[3]	DID/tie line routes per Non-DNIS assignments: (DID Prog *09 and tie Prog 04); or for ANI only lines[3]
04		DID/tie no second dial tone	DID/tie second dial tone
03		DID line Auto Camp-on busy	DID line no Camp-on busy
02		Wink start for tie or DID[1]	Immediate start for tie or DID[1]
01		Page and Voice Announce on incoming tie line Page access for tie/DID DNIS lines[2]	No Page and Voice Announce on incoming tie line No Page for tie/DID DNIS Lines[2]

DK0115

Notes:

1. *LED 03/04 applies to REMU, PEMU, RDDU and RDTU DIDs and tie lines, LED 02 applies to PEMU, REMU, and RDDU only; see Program *41-2 for RDTU wink/immediate assignments.*
2. a. *In DK280 Release 1 and 2, LED 01 applies to tie lines only. DID lines are not allowed Page or Voice Announce per FCC regulations.*
   b. *If the DID lines are on a private network, then in DK280 Release 3, LED 01 may be on to allow Page access on tie and DID lines programmed with DNIS assignments in Program 71 (Code #039). For public telephone networks, tie, DID, or DNIS lines must always be restricted (LED 01 OFF) from Page and Handsfree Answerback per FCC regulations.*
3. *If normal (non-ANI and/or DNIS), tie/DID lines should use Program 71 and 72 assignments instead of Program 04 (tie) and Program *09 (DID) assignments, turn LED 05 ON and LEDs 06, 07, and 08 OFF. Turn LED 05 off for ANI only lines which should route per Programs 71 and 72. Turn LED 05 ON for DNIS only or ANI with DNIS lines.*
4. *Telephone LCDs can display ANI or DNIS information as a priority when tie/DID lines receive both ANI and DNIS digits.*
5. *DID/tie lines with ANI/DNIS digit format includes * tone with digits; DID/tie lines with normal digit format does not include * tone with digits. Most all ANI/DNIS carrier providers include * tones with digits (LED 08 ON), except, as of this writing, when Sprint provides DNIS without ANI, it does not include *'s with digits (LED 08 OFF).*
6. *Copy one record sheet for each group of tie/DID lines that have different Program 17 parameters.*

General Notes:

- *Each REMU, PEMU or RDDU PCB reduces the station port capacity by four station ports, each RDTU tie/DID line channel reduces the system's station port capacity by one port.*
- *Always install tie or DID line PCBs in slot numbers that are higher than station PCB slot numbers (see Chapter 1—Configuration).*
- *Initialized data LED 01/02 OFF, LED 03/04 ON.*
- *Incoming tie line calls will camp-on only if Program 71 assignments are used.*

Program *17 — DID Intercept Port Number (When Caller Dials Vacant or Wrong Number)

##*1*2*3 – Spkr *17 Hold – Spkr ___ # ___ Hold – Spkr ## Hold – Spkr ## Hold

SELECT = DID-Line Number[1] (001 ~ 144)

HUNT TO = Enter Intercept Station Logical Port No. (000 ~ 239) (Press Button 01 to enter blanks.)

To enter DID Line Range: ___ * ___

Low DID Line

High DID Line

DID LINE NUMBER	INTERCEPT PORT NUMBER
001	
002	
003	
004	
005	
006	
007	
008	
009	
010	
011	
012	
013	
014	
015	
016	
017	
018	
019	
020	
021	
022	
023	
024	
025	
026	
027	
028	
029	
030	
031	
032	
033	
034	
035	
036	
037	
038	
039	
040	
041	
042	
043	
044	
045	
046	
047	
048	

DID LINE NUMBER	INTERCEPT PORT NUMBER
049	
050	
051	
052	
053	
054	
055	
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091	
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093	
094	
095	
096	

DID LINE NUMBER	INTERCEPT PORT NUMBER
097	
098	
099	
100	
101	
102	
103	
104	
105	
106	
107	
108	
109	
110	
111	
112	
113	
114	
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116	
117	
118	
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144	

DK0116

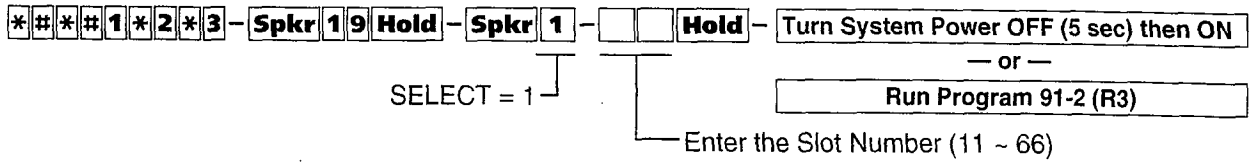
Note:

1. *Intercept does not apply to tie line calls.*

General Notes:

- *Initialized data = blanks (no data).*
- *Use Button 01 to reset to non-intercept (re-order tone).*

Program 19 — Alternate Background Music Source Slot Assignment



General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *If PEKU, the BGM source must be wired to Circuit 3 (Program 10-2).*
- *If PESU, the BGM source must be wired to Circuit 8 (Program 10-2).*
- *If RSTU, RSTU2, RDSU, or PSTU, the BGM source must be wired to Circuit 2. An isolation transformer may be required if connecting the source to a RSTU, RSTU2, RDSU, or PSTU. See Chapter 6—Peripheral Installation for isolation transformer installation instructions.*
- *LED 09 (PEKU) or LED 10 (PESU) in Program 10-2 must be ON to enable the BGM connection; Program 10-2, LED 09 and 10 must be OFF when connecting BGM to RSTU, RSTU2, RDSU or PSTU.*
- *BGM cannot be connected to the PDKU.*

IMPORTANT !

If alternate BGM source is not connected to a station circuit, assign slot 11 as data in Program 19-1. This will ensure that there is not a misoperation of PSTU/RSTU/RSTU2/RDSU ports caused by corrupted data in RAM.

DK0117

Program 20 — Computer Interface Unit and Data Interface Unit Configuration

[*][#][*][#][1][*][2][*][3] – [Spkr][2][0][Hold] – [Spkr][ ][ ][ ][#] { [ ] } [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

Select = PDKU/PDSU Station Logical Port Number that is connected to PDIU-DS or to DKT with PDIU-DI or RPCI-DI (R3).

LEDs 01 ~ 06 defines data port type;
LEDs 17 ~ 20 assigns data port to security group.

Copy this page if more than three DIUs are installed.

PDKU/RDSU Port Number [ ][ ][ ]

	LED	X	LED ON	LED OFF
	20		Data Security Group 4	Not Included
	19		Data Security Group 2	Not Included
	18		Data Security Group 3	Not Included
	17		Data Security Group 1	Not Included
	16			
	15			
	14			
	13			
	12			
(R3)	11		RPCI-DI DNIS Sent	RPCI-DI DNIS Not Sent
(R3)	10		RPCI-DI Caller ID / ANI Sent	RPCI-DI Caller ID / ANI Not Sent
	09			
	08			
	07			
	06		DTR Pulse with[3] Data Release	No DTR[3] Pulse
	05		Auto Pause[1] Behind PBX	No Auto Pause
	04		PDIU-DS[2] Connected	PDIU-DI/RPCI-DI Connected
	03		PDIU-DS to Modem Connection	PDIU-DS to other type DCE or DTE
	02		AT Commands and Result Codes	AT Commands Only
	01		PDIU/RPCI Connected	No PDIU/RPCI Connected

PDKU/RDSU Port Number [ ][ ][ ]

LED	X	LED ON	LED OFF
20		Data Security Group 4	Not Included
19		Data Security Group 2	Not Included
18		Data Security Group 3	Not Included
17		Data Security Group 1	Not Included
16			
15			
14			
13			
12			
11		RPCI-DI DNIS Sent	RPCI-DI DNIS Not Sent
10		RPCI-DI Caller ID / ANI Sent	RPCI-DI Caller ID / ANI Not Sent
09			
08			
07			
06		DTR Pulse with[3] Data Release	No DTR[3] Pulse
05		Auto Pause[1] Behind PBX	No Auto Pause
04		PDIU-DS[2] Connected	PDIU-DI/RPCI-DI Connected
03		PDIU-DS to Modem Connection	PDIU-DS to other type DCE or DTE
02		AT Commands and Result Codes	AT Commands Only
01		PDIU/RPCI Connected	No PDIU/RPCI Connected

PDKU/RDSU Port Number [ ][ ][ ]

LED	X	LED ON	LED OFF
20		Data Security Group 4	Not Included
19		Data Security Group 2	Not Included
18		Data Security Group 3	Not Included
17		Data Security Group 1	Not Included
16			
15			
14			
13			
12			
11		RPCI-DI DNIS Sent	RPCI-DI DNIS Not Sent
10		RPCI-DI Caller ID / ANI Sent	RPCI-DI Caller ID / ANI Not Sent
09			
08			
07			
06		DTR Pulse with[3] Data Release	No DTR[3] Pulse
05		Auto Pause[1] Behind PBX	No Auto Pause
04		PDIU-DS[2] Connected	PDIU-DI/RPCI-DI Connected
03		PDIU-DS to Modem Connection	PDIU-DS to other type DCE or DTE
02		AT Commands and Result Codes	AT Commands Only
01		DIU Connected	No PDIU/RPCI Connected

DK0118

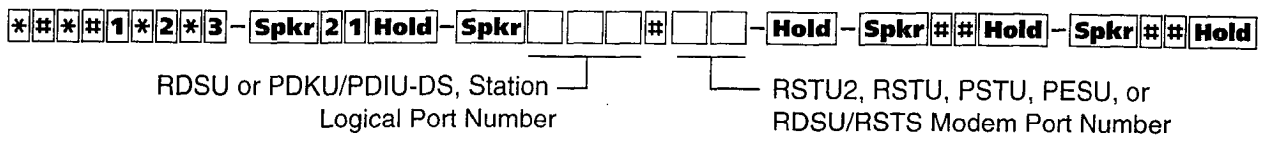
Notes:

1. *Auto pause will be inserted after a Centrex or PBX access code is dialed by a DIU or RPCI: CO line must be assigned in Program 42-0, and must have access code assigned in Program 42 (1 ~ 8). Pause time is determined by Program 12-3. A pause will also be inserted after the CO line access code is dialed (by the DIU) in all cases if LED 05 is turned on.*
2. *Only turn LED 04 on if a PDIU-DS is connected, if LED 04 is turned on for a telephone port, that telephone cannot be called.*
3. *LED06 should be OFF for PDIU-DS, if PDIU-DS is connected to a modem for a modem pool application. See Chapter 6—Peripheral Installation, subsection 6.9.6.*

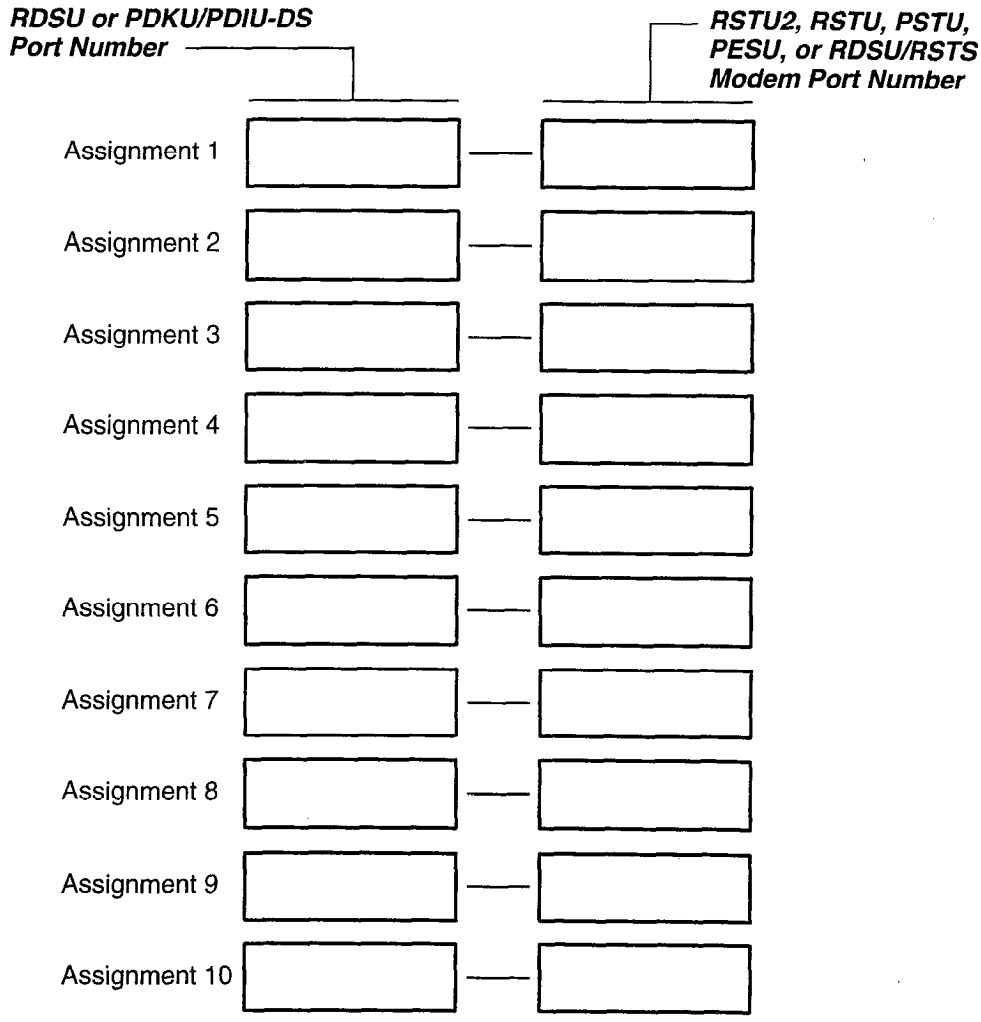
General Notes:

- *Initialized data: LED 17 ON, all others OFF.*
- *RPCIs and DIUs cannot be connected to PDKU1 Circuit 8, but can be connected to all 8 PDKU2 circuits. RPCIs and DIUs cannot be connected to PDKU in all slots (see Chapter 1—Configuration—Worksheet 2 PDKU slot assignment table).*
- *If a PDIU-DS is connected to a modem, refer to Figure 6-36 and Subsection 6.9.6—Modem Setup Recommendations.*
- *If a PC is connected to the RPCI or DIU, the escape sequence of the RPCI or DIU should be set in the PC communication software "Modem Initialization" character sequence. This will ensure that the escape sequence is restored in case the RCPI Telephone or DIU is unplugged temporarily.*
- *RPCI-DI does not require Program 20 assignments if it is not used in the data switching mode; except for LED 10 and/or LED 11 if ANI, DNIS, and/or Caller ID must be sent from the RPCI-DI to the PC to which it is connected.*

Program 21 — Modem Pool Port Assignments



Copy this page if more than 10 modems are assigned to modem pool.



General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data is blank.*
- *DIUs can be connected to any ports associated with PDKU circuits, except for ports associated with Circuit 8 on a PDKU1. All PDKU2 circuits can support DIUs.*
- *PDIU-DS must be installed on PDKUs in slots designated for DIU operation (see Chapter 1—Configuration, Worksheet 2—PDKU slot assignment table).*

DK0119

Program 22 — Computer Interface Unit and Data Interface Unit (DIU) Station Hunting (Data Calls Only)

[*][#][*][#][1][*][2][*][3] – [Spkr][2][2][Hold] – [Spkr][ ][ ][ ] – [#] – [ ][ ][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Port Number (000 ~ 239)
Enter the PDKU or RDSU/DIU port number of the "hunt-from" station. See Note 1 for entering a range of ports.

HUNT TO = (000 ~ 239)
Enter the "hunt-to" PDKU or RDSU/DIU Station Logical port number. See Note 2.

Port	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015
Hunt To																
	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031
	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047
	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063
	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079
	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095
	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111
	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239

DK0120

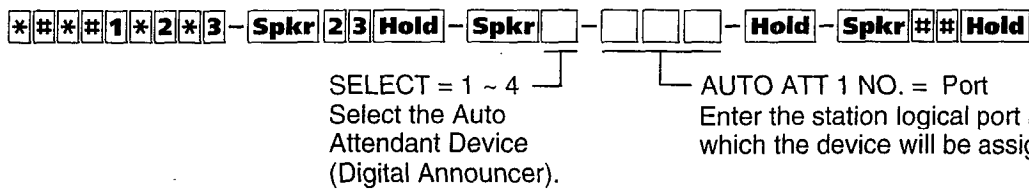
Notes:

1. *A range of ports may be assigned by pressing the following button sequence:* [ ][ ][ ][*][ ][ ][ ]
   Low port — *High port*
2. *Press Button/LED 01 to delete a digit from "hunt-to" port.*

General Notes:

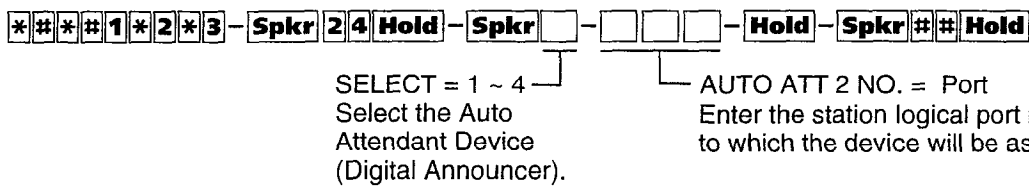
- *For more information, see the instructions preceding the record sheets.*
- *Initialized data does not assign "hunt-to" ports to any port.*
- *Program 22 applies to RCPI-DI, PDIU-DI and PDIU-DS data stations. If programming a RCPI-DI or PDIU-DI station, use the associated digital telephone logical port number; the PDIU-DS is programmed using its own unique port number.*

Program 23 — Primary Built-in Auto Attendant Announcement Device Assignments



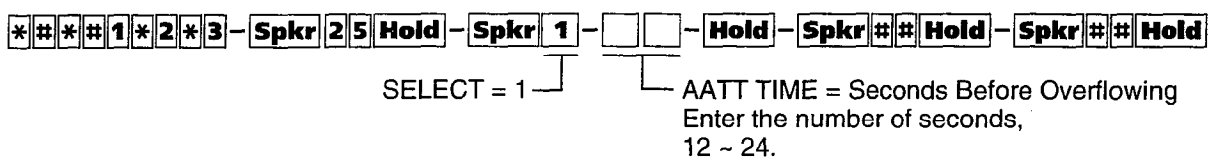
Device	Port Number
1	
2	
3	
4	

Program 24 — Secondary Built-in Auto Attendant Announcement Device Assignments



Device	Port Number
1	
2	
3	
4	

Program 25-1 — Incoming Built-in Auto Attendant Call Overflow Time



General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Overflow stations and delay ring operation is assigned in Programs 81 ~ 89.*
- *Default overflow time is 20 seconds.*
- *This overflow time applies to the overflow of incoming Auto Attendant calls to normal CO line ringing if either a primary announcement device or RRCS (DTMF) circuit is not available.*

DK0121

Program 26 — Built-in Auto Attendant Camp-On-Busy Time

[*][#][*][#][1][*][2][*][3] – [Spkr] [2][6] [Hold] – [Spkr] [ ][ ][ ][#][ ][ ][ ] [Hold] – [Spkr][#][#] [Hold] – [Spkr][#][#] [Hold]

SELECT = Port Number (000~239) — Enter the number of the called Station logical port that needs a Camp-on-Busy time assigned. See Note 1 for entering a range of ports.

— HOLD TIME = Auto Attendant (AA) Camp-on-Busy Time
Enter the Time (in seconds). The acceptable range is 011 ~ 999 seconds. Use three digits. See Note 2.

Port	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015
Hold Time																
	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031
	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047
	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063
	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079
	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095
	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111
	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239

DK0122

Notes:

1. *To specify a range of ports, enter in the sequence:* [ ][ ][ ][*][ ][ ][ ]
   Low port — *High port*
2. *999 seconds equals 16.65 minutes.*

General Notes:

- *Initialized data assigns a AA Camp-on-Busy Time of 016 seconds to all ports.*
- *This timer sets the time that Auto Attendant calls to a busy station will camp-on before routing back to a primary announcement or to the calling CO line's normal ring pattern. (See Program 10-3, LED 3 for routing option after Camp-on-Busy). The time set in this program applies to the called station.*
- *This program only applies to Auto Attendant (Built-in) calls; it does not apply to ring transfer camp-on time from stations or customer-supplied Auto Attendant devices; see Program 37 Ring Transfer (Camp-on) recall time.*
- *If CF-NA or CF-B/NA is set on a Telephone, the CF-N/A ring timer will have priority over this 16-sec. camp-on-busy timer. Auto Attendant calls to a ring-no-answer or busy station will only forward to one destination, if the CF destination station has call forward set, the call will camp-on for 16-seconds and then route per the Auto Attendant flow diagram—the call will not forward a second time to another destination.*

Program 27 — Digital Telephone Handset/Headset Receiver Volume Level

[*][#][*][#][1][*][2][*][3] – [Spkr][2][7][Hold] – [Spkr][ ][ ][ ][#][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

Digital Telephone Logical Port Number: ┘ └ VR = Enter volume level 1 ~ 4

Lowest Volume	< Total DKT Volume Range (VR) >								Highest Volume
	0	1	2	3	4	5	6	7	8

└ Set VR 1 ~ 4 for initial off-hook handset receiver volume level;
VR resets to programmed level (1 ~ 4) after each call (on-hook/off-hook).

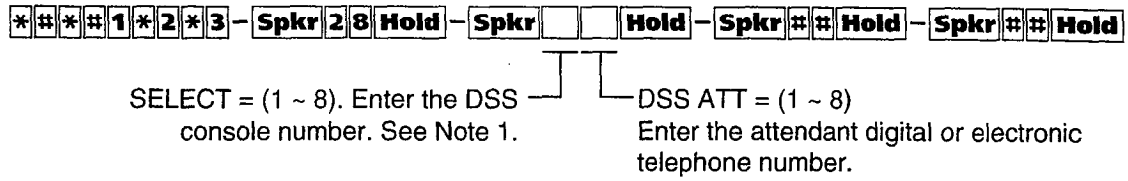
Port / VR Level (1 ~ 4)																
	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015
	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031
	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047
	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063
	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079
	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095
	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111
	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239

DK0123

General Notes:

- *Initialized value is VR = 2.*
- *Each level is equivalent to a 2 dB change.*

Program 28 — DSS Console/Attendant Telephone Assignments



DDSS PDKU/HDSS PEKU PCBs (Lowest Slot to Highest)	DDSS/HDSS Console Number	Attendant Digital/ElectronicTelephone Number (1, 2, 3, 4, 5, 6, 7, 8)
Low Slot Number:	1	
Slot Number:	2	
Slot Number:	3	
Slot Number:	4	
Slot Number:	5	
Slot Number:	6	
Slot Number:	7	
High Slot Number:	8	

DK0124

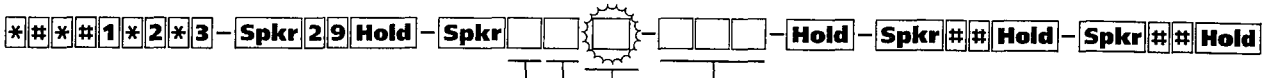
Notes:

1. *Digital DSS consoles (DDSS console) should be assigned to digital telephones, and electronic DSS consoles (HDSS console) should be assigned to electronic telephones.*
2. *RCTUA can support 3 DSS consoles; RCTUB, RCTUBA/BB, 4 DSS consoles; and RCTUC/D, 8 DSS consoles.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Refer to Program 03, Flexible PCB Slot Assignments, for the PCB slots of PEKUs and PDKUs configured to support consoles.*
- *The system automatically assigns the console supported by the PEKU or PDKU in the lowest-number PCB slot to be Console number 1. See Note 2 above.*
- *The system automatically assigns the telephone connected to the first station port on a console PDKU or PEKU to be attendant number 1. See Note 2 above.*
- *If more than one console is associated with one attendant telephone, then specify the same number attendant telephone for all consoles associated with it.*
- *Initialized data assigns Console #1 to Attendant Telephone #1; Console #2 to Attendant Telephone #2; Console #3 to Attendant Telephone #3 and Console #4 to Attendant Telephone #4, etc.*

Program 29-1 ~ 8 — DSS Console Button Assignments Console Number



SELECT = 1 ~ 8. DDSS/HDSS Number 1 ~ 8: Each system can have up to eight consoles. Enter the console to which buttons are being assigned.

DDSS/HDSS Button Group 1 ~ 3: Each console has three groups of 20 LED buttons. Choose the group to be assigned.

No. 01 ~ No. 20 Press the DKT LED that is in the same position as the console button being assigned. The LED lights and the LCD displays the console button's number.

Code: Assign the appropriate Speed Dial, trunk access, or DSS access code to the button chosen. See Code Table below for the buttons to enter. See Notes 1 and 2.

Copy this page for more DSS Consoles.

Console No. = _____					
Group No. 1		**Group No. 2**		**Group No. 3**	
Button/Code	**Button/Code**	**Button/Code**	**Button/Code**	**Button/Code**	**Key/Code**
10	20	10	20	10	20
09	19	09	19	09	19
08	18	08	18	08	18
07	17	07	17	07	17
06	16	06	16	06	16
05	15	05	15	05	15
04	14	04	14	04	14
03	13	03	13	03	13
02	12	02	12	02	12
01	11	01	11	01	11

DK0125

Code Table

Button Type	Code
Station Speed Dial	*10 ~ *49
System Speed Dial[3]	*600 ~ *699 or *60 ~ *99
CO Line Access	001 ~ 144
DSS (Station Access)	#000 ~ #239
All Call	489
Night Transfer 1	439
Night Transfer 2	440
Night Transfer 3	441
Night Transfer 4	442

Notes:

1. *The* **Night Transfer** *(***NT***) and* **All Call Page** *(***AC***) buttons may be changed to* **DSS**, **Line** *(***CO***) or* **SD** *buttons, but they may not be reassigned to other button locations.*
2. *Initialized key assignments are shown following the Program 29 System Record Sheets.*
3. *With DK280 release 1, 2, and 3 RCTUA provides 40 system speed dial numbers (60 ~ 99), RCTUB, RCTUBA/BB, and RCTU C/D provides 100 system speed dial numbers (600 ~ 699).*

General Notes:

- *With DK280 release 1, 2, and 3 RCTUA can support 3 DSS consoles; the RCTUB, or RCTUBA/BB 4 DSS consoles; and the RCTUC/RCTUD, 8 DSS consoles.*
- *It is not possible to assign Primary/Secondary/Phantom Directory Numbers to DSS consoles.*
- *Initialized data associates the PDKU's or PEKU's console with the telephone connected to PDKU's first port. See Program 28 to reassign consoles to other telephones.*
- *When assigning CO line access buttons (001 ~ 144), the associated telephone must be assigned access to the CO line also. See Program 40.*

IMPORTANT !

Only program **SD**, **Line** *(***CO***)*, **DSS**, **All Call Page** *(***AC***)*, *and* **Night Transfer** *(***NT***) buttons; programming other feature buttons on a console may cause system operation problems*

Program 29 — Initialized DSS Console Button Assignments

Group No. 1		Group No. 2		Group No. 3	
#009	#019	#029	#039	#049	NT 1(439)
#008	#018	#028	#038	#048	AC (489)
#007	#017	#027	#037	#047	#057
#006	#016	#026	#036	#046	#056
#005	#015	#025	#035	#045	#055
#004	#014	#024	#034	#044	#054
#003	#013	#023	#033	#043	#053
#002	#012	#022	#032	#042	#052
#001	#011	#021	#031	#041	#051
#000	#010	#020	#030	#040	#050

DK0126

Program *29 — Add-On Module Button Assignments

##1*2*3 – Spkr *29 Hold – Spkr □□□□ □ □□□ Hold – Spkr ## Hold – Spkr ## Hold

Enter the station logical port of the telephone which will have buttons assigned to its attached Add-on Module(s).

Enter the Add-on Module which will have buttons assigned to it (0, 1, or 2). Enter 0 when removing ADMs.

Button No. 01 ~ 20
Press the LED that is in the same position as the Add-on Module button being assigned.

Code:
Assign the appropriate code. See the Code table below.

Copy this page for more ports.

CODE TABLE	
BUTTON TYPE	CODE
DSS (STATION ACCESS)	**#000 ~ #239**
CO LINE ACCESS	**001 ~ 144**
SYSTEM SPEED DIAL[1]	***600 ~ *699** or ***60 ~ *99**
STATION SPEED DIAL	***10 ~ *49**

Initialized Data:

ADM1: (all RCTU PCBs)
Key 01 ~ 20 is **#000 ~ #019**

ADM2: (RCTU BA/BB and C/D)
Key 01 ~ 20 is **#020 ~ #039**

ADM2: (RCTUA)
Key 01 ~ 12 is **#020 ~ #031**
Key 13 ~ 20 is ***010 ~ *017**

PORT ______

ADD-ON MODULE 1 BUTTON/CODE				ADD-ON MODULE 2 BUTTON/CODE			
10/		20/		10/		20/	
09/		19/		09/		19/	
08/		18/		08/		18/	
07/		17/		07/		17/	
06/		16/		06/		16/	
05/		15/		05/		15/	
04/		14/		04/		14/	
03/		13/		03/		13/	
02/		12/		02/		12/	
01/		11/		01/		11/	

PORT ______

ADD-ON MODULE 1 BUTTON/CODE				ADD-ON MODULE 2 BUTTON/CODE			
10/		20/		10/		20/	
09/		19/		09/		19/	
08/		18/		08/		18/	
07/		17/		07/		17/	
06/		16/		06/		16/	
05/		15/		05/		15/	
04/		14/		04/		14/	
03/		13/		03/		13/	
02/		12/		02/		12/	
01/		11/		01/		11/	

PORT ______

ADD-ON MODULE 1 BUTTON/CODE				ADD-ON MODULE 2 BUTTON/CODE			
10/		20/		10/		20/	
09/		19/		09/		19/	
08/		18/		08/		18/	
07/		17/		07/		17/	
06/		16/		06/		16/	
05/		15/		05/		15/	
04/		14/		04/		14/	
03/		13/		03/		13/	
02/		12/		02/		12/	
01/		11/		01/		11/	

PORT ______

ADD-ON MODULE 1 BUTTON/CODE				ADD-ON MODULE 2 BUTTON/CODE			
10/		20/		10/		20/	
09/		19/		09/		19/	
08/		18/		08/		18/	
07/		17/		07/		17/	
06/		16/		06/		16/	
05/		15/		05/		15/	
04/		14/		04/		14/	
03/		13/		03/		13/	
02/		12/		02/		12/	
01/		11/		01/		11/	

DK0127

Note:

1. *Primary/Secondary/Phantom directory numbers cannot be assigned to ADMs.*

General Notes:

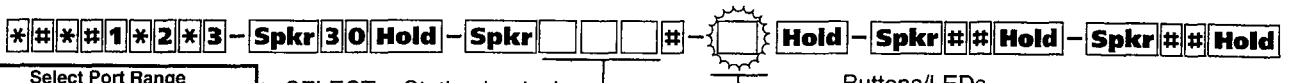
- *For more information, see the instructions preceding the record sheets.*
- *With DK280 R1, 2, and 3, RCTUA can support 12 Add-on Modules; RCTUB, RCTUBA/BB, 40 Add-on Modules; and RCTUC/RCTUD, 120 Add-on Modules.*

IMPORTANT !

This program must be run for each station that has an ADM equipped or the ADM will not function. At least one ADM key must be programmed for each ADM.

- *RCTUA provides 40 system speed dial numbers (60 ~ 99); RCTUB, RCTUBA/BB, and RCTU C/D provides 100 system speed dial numbers (600 ~ 699).*

Program 30 — Station Class of Service



Select Port Range			
000 ~ 039		120 ~ 159	
040 ~ 079		160 ~ 199	
080 ~ 119		200 ~ 239	
		= DISA	

SELECT = Station Logical Port Number(s) Enter the port number(s) to which class of service must be assigned. See Note 2 for entering a range of ports.

Buttons/LEDs
Light LEDs for the port specified in the last step. All LEDs marked with an "X" in the table below should be lit.

Copy this page for more ports

Feature	PORT → / LED ↓																			
	20																			
Priv. Override Allowed[5]	19																			
Exec. Override Allowed[5]	18																			
DND Override Allowed	17																			
Change T.C.O. Code	16																			
Change Verified A.C.	15																			
Account Codes Verified[3]	14																			
	13																			
SLT-Hook Flash Anti-Bounce[6]	12																			
Tie/DID Dial Pulse Only (No DTMF)[4]	11																			
Change DISA Security Code	10																			
Change TR Override Code	09																			
Forced Acc't Code[3]	08																			
OCA/Busy Override Automatic (Caller)[1]	07																			
ABR Access Enabled	06																			
Speed Dial Allowed[1]	05																			
	04																			
MIC on at Start of Call	03																			
MIC Key Lock Enabled	02																			
Speakerphone Enabled[1]	01																			

DK0128

Notes:

1. *Initialized data reads LEDs 01, 05, and 07 for all ports.*
2. *A range of ports may be specified by entering:* □□□*□□□ (*Low port* — *High port*)
3. *To force a verified account code to be entered on two-CO-line DISA calls through the system, turn LED 08 and 14 on for Port 039-RCTUA, Port 089-RCTUB, RCTUBA/BB or 249-RCTU C/D and Forced A.C. must be enabled for outgoing CO line in Program 15-7.*
4. *If a tie or DID line is Dial Pulse (Program 15-1, LED ON), Program 30, LED 11 must be "ON" for that tie or DID station port number. If the DID or tie line is DTMF tone dial (Program 15-1, LED OFF) Program 30, LED 11 must be OFF and RRCS must be installed on RCTU.*
5. *Disabling this option for attendant console ports does not deny Attendant Supervised Loop Monitoring.*
6. *Standard Telephone (SLT) Anti-Bounce prevents false recalls due to Hook Flash bounce during SLT hang-up on outside calls. The system automatically disconnects the CO line if the SLT hangs-up after a Hook Flash.*

Program *30 — Telephone Group Page Assignments

##1*2*3 – Spkr *30 Hold – Spkr [ ][ ][ ] # [ ] Hold – Spkr ## Hold – Spkr ## Hold

Enter the station logical port which will be assigned to a page group or groups. See Note 1 for entering a range of ports.

Buttons/LEDs
Press Button 01 ~ 08 to light LEDs for the port specified in the last step. All buttons/LEDs marked with an "X" in the table below should be lit.

Select Port Range											
000 ~ 039		040 ~ 079		080 ~ 119		120 ~ 159		160 ~ 199		200 ~ 239	

Copy this page for more ports.

FEATURE	PORT→ / LED ↓																				
PAGE GROUP H	08																				
PAGE GROUP G	07																				
PAGE GROUP F	06																				
PAGE GROUP E	05																				
PAGE GROUP D	04																				
PAGE GROUP C	03																				
PAGE GROUP B	02																				
PAGE GROUP A	01																				

Select Port Range											
000 ~ 039		040 ~ 079		080 ~ 119		120 ~ 159		160 ~ 199		200 ~ 239	

FEATURE	PORT→ / LED ↓																				
PAGE GROUP H	08																				
PAGE GROUP G	07																				
PAGE GROUP F	06																				
PAGE GROUP E	05																				
PAGE GROUP D	04																				
PAGE GROUP C	03																				
PAGE GROUP B	02																				
PAGE GROUP A	01																				

DK0203

Notes:

1. *Specify a range of ports by entering:* [ ][ ][ ][*][ ][ ][ ]
   Low port — *High port*

General Notes:

- *Initialized data reads all LEDs off.*
- *With DK280 Release 1, 2, and 3 RCTUA , RCTUB, and RCTUBA/BB can support four groups, and RCTUC/RCTUD can support eight groups.*
- *A maximum of 120 telephones can be assigned to a particular page group.*
- *Only 120 telephones can be paged simultaneously. Example: If Page Group "A" has 60 telephones, Page Group "B" has 50 telephones, and Page Group "C" has 70 telephones, then Group A + B (60 + 50 = 110) can be, Group B + C (50 + 70 = 120) can be, but Group A + C (60 + 70 = 130) cannot be paged simultaneously.*

Program 31 — Station Class of Service

SELECT = Station Logical Port Number(s)
Enter the port number(s) to which class of service must be assigned. See Note 1 to enter a range of ports.

Buttons/LEDs
Light LEDs for the port specified in the last step. All buttons/LEDs marked with an "X" in the table below should be lit.

Select Port Range					
000 ~ 039	040 ~ 079	080 ~ 119	120 ~ 159	160 ~ 199	200 ~ 239

Copy this page for more ports

	Feature	PORT→ / LED↓																					
	Toshiba VP or Stratagy (B + Station No.)	20	X																				
	Toshiba VP or Stratagy (B No Station)	19	X																				
	Block Exec./Priv. Ovr.[3]	18																					
	End/End Signal Rcv (VM)	17	X																				
	Receive VM ID Code	16																					
	Toshiba VP or Stratagy Integration (A/D)	15	X																				
(R3)	Handset OCA[7]	14																					
(R3)	Handset OCA Warning Tone	13																					
	Pooled Line Key - No Flash if No Ring[4]	12																					
(R3)	Busy Override Tone - Two Muted Rings[5]	11																					
	All Call Page Allowed - EKTs/DKTs[2]	10	X																				
	VM (No Conference)	09																					
	VM Group 4[6]	08																					
	VM Group 3[6]	07																					
	VM Group 2[6]	06																					
	VM Group 1[6]	05																					
	VM to VM Call Blocking Called/Calling	04																					
	OCA Enabled (Receive)	03																					
	Handsfree No Warning Tone	02																					
	Handsfree Disabled	01																					

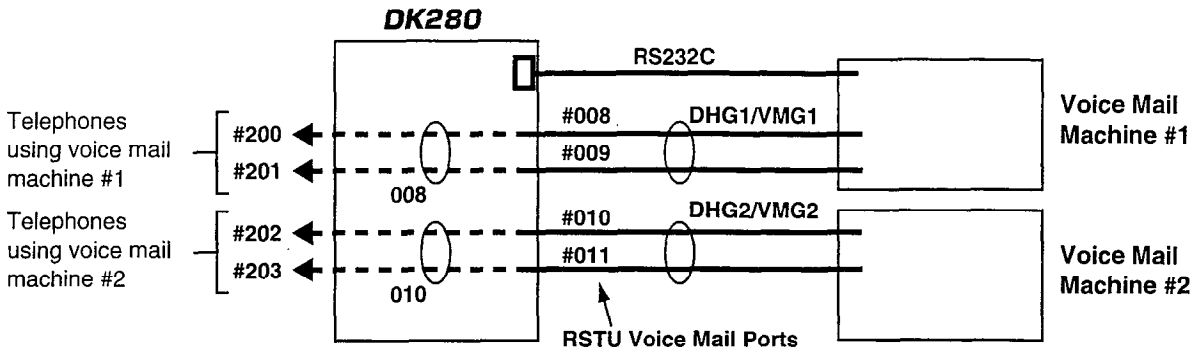
Select Port Range					
000 ~ 039	040 ~ 079	080 ~ 119	120 ~ 159	160 ~ 199	200 ~ 239

	Feature	PORT→ / LED↓																					
	Toshiba VP or Stratagy (B + Station No.)	20																					
	Toshiba VP or Stratagy (B No Station)	19																					
	Block Exec./Priv. Ovr.[3]	18																					
	End/End Signal Rcv (VM)	17																					
	Receive VM ID Code	16																					
	Toshiba VP or Stratagy Integration (A/D)	15																					
(R3)	Handset OCA[7]	14																					
(R3)	Handset OCA Warning Tone	13																					
	Pooled Line Key - No Flash if No Ring[4]	12																					
(R3)	Busy Override Tone - Two Muted Rings[5]	11																					
	All Call Page Allowed - EKTs/DKTs[2]	10																					
	VM (No Conference)	09																					
	VM Group 4[6]	08																					
	VM Group 3[6]	07																					
	VM Group 2[6]	06																					
	VM Group 1[6]	05																					
	VM to VM Call Blocking (Called/Calling)	04																					
	OCA Enabled (Receive)	03																					
	Handsfree No Warning Tone	02																					
	Handsfree Disabled	01																					

See Notes and example on the next page.

DK0204

Voice Mail Group/Distributed Hunt Group Programming Examples[8]



PROGRAMMING ASSIGNMENTS

Program *32	**000 ~ 008** **001 ~ 008**	**VMG1 Message Center**
	002 ~ 010 **003 ~ 010**	**VMG2 Message Center**
Program 31	**008 — Button 5 On** **009 — Button 5 On**	**VMG1 RSTU VM Ports**
	010 — Button 6 On **011 — Button 6 On**	**VMG2 RSTU VM Ports**
Program *40	**850 — 01 008** **02 009**	**VMG1 DH Group Members**
	851 — 01 010 **02 011**	**VMG1 DH Group Members**

Notes:

1. *A range of ports may be specified by entering:* [ ][ ][ ][*][ ][ ][ ] (*Low port* — *High port*)
2. *A maximum of 120 stations can be assigned to the All Call page group (see Program *30 note 5); AC page is treated as any other page group.*
3. *This option does not block Attendant Supervised Loop Monitoring.*
4. *Incoming calls on ground and loop start lines assigned to a pooled line button LED will only flash if they are assigned to ring the telephone (in Program 81-89). This option is only available with DK280 Release 1, 2, and 3, RCTUB2 and RCTU C/D2 processor PCBs and above on which they appear (LED 12 ON). If LED 12 is OFF, the Pooled line LED will flash when an incoming line call is received – even if the telephone does not ring.*
5. *If LED 11 is OFF for a port, the DKT or EKT telephone connected to the port will receive two muted rings, three seconds apart when it receives a call, when the telephone is busy. If LED 11 is ON the telephone will receive repeated muted rings three seconds apart on an idle **[DN]**, when called during a busy state. If a busy telephone **[DN]** is called and there are no idle **[DN]** buttons available to ring, the telephone will receive two muted rings when the caller activates Busy Override (BOV) (regardless of LED 11's option). The call will camp-on to the busy **[DN]**. This option does not apply to standard telephones which always get two BOV or camp-on tones only if enabled in Program *34.*
6. *With DK280 Release 3 and above, all ports assigned to a Voice Mail Group should also be assigned to a unique Distributed Hunt Group using Program *40. Each Voice Mail Group must be associated with a unique Distributed Hunt Group that hunts only to its own Voice Mail Group ports.*
7. *Handset OCA function on digital telephones only, not electronic or standard telephones.*
8. *Available with DK280 Release 3.1 and above.*

General Notes:

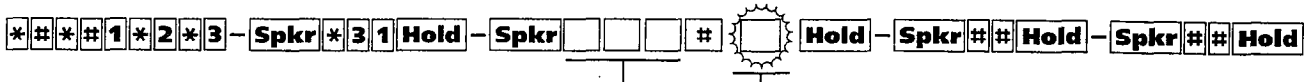
- *Initialized data reads LED 11,12, and 13 ON for all ports; LED 10 is ON for ports 000 ~ 119 only.*
- *For Toshiba proprietary integration LEDs 04, 09, 15, 16, 17 and 18 should be ON and for SMDI integration LEDs 04, 09, 16, 17 and 18 should be ON for all RSTU ports connected to the VM machine.*
- *LED 19 and 20 should be off if the VM machine does not respond properly to transfer recall (B-Tone) signals when using any type of Voice Mail Interface.*

IMPORTANT !

*If CO lines direct ring VM ports via Program 81 ~ 89, the data in Programs *81, *84, and *87 must be blank.*

DK0205

Program *31 — Group Pickup Assignments



Enter the station logical port which will be assigned to a pickup group or pickup groups. See Note 1 for entering a range of ports.

Buttons/LEDs
Light LEDs for the port specified in the last step. All buttons/LEDs marked with an "X" in the table below should be lit.

Select Port Range													
000 ~ 039		040 ~ 079		080 ~ 119		120 ~ 159		160 ~ 199		200 ~ 239			

Copy this page for more ports.

PICKUP GROUP	PORT → / LED ↓																				
PICKUP GROUP 20	20																				
PICKUP GROUP 19	19																				
PICKUP GROUP 18	18																				
PICKUP GROUP 17	17																				
PICKUP GROUP 16	16																				
PICKUP GROUP 15	15																				
PICKUP GROUP 14	14																				
PICKUP GROUP 13	13																				
PICKUP GROUP 12	12																				
PICKUP GROUP 11	11																				
PICKUP GROUP 10	10																				
PICKUP GROUP 9	09																				
PICKUP GROUP 8	08																				
PICKUP GROUP 7	07																				
PICKUP GROUP 6	06																				
PICKUP GROUP 5	05																				
PICKUP GROUP 4	04																				
PICKUP GROUP 3	03																				
PICKUP GROUP 2	02																				
PICKUP GROUP 1	01																				

DK0206

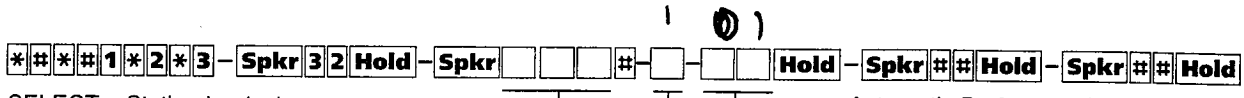
Note:

1. *Specify a range of ports by entering:* [ ][ ][ ][*][ ][ ][ ]
   Low port — *High port*

General Note:

- *Initialized data reads all LEDs off.*

Program 32 — Automatic Preference (Ports 000 ~ 119)



SELECT = Station Logical Port Number
Enter the port number of the station having preference defined. See Note 1 for entering a range of ports.

DATA = Ringing Code
Enter 0 to disable Ringing Line Preference.[3]
Enter 1 to enable Ringing Line Preference.[3]

Automatic Preference Code:
Enter 00 for no selection.
Enter 01 for Primary **[DN]**.[3]
Enter 02 for lowest CO, tie, or DID line.[3]
Enter 11 ~ 26 for line groups 1 ~ 16.[2,3]

Port Number	Ringing Code (0 or 1)	Automatic Preference Code
000		
001		
002		
003		
004		
005		
006		
007		
008		
009		
010		
011		
012		
013		
014		
015		
016		
017		
018		
019		
020		
021		
022		
023		
024		
025		
026		
027		
028		
029		
030		
031		
032		
033		
034		
035		
036		
037		
038		
039		

Port Number	Ringing Code (0 or 1)	Automatic Preference Code
040		
041		
042		
043		
044		
045		
046		
047		
048		
049		
050		
051		
052		
053		
054		
055		
056		
057		
058		
059		
060		
061		
062		
063		
064		
065		
066		
067		
068		
069		
070		
071		
072		
073		
074		
075		
076		
077		
078		
079		

Port Number	Ringing Code (0 or 1)	Automatic Preference Code
080		
081		
082		
083		
084		
085		
086		
087		
088		
089		
090		
091		
092		
093		
094		
095		
096		
097		
098		
099		
100		
101		
102		
103		
104		
105		
106		
107		
108		
109		
110		
111		
112		
113		
114		
115		
116		
117		
118		
119		

DK0207

Notes:

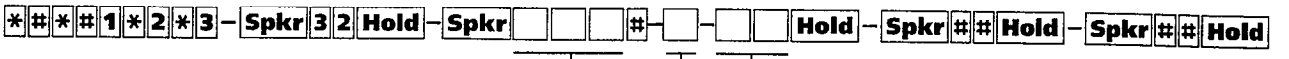
1. *Specify a range of ports by entering:* 

2. *RCTUA , RCTUB provides 8 CO line groups, RCTU C/D provides 16 CO line groups.*
3. *Intercom, lowest* **[PDN]**, *lowest CO line, or Line Group will be selected only if the telephone is not ringing when it is taken off-hook (or* **Spkr** *is pressed). If a telephone is ringing, Auto Preference of Intercom,* **[PDN]**, *or outgoing CO line is canceled. In this case, no selection is made if ringing line Preference is disabled or the ringing line is selected if ringing line Preference is enabled.*

General Notes:

- *For more information, see the instructions preceding the records sheets.*
- *Initialized data assigns Ringing Code 1 and Automatic Off-hook (Preference) Code 00 for all ports.*

Program 32 — Automatic Preference (Ports 120 ~ 239) (continued)



SELECT = Station Logical Port Number
Enter the port number of the station having preference defined. See Note 1 for entering a range of ports.

DATA = Ringing Code
Enter 0 to disable Ringing Line Preference.[3]
Enter 1 to enable Ringing Line Preference.[3]

Automatic Preference Code:
Enter 00 for no selection.
Enter 01 for Primary **[DN]**.[3]
Enter 02 for lowest CO line.[3]
Enter 11 ~ 26 for line groups 1 ~ 16.[2,3]

Port Number	Ringing Code (0 or 1)	Automatic Preference Code
120		
121		
122		
123		
124		
125		
126		
127		
128		
129		
130		
131		
132		
133		
134		
135		
136		
137		
138		
139		
140		
141		
142		
143		
144		
145		
146		
147		
148		
149		
150		
151		
152		
153		
154		
155		
156		
157		
158		
159		

Port Number	Ringing Code (0 or 1)	Automatic Preference Code
160		
161		
162		
163		
164		
165		
166		
167		
168		
169		
170		
171		
172		
173		
174		
175		
176		
177		
178		
179		
180		
181		
182		
183		
184		
185		
186		
187		
188		
189		
190		
191		
192		
193		
194		
195		
196		
197		
198		
199		

Port Number	Ringing Code (0 or 1)	Automatic Preference Code
200		
201		
202		
203		
204		
205		
206		
207		
208		
209		
210		
211		
212		
213		
214		
215		
216		
217		
218		
219		
220		
221		
222		
223		
224		
225		
226		
227		
228		
229		
230		
231		
232		
233		
234		
235		
236		
237		
238		
239		

DK0208

Notes:

1. *Specify a range of ports by entering:* 

2. *RCTUA and RCTUB provides 8 CO line groups, RCTU C/D provides 16 CO line groups.*
3. *Intercom, lowest* **[PDN]**, *lowest CO line, or Line Group will be selected only if the telephone is not ringing when it is taken off-hook (or* **Spkr** *is pressed). If a telephone is ringing, Auto Preference of Intercom,* **[PDN]**, *or outgoing CO line is canceled. In this case, no selection is made if ringing line Preference is disabled or the ringing line is selected if ringing line Preference is enabled.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns Ringing Code 1 and Automatic Off-hook (Preference) Code 00 for all ports.*

Program *32 — RS-232 (SMDI or Toshiba Proprietary) Voice Mail Message Center Port[2]

[*][#][*][#][1][*][2][*][3] – [Spkr][*][3][2][Hold] – [Spkr][ ][ ][ ][#][ ][ ][ ][Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Station Logical Port Number (000 ~ 239). Enter the port number having a Message Center assigned. Enter all station ports using the same Voice Mail machine. See Note 1 for entering a range of ports.

VM PORT = Enter the Voice Mail Message Center Port number (000 ~ 239) that should be assigned to each station. Enter the lowest RSTU port number[3] that is connected to the VM machine.

Port Message Waiting Center Port																
	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015
	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031
	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047
	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063
	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079
	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095
	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111
	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239

DK0209

Notes:

1. *Specify a range of ports by entering:* [ ][ ][ ][*][ ][ ][ ] (*Low port* — *High port*)
2. *The same message center port should also be assigned in Program 13.*
3. *If VM ports are assigned to a Distributed Hunt Group in Program *40, enter the port number of the first DH Group member (see example following Program 31 record sheet).*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *See Program 10-3 for other RS-232 Voice Mail Interface Programs.*
- *SMDI and Toshiba Proprietary Voice Mail Interface are available with RCTUB2 and RCTUC/D2 Release 2 and above only.*

Program 33 — Station Intercom and Directory Number Hunting (Voice Calls Only)

[*][#][*][#][1][*][2][*][3] – [Spkr] [3][3] [Hold] – [Spkr] [ ][ ][ ] – [#] – [ ][ ][ ] – [Hold] – [Spkr] [#][#] [Hold] – [Spkr] [#][#] [Hold]

SELECT[3] = Port Reference Number (000 ~ 239 and/or 500 ~ 739) Enter the Intercom, **[PDN]**, or **[PhDN]** Port Reference Number of the "hunt-from" station. (See Note 1 below for entering a range of ports.)

HUNT TO[3] = (000 ~ 239 and/or 500 ~ 739) Enter the "hunt-to" Intercom, **[PDN]**, or **[PhDN]** Port Reference Number. (See Note 2).

Port	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015
Hunt To																
	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031
	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047
	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063
	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079
	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095
	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111
	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239

DK0210

Notes:

1. *Spedify a range of ports by entering:* [ ][ ][ ][*][ ][ ][ ]
   Low port — *High port*
2. *Press Button LED 01 to delete a digit from the "hunt-to" port.*
3. **[PhDN]** *assignments 500 ~ 739 are available on Release 3 and above only.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data does not assign "hunt-to" points to any port.*

Program *33 — Phantom Directory Number [PhDN] Owner Telephone Assignment

##1*2*3 – Spkr *33 Hold – Spkr [ ][ ][ ] # [ ][ ][ ] Hold – Spkr ## Hold – Spkr ## Hold

SELECT = **[PhDN]** Port Reference Number (500 ~ 739)

Enter the **[PhDN]** Owner Station (Program 04) Logical Port Number.

To enter **[PhDN]** Range: [ ][ ][ ]*[ ][ ][ ]

Low **[PhDN]** Port — High **[PhDN]** Port

[PhDN] Port Reference Number	Owner Telephone (Program 04) Port Number
500	
501	
502	
503	
504	
505	
506	
507	
508	
509	
510	
511	
512	
513	
514	
515	
516	
517	
518	
519	
520	
521	
522	
523	
524	
525	
526	
527	
528	
529	
530	
531	
532	
533	
534	
535	

[PhDN] Port Reference Number	Owner Telephone (Program 04) Port Number
536	
537	
538	
539	
540	
541	
542	
543	
544	
545	
546	
547	
548	
549	
550	
551	
552	
553	
554	
555	
556	
557	
558	
559	
560	
561	
562	
563	
564	
565	
566	
567	
568	
569	
570	
571	

[PhDN] Port Reference Number	Owner Telephone (Program 04) Port Number
572	
573	
574	
575	
576	
577	
578	
579	
580	
581	
582	
583	
584	
585	
586	
587	
588	
589	
590	
591	
592	
593	
594	
595	
596	
597	
598	
599	
600	
601	
602	
603	
604	
605	
606	
607	

DK0211

General Notes:

- *Initialized data = blanks (no data).*
- *Use button 01 to enter blanks.*

Program *33 — Phantom Directory Number [PhDN] Owner Telephone Assignment (continued)

[PhDN] Port Reference Number	Owner Telephone (Program 04) Port Number
608	
609	
610	
611	
612	
613	
614	
615	
616	
617	
618	
619	
620	
621	
622	
623	
624	
625	
626	
627	
628	
629	
630	
631	
632	
633	
634	
635	
636	
637	
638	
639	
640	
641	
642	
643	
645	
646	
647	
648	
649	
650	
651	
652	

[PhDN] Port Reference Number	Owner Telephone (Program 04) Port Number
653	
654	
655	
656	
657	
658	
659	
660	
661	
662	
663	
664	
665	
666	
667	
668	
669	
670	
671	
672	
673	
674	
675	
676	
677	
678	
679	
680	
681	
682	
683	
684	
685	
686	
687	
688	
689	
690	
691	
692	
693	
694	
695	
696	

[PhDN] Port Reference Number	Owner Telephone (Program 04) Port Number
697	
698	
699	
700	
701	
702	
703	
704	
705	
706	
707	
708	
709	
710	
711	
712	
713	
714	
715	
716	
717	
718	
719	
720	
721	
722	
723	
724	
725	
726	
727	
728	
729	
730	
731	
732	
733	
734	
735	
736	
737	
738	
739	

DK0212

General Notes:

- *Initialized data = blanks (no data).*
- *Use button 01 to enter blanks.*

Program 34 — Hold Recall Timing

[*][#][*][#][1][*][2][*][3] – [Spkr][3][4][Hold] – [Spkr][ ][ ][ ][#][ ][ ][ ] [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Station Logical Port Number (000 ~ 239) Enter the port number having its Hold Recall Time defined. See Note 1 for entering a range of ports.

HOLD TIME = Seconds
Enter the number of seconds the system will wait. Use three digits. Acceptable range is 000 or 011 ~ 160. See Note 2.

Port	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015
Seconds																
	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031
	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047
	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063
	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079
	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095
	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111
	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239

DK0213

Notes:

1. *Enter 000 for no Hold Recall. Enter 011 ~ 160 for 11 to 160 seconds.*
2. *Specify a range of ports by entering:* [ ][ ][ ][*][ ][ ][ ]
   Low port — *High port*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns a Hold Recall Time of 032 seconds to all ports.*

Program *34 — Station Class of Service (R3)

SELECT = Station Logical Port Number (000 ~ 239) Enter the port number(s) being defined. See note 1 below for entering a range of ports.

LED – Select LEDs to light for the port specified in the last step. All LEDs marked with an "X" in the table below should be lit.

Select Port Range					
000 ~ 039	040 ~ 079	080 ~ 119	120 ~ 159	160 ~ 199	200 ~ 239

Copy this page for more ports

Feature	PORT → / LED ↓																				
	20																				
	19																				
	18																				
	17																				
	16																				
	15																				
	14																				
	13																				
	12																				
	11																				
	10																				
	09																				
	08																				
	07																				
	06																				
	05																				
	04																				
	03																				
	02																				
Camp-on/BOV Tone to Standard. Tel. Handset[2]	01																				

DK0214

Notes:

1. *Specify a range of ports by entering:* 

2. *An optional Camp-on busy and Busy Override (BOV) tone burst can be sent to standard telephone handsets/headsets (LED 01 ON). Turn LED 01 OFF for all standard telephone ports connected to voice mail and/or auto attendant devices.*

General Notes:

- *Initialized data = LED 01 ON.*
- *Camp on and BOV tone to a standard telephone handset is:*
  - *Two 160 ms bursts of 1209 Hz, 3-seconds apart (internal or tie line calls).*
  - *Two 1-second bursts of 1209 Hz, (interrupted by 160 ms), 3-seconds apart (external CO or DID line call).*
- *Program 31, Button 11 does not apply to standard telephones.*

Program 35 — Station Class of Service

[*][#][*][#][1][*][2][*][3] – [Spkr][3][5][Hold] – [Spkr][ ][ ][ ][#] – [ ] [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Station Logical Port Number (000 ~ 239) Enter the port number(s) being defined. See note 1 below for entering a range of ports.

LED – Select LEDs to light for the port specified in the last step. All LEDs marked with an "X" in the table below should be lit.

Select Port Range					
000 ~ 039	040 ~ 079	080 ~ 119	120 ~ 159	160 ~ 199	200 ~ 239

Copy this page for more ports

	Feature	PORT→ / LED↓																						
	Busy Station Transfer	20																						
	Busy Station Ringing	19																						
	Automatic Hold	18																						
	DKT 2000 Telephone Continuous DTMF Tones Off	17																						
(R2)	No CF/NA Handsfree or OCA	16																						
		15																						
(R3)	Toll Restriction After Answer[4,5]	14																						
(R3)	Toll Restriction After Answer[4,5]	13																						
		12																						
		11																						
		10																						
		09																						
		08																						
		07																						
		06																						
	LCD Personal Message (10-19) Allowed	05																						
	Message Waiting (RCV)[4]	04																						
(R3)	Message Waiting Lamp Std. Telephones[3]	03																						
	LCD Type/32-ON/12-OFF[2]	02																						
	LCD Display[2]	01																						

Notes:

1. *Specify a range of ports by entering:* [ ][ ][ ][*][ ][ ][ ]
   Low port — High port
2. *LEDs 01, 02, and 04 must be on to allow the Telephone's Message Waiting LED to function with voice mail—even if the Telephone is not an LCD type.*
3. *Turn LED 03 ON for ports that are connected to standard telephones equipped with message waiting lamps, turn LED 03 OFF for all other ports – including electronic and digital telephones.*
4. *Dial out (with or without Toll Restriction) must be allowed to use Speed Dial Buttons after answering incoming calls. If a CO line is put on hold, Toll Restriction will be applied to stations that are restricted when the held line is picked up by a toll restricted station. If "Dial out with T.R." is enabled, the CO line will drop if a station dials a restricted number after answering an incoming call, or if any digit is dialed with "dial out not allowed."*

IMPORTANT !

5. *With R3, LED 13/14 options are available on all lines except DID. LED 13/14 will be available to DID lines with R3.1 and above software ROMs. Turn LED 13/14 off for stations that answer DID calls if using R3.0 software ROMs.*

General Notes:

- *Maximum LCD Telephones with Personal Messages: RCTUC/D = 96, RCTUB, RCTUBA/BB = 32, RCTUA = 16*
- *Initialized data LED 01, 02, 04, 05, 16 are ON, all other LEDs off. The lowest port numbers (96, 32, 16-note 3) are initialized with LED 05 ON (LCD messages). To enable a higher port number with LCD message (LED 05 ON) a lower port must be disabled (LED 05 OFF).*

LED		Operation after answering an incoming call[4]
13	14	
OFF	OFF	Dial out not allowed
ON	OFF	Dial out with Toll Restriction
OFF	ON	Dial out with No Toll Restriction

DK0215

Program 36 — Fixed Call Forward (Voice Calls Only)

[*][#][*][#][1][*][2][*][3] – [Spkr][3][6][Hold] – [Spkr][ ][ ][ ][#][ ][ ][ ][Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Station Logical Port Number (000 ~ 239)
Enter the port number of the station that needs a Fixed Call Forward location assigned. See Note 1 for a range of ports.

FORWARD TEL = Port Number
Enter the port number of the Primary **[DN]** that will be call forwarded to when the Fixed Call Forward button is pressed.
Station Logical Ports: (000 ~ 239)

Port	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015
Forward Tel																
	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031
	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047
	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063
	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079
	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095
	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111
	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239

DK0216

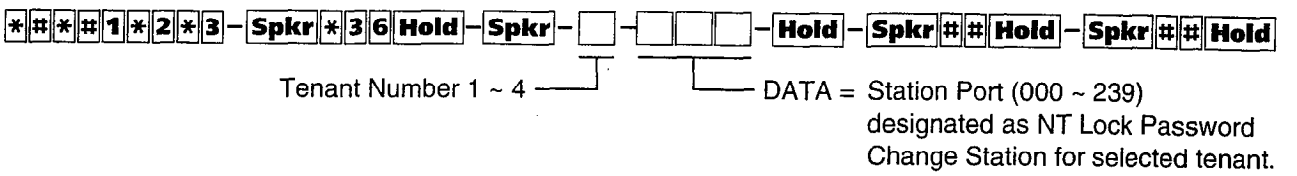
Note:

1. *Specify a range of ports by entering:* [ ][ ][ ][*][ ][ ][ ]
   Low port — *High port*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initializ ed data does not assign a Fixed Call Forward location to any port.*
- *Press Button/LED 01 to enter blanks.*
- *Telephones and attendant consoles must have a fixed-call forward button to activate this feature (See Program 39 and 59).*

Program *36 — System NT Button Lock Password Changing Station Assignment (R3)

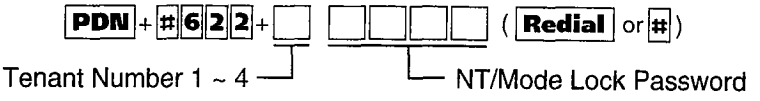


Tenant Number	NT Lock Station Port
1	
2	
3	
4	

General Notes:

- *Initialized data = Port 000 for all tenants.*
- *NT lock related programs include:*

  Program 39 **NT** *and* **NT Lock** *buttons*
  *Program *36* *NT Lock Station Assignment*
  *Program *15* *Tenant CO Line Assignments*
  Program 77-3 *Tenant Night Ring over External Page Assignments*
- *To operate the NT Lock mode, a station must be assigned the appropriate* **Tenant NT** *and* **NT Lock** *button in Program 39.*
- *All attendant consoles can operate all* **NT/NT Lock** *buttons if flexible buttons are assigned in Program 59. Program *36 is not required to assign attendant consoles to NT Lock functions.*
- *Attendant consoles and stations designated (NT Lock Password Change) in Program *36 can change the NT Lock password by dialing the sequence below:*



DK0217

Program 37 — CO and Tie Line Ring Transfer (Camp-on) Recall Time

##1*2*3 – Spkr 37 Hold – Spkr [ ][ ][ ] # [ ][ ][ ] Hold – Spkr ## Hold – Spkr ## Hold

SELECT = Station Logical Port Number (000 ~ 239)
Enter the number of the port that needs a Ring Transfer Recall time assigned. See Note 1 for entering a range of ports.

HOLD TIME = Ring Transfer Recall Time
Enter the Ring Transfer Recall Time (in seconds). The acceptable range is 011 ~ 999 seconds. Use three digits.

Port	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015
Hold Time																
	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031
	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047
	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063
	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079
	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095
	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111
	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239

DK0218

Note:

1. *Specify a range of ports by entering:* [ ][ ][ ] * [ ][ ][ ]
   Low port — *High port*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns a Ring Transfer Recall Time of 32 seconds to all ports.*

Program *37 — Park Recall Timing[1]

##1*2*3 – Spkr *37 Hold – Spkr [ ][ ][ ]#[ ][ ][ ] Hold – Spkr ## Hold – Spkr ## Hold

SELECT = Station Logical Port Number (000 ~ 239)
Enter the port number having its Park Recall Time defined. See Note 3 for entering a range of ports.

PARK TIME = Seconds
Enter the number of seconds the system will wait. Use three digits. Acceptable range is 000 or 011 ~ 999. See Note 2.

Port	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015
Seconds																
	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031
	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047
	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063
	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079
	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095
	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111
	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239

DK0219

Notes:

1. *Use with RCTUA, RCTUBA3 / RCUTBB3 or RCTUC / RCTUD3 Release 3 or above only.*
2. *Enter 000 for no Park Recall. Enter 011 ~ 999 for 11 to 999 seconds.*
3. *Specify a range of ports by entering:* [ ][ ][ ]*[ ][ ][ ]
   Low port — *High port*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns a Park Recall Time of 032 seconds to all ports.*

Program 38 — Digital and Electronic Telephone Keystrip Type

[*][#][*][#][1][*][2][*][3] – [Spkr][3][8][Hold] – [Spkr][ ][ ][ ][#][ ][ ][Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Port Number (000 ~ 239)
Enter the port number of the station that needs a keystrip defined. See Note 1 for entering a range of ports.

BUTTON MENU = Code
Enter the appropriate code as follows:

Telephone Type	Code
10-button	21
20-button (A)	31
20-button (B)	32
20-button (C)	33

Port / Button Menu																
	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015
	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031
	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047
	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063
	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079
	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095
	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111
	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239

DK0220

Note:

1. *Specify a range of ports by entering:* [ ][ ][ ][*][ ][ ][ ]
   Low port — *High port*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns Code 31 to all ports.*
- *Always complete Program 38 before proceeding to Program 39.*

Program 38 — Digital and Electronic Telephone Keystrip Type (continued)

Assignments for 2000-series Digital Telephone keystrips are as follows:

Speed Dial[1,4]
Do Not Disturb
Line 7
Line 6
Line 5
Line 4
Line 3
Line 2
Line 1
Intercom or Primary [DN][2]

Code 21
10-button

Line 9	Speed Dial[1,4]
Line 8	Do Not Disturb
Line 7	Line 17[3]
Line 6	Line 16
Line 5	Line 15
Line 4	Line 14
Line 3	Line 13
Line 2	Line 12
Line 1	Line 11
Intercom or Primary [DN][2]	Line 10

Code 31(Default)
20-button (A)

Line 9	Speed Dial[1,4]
Line 8	Do Not Disturb
Line 7	SD 14
Line 6	SD 13
Line 5	SD 12
Line 4	SD 11
Line 3	SD 10
Line 2	Line 12
Line 1	Line 11
Intercom or Primary [DN][2]	Line 10

Code 32
20-button (B)

SD 10	Flash
Line 8	Do Not Disturb
Line 7	Speed Dial
Line 6	Redial
Line 5	Spd Dial Pause
Line 4	SD 15
Line 3	SD 14
Line 2	SD 13
Line 1	SD 12
Intercom or Primary [DN][2]	SD 11

Code 33
20-button (C)
(Keystrip not provided, but can be assigned)

Assignments for 1000-series Digital Telephone keystrips are as follows:

CO15	CO16	CO17[3]	DND	SDS
CO10	CO11	CO12	CO13	CO14
CO5	CO6	CO7	CO8	CO9
INT or [PDN][2]	CO1	CO2	CO3	CO4

Code 31 (Default)
20-button(A)

SD12	SD13	SD14	DND	SDS
CO10	CO11	CO12	SD10	SD11
CO5	CO6	CO7	CO8	CO9
INT or [PDN][2]	CO1	CO2	CO3	CO4

Code 32
20-button (B)

PAU	RDL	SDS	DND	FLASH
SD11	SD12	SD13	SD14	SD15
CO5	CO6	CO7	CO8	SD10
INT or [PDN][2]	CO1	CO2	CO3	CO4

DK0221

Code 33
20-button (C)

Notes:

1. *The* **Speed Dial** *button is the same as the SDS or REP buttons in previous Strata systems (Program 39, Code 97).*
2. *DK280 Release 1 and 2* **Intercom (INT)** *buttons are replaced by Primary Directory Number* **[PDN]** *buttons in DK280 Release 3 software.*
3. *This button is initialized as SD10 with RCTUA since there are only 16 CO lines.*
4. *If changing PEKU PCBs (electronic telephone) to PDKU PCBs (digital telephone), or vice versa, always check that the* **Speed Dial** *or* **MW/FL** *button is set appropriately in Program 39.*

Program 38 — Digital and Electronic Telephone Keystrip Type (continued)

The electronic telephone keystrip code assignments are as follows:

MW/FL[3]
DND
CO7
CO6
CO5
CO4
CO3
CO2
CO1
INT or [PDN][2]

Code 21
10-button

CO9	MW/FL[3]
CO8	DND
CO7	CO17[1]
CO6	CO16
CO5	CO15
CO4	CO14
CO3	CO13
CO2	CO12
CO1	CO11
INT or [PDN][2]	CO10

Code 31(Default)
20-button (A)

CO9	MW/FL[3]
CO8	DND
CO7	SD14
CO6	SD13
CO5	SD12
CO4	SD11
CO3	SD10
CO2	CO12
CO1	CO11
INT or [PDN][2]	CO10

Code 32
20-button (B)

SD 10	MW/FL[3]
CO8	DND
CO7	SDS
CO6	RDL
CO5	PAU
CO4	SD15
CO3	SD14
CO2	SD13
CO1	SD12
INT or [PDN][2]	SD11

Code 33
20-button (C)

The programming keystrips are as follows:

10 30, 50, 70 90, 110, 130	20 40, 60, 80 100, 120, 140
09 29, 49, 69 89, 109, 129	19 39, 59, 79 99, 119, 139
08 28, 48, 68 88, 108, 128	18 38, 58, 78 98, 118, 138
07 27, 47, 67 87, 107, 127	17 37, 57, 77 97, 117, 137
06 26, 46, 66 86, 106, 126	16 36, 56, 76 96, 116, 136
05 25, 45, 65 85, 105, 125	15 35, 55, 75 95, 115, 135
04 24, 44, 64 84, 104, 124, 144	14 34, 54, 74 94, 114, 134
03 23, 43, 63 83, 103, 123, 143	13 33, 53, 73 93, 113, 133
02 22, 42, 62 82, 102, 122, 142	12 32, 52, 72 92, 112, 132
01 21, 41, 61 81, 101, 121, 141	11 31, 51, 71 91, 111, 131

2000-series Digital Telephone

16, 36, 56, 76 96, 116, 136	17, 37, 57, 77 97, 117, 137	18, 38, 58, 78 98, 118, 138	19, 39, 59, 79 99, 119, 139	20, 40, 60, 80 100, 120, 140
11, 31, 51, 71 91, 111, 131	12, 32, 52, 72 92 112, 132	13, 33, 53, 73 93, 113, 133	14, 34, 54, 74 94, 114, 134	15, 35, 55, 75 95, 115, 135
06, 26, 46, 66 86, 106, 126	07, 27, 47, 67 87, 107, 127	08, 28, 48, 68 88, 108, 128	09, 29, 49, 69 89, 109, 129	10, 30, 50, 70 90, 110, 130
01, 21, 41, 61 81, 101, 121, 141	02, 22, 42, 62 82, 102, 122, 142	03, 23, 43, 63 83, 103, 123, 143	04, 24, 44, 64 84, 104, 124, 144	05, 25, 45, 65 85, 105, 125

1000-series Digital Telephone DK0222

Notes:

1. *This button is initialized as SD10 with RCTUA since there are only 16 CO lines.*
2. *DK280 Release 1 and 2* **Intercom (INT)** *buttons are replaced by Primary Directory Number* **[PDN]** *buttons in DK280 Release 3 software.*
3. *If changing PEKU PCBs (electronic telephone) to PDKU PCBs (digital telephone), or vice versa, always check that the Speed Dial or* **MW/FL** *button is set appropriately in Program 39.*

General Note:

- *Button numbers 01 ~ 144 on electronic telephones (6000, 6500 series, etc) are in the same position as shown on the 2000-series digital telephone programming keystrip.*

Program 39 — Flexible Button Assignment[1]

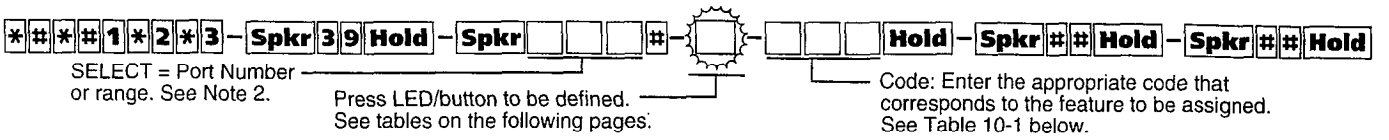


Table 10-1
Flexible Button Codes for Digital and Electronic Telephones

Button Function	Button Labels	Code	Notes
Account Code	Account Code or ACCNT	450	Allows a Voluntary Account Code to be entered.
Alarm	Alarm Reset or ALRM	477	Resets alarm condition system-wide.
Alert Signaling (see following pages)			
All Call Voice Page	All Call Page or AC	489	Pages up to 120 idle electronic or digital telephones over speaker.
Automatic Busy Redial	Auto Busy Redial or ABR	470	Sets ABR of busy outgoing number.
Automatic Callback Busy	Auto Callback or ACB	494	Sets ACB for station recalled by busy line.
Background Music	Tel Set Music or BGM	478	Turns BGM ON or OFF through station speaker.
Call Forward All Calls	Call Frwd All Calls or CFAC	487	All calls forward to selected station.
Call Forward A.C. Fixed	Call Frwd to: or CFF	486	Forwards all calls to pre-defined destination. See Program 36.
Call Forward Busy	Call Frwd Busy or CFB	459	Forwards calls to selected station if station is busy.
Call Forward Busy/No Answer	Call Frwd Busy/NAns or CFB/NA	457	Forwards calls to selected station if station is busy or does not answer.
Call Forward External	Call Frwd External or CF-EXT	460	Forward calls externally.
Call Foward No Answer	Call Frwd No Answer or CFNA	458	Forwards calls to selected station if station does not answer.
Call Park[5]	Park in Orbit or PARK (R3)	464	Call Park Only.
Call Park LCD Display[5]	Park Orbit DIsplay or CPD (R3)	465	CP Display Button and Mode 64 can be used interchangeably. Displays call parked via telephone LCD.
Call Park and Page[5]	Call Park/Page or CP/PG (R3)	463	Parking and Paging Park Pickup.
Call Pickup (Directed)	Directed Pickup or PKUP	484	Picks up ringing or held intercom, trunk calls, and page.
Call Pickup[3] Tenant 4	PKUP 4	435	Picks up tenant 4's ringing CO calls.
Call Pickup[3] Tenant 3	PKUP 3	436	Picks up tenant 3's ringing CO calls.
Call Pickup[3] Tenant 2	PKUP 2	437	Picks up tenant 2's ringing CO calls.
Call Pickup[3] Tenant 1	PKUP 1	438	Picks up tenant 1's ringing CO calls.
Call Pickup (Group)[4]	Group Pickup	480	Picks up a call to any group to which station is assigned in *31.
Unanswered Caller ID and/or ANI Stored Number Auto Dial	Lost Call Auto Dial (R3) or LCAD	462	Will Auto Dial a Caller ID and/or Automatic Number Identification (ANI) telephone number that was stored in station Caller ID/ANI memory.
CO Line Appearance	Line 1 ~ 144 or CO 001 ~ CO 144	001 ~ 144	CO line access of appearing calls.
Data	Data Call or DATA	456	Used to place data call.
Data Release	Data Release or DRLS	454	Releases data call.
Direct Station Selection	DSS	#000 ~ #239	Assigns DSS hotline keys to port number.
Directory Numbers (see following pages)			
Do Not Disturb	Do Not Disturb or DND	498	Prevents calls to station.

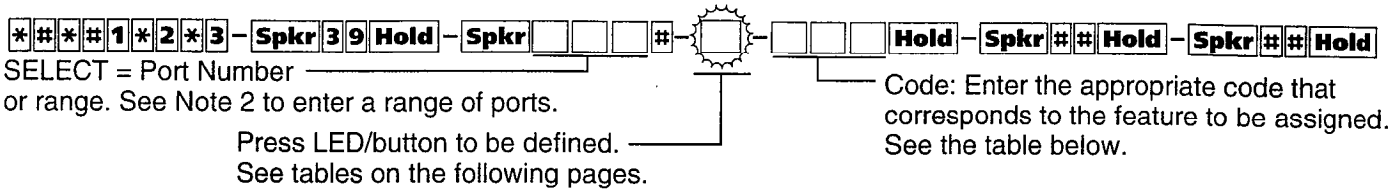
DK0223

Program 39 — Flexible Button Assignment[1] (continued)

Button Function	Button Labels	Code	Notes
Door Lock 0 thru Door Lock 4 (DDCB/HDCB)	Unlock Door 0 or DRLK 0 Unlock Door 1 or DRLK 1 Unlock Door 2 or DRLK 2 Unlock Door 3 or DRLK 3 Unlock Door 4 or DRLK 4	471 472 473 474 475	Momentarily unlocks door (3 or 6 seconds). See Program 77-1 and 77-2.
Handset Off-Hook Call Announce	HS-OCA	468	Activates 2-way voice path to Off-Hook Call Announce caller. (R3)
LCD Message Select	LCD Msg Select or LCD M	481	Begins LCD message selection.
Message Waiting and Flash	Msg Wait, Flash or MW/FL	499	Provides message waiting LED for EKT and Flash Button.
Microphone Cutoff	Microphn Cut-off or MCO	488	Sets microphone ON/OFF for incoming handsfree Directory Number **[DN]** calls.
Modem	Modem or MODEM	455	Used to reserve modem in modem pool.
Night Transfer Tenant 1[3]	Night Transfer1 or NT1	439	Sets Tenant 1 CO line DAY/NIGHT ring mode.
Night Transfer Tenant 2[3]	Night Transfer2 or NT2	440	Sets Tenant 2 CO line DAY/NIGHT ring mode.
Night Transfer Tenant 3[3]	Night Transfer3 or NT3	441	Sets Tenant 3 CO line DAY/NIGHT ring mode.
Night Transfer Tenant 4[3]	Night Transfer4 or NT4	442	Sets Tenant 4 CO line DAY/NIGHT ring mode.
Night Transfer Lock Tenant 1[5]	Night Lock1 or NT1 L1	431	Used to lock system ringing mode: DAY, DAY2 , NIGHT See Programs 74 and 36 for NT Lock Password assignments. (R3)
Night Transfer Lock Tenant 2[5]	Night Lock2 or NT2 L2	432	
Night Transfer Lock Tenant 3[5]	Night Lock3 or NT3 L3	433	
Night Transfer Lock Tenant 4[5]	Night Lock4 or NT4 L4	434	
Pause	Spd Dial Pause or PAU	495	Sets pause in Speed dial See Program 12-3.
Pause (Long)	Spd Dial Lng Pause or PAU/L	493	Sets a 10-second pause in Speed Dial.
Pooled Line	Pooled Line Grp or PL	301 ~ 316	Mulitiple CO line may appear under one button.
Privacy	Privacy On Line or PRIV	453	Prevents Privacy Override (not Executive Overrride).
Privacy Release	Privacy Release or PRV RLS	479	Changes station Privacy mode to Non-private for CO lines.
Redial Last Number (# Button)	Redial or RDL	496	Redials the last number.
Release to Idle	Release Call or RLS	476	Releases current call and makes station idle.
Release and Answer	Release and Ans or RLS/ANS	466	Simlulates On-hook/Off-hook operation to release an existing call and answer new incoming/ringing call.

DK0810

Program 39 — Flexible Button Assignment[1] (continued)



Button Function	Button Labels	Code	Notes
Save Last Dialed Number	Save Last Number or SAVE	485	Saves last number dialed for future speed dial.
Speed Dial Select (★ Button)	Speed Dial or SDS	497	Begins speed dial selection.
Station Speed Dial Codes	SD	★10 ~ ★49	Reserves button for station speed dial.
System Speed Dial Codes[6]	SD	★600 ~ ★699 - or - ★60 ~ ★69	Speed dial number set by station port 000.
Tone	Tone Dial Select or TONE	490	CO dial signals set to tone or pulse.

DK0224

Notes:

1. *Some assignments are not available in Release 1 or 2.*
2. *Specify a range of ports by keying in:* ___*___ (*Low port* — *High port*)
3. *See Program ★15 for Tenant Group assignments.*
4. *Picks up calls to telephones in any call pickup group to which the telephone is assigned in Program *31.*
5. *Available with RCTUA3, RCTUBA3/RCTUBB3 or RCTUC/D3 Release 3 or above only.*
6. *RCTUA and RCTUA3 provide 40 system speed dial numbers (60 ~ 99), RCTUB, RCTUBA/RCTUBB, and RCTU C/D provide 100 system speed dial numbers (600 ~ 699).*

General Notes:

- *Attendant Consoles cannot be equipped with Secondary or Phantom* **[DNs]**. *The console Directory Number is assigned to the console port number in Program 04. The console* **[DN]** *can have only one appearance.*
- *Complete Program 38 before Program 39.*
- *Initialized data assigns the keystrip pattern associated with Code 31 from Program 38.*

Program 39 — Directory Number Assignments (R3)

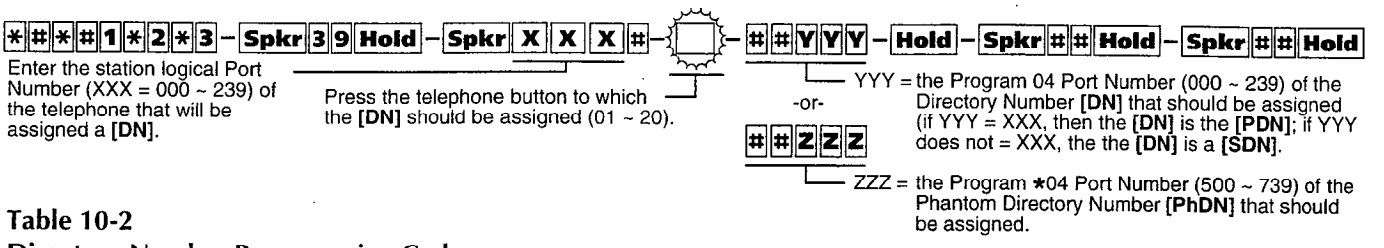
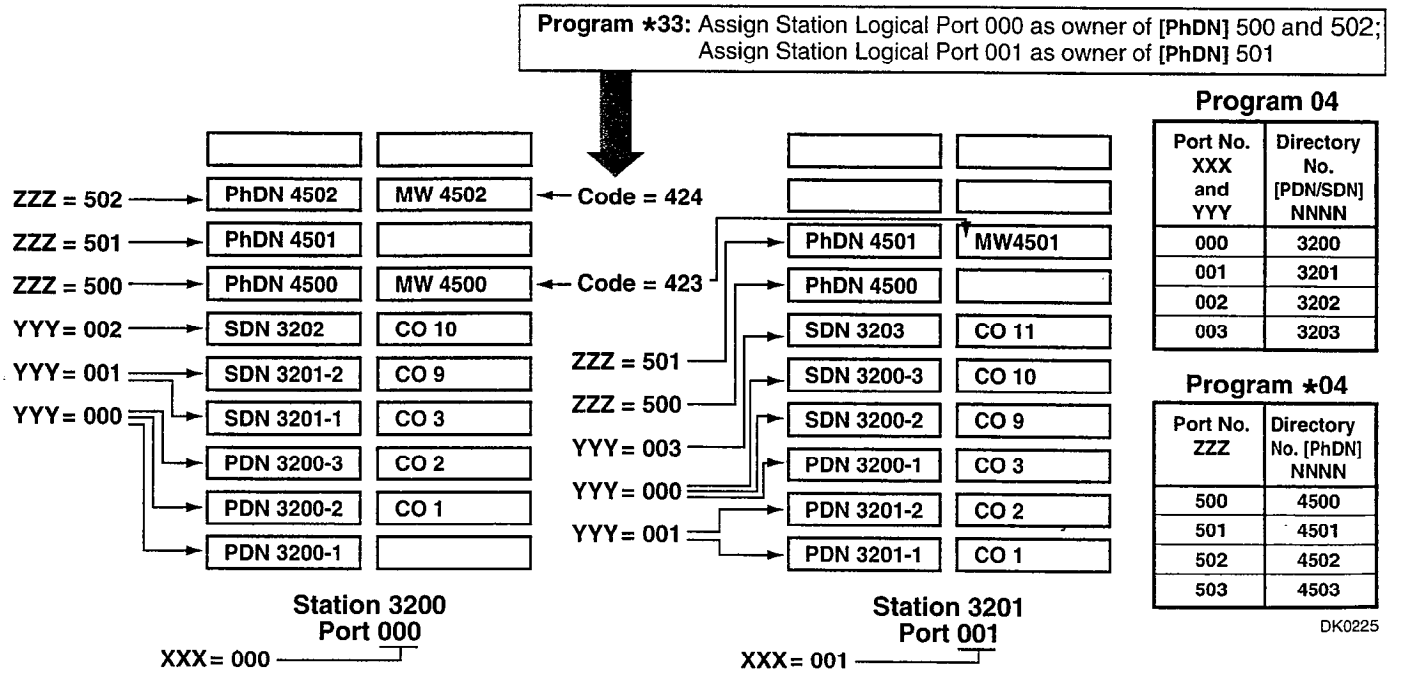


Table 10-2
Directory Number Programming Codes

Note: Press a [DN] and dial #407 and the system displays the [DN] number.

Button Type	Button Labels	Code	Notes
Primary Directory Numbers [PDNs] 4-Maximum of same [PDN] per telephone	[PDN] NNNN - 1, Highest button [PDN] NNNN - 2, next highest [PDN] NNNN - 3, next highest [PDN] NNNN - 4, Lowest button See Table 10-3.	##YYY ##YYY ##YYY ##YYY	YYY = the Program 04 station logical port number (000-239) of the [DN] that should appear as a Primary [DN]. YYY should be the same port number as the port number (XXX) of the telephone to which the [PDN] is assigned. NNNN is the actual [DN] assignment for Port YYY in Program 04.
Secondary Directory Numbers [SDNs] 16 total [PDNs] + [SDNs]; 4-Maximum of same [SDN] per telephone	[SDN] NNNN - 1, Highest button [SDN] NNNN - 2, next highest [SDN] NNNN - 3, next highest [SDN] NNNN - 4, Lowest button See Table 10-3.	##YYY ##YYY ##YYY ##YYY	YYY = the Program 04 station logical port number (000-239) of the [DN] that should appear as a Secondary [DN]. YYY should not be the same port number as the port number (XXX) of the telephone on which the [SDN] is assigned. NNNN is the actual DN assignment for Port YYY in Program 04.
Phantom Directory Numbers [PhDNs] 8-Maximum unique [PhDNs] 1-Maximum of same [PhDN] per telephone	[PhDN] NNNN See Table 10-3.	##ZZZ	ZZZ = the Program *04 Port ref. number (500-739) of the Phantom [DN]. NNNN is the actual [DN] assignment for Port ZZZ in Program *04. Each [PhDN] ***must have*** an owner telephone assigned in Program *33. If an owner is not assigned, the [PhDN] can originate but cannot receive calls.
Phantom Directory Number Message Waiting button [PhDN] 4- maximum [PhDN/MW] keys per telephone	[PhDN/MW] - 1 Lowest [PhDN] [PhDN/MW] - 2 Next Highest [PhDN/MW] - 3 Next Highest [PhDN/MW] - 4 Highest [PhDN]	423 424 425 426	Message Waiting Key for [PhDNs] assigned to telephone. Telephone must be assigned as [PhDN] owner in Program *33 to allow it to be equipped with a [PhDN/MW] button.

Directory Number Programming Example:



Program 04

Port No. XXX and YYY	Directory No. [PDN/SDN] NNNN
000	3200
001	3201
002	3202
003	3203

Program *04

Port No. ZZZ	Directory No. [PhDN] NNNN
500	4500
501	4501
502	4502
503	4503

DK0225

Program 39 — Directory Number Assignments (continued)

Table 10-3
Directory Number Programming

Directory Number [DN] Type	Maximum [DN] Buttons on a Telephone	Maximum System [DN] Button Appearances	Maximum [DN] Numbers per system
Primary Directory Number **[PDN]**: One **[DN]** is assigned to each Telephone port in Program 04; this **[DN]** is designated as the **[PDN]** of that telephone. The telephone is designated as the **[PDN]** owner.	Up to 4 **[PDN]** buttons per owner telephone. **[PDN]** buttons are assigned in Program 39.	A Primary Directory Number can appear as a **[PDN]** button on the **[PDN]** owner telephone only; however, any Primary Directory Number can appear as an **[SDN]** button on all Toshiba telephones in the system. A **[PDN]/[SDN]** button is limited to ring on 120 telephones, maximum.	**[PDNs]** are defined in Program 04. RCTUA = 32 **[PDNs]** RCTUBA/BB = 80 **[PDNs]** RCTUC3/D3 = 240 **[PDNs]**
Secondary Directory Number **[SDN]** : **[SDN]** buttons are Primary Directory Numbers that appear on telephones other than the **[PDN]** owner telephone.	Four of the same **[SDN]** button per telephone. 16 **[PDN]** and **[SDN]** buttons per telephone combined, maximum. **[SDN]** buttons are assigned in Program 39.	Any Primary Directory Number can appear as an **[SDN]** button on all Toshiba telephones in the system but a **[PDN]/[SDN]** button is limited to ring on 120 telephones maximum.	*Note:* **[PDNs]** *and* **[SDNs]** *are actually the same numbers.*
Phantom Directory Number **[PhDN]**: 240 **[PhDNs]** are defined in Program *04, **[PhDNs]** must be assigned to owner telephones in Program *33. Default programming assigns no telephones as **[PhDN]** owner telephones (see Note 3 below).	One of the same **[PhDN]** button per telephone. Eight different **[PhDN]** buttons per telephone. **[PhDN]** buttons are assigned in Program 39.	Any **[PhDN]** button can appear on all Toshiba telephones in the system but an **[PhDN]** button is limited to ring on 120 telephones maximum.	**[PhDNs]** are defined in Program *04 RCTUA = 32 **[PhDNs]** RCTUBA/BB = 80 **[PhDNs]** RCTUC3/D3 = 240 **[PhDNs]**

DK0226

General Notes:

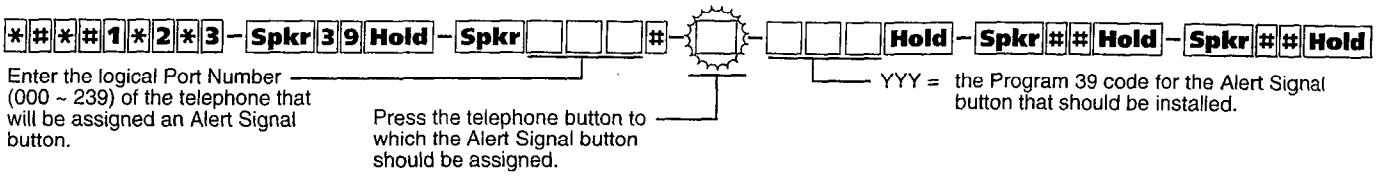
- *The total number of* **[DNs]** *allowed on a telephone (***[PDN]** *,* **[SDNs]** *, and* **[PhDNs]***) is limited to the number of buttons on the telephone (i.e., a 20-button telephone can have 20* **[DN]** *buttons with any combination that meets the above Table A criteria).*
- *The total number of actual unique directory numbers in Strata DK280 Release 3 RCTUC/D, is 240* **[PDNs]** *+ 240* **[PhDNs]** *= 480* **[DNs]***;* **[SDN]** *buttons are actually* **[PDNs]** *that appear on telephones other than the* **[PDNs]** *owner telephone.*
- *Phantom* **[DN]** *owner telephones have the following attributes:*
  - *Set Call Forward for* **[PhDNs]**
  - *Set Call Forward Mail Box destinations (VM ID codes) for* **[PhDNs]**
  - *Receive Message Waiting indication for up to four Phantom Directory Numbers on individual* **[PhDN/MW]** *button LEDs*
  - *When off-hook, the* **[PhDN]** *telephone owner will receive OCA calls directed to a busy the* **[PhDN].**
- *The number of* **[SDN]** *buttons programmed on a telephone for a given Primary Directory Number must always be the same as the number of* **[PDN]** *buttons that exist on the* **[PDN]** *owner telephone. Example: If* **[PDN]** *200 appears on 3 buttons on station 200, and* **[SDN]** *200 should appear on station 201, then* **[SDN]** *200 must appear on 3-buttons on station 201. Never put more (or less)* **[SDN]** *buttons of the same Directory Number on a telephone than* **[PDN]** *buttons that appear on the* **[PDN]** *owner telephone. If this guideline is not followed, calls to the* **[PDN]** *telephone will be missed on the* **[SDN]** *telephone.*
- **[PDN]** *and/or* **[PhDN]** *Call Forward/Message retrieval can only be set/received from the* **[PDN]** *and/or* **[PhDN]** *owner telephone.*
- *To assign ground/loop start lines to ring* **[DNs]***, use Program 81 ~ 88 to assign the* **[DN]***'s telephone to ring and Program *81, *84,agd *87 to assign the* **[DN]** *button LED to flash (1 Hz) on the telephone when the CO line rings. Do not assign use Program *81, *84,and *87 to assign* **[DNs]** *to flash on incoming CO line calls if the incoming CO line buttons appear on the telephone – this will cause more than one button to flash when the CO line rings the telephone. See "IMPORTANT" below.*
- *To assign a* **[DN]** *to ring when called from another* **[DN]***, a tie line, or DID line; use Programs *71, *72, and *73 to assign the telephone(s) on which the* **[DN]** *button appears to ring. Also use Programs *09 or 71-1 (1 ~ 3) to assign the Primary or Phantom* **[DN]** *to ring for DID, DNIS, and ANI calls.*

IMPORTANT !

Only 120 telephones, maximum can be programmed to ring when a CO line, **[PDN]/[SDN],** *or* **[PhDN]** *is called.*

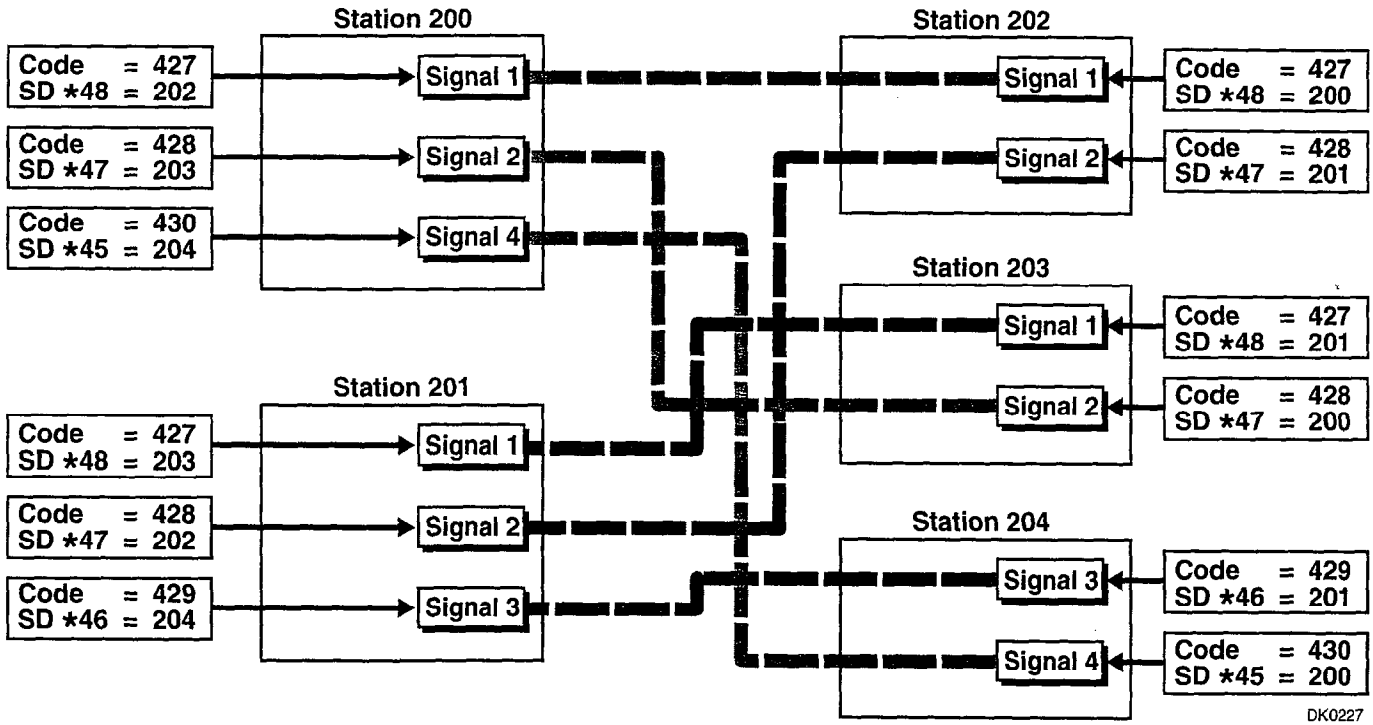
- *Do not assign DID, tie, DNIS, or ANI lines to CO or pooled line button appearances on telephones because these types of lines will cause the telephone* **[PDN]** *,* **[SDN]***, or* **[PhDN]** *to flash and ring when the line rings. If a DID/tie line button appears on a telephone, the telephone* **[DN]** *button and the tie/DID line (or pooled line) button will flash when the tie or DID line rings the telephone. This could be confusing to the telephone user.*

Program 39 — Alert Signal Button Assignments (R3)



Button Function	Button Labels	Code	Notes
Alert Signal 1	Alert Signal 1 or ALERT1 *(Name)*	427	This button will signal the station number programmed in Speed Dial *48
Alert Signal 2	Alert Signal 2 or ALERT2 *(Name)*	428	This button will signal the station number programmed in Speed Dial *47
Alert Signal 3	Alert Signal 3 or ALERT3 *(Name)*	429	This button will signal the station number programmed in Speed Dial *46
Alert Signal 4	Alert Signal 4 or ALERT4 *(Name)*	430	This button will signal the station number programmed in Speed Dial *45

Alert Signal Button Programming Example:



IMPORTANT !

1. *Both partner stations must have the same Alert Signal button number programmed in Program 39 and the appropriate Speed Dial Number programmed to allow the Alert Signal buttons to operate. (See the record sheet on the next page.)*
2. *The Alert Signal will be sent to one partner station when the other partner station presses the "Signal" button. The Alert Signal is 4-short bursts of tone, sent two times/three seconds apart – it will be sent to stations that are idle or busy, or in Call Forward or Do Not Disturb mode. No talk path will exist before or after the Alert Signal is activated.*

Program 39 — Alert Signal Button Record Sheet (R3)

Station Number

Alert Signal Button		Button Number (01 ~ 20)	Speed Dial Number	Alert Signal Button Partner Station Number
Number	Code			
1	427		*48	
2	428		*47	
3	429		*46	
4	430		*45	

Station Number

Alert Signal Button		Button Number (01 ~ 20)	Speed Dial Number	Alert Signal Button Partner Station Number
Number	Code			
1	427		*48	
2	428		*47	
3	429		*46	
4	430		*45	

Station Number

Alert Signal Button		Button Number (01 ~ 20)	Speed Dial Number	Alert Signal Button Partner Station Number
Number	Code			
1	427		*48	
2	428		*47	
3	429		*46	
4	430		*45	

Station Number

Alert Signal Button		Button Number (01 ~ 20)	Speed Dial Number	Alert Signal Button Partner Station Number
Number	Code			
1	427		*48	
2	428		*47	
3	429		*46	
4	430		*45	

Station Number

Alert Signal Button		Button Number (01 ~ 20)	Speed Dial Number	Alert Signal Button Partner Station Number
Number	Code			
1	427		*48	
2	428		*47	
3	429		*46	
4	430		*45	

Station Number

Alert Signal Button		Button Number (01 ~ 20)	Speed Dial Number	Alert Signal Button Partner Station Number
Number	Code			
1	427		*48	
2	428		*47	
3	429		*46	
4	430		*45	

Station Number

Alert Signal Button		Button Number (01 ~ 20)	Speed Dial Number	Alert Signal Button Partner Station Number
Number	Code			
1	427		*48	
2	428		*47	
3	429		*46	
4	430		*45	

Station Number

Alert Signal Button		Button Number (01 ~ 20)	Speed Dial Number	Alert Signal Button Partner Station Number
Number	Code			
1	427		*48	
2	428		*47	
3	429		*46	
4	430		*45	

Station Number

Alert Signal Button		Button Number (01 ~ 20)	Speed Dial Number	Alert Signal Button Partner Station Number
Number	Code			
1	427		*48	
2	428		*47	
3	429		*46	
4	430		*45	

Station Number

Alert Signal Button		Button Number (01 ~ 20)	Speed Dial Number	Alert Signal Button Partner Station Number
Number	Code			
1	427		*48	
2	428		*47	
3	429		*46	
4	430		*45	

DK0228

Program 39 — Flexible Button Assignment for Ports ____to____

* # * # 1 * 2 * 3 – Spkr 3 9 Hold – Spkr [ ][ ][ ] # – ( ) – [ ][ ][ ] Hold – Spkr # # Hold – Spkr # # Hold

Port Number — Code

Copy for more telephones

PORT NO. ____. 10□ 20□ LCD □ DIU □

LOCATION:

Button	Code	Button	Code
10		20	
09		19	
08		18	
07		17	
06		16	
05		15	
04		14	
03		13	
02		12	
01		11	

PORT NO. ____. 10□ 20□ LCD □ DIU □

LOCATION:

Button	Code	Button	Code
10		20	
09		19	
08		18	
07		17	
06		16	
05		15	
04		14	
03		13	
02		12	
01		11	

PORT NO. ____. 10□ 20□ LCD □ DIU □

LOCATION:

Button	Code	Button	Code
10		20	
09		19	
08		18	
07		17	
06		16	
05		15	
04		14	
03		13	
02		12	
01		11	

PORT NO. ____. 10□ 20□ LCD □ DIU □

LOCATION:

Button	Code	Button	Code
10		20	
09		19	
08		18	
07		17	
06		16	
05		15	
04		14	
03		13	
02		12	
01		11	

PORT NO. ____. 10□ 20□ LCD □ DIU □

LOCATION:

Button	Code	Button	Code
10		20	
09		19	
08		18	
07		17	
06		16	
05		15	
04		14	
03		13	
02		12	
01		11	

PORT NO. ____. 10□ 20□ LCD □ DIU □

LOCATION:

Button	Code	Button	Code
10		20	
09		19	
08		18	
07		17	
06		16	
05		15	
04		14	
03		13	
02		12	
01		11	

PORT NO. ____. 10□ 20□ LCD □ DIU □

LOCATION:

Button	Code	Button	Code
10		20	
09		19	
08		18	
07		17	
06		16	
05		15	
04		14	
03		13	
02		12	
01		11	

PORT NO. ____. 10□ 20□ LCD □ DIU □

LOCATION:

Button	Code	Button	Code
10		20	
09		19	
08		18	
07		17	
06		16	
05		15	
04		14	
03		13	
02		12	
01		11	

PORT NO. ____. 10□ 20□ LCD □ DIU □

LOCATION:

Button	Code	Button	Code
10		20	
09		19	
08		18	
07		17	
06		16	
05		15	
04		14	
03		13	
02		12	
01		11	

PORT NO. ____. 10□ 20□ LCD □ DIU □

LOCATION:

Button	Code	Button	Code
10		20	
09		19	
08		18	
07		17	
06		16	
05		15	
04		14	
03		13	
02		12	
01		11	

PORT NO. ____. 10□ 20□ LCD □ DIU □

LOCATION:

Button	Code	Button	Code
10		20	
09		19	
08		18	
07		17	
06		16	
05		15	
04		14	
03		13	
02		12	
01		11	

PORT NO. ____. 10□ 20□ LCD □ DIU □

LOCATION:

Button	Code	Button	Code
10		20	
09		19	
08		18	
07		17	
06		16	
05		15	
04		14	
03		13	
02		12	
01		11	

DK0229

Programs 40 through 48 are in the Toll Restriction System Record Section

Programs 50 through 56 are in the Least Cost Routing System Record Section

Program *40 — Distributed Hunt Group Member Assignments[1]

##1*2*3–Spkr*40 Hold–Spkr[ ][ ][ ]–[ ][ ]–[ ][ ][ ]–Hold–Spkr##Hold–Spkr##Hold

SELECT = Distributed Hunt (DH) Group Number (900 ~ 915)

DATA = Hunt member (Station Logical Port 000 ~ 239)[2]
Hunt order (01 ~ 32)

Hunt Order

SELECT =	DATA = (Hunt Order 01 ~ 32) and Port (000 ~ 239)															
DHG: 900	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 901	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 902	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 903	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 904	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 905	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 906	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 907	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 908	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

DK0230

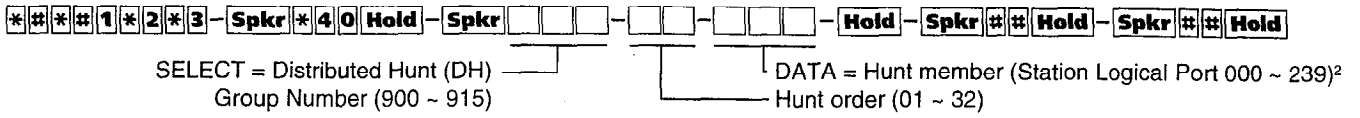
Notes:

1. *Distributed Hunt is available with DK280 Release 3.1 and above.*
2. *When editing the data field, use button/LED 01 to delete a member.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data does not assign any member (station port) to any DH number.*
- *To assign voice mail ports to a DH group, see the example following the Program 31 record sheet.*
- *See Program 31 for Voice Mail programming examples.*

Program *40 — Distributed Hunt Group Member Assignments[1] (continued)



Hunt Order

SELECT =	DATA = (Hunt Order 01 ~ 32) and Port (000 ~ 239)															
DHG: 909	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 910	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 911	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 912	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 913	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 914	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DHG: 915	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

DK0231

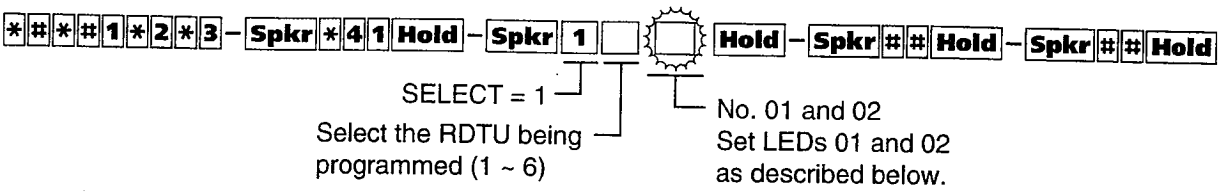
Notes:

1. *Distributed Hunt is available with DK280 Release 3.1 and above.*
2. *When editing the data field, use button/LED 01 to delete a member.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data does not assign any member (station port) to any DH number.*
- *To assign voice mail ports to a DH group, see the example following the Program 31 record sheet.*

Program *41-1 — T1 Span Frame and Coding Assignments



RDTU FRAME AND LINE CODE ASSIGNMENT RECORD				
T1 SPAN	**EXTENDED SUPERFRAME LED 01 ON**	**SUPERFRAME LED 01 OFF**	**B8ZS CODE LED 02 ON**	**AMI CODE LED 02 OFF**
1 RDTU				
2 RDTU				
3 RDTU				
4 RDTU				
5 RDTU				
6 RDTU				

DK0232

General Note:

- *Initialized data LED 01 and 02 off for all T1 span lines.*

Program *41-2 — T1 Channel Assignments

More channels

[*][#][*][#][1][*][2][*][3] – [Spkr][*][4][1][Hold] – [Spkr][2][ ][ ][ ][#][ ][Hold] – [Turn System Power OFF (5 sec) then ON][2]

- or -

[Run Program 91-2 (R3)]

SELECT = 2

Enter the RDTU being programmed (1 ~ 6).

Enter the RDTU channel number (01 ~ 24) to be assigned a line type. To enter a range: [ ][ ][*][ ][ ]

Low channel — High channel

Enter the CO line type to be assigned to the CO line:

1 = Loop Start (Initialized) 4 = Tie (Wink)[1]
2 = Ground Start 5 = DID (Immediate)[1]
3 = Tie (Immediate)[1] 6 = DID (Wink)[1]

Copy this page for more RDTU assignments.

RDTU (1 ~ 6)____		RDTU (1 ~ 6)____		RDTU (1 ~ 6)____	
RDTU Channel No.	**Line Type**	**RDTU Channel No.**	**Line Type**	**RDTU Channel No.**	**Line Type**
01		01		01	
02		02		02	
03		03		03	
04		04		04	
05		05		05	
06		06		06	
07		07		07	
08		08		08	
09		09		09	
10		10		10	
11		11		11	
12		12		12	
13		13		13	
14		14		14	
15		15		15	
16		16		16	
17		17		17	
18		18		18	
19		19		19	
20		20		20	
21		21		21	
22		22		22	
23		23		23	
24		24		24	

DK0233

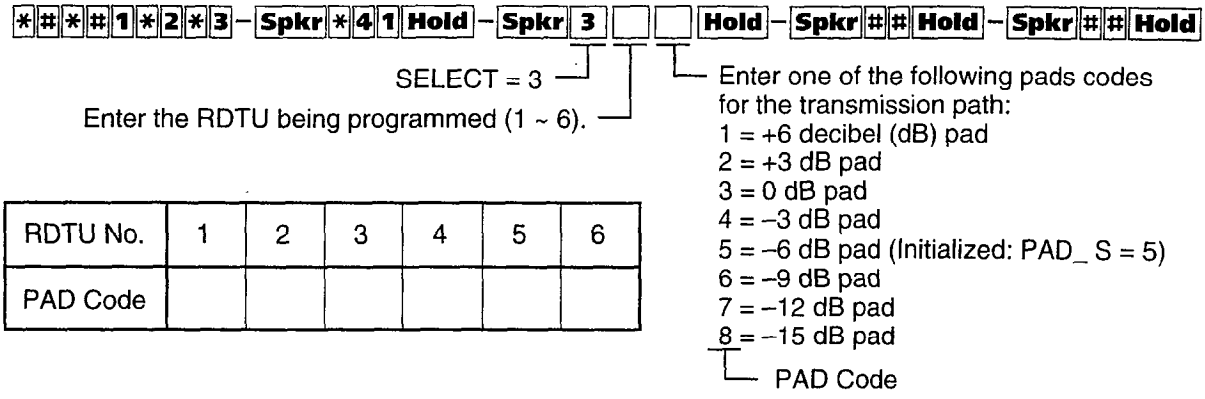
IMPORTANT !

1. *See Program 17 for other tie/DID assignments; see Program *17 and Program *09 for other DID assignments.*
2. *System power must be cycled or Program 91-2 must be run to transfer Program *41-2 data from temporary memory to working memory. Program 91-2 is available with Release 3 and above only.*

General Notes:

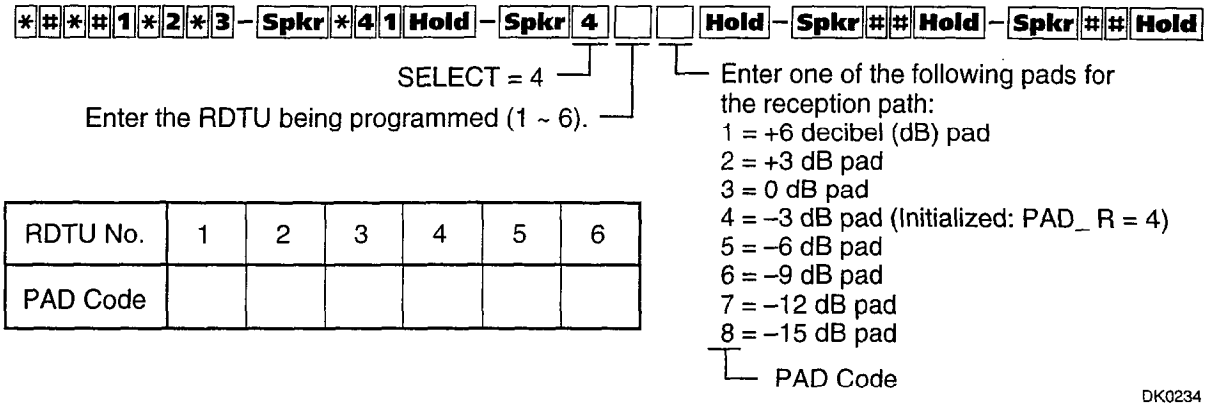
- *Turn system power off (5 seconds) and on after running Program *41-2.*
- *Always install RDTU PCBs that have tie or DID channels in slot numbers that are higher than station and Attendant Console PCB slot numbers. Each tie or DID line installed will use a station port in software (see Chapter 1—Configuration Worksheet 2 for tie/DID configuration).*

Program *41-3 — T1 Span Transmit (Send) Level Pad Assignments



RDTU No.	1	2	3	4	5	6
PAD Code						

Program *41-4 — T1 Span Receive Level Pad Assignments



RDTU No.	1	2	3	4	5	6
PAD Code						

Program *42-1 — T1 Span Primary Timing Reference Assignments

■ **Primary Clock Reference T1 PCB assignment**

##1*2*3–Spkr*42 Hold–Spkr 1 [ ]–Hold–Spkr##Hold–Spkr##Hold

Primary T1 (1 ~ 6) [ ]
Initialized Data = 1

See notes below.

Enter the RDTU PCB number (1 ~ 6)[1] that is connected to the primary reference T1 (span line) clock source.[2]

Press button 01 (Blank) if the DK280 T1 is the master (free run) clock source.[3]

Program *42-2 — T1 Span and Secondary Timing (Backup) Reference Assignments

■ **Secondary (Back-up) Reference T1 PCB assignment**

##1*2*3–Spkr*42 Hold–Spkr 2 [ ]–Hold–Spkr##Hold–Spkr##Hold

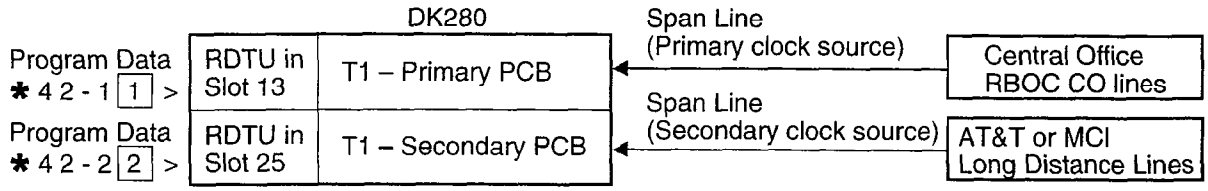
Secondary T1 (1 ~ 6) [ ]
Initialized Data = 2

Enter the RDTU PCB number (1 ~ 6)[1] that is connected to the back-up reference T1 (span line) clock source.[2]

Press button 01 (Blank) if the DK280 T1 is the master (free run) clock source.[3]

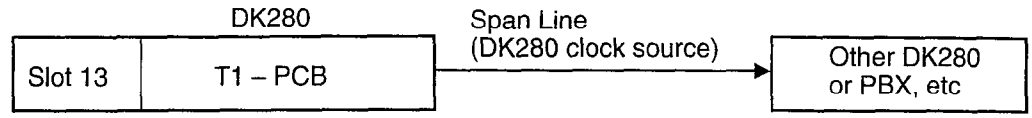
Notes:

1. *RDTU No.1 is the RDTU PCB installed in the lowest slot number of all RDTU PCBs, RDTU No. 2 is the RDTU PCB installed in the next highest slot number of all RDTUs and so on.*
2. *Example of Primary/Back-Up assignments:*



Note:
A second RBOC T1 span line can also be used as the secondary clock source.

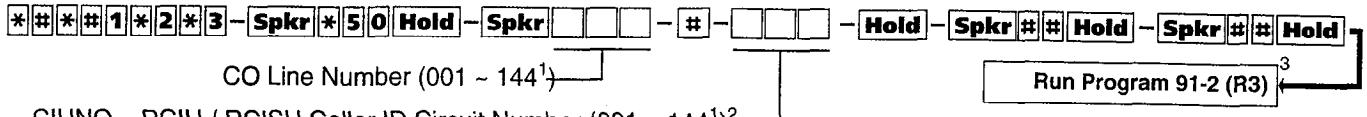
3. *Example of DK280 Master (free run) assignment:*



Program Data = blank button (Button 01) for * 4 2 - 1 and * 4 2 - 2

DK0235

Program *50 — Caller ID (RCIU/RCIS) Circuit Assignments to CO Line (RCOU/RCOS/ RGLU/PCOU) (R3)



CO Line Number (001 ~ 036)	RCIU / RCIS Circuit Number Assigned
001	
002	
003	
004	
005	
006	
007	
008	
009	
010	
011	
012	
013	
014	
015	
016[1]	
017	
018	
019	
020	
021	
022	
023	
024	
025	
026	
027	
028	
029	
030	
031	
032	
033	
034	
035	
036	

CO Line Number (037 ~ 072)	RCIU / RCIS Circuit Number Assigned
037	
038	
039	
040	
041	
042	
043	
044	
045	
046	
047	
048[1]	
049	
050	
051	
052	
053	
054	
055	
056	
057	
058	
059	
060	
061	
062	
063	
064	
065	
066	
067	
068	
069	
070	
071	
072	

CO Line Number (073 ~ 108)	RCIU / RCIS Circuit Number Assigned
073	
074	
075	
076	
077	
078	
079	
080	
081	
082	
083	
084	
085	
086	
087	
088	
089	
090	
091	
092	
093	
094	
095	
096	
097	
098	
099	
100	
101	
102	
103	
104	
105	
106	
107	
108	

CO Line Number (109 ~ 144)	RCIU / RCIS Circuit Number Assigned
109	
110	
111	
112	
113	
114	
115	
116	
117	
118	
119	
120	
121	
122	
123	
124	
125	
126	
127	
128	
129	
130	
131	
132	
133	
134	
135	
136	
137	
138	
139	
140	
141	
142	
143	
144[1]	

DK0236

Notes:

1. *RCTUA: 16 lines maximum. RCTUBA3 /RCTUBB3: 48 lines maximum. RCTUC/D: 144 lines maximum.*
2. *Any Caller ID circuit can be assigned to any analog ground or loop start CO line circuit. Circuit numbers do not have to match.*
3. *System power must be cycled or Program 91-2 must be run after completing *50 data entry to transfer data from temporary memory to working memory.*

General Note:

- *Initialized data = no RCIU / RCIS circuits assigned.*

Program *51 — Station Memory Allocation to Store Caller ID and/or ANI Numbers on Abandoned/Unanswered Calls (R3)

[*][#][*][#][1][*][2][*][3]-[Spkr][*][5][1][Hold]-[Spkr][ ][ ][ ]-[#]-[ ][ ][ ]-[Hold]-[Spkr][#][#][Hold]-[Spkr][#][#][Hold]

Station Port Number* (000 ~ 239[1])
* To enter a range of station ports

ENTER: [ ][ ][ ]-[*]-[ ][ ][ ]
Low Port — High Port

BUF = 000, 010, 020, 030, 040, 060, 070, 080, 090, 100[2]

IDL = Total Number Available[2,3] (Initial - 1000)
Initial: RCTUC3/D3 = 1000
RCTUBA/BB = 400
RCTUA3 = 200

Station Logical Port Number	Memory Allocation (100 max. each)[2]	Station Logical Port Number	Memory Allocation (100 max. each)[2]	Station Logical Port Number	Memory Allocation (100 max. each)[2]	Station Logical Port Number	Memory Allocation (100 max. each)[2]

DK0237

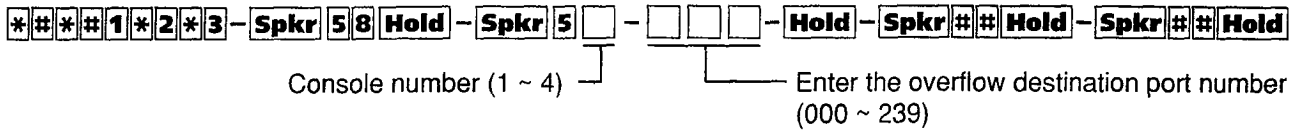
Notes:

1. *If a Caller ID CO line is programmed to direct ring more than one station (81 ~ 89) a station logical port must be assigned as owner of the ground and/or loop start Caller ID line (in Program *52) to be able to store Caller ID numbers on abandoned or unanswered calls on Direct Incoming calls. If a Caller ID CO line is programmed (81~89) to ring only one station, that station will store Caller ID abandoned call information regardless of Program *52 data - the station must have storing memory assigned in Program *51. ANI abandoned call numbers will be stored in the telephone memory of the called Primary Directory Number* **[PDN]** *owner telephone or the called Phantom Directory Number* **[PhDN]** *owner telephone. Transferred Caller ID and/or ANI line abandoned call numbers will be stored in the "transferred-to" telephone memory if that telephone is assigned memory in this program. (see Program *52). Call forwarded Caller ID and/or ANI line abandoned call numbers will be stored in the* **[PDN]** *or* **[PhDN]** *owner telephone memory if that telephone is assigned memory in this program.*
2. *BUF data is the number of telephone numbers that can be stored at the designated port(s). The maximum number of Caller ID/ANI numbers that can be stored per telephone is 100. The maximum number of Caller ID/ANI telephone numbers that can be stored per DK280 system is: RCUTA: 200, RCTUBA3 / RCTUBB3: 400, and RCTUC3/D3: 1000.*
3. *IDL =XXXX will display on the program telephone LCD to indicate the total number of telephone number storage bins which are available in the system. This number is reduced accordingly each time memory is allocated to a station.*

General Notes:

- *Initialized data = no memory for all ports.*
- *ACD, Distributed Hunt, DISA, Built-in Auto Attendant, and Abandoned Calls store ANI/Caller ID data in the Program *52 CO line owner station.*
- *RCTUA3: 32 stations maximum, RCTUBA3 / RCUTBB3: 80 stations maximum, RCTUC3/D3: 240 stations maximum.*

Program 58-5 — Attendant Console Overflow Destination Assignments[1]



Console overflow destination = [ ]

Note:

1. *Use with RCTUB2 or RCTU C/D Release 2 or above only.*

General Notes:

- *Calls that will overflow include ring transfer, CO line incoming, dial "0", and Attd Call button calls; Ring Transfer recall and Hold recall will not overflow.*
- *Overflow recall time is set in Program 58-1.*

DK0240

Program 59 — Attendant Console Flexible Button Codes[1]

[*][#][*][#][1][*][2][*][3] – [Spkr] – [5][9] – [Hold] – [ ] – [ ] – [ ] – [ ][ ][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

Attendant Console (1~4)

1 = Left, 2 = Right

Data = Button Code (3-digits)
(See tables A, B, and C on previous pages)

Press Button 01~12 on Programming Telephone to enter data for corresponding console button.

Note:

1. *Use with RCTUB2, RCTUBA/BB, or RCTU C/D Release 2 or above only.*

General Note:

- *Attendant Console cannot be equipped with* **[PDNs]**, **[SDNs]**, *or* **[PhDNs]**. *The* **[In-DN]** *button is the console's Directory Number assigned in Program 04 - it supports incoming calls only and can only appear once on a console.*

Copy as required for more consoles.

Attendant Console No. _____

Left (Buttons 1~12)			Right (Buttons 1~12)		
10	11	12	10	11	12
07	08	09	07	08	09
04	05	06	04	05	06
01	02	03	01	02	03

Attendant Console No. _____

Left (Buttons 1~12)			Right (Buttons 1~12)		
10	11	12	10	11	12
07	08	09	07	08	09
04	05	06	04	05	06
01	02	03	01	02	03

Initialized Data:

Left (Buttons 1 ~ 12)

Split (295)	**Join-Loop (293)**	**Sup. LOOP (296)**
In-Emrg (261)	**In-DN (257)**	**In-Dial "0" (262)**
In-Trans (258)	**Trans-RC (260)**	**Hold-RC (259)**
In-LG3 (243)	**In-LG2 (242)**	**In-LG1 (241)**

Right (Buttons 1 ~ 12)

Conf (297)	**Overflow (299)**	**Night (439)**
Redial (496)	**Spdial (497)**	**SD13 (*13)**
BLF (298)	**Out Dial (294)**	**SD12 (*12)**
Attd Call (000)	**SD10 (*10)**	**SD11 (*11)**

DK0242

Program 59 — Attendant Console Flexible Button Codes[1]

Table 10-4
Console-only Buttons and Codes
(also see Table 10-6 when entering Program 59 button labels)

Button Function	Button Labels	Code	Notes
Out Dial	Out Dial	294	Switches ATTD consoles dialpad from digital to tone mode.
Display BLF	BLF	298	Displays BLF on CRT or EL display.
Conference	Conf	297	Starts conference calls.
Join-Loop	Join-Loop	293	Connects any held call to an existing call.
Overflow	Overflow	299	Places console in the call overflow mode.
Supervised Loop	Sup Loop	296	Places call on attendant hold loop key so attendant can supervise call.
Emergency Page Access	Emrg Page	292	Activates ALL CALL Paging to telephone speakers (not EXTR Page). Overrides any existing ALL CALL page.
Split Call	Split	295	Allows attendant to talk to either party separately on a conference call.
Incoming Dial "0"	In-Dial "0"	262	Dial "0" calls ring in on this button.
Incoming Emergency	In-Emrg	261	Emergency calls ring in on this button (INT #400).
Transfer Recall	Trans-RC	260	No answer transferred calls, recall on this button.
Hold Recall	Hold-RC	259	Held calls recall on this button.
Incoming Ring Transfer	In-Trans	258	Receive call transfer.
Attendant Call[3]	Attd Call	000	Can originate calls on this button. The Attendant Call LED is lit red any time the attendant talk path is connected. (R3)
Incoming Directory Number	In-DN[4]	257	Incoming calls to the console DN ring on this button. The console **[DN]** is the Prog 04 assignment of of the Prog 04 console port number.

DK0241

Table 10-5
Incoming Line Group (LG) Button Codes[2]

Incoming Line Group Button Assignments	In-LG1 ~ 241	In-LG5 ~ 245	In-LG9 ~ 249	In-LG13 ~ 253
	In-LG2 ~ 242	In-LG6 ~ 246	In-LG10 ~ 250	In-LG14 ~ 254
	In-LG3 ~ 243	In-LG7 ~ 247	In-LG11 ~ 251	In-LG15 ~ 255
	In-LG4 ~ 244	In-LG8 ~ 248	In-LG12 ~ 252	In-LG16 ~ 256

Notes:

1. *Use with RCTUB2, RCTUBA/BB, or RCTUC/RCTUD2 Release 2 or above only.*
2. *Only assign one In-LG button per group per console. Only one In-LG button can be active on each console.*
3. *Use with RCTUBA3/RCTUBB3 or RCUTC/RCTUD3 Release 3 or above only.*
4. *The In-***[DN]** *will be the Directory Number assigned to the attendant console port in Program 04. Attendant consoles cannot have multiple* **[PDNs]**, **[SDNs]**, *or* **[PhDNs]**.

Program 59 — Attendant Console Flexible Button Codes[1] (continued)

Table 10-6
Miscellaneous Attendant Console Button Codes

Button Function	Button Labels	Code	Notes
Account Code	Account Code or ACCNT	450	Allows a Voluntary Account Code to be entered.
Alarm	Alarm Reset or ALRM	477	Resets alarm condition system-wide.
Alert Signaling			Console can alert another station but another station cannot alert the console. See Program 39 for more information.
All Call Voice Page	All Call Page or AC	489	Pages up to 120 idle electronic or digital telephones over speaker.
Automatic Busy Redial	Auto Busy Redial or ABR	470	Sets ABR of busy outgoing number.
Automatic Callback Busy	Auto Callback or ACB	494	Sets ACB for station recalled by busy line.
Call Forward All Calls	Call Frwd All Calls or CFAC	487	All calls forward to selected station.
Call Forward A.C. Fixed	Call Frwd to: or CFF	486	Forwards all calls to pre-defined destination. See Program 36.
Call Forward Busy	Call Frwd Busy or CFB	459	Forwards calls to selected station if station is busy.
Call Forward Busy/No Answer	Call Frwd Busy/NAns or CFB/NA	457	Forwards calls to selected station if station is busy or does not answer.
Call Forward External	Call Frwd External or CF-EXT	460	Forward calls externally.
Call Foward No Answer	Call Frwd No Answer or CFNA	458	Forwards calls to selected station if station does not answer.
Call Park[5]	Park in Orbit or PARK	464	Call Park Only. (R3)
Call Park LCD Display[5]	Park Orbit DIsplay or CPD	465	CP Display Button and Mode 64 can be used interchangeably. Displays call parked via telephone LCD. (R3)
Call Park and Page[5]	Call Park/Page or CP/PG	463	Parking and Paging Park Pickup. (R3)
Call Pickup (Directed)	Directed Pickup or PKUP	484	Picks up ringing or held intercom, trunk calls, and page.
Call Pickup[3] Tenant 4	PKUP 4	435	Picks up tenant 4's ringing CO calls.
Call Pickup[3] Tenant 3	PKUP 3	436	Picks up tenant 3's ringing CO calls.
Call Pickup[3] Tenant 2	PKUP 2	437	Picks up tenant 2's ringing CO calls.
Call Pickup[3] Tenant 1	PKUP 1	438	Picks up tenant 1's ringing CO calls.
Call Pickup (Group)[4]	Group Pickup	480	Picks up a call to any group to which station is assigned in *31.
Unanswered Caller ID and/or ANI Stored Number Auto Dial[5]	Lost Call Auto Dial or LCAD	462	Will Auto Dial a Caller ID and/or Automatic Number Identification (ANI) telephone number that was stored in station Caller ID/ANI memory. (R3)
CO Line Appearance	Line 1 ~ 144 or CO 001 ~ CO 144	001 ~ 144	CO line access of appearing calls.
Direct Station Selection	DSS	#000 ~ #239	Assigns DSS hotline keys to port number.
Do Not Disturb	Do Not Disturb or DND	498	Prevents calls to station.

DK0243

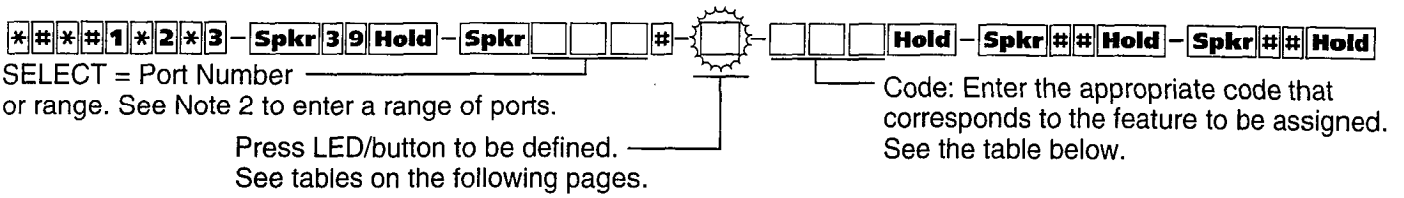
Program 59 — Attendant Console Flexible Button Codes[1] (continued)

Table 10-6
Miscellaneous Attendant Console Button Codes (continued)

Button Function	Button Labels	Code	Notes
Door Lock 0 thru Door Lock 4 (DDCB/HDCB)	Unlock Door 0 or DRLK 0 Unlock Door 1 or DRLK 1 Unlock Door 2 or DRLK 2 Unlock Door 3 or DRLK 3 Unlock Door 4 or DRLK 4	471 472 473 474 475	Momentarily unlocks door (3 or 6 seconds). See Program 77-1 and 77-2.
LCD Message Select	LCD Msg Select or LCD M	481	Begins LCD message selection.
Message Waiting/Flash	Msg Wait, Flash or MW/FL	499	Provides message waiting LED for EKT and Flash Button.
Modem	Modem or MODEM	455	Used to reserve modem in modem pool.
Night Transfer Tenant 1[3]	Night Transfer1 or NT1	439	Sets Tenant 1 CO line DAY/NIGHT ring mode.
Night Transfer Tenant 2[3]	Night Transfer2 or NT2	440	Sets Tenant 2 CO line DAY/NIGHT ring mode.
Night Transfer Tenant 3[3]	Night Transfer3 or NT3	441	Sets Tenant 3 CO line DAY/NIGHT ring mode.
Night Transfer Tenant 4[3]	Night Transfer4 or NT4	442	Sets Tenant 4 CO line DAY/NIGHT ring mode.
Night Transfer Lock Tenant 1[5]	Night Lock1 or NT1 L1	431	Used to lock system ringing mode: DAY, DAY2 , NIGHT See Programs 74 and 36 for NT Lock Password assignments. (R3)
Night Transfer Lock Tenant 2[5]	Night Lock2 or NT2 L2	432	
Night Transfer Lock Tenant 3[5]	Night Lock3 or NT3 L3	433	
Night Transfer Lock Tenant 4[5]	Night Lock4 or NT4 L4	434	
Park Recall[5]	Park-RC	263	Parked calls recall on this button. (R3)
Pause	Spd Dial Pause or PAU	495	Sets pause in Speed dial See Program 12-3.
Pause (Long)	Spd Dial Lng Pause or PAU/L	493	Sets a 10-second pause in Speed Dial.
Pooled Line	Pooled Line Grp or PL	301 ~ 316	Mulitiple CO line may appear under one button.
Privacy	Privacy On Line or PRIV	453	Prevents Privacy Override (not Executive Overrride).
Privacy Release	Privacy Release or PRV RLS	479	Changes station Privacy mode to Non-private for CO lines.
Redial Last Number (# Button)	Redial or RDL	496	Redials the last number.
Release to Idle	Release Call or RLS	476	Releases current call and makes station idle.
Release and Answer	Release and Ans and RLS/ANS	466	Simlulates On-hook/Off-hook operation to release an existing call and answer new incoming/ringing call.

DK0301

Program 59 — Attendant Console Flexible Button Codes[1] (continued)



Button Function	Button Labels	Code	Notes
Save Last Dialed Number	Save Last Number or SAVE	485	Saves last number dialed for future speed dial.
Speed Dial Select (★ Button)	Speed Dial or SDS	497	Begins speed dial selection.
Station Speed Dial Codes	SD	★10 ~ ★49	Reserves button for station speed dial.
System Speed Dial Codes[6]	SD	★600 ~ ★699 - or - ★60 ~ ★69	Speed dial number set by station port 000.
Tone	Tone Dial Select or TONE	490	CO dial signals set to tone or pulse.

DK0224

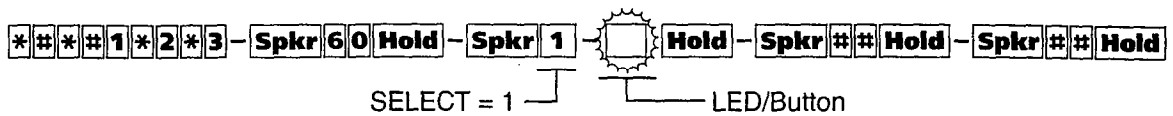
Notes:

1. *Some assignments are not available in Release 1 or 2.*
2. *Specify a range of ports by keying in:* ___ * ___ (*Low port* — *High port*)
3. *See Program ★15 for Tenant Group assignments.*
4. *Picks up calls to telephones in any call pickup group to which the telephone is assigned in Program *31.*
5. *Available with RCTUA3, RCTUBA3/RCTUBB3 or RCTUC/D3 Release 3 or above only.*
6. *RCTUA and RCTUA3 provide 40 system speed dial numbers (60 ~ 99), RCTUB, RCTUBA/RCTUBB, and RCTU C/D provide 100 system speed dial numbers (600 ~ 699).*

General Notes:

- *Attendant Consoles cannot be equipped with Secondary or Phantom* **[DNs]**. *The console Directory Number is assigned to the console port number in Program 04. The console* **[DN]** *can have only one appearance.*
- *Complete Program 38 before Program 39.*
- *Initialized data assigns the keystrip pattern associated with Code 31 from Program 38.*

Program 60-1 — SMDR Data Output Options (R3)



Light the Buttons/LEDs that are marked with an X in the table below.

LED/ Button	X	LED ON	LED OFF
20			
19			
18			
17			
16			
15			
14			
10			
09			
08			
07			
06			
05			
04			
03			
02			
01[1]		Caller ID, ANI, and DNIS data will be sent from the system SMDR port	Account code data will be sent from the system SMDR port

DK0244

Note:

1. *LED 01 determines which data will be sent out the SMDR port, this data is output on the last 15-digit (right hand) field columns of the SMDR print out (see Figure 6-20 in Chapter 6—Peripheral Installation of the Strata DK280 Installation and Maintenance manual).*

General Note:

- *Initialized data = LED 01 OFF.*

Program 60-2 ~ 7 — SMDR Output/Account Code Digit Length

##1*2*3 – Spkr 6 0 Hold – Spkr [ ][ ][ ][ ][ ] – Hold – Spkr ## Hold – Spkr ## Hold

SELECT = 2 ~ 7 (Item)
Make a selection to indicate which item is being assigned.

For "2" SMDR TIME = 0 or 1
Enter 0 to indicate 1 second threshold time.
Enter 1 to indicate 10 second threshold time.

For "3" SMDR COR = 0 or 1 (Data)
Enter one digit to indicate SMDR output operation.
0 = No Incoming Record
1 = Incoming and Outgoing Record

For "4" ACCOUNT = 04 ~ 15
Enter the number of digits allowed for Forced/Voluntary Account Codes. The range is 04 ~ 15. Enter two digits.

For "5" TOLL DIAL
Enter one digit (the range is 0 ~ 5).

For "6" DISA SECURITY CODE 01 ~ 15 DIGITS

For "7" CREDIT CARD DIGITS

Item	Description	Data
2	SMDR Threshold Time[6] 0 = 1 second 1 = 10 seconds	TIME [ ]
3	SMDR Output when a call is completed. 0 = Outgoing Only 1 = Incoming and Outgoing	(SMDR COR) [ ]
4	Forced/Voluntary Account Code Digit Length 04 ~ 15[4]. (Digits are verified per Prog. 30, Button/LED 14, and Prog. 69)	(ACCOUNT) [ ][ ]
5	SMDR Printout options Toll Dial = [0] All Calls[1] = [1] Dial "0" calls only = [2] Dial "1" calls only = [3] Dial "00" calls only = [4] Dial "1", "0", calls only = [5] Dial "1" or "00" calls only	(TOLL DIAL DATA) [ ]
6	DISA Security Code[3] (01 ~ 15 digits, may be changed from station, per Program 30)	DATA[2] [ ][ ]
7	Credit card call digit length, 01 ~ 30[7] digits (see Program 43)	CREDIT[5] [ ][ ]

DK0245

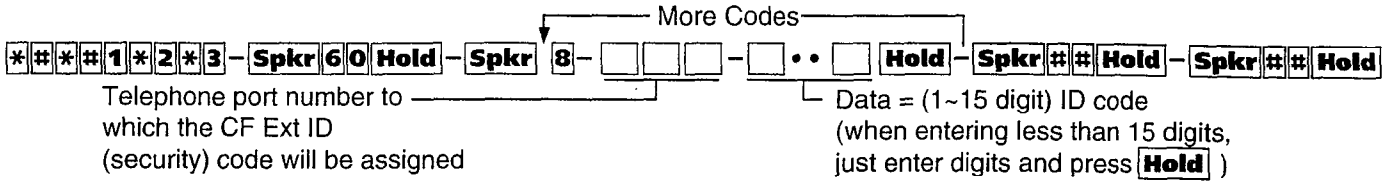
Notes:

1. *Selection 3 (printout outgoing call only) is still available.*
2. *Button 01 = blank: Button 02 is a wild card (can be any digit from 1 ~ 9).*
3. *If a security code is not programmed, outgoing trunk access via DISA will not require a security code when dialing.*
4. *See Program 69 for Verified Account Codes.*
5. *Number of digits required when "0" is the first digit dialed; if this number of digits is not dialed, the system will disconnect the call after 20 seconds. "0" is counted as a digit. Example: 0 + 1 + 714 + 583 - 3700 = 12 digits; 12 should be programmed as a minimum in this case.*
6. *Default is 10 seconds.*
7. *Default is 21-digits.*

General Notes:

- *For Selection 3, initialized data assigns SMDR output to be enabled for incoming/outgoing calls that are answered.*
- *For Selection 4, initialized data assigns a 6-digit length to all Forced/Voluntary Account Codes.*
- *If PBX code is dialed, numbers dialed after the code will be checked.*
- *If A/C, O/C or SPCC code begins with "0", "1", or "00", that call will print out.*

Program 60-8 — Call Forward External (Remote Change, Security) ID Code



Copy as required

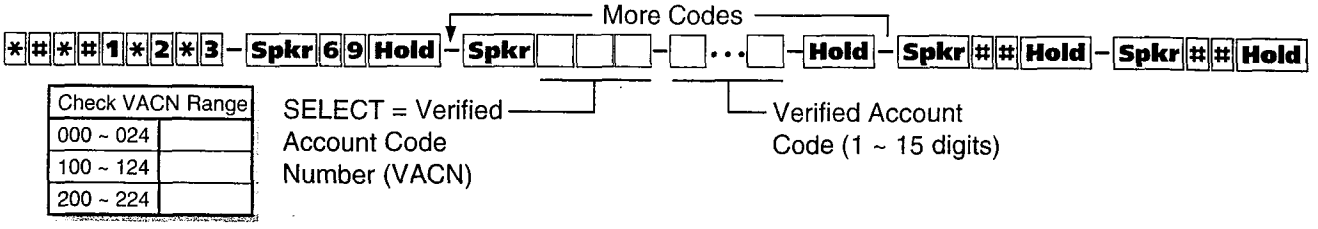
Telephone Port Number	CF/EXT ID Code (1 ~ 15 Digits)	Telephone Port Number	CF/EXT ID Code (1 ~ 15 Digits)	Telephone Port Number	CF/EXT ID Code (1 ~ 15 Digits)

DK0246

General Notes:

- *Initialized data is no digits.*
- *Press button 01 to enter blanks/erase data.*
- *CF/EXT ID code must be assigned to a telephone to allow callers to change the Call Forward-External destination of that telehone from a remote location by calling in on a DISA CO line.*
- *Call Forward applies to call directed to Primary Directory Numbers but not to Phantom Directory Numbers.*
- *Button 01 = blank: Button 02 is a wild card (can be any digit from 1 ~ 9).*

Program 69 — Verified Account Codes



Check VACN Range	
000 ~ 024	
100 ~ 124	
200 ~ 224	

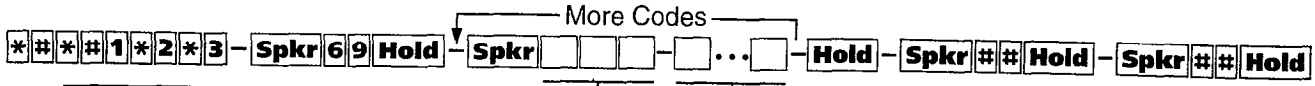
Copy as required.

Name	VACN (3-Digit)	Verified Account Code (1 ~ 15 Digits)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	_00															
	_01															
	_02															
	_03															
	_04															
	_05															
	_06															
	_07															
	_08															
	_09															
	_10															
	_11															
	_12															
	_13															
	_14															
	_15															
	_16															
	_17															
	_18															
	_19															
	_20															
	_21															
	_22															
	_23															
	_24															

General Notes: DK0247

- *Account code format*
  - *Account Code digit length is defined in Program 60-4 (4 ~ 15 digits).*
  - *To dial an Account Code, station users must always dial the quantity of digits defined in Program 60-4.*
  - *If the quantity of digits in a Verified Account Code is the same as the Account Code digit length in Program 60-4, then all digits will be Verified; if the quantity of digits is less, then only those digits will be verified. Stations must have LED 14 ON in Program 30 to use Verified Account Codes.*
- *Account Codes may not conflict (be the same as) emergency numbers in Program 44-91 ~ 93.*

Program 69 — Verified Account Codes (continued)



Check VACN Range	
025 ~ 049	
125 ~ 149	
225 ~ 249	

SELECT = Verified Account Code Number (VACN)

Verified Account Code (1 ~ 15 digits)

Copy as required.

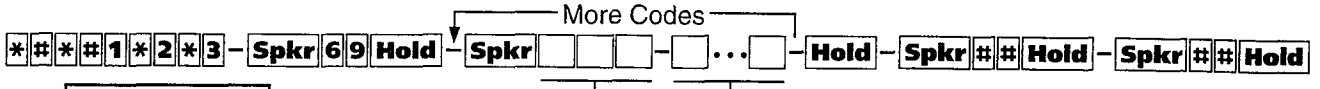
Name	VACN (3-Digit)	Verified Account Code (1 ~ 15 Digits)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	_25															
	_26															
	_27															
	_28															
	_29															
	_30															
	_31															
	_32															
	_33															
	_34															
	_35															
	_36															
	_37															
	_38															
	_39															
	_40															
	_41															
	_42															
	_43															
	_44															
	_45															
	_46															
	_47															
	_48															
	_49															

DK0248

General Notes:

- *Account code format*
  - *Account Code digit length is defined in Program 60-4 (4 ~ 15 digits).*
  - *To dial an Account Code, station users must always dial the quantity of digits defined in Program 60-4.*
  - *If the quantity of digits in a Verified Account Code is the same as the Account Code digit length in Program 60-4, then all digits will be Verified; if the quantity of digits is less, then only those digits will be verified. Stations must have LED 14 ON in Program 30 to use Verified Account Codes.*
- *Account Codes may not conflict (be the same as) emergency numbers in Program 44-91 ~ 93.*

Program 69 — Verified Account Codes (continued)



Check VACN Range	
075 ~ 099	
175 ~ 199	
275 ~ 299	

SELECT = Verified Account Code Number (VACN)

Verified Account Code (1 ~ 15 digits)

Copy as required.

Name	VACN (3-Digit)	Verified Account Code (1 ~ 15 Digits)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	_75															
	_76															
	_77															
	_78															
	_79															
	_80															
	_81															
	_82															
	_83															
	_84															
	_85															
	_86															
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	_89															
	_90															
	_91															
	_92															
	_93															
	_94															
	_95															
	_96															
	_97															
	_98															
	_99															

DK0250

General Notes:

- *Account code format*
  - *Account Code digit length is defined in Program 60-4 (4 ~ 15 digits).*
  - *To dial an Account Code, station users must always dial the quantity of digits defined in Program 60-4.*
  - *If the quantity of digits in a Verified Account Code is the same as the Account Code digit length in Program 60-4, then all digits will be Verified; if the quantity of digits is less, then only those digits will be verified. Stations must have LED 14 ON in Program 30 to use Verified Account Codes.*
- *Account Codes may not conflict (be the same as) emergency numbers in Program 44-91 ~ 93.*

Program 70 — Verified Account Code Toll Restriction Assignments

[*][#][*][#][1][*][2][*][3] – [Spkr][7][0][Hold] – [Spkr][ ][ ][ ] – [ ][ ][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Verified Account Code Number (VACN) 000 ~ 299

DATA = VAC Digit Restriction Code 0 or 1
Enter 0 for no digit restriction.
Enter 1 for digit restriction.

VAC Restrict Code (00 ~ 10)
Enter 00 for No Station Toll Restriction.
Enter 01 for Area Code Toll Restriction.
Enter 02 for Area Code Toll Restriction and 0 or 1 as 1st (or 2nd digit).
Enter 03 for Class 1 T.R. Enter 07 for Class 5[1]
Enter 04 for Class 2 T.R. Enter 08 for Class 6[1]
Enter 05 for Class 3 T.R. Enter 09 for Class 7[1]
Enter 06 for Class 4 T.R. Enter 10 for Class 8[1]

Check VACN Range	
000 ~ 099	
100 ~ 199	
200 ~ 299	

Copy as required.

VACN	VAC Digit Restrict Code	VAC Restrict Code
_00		
_01		
_02		
_03		
_04		
_05		
_06		
_07		
_08		
_09		
_10		
_11		
_12		
_13		
_14		
_15		
_16		
_17		
_18		
_19		
_20		
_21		
_22		
_23		
_24		
_25		
_26		
_27		
_28		
_29		
_30		
_31		

VACN	VAC Digit Restrict Code	VAC Restrict Code
_32		
_33		
_34		
_35		
_36		
_37		
_38		
_39		
_40		
_41		
_42		
_43		
_44		
_45		
_46		
_47		
_48		
_49		
_50		
_51		
_52		
_53		
_54		
_55		
_56		
_57		
_58		
_59		
_60		
_61		
_62		
_63		

VACN	VAC Digit Restrict Code	VAC Restrict Code
_64		
_65		
_66		
_67		
_68		
_69		
_70		
_71		
_72		
_73		
_74		
_75		
_76		
_77		
_78		
_79		
_80		
_81		
_82		
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_90		
_91		
_92		
_93		
_94		
_95		
_99		

DK0251

Note:

1. *With DK280 Release 1, 2, and 3 RCTUA, RCTUBA/BB, and RCTUB provide Classes 1 ~ 4, RCTU C/D provide Classes 1 ~ 8.*

General Notes:

- *Initialized data reads 000 for all VACNs (when stations enter VACs they will be unrestricted).*
- *This restriction overrides the normal station restriction assigned in Program 48 when a VAC is entered at the station. The station resumes its Program 48 restriction after the call is disconnected.*
- *Range programming is not available.*
- *If dial "0" credit card dialing is allowed, use Program 43 to allow designated stations/CO lines credit card calling.*

DNIS/ANI/DID/Tie Line Assignment Programming (R3) (see Program 17, LED 05)

Program 71-0 — DID/Tie/DNIS/ANI Lines (R3) (see Record Sheet on the next page)

[*][#][*][#][1][*][2][*][3] – [Spkr][7][1][Hold] – [Spkr] – [0] – [ ][ ][ ] – [ ][ ][ ][ ][ ] [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

DNIS Address:
RCTU C3/D3 = 000 ~ 499
RCTU BA/BB = 000 ~ 349
RCTU A3 = 000 ~ 199

DNIS Number (2 ~ 5 digits)
Use **Button 01** to blank out data.

Program 71-(1 ~ 3) — DNIS Number and ANI Line Routing Assignments (R3)

(see Record Sheet on the next page)

[*][#][*][#][1][*][2][*][3] – [Spkr][7][1][Hold] – [Spkr] – [ ] – [ ][ ][ ] – [ ][ ][ ][ ] [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

Enter 1, 2, or 3
[1] = Day Ring Assignment
[2] = Day2 Ring Assignment
[3] = Night Ring Assignment

DNIS Address:
RCTU C3/D3 = 000 ~ 499
RCTU BA/BB = 000 ~ 349
RCTU A3 = 000 ~ 199

Note for ANI **Only** lines:
Enter Address (see note):
RCTU C3/D3 - 499
RCTU BA/BB - 349
RCTU A - 199

Note: Only one assignment is provided for ANI lines without DNIS.

Ringing Assignments: Use **Button 01** to blank out data.

0000 ~ 0239: Primary **[DN]** Port Number (See Prg. 04)
0500 ~ 0739: Phantom **[DN]** Port Number (See Prg. *04)
0900 ~ 0915: Distributed Hunt Group Number (See Prg. *04) (DH Group is available with DK280 Rel. 3.1 & above.)
#245: PIOU/RSIU Maintenance Modem (RCTU C3/D3)
#085: PIOU/RSIU Maintenance Modem (RCTU BA/BB)
#035: PIOU/RSIU Maintenance Modem (RCTU A3)
#250 ~ #265: ACD Group (01 ~ 16) (RCTU C3/D3)
#090 ~ #097: ACD Group (01 ~ 08) (RCTU BA/BB)
#039: All Call External Page (See Prg. 17 LED 01 should be ON for private network Tie line only)
#271: Ringing over PIOU/PIOUS/PEPU external page output
#300 ~ #599: Network Table Number (See Prg. 72)

Program 71-4 — DNIS Number and ANI Only Lines Voice Mail (VM) ID Assignments (R3) (see Record Sheet on the next page)

[*][#][*][#][1][*][2][*][3] – [Spkr][7][1][Hold] – [Spkr] – [4] – [ ][ ][ ] – [ ] • • • [ ] [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

DNIS Address:
RCTU C3/D3 = 000 ~ 499
RCTU BA/BB = 000 ~ 349
RCTU A3 = 000 ~ 199

Enter VM ID code that should be sent to Voice Mail when the selected DNIS number Call-Forwards or rings directly to Voice Mail (1 ~ 16 digits).
Use **Button 01** to blank out data.
Press: Button 02 to enter [*]
Press: Button 03 to enter [#]
Press: Button 04 to enter **Pause**

Program 71-5 — DNIS Number Name Display (R3) (see Record Sheet on the next page)

[*][#][*][#][1][*][2][*][3] – [Spkr][7][1][Hold] – [Spkr] – [5] – [ ][ ][ ] – [ ] • • • [ ] [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

DNIS Address:
RCTU C3/D3 = 000 ~ 499
RCTU BA/BB = 000 ~ 349
RCTU A3 = 000 ~ 199

Enter the DNIS NAME TAG up to 16 characters (use the character entry procedures that follow Program 93 record sheets). This "NAME" will display on telephone LCDs when the DNIS number rings the telephone.

DK0252

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address 000 ~ 039)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
000						
001						
002						
003						
004						
005						
006						
007						
008						
009						
010						
011						
012						
013						
014						
015						
016						
017						
018						
019						
020						
021						
022						
023						
024						
025						
026						
027						
028						
029						
030						
031						
032						
033						
034						
035						
036						
037						
038						
039						

DK0353

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address (040 ~ 079)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
040						
041						
042						
043						
044						
045						
046						
047						
048						
049						
050						
051						
052						
053						
054						
055						
056						
057						
058						
059						
060						
061						
062						
063						
064						
065						
066						
067						
068						
069						
070						
071						
072						
073						
074						
075						
076						
077						
078						
079						

DK0354

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address (080 ~ 119)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
080						
081						
082						
083						
084						
085						
086						
087						
088						
089						
090						
091						
092						
093						
094						
095						
096						
097						
098						
099						
100						
101						
102						
103						
104						
105						
106						
107						
108						
109						
110						
111						
112						
113						
114						
115						
116						
117						
118						
119						

DK0355

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address (120 ~ 159)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
120						
121						
122						
123						
124						
125						
126						
127						
128						
129						
130						
131						
132						
133						
134						
135						
136						
137						
138						
139						
140						
141						
142						
143						
144						
145						
146						
147						
148						
149						
150						
151						
152						
153						
154						
155						
156						
157						
158						
159						

DK0356

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address (160 ~ 199)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
160						
161						
162						
163						
164						
165						
166						
167						
168						
169						
170						
171						
172						
173						
174						
175						
176						
177						
178						
179						
180						
181						
182						
183						
184						
185						
186						
187						
188						
189						
190						
191						
192						
193						
194						
195						
196						
197						
198						
199	RCTUA3 END					

DK0357

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address (239 ~ 239)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
200						
201						
202						
203						
204						
205						
206						
207						
208						
209						
210						
211						
212						
213						
214						
215						
216						
217						
218						
219						
220						
221						
222						
223						
224						
225						
226						
227						
228						
229						
230						
231						
232						
233						
234						
235						
236						
237						
238						
239						

DK0358

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address (240 ~ 279)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
240						
241						
242						
243						
244						
245						
246						
247						
248						
249						
250						
251						
252						
253						
254						
255						
256						
257						
258						
259						
260						
261						
262						
263						
264						
265						
266						
267						
268						
269						
270						
271						
272						
273						
274						
275						
276						
277						
278						
279						

DK0359

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address (280 ~ 319)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
280						
281						
282						
283						
284						
285						
286						
287						
288						
289						
290						
291						
292						
293						
294						
295						
296						
297						
298						
299						
300						
301						
302						
303						
304						
305						
306						
307						
308						
309						
310						
311						
312						
313						
314						
315						
316						
317						
318						
319						

DK0360

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address (320 ~ 359)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
320						
321						
322						
323						
324						
325						
326						
327						
328						
329						
330						
331						
332						
333						
334						
335						
336						
337						
338						
339						
340						
341						
342						
343						
344						
345						
346						
347						
348						
349	RCTUBA/BB END					
350						
351						
352						
353						
354						
355						
356						
357						
358						
359						

DK0361

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address (360 ~ 399)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
360						
361						
362						
363						
364						
365						
366						
367						
368						
369						
370						
371						
372						
373						
374						
375						
376						
377						
378						
379						
380						
381						
382						
383						
384						
385						
386						
387						
388						
389						
390						
391						
392						
393						
394						
395						
396						
397						
398						
399						

DK0362

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address (400 ~ 439)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
400						
401						
402						
403						
404						
405						
406						
407						
408						
409						
410						
411						
412						
413						
414						
415						
416						
417						
418						
419						
420						
421						
422						
423						
424						
425						
426						
427						
428						
429						
430						
431						
432						
433						
434						
435						
436						
437						
438						
439						

DK0363

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address (440 ~ 479)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
440						
441						
442						
443						
444						
445						
446						
447						
448						
449						
450						
451						
452						
453						
454						
455						
456						
457						
458						
459						
460						
461						
462						
463						
464						
465						
466						
467						
468						
469						
470						
471						
472						
473						
474						
475						
476						
477						
478						
479						

DK0364

DNIS/ANI/DID/Tie Line Assignment Record Sheet (DNIS Address (480 ~ 499)

(See previous programming instructions.)

DNIS ADDRESS	DNIS NUMBER (1 ~ 5 digits) (71-0)	DNIS NUMBER Routing Points (71-1, 2, 3)			DNIS NUMBER VM ID CODE (1 ~ 16 digits) (71-4)	DNIS NUMBER NAME (1 ~ 16 characters) (71-5)
		1	2	3		
480						
481						
482						
483						
484						
485						
486						
487						
488						
489						
490						
491						
492						
493						
494						
495						
496						
497						
498						
499						

DK0365

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (000 ~ 010) (R3)

Use **Vol▲** / **Vol▼** to turn ON / OFF all LEDs

Use **Scroll** / **Page** to advance / go back

##1*2*3 – Spkr * 7 [ ] Hold Spkr [ ][ ][ ] – # – EK BUTTON (1 / 2) – Hold – Spkr ## Hold

Enter: 1, 2, or 3
- 1 = Immediate Ring
- 2 = Delay 1 Ring (12 sec. delay)
- 3 = Delay 2 Ring (24 sec. delay)

Enter the Port Reference Number of the **[DN]** that should ring:
Primary Port Ref. Number: Port 000 ~ 239 (Program 04 Station Logical Ports)
Phantom Port Ref. Number: Port 500 ~ 739 (Program *04)

Press the button associated with the telephones (EKs) that should ring when the selected **[DN]** is called.

PRIMARY DIRECTORY NUMBER PORTS (000 ~ 239)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the [DN] is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
000	(000)
001	(001)
002	(002)
003	(003)
004	(004)
005	(005)
006	(006)
007	(007)
008	(008)
009	(009)
010	(010)

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0366

Notes:

1. *To enter a range of **[DNs]**, enter:* [ ][ ][ ]*[ ][ ][ ]* *in place of* [ ][ ][ ]#
2. *Buttons 01 ~ 20 on the programming telephone are associated with the telephone groups displayed on the telephone LCD.*

First Telephone Group

GRP EK000 = Telephone Port 000 is represented by programming button 01.
GRP EK001 = Telephone Port 001 is represented by programming button 02.
•
•
•
GRP EK019 = Telephone Port 019 is represented by programming button 20.

Press **Scroll** to display the next group; press **Page** to display the previous group.

In telephone group "GRP 020 ~ 039", the relationship is as shown below:

Second Telephone Group

GRP EK020 = Telephone Port 020 is represented by programming button 01.
GRP EK021 = Telephone Port 021 is represented by programming button 02.
•
•
•
GRP EK039 = Telephone Port 039 is represented by programming button 20.

General Note:

- *A **[DN]** can be assigned to ring up to 120 telephones, maximum total in *71, *72 and *73 combined.*

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (011 ~ 041) (R3)

PRIMARY DIRECTORY NUMBER PORTS (000 ~ 239)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
011	(011)
012	(012)
013	(013)
014	(014)
015	(015)
016	(016)
017	(017)
018	(018)
019	(019)
020	(020)
021	(021)
022	(022)
023	(023)
024	(024)
025	(025)
026	(026)
027	(027)
028	(028)
029	(029)
030	(030)
031	(031)
032	(032)
033	(033)
034	(034)
035	(035)
036	(036)
037	(037)
038	(038)
039	(039)
040	(040)
041	(041)

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0367

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (042 ~ 072) (R3)

PRIMARY DIRECTORY NUMBERS PORTS (000 ~ 239)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
042	(042)
043	(043)
044	(044)
045	(045)
046	(046)
047	(047)
048	(048)
049	(049)
050	(050)
051	(051)
052	(052)
053	(053)
054	(054)
055	(055)
056	(056)
057	(057)
058	(058)
059	(059)
060	(060)
061	(061)
062	(062)
063	(063)
064	(064)
065	(065)
066	(066)
067	(067)
068	(068)
069	(069)
070	(070)
071	(071)
072	(072)

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0368

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (073 ~ 103) (R3)

PRIMARY DIRECTORY NUMBER PORTS (000 ~ 239)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
073	(073)
074	(074)
075	(075)
076	(076)
077	(077)
078	(078)
079	(079)
080	(080)
081	(081)
082	(082)
083	(083)
084	(084)
085	(085)
086	(086)
087	(087)
088	(088)
089	(089)
090	(090)
091	(091)
092	(092)
093	(093)
094	(094)
095	(095)
096	(096)
097	(097)
098	(098)
099	(099)
100	(100)
101	(101)
102	(102)
103	(103)

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0369

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (104 ~ 134) (R3)

PRIMARY DIRECTORY NUMBER PORTS (000 ~ 239)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
104	(104)
105	(105)
106	(106)
107	(107)
108	(108)
109	(109)
110	(110)
111	(111)
112	(112)
113	(113)
114	(114)
115	(115)
116	(116)
117	(117)
118	(118)
119	(119)
120	(120)
121	(121)
122	(122)
123	(123)
124	(124)
125	(125)
126	(126)
127	(127)
128	(128)
129	(129)
130	(130)
131	(131)
132	(132)
133	(133)
134	(134)

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0370

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (135 ~ 165) (R3)

PRIMARY DIRECTORY NUMBER PORTS (000 ~ 239)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
135	(135)
136	(136)
137	(137)
138	(138)
139	(139)
140	(140)
141	(141)
142	(142)
143	(143)
144	(144)
145	(145)
146	(146)
147	(147)
148	(148)
149	(149)
150	(150)
151	(151)
152	(152)
153	(153)
154	(154)
155	(155)
156	(156)
157	(157)
158	(158)
159	(159)
160	(160)
161	(161)
162	(162)
163	(163)
164	(164)
165	(165)

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0371

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (166 ~ 196) (R3)

PRIMARY DIRECTORY NUMBER PORTS (000 ~ 239)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another DN or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
166	(166)
167	(167)
168	(168)
169	(169)
170	(170)
171	(171)
172	(172)
173	(173)
174	(174)
175	(175)
176	(176)
177	(177)
178	(178)
179	(179)
180	(180)
181	(181)
182	(182)
183	(183)
184	(184
185	(185)
186	(186)
187	(187)
188	(188)
189	(189)
190	(190)
191	(191)
192	(192)
193	(193)
194	(194)
195	(195)
196	(196)

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0372

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (197 ~ 227) (R3)

PRIMARY DIRECTORY NUMBER PORTS (000 ~ 239)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
197	(197)
198	(198)
199	(199)
200	(200)
201	(201)
202	(202)
203	(203)
204	(204)
205	(205)
206	(206)
207	(207)
208	(208)
209	(209)
210	(210)
211	(211)
212	(212)
213	(213)
214	(214)
215	(215)
216	(216)
217	(217)
218	(218)
219	(219)
220	(220)
221	(221)
222	(222)
223	(223)
224	(224)
225	(225)
226	(226)
227	(227)

DK0373

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (228 ~ 239-[PDN], 500 ~ 516-[PhDN]) (R3)

PRIMARY DIRECTORY NUMBER PORTS (000 ~ 239)

[DN]PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
228	(228)
229	(229)
230	(230)
231	(231)
232	(232)
233	(233)
234	(234)
235	(235)
236	(236)
237	(237)
238	(238)
239	(239)

PHANTOM DIRECTORY NUMBER PORTS (500 ~ 739)

500	
501	
502	
503	
504	
505	
506	
507	
508	
509	
510	
511	
512	
513	
514	
515	
516	

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0374

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (517 ~ 547) (R3)

PHANTOM DIRECTORY NUMBER PORTS (500 ~ 739)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
517	
518	
519	
520	
521	
522	
523	
524	
525	
526	
527	
528	
529	
530	
531	
532	
533	
534	
535	
536	
537	
538	
539	
540	
541	
542	
543	
544	
545	
546	
547	

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0375

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (548 ~ 578) (R3)

PHANTOM DIRECTORY NUMBER PORTS (500 ~ 739)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
548	
549	
550	
551	
552	
553	
554	
555	
556	
557	
558	
559	
560	
561	
562	
563	
564	
565	
566	
567	
568	
569	
570	
571	
572	
573	
574	
575	
576	
577	
578	

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0376

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (579 ~ 609) (R3)

PHANTOM DIRECTORY NUMBER PORTS (500 ~ 739)

[DN]PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
579	
580	
581	
582	
583	
584	
585	
586	
587	
588	
589	
590	
591	
592	
593	
594	
595	
596	
597	
598	
599	
600	
601	
602	
603	
604	
605	
606	
607	
608	
609	

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0377

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (610 ~ 640) (R3)

PHANTOM DIRECTORY NUMBER PORTS (500 ~ 739)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
610	
611	
612	
613	
614	
615	
616	
617	
618	
619	
620	
621	
622	
623	
624	
625	
626	
627	
628	
629	
630	
631	
632	
633	
634	
635	
636	
637	
638	
639	
640	

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0378

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (641 ~ 671) (R3)

PHANTOM DIRECTORY NUMBER PORTS (500 ~ 739)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
641	
642	
643	
644	
645	
646	
647	
648	
649	
650	
651	
652	
653	
654	
655	
656	
657	
658	
659	
660	
661	
662	
663	
664	
665	
666	
667	
668	
669	
670	
671	

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0379

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (672 ~ 702) (R3)

PHANTOM DIRECTORY NUMBER PORTS (500 ~ 739)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
672	
673	
674	
675	
676	
677	
678	
679	
680	
681	
682	
683	
684	
685	
686	
687	
688	
689	
690	
691	
692	
693	
694	
695	
696	
697	
698	
699	
700	
701	
702	

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0380

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (703 ~ 733) (R3)

PHANTOM DIRECTORY NUMBER PORTS (500 ~ 739)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
703	
704	
705	
706	
707	
708	
709	
710	
711	
712	
713	
714	
715	
716	
717	
718	
719	
720	
721	
722	
723	
724	
725	
726	
727	
728	
729	
730	
731	
732	
733	

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0381

Program *71 ~ *73— [DN] to [DN], Tie to [DN], and DID to [DN] Ringing Assignments (734 ~ 739) (R3)

PhDN PORTS (500 ~ 739)

[DN] PORT REFERENCE NUMBER	Enter the **Program 04** telephone ports of the telephones that should ring when the **[DN]** is called from another **[DN]** or a tie or DID line (maximum of 120 telephones can be assigned to ring). The **[DN]** button must be assigned (Program 39) to the telephone that should ring.
734	
735	
736	
737	
738	
739	

( ) = Default telephones assigned to ring when **[PDNs]** are called.
No telephones are assigned to ring when **[PhDNs]** are called (default setting).

DK0382

Program 72 — DNIS Number Network Table Assignments (300 ~ 371) (R3)
(See DNIS Ring Assignment Program 71-1 (1,2, and 3))

[*][#][*][#][1][*][2][*][3] – [Spkr][7][2][Hold] – [Spkr][ ][ ][ ] – [ ][ ] • • • [ ][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

Network Table Number (300 ~ 599)

Line[1] Access Code and Network Telephone Number (1 ~ 27 digits)

Press Button 03 to enter [#]

Press Button 02 to enter [*]

Press Button 04 to enter [Pause]

Network Table Number	Ground / Loop / Tie / DID Line Access Code - and - Network Telephone Number
300	
301	
302	
303	
304	
305	
306	
307	
308	
309	
310	
311	
312	
313	
314	
315	
316	
317	
318	
319	
320	
321	
322	
323	
324	
325	
326	
327	
328	
329	
330	
331	
332	
333	
334	
335	

Network Table Number	Ground / Loop / Tie / DID Line Access Code - and - Network Telephone Number
336	
337	
338	
339	
340	
341	
342	
343	
344	
345	
346	
347	
348	
349	
350	
351	
352	
353	
354	
355	
356	
357	
358	
359	
360	
361	
362	
363	
364	
365	
366	
367	
368	
369	
370	
371	

DK0383

Note:

1. *Any type line can be accessed (Ground, Loop, tie, and/or DID) to send a DNIS call back out over the telephone network.*

General Notes:

- *Initialized Data = blank*
- *DNIS network calls are timed by Program 12 disconnect timer.*

Program 72 — DNIS Number Network Table Assignments (372 ~ 449) (R3) (continued)

(See DNIS Ring Assignment Program 71-1 (1,2, and 3))

[*][#][*][#][1][*][2][*][3][Spkr][7][2][Hold] – [Spkr][ ][ ][ ] – [ ][ ] • • • [ ][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

Network Table Number (300 ~ 599)

Line[1] Access Code and Network Telephone Number (1 ~ 27 digits)

Press Button 03 to enter [#]

Press Button 02 to enter [*]

Press Button 04 to enter [Pause]

Network Table Number	Ground / Loop / Tie / DID Line Access Code - and - Network Telephone Number
372	
373	
374	
375	
376	
377	
378	
379	
380	
381	
382	
383	
384	
385	
386	
387	
388	
389	
390	
391	
392	
393	
394	
395	
396	
397	
398	
399	
400	
401	
402	
403	
404	
405	
406	
407	
408	
409	
410	

Network Table Number	Ground / Loop / Tie / DID Line Access Code - and - Network Telephone Number
411	
412	
413	
414	
415	
416	
417	
418	
419	
420	
421	
422	
423	
424	
425	
426	
427	
428	
429	
430	
431	
432	
433	
434	
435	
436	
437	
438	
439	
440	
441	
442	
443	
444	
445	
446	
447	
448	
449	

DK0384

Note:

1. *Any type line can be accessed (ground, loop, tie, and/or DID) to send a DNIS call back out over the telephone network.*

General Notes:

- *Initialized Data = blank*
- *DNIS network calls are timed by Program 12 disconnect timer.*

Program 72 — DNIS Number Network Table Assignments (450 ~ 527) (R3) (continued)
(See DNIS Ring Assignment Program 71-1 (1,2, and 3))

[*][#][*][#][1][*][2][*][3][Spkr][7][2][Hold] – [Spkr] [ ][ ][ ] – [ ][ ] • • • [ ][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

Network Table Number (300 ~ 599)

Line[1] Access Code and Network Telephone Number (1 ~ 27 digits)

Press Button 03 to enter [#]

Press Button 02 to enter [*]

Press Button 04 to enter [Pause]

Network Table Number	Ground / Loop / Tie / DID Line Access Code - and - Network Telephone Number	Network Table Number	Ground / Loop / Tie / DID Line Access Code - and - Network Telephone Number
450		489	
451		490	
452		491	
453		492	
454		493	
455		494	
456		495	
457		496	
458		497	
459		498	
460		499	
461		500	
462		501	
463		502	
464		503	
465		504	
466		505	
467		506	
468		507	
469		508	
470		509	
471		510	
472		511	
473		512	
474		513	
475		514	
476		515	
477		516	
478		517	
479		518	
480		519	
481		520	
482		521	
483		522	
484		523	
485		524	
486		525	
487		526	
488		527	

DK0385

Note:

1. *Any type line can be accessed (ground, loop, tie, and/or DID) to send a DNIS call back out over the telephone network.*

General Notes:

- *Initialized Data = blank*
- *DNIS network calls are timed by Program 12 disconnect timer.*

Program 72 — DNIS Number Network Table Assignments (528 ~ 599) (R3) (continued)
(See DNIS Ring Assignment Program 71-1 (1,2, and 3))

[*][#][*][#][1][*][2][*][3] – [Spkr][7][2][Hold] – [Spkr][ ][ ][ ] – [ ][ ] • • • [ ][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

Network Table Number (300 ~ 599)

Line[1] Access Code and Network Telephone Number (1 ~ 27 digits)

Press Button 03 to enter [#]

Press Button 02 to enter [*]

Press Button 04 to enter [Pause]

Network Table Number	Ground / Loop / Tie / DID Line Access Code - and - Network Telephone Number
528	
529	
530	
531	
532	
533	
534	
535	
536	
537	
538	
539	
540	
541	
542	
543	
544	
545	
546	
547	
548	
549	
550	
551	
552	
553	
554	
555	
556	
557	
558	
559	
560	
561	
562	
563	

Network Table Number	Ground / Loop / Tie / DID Line Access Code - and - Network Telephone Number
564	
565	
567	
568	
569	
570	
571	
572	
573	
574	
575	
576	
577	
578	
579	
580	
581	
582	
583	
584	
585	
586	
587	
588	
589	
590	
591	
592	
593	
594	
595	
596	
597	
598	
599	

DK0386

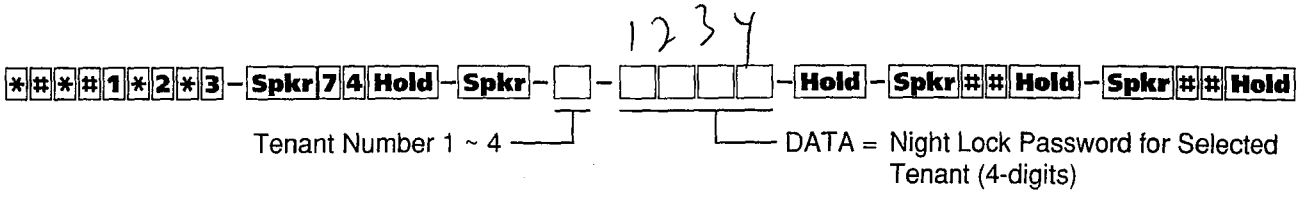
Note:

1. *Any type line can be accessed (ground, loop, tie, and/or DID) to send a DNIS call back out over the telephone network.*

General Notes:

- *Initialized Data = blank*
- *DNIS network calls are timed by Program 12 disconnect timer.*

Program 74 — System NT Button Lock Password (R3)



Tenant Number	NT Lock Password (4 digits)
1	0
2	0
3	0
4	0

General Notes:

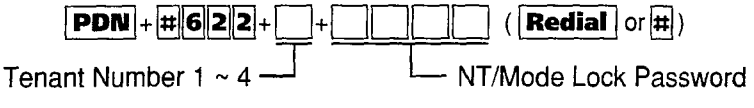
- *Initialized data = Port 000 for all tenants.*
- *NT lock related programs include:*

  Program 39 NT and NT Lock Buttons

  *Program *36 NT Lock Password Change Station Assignment*

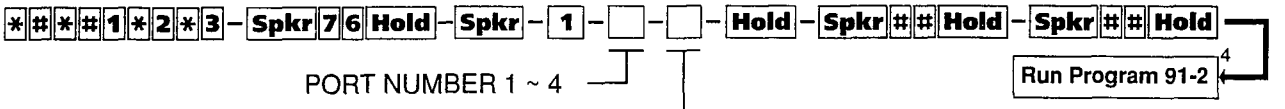
  *Program *15 Tenant CO Line Assignments*

  Program 77-3 Tenant Night Ring over External Page Assignments
- *To operate the NT Lock mode, a station must be assigned the appropriate Tenant NT and NT Lock button in Program 39 and must be assigned as the designated NT Lock Station in Program *36.*
- *All attendant consoles can operate all NT/NT Lock buttons if flexible buttons are assigned in Program 59. Program *36 is not required to assign attendant consoles to NT Lock functions.*
- *Attendant consoles and stations designated (NT Lock) in Program *36 can change the NT Lock password by dialing the sequence below:*



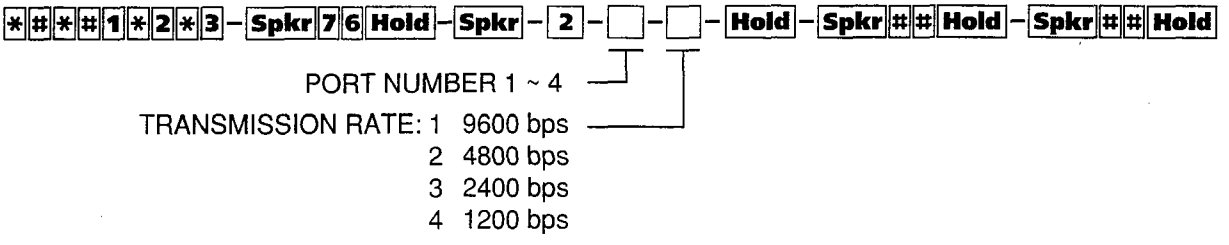
DK0387

Program 76-1 — RSIU/RSIS/RMDS Port Assignments (R3)



*(See Record Sheet below for **Program 76-1** data)*

Program 76-2 — RSIU/RSIS/RMDS Port Assignments (R3)



PROGRAM	76-1	76-2
PORT NUMBER	PORT TYPE[1]	DATA TRANSMISSION RATE [bps]
1	(1)	(3)
2	(0)	(3)
3	(0)	(3)
4	(0)	(3)
( ) = Initialized Data		**Total ≤ 9600 bps[3]**

Notes:

1. *Always enter port type code "0" for non-equipped ports.*
2. *If port type code 1 is set, then Program 77-1, LED 14 status determines if the port operates as a system administration/maintenance modem (LED 14 ON) or an RS-232 administration/maintenance TTY port (LED 14 OFF). For modem operation, a RMDS piggy-back PCB is required, for RS-232 TTY port, an RSIU/RSIS or RMDS PCB may be used.*
3. *The transmission data rate sum of the equipped RSIU/RSISI/RMDS port can not exceed 9600 bps.*
4. *System power must be cycled or Program 91-2 must be run to transfer Program 76-1 data entries from temporary memory to working memory; Program 76-2 does not require data transfer.*

General Note:

- *Initialized Data = ( ), codes set in Program 76 have priority over codes 41, 42, and 43 set in Program 03 for PIOU/PIOUS ports.*

IMPORTANT !

Whenever uploading Program 76 with 280Admin/280Backup, the bps rate of 280Backup/280Admin, the customer database (on the PC) and the RSIU/RSIS/RMDS TTY/RMDS port must all be set the same. If the bps rate of these items are not the same, uploading Program 76 will fail.

DK0388

Program 77-1 — Peripheral Options (Door Phones) RSIU/RSIS/RMDS/IMDU/PIOU/PIOUS/PEPU

[*][#][*][#][1][*][2][*][3] – [Spkr][7][7][Hold] – [Spkr][1] – [ ] [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = 1

LED/Button
Light the Buttons/LEDs that are marked with an X in the table below.

LED/ Button	X	LED ON	LED OFF
20		Door Lock Time/6 sec.	Door Lock Time/3 sec.
19[1, 5]		Port 028/DDCB 4 or[1] HDCB 4	Port 028/Telephone
18[1, 5]		Port 020/DDCB 3 or[1] HDCB 3	Port 020/Telephone
17[1, 5]		Port 012/DDCB 2 or[1] HDCB 2	Port 012/Telephone
16[1, 5]		Port 004/DDCB 1 or[1] HDCB 1	Port 004/Telephone
(R3) 15		RMDS Modem Protocol CCITT (2400 bps)[8]	RMDS Modem Protocol Bell212A (1200 bps)[8]
14		RMDS/IMDU[7] Modem (DN #19)/Enabled[2]	RMDS/IMDU[7] Modem (DN #19)/Disabled
10[9]		Enable 280ADMIN/BACKUP Protocol	Disable 280ADMIN/BACKUP Protocol
08		Door Phone Ring on Ext Page[3]	No Ring over Ext Page
07		Door Lock Relay Enabled[4]	External Page Relay Enabled[4]
06		NT Relay with NT1 or NT2 Button and ringing CO line[6]	NT Relay Steady with NT1 Button
05		MOH Relay Enabled	NT Relay Enabled
04		—	—
03		—	—
02		—	—
01		—	—

DK0389

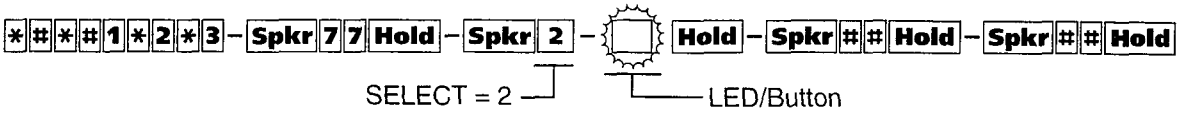
Notes:

1. *DDCB/HDCB = Door Phone/Lock Control Unit. Up to four DDCBs/HDCBs can be installed in a system with RCTU B, RCTUBA/BB and C/D, only 3 are allowed with RCTU A. They must be assigned a PDKU, RDSU, PEKU or PESU port number to operate (DDCB to PDKU or RDSU, and HDCB to PEKU or PESU). (See Program 79 and ✱79 for door phone ringing assignments).*
2. *If a modem unit (RMDS/IMDU) is installed, it can be accessed by dialing Station #19 and can be assigned a DID extension number in Program ✱09 or in Program 71 (1 ~ 3).*
3. *The door phone will ring over external page if the DK system is in the NIGHT mode.*
4. *This option applies to the PIOU/PIOUS/PEPU Door Lock Control 0 assigned to electronic or digital telephone buttons using Code 471 in Program 39; it does not apply to DDCB or HDCB Door Lock Control.*
5. *Station PCBs that are connected to HDCB/DDCB door phones control boxes must be installed in lower slot numbers than tie, DID, or Attendant Console PCBs.*
6. *CO lines must be assigned to night ring over External Page (Program 78-1) to allow the NT relay to operate when incoming CO lines ring.*
7. *See Program 79 and ✱Program ✱79 for door phone ringing assignments.*
8. *IMDU can be 1200 bps or 300 bps as set by SW2 on the PIOU or PIOUS PCB; RMDS can be 1200 bps or 2400 bps as set in Program 76-2 and Program 77-1 LED 15.*
9. *The Toshiba 280Admin/Backup software programs will automatically turn ON LED 10 when the programs communicate with the DK280 locally or remotely.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data leaves all LEDs OFF.*

Program 77-2 — Door Phone Busy Signal/Door Lock Assignments



LED Button	X	LED ON	LED OFF
20		One Door Phone Ring	Five Door Phone Rings
19		—	—
18		—	—
17		—	—
16		DDCB4/HDCB4 B-jack is Lock Control #4	B is connected to Door Phone 4B
15		Door phone 4C Busy Out	No Busy Signal
14		Door phone 4B Busy Out	No Busy Signal
13		Door phone 4A Busy Out	No Busy Signal
12		DDCB3/HDCB3 B-jack is Lock Control #3	B is connected to Door Phone 3B
11		Door phone 3C Busy Out	No Busy Signal
10		Door phone 3B Busy Out	No Busy Signal
09		Door phone 3A Busy Out	No Busy Signal
08		DDCB2/HDCB2 B-jack is Lock Control #2	B is connected to Door Phone 2B
07		Door phone 2C Busy Out	No Busy Signal
06		Door phone 2B Busy Out	No Busy Signal
05		Door phone 2A Busy Out	No Busy Signal
04		DDCB1/HDCB1 B-jack is Lock Control #1	B is connected to Door Phone 1B
03		Door phone 1C Busy Out	No Busy Signal
02		Door phone 1B Busy Out	No Busy Signal
01		Door phone 1A Busy Out	No Busy Signal

DK0390

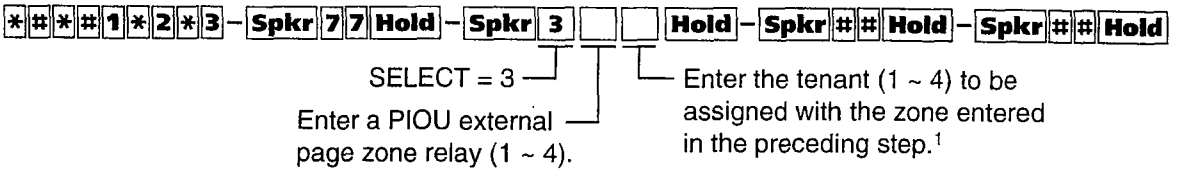
General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data reads all LEDs OFF.*

DDCB and HDCB Port Assignments

DDCB/HDCB Slot No.	*Port No.*
11	*004*
12	*012*
13	*020*
14	*028*

Program 77-3 — Night Ringing Over PIOU External Page Zones



TENANT	ZONE 1	ZONE 2	ZONE 3	ZONE 4
TENANT 1 CO Lines				
TENANT 2 CO Lines				
TENANT 3 CO Lines				
TENANT 4 CO Lines				

DK0391

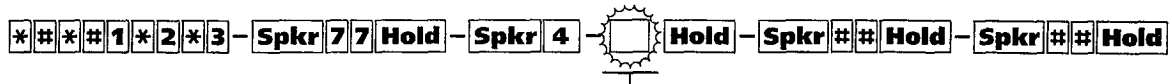
Note:

1. *These assignments apply to ground and loop start lines only; they do not apply to DID and tie lines.*

General Note:

- *Initialized all zones (1-4) assigned to tenant 1.*

Program 77-4 — RSIU Open Architecture (OA) Data Output Assignments (R3)



LED/Button
Light the Buttons/LEDs that are marked with an X in the table below.

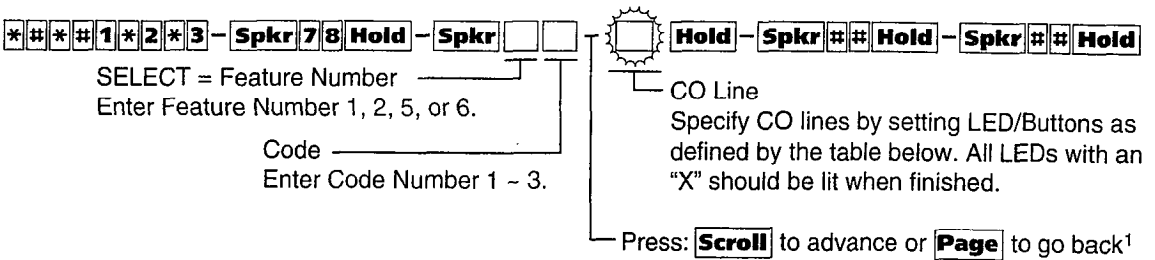
LED/ Button	X	LED ON	LED OFF
20			
19			
18			
17			
16			
15			
14			
10			
08			
07			
06			
05			
04			
03			
02		DNIS number will be sent from OA port.	DNIS number will not be sent from OA port.
01		Caller ID/ANI will be sent from OA port.	Caller ID/ANI will not be sent from OA port.

DK0392

General Notes:

- *Initialized data leaves all LEDs OFF.*
- *LED 01 and 02 may be ON or OFF in any combination. Always set LED 01 or 02 OFF when it is not required to send Caller ID / ANI / DNIS information.*
- *RCTU PCB requires RKYS4 to provide MIS, caller ID, ANI, and DN information via the system O.A. port.*

Program 78 — Ground/Loop Start CO Line Special Ringing Assignments DISA/IMDU/RMDS/Night Ringing Over External Page



Check off the line range covered by this table.

Range	001 ~ 020 ___	021 ~ 040 ___	041 ~ 060 ___	061 ~ 080 ___	081 ~ 100 ___	101 ~ 120 ___	121 ~ 140 ___	141 ~ 144 ___

Copy this page for more trunks.

Feature Number	Code	Feature Description	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	LINE LED
1	3	Ring Over External Page during NIGHT mode																					
2	1	DISA CO Line during DAY Mode																					
	2	DISA CO Line during DAY2 Mode																					
	3	DISA CO Line during NIGHT Mode																					
5	1	Ring IMDU or RMDS[2]. Modem during DAY Mode																					
	2	Ring IMDU or RMDS[2]. Modem during DAY2 Mode																					
	3	Ring IMDU or RMDS[2]. Modem during NIGHT Mode																					
6	1	Auto Attendant during DAY Mode[3]																					
	2	Auto Attendant during DAY2 Mode[3]																					
	3	Auto Attendant during NIGHT Mode[3]																					

Check off the line range covered by this table.

Range	001 ~ 020 ___	021 ~ 040 ___	041 ~ 060 ___	061 ~ 080 ___	081 ~ 100 ___	101 ~ 120 ___	121 ~ 140 ___	141 ~ 144 ___

Feature Number	Code	Feature Description	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	LINE LED
1	3	Ring Over External Page during NIGHT mode																					
2	1	DISA CO Line during DAY Mode																					
	2	DISA CO Line during DAY2 Mode																					
	3	DISA CO Line during NIGHT Mode																					
5	1	Ring IMDU or RMDS[2]. Modem during DAY Mode																					
	2	Ring IMDU or RMDS[2]. Modem during DAY2 Mode																					
	3	Ring IMDU or RMDS[2]. Modem during NIGHT Mode																					
6	1	Auto Attendant during DAY Mode[3]																					
	2	Auto Attendant during DAY2 Mode[3]																					
	3	Auto Attendant during NIGHT Mode[3]																					

DK0393

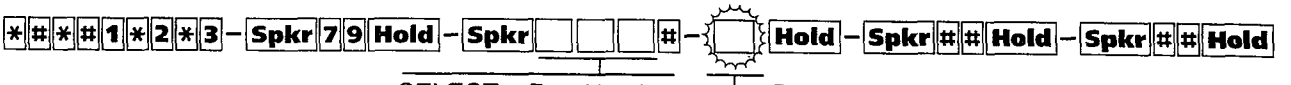
Notes:

1. *To turn all CO LEDs on or off, after the program code is entered, press* **Vol▲** *(all LEDs on) or* **Vol▼** *(all LEDs off). To check a particular CO line after the program code is entered, press Mode and enter the CO line number, then use the* **#** *button to display and advance.*
2. *RMDS requires RSIU and is available with DK280 R3 and above only, IMDU requires PIOU or PIOUS. See Programs 77-1 LED 14, and Program 76 for RMDS. Only one built-in maintenance modem, IMDU or RMDS, will function at a time in DK280.*
3. *If CO lines should ring telephones before the Auto Attendant answers, use Program 81 ~ 89 to assign telephones to ring. Do not assign telephones in Program 81 ~ 89, if the Auto Attendant should answer on the first ring.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data leaves all LEDs off.*
- *The above assignments apply to ground and loop start lines only, they do not apply to tie or DID lines.*
- *Auto Attendant assignments 61~63 have priority over ACD assignments in Program 14-0.*

Program 79 — Door Phone Ringing



Enter the port number having Door Phone Ringing assigned. See Note 1 for entering a range of ports.

Select buttons indicated in the table below.

Select Port Range					
000 ~ 039		080 ~ 119		160 ~ 199	
040 ~ 079		120 ~ 159		200 ~ 239	

Copy this page for more ports.

Feature	PORTS → / LED ↓					
Muted ring to busy DKT/EKT	20					
	19					
	18					
	17					
	16					
	15					
	14					
	13					
Door phone 4C Ring DP12	12					
Door phone 4B Ring DP11	11					
Door phone 4A Ring DP10	10					
Door phone 3C Ring DP9	09					
Door phone 3B Ring DP8	08					
Door phone 3A Ring DP7	07					
Door phone 2C Ring DP6	06					
Door phone 2B Ring DP5	05					
Door phone 2A Ring DP4	04					
Door phone 1C Ring DP3	03					
Door phone 1B Ring DP2	02					
Door phone 1A Ring DP1	01					

DP = Door Phone

DK0394

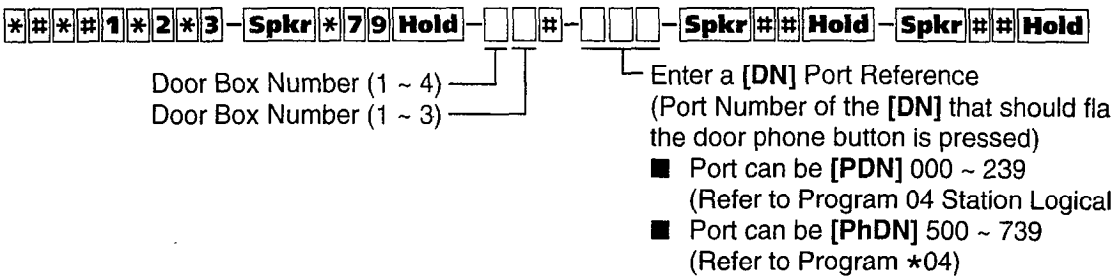
Note:

1. *Specify a range of ports may by entering:* [ ][ ][ ]*[ ][ ][ ] *Low port — High port*

General Notes:

- *Initialized data does not assign door phone ringing to any station port. All LEDs are OFF.*
- *Door phones will not ring Attendant Consoles or Standard Telephones. Ringing door phones will flash on idle console's answer buttons, but will not alert a console that is in the busy mode.*
- *Use Program *79 to assign **[DN]** button LEDs to flash on telephones that are assigned to ring.*
- *See Program 77-1 for door phone box port assignments.*

Program *79 — Door Phone to [DN] Flashing Assignments



DOOR PHONE NUMBER/LOCATION	DOOR PHONE BOX NUMBER	DN PORT REFERENCE NUMBER
1	1	1
2		2
3		3
4	2	1
5		2
6		3
7	3	1
8		2
9		3
10	4	1
11		2
12		3

DK0395

General Notes:

- *Initialized data = no **[DNs]** assigned to ring for all door phones.*
- *See Program 77-1 for door phone control box port assignments.*

IMPORTANT !

*To allow a door phone to flash and ring a **[DN]**, the **[DN]** must be assigned to flash in Program *79 and the telephone on which the **[DN]** appears must be assigned to ring in Program 79.*

Program 80 — Electronic and Digital Telephone Ringing Tones (CO Line Calls)

[*][#][*][#][1][*][2][*][3] – [Spkr][8][0][Hold] – [Spkr][ ][ ][ ][#] – [ ][Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Station Logical Port Number (000~239)
Enter telephone port number for which the ringing tone is being defined.
See Note 1 if entering a range of ports.

Ringing Tone Code (see note 2).
Enter 1 for Tone Option 1.
Enter 2 for Tone Option 2.
Enter 3 for Tone Option 3.

Ringing Tone (Code)	Port Numbers 000 ~ 039																																					
	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	037	038	039
Tone 1 (1)																																								
Tone 2 (2)																																								
Tone 3 (3)																																								

Ringing Tone (Code)	Port Numbers 040 ~ 079																																							
	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079
Tone 1 (1)																																								
Tone 2 (2)																																								
Tone 3 (3)																																								

Ringing Tone (Code)	Port Numbers 080 ~ 119																																							
	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
Tone 1 (1)																																								
Tone 2 (2)																																								
Tone 3 (3)																																								

Ringing Tone (Code)	Port Numbers 120 ~ 159																																							
	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
Tone 1 (1)																																								
Tone 2 (2)																																								
Tone 3 (3)																																								

Ringing Tone (Code)	Port Numbers 160 ~ 199																																							
	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199
Tone 1 (1)																																								
Tone 2 (2)																																								
Tone 3 (3)																																								

Ringing Tone (Code)	Port Numbers 200 ~ 239																																							
	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
Tone 1 (1)																																								
Tone 2 (2)																																								
Tone 3 (3)																																								

DK0396

Notes:

1. *A range of ports may be specified by entering:* [ ][ ][ ][*][ ][ ][ ]
   Low port — *High port*

2.

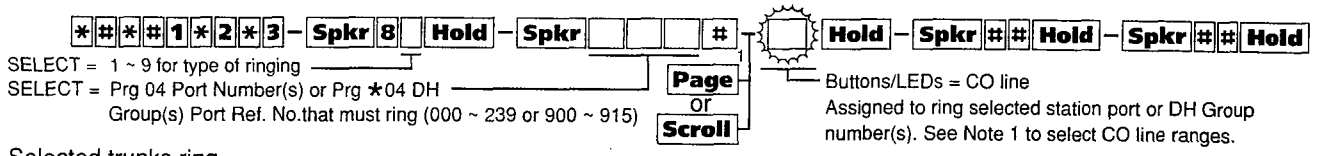
Ring Tone Option	(1)	(2)	(3)
Incoming Line Call*	500/640 Hz	1200/1500 Hz	800/1000 Hz
Transferred Line Call	540/760 Hz	1300/1780 Hz	880/1180 Hz

. Incoming Line Call distinctive ring tones apply to DID, ground, and loop start CO lines; ring tone for internal or **[DN] calls, and tie line incoming calls is 500 Hz for all telephones.*

General Note:

- *Initialized data assigns Tone 1 to all station ports.*

Program 81 ~ 89 — Ground/Loop Start/CO Line/Station Auto Attendant, Attendant Console, and Distributed Hunt Group Ringing Assignments



Selected trunks ring selected station ports per ringing program options as follows:

DAY	81 Immediate 82 12-second delay 83 24-second delay	DAY 2	84 Immediate 85 12-second delay 86 24-second delay	NIGHT	87 Immediate 88 12-second delay 89 24-second delay

Check Off the CO line and Port Range Covered by this Record Sheet

CO line Range	001 ~ 040___	041 ~ 080___	081 ~ 120___	121 ~ 144___		
Port Range	000 ~ 039___	040 ~ 079___	080 ~ 119___	120 ~ 159___	160 ~ 199___	200 ~ 239___
Port Range	000 ~ 039___					

Copy this page for more CO line and ports. (Ports include Station (000 ~ 239)[3] and Distributed Hunt Groups (900 ~ 916).[2]

PORTS →											
CO line	LED ↓										
	20										
	19										
	18										
	17										
	16										
	15										
	14										
	13										
	12										
	11										
	10										
	09										
	08										
	07										
	06										
	05										
	04										
	03										
	02										
	01										

Notes: DK0397

1. *To turn all CO LEDs on or off, after the port number is entered, press the* **Vol▲** *(all LEDs on) or* **Vol▼** *(all LEDs off). To check a particular CO line, after the port number and* **#** *is entered, press* **Mode** *and enter the CO line number, then use the* **#** *button to display and advance.*
2. *Program 81 ~ 89 assigns CO lines to ring the telephones or DH Groups, use Programs *81, *84 and *87 to cause CO lines to flash the appropriate* ***[PDN]*** *and/or* ***[PhDN]*** *buttons as required. If the CO line or Pooled Line button appears on a telephone, do not use Programs *81, *84 or *87 to assign* ***[DN]*** *LEDs to flash ~ this will cause both the CO line and* ***[DN]*** *button to flash on the telephone when the CO line rings on an incoming call.*
3. *CO lines that must ring DH groups must be assigned to ring the DH group (900 ~ 915) and the DH Group telephone* ***[PDN]*** *or* ***[PhDN]*** *in Programs *81, *84, and *87, if the CO line button or Pooled Line buttons appear on the DH Group member telephones, then Program *81, *84 and *87 assignments are not necessary. Do not assign DH group member station ports in Program 81 ~ 89.*

General Notes:

- *Initialized data reads all LEDs ON for Port 000 in Program 81 and port 001 in Program 87; all other LEDs are OFF.*
- *Program 81 ~ 89 can be used to set-up DK280 built-in Auto Attendant delay ring feature per the guide on the next page.*
- *Program 81 ~ 89 are used to ring individual attendant consoles and/or to enable attendant console incoming CO line call load sharing. (See the next page and Chapter 5—Station Apparatus, Subsection 5.8.2 of the DK280 Installation and Maintenance manual.)*
- *See CO line ringing control logical diagrams that follow *81, *84, and *87 record sheets.*

IMPORTANT !

120 telephones maximum can be programmed to ring in any one mode (Day/Day2/Night) per CO line.

Program 81 ~ 89 — Ground/Loop Start/CO Line/Station Auto Attendant, Attendant Console, and Distributed Hunt Group Ringing Assignments (continued)

Auto Attendant Delay Ring

1. *To set Auto Attendant (AA) Delay Ring operation follow the guidelines below.*

Note:
If the Auto Attendant must answer calls on the first ring, do not assign CO lines to ring telephones in Programs 81 ~ 89.

A. *Assign CO lines to ring the Auto Attendant (AA) in Program 78.*
Program 78 -61 – AA DAY
-62 – AA DAY 2
-63 – AA NIGHT

B. *Assign stations that should Ring (immediately for 12 seconds) before the AA answers to the AA CO lines in Program 81 (84 – Day 2, 87 – Night). Also assign the **[DN]** that should flash when the CO lines ring with Program *81 (*84 – Day 2, *87 – Night).*

C. *Assign stations that should ring (after a 12-second delay – for 12 seconds) before the AA answers to the AA CO lines in Program 82 (85 – Day 2, 88 – Night). Also assign the **[DN]** that should flash when the CO lines ring with Program *81 (*84 – Day 2, *87 – Night).*

D. *Use Program 39 to assign the **[DN]** button that should flash and ring before the AA answers. The **[DN]** button, or buttons for multiple **[PDNs]**, must be assigned on all station ports assigned to ring in Programs 81-89.*

E. *Assign any station to ring the AA CO lines in Program 83 (86 – Day 2, 89 – Night). This assignment is only a flag that notifies the software to delay ring stations assigned in Program 82. Program 83 station assignments will not ring.*

1. *No Delay: If AA line(s) are assigned to ring stations in Program 81 but no stations are assigned in Program 82 or 83, the AA will answer the call immediately (no delay ring).*
2. *12 Second Delay: If AA line(s) are assigned to ring stations in Programs 81 and 82 but no stations are assigned in Program 83, stations assigned in Program 81 will ring immediately for 12 seconds and then the AA will answer (stations assigned in Program 82 will not ring).*
3. *24 Second Delay: If AA CO line(s) are assigned to ring stations in Programs 81, 82, and 83, then the following ringing occurs:*
   A. *Stations assigned in Program 81 and the **[DN]** assigned in Program *81 – ring immediate for 12 seconds and then stop ringing unless they are also assigned to ring in Program 82. Assign **[DN]** buttons to these ports using Program 39.*
   B. *Station assigned in Program 82 and the **[DN]** assigned in Program *81 – ring after a 12-second delay for 12 seconds and then stop ringing. Assign **[DN]** buttons to these ports using Program 39.*
   C. *The Auto Attendant Answers after stations assigned in Program 81 and 82 stop ringing (24 seconds from start of call).*
   D. *The station assigned in Program 83 will not ring because the AA will answer the call after 24 seconds. Assign the **[DN]** buttons that flash/ring on this station port using Program 39.*

2. *Auto Attendant Program Example:*

A. *CO lines 1 ~ 5 should ring **[PhDN]**500 on station 200 immediately for 24 seconds (6 rings).*

B. *CO lines 1 ~ 5 should delay ring **[PhDN]**500 on station 208 after ringing **[PhDN]** on station 200 for 12 seconds.*

C. *The Auto Attendant should answer CO 1 ~ 5, 24 seconds after station 200 started ringing and 12 seconds after station 208 started ringing.*

Program 81 ~ 89 — Ground/Loop Start/CO Line/Station Auto Attendant, Attendant Console, and Distributed Hunt Group Ringing Assignments (continued)

Program as follows for the above example.

1. *Assign lines 001 ~ 005 to AA in Program 78-61.*
2. *Assign lines 001 ~ 005 to ring station 200 in Program 81.*
3. *Assign lines 001 ~ 005 to ring station 208 in Program 82.*
4. *Assign lines 001 ~ 005 to ring any installed RSTU, PDKU, or PEKU port that has a telephone or does not have a telephone connected in Program 83 (Program 83 assignment is used only to enable Program 82 delay ring stations to ring. Assign* ***[PhDN]*** *500 button on this port using Program 39).*
5. *Assign lines 001 ~ 005 to flash* ***[PhDN]*** *500 in Program *81.*
6. *Assign the* ***[PhDN]*** *500 button to station 200 and 208 using Program 39.*
7. *Using Program 39, assign* ***[PhDN]*** *button 500 on all station ports assigned to ring in Programs 81, 82, and 83.*

Attendant Console Load Sharing

1. *Assign all CO lines (ground, loop, and DID) that should alternately ring multiple attendant consoles to the respective Load Share console ports in Programs 81, 84, and 87 (see example in Subsection 5.8.2 in Chapter 5—Station Apparatus of the DK280 I&M manual).*
2. *On DID lines, when the digits assigned to console ports in Program *09 are dialed on incoming calls, the calls will alternately ring the Load Share consoles.*

Program *81, *84, and *87 — Ground/Loop Start/CO Line to Directory Number Button LED Flash Assignments (001 ~ 072) (R3)

##1*2*3 - Spkr *8☐ Hold - Spkr ☐☐☐ - #[1] - ☐☐☐ - Spkr ## Hold - Spkr ## Hold

Enter: 1, 4, or 7
- 1 = Day Ring
- 4 = Day 2 Ring
- 7 = Night Ring

Enter CO line number (001 ~ 144)

Enter the Station Logical Port Number of the **[DN]** LED that should flash:
Primary **[DN]**: Port 000 ~ 239 (Prg 04)
Phantom **[DN]**: Port 500 ~ 739 (Prg *04)
Button 01 enters blank data.

CO LINE NUMBER	DAY RING DN (*81)	DAY 2 RING DN (*84)	NIGHT RING DN (*87)
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011			
012			
013			
014			
015			
016			
017			
018			
019			
020			
021			
022			
023			
024			
025			
026			
027			
028			
029			
030			
031			
032			
033			
034			
035			
036			

CO LINE NUMBER	DAY RING DN (*81)	DAY 2 RING DN (*84)	NIGHT RING DN (*87)
037			
038			
039			
040			
041			
042			
043			
044			
045			
046			
047			
048			
049			
050			
051			
052			
053			
054			
055			
056			
057			
058			
059			
060			
061			
062			
063			
064			
065			
066			
067			
068			
069			
070			
071			
072			

Notes:

1. To enter a CO line range, enter: ☐☐☐*☐☐☐ *in place of:* ☐☐☐#

Low CO line — High CO line

General Notes:

- *Initialized data: no **[DNs]** assigned to ring.*
- *If a CO line is assigned to flash a Directory Number **[DN]** in this program, the assigned **[DN]** LED will flash as 1 Hz rate when the CO line rings into the DK280; use Program 81 ~ 89 to assign the telephones equipped with the **[DN]** to ring as required.*

IMPORTANT!

*If CO lines direct ring VM ports in Program 81 ~ 89, the data in Programs *81, *84, and *87 must be blank.*

- *The CO line that is assigned to flash a **[DN]** in Program *81, *84, and *87 should also be assigned to ring the telephones on which the **[DN]** appears. CO lines are assigned to ring telephones using Program 81 ~ 89.*
- *If the CO line button is programmed (Program 39) to appear on a telephone, do not assign a **[DN]** to flash on that telephone with Program *81, *84, and *87.*
- *See CO line/**[DN]** button LED control logic diagrams that follow these record sheets.*

DK0398

Program *81, *84, and *87 — Ground/Loop Start/CO Line to Directory Number Button LED Flash Assignments (073 ~ 144) (R3)

[*][#][*][#][1][*][2][*][3] - [Spkr][*][8][ ][Hold] - [Spkr][ ][ ][ ]-[#][1]-[ ][ ][ ]-[Spkr][#][#][Hold] - [Spkr][#][#][Hold]

Enter: 1, 4, or 7 — [1] = Day Ring, [4] = Day 2 Ring, [7] = Night Ring

Enter CO line number (001 ~ 144)

Enter the Port Number of the LED that should flash:
Primary [DN]: Port 000 ~ 239 (Prg 04)
Phantom [DN]: Port 500 ~ 739 (Prg *04)
Button 01 enters blank data.

CO LINE NUMBER	DAY RING DN (*81)	DAY 2 RING DN (*84)	NIGHT RING DN (*87)
073			
074			
075			
076			
077			
078			
079			
080			
081			
082			
083			
084			
085			
086			
087			
088			
089			
090			
091			
092			
093			
094			
095			
096			
097			
098			
099			
100			
101			
102			
103			
104			
105			
106			
107			
108			

CO LINE NUMBER	DAY RING DN (*81)	DAY 2 RING DN (*84)	NIGHT RING DN (*87)
109			
110			
111			
112			
113			
114			
115			
116			
117			
118			
119			
120			
121			
122			
123			
124			
125			
126			
127			
128			
129			
130			
131			
132			
133			
134			
135			
136			
137			
138			
139			
140			
141			
142			
143			
144			

DK0399

Note:

1. *To enter a CO line range, enter:* [ ][ ][ ][*][ ][ ][ ] *in place of :* [ ][ ][ ][#]
   Low CO line — *High CO line*

General Notes:

- *Initialized data: no Directory Numbers* **[DNs]** *assigned to ring.*
- *If a CO line is assigned to flash a* **[DN]** *in this program, the assigned* **[DN]** *LED will flash as 1 Hz rate when the CO line rings into the DK280; use Program 81 ~ 89 to assign the telephones equipped with the* **[DN]** *to ring as required.*

IMPORTANT !

*If CO lines direct ring VM ports via Program 81 ~ 89, the data in Programs *81, *84, and *87 must be blank.*

- *The CO line that is assigned to flash a* **[DN]** *in Program *81, *84, and *87 should also be assigned to ring the telephones on which the* **[DN]** *appears. CO lines are assigned to ring telephones using Program 81 ~ 89.*
- *If the CO line button is programmed (Program 39) to appear on a telephone, do not assign a* **[DN]** *to flash on that telephone with Program *81, *84, and *87.*
- *See CO line/***[DN]** *button LED control logic diagrams that follow these record sheets.*

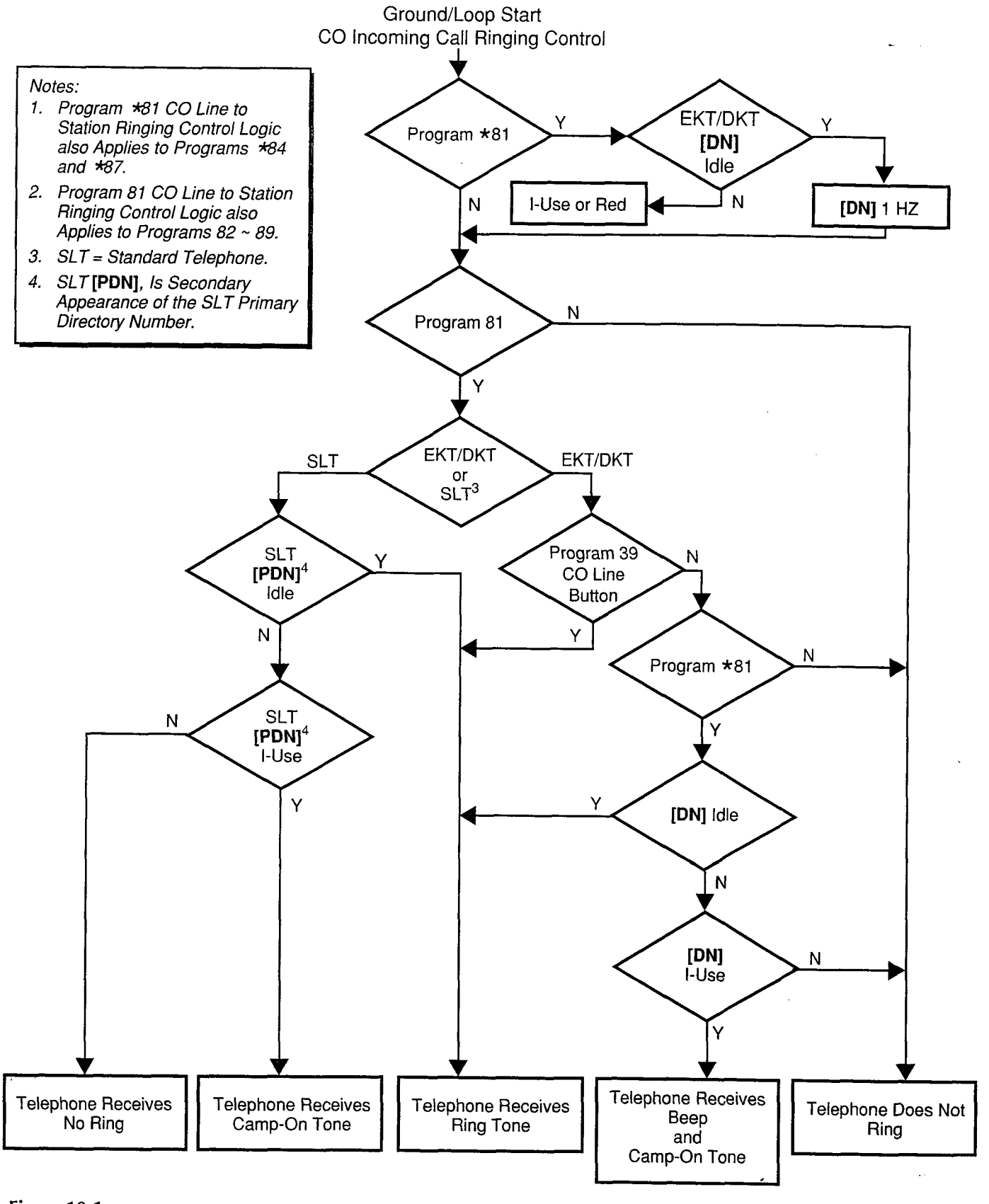


Figure 10-1
Strata DK280 Release 3 CO Line Button/Directory Number [DN] Button Ringing Control Logic Diagram

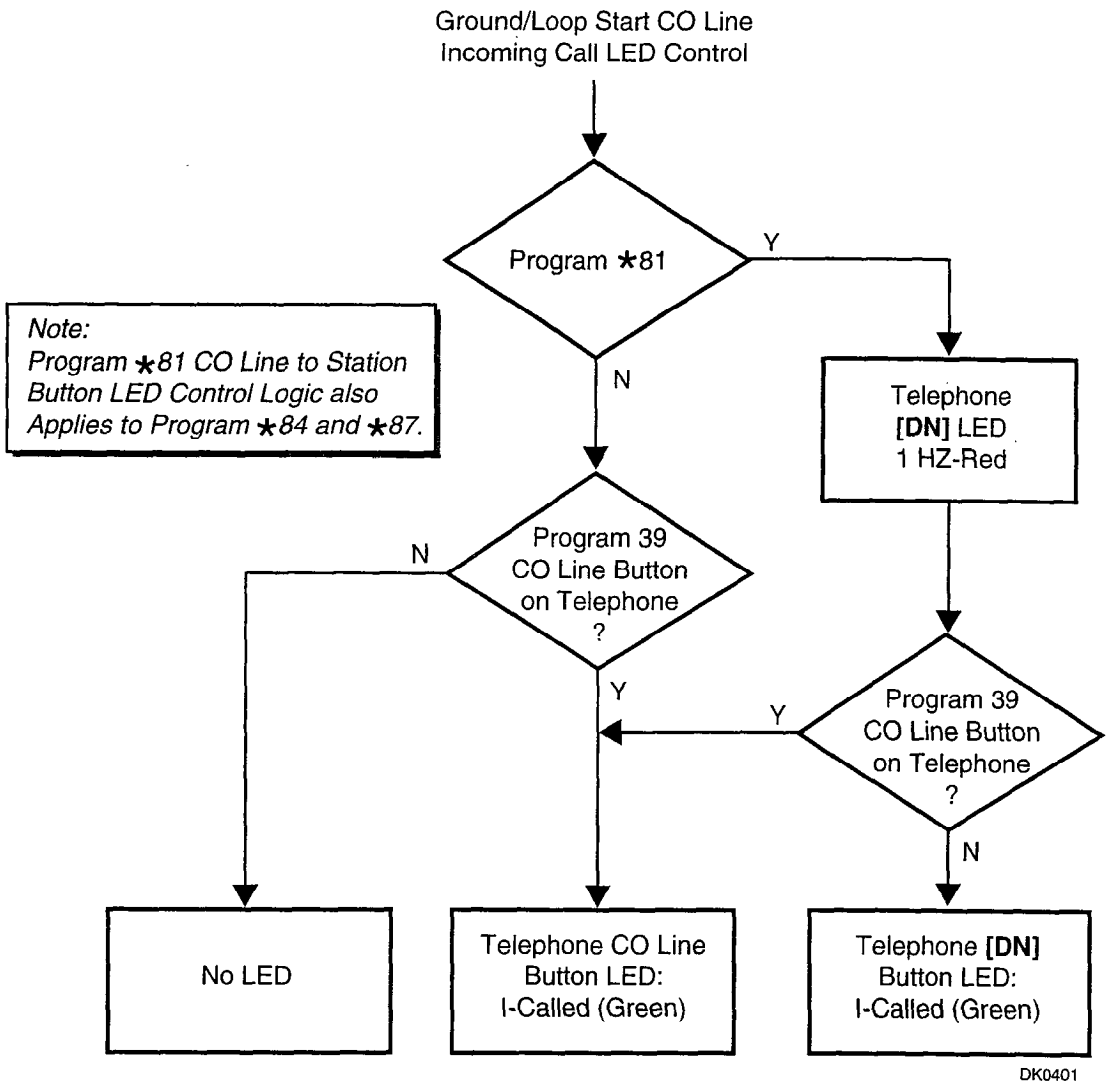
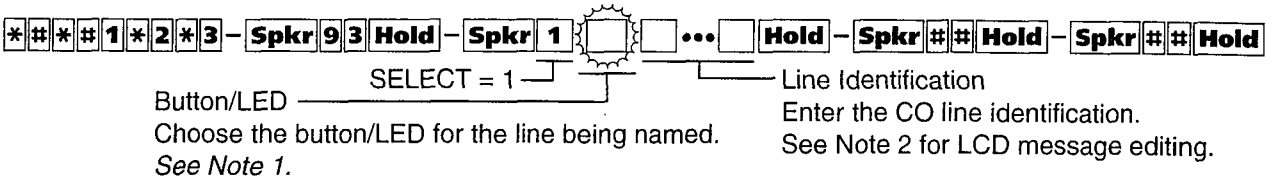


Figure 10-2
Strata DK280 Release 3 CO Line Button/Directory Number LED Flash Control Logic Diagram

System Record Sheets for Programs 90, 91, and 92 appear in the beginning of this section because they must be executed prior to running any other programs.

Program 93 — CO Line Identification



Check off the line ranges covered by this record sheet

Range							
001 ~ 020	021 ~ 040	041 ~ 060	061 ~ 080	081 ~ 100	101 ~ 120	121 ~ 140	141 ~ 144

Copy this page for more trunks.

LED	Line	CO Line Identification (16 Characters Max. – Enter One Per Rectangle)
20		
19		
18		
17		
16		
15		
14		
13		
12		
11		
10		
09		
08		
07		
06		
05		
04		
03		
02		
01		
20		
19		
18		
17		
16		
15		
14		
13		
12		
11		
10		
09		
08		
07		
06		
05		
04		
03		
02		
01		

Notes:

DK0402

1. *To advance the line range, press the* **Scroll** *button beneath the LCD. Press the* **Page** *button for a lower range.*
2. *Editing buttons include:* **#** *to toggle from alphabetic to numeric.*
   1 *moves cursor to right.*
   ***** *moves cursor to left.*
   0 *increments letters, etc.*

Program 93 — CO Line Identification-Alphanumeric Entry (continued)

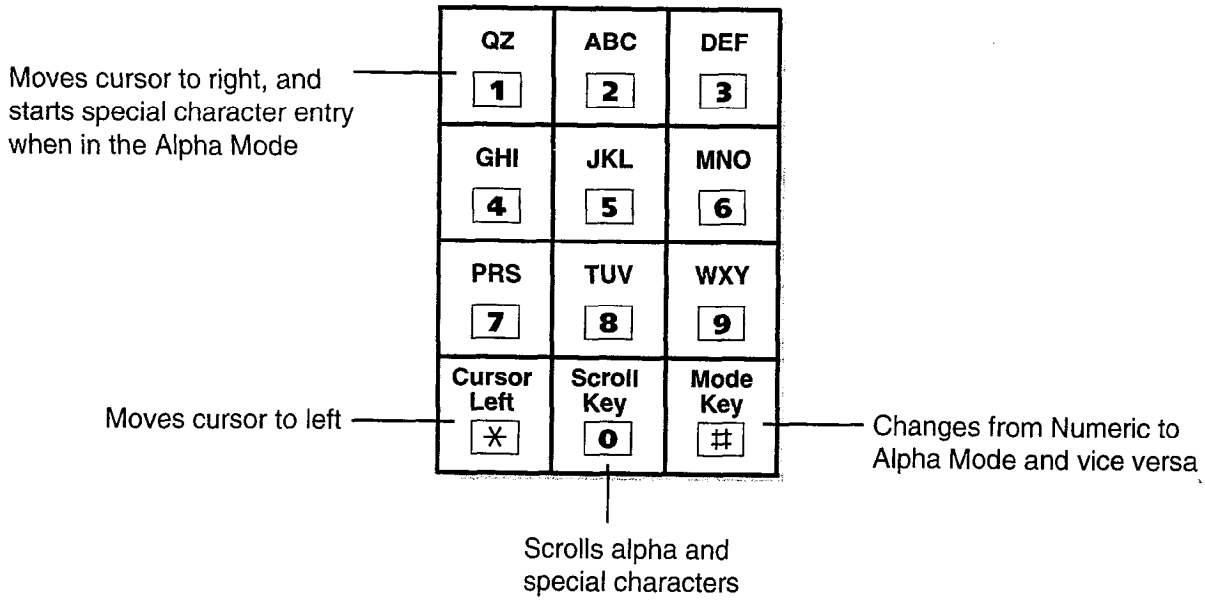
1. Enter **Program 93** and select the desired CO line.
2. Use the guide below to enter CO line identification information.

Numeric Mode

"0" to "9" are treated as numerals.

Note:
*Dial pad starts out in **Numeric** Mode.*
*Use **#** button to switch to **Alpha** Mode.*

Alpha Mode



Alpha Entry (Example):

A ➡ 2

B ➡ 2 0

C ➡ 2 0 0

Alpha Character — Entry Sequence

Special Character Entry:

"Q" ➡ 1 0

"Z" ➡ 1 0 0

":" ➡ 1 0 0 0

"–" ➡ 1 0 0 0 0

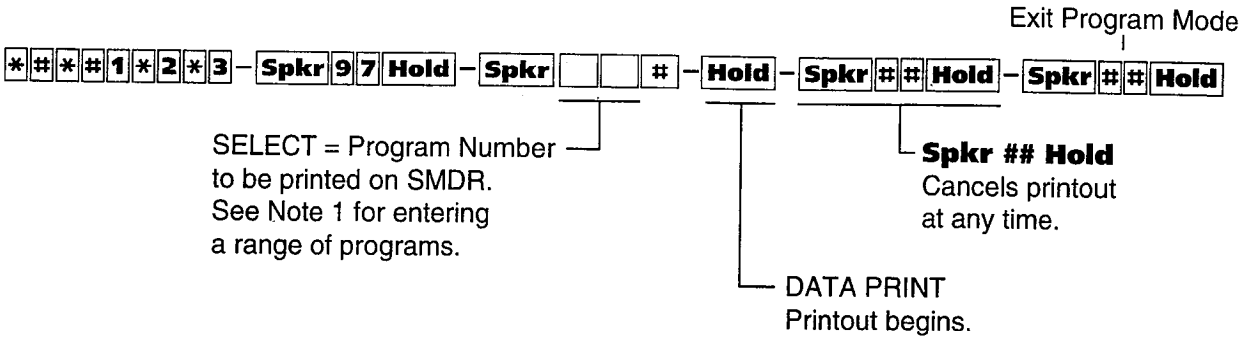
"+" ➡ 1 0 0 0 0 0

"/" ➡ 1 0 0 0 0 0 0

Special Character — Entry Sequence

DK0403

Program 97 — Printing Program Data Through SMDR



Note:

1. Specify a range of programs by entering: [ ][ ]*[ ][ ]

High program in range

Low program in range

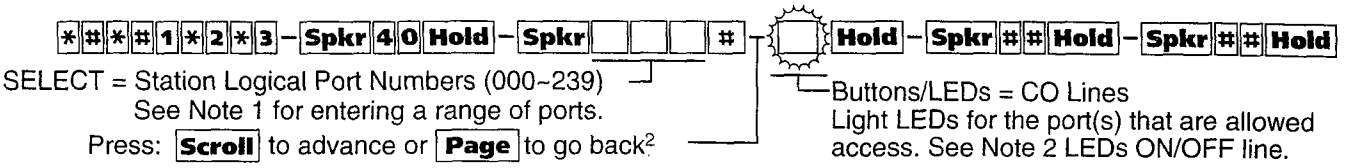
General Note:

- *For more information, see the instructions preceding the record sheets.*

DK0811

Toll Restriction System Record Sheets
Programs 40 ~ 48

Program 40 — Station CO Line Access



Check Off the Trunk and Port Range Covered by this Record Sheet

CO Line Range	001 ~ 040___	041 ~ 080___	081 ~ 120___	121 ~ 144___		
Port Range	000 ~ 039___	040 ~ 079___	080 ~ 119___	120 ~ 159___	160 ~ 199___	200 ~ 239___

Copy this page for more CO lines and ports.

PORTS →											
CO Line	LED ↓										
	20										
	19										
	18										
	17										
	16										
	15										
	14										
	13										
	12										
	11										
	10										
	09										
	08										
	07										
	06										
	05										
	04										
	03										
	02										
	01										

PORTS →											
CO Line	LED ↓										
	20										
	19										
	18										
	17										
	16										
	15										
	14										
	13										
	12										
	11										
	10										
	09										
	08										
	07										
	06										
	05										
	04										
	03										
	02										
	01										

DK0404

Notes:

1. *Specify a range of ports by entering:* ☐☐☐*☐☐☐ (*Low port* — *High port*)
2. *To turn all CO LEDs on or off, after the port number and* **#** *is entered, press the* **Vol▲** *(all LEDs on) or* **Vol▼** *(all LEDs off). To check a particular CO line, after the port number is entered, press* **Mode** *and enter the CO line number, then use the* **#** *button to display and advance.*

General Notes:

- *Initialized data reads all LEDs ON for all CO lines. Complete CO line access is allowed on all ports.*
- *To advance the CO line range, press the* **Scroll** *button beneath the LCD. Press the* **Page** *button for a lower range.*

Program 41 — Station Outgoing Call Restriction

[*][#][*][#][1][*][2][*][3] – [Spkr][4][1][Hold] – [Spkr][ ][ ][ ][#] – [ ] [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Station Logical Port Numbers (000~239)
See Note 1 for entering a range of ports.

Press: [Scroll] to advance or [Page] to go back[2]

Buttons/LEDs = CO lines
Light LEDs for the port(s) to be restricted.
See Note 2.

Check Off the CO lines and Port Range Covered by this Record Sheet

Trunk Range	001 ~ 040___	041 ~ 080___	081 ~ 120___	121 ~ 144___			
Port Range	000 ~ 039___	040 ~ 079___	080 ~ 119___	120 ~ 159___	160 ~ 199___	200 ~ 239___	= DISA[3]

Copy this page for more CO lines and ports.

PORTS →											
CO Line	LED ↓										
	20										
	19										
	18										
	17										
	16										
	15										
	14										
	13										
	12										
	11										
	10										
	09										
	08										
	07										
	06										
	05										
	04										
	03										
	02										
	01										

PORTS →											
CO Line	LED ↓										
	20										
	19										
	18										
	17										
	16										
	15										
	14										
	13										
	12										
	11										
	10										
	09										
	08										
	07										
	06										
	05										
	04										
	03										
	02										
	01										

DK0405

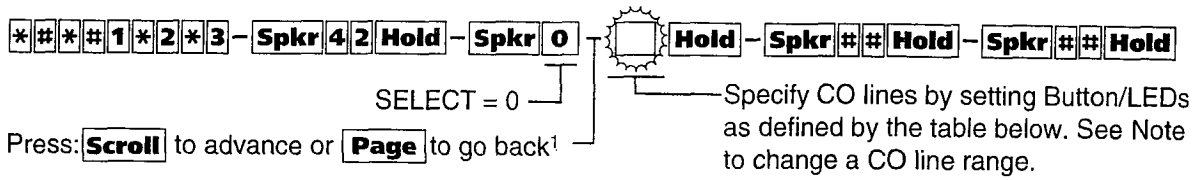
Notes:

1. *Specify a range of ports by entering:* [ ][ ][ ][*][ ][ ][ ]
   Low port — *High port*
2. *To turn all CO LEDs on or off, after the port number is entered, press the* **Vol▲** *(all LEDs on) or* **Vol▼** *(all LEDs off). To check a particular CO line, after the port number is entered, press* **Mode** *and enter the CO line number, then use the* **#** *button to display and advance.*
3. *To* ***not allow*** *a CO line to be accessed for DISA or external call forward, turn its LED ON for port 039-RCTUA; 089-RCTUB, or 249 for RCTUC/D.*

General Notes:

- *To advance the CO line range, press the* **Scroll** *button beneath the LCD. Press the* **Page** *button for a lower range.*
- *Initialized data reads all LEDs OFF for all CO lines (all stations allowed outgoing access to all CO lines).*

Program 42 - 0 — CO Line to PBX/Centrex Connection (Lines 1 ~ 80)



Button LED	Line	Set Button LEDs	
		Centrex/PBX Connection (LED ON)	Normal (LED OFF)
20	040		
19	039		
18	038		
17	037		
16	036		
15	035		
14	034		
13	033		
12	032		
11	031		
10	030		
09	029		
08	028		
07	027		
06	026		
05	025		
04	024		
03	023		
02	022		
01	021		
20	020		
19	019		
18	018		
17	017		
16	016		
15	015		
14	014		
13	013		
12	012		
11	011		
10	010		
09	009		
08	008		
07	007		
06	006		
05	005		
04	004		
03	003		
02	002		
01	001		

Button LED	Line	Set Button LEDs	
		Centrex/PBX Connection (LED ON)	Normal (LED OFF)
20	080		
19	079		
18	078		
17	077		
16	076		
15	075		
14	074		
13	073		
12	072		
11	071		
10	070		
09	069		
08	068		
07	067		
06	066		
05	065		
04	064		
03	063		
02	062		
01	061		
20	060		
19	059		
18	058		
17	057		
16	056		
15	055		
14	054		
13	053		
12	052		
11	051		
10	050		
09	049		
08	048		
07	047		
06	046		
05	045		
04	044		
03	043		
02	042		
01	041		

DK0406

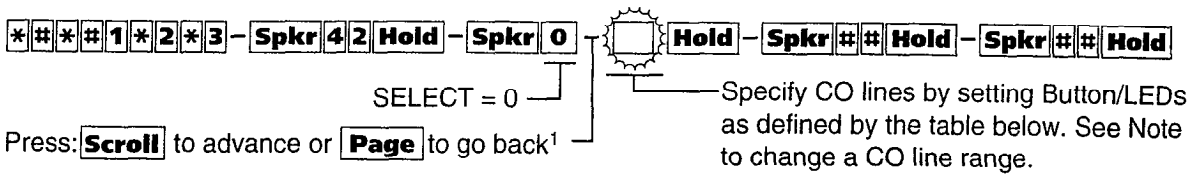
Notes:

1. *To advance the CO line range, press the* **Scroll** *button beneath the LCD, press the* **Page** *button for a lower range.*
2. *To turn all CO LEDs on or off, after the port number code is entered, press the* **Vol▲** *(all LEDs on) or* **Vol▼** *(all LEDs off). To check a particular CO line, after the port number is entered, press* **Mode** *and enter the CO line number, then use the* **#** *button to display and advance.*

General Notes:

- *Initialized data reads all LEDs OFF for all CO lines.*
- *This program must be utilized to allow Centrex/PBX (after flash) features to operate.*
- *If CO line is programmed for behind Centrex/PBX (LED ON), reseize guard time is 1.5 seconds. If CO line is programmed for normal operation guard time is 0.45 seconds. See Program 10-1, Button/LED 02.*
- *Do not use this program if installing DK 280 CO lines behind "assume-9" Centrex.*

Program 42 - 0 — CO Line to PBX/Centrex Connection (Lines 81 ~ 144)



Button LED	Line	Set Button LEDs	
		Centrex/PBX Connection (LED ON)	Normal (LED OFF)
20	120		
19	119		
18	118		
17	117		
16	116		
15	115		
14	114		
13	113		
12	112		
11	111		
10	110		
09	109		
08	108		
07	107		
06	106		
05	105		
04	104		
03	103		
02	102		
01	101		
20	100		
19	099		
18	098		
17	097		
16	096		
15	095		
14	094		
13	093		
12	092		
11	091		
10	090		
09	089		
08	088		
07	087		
06	086		
05	085		
04	084		
03	083		
02	082		
01	081		

Button LED	Line	Set Button LEDs	
		Centrex/PBX Connection (LED ON)	Normal (LED OFF)
20	140		
19	139		
18	138		
17	137		
16	136		
15	135		
14	134		
13	133		
12	132		
11	131		
10	130		
09	129		
08	128		
07	127		
06	126		
05	125		
04	124		
03	123		
02	122		
01	121		

Button LED	Trunk	Set Button LEDs	
		Centrex/PBX Connection (LED ON)	Normal (LED OFF)
04	144		
03	143		
02	142		
01	141		

DK0407

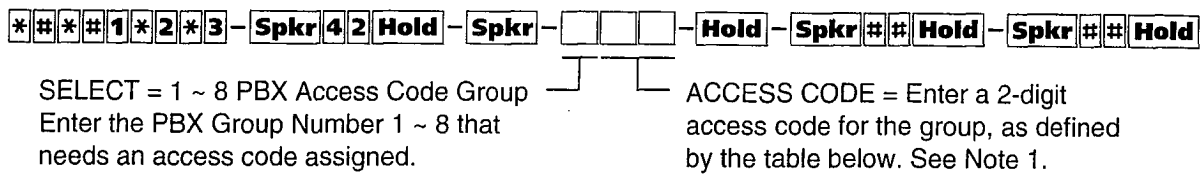
Notes:

1. *To advance the CO line range, press the* **Scroll** *button beneath the LCD, press the* **Page** *button for a lower range.*
2. *To turn all CO LEDs on or off, after the port number code is entered, press the* **Vol▲** *(all LEDs on) or* **Vol▼** *(all LEDs off). To check a particular CO line, after the port number is entered, press* **Mode** *and enter the CO line number, then use the* **#** *button to display and advance.*

General Notes:

- *Initialized data reads all LEDs OFF for all CO lines.*
- *This program enables Centrex/PBX (after flash) features to operate.*
- *If CO line is programmed for behind Centrex/PBX (LED ON), reseize guard time is 1.5 seconds. If CO line is programmed for normal operation guard time is 0.45 seconds. See Program 10-1, Button/LED 02.*
- *Do not use this program if installing DK 280 CO lines behind "assume-9" Centrex.*

Program 42-1~8 — PBX/Centrex Access Codes



PBX/Centrex Access Code Number	PBX/Centrex Outgoing CO Line Access Code(s)	
	1st digit	2nd digit
1		
2		
3		
4		
5		
6		
7		
8		

DK0408

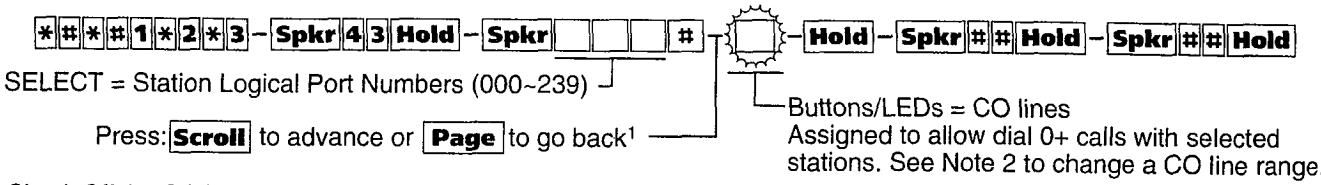
Note:

1. • *If access code is single digit, enter the first digit and press Button/LED 01 as second digit.*
   • *Press Button/LED 01 to delete a digit.*
   • *Press Button/LED 02 for don't care. For example, pressing* **8** *+ Button/LED 02 allows 80 ~ 89.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns no access codes to PBX goups.*
- *Use this program to allow correct Toll Restriction and Centrex/PBX transfer operation.*
- *Do not use this program if installing DK 280 CO lines behind "assume-9" Centrex.*

Program 43 — 0 + Credit Card Dialing Option



Check Off the CO Line and Port Range Covered by this Record Sheet

Trunk Range	001 ~ 040___	041 ~ 080___	081 ~ 120___	121 ~ 144___		
Port Range	000 ~ 039___	040 ~ 079___	080 ~ 119___	120 ~ 159___	160 ~ 199___	200 ~ 239___

Copy this record sheet for more CO lines and ports.

PORTS →											
CO line	LED ↓										
	20										
	19										
	18										
	17										
	16										
	15										
	14										
	13										
	12										
	11										
	10										
	09										
	08										
	07										
	06										
	05										
	04										
	03										
	02										
	01										
	20										
	19										
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	14										
	13										
	12										
	11										
	10										
	09										
	08										
	07										
	06										
	05										
	04										
	03										
	02										
	01										

Notes:

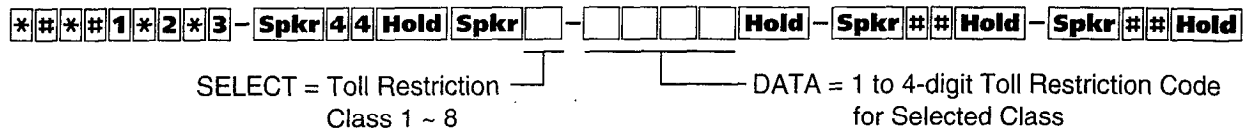
DK409

1. *To advance the CO line range, press the* **Scroll** *button beneath the LCD. Press the* **Page** *button for a lower range.*
2. *To turn all CO LEDs on or off, after the port number is entered, press the* **Vol▲** *(all LEDs on) or* **Vol▼** *(all LEDs off). To check a particular CO line, after the port number is entered, press* **Mode** *and enter the CO line number, then use the # button to display and advance.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized DATA, all LEDS off.*

Program 44-1~8 — Toll Restriction (1 ~ 8)/Traveling Class Override Codes

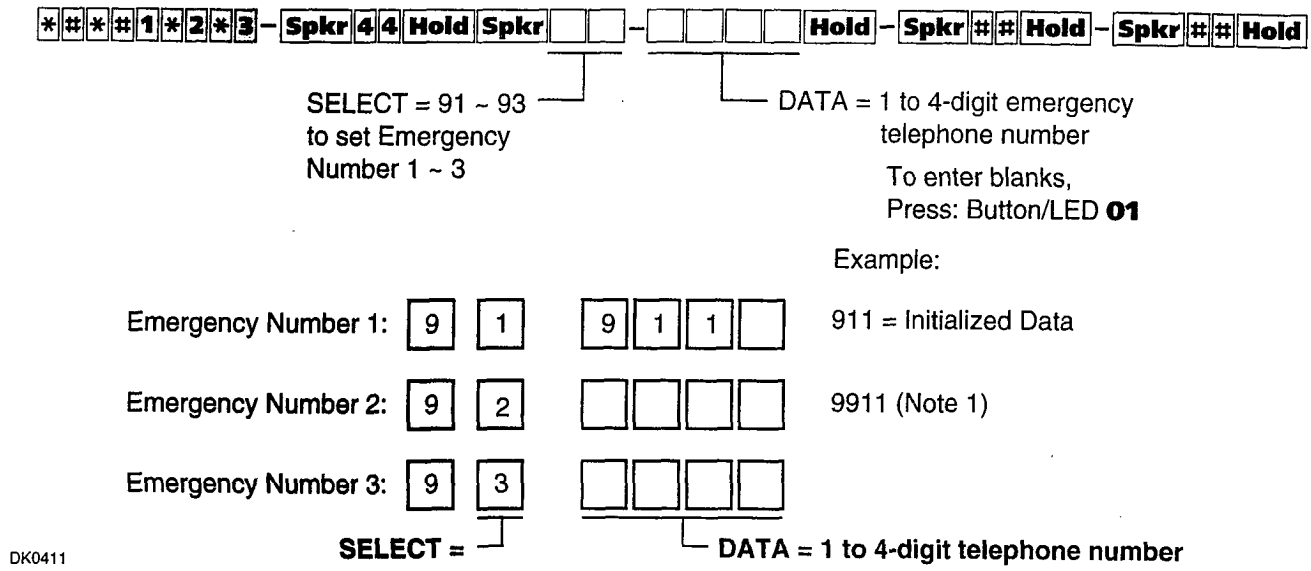


General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Classes 1 ~ 8 are defined in Program 46.*
- *When the Toll Restriction Override code is dialed, the station's class defined in Program 48 will change to the class assigned to the code in Program 44-1 ~ 8.*
- *Do not use same codes set in Program 45 (8 and 9).*
- *Stations enabled in Program 30, Button/LED 16 ON, are allowed to enter and change Toll Restriction Class (1 ~ 8) override codes.*
- *RCTUA, RCTUBA/BB, and RCTUB can support up to four Toll Restriction Traveling Class codes. RCTUC/D can support up to eight.*
- *Initialized Data = all Classes Blank (no code).*

DK0410

Program 44-91~93 — Emergency Bypass of Forced/Verified Account Codes



Note:

1. *If CO lines are behind PBX or Centrex, program the PBX/Centrex outside CO line access code: Example: "9". A pause is automatically inserted following the first 9. See Programs 42-0 and 42-1 to assign the CO line and access code for behind PBX/Centrex operation. Also, if the system CO lines are behind Centrex/PBX, the Centrex/PBX CO line access codes must be programmed in front of the emergency telephone number. Example: If the Centrex/PBX access code is "9", then enter 9911 in Program 44-91 ~ 93.*

General Notes:

- *The emergency telephone numbers assigned in this program will be sent out to the CO line immediately when dialed; they will bypass the Forced/Verified Account Code dialing restriction.*
- *If Verified Account Codes assigned in Program 69 conflict (are the same) with emergency telephone numbers assigned in Program 44-91 ~ 93; Program 44-91 ~ 93 has priority.*
- *This feature is for use with Forced (Verified or Nonverified) Account Codes, but not with ABR and DISA. It also does not override Toll Restriction; emergency numbers must be allowed using system Toll Restriction tables per normal Toll Restriction programming procedures.*
- *Program 44-1 ~ 8 is related to Toll Restriction and is placed with the other Toll Restriction programs in this chapter.*

Program 45-1 — LCR/Toll Restriction Dial Plan

[*][#][*][#][1][*][2][*][3] – [Spkr][4][5][Hold] – [Spkr][1][ ][Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = 1 — DATA = Plan 1 ~ 9
Enter Codes 1 ~ 9 to indicate the dial plan for the system.

X	Plan	Toll Restriction/LCR Dial Plans
	9	(101XXXX)+1+NXX+NXX/NXX
	8	(101YXXX)+1+NXX+NXX/NXX
	7	(10XXX)+1+NXX+NXX/NXX
	6	See Note 2
	5	0+ (Note 1)
	4	Universal (Note 1)
	3	(10XXX)+1+AC+NXX/NXX
	2	(10XXX)+1+AC+NXX/1+NNX
	1	(10XXX)+AC+NXX/1+NNX

DK0412

Where:

In NXX and NNX, X = 0 ~ 9, N = 2 ~ 9.
*NXX = Office code (interchangeable; second digit can be **1** or **0**).*
*NNX = Office code (**not** interchangeable; second digit **cannot** be **1** or **0**).*
AC = Area Code
1+ NNX indicates 1 may be dialed before office codes.
10XXX = old 5-digit Carrier Access Codes
101YXXX/101XXXX = new 7-digit Carrier Access Codes
Y = 0, 5 or 6.

IMPORTANT!

The correct Dial Plan must be assigned to allow system LCR and/or Toll Restriction to function properly.

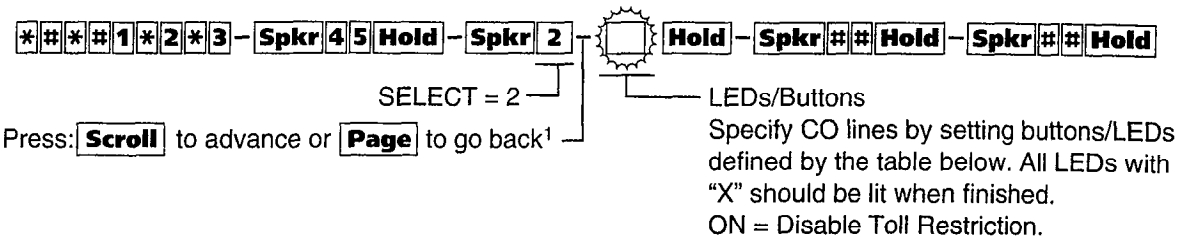
Notes:

1. *0+ and universal (Codes 5 and 4) are not used in USA.*
2. *For UK only.*

General Notes:

- *Initialized data assigns Dial Plan 7 to the system with Release 3 and above software; and, Dial Plan 1 with Release 1 and 2 software.*
- *The DK280 will restrict direct dialing of 10XXX+1 and 10XXXXX+1 access codes. These codes are allowed in system speed dial and LCR modified digit tables. This is necessary to control Long-Distance-Carrier access. 10XXX+0 and 10XXXXX+0 are allowed/denied depending on the station's class and Program 46 (10~80) button/LED 01 assignment.*
- *For NANP (North American Numbering Plan) upgraded SW version, the dial plan may also be changed from the station port 000 by entering **INTERCOM** or **DN # 650 6267 X REDIAL**, where X = dial plan number.*

Program 45-2 — Toll Restriction Disable (CO Lines 001 ~ 080)



Specify CO lines by setting buttons/LEDs as defined by the table below. All LEDs with an "X" should be lit when finished.
ON = Disable Toll Restriction.

LED	Trunk	X
20	040	
19	039	
18	038	
17	037	
16	036	
15	035	
14	034	
13	033	
12	032	
11	031	
10	030	
09	029	
08	028	
07	027	
06	026	
05	025	
04	024	
03	023	
02	022	
01	021	
20	020	
19	019	
18	018	
17	017	
16	016	
15	015	
14	014	
13	013	
12	012	
11	011	
10	010	
09	009	
08	008	
07	007	
06	006	
05	005	
04	004	
03	003	
02	002	
01	001	

LED	Trunk	X
20	080	
19	079	
18	078	
17	077	
16	076	
15	075	
14	074	
13	073	
12	072	
11	071	
10	070	
09	069	
08	068	
07	067	
06	066	
05	065	
04	064	
03	063	
02	062	
01	061	
20	060	
19	059	
18	058	
17	057	
16	056	
15	055	
14	054	
13	053	
12	052	
11	051	
10	050	
09	049	
08	048	
07	047	
06	046	
05	045	
04	044	
03	043	
02	042	
01	041	

DK0413

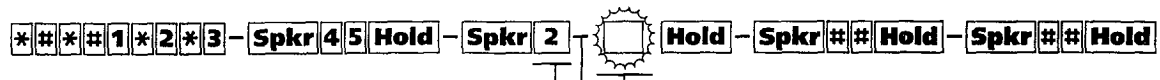
Note:

1. *To turn all CO LEDs on or off, press the* **Vol▲** *(all LEDs on) or* **Vol▼** *(all LEDs off).*

General Notes:

- *To advance the CO line range, press the* **Scroll** *button beneath the LCD. Press the* **Page** *button for a lower range.*
- *Initialized data reads all LEDs OFF for all CO lines (all lines will apply Toll Restriction).*

Program 45-2 — Toll Restriction Disable (CO Lines 081 ~ 144)



Press: **Scroll** to advance or **Page** to go back[1]

Specify CO lines by setting buttons/LEDs as defined by the table below. All LEDs with an "X" should be lit when finished.
ON = Disable Toll Restriction.

LED	Trunk	X
20	120	
19	119	
18	118	
17	117	
16	116	
15	115	
14	114	
13	113	
12	112	
11	111	
10	110	
09	109	
08	108	
07	107	
06	106	
05	105	
04	104	
03	103	
02	102	
01	101	
20	100	
19	099	
18	098	
17	097	
16	096	
15	095	
14	094	
13	093	
12	092	
11	091	
10	090	
09	089	
08	088	
07	087	
06	086	
05	085	
04	084	
03	083	
02	082	
01	081	

LED	Trunk	X
04	144	
03	143	
02	142	
01	141	
20	140	
19	139	
18	138	
17	137	
16	136	
15	135	
14	134	
13	133	
12	132	
11	131	
10	130	
09	129	
08	128	
07	127	
06	126	
05	125	
04	124	
03	123	
02	122	
01	121	

DK0414

Note:

1. *To turn all CO LEDs on or off, press the* **Vol▲** *(all LEDs on) or* **Vol▼** *(all LEDs off).*

General Notes:

- *To advance the CO line range, press the* **Scroll** *button beneath the LCD. Press the* **Page** *button for a lower range.*
- *Initialized data reads all LEDs OFF for all CO lines (all lines will apply Toll Restriction).*

Program 45-3 ~ 6 — Special Common Carrier (SPCC) Numbers and Authorization Code Digit Length

Item	Description	Data = 1st five digits of SPCC Number or Digit Length
3	SPCC1 Number	☐☐☐☐☐
4	Allowed Digit Length (00 ~ 99)[2]	☐☐
5	SPCC2	☐☐☐☐☐
6	Allowed Digit Length (00 ~ 99)[2]	☐☐

DK0415

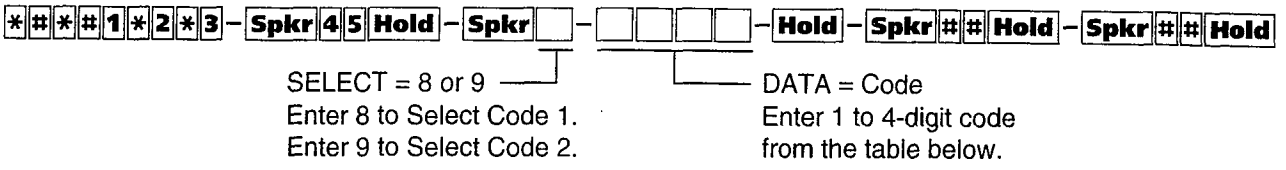
Notes:

1. *When editing,*
   - *Press # to move cursor.*
   - *Press button/LED 01 to delete or leave a blank.*
   - *Press button/LED 02 to allow all digits to work.*
2. *The allowed digit length is the total number of digits allowed to be dialed after the SPCC Number before toll Restriction Digit Restriction activates. In most cases, 99 digits should be allowed for voice mail applications.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns "00" data to Items 4 and 6, and assigns blank data to Items 3 and 5.*
- *Do not enter a digit length greater than necessary or users may be able to override Toll Restriction.*
- *This program is designed for the following Special Common Carrier (SPCC) access dialing sequence: SPCC Number + Telephone Number + CREDIT CARD Authorization Code. This program requires only the first five digits of the SPCC Number (950XXXX). SMDR will print out the following: SPCC Number + ---- + Telephone Number. (The Authorization Code will not print out. If the SPCC access code is a 1+800 number, the dialed SPCC code will over. Write in the actual telephone number dialed on the SMDR report.*
- *Do not assign 10XXX or 101XXXX Carrier Access Codes (CACs) in this Program. The DK280 automatically treats CACs as special codes and applies Toll Restriction and LCR as shown below:*
  - *For stations that are Toll Restricted, 10XXX+1/101XXXX+1 are restricted for manual dialing but are allowed in system speed dial and LCR modified digit tables.*
  - *10XXX+0/101XXXX+0 are allowed or denied depending on the station's class and 46 (10-80) Key 01 assignment.*
  - *LCR always routes 10XXX and 101XXXX via the local route plan, if not restricted.*

Program 45-8,9 — Toll Restriction Override Code



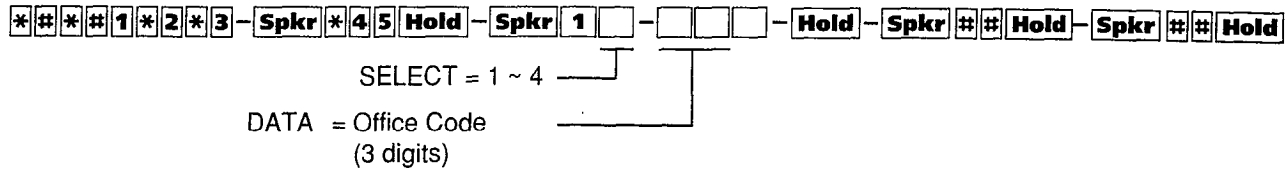
Select =		Code (1 to 4 digits)
8	Code 1	[ ][ ][ ][ ]
9	Code 2	[ ][ ][ ][ ]

DK0416

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *When editing the data field, use Button/LED 01 to delete a digit; Button/LED 02 to allow all digits to work.*
- *Initialized data leaves code assignments blank.*
- *Codes may be revised by station users specified in Program 30, Button/LED 09.*
- *Do not use same 4-digit codes set in Program 44-1 ~ 8, Toll Restriction/Traveling Class (1 ~ 8) Override codes. Program 45 (8 ~ 9) overrides Program 44-1 ~ 8 if same codes are used.*

Program *45-1 — Toll Restriction for Office Codes in Local and All Other Area Codes (R3)[1]



SELECT =	OFFICE CODE
1	976
2	
3	
4	

DK0417

Note:

1. *This program option is provided with DK280, R3 Program 45 Dial Plan 7, 8, or 9 only.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *When editing the data field, use Button/LED 01 to delete a digit.*
- *Initialized data assigns the first office code, 976, to be restricted for all area codes. The other three office codes to be restricted are left blank.*
- *This table applies to all staions with Program 48 TR Codes 03~10 only (TR classes 1~8); not to stations with Program 48 TR Codes 00, 01, or 02.*

Program *45-2 — LCR/Toll Restriction Bypass for Special Numbers That Do Not Begin with * or # Digits (R3)

[*][#][*][#][1][*][2][*][3] – [Spkr] [*][4][5] [Hold] – [Spkr] [2] [ ] – [ ][ ][ ][ ][ ] – [Hold] – [Spkr] [#][#] [Hold] – [Spkr] [#][#] [Hold]

SELECT = 1 ~ 6

DATA = 1 ~ 5 Digit Code (that are not subject to toll restriction)
First digit: 0 ~ 9 only
Non-First digits: 0 ~ 9, *, #
Button 01: Blank (end digit string)[1]
Button 02: Wild Card digit (any digit, 0 ~ 9)

SELECT =	DATA = 1 ~ 5 DIGITS
1	
2	
3	
4	
5	
6	

Note:

1. *The table shown above allows up to 5-digit numbers. If the number to be entered is less than 5 digits, enter Blanks (Button 01) for all digits less than 5 digits. See example b below where 817 is the data entered.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *When editing the data field, use Button/LED 01 to end the digit string, Button/LED 02 to assign a wild card value (0~ 9, *, #).*
- *Initialized data leaves all data blank.*
- *See Program 46 (10 ~ 80) Button/LED 04 should be OFF when dialing codes containing * and/or #.*
- *This program option is provided with DK280, R3 Program 45, Dial Plan 7, 8, and 9 (only).*
- a. *Use this program to allow special CO Area Codes and Centrex feature access codes or extension numbers to bypass toll restrication and route over the local LCR route - if using LCR. (Toll Restriction will always be applied after dialing the special numbers assigned to this table.*

  EXAMPLE:

  If using LCR behind "assume 9" Centrex,and restricted stations (1+AC not allowed) must dial 12XX# and 13XX# as Centrex station numbers (# is the Centrex suffix for extensions)

  Enter:

  [1][2] [Button 02] [Button 02] [#] and [1][3] [Button 02] [Button 02] [#] as data in Programs *45-21 and *45-22, respectively.

  This will allow Centrex station numbers (1200# ~ 1299# and 1300# ~ 1399#) to de dialed - overriding Toll Restriction.

  b. *Use this table to Toll Restrict and/or LCR route office codes in 10-digit dialing areas. If some non-toll numbers require 10-digit dialing: Area Code (AC) + Office Code (OC) + YYYY dialing (no digit "1" before the area code) enter the area code in this table if dialing through LCR. Area codes entered in this table (without the long distance "1" prefix) will be routed over the LCR local call route when dialed with the AC + OC + YYYY format.*

  EXAMPLE:

  If area code 817 is a local area code that must be dialed without the prefix digit "1",

  enter: [8][1][7] [Button 01] [Button 01]

  in Program *45-2X. With this entry, LCR will route 817 calls over the local route after dialing: **817 XXX XXX**.

DK0418

Program *45-3 — LCR/Toll Restriction Bypass for Special Numbers That Begin with * or # Digits (R3)

[*][#][*][#][1][*][2][*][3]–[Spkr][*][4][5][Hold]–[Spkr][3][ ]–[ ][ ][ ]–[ ]–[Hold]–[Spkr][#][#][Hold]–[Spkr][#][#][Hold]

SELECT = 1 ~ 9

DATA = Digit string
(1 ~ 3 digits. Do not enter * or #)
Button 01 = blank (end digit string)[1]
Button 02 = Wild Card digit (any digit: 0 ~ 9)

OPTION = 0 ~ 2
0 = No Toll Restriction after Special Code
1 = Toll Restriction after Special Code
2 = Special Code Restricted

SELECT =	DATA =	OPTION =
1		
2		
3		
4		
5		
6		
7		
8		
9		

DK0419

Note:

1. *If the digit string is less than 3 digits, blanks must be entered in place of each digit less than 3 digits.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *When editing the data field, use Button/LED 01 to end the digit string, Button/LED 02 to assign a wild card value (any digit: 0 ~ 9).*
- *Initialized data leaves all data blank.*
- *This program option is provided with DK280, R3, Program 45 Dial Plan 7, 8, and 9 only.*
- *Use this program to allow special CO or Centrex access codes that begin with the * or # prefix. Assign them in this table if it is required to bypass Toll Restriction and/or route over the local LCR route, if using LCR. (T.R. options 0 ~ 2 will be applied after dialing the special numbers assigned in this table).*

  EXAMPLE 1:

  If using LCR behind Centrex and you must dial Centrex speed dial numbers ***700** ~ ***799**, enter: [7][Button 02][Button 02][0] in Program *45-31. In this case, Toll Restriction will not be appplied after the Centrex speed dial number (***7XX**) is sent to the Centrex because Option "0" is set.

  EXAMPLE 2:

  If you are dialing out and you wish to block the Caller ID feature, you must dial ***67** or the appropriate provider's code (e.g., ***82**, ***85**). In this case enter: [6][7][Button 01][1] in Table *45-31. In this case the user dials ***67** + telephone number and Toll Restriction is applied to the telephone number after ***67** is dialed because Option "1" is set.

- *To allow * or # to be entered as a first digit, a number must be entered in at least one table of Program *45-3X; do not enter * and # as the first digit of any number in Program *45-3X; DK280 assumes the number entered in this table begins with a * or #.*

Program 46-2 ~ 4 — Toll Restriction Allowed/Denied Area Codes Assigned by Class (Class 1 ~ 4)

[*][#][*][#][1][*][2][*][3] – [Spkr][4][6][Hold] – [Spkr][ ][ ] – [ ][ ][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Class Number — Enter Toll Restriction class number 1 ~ 4.

2, 3 or 4# — Enter one of the following numbers: 2 = add to memory, 3 = delete from memory, 4# = display allowed codes in memory.

DATA = Area Codes — Enter or display area codes. See Notes 1 and 2.

Class 1	Allowed ☐	Denied ☐	(Check one)
Area Codes			

Class 2	Allowed ☐	Denied ☐	(Check one)
Area Codes			

Class 3	Allowed ☐	Denied ☐	(Check one)
Area Codes			

Class 4	Allowed ☐	Denied ☐	(Check one)
Area Codes			

DK0420

Notes:

1. *A range of area codes can be entered by pressing:* [ ][ ][ ][*][ ][ ][ ][#][ ][ ][ ][*][ ][ ][ ]
   - *Low Area Code*
   - *High Area Code*
   - *Denotes end of string*
2. *Several ranges or individual area codes may be entered by separating them with the # button.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data includes all area codes in all classes.*
- *Tables with deny box checked do not represent memory. All area codes in memory are allowed.*
- *International calls may be allowed/denied by entering 011 as the area code. See Program 47 General Notes for International Call Restriction by Country Codes.*

Program 46-2 ~ 4 — Toll Restriction Allowed/Denied Area Codes Assigned by Class (Class 5 ~ 8 RCTUC/D Only)

[*][#][*][#][1][*][2][*][3] – [Spkr] [4] [6] [Hold] – [Spkr] [ ][ ] – [ ][ ][ ] – [Hold] – [Spkr] [#][#] [Hold] – [Spkr] [#][#] [Hold]

SELECT = Class Number — Enter Toll Restriction Class 5 ~ 8.

2, 3 or 4# — Enter one of the following numbers: 2 = add to memory, 3 = delete from memory, 4# = display allowed codes in memory.

DATA = Area Codes — Enter or display area codes. See Notes 1 and 2.

Class 5 Allowed ☐ Denied ☐ (Check one)

Area Codes									

Class 6 Allowed ☐ Denied ☐ (Check one)

Area Codes									

Class 7 Allowed ☐ Denied ☐ (Check one)

Area Codes									

Class 8 Allowed ☐ Denied ☐ (Check one)

Area Codes									

DK0421

Notes:

1. *A range of area codes can be entered by pressing:* [ ][ ][ ][*] [ ][ ][ ][#] [ ][ ][ ][*] [ ][ ][ ]
   - *Low Area Code*
   - *High Area Code*
   - *Denotes end of string*
2. *Several ranges or individual area codes may be entered by separating them with the # button.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data includes all area codes in all classes.*
- *Tables with deny box checked do not represent memory. All area codes in memory are allowed.*
- *International calls may be allowed/denied by entering 011 as the area code. See Program 47 General Notes for International Call Restriction by Country Codes.*

Program 46-6 ~ 8 — Toll Restriction Allowed/Denied Office Codes Assigned by Class (Class 1 ~ 4) for Local Calls

[*][#][*][#][1][*][2][*][3] – [Spkr][4][6][Hold] – [Spkr][ ][ ] – [ ][ ][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Class Number — Enter Toll Restriction Class 1 ~ 4.

6, 7 or 8# — Enter one of the following numbers: 6 = add to memory, 7 = delete from memory, 8# = display allowed codes in memory.

DATA = Office Codes — Enter or display office codes. See Notes 1 and 2.

Class 1	Allowed ☐	Denied ☐	(Check one)
Office Codes			

Class 2	Allowed ☐	Denied ☐	(Check one)
Office Codes			

Class 3	Allowed ☐	Denied ☐	(Check one)
Office Codes			

Class 4	Allowed ☐	Denied ☐	(Check one)
Office Codes			

DK0422

Notes:

1. *A range of office codes can be entered by pressing:* [ ][ ][ ][*][ ][ ][ ][#][ ][ ][ ][*][ ][ ][ ]

   Low Area Code — *High Area Code* — *Denotes end of string*

2. *Several ranges or individual office codes may be entered by separating them with the # button.*

General Notes:

- *Initialized data includes all office codes in memory in all classes (allowed)*
- *Tables with deny box checked do not represent memory. All office codes in memory are allowed.*

Program 46-6 ~ 8 — Toll Restriction Allowed/Denied Office Codes Assigned by Class (Class 5 ~ 8 RCTUC/D Only) for Local Calls

###1*2*3–Spkr 4 6 Hold–Spkr [ ][ ]–[ ][ ][ ]–Hold–Spkr ## Hold–Spkr ## Hold

SELECT = Class Number
Enter Toll Restriction Class 5 ~ 8.

6, 7 or 8#
Enter one of the following numbers: 6 = add to memory, 7 = delete from memory, 8# = display allowed codes in memory.

DATA = Office Codes
Enter or display office codes.
See Notes 1 and 2.

Class 5	Allowed ☐	Denied ☐ (Check one)
Office Codes		

Class 6	Allowed ☐	Denied ☐ (Check one)
Office Codes		

Class 7	Allowed ☐	Denied ☐ (Check one)
Office Codes		

Class 8	Allowed ☐	Denied ☐ (Check one)
Office Codes		

DK0423

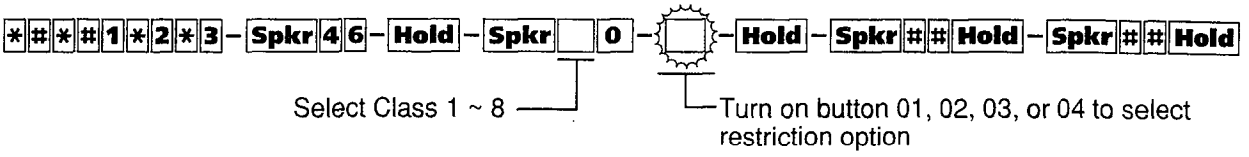
Notes:

1. *A range of office codes can be entered by pressing:* [ ][ ][ ]*[ ][ ][ ]#[ ][ ][ ]*[ ][ ][ ]
   Low Area Code — *High Area Code* — *Denotes end of string*
2. *Several ranges or individual office codes may be entered by separating them with the # button.*

General Notes:

- *Initialized data includes all office codes in memory in all classes (allowed)*
- *Tables with deny box checked do not represent memory. All office codes in memory are allowed.*

Program 46 (10 ~ 80) — Toll Restriction Class Parameters



Class Number	Restriction Options							
	Button 01 LED		Button 02 LED		Button 03 LED		Button 04 LED[1]	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF
	Dial 0 Restricted	Dial 0 Allowed	Dial 01 Restricted	Dial 01 Allowed	A/C + 555 OR 1 + A/C + 555 Allowed for all A/Cs	555 Allowed or Denied per A/C Restriction Table	Restrict Numbers that contain * or # within the first 4 digits[1]	Allow Numbers that contain * or # within the first 4 digits[1]
1								
2								
3								
4								
5								
6								
7								
8								

DK0424

Note:

1. *LED 04 should be turned ON only if the DK280 outgoing CO lines are installed behind a Central office that absorbs * and # digits. Button LED 04 applies only to the first 4 digits of a dialed number when no digit restriction (Code 0) is set for the station T.R. class in Program 48.*

   EXAMPLE:

   If LED 04 is "ON", **1 7 #** will be restricted when the **#** is dialed but **1 7 5 1 #** will be allowed because the **#** comes after the fourth digit dialed.

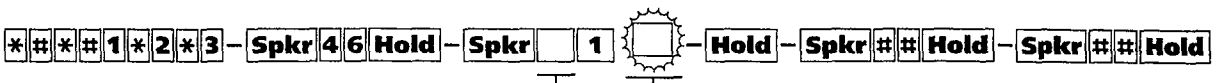
General Notes:

- *Initialized Data = all LEDs off*
- *With DK280 Release 1, 2, and 3 RCTUA, RCTUBA/BB, and RCTUB provides Classes 1 ~ 4, RCTU C/D provides Classes 1 ~ 8.*
- *Numbers set in Program *45-2X will override the #/* restriction function of Program 46(10~80) Button LED 04.*

  EXAMPLE:

  If **1 7 #** is set in Program *45-21, then **1 7 #** will be allowed even if LED 04 is ON in Program 45(10~80) but **1 Z #** will be restricted where **Z** = any digit except 7.

Program 46 (11 ~ 81) — Toll Restriction Class (1 ~ 8) Parameters



Copy as required for each Class.

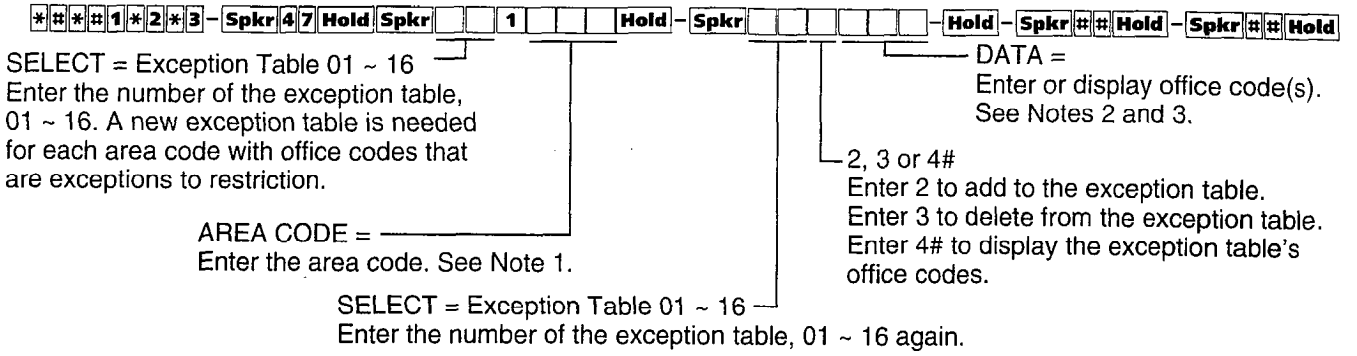
LED	X	LED ON	LED OFF
20			
19			
18			
17			
16		Table 16 Area/Office Exception	Not Selected
15		Table 15 Area/Office Exception	Not Selected
14		Table 14 Area/Office Exception	Not Selected
13		Table 13 Area/Office Exception	Not Selected
12		Table 12 Area/Office Exception	Not Selected
11		Table 11 Area/Office Exception	Not Selected
10		Table 10 Area/Office Exception	Not Selected
09		Table 09 Area/Office Exception	Not Selected
08		Table 08 Area/Office Exception	Not Selected
07		Table 07 Area/Office Exception	Not Selected
06		Table 06 Area/Office Exception	Not Selected
05		Table 05 Area/Office Exception	Not Selected
04		Table 04 Area/Office Exception	Not Selected
03		Table 03 Area/Office Exception	Not Selected
02		Table 02 Area/Office Exception	Not Selected
01		Table 01 Area/Office Exception	Not Selected

DK0425

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data leaves all LEDs OFF.*
- *RCTUA, RCTUBA/BB, and RCTUB provide 8 tables; RCTU C/D provides 16 tables.*
- *RCTUA, RCTUBA/BB, and RCTUB provides Classes 1 ~ 4; RCTU C/D provides Classes 1 ~ 8.*
- *Table 01 ~ 16, Area/Office Exception tables are created with Program 47.*

Program 47 — Toll Restriction Exception Office Codes Assigned by Area Codes



(Copy blank record sheets as required)

Exception Table (01 ~ 16) ☐

Area Code ☐☐☐

Record of Exception Office Codes (Data)

Exception Table (01 ~ 16) ☐

Area Code ☐☐☐

Record of Exception Office Codes (Data)

DK0426

Notes:

1. *Only one area code may be entered per exception table.*
2. *To enter a range of office codes, key in:* ☐☐☐ * ☐☐☐ # ☐☐☐ * ☐☐☐

   Low Office Code — *High Office Code* — *Denotes end of string*
3. *Several ranges or individual office codes may be entered by separating them with a* **#** *button.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns no office codes to tables.*
- *With DK280 Release 1, 2, and 3, maximum of 16 exception tables, for RCTU C/D, 8 exception tables for RCTUA, RCTUBA/BB, and RCTUB.*
- *For International Call Restriction by country codes, enter 011 for the area code, and Restricted country code(s) in the office table(s). To fully restrict a 2-digit country code, also Restrict the imaginary 3rd digit of that country code. For example, to Restrict country code 81, you must Restrict 10 country codes 810 to 819.*

Program 48 — Station Toll Restriction Classification (Ports 000 ~ 120)

##1*2*3–Spkr 4 8 Hold–Spkr [ ][ ][ ]# –[ ][ ][ ]–Hold–Spkr ##Hold–Spkr ##Hold

SELECT = Port Number(s)
Enter the port number(s) of the station(s) being defined.
See Note 1 for entering a range.

DATA =
Digit Restriction Code 0 or 1
Enter 0 for no digit restriction.
Enter 1 for digit restriction.

Station Restriction Code (00 ~ 10)
Enter 00 for No Station Toll Restriction.
Enter 01 for Area Code Toll Restriction and 0 or 1 as 1st digit.[3]
Enter 02 for Area Code Toll Restriction and 0 or 1 as 1st digit.[3]
Enter 03 for Class 1 T.R. Enter 07 for Class 5
Enter 04 for Class 2 T.R. Enter 08 for Class 6
Enter 05 for Class 3 T.R. Enter 09 for Class 7
Enter 06 for Class 4 T.R. Enter 10 for Class 8

Port No.	Digit Restrict Code	Station Restrict Code
000		
001		
002		
003		
004		
005		
006		
007		
008		
009		
010		
011		
012		
013		
014		
015		
016		
017		
018		
019		
020		
021		
022		
023		
024		
025		
026		
027		
028		
029		
030		
031		

Port No.	Digit Restrict Code	Station Restrict Code
032		
033		
034		
035		
036		
037		
038		
039[2]		
040		
041		
042		
043		
044		
045		
046		
047		
048		
049		
050		
051		
052		
053		
054		
055		
056		
057		
058		
059		
060		
061		
062		
063		

Port No.	Digit Restrict Code	Station Restrict Code
064		
065		
066		
067		
068		
069		
070		
071		
072		
073		
074		
075		
076		
077		
078		
079		
080		
081		
082		
083		
084		
085		
086		
087		
088		
089[2]		
090		
091		
092		
093		
094		
095		

Port No.	Digit Restrict Code	Station Restrict Code
096		
097		
098		
099		
100		
101		
102		
103		
104		
105		
106		
107		
108		
109		
110		
111		
112		
113		
114		
115		
116		
117		
118		
119		
120		

DK0427

Notes:

1. *A range of ports may be entered:* [ ][ ][ ]*[ ][ ][ ] (Low port — High port)
2. *Toll Restriction Classification Ports for DISA calls are: Port 039-RCTUA, Port 089-RCTUB and RCTUBA/BB, and Port 249 for RCTU C/D.*
3. *If dial "0" credit card calling must be allowed use Program 43 to assign designated stations/CO lines to allow credit card calling.*

General Notes:

- *Initialized data reads "100" for all ports.*
- *RCTU C/D provides 8 classes, RCTUA, RCTUBA/BB, and RCTUB provides 4 classes.*

Program 48 — Station Toll Restriction Classification (Ports 121 ~ 239)

##1*2*3 – Spkr 48 Hold – Spkr [ ][ ][ ]# – [ ][ ][ ] – Hold – Spkr ##Hold – Spkr ##Hold

SELECT = Station Logical Port Number(s)
Enter the port number(s) of the station(s) being defined.
See Note 1 for entering a range.

DATA =
Digit Restriction Code 0 or 1
Enter 0 for no digit restriction.
Enter 1 for digit restriction.

Station Restriction Code (00 ~ 10)
Enter 00 for No Station Toll Restriction.
Enter 01 for Area Code Toll Restriction and 0 or 1 as 1st digit.[3]
Enter 02 for Area Code Toll Restriction and 0 or 1 as 1st digit.[3]
Enter 03 for Class 1 T.R. Enter 07 for Class 5
Enter 04 for Class 2 T.R. Enter 08 for Class 6
Enter 05 for Class 3 T.R. Enter 09 for Class 7
Enter 06 for Class 4 T.R. Enter 10 for Class 8

Port No.	Digit Restrict Code	Station Restrict Code
121		
122		
123		
124		
125		
126		
127		
128		
129		
130		
131		
132		
133		
134		
135		
136		
137		
138		
139		
140		
141		
142		
143		
144		
145		
146		
147		
148		
149		
150		
151		
152		

Port No.	Digit Restrict Code	Station Restrict Code
153		
154		
155		
156		
157		
158		
159		
160		
161		
162		
163		
164		
165		
166		
167		
168		
169		
170		
171		
172		
173		
174		
175		
176		
177		
178		
179		
180		
181		
182		
183		
184		

Port No.	Digit Restrict Code	Station Restrict Code
185		
186		
187		
188		
189		
190		
191		
192		
193		
194		
195		
196		
197		
198		
199		
200		
201		
202		
203		
204		
205		
206		
207		
208		
209		
210		
211		
212		
213		
214		
215		
216		

Port No.	Digit Restrict Code	Station Restrict Code
217		
218		
219		
220		
221		
222		
223		
224		
225		
226		
227		
228		
229		
230		
231		
232		
233		
234		
235		
236		
237		
238		
239		
249		DISA[2]

DK0428

Notes:

1. *Specify a range of ports by entering:* [ ][ ][ ]*[ ][ ][ ] (Low port — High port)
2. *Toll Restriction Classification Ports for DISA calls are: Port 039-RCTUA, Port 089-RCTUB and RCTUBA/BB, and Port 249 for RCTU C/D.*
3. *If dial "0" credit card calling must be allowed use Program 43 to assign designated stations/CO lines to allow credit card calling.*

General Notes:

- *Initialized data reads "100" for all ports.*
- *RCTU C/D provides 8 classes, RCTUA, RCTUBA/BB, and RCTUB provides 4 classes.*

Least Cost Routing System Record Sheets
Programs 50 ~ 56

LCR CO Line Programming

1. Use Program 16 to assign CO lines in groups per the reference chart below.

CO line Group Reference Chart

Line Group	CO line in Group	CO line Type/Comments
801		
802		
803		
804		
805		
806		
807		
808		
809		
810		
811		
812		
813		
814		
815		
816		

DK0429

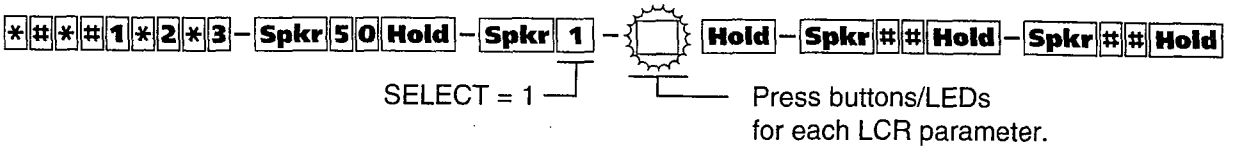
2. Use Program 40 to allow CO line access to stations using LCR for outgoing calls.
3. Use Program 41 to deny outgoing CO line access, except for LCR access.

IMPORTANT !

Area code and office code structure must be defined by (Toll Restriction Dial Plan) for LCR to work properly.

4. Use Program 45-1 to enable the dialplan that is appropriate for the area where the LCR calls will originate.

Program 50-1 — LCR Parameters



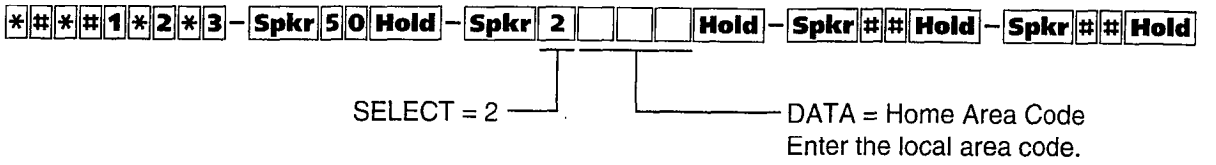
LED	X	LED ON	LED OFF
1		Enable System LCR	No LCR
2		Not Used	Not Used
3		555 LDI Route Per Program 50-4	Per Area Code Table
4		Dial Tone After LCR Access	Silent
5		Warning Tone Last Choice Route No.	No Warning Tone

DK0430

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Program 40 denies CO line access via LCR, but denies all other access methods.*
- *Program 41 allows CO line access via LCR, but denies all other outgoing access methods: (#7001 ~ #7144, 801 ~ 816, Line button).*
- *Initialized data: All LEDs OFF.*
- *Toll Restricted standard telephones should be forced to dial outgoing calls via LCR. This is to prevent Toll Restriction defeat when the RRCS times out.*

Program 50-2 — LCR Home Area Code

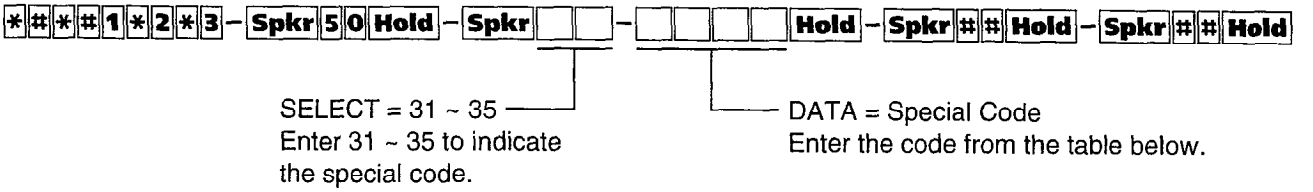


LCR Home Area Code

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Typically this code is entered in Program 51 table for the LCR route plan number defined for the local calls in Program 50-5.*
- *Initialized data leaves the home area code blank.*

Program 50-3 — LCR Special Code



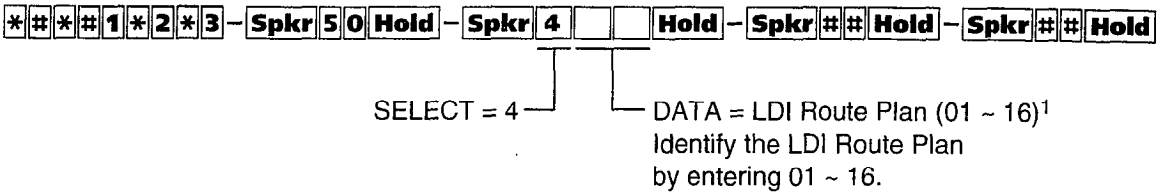
	Special Code	Examples
31		1-411
32		911
33		611
34		
35		

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data leaves all codes blank.*
- *Press Button/LED 01 to erase data; and leave blank.*
- *These calls follow the local call route defined in Program 50-5.*

DK0431

Program 50-4 — LCR Long Distance Information (LDI) Plan Number



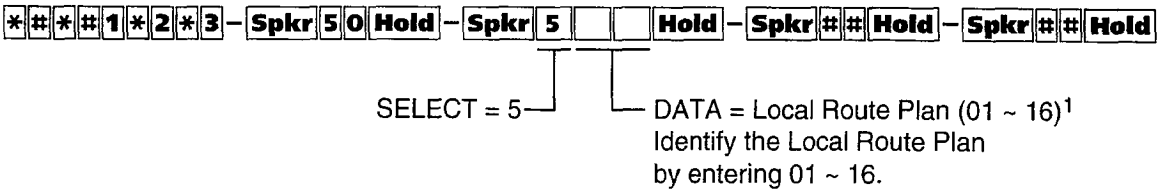
Note:

1. RCTUA and B provide 8 LCR Route Plans, RCTU C/D provides 16.

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns LDI Plan Number 16 for RCTU C/D, or Number 8 for RCTUA and B.*
- *Typically, LDI Plan Number = Local Call Plan Number.*

Program 50-5 — LCR Local Call Plan Number



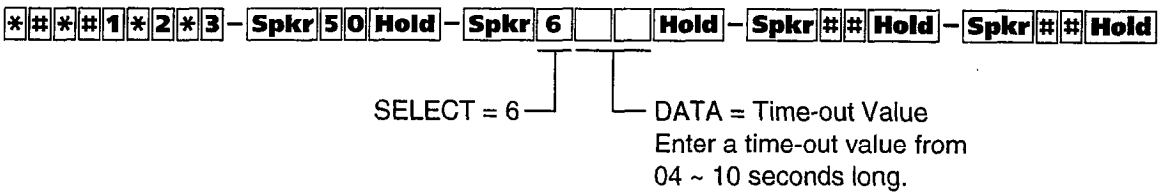
Notes:

1. RCTUA and B provide 8 LCR Route Plans, RCTU C/D provide 16.

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns Plan 16 to be the local call plan for RCTU C/D, or Plan 8 for RCTUA and B.*
- *The local plan handles special codes and operator calls.*

Program 50-6 — LCR Dial Zero Time-out



General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns an LCR Dial Zero Time-out value of 06.*
- *This value determines pause time before sending a call on to an operator, etc.*

DK0432

Program 51 — LCR Area Codes (Plans 1 ~ 4)

[*][#][*][#][1][*][2][*][3] – [Spkr][5][1][Hold] – [Spkr][ ][ ][ ][ ][ ][ ][Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = LCR Plan Number (01 ~ 04)

Action Code:
Enter 2 to add code to table.
Enter 3 to delete code from table.
Enter 4# to display codes in table.

DATA = Area Code(s) (3 digits). See Note 1 for entering a range of area codes.

LCR Plan 01	LCR Plan 02	LCR Plan 03	LCR Plan 04
DATA = Area Code(s)	DATA = Area Code(s)	DATA = Area Code(s)	DATA = Area Code(s)

DK0433

Note:

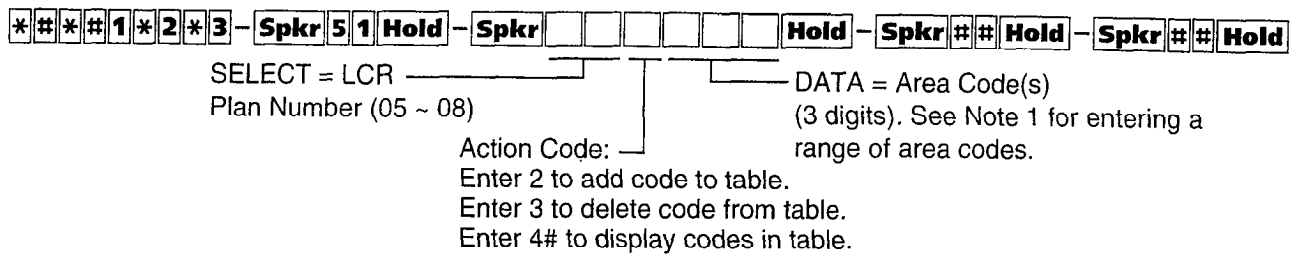
1. *To enter a range of Area Codes, press:* [ ][ ][ ][*][ ][ ][ ][#][ ][ ][ ][*][ ][ ][ ]

Low Area Code — *High Area Code* — *Denotes end of string*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data leaves Tables 01 ~ 15 blank; all codes (000 ~ 999) are initialized in Table 16.*
- *Several ranges or individual codes can be expressed at once by separating them with a # button.*
- *011 may be entered as an Area Code into any LCR plan to route direct dial international calls via LCR. To route international calls by country code, see Note 5 on Program 52 record sheet.*

Program 51 — LCR Area Codes (Plans 5 ~ 8)



LCR Plan 05	LCR Plan 06	LCR Plan 07	LCR Plan 08
DATA = Area Code(s)	DATA = Area Code(s)	DATA = Area Code(s)	DATA = Area Code(s)

DK0434

Note:

1. *To enter a range of Area Codes, press:* [ ][ ][ ] * [ ][ ][ ] # [ ][ ][ ] * [ ][ ][ ]

Low Area Code — *High Area Code* — *Denotes end of string*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data leaves Tables 01 ~ 15 blank; all codes (000 ~ 999) are initialized in Table 16.*
- *Several ranges or individual codes can be expressed at once by separating them with a # button.*
- *011 may be entered as an Area Code into any LCR plan to route direct dial international calls via LCR. To route international calls by country code, see Note 5 on Program 52 record sheet.*

Program 51 — LCR Area Codes (Plans 9 ~ 16, RCTUC/D Only)

##1*2*3 – Spkr 5 1 Hold – Spkr [ ][ ][ ][ ][ ][ ] Hold – Spkr #[ ] Hold – Spkr #[ ] Hold

SELECT = LCR Plan Number (09 ~ 16)

Action Code:
Enter 2 to add code to table.
Enter 3 to delete code from table.
Enter 4# to display codes in table.

DATA = Area Code(s) (3 digits). See Note 1 for entering a range of area codes.

LCR Plan 09	LCR Plan 10	LCR Plan 11	LCR Plan 12	LCR Plan 13	LCR Plan 14	LCR Plan 15	LCR Plan 16
DATA = Area Code(s)	DATA = Area Code(s)	DATA = Area Code(s)	DATA = Area Code(s)	DATA = Area Code(s)	DATA = Area Code(s)	DATA = Area Code(s)	DATA = Area Code(s)

DK0435

Note:

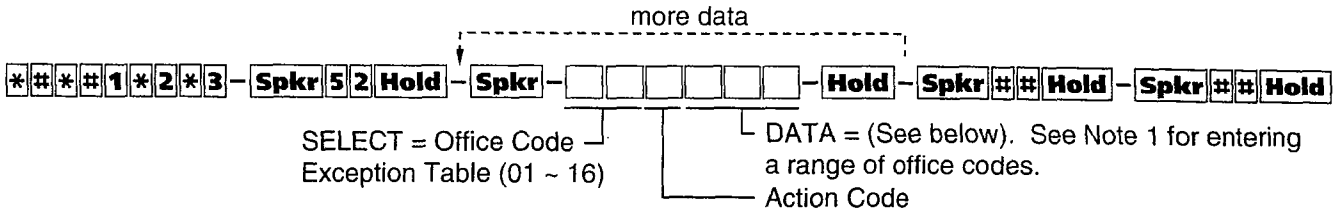
1. *To enter a range of Area Codes, press:* [ ][ ][ ] * [ ][ ][ ] # [ ][ ][ ] * [ ][ ][ ]

Low Area Code — *High Area Code* — *Denotes end of string*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data leaves Tables 01 ~ 15 blank; all codes (000 ~ 999) are initialized in Table 16.*
- *Several ranges or individual codes can be expressed at once by separating them with a # button.*
- *011 may be entered as an Area Code into any LCR plan to route direct dial international calls via LCR. To route international calls by country code, see Note 5 on Program 52 record sheet.*

Program 52 — LCR Office Code Exceptions for Specified Area Code (1 ~ 4)



Action Code Function	Action Codes	DATA =
Assign Exception Table to LCR Plan	0	LCR Plan 01 ~ 16
Assign Area Code to LCR Plan	1	3-digit Area Code
Add Office Codes to Exception Table	2	3-digit Office Code
Delete Office Codes from Exception Table	3	3-digit Office Code
Display Office Codes in Exception Table	4 # more #	3-digit Office Code

Office Code Exception Table 01 for Area Code ___
Assign to LCR Route Plan Number ___ Office Codes:

Office Code Exception Table 02 for Area Code ___
Assign to LCR Route Plan Number ___ Office Codes:

Office Code Exception Table 03 for Area Code ___
Assign to LCR Route Plan Number ___ Office Codes:

Office Code Exception Table 04 for Area Code ___
Assign to LCR Route Plan Number ___ Office Codes:

DK0436

Note:

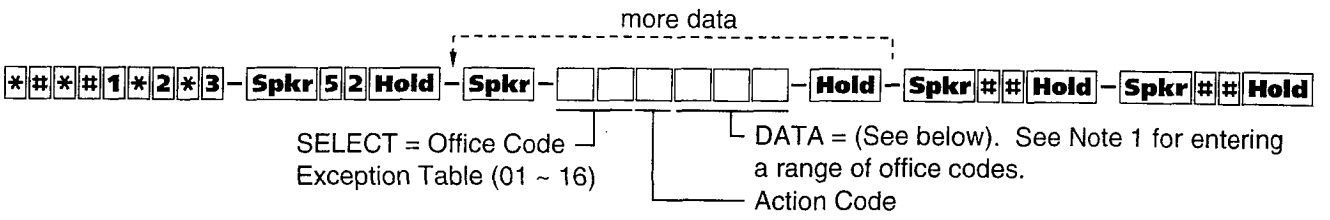
1. *To enter a range of Office Codes, press:* ___*___#___*___

Low Office Code — High Office Code — Denotes end of string

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data leaves all codes blank.*
- *Several ranges or individual codes can be expressed at once by separating them with the # button.*
- *To route International (011) calls over any selected plan by Country Code, program 011 as the Area Code and the Country Code as the Office Code in Program 52 in any Exception Code Table. If the Country Code is two digits, add 10, 3-digit Office Codes as follows: XX0 through XX9, where XX is the Country Code.*

Program 52 — LCR Office Code Exceptions for Specified Area Code (5 ~ 8)



Action Code Function	Action Codes	DATA =
Assign Exception Table to LCR Plan	0	LCR Plan 01 ~ 16
Assign Area Code to LCR Plan	1	3-digit Area Code
Add Office Codes to Exception Table	2	3-digit Office Code
Delete Office Codes from Exception Table	3	3-digit Office Code
Display Office Codes in Exception Table	4 # more #	3-digit Office Code

Office Code Exception Table 05 for Area Code ___
Assign to LCR Route Plan Number ___ Office Codes:

Office Code Exception Table 06 for Area Code ___
Assign to LCR Route Plan Number ___ Office Codes:

Office Code Exception Table 07 for Area Code ___
Assign to LCR Route Plan Number ___ Office Codes:

Office Code Exception Table 08 for Area Code ___
Assign to LCR Route Plan Number ___ Office Codes:

DK0437

Note:

1. *To enter a range of Office Codes, press:* ___ * ___ # ___ * ___

Low Office Code — *High Office Code* — *Denotes end of string*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data leaves all codes blank.*
- *Several ranges or individual codes can be expressed at once by separating them with the # button.*
- *To route International (011) calls over any selected plan by Country Code, program 011 as the Area Code and the Country Code as the Office Code in Program 52 in any Exception Code Table. If the Country Code is two digits, add 10, 3-digit Office Codes as follows: XX0 through XX9, where XX is the Country Code.*

Program 52 — LCR Office Code Exceptions for Specified Area Code (9 ~ 12, RCTUC/D Only)

more data

[*][#][*][#][1][*][2][*][3] – [Spkr][5][2][Hold] – [Spkr] – [ ][ ][ ][ ][ ][ ] – [Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Office Code Exception Table (01 ~ 16)

DATA = (See below). See Note 1 for entering a range of office codes.

Action Code

Action Code Function	Action Codes	DATA =
Assign Exception Table to LCR Plan	[0]	[ ][ ] LCR Plan 01 ~ 16
Assign Area Code to LCR Plan	[1]	[ ][ ][ ] 3-digit Area Code
Add Office Codes to Exception Table	[2]	[ ][ ][ ] 3-digit Office Code
Delete Office Codes from Exception Table	[3]	[ ][ ][ ] 3-digit Office Code
Display Office Codes in Exception Table	[4] [#] more [#]	[ ][ ][ ] 3-digit Office Code

Office Code Exception Table [09] for Area Code [ ][ ][ ]
Assign to LCR Route Plan Number [ ] Office Codes:

Office Code Exception Table [10] for Area Code [ ][ ][ ]
Assign to LCR Route Plan Number [ ] Office Codes:

Office Code Exception Table [11] for Area Code [ ][ ][ ]
Assign to LCR Route Plan Number [ ] Office Codes:

Office Code Exception Table [12] for Area Code [ ][ ][ ]
Assign to LCR Route Plan Number [ ] Office Codes:

DK0438

Note:

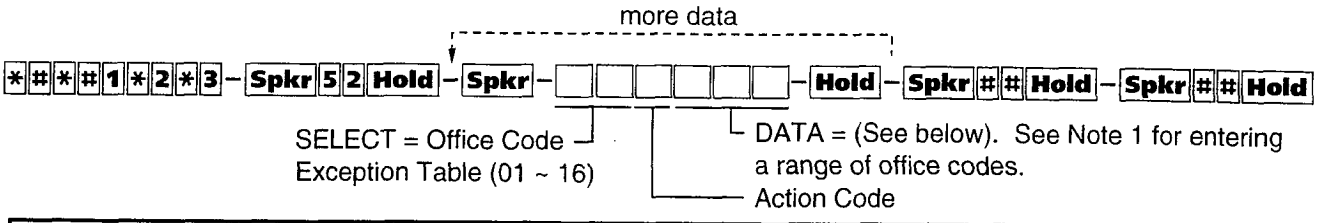
1. *To enter a range of Office Codes, press:* [ ][ ][ ][*][ ][ ][ ][#][ ][ ][ ][*][ ][ ][ ]

Low Office Code — *High Office Code* — *Denotes end of string*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data leaves all codes blank.*
- *Several ranges or individual codes can be expressed at once by separating them with the # button.*
- *To route International (011) calls over any selected plan by Country Code, program 011 as the Area Code and the Country Code as the Office Code in Program 52 in any Exception Code Table. If the Country Code is two digits, add 10, 3-digit Office Codes as follows: XX0 through XX9, where XX is the Country Code.*

Program 52 — LCR Office Code Exceptions for Specified Area Code (13 ~ 16, RCTUC/D Only)



Action Code Function	Action Codes	DATA =
Assign Exception Table to LCR Plan	0	LCR Plan 01 ~ 16
Assign Area Code to LCR Plan	1	3-digit Area Code
Add Office Codes to Exception Table	2	3-digit Office Code
Delete Office Codes from Exception Table	3	3-digit Office Code
Display Office Codes in Exception Table	4 # more #	3-digit Office Code

Office Code Exception Table 13 for Area Code ☐☐☐
Assign to LCR Route Plan Number ☐ Office Codes:

Office Code Exception Table 14 for Area Code ☐☐☐
Assign to LCR Route Plan Number ☐ Office Codes:

Office Code Exception Table 15 for Area Code ☐☐☐
Assign to LCR Route Plan Number ☐ Office Codes:

Office Code Exception Table 16 for Area Code ☐☐☐
Assign to LCR Route Plan Number ☐ Office Codes:

DK0439

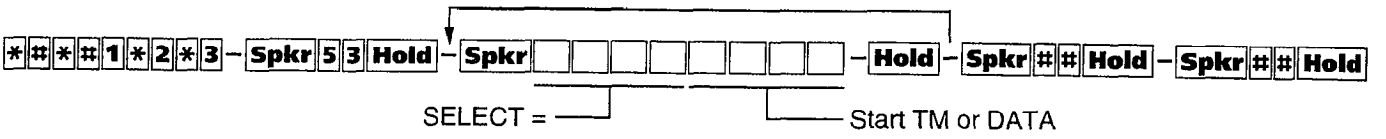
Note:

1. *To enter a range of Office Codes, press:* ☐☐☐ * ☐☐☐ # ☐☐☐ * ☐☐☐
   Low Office Code — High Office Code — Denotes end of string

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data leaves all codes blank.*
- *Several ranges or individual codes can be expressed at once by separating them with the # button.*
- *To route International (011) calls over any selected plan by Country Code, program 011 as the Area Code and the Country Code as the Office Code in Program 52 in any Exception Code Table. If the Country Code is two digits, add 10, 3-digit Office Codes as follows: XX0 through XX9, where XX is the Country Code.*

Program 53 — LCR Schedule Assignments for LCR Plan No. 1 and 2



Start TM Schedule (1 ~ 3) Plan _1_

SELECT			Start TM				
01	1	0					
01	2	0					
01	3	0					

LCR Plan Schedule (1 ~ 3) Action Code

H H M M
(**HH** = 00 ~ 23
MM = 00 ~ 59)

	SELECT			DATA (Route Choices)			
Schedule 1 Route Choices For Plan _01_	01	1	1				
	01	1	2				
	01	1	3				
	01	1	4				
	01	1	5				
	01	1	6				
	01	1	7				
	01	1	8				
Schedule 2 Route Choices For Plan _01_	01	2	1				
	01	2	2				
	01	2	3				
	01	2	4				
	01	2	5				
	01	2	6				
	01	2	7				
	01	2	8				
Schedule 3 Route Choices For Plan _01_	01	3	1				
	01	3	2				
	01	3	3				
	01	3	4				
	01	3	5				
	01	3	6				
	01	3	7				
	01	3	8				

LCR Plan Schedule (1 ~ 3) LCR Station Group No. (1 ~ 8)[1] (see Program 56)

1st 2nd 3rd Last
(Route Definition No's (1 ~ 6)[2] From Program 54)

Start TM Schedule (1 ~ 3) Plan _2_

SELECT			Start TM				
02	1	0					
02	2	0					
02	3	0					

LCR Plan Schedule (1 ~ 3) Action Code

H H M M
(**HH** = 00 ~ 23
MM = 00 ~ 59)

	SELECT			DATA (Route Choices)			
Schedule 1 Route Choices For Plan _02_	02	1	1				
	02	1	2				
	02	1	3				
	02	1	4				
	02	1	5				
	02	1	6				
	02	1	7				
	02	1	8				
Schedule 2 Route Choices For Plan _02_	02	2	1				
	02	2	2				
	02	2	3				
	02	2	4				
	02	2	5				
	02	2	6				
	02	2	7				
	02	2	8				
Schedule 3 Route Choices For Plan _02_	02	3	1				
	02	3	2				
	02	3	3				
	02	3	4				
	02	3	5				
	02	3	6				
	02	3	7				
	02	3	8				

LCR Plan Schedule (1 ~ 3) LCR Station Group No. (1 ~ 8)[1] (see Program 56)

1st 2nd 3rd Last
(Route Definition No's (1 ~ 6)[2] From Program 54)

Notes:

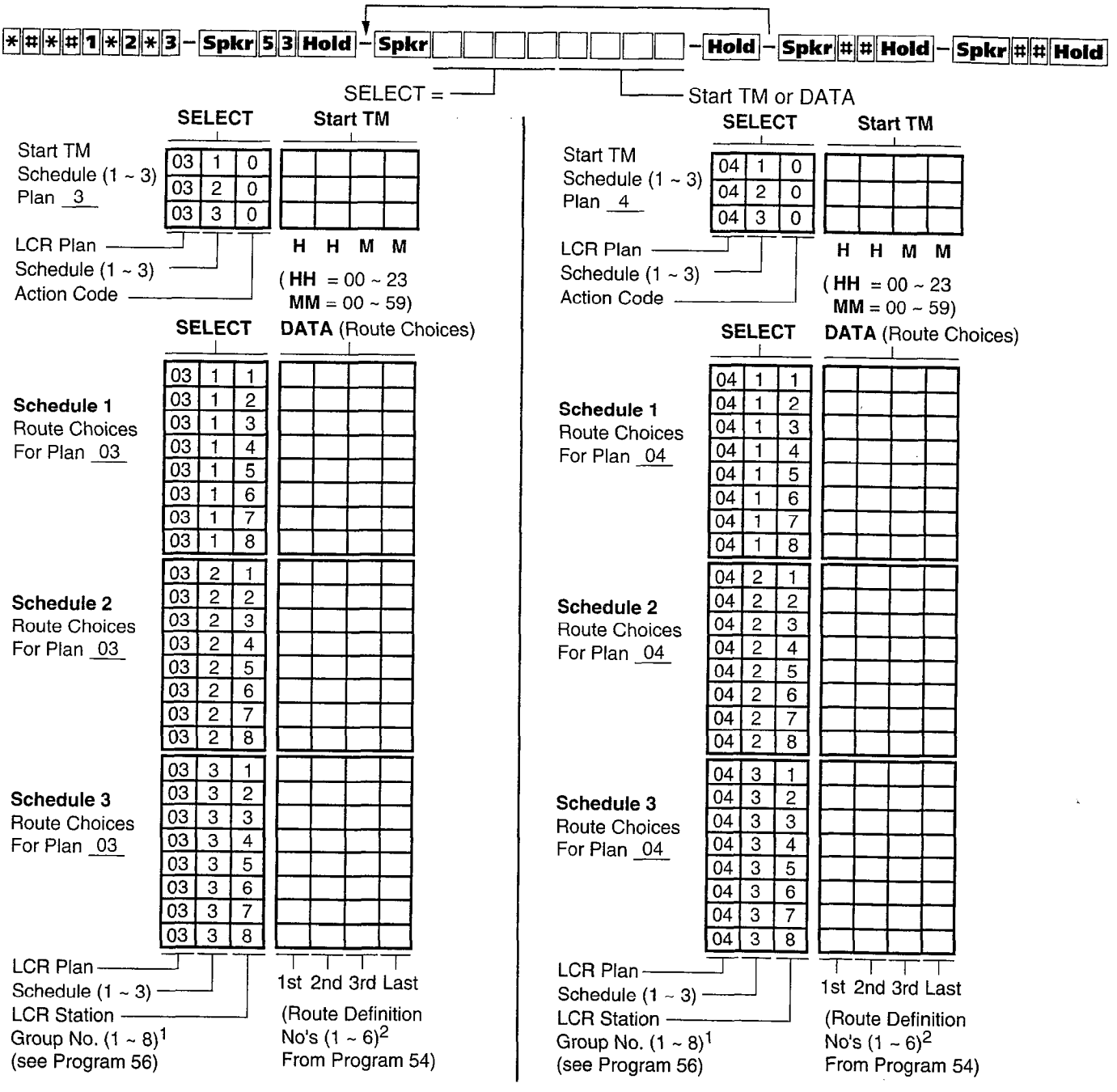
1. *RCTUA and RCTUB provides 4 LCR station groups; RCTUC/D provides 8 LCR station groups.*
2. *RCTUA and RCTUB provides 4 route definition Nos.; RCTUC/D provides 6 route definition Nos.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns starting time as 0000 and Route Definitions as blank for all schedules.*
- *If Schedules 1 & 2 start at the same time, then Time of Day schedule change does not occur, and data only needs to be entered for Schedule 1.*
- *Press Button/LED 01 to erase data (LED does not light).*

DK0440

Program 53 — LCR Schedule Assignments for LCR Plan No. 3 and 4



Notes:

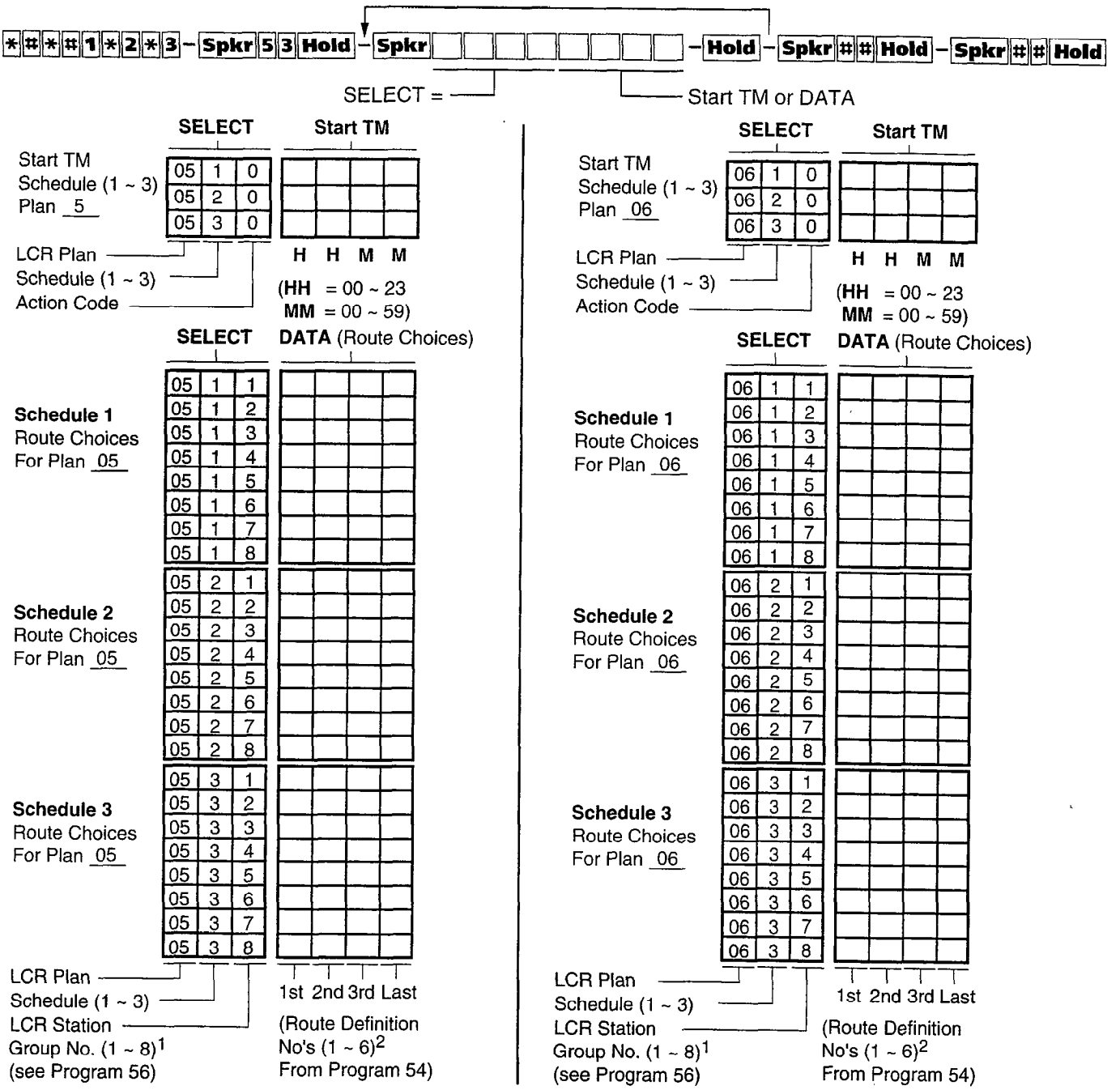
1. *RCTUA and RCTUB provides 4 LCR station groups; RCTUC/D provides 8 LCR station groups.*
2. *RCTUA and RCTUB provides 4 route definition Nos.; RCTUC/D provides 6 route definition Nos.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns starting time as 0000 and Route Definitions as blank for all schedules.*
- *If Schedules 1 & 2 start at the same time, then Time of Day schedule change does not occur, and data only needs to be entered for Schedule 1.*
- *Press Button/LED 01 to erase data (LED does not light).*

DK0441

Program 53 — LCR Schedule Assignments for LCR Plan No. 5 and 6



Notes:

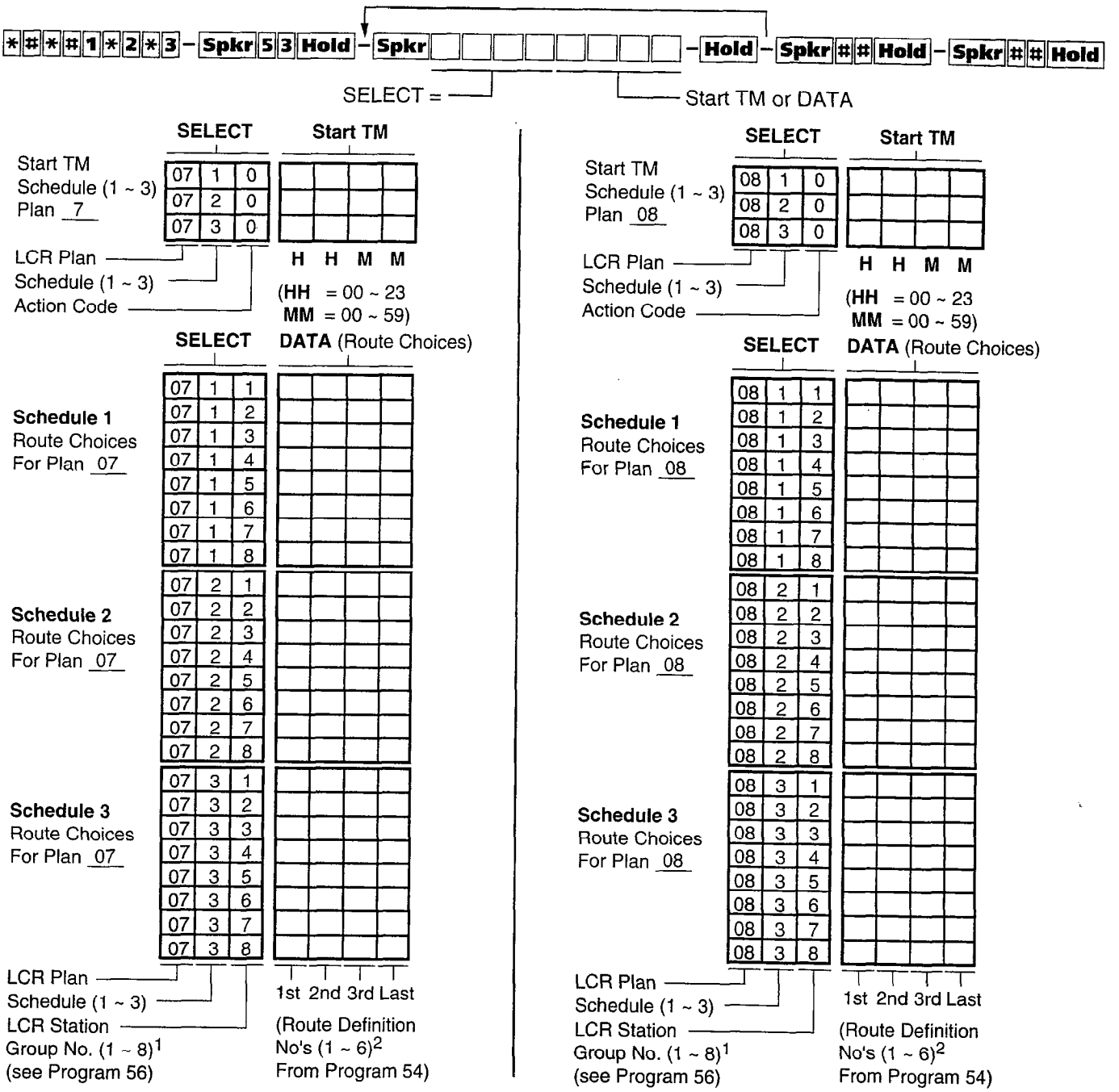
1. *RCTUA and RCTUB provides 4 LCR station groups; RCTUC/D provides 8 LCR station groups.*
2. *RCTUA and RCTUB provides 4 route definition Nos.; RCTUC/D provides 6 route definition Nos.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns starting time as 0000 and Route Definitions as blank for all schedules.*
- *If Schedules 1 & 2 start at the same time, then Time of Day schedule change does not occur, and data only needs to be entered for Schedule 1.*
- *Press Button/LED 01 to erase data (LED does not light).*

DK0442

Program 53 — LCR Schedule Assignments for LCR Plan No. 7 and 8



Notes:

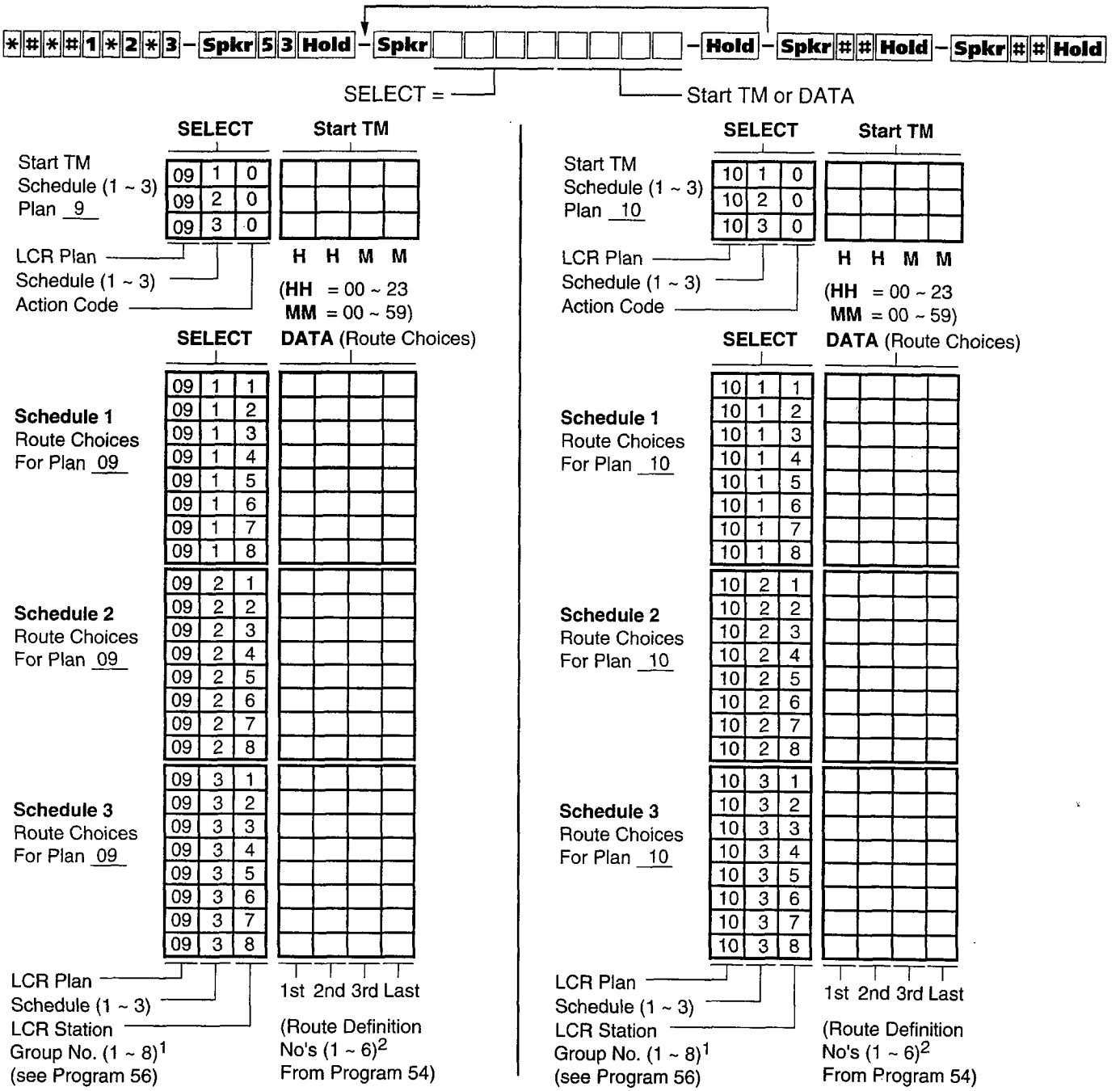
1. *RCTUA and RCTUB provides 4 LCR station groups; RCTUC/D provides 8 LCR station groups.*
2. *RCTUA and RCTUB provides 4 route definition Nos.; RCTUC/D provides 6 route definition Nos.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns starting time as 0000 and Route Definitions as blank for all schedules.*
- *If Schedules 1 & 2 start at the same time, then Time of Day schedule change does not occur, and data only needs to be entered for Schedule 1.*
- *Press Button/LED 01 to erase data (LED does not light).*

DK0443

Program 53 — LCR Schedule Assignments for LCR Plan No. 9 and 10 (RCTUC/D Only)



Notes:

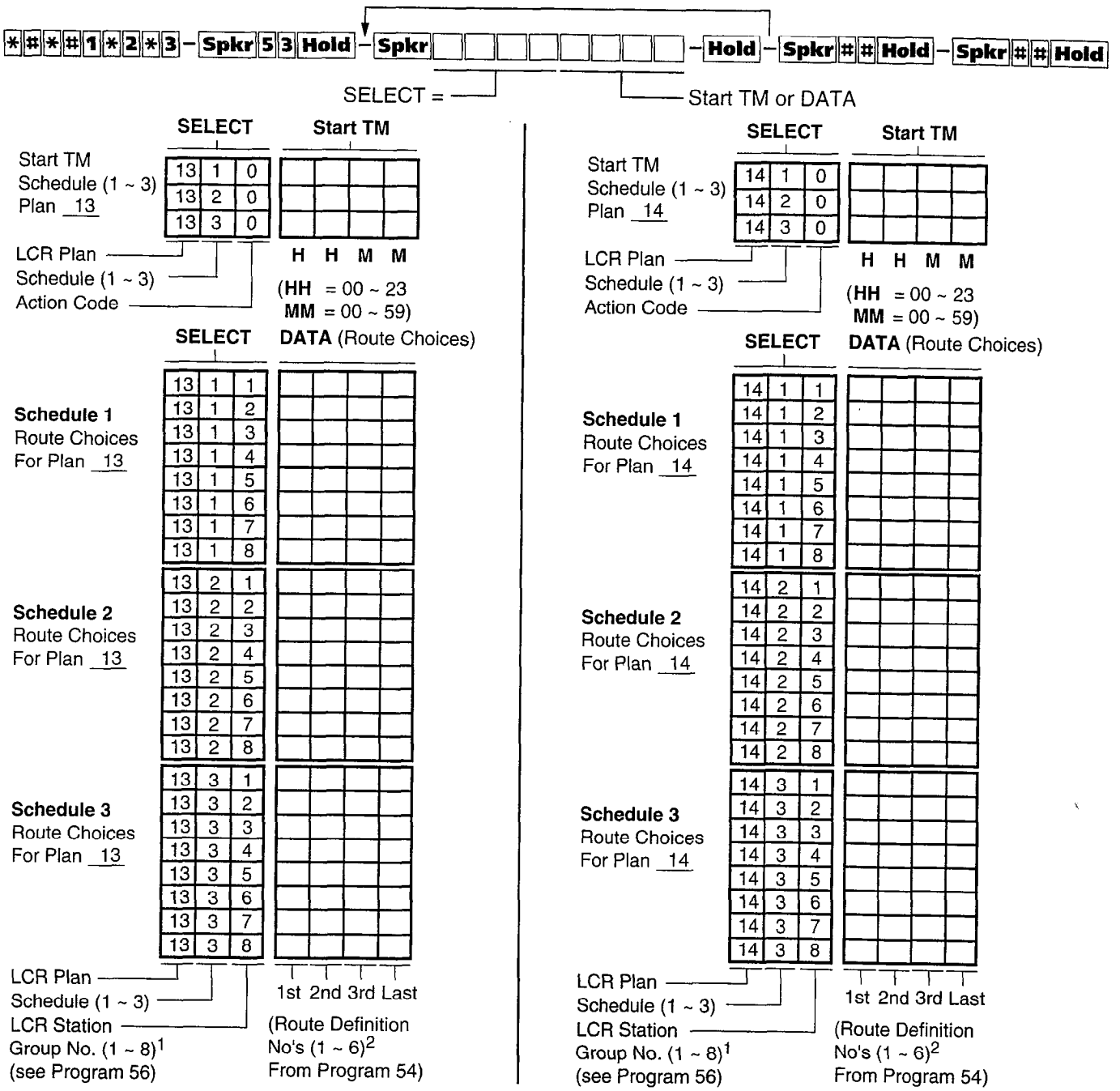
1. *RCTUA and RCTUB provides 4 LCR station groups; RCTUC/D provides 8 LCR station groups.*
2. *RCTUA and RCTUB provides 4 route definition Nos.; RCTUC/D provides 6 route definition Nos.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns starting time as 0000 and Route Definitions as blank for all schedules.*
- *If Schedules 1 & 2 start at the same time, then Time of Day schedule change does not occur, and data only needs to be entered for Schedule 1.*
- *Press Button/LED 01 to erase data (LED does not light).*

DK0444

Program 53 — LCR Schedule Assignments for LCR Plan No. 15 and 16 (RCTUC/D Only)



Notes:

1. *RCTUA and RCTUB provides 4 LCR station groups; RCTUC/D provides 8 LCR station groups.*
2. *RCTUA and RCTUB provides 4 route definition Nos.; RCTUC/D provides 6 route definition Nos.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data assigns starting time as 0000 and Route Definitions as blank for all schedules.*
- *If Schedules 1 & 2 start at the same time, then Time of Day schedule change does not occur, and data only needs to be entered for Schedule 1.*
- *Press Button/LED 01 to erase data (LED does not light).*

DK0446

Program 54 — LCR Route Definition Tables (1 ~ 8)

##*#1*2*3 – Spkr 5 4 Hold – Spkr [ ][ ][ ] – [ ][ ][ ][ ] – Hold – Spkr #[ ] Hold – Spkr #[ ] Hold

SELECT = [ ][ ][ ] CODE = [ ][ ][ ][ ]

Enter Data

SELECT = [ ][ ][ ] **CODE** = CO line group and modified digits table [ ][ ][ ][ ]

Route Definition Table for LCR Plan			
01	0	1	1
	0	1	2
	0	1	3
	0	1	4
	0	1	5
(Note 1)	0	1	6
02	0	2	1
	0	2	2
	0	2	3
	0	2	4
	0	2	5
	0	2	6
03	0	3	1
	0	3	2
	0	3	3
	0	3	4
	0	3	5
	0	3	6
04	0	4	1
	0	4	2
	0	4	3
	0	4	4
	0	4	5
	0	4	6

Enter Data

SELECT = [ ][ ][ ] **CODE** = CO line group and modified digits table [ ][ ][ ][ ]

Route Definition Table for LCR Plan			
05	0	5	1
	0	5	2
	0	5	3
	0	5	4
	0	5	5
(Note 1)	0	5	6
06	0	6	1
	0	6	2
	0	6	3
	0	6	4
	0	6	5
	0	6	6
07	0	7	1
	0	7	2
	0	7	3
	0	7	4
	0	7	5
	0	7	6
08	0	8	1
	0	8	2
	0	8	3
	0	8	4
	0	8	5
	0	8	6

LCR Plan No. (1 ~ 4)

Route Definition Number[1]

CO Line Group 01 ~ 16, see Program 16

Modified Digits Table 1 ~ 12, see Program 55

LCR Plan No. (5 ~ 8)

Route Definition Number[1]

CO Line Group 01 ~ 16, see Program 16

Modified Digits Table 1 ~ 12, see Program 55

Note:

1. *RCTUA and RCTUB provides 4 and RCTU C/D provides 6 route definition numbers.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data is "0101".*

DK0448

Program 54 — LCR Route Definition Tables (9 ~ 16, RCTUC/D Only)

##1*2*3 – Spkr 5 4 Hold – Spkr [ ][ ][ ] – [ ][ ][ ][ ] – Hold – Spkr ## Hold – Spkr ## Hold

SELECT = CODE =

SELECT = Enter Data **CODE** = CO line group and modified digits table

Route Definition Table for LCR Plan								
09	0	9	1					
	0	9	2					
	0	9	3					
	0	9	4					
	0	9	5					
(Note 1)	0	9	6					
10	1	0	1					
	1	0	2					
	1	0	3					
	1	0	4					
	1	0	5					
	1	0	6					
11	1	1	1					
	1	1	2					
	1	1	3					
	1	1	4					
	1	1	5					
	1	1	6					
12	1	2	1					
	1	2	2					
	1	2	3					
	1	2	4					
	1	2	5					
	1	2	6					

LCR Plan No. (9 ~ 12)

Route Definition Number[1]

CO Line Group 01 ~ 16, see Program 16

Modified Digits Table 1 ~ 12, see Program 55

SELECT = Enter Data **CODE** = CO line group and modified digits table

Route Definition Table for LCR Plan								
13	1	3	1					
	1	3	2					
	1	3	3					
	1	3	4					
	1	3	5					
(Note 1)	1	3	6					
14	1	4	1					
	1	4	2					
	1	4	3					
	1	4	4					
	1	4	5					
	1	4	6					
15	1	5	1					
	1	5	2					
	1	5	3					
	1	5	4					
	1	5	5					
	1	5	6					
16	1	6	1					
	1	6	2					
	1	6	3					
	1	6	4					
	1	6	5					
	1	6	6					

LCR Plan No. (13 ~ 16)

Route Definition Number[1]

CO Line Group 01 ~ 16, see Program 16

Modified Digits Table 1 ~ 12, see Program 55

Note:

1. *RCTUA and RCTUB provides 4 and RCTU C/D provides 6 route definition numbers.*

General Notes:

- *For more information, see the instructions preceding the record sheets.*
- *Initialized data is "0101".*

DK0449

Program 55-0 — LCR Modified Digits Table (Delete From Front)

##1*2*3 – Spkr 5 5 Hold – Spkr [ ][ ] 0 [ ][ ] Hold – Spkr # # Hold – Spkr # # Hold

SELECT = Modified Digits Table 01 ~ 12 (twelve available).

FIGURE = Quantity of Digits (00 ~ 10) to be deleted.

Program 55-1 and 2 — LCR Modified Digits Table (Add)

##1*2*3 – Spkr 5 5 Hold – Spkr [ ][ ][ ] ••• Hold – Spkr # # Hold – Spkr # # Hold

SELECT = Modified Digits Table (01 ~ 12)
Enter 1 to add digits in front of number dialed
Enter 2 to add digits at end of number dialed

CODE = Digits added (up to 22). Enter the digits to be added. Pauses may be coded as described in the pause entry reference table below.

DELETE DIGITS TABLES

Table No.	Quantity of Digits	
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		

Quantity 10 Max. (00 ~ 10)

PAUSE ENTRY REFERENCE (Program 55-1, 55-2)

LED	Pause (Seconds)	Record Entry
08	16	P8
07	14	P7
06	12	P6
05	10	P5
04	8	P4
03	6	P3
02	4	P2
01	2	P1

Special Buttons
Button/LED
11 – Clear
10 – Convert DP to DTMF

ADD DIGIT TABLES

Add to **FRONT** of Dialed Number (Program 55-1)

Table No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Comments
01																							
02																							
03																							
04																							
05																							
06																							
07																							
08																							
09																							
10																							
11																							
12																							

Add to **END** of Dialed Number (Program 55-2)

Table No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Comments
01																							
02																							
03																							
04																							
05																							
06																							
07																							
08																							
09																							
10																							
11																							
12																							

DK0450

General Notes:

- *Initialized data leaves all tables blank except Delete Digits, which are all 00.*
- *RCTUA and RCTUB provide 6 modified/add/delete digit tables, RCTUC/D provides 12 modified/add/delete tables.*

Program 56 — LCR Station Group Assignments (Ports 000 ~ 120)

[*][#][*][#][1][*][2][*][3] – [Spkr] [5][6] [Hold] – [Spkr] [ ][ ][ ] [#] [ ] [Hold] – [Spkr] [#][#] [Hold] – [Spkr] [#][#] [Hold]

SELECT = Station Logical Port Number(s) — Enter LCR Station Group (1 ~ 8)

Enter port numbers of stations being assigned.
See Note 1 for entering a range of ports.

Port Number	LCR Station Group No. (1 ~ 8)	Port Number	LCR Station Group No. (1 ~ 8)	Port Number	LCR Station Group No. (1 ~ 8)	Port Number	LCR Station Group No. (1 ~ 8)
000		031		062		093	
001		032		063		094	
002		033		064		095	
003		034		065		096	
004		035		066		097	
005		036		067		098	
006		037		068		099	
007		038		069		100	
008		039		070		101	
009		040		071		102	
010		041		072		103	
011		042		073		104	
012		043		074		105	
013		044		075		106	
014		045		076		107	
015		046		077		108	
016		047		078		109	
017		048		079		110	
018		049		080		111	
019		050		081		112	
020		051		082		113	
021		052		083		114	
022		053		084		115	
023		054		085		116	
024		055		086		117	
025		056		087		118	
026		057		088		119	
027		058		089		120	
028		059		090			
029		060		091			
030		061		092			

DK0451

Note:
1. *To enter a range of ports, press:* [ ][ ][ ][*][ ][ ][ ]
   Low port — High port

General Notes:
- *Initialized data assigns all stations to Group 1.*
- *For more information, see the instructions preceding the records sheets.*
- *Refer to Program 53.*
- *RCTUA and RCTUB provides 4 LCR station groups, RCTUC/D provides 8 LCR station groups.*

Program 56 — LCR Station Group Assignments (Ports 121 ~ 239)

[*][#][*][#][1][*][2][*][3] – [Spkr][5][6][Hold] – [Spkr][ ][ ][ ][#][ ][Hold] – [Spkr][#][#][Hold] – [Spkr][#][#][Hold]

SELECT = Station Logical Port Number(s) — Enter LCR Station Group (1 ~ 8)

Enter port numbers of stations being assigned.
See Note 1 for entering a range of ports.

Port Number	LCR Station Group No. (1 ~ 8)	Port Number	LCR Station Group No. (1 ~ 8)	Port Number	LCR Station Group No. (1 ~ 8)	Port Number	LCR Station Group No. (1 ~ 8)
121		152		183		214	
122		153		184		215	
123		154		185		216	
124		155		186		217	
125		156		187		218	
126		157		188		219	
127		158		189		220	
128		159		190		221	
129		160		191		222	
130		161		192		223	
131		162		193		224	
132		163		194		225	
133		164		195		226	
134		165		196		227	
135		166		197		228	
136		167		198		229	
137		168		199		230	
138		169		200		231	
139		170		201		232	
140		171		202		233	
141		172		203		234	
142		173		204		235	
143		174		205		236	
144		175		206		237	
145		176		207		238	
146		177		208		239	
147		178		209			
148		179		210			
149		180		211			
150		181		212			
151		182		213			

DK0452

Note:
1. To enter a range of ports, press: [ ][ ][ ][*][ ][ ][ ]
Low port — High port

General Notes:
- *Initialized data assigns all stations to Group 1.*
- *For more information, see the instructions preceding the records sheets.*
- *Refer to Program 53.*
- *RCTUA and RCTUB provides 4 LCR station groups, RCTUC/D provides 8 LCR station groups.*

Table 10-7
Account Code Program Option Matrix

Account Code Dial Plan	Account Code Program Options: Station — Verified Program 30 LED 14	Account Code Program Options: Station — Forced Program 30 LED 08	Account Code Program Options: CO Line — Forced Program 15-7 CO LED
Verified (Forced)	On	On	On
Verified (Voluntary)	On	On	Off
Verified (Voluntary)	On	Off	On
Verified (Voluntary)	On	Off	Off
Not Verified (Forced)	Off	On	On
Not Verified (Voluntary)	Off	On	Off
Not Verified (Voluntary)	Off	Off	On
Not Verified (Voluntary)	Off	Off	Off

System Initialization

Table 10-8
Override Option Matrix (For CO line buttons only - not [DN] buttons)

Station A May Override Station B[1]		Privacy Override Station A Options	Privacy Override Block Station B Options	Station B Button Options (Program 39)	
Executive[3]	Privacy	Program 30[3] LED 19	Program 31 LED 18	Privacy[2] Button	Privacy Release[2] Button
Yes	No	Off	Off	Off	Off
Yes	Yes	Off	Off	Off	On
Yes	No	Off	Off	On	Off
Yes	Yes	Off	Off	On	On
No	No	Off	On	Off	Off
No	Yes	Off	On	Off	On
No	No	Off	On	On	Off
No	Yes	Off	On	On	On
Yes	Yes	On	Off	Off	Off
Yes	Yes	On	Off	Off	On
Yes	No	On	Off	On	Off
Yes	Yes	On	Off	On	On
No	No	On	On	Off	Off
No	Yes	On	On	Off	On
No	No	On	On	On	Off
No	Yes	On	On	On	On

DK0453

Notes:

1. *Station A attempts to override (Executive or Privacy) Station B.*
2. *Normally either just a* **Privacy on Line (PRIVACY)** *or a* **Privacy Release (PRVRLS)** *is assigned to a telephone (Program 39) depending on how it should operate with Privacy Override.*
3. *Program 30, Button/LED 18 is ON for Station A, allowing Station A to have executive override to Station B for some possibilities in this table. If Program 30, LED 18 is OFF for Station A, then it can never executive override any station.*

Strata® DK280

Digital Business Telephone System

Release 3

T1 Interface

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11

11.1 RDTU (T1) Installation Guideline

Toshiba recommends the following when installing Strata DK280 RDTU (T1) circuit boards.

1. Read Section 11.2 before proceeding to Step 2.
2. Run RDTU T1 related system programs as described in Section 11.3 of this chapter.
3. Set P1 and P2, loop back jumper to the ON position for RDTU self test (see Figure 11-5).
4. Refer to Subsection 11.5.1 for the appropriate SW1 Equalizer Switch setting and set SW1 to the setting that matches the RDTU cable length.

   Note:
   Ensure the RDTU's component side is facing right when installing it in the Key Service Unit (KSU).
5. Insert the RDTU into the appropriate slot and apply firm, even pressure to ensure proper mating of connectors. See Tables 11-1, 11-2 and 11-3 for RDTU slot installation roles. If the RDTU is providing tie or DID lines, special consideration must be taken to determine which slot to install the RDTU, see Worksheet 2 of Chapter 1 for tie/DID slot assignment recommendations.
6. After installing the RDTU, gently pull the PCB outward. If the connectors are properly mated, a slight resistance will be felt.
7. Run the RDTU self check per Subsection 11.6.6. After self check passes, put P1 and P2 to the OFF position for normal operation and insert the RDTU PCB back into the appropriate slot.
8. Install Channel Service Unit(s) (CSUs) and wire CSUs to the RDTU and Network Interface Unit or Customer Premises T1 circuit as required per Section 11.4.

   Note:
   Before connecting the CSU to the Telco line, notify the T1 provider. You should also notify the T1 provider before disconnecting the CSU.
9. Perform CSU to RDTU and CSU to Network loop back testing per CSU documentation and Section 11.6 of this section (see Figure 11-10).
10. After loop back testing is complete and is synchronized with the far end T1 circuit, perform test calls on all RDTU lines. (Use the troubleshooting procedures in Section 11.8 of this section to help correct problems.)
11. Check T1 performance periodically for transmission errors using the "T1ERR" test described in the Section 13.9, Data Dump Mode. This requires a local or remote maintenance terminal connected to the PIOU or PIOUS PCB (local) and IMDU or Hayes-compatible modem (remote).

Table 11-1
1 ~ 8 Channel RDTU Slot Configuration

CABINET	Allowed RDTU Slot Numbers	Slots that must remain vacant if RDTU is installed in the allowed slot.
1 (Base Unit)	13	None
	15	None
2 (Expansion Unit)	21	None
	23	None
	25	None
3 (Expansion Unit)	31	None
	33	None
4 (Expansion Unit)	41	None
	43	None
5 (Expansion Unit)	51	None
	53	None
6 (Expansion Unit)	61	None
	63	None

DK0506

General Note:
- *Program 03-code 71, software assigns 8 lines to RDTU slot in all cases.*

Table 11-2
1 ~ 16 Channel RDTU Slot Configuration

CABINET	Allowed RDTU Slot Numbers	Slots that must remain vacant if RDTU is installed in the allowed slot.
1 (Base Unit)	13	None
	15	None
2 (Expansion Unit)	21	None
	23	None
	25	None
3 (Expansion Unit)	31	None
	33	35
4 (Expansion Unit)	41	None
	43	45
	51	None
	53	55
5 (Expansion Unit)	61	None
	63	65

DK0507

General Note:
- *Program 03-code 72, software assigns 16 lines to RDTU slot in all cases.*

Table 11-3
1 ~ 24 Channel RDTU Slot Configuration

CABINET	Allowed RDTU Slot Numbers	Slots that must remain vacant if RDTU is installed in the allowed slot.
1 (Base Unit)	13	14
	15	16
2 (Expansion Unit)	21	22
	23	24
	25	26
3 (Expansion Unit)	31	32
	33	34, 35
4 (Expansion Unit)	41	42
	43	44, 45
5 (Expansion Unit)	51	52
	53	54, 55
6 (Expansion Unit)	61	62
	63	64, 65

DK0508

General Note:
- *Program 03-code 73, software assigns 24 lines to RDTU slot in all cases.*

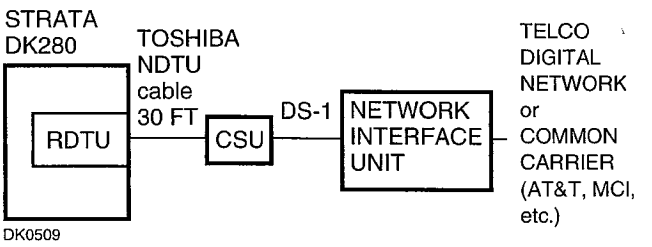


Figure 11-1
RDTU Connection to Digital Network or OCC (see Subsection 11.5.4)

11.2 DK280 T1 General Installation Information

11.2.1 RDTU Channelization

The Strata DK280 RDTU PCB provides T1/DS-1 interface up to 24 channels. Each channel can be individually set for loop start, ground start, tie, or DID line operation (voice only, not data lines). Each RDTU can be set in system programming to activate (1~8), (1~16), or (1~24) channels (lines). Fractional increments of 4, 12, and 20 are also possible but the RDTU will still assign 8, 16, or 24 channels respectively in system software. Example: If only 12 channels of fractional T1 are used, assign RDTU as a 16 channel RDTU. The system will assign 16 CO lines to the RDTU even though only 12 CO lines will be used. To busy out unused RDTU channels (see Section 11.4, Step 4). Use Program 03 to set the quantity of RDTU channels.

11.2.2 RDTU Slot Assignments

Up to six RDTU PCBs can be installed in a DK280 to provide up to 144 lines. RDTU PCBs can be installed in the same cabinets that have analog type CO line PCBs installed. RDTU PCBs must be placed in designated slots in each of the DK280 cabinets. If an RDTU is installed in a cabinet (in some cases one or two slots to the right of the RDTU may not be used in that cabinet) the number of unusable slots in a cabinet (none, 1 or 2) depends on which slot the RDTU occupies and how many lines (8, 16, or 24) the RDTU is programmed to provide (see Tables 11-1, 11-2 and 11-3 for RDTU slot installation rules). Use Program 03 to set the RDTU slot assignments and Channel quantities (Code 71 = 8 ch., Code 72 = 16 ch., and Code 73 = 24 ch.).

11.3 DK280 RDTU (T1) Applications

Each RDTU T1 PCB requires the following connecting equipment and cables to provide service:

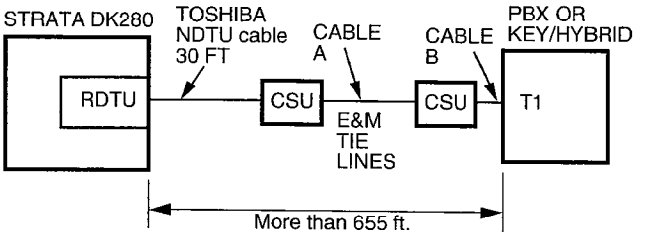
11.3.1 RDTU to Network

If the RDTU must interface to a public telephone network or common carrier T1 circuit, the RDTU must be connected to a Channel Service Unit (CSU). Use the NDTU cable (30 ft. cable supplied with RDTU) to connect the RDTU to the CSU (see Figure 11-1). The function of the CSU is to provide the required interface between the DK280 RDTU PCB and the Public Telephone or Carrier Network. The interface created by the CSU normally provides protection and capabilities for loop back testing both the Network equipment and the DK280 RDTU PCB.

Connecting the CSU to the Network Interface Unit (NIU) is specified by the CSU manufacturer—see CSU installation documentation. Toshiba does not supply the cables and connectors required to connect the CSU to the NIU (see Subsection 11.5.4 of this chapter).

11.3.2 RDTU to PBX T1 (Separated More Than 655 ft.)

If the RDTU must interface to a customer's premises T1 circuit (PBX, key/hybrid, or another DK280) to provide tie line service, the RDTU must be connected to a CSU (with Toshiba NDTU cable) if the other customer premise T1 equipment is more than 655 ft.



General Note:

- *Cable A, B and connectors are special cables supplied by customer (see Subsection 11.5.4).*

DK0510

Figure 11-2
RDTU Connection via CSU

from the RDTU. The T1 span on the other end must also connect to a CSU (see Figure 11-2).

The RDTU equalization switch (SW1) must be set for "SHORT" cable length because RDTU will be connected to the CSU with the 30 ft. NDTU cable (see Table 11-4).

Connecting CSU to CSU and CSU to the far-end PBX T1 is specified by the CSU manufacturer—see the CSU installation documentation. Toshiba does not supply cables or connectors to connect CSU to CSU (Cable A) or CSU to the far end PBX (Cable B).

11.3.3 RDTU to PBX T1 (Separated Less Than 655 ft.)

If the RDTU is within 655 ft. of the far-end PBX T1 circuit, a CSU is not required (see Figure 11-3). However, connecting a RDTU T1 span to another PBX or Key/Hybrid T1, in a tie line configuration at a distance less than 655 ft. (without a CSU) will require a customer provided special cable (see Figure 11-3). The transmit and receive pair of this span cable must be separated by at least five cable pairs and the wires must be 24 AWG, twisted pair, otherwise 22 AWG, ABAM type cable must be used.

Two CSUs (customer provided) are required if the RDTU is more than 655 ft. from the customer premise channel bank (Figure 11-4); CSUs are not required if the RDTU is less than 655 ft. from the channel bank (Figure 11-3).

11.4 RDTU (T1) System Programming

Installing a RDTU (T1) into a Strata DK280 requires a number of system programs to be run. It is recommended to run these programs in the order listed below before actually installing the RDTU into the system. This will allow the RDTU to function immediately, including self-check loop back testing and normal operation, when it is inserted into the system. Use the instructions provided below and use the appropriate systems record sheets to record and enter the data for each of the programs listed.

1. **Run Program 03**—Assign the number of RDTU channels used and the cabinet slot number into which the RDTU will be installed (see Subsections 11.2.1 and 11.2.2). If 1~8 channel are required, assign code 71, if 1~16 channels are required, assign code 72, or if 1~24 channels are required, assign code 73 to the RDTU slot. Also, assign RRCS code to RCTU if RDTU tie/DID channels are DTMF.

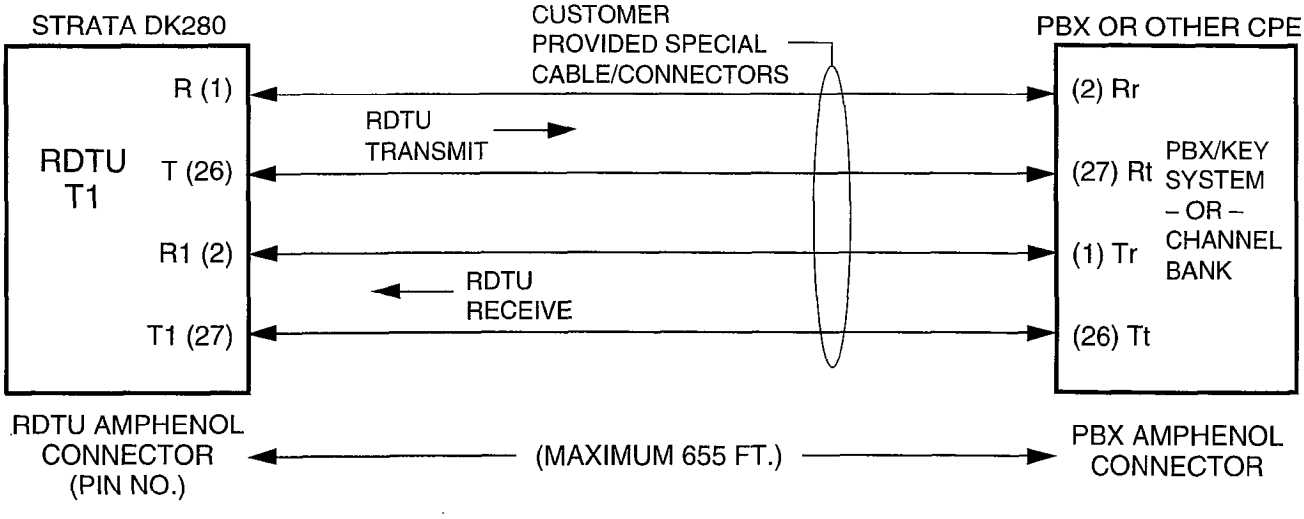
IMPORTANT !
Special consideration must be taken when installing tie or DID T1 channels (see Worksheet 2 of Chapter 1.

2. **Run Program ∗41-2**—Assign each channel for loop start, ground start tie (Immediate or Wink), or DID (Immediate or Wink). See Program ∗41-2 record sheet (unused channels can remain as initialized—loop start).

3. Turn system power supply OFF (five seconds) and ON to activate Program 03 and ∗41-2 program data.

   Note:
   These are the only programs relating to RDTU operation that require system power to be cycled OFF and ON.

4. **Run Programs 16, 40, 39**—If an RDTU is connected to a fractional T1 circuit and all the



General Note:
- *Special cable and connectors provided by customer. (See Subsection 11.5.4.)*

DK0511

Figure 11-3
Required Cables/Connectors for RDTU Connection at Distances of Less Than 655 Feet (200 Meters)

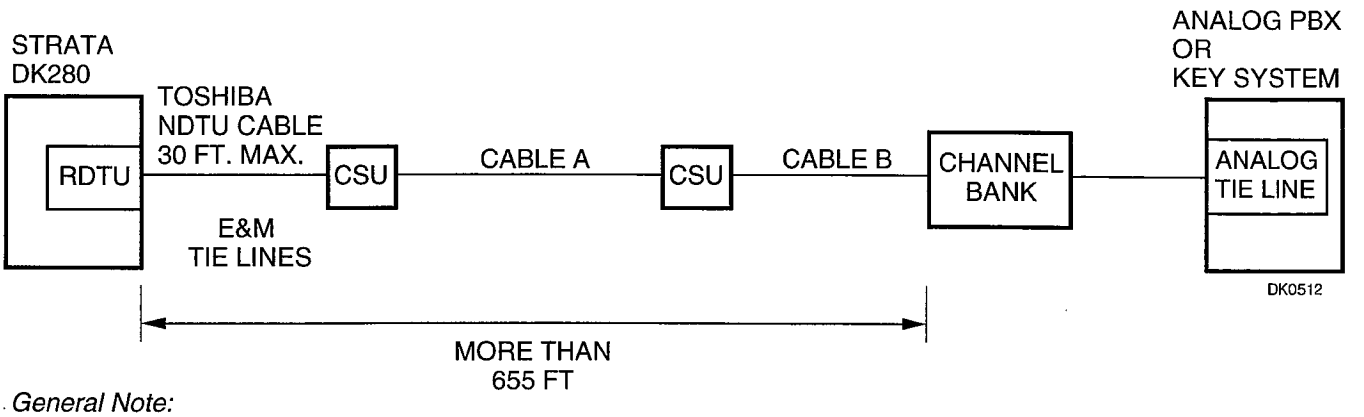
RDTU channels (8, 16, or 24) are not used, busy-out the unused CO lines from all line groups (Program 16, all telephone buttons (Program 39), and restrict all stations from accessing the unused lines (Program 40).

Example, if the Network fractional T1 provides 12 channels, set the RDTU connected to this T1 for 16 channels in Program 03 (with code 72). If this RDTU is the first CO line PCB in the system, the RDTU CO lines will be numbered 001~016. Use Programs 16, 39 and 40 to deny use of all unused lines (i.e., lines 13, 14, 15, and 16). In this case the first 12 lines are usable; lines 13, 14, 15, and 16 cannot be used. The CO lines on the next CO line PCB (any type) following the RDTU PCB will start numbering at line 017.

5. **Run Programs 15 and 30**—If RDTU tie and/or DID are dial pulse: Run Program 15-1, LED ON for each DP tie/DID line and run Program 30, LED 11 ON for each tie/DID station port.

6. **Run Program 17**
   - **LED01**—For RDTU tie lines, set LED01 to allow (ON) or deny (OFF) Page and Voice Announce on incoming calls to DK280 stations from the far end T1 tie line stations. This option (LED01) does not apply to RDTU DID lines—Page and Voice Announce is always denied to incoming DID calls because of FCC "answer supervision" rules.
   - **LED02 (Wink/Immediate)**—This assignment is for RDDU, REMU, and PEMU lines only; it does not apply to RDTU tie or DID lines. Use Program *41-2 to assign RDTU lines for wink or immediate start.
   - **LED03**—Toshiba recommends turning this LED ON (initialized state) for all RDTU DID lines to enable incoming DID calls to camp-on busy stations. This is also necessary to allow more than one DID line to ring into a station simultaneously. LED03 does not apply to RDTU tie lines.
   - **LED04**—For RDTU tie lines, LED04 is normally OFF to enable dial tone to be received from the far end tie line when calling DK280 stations. For DID lines LED04 is normally ON so RDTU DID lines do not send dial tone to the Central Office (initialized state is LED04 ON, No Dial Tone return).

7. **Run *41-1**—Use this program to assign the RDTU (T1) Line Coding method (B8ZS or AMI) and signal Framing format (SF or ESF). Contact the account representative of the company that is providing the T1 span line (Local Central Office or Long Distance Provider) to determine which line Coding and Frame format will be used.



General Note:
- *Special cable A, B and connectors provided by customer (see Subsection 11.4.4).*

Figure 11-4
RDTU Connection via CSU and Channel Bank

- **Line Coding**—The DK280 RDTU supports T1/DS-1 transmission of Voice and Analog Data (using modems) using Alternate Mark Inversion (AMI) with Zero Code Suppression (ZCS) or Bipolar Eight Zero Substitution (B8ZS) line coding. B8ZS provides clear channel capability, which allows frame information bits to carry any combination of ones and zeros—a feature needed for T1/DS-1 transmission of digital DATA (DK280 does not support transmission of digital DATA over RDTU T1/DS-1 at this time).

  As of this writing, most Telcos provide AMI line coding which is adequate for DK280 RDTU voice transmission; however, B8ZS may be required by some long distance providers, college campus private networks, or customer premise end to end T1 connections. AMI and B8ZS are adequate for DK280 Voice T1/DS-1 transmission.

- **Framing**—As of the time of this writing, D3/D4 Superframe (SF), or Type I and Extended Superframe (ESF), or Type II T1/DS-1 is offered by most all local Telcos and Long Distance Providers. Normally the local Telco will provide SF, which is adequate for DK280 voice (and modem type data) transmission. Long distance providers may offer either SF or ESF.

  ESF provides a more enhanced method of error checking that SF; however, the Channel Service Unit (CSU) must be compatible with ESF and may cost more than a SF only CSU. ESF circuits have the additional power of Cyclic Redundancy Checking (CRC), which allows end-to-end monitoring of T1 circuit performance. ESF, T1 performance monitoring normally requires that a person be specially trained for this function. SF and ESF Frame format is adequate for DK280 Voice (and modem type data) T1/DS-1 transmission.

8. **Programs *41-3 and -4**—These programs allow the RDTU Transmit and Receive (Volume) level to be adjusted by changing the RDTU built-in digital PAD value between +6 decibels (dB) and –15 dB. Transmit and Receive levels are individually adjustable on each RDTU (all channels will have the same level). It is recommended to use the initialized levels (Receive –3 dB/Transmit –6 dB) upon initial installation. Adjust the RDTU digital PAD as required while testing each RDTU T1 channel.

9. **Program *42 Series**—T1 Span Timing Reference Assignments

   Timing references for T1 RDTU PCBs are made with the Program *42 series. The RDTU (T1) timing (or synchronization) program options determine how the DK280 system digital voice transmission path (time-switch) is synchronized with the far end digital system transmission path. For proper T1 operation, the equipment at each end of a T1 span line must be synchronized.

   The DK280 time-switch is synchronized (as slave) to the T1 span equipment on the other end of the T1 line by the RDTU PCB designated as the Primary Reference in Program *42-1. When a RDTU is connected to a Telco or Long Distance Provider T1 span line, the RDTU in the lowest slot number should be assigned as the Primary Reference RDTU (*42-1, DATA = 1 FOR THIS RDTU). If a malfunction occurs and Primary Synchronization is lost, the DK280 automatically switches modes and synchronizes to the T1 span connected to the RDTU PCB designated as the Secondary Reference (provided that there are two RDTU PCBs installed in the DK280) (see Figure 11-12).

   If there are two RDTU PCBs installed, it is recommended not to install the Primary and Secondary Reference RDTU PCBs in the same DK280 cabinet if possible (although both Primary and Secondary Reference RDTU PCBs can be installed in the same cabinet). The Secondary Reference RDTU should also be connected to a Telco or Long Distance Provider T1 span (*42-2, Data = 2 for this RDTU).

   If the equipment on the other end of the DK280 T1 lines should synchronize to the DK280 clock source, then blanks should be entered in Program *42. In this case, the DK280 clock runs free and is considered the Master Synchronization provider. The DK280 can be assigned as the Master (free run) clock provider if the far end equipment connected to the RDTU T1 span is a Customer Premise type equipment and it is not synchronized to some other T1 provider (i.e., PBX, Channel Bank, Key/Hybrid or other DK280). In this case (when the Telco network is not connected), either the DK280 RDTU span or the far end equipment can be the Master (synchronization clock provider).

- Program *42-1, Primary Timing Reference Assignment—assign the Primary Timing Reference with this program.
- Program *42-2, Secondary Timing (Backup) Reference Assignment—assign the Secondary (Backup) Timing Reference with this program.
- To assign RDTUs for the Master Clock Provider, leave Programs *42-1 and *42-2 blank. Press button/LED01 to enter blanks.

IMPORTANT !

1. *The Digital Network is connected to clocks with various degrees of precision called stratum levels from STRATUM 1 (highest level of accuracy) to STRATUM 4 (lowest level) as follows:*
   - *STRATUM 1—Public Telephone Network clock located in Hillsboro, Missouri.*
   - *STRATUM 2—Normally associated with #4 ESS Toll switches.*
   - *STRATUM 3—Normally associated with #5 ESS Central offices.*
   - *STRATUM 4—Normally associated with Digital PBXs.*
2. *If a DK280 RDTU is programmed as the Primary Synchronization Clock reference, the clock provider connected to this RDTU should be a reliable clock provider, such as a Telco or common carrier (Example—AT&T). All other T1 span lines connected to RDTUs in the DK280 must be synchronized to the same clock source as the AT&T span line. If a T1 span line is not synchronized with the primary clock provider (AT&T, for this example), then DK280 lines assigned to this T1 span line (RDTU) may experience "slip" problems.*

---

10. The programs in Step 1~8 are described for specific RDTU application programming. The programs listed below apply to any type of DK280 CO lines and also to RDTU CO lines. The guidelines for these programs are given in Chapter 9—Record Sheet Instructions. Run the programs listed below as they apply to RDTU CO line applications.

- **Program 03 (see previous Step 1)**—Specify Code 71 for an 8-channel RDTU, Code 72 for a 16-channel RDTU, or Code 73 for a 24-channel RDTU. (The 8-channel RDTU is the default.) Also assign RCCS to RCTU for tie and DID DTMF lines—if RDTU tie and/or DID lines are DTMF, RRCS must be installed.
- **Program *09**—Use to translate DID digits to ring designated stations.
- **Program 10-1**—Use to enable or disable Two-Line Conference and Direct Inward System Access (DISA).
- **Program 15**—Use to assign Dual-tone Multi-frequency (DTMF)/Dial Pulse dialing, DISA, and additional attributes to each line. Automatic Release (AR) assignments only need to be made for loop start lines; AR is not needed for ground start lines. With DK280, Release 3, Program 15 is used to enable DID lines with DNIS and ANI options.
- **Program *15**—Use to make tenant assignments.
- **Program 16**—Use to assign lines to line groups.
- **Program 17** (see previous Step 5)—Use to assign tie/DID Auto Camp-on, and second dial tone.
- **Program *17**—Use to assign intercept port for DID line calls to wrong or vacant numbers.
- **Program 30**—If RDTU tie and/or DID lines are Dial Pulse (DP—Program 15-1), then Program 30, LED 11 should be ON for the tie/DID station port numbers; if they are DTMF, LED 11 should be OFF.
- **Program 39**—Use to assign line access buttons to digital and electronic telephones.
- **Program 40**—Use to assign station access to lines (incoming and outgoing).
- **Program 41**—Use to assign station station access to lines (outgoing only).
- **Program *41** Series (see previous Steps 2, 6, and 7)—Run to assign RDTU channel line operation, as well as coding and framing modes.
- **Program 42-0, 1 ~ 8**—Use to assign behind PBX/CENTREX operation to each line.
- **Program *42 Series** (see previous Step 8)—Use to assign timing reference for RDTUs.

- **Programs 45 ~ 48**—Use to define Toll Restriction for any line.
- **Programs 50 ~ 56**—Use to define Least Cost Routing assignments.
- **Program 59**—Use to assign T1 lines to attendant console buttons.
- **Program 71 ~ 74**—With DK280 Release 3 and above, these programs are used in place of Program *09 to assign DID/tie/DNIS line ringing destinations.
- **Program 78**—Use to assign special ringing of lines: includes Night Ring Over Page, DISA, Remote Maintenance via the Internal Maintenance Modem (IMDU), and Built-in Auto Attendant.
- **Programs 81 ~ 89**—Use to assign loop and ground start RDTU CO lines to ring selected stations on incoming calls.
- **Programs *81 ~ *83**—With DK280 Release 3, these Programs are used to designate which DNs will flash when a CO line rings a telephone.

11.5 RDTU Hardware and Cabling Installation

11.5.1 RDTU Cable Length Switch

The distance between the DK280, RDTU and CSU or RDTU to other Customer Premise Equipment (CPE) T1 may vary (0~655 ft.) as shown in Figures 11-1, 11-2, and 11-3. The RDTU interface transmitter must be equalized and its impedance must be matched to the cable length connecting the RDTU to the CSU or other CPE, T1. RDTU transmit equalization/ impedance matching is accomplished by setting RDTU SW1 for the proper cable length (see Figure 11-5 for SW1 location and Table 11-4 for SW1 setting instruction).

11.5.2 RDTU Loop Back Jumper Plugs

The RDTU PCB provides jumper plugs for Loop back testing. Loop back tests are described in Section 11.6 of this chapter.

11.5.3 RDTU Front Panel Indicators

The RDTU PCB provides seven LED indicators to show the status of RDTU: Busy or Idle condition, Alarm status, and Synchronization status. A description and the function of each status LED is provided below (see Figure 11-5).

Table 11-4
Transmit Equalizer Setting Switch

	SHORT 0 ~ 150 ft	MEDIUM 150 ~ 450 ft	LONG 450 ~ 655 ft
s1	ON	OFF	OFF
s2	OFF	ON	OFF
s3	OFF	OFF	ON
s4	OFF	ON	OFF
s5	OFF	OFF	ON
s6	OFF	ON	OFF
s7	OFF	OFF	ON
s8	NOT USED	NOT USED	NOT USED

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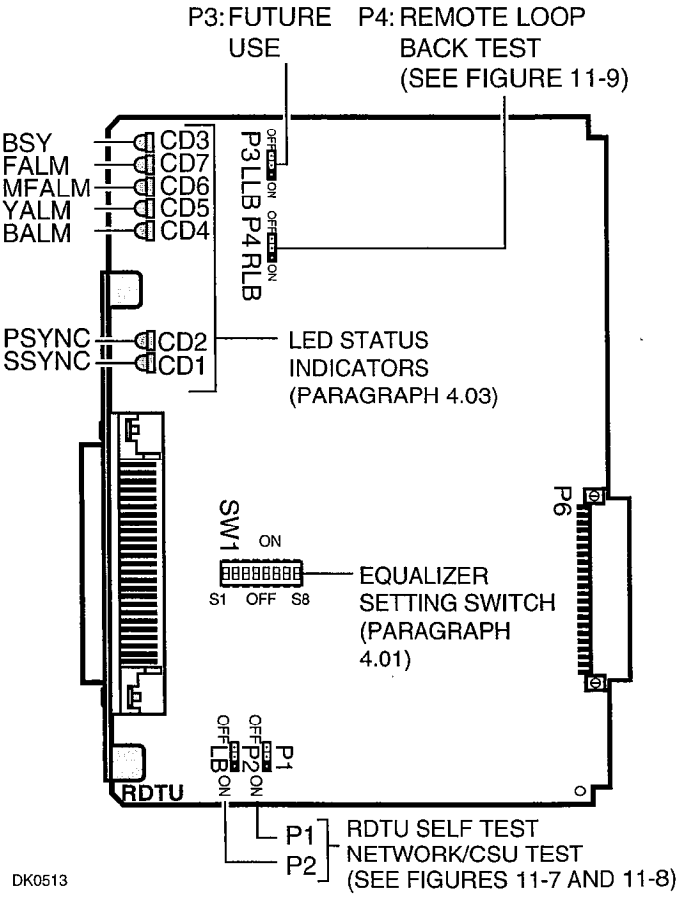


Figure 11-5
RDTU Printed Circuit Board

- **Busy LED (BSY)**—Turns on when one or more RDTU channels (lines) are in use. Also, when the RDTU does not receive the far end 1.544 mbs carrier signal, the RDTU will cause the BSY to be on steady.

  Alarms—are features of the telephone network to indicate a potentially serious problem. Example: when monitoring a T1 network, if a Blue or Yellow alarm is indicated, it can be concluded that there is a cable fault or some other serious transmission impairment.

- **Frame Alarm (FALM)**—This LED will turn "ON" steady if the RDTU has not achieved synchronization or when the span cable is not connected.

- **Multi-Frame Alarm (MFALM)**—LEDs will turn "ON" steady if the RDTU receives the 1.554 mbs T1 carrier from the far end but has not achieved Frame synchronization or when the span cable is not connected. Also, if the RDTU is set for SF and the far end is sending ESF (or vice versa), the MFALM LED will be "ON" steady.

- **Red Alarm (FALM and MFALM)**—When FALM and MFALM are both "ON" steady, a Red alarm condition exists. This indicates that the RDTU does not detect a proper carrier signal (1.544 mbs T1) on its receive pair and the RDTU is not synchronized. When the Red alarm condition exists, the RDTU should turn the BSY LED "ON" steady and attempt to send a Yellow alarm signal (RDTU YALM LED flashes) to the far end T1 circuit.

- **Yellow Alarm (YALM)**—When the far end network or CPE T1 does not detect the RDTU transmitted 1.544 mbs T1 carrier signal on its receive pair the far end T1 will send a Yellow alarm signal pattern to the RDTU—the RDTU should turn on the YALM LED (the YALM will repeat the signal it receives from the far end—flashing or steady). If the RDTU does not receive the far end carrier signal, the RDTU will send the Yellow alarm signal to the far end and will cause the BSY and YALM LEDs to flash.

- **Blue Alarm (BALM)**—The Blue alarm, also known as the Alarm Indication Signal (AIS), is detected by the RDTU. This signal is sent by the Far End Network equipment to RDTU when it loses the carrier from a Network T1 circuit (other than RDTU). This signal assures that the RDTU maintains synchronization when there is a problem between two Network Nodes. The RDTU BALM will also light if the far end sends a Blue alarm signal during loop back. The RDTU will send a Blue alarm signal when loop-back test is being performed.

Synchronization LEDs (see Figure 11-12)

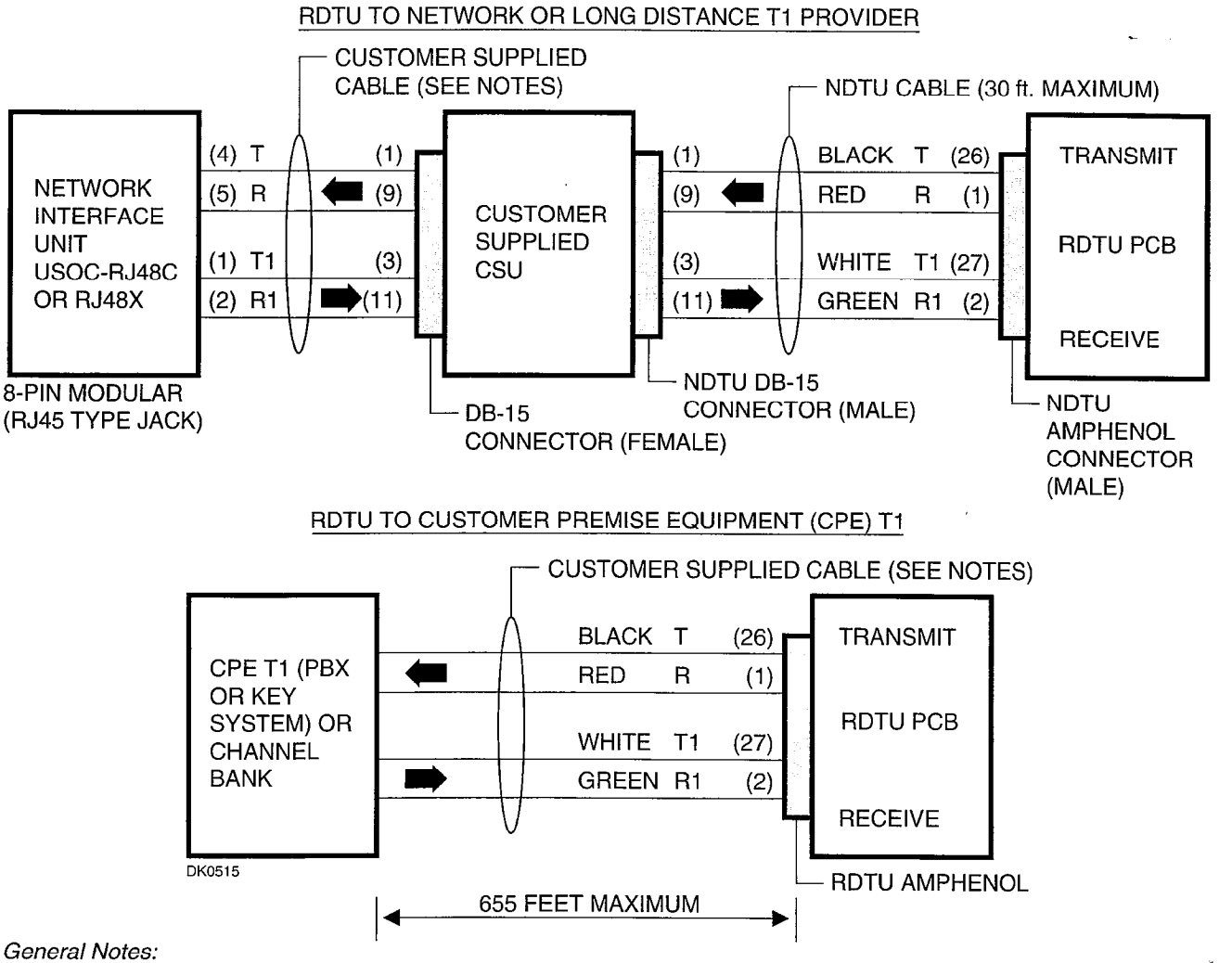
- **Primary Synchronization (PSYNC) LED**—If one RDTU PCB is assigned as the Primary Timing T1 PCB in Program *42, the PSYNC LED of this RDTU PCB will flash when it is synchronized with the far end T1 span line clock provider. If the Primary RDTU is not synchronized with the clock provider, the PSYNC LED will be ON steady. The SSYNC LED of the Primary sync RDTU PCB should always be OFF. The Primary sync RDTU PCB synchronizes the RTCU (time-switch) to the clock signal it receives from the T1 span circuit to which it is connected. The RTCU then synchronizes the DK280 PCM talk path (time-switch) to the far end PCM talk path.

- **Secondary Synchronization (SSYNC) LED**—If an RDTU PCB is assigned as the Secondary time T1 PCB in Program *42, its SSYNC LED will be ON steady (standby mode) when the DK280 is synchronized to the Primary T1 clock provider. In the event of a loss of Primary synchronization (when 4 out of 12 consecutive frame timing bits are in error) the DK280 will switch from synchronizing to the Primary RDTU span line clock to the span line clock connected RDTU designated as the Secondary Timing Reference. When the DK280 is synchronized to the Secondary Reference RDTU, the PSYNC LED on the Primary Reference RDTU will turn on steady and the SSYNC LED on the Secondary Reference RDTU will flash.

- **Run Free (PSYNC/SSYNC)**—If the RDTU PCB is the clock provider to the Far-end T1 span circuit both the PSYNC and SSYNC LEDs will always be OFF.

11.5.4 RDTU Cable Installation

The RDTU PCB is shipped with a Toshiba NDTU cable for connecting the RDTU PCB to a CSU. The NDTU is a 30 ft. cable and is specially made to conform with EIA specifications (see Figure 11-6). All other cables required to connect the T1 span line to the RDTU PCB are customer supplied and must conform with EIA specification as described in Note 4 of Figure 11-6. Most all CSU manufacturers supply



General Notes:

- *Pins 2 and 4 of the DB-15 connector in most CSUs are frame ground. No connection is required.*
- *NDTU cable is supplied with RDTU PCB (30 ft maximum).*
- *Set RDTU SW1 switch for proper loop length per Chapter 3—Cabinet Installation.*
- *Customer supplied span cables must be 22 AWG, ABAM cable; or, if using standard 24 AWG twisted pair, the transmit pair must be separated from the receive pair by at least 5-cable pairs. Most CSU manufacturers supply cables to connect the CSU to the Network Interface Unit or other CPE equipment.*

Figure 11-6
RDTU Cable Connections

cables that comply with T1 span specifications for connecting the CSU to customer premise equipment (like DK280, RDTU) and to the Network Interface equipment.

11.6 RDTU Loop Back Testing

The RDTU provides three loop back test configurations. These loop back tests should be performed as required in conjunction with CSU loop back tests (see CSU loop back test documentation).

11.6.1 RDTU Self Test

This test should be performed upon initial installation of a RDTU PCB. Program the RDTU per Section 11.4 of this section; then perform the RDTU loop back test, per the instructions in Figure 11-7, before connecting the far end (CSU, Network, or CPE) T1 span line.

11.6.2 Network/CSU T1 Span Test

This test will verify that the far end (CSU, Network, or CPE) T1 equipment and span cabling is functioning properly. This test checks all T1 span cabling including the RDTU amphenol cable and connector. Guidelines for this test are provided in Figure 11-8.

11.6.3 Network/CSU/RDTU Span Test

This test checks all equipment that is checked with the test in the above paragraph, but this test also checks that the RDTU Mitel LSI chip is functioning. Guidelines for this test are described in Figure 11-9.

Note:

Loop back tests shown in Figures 11-7, 11-8, and 11-9 show loop back testing with CSU and Network equipment. The same tests can be performed when connecting the RDTU PCB directly to a customer premise (PBX, Key Hybrid, Channel bank) T1 circuit.

RDTU Self Check

- Active test of RDTU circuit.

Network/CSU Test

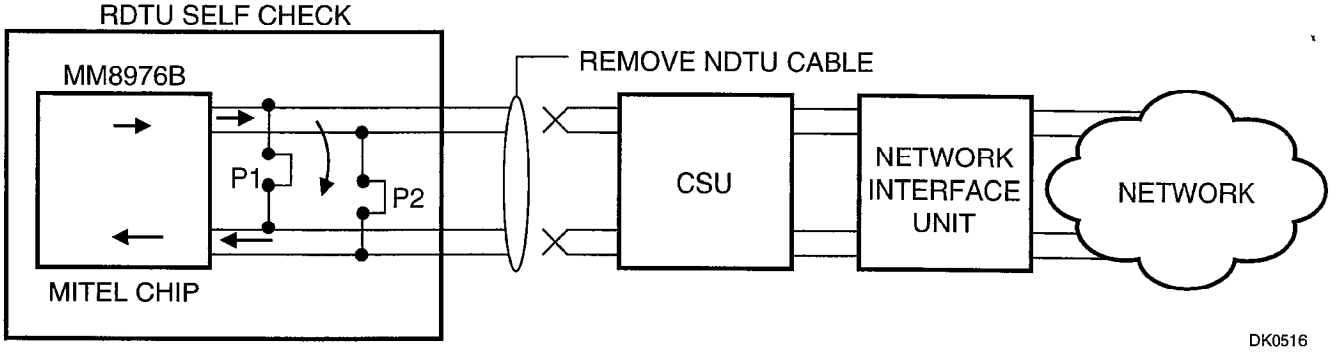
- Tests all cables, Network and CSU equipment (RDTU is not active).

Remote Loop Back (RLB) Test

- Active test of RDTU (LSI MM8976B), CSU, Network equipment and all cables.

CSU Local/Network Loopback Tests

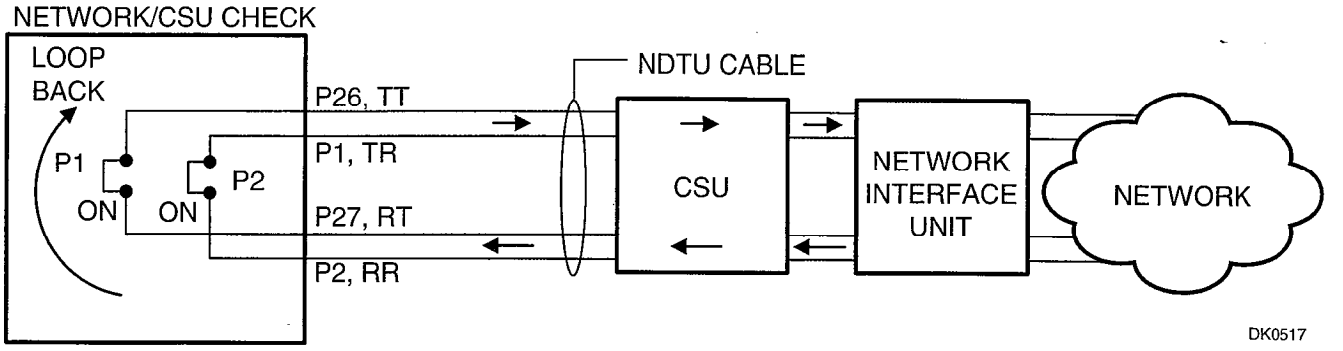
- See Figure 11-10 and the CSU manufacturer's Installation and Maintenance manual.



General Notes:

- *P1 and P2 to ON position (see Figure 11-5).*
- *Remove NDTU cable from RDTU amphenol connector.*
  - *After about 12 seconds, all RDTU LEDs (except PRI/SEC SYNC) turn off.*
  - *Appropriate primary or secondary sync. LED flashes if RDTU is Primary or Secondary reference.*
  - *If RDTU is not a primary or secondary reference, then the Primary and Secondary sync LEDs should turn off.*

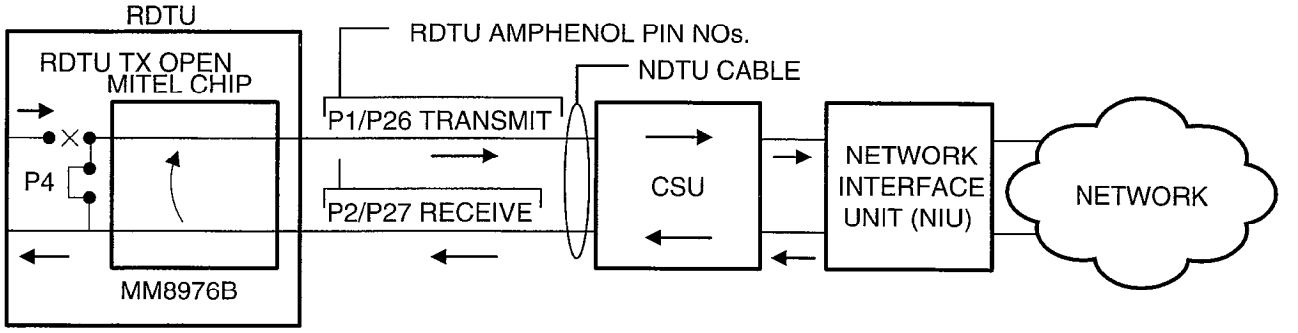
Figure 11-7
RDTU Self Test



General Notes:

- *P1 and P2 to ON position (see Figure 11-5).*
- *Unplug RDTU from DK280 back plane.*
  - *CSU or Network T1 equipment should receive its own transmitted signal.*
  - *Indications and results depend on CSU and/or Network equipment.*

Figure 11-8
Network/CSU T1 Span Test



General Notes:

- *Put P4 (RLB) in the ON position to perform remote loop back test (see Figure 11-5).*
- *RDTU transmit signal is blocked; signal received from network (CSU) is sent back to (CSU) network.*
- *RDTU LEDs (during remote loop back) will continue to turn OFF/ON as shown below during the test.*

LEDS ON RDTU PCB

TOP LED →	0	BUSY →	ON STEADY					
	0	FALM →	ON	OFF	OFF	OFF	ON	
	0	FMALM →	OFF	ON	OFF	OFF	OFF	→ CONTINUE TO CYCLE WHEN P4 IS IN **ON** POSITION
	0	YALM →	OFF	OFF	ON	OFF	OFF	
	0	BALM →	OFF	OFF	OFF	ON	OFF	
			T1	T2	T3	T4	T5	T6 T = ABOUT 1/2 SECOND
BOTTOM LED →	0	PRIMARY SYNC	ON OR OFF, STEADY					
	0	SECONDARY SYNC	ON OR OFF, STEADY					

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- *Put P4 in the OFF position when RLB test is complete.*

IMPORTANT !

This test only loops "data" back. If A, B, C, and D signaling is sent by the network, it is not looped back to the network and may appear as an error to the network test equipment. These errors should be disregarded.

Figure 11-9
Network/CSU/RDTU Span Test

11.7 DK280 RDTU (T1) Performance Monitoring

The performance of the RDTU can be monitored using the Data Dump Mode (see Chapter 13—Remote Maintenance). This requires a PIOU or PIOUS PCB, an ASCII terminal (or PC) and, if monitoring RDTU performance from a remote location, an IMDU modem or Hayes compatible modem is required.

The RDTU monitoring feature provides a printout (or CRT display) of RDTU detected T1 errors as shown in Figure 11-11. There are no time parameters given with this error report so the time between error count increments must be monitored manually. Basically the error count of any error category should not increase within 24 hour periods (see Table 11-5).

The error categories are as follows:

- Synchro Bit Error—This counter increments each time the RDTU detects 1024 synchronization bit errors.
- Bipolar Violation Error—This counter increments each time the RDTU detects 6.55x104 bipolar violations.
- Slip error: This counter increments each time the RDTU detect 256 slips.
- CRC Errors: Cyclical Redundancy Check counter increments each time the RDTU detects 256 CRC-6 errors. This is only available when the RDTU is in the Extended Super Frame mode.

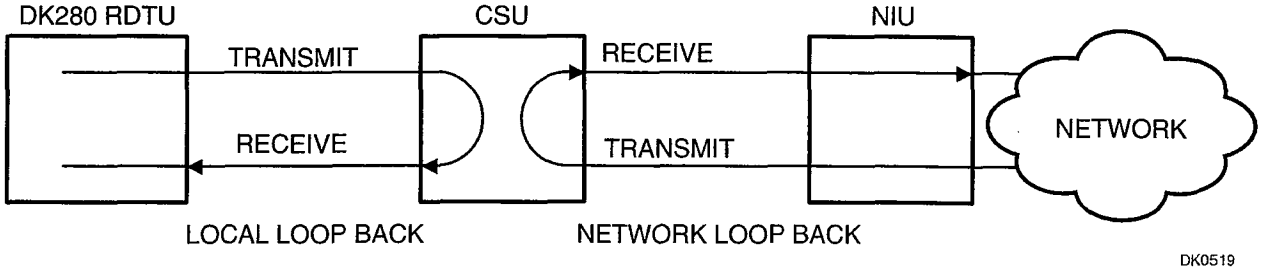
To receive the "T1 ERROR DISPLAY" from a terminal (local or remote), place the DK280 in the Data Dump Mode of Chapter 13 and enter "T1ERR" and press the RETURN or ENTER key. The display shows all RDTU PCBs (DTUNO=1 ~ DTUNO=6) even if the associated RDTU (1~6) is not installed. The ERROR counter can only be reset by turning the DK280 OFF and ON.

11.8 T1 Fault Isolation

T1 fault troubleshooting can be complex and may require expensive test equipment to perform the necessary fault isolation. Because of the high cost, many dealers have not purchased T1 test equipment. As a result, on a cutover when an RDTU does not synchronize or CO lines simply do not function, the site technician can only check wiring and cabling. Without proper test equipment, there is very little that can be tested. This section provides some procedures that can be done without T1 test equipment to help find the cause of a failure, or at least determine if system hardware is functioning properly.

The DK280 also provides T1 "in-service" monitoring which allows maintenance personnel to detect line errors without introducing any disturbances on the line. This method of testing permits maintenance personnel to monitor T1 performance without the expense of test equipment or without taking the T1 circuit out of service. The T1 error check is particularly useful for monitoring the T1 circuit for intermittent problems that may become more serious as time progresses (see Section 11.7 for more information regarding T1 performance monitoring).

If experiencing problems with an RDTU span circuit, start with Flowchart 11-1 to isolate the fault. The flowcharts in this section use the same logic symbols as those used in the Chapter 12.



General Notes:

- *Notify T1 provider before performing CSU loop back tests.*
- *Local loop back and network loop back test cannot be peformed simultaneously.*
- *CSU Local/Network Loop back is a function of the CSU, not all CSUs provide this function → see CSU I&M documentation for CSU loop back test procedures.*

Figure 11-10
CSU Local and Network Loop Back Tests

```
                    T1 ERROR DISPLAY
T1ERR
DTU NO = 1
    SYNCHRO BIT ERROR     =     XXXX  TIMES  (1 TIME = 1024 ERRORS)
    BIPOLAR VIOLATION ERROR = XXXX  TIMES  (1 TIME = 256 X 256 ERRORS)
    SLIP ERROR      =         XXXX  TIMES  (1 TIME = 256 ERRORS)
    CRC ERROR       =         XXXX  TIMES  (1 TIME = 256 ERRORS)
DTU NO = 2
    SYNCHRO BIT ERROR     =     XXXX  TIMES  (XXXX = 0 ~ 9999)
    BIPOLAR VIOLATION ERROR = XXXX  TIMES
    SLIP ERROR      =         XXXX  TIMES
    CRC ERROR       =         XXXX  TIMES
DTU NO = 3
    SYNCHRO BIT ERROR     =     XXXX  TIMES
    BIPOLAR VIOLATION ERROR = XXXX  TIMES
    SLIP ERROR      =         XXXX  TIMES
    CRC ERROR       =         XXXX  TIMES
DTU NO = 4
    SYNCHRO BIT ERROR     =     XXXX  TIMES
    BIPOLAR VIOLATION ERROR = XXXX  TIMES
    SLIP ERROR      =         XXXX  TIMES
    CRC ERROR       =         XXXX  TIMES
DTU NO = 5
    SYNCHRO BIT ERROR     =     XXXX  TIMES
    BIPOLAR VIOLATION ERROR = XXXX  TIMES
    SLIP ERROR      =         XXXX  TIMES
    CRC ERROR       =         XXXX  TIMES
DTU NO = 6
    SYNCHRO BIT ERROR     =     XXXX  TIMES
    BIPOLAR VIOLATION ERROR = XXXX  TIMES
    SLIP ERROR      =         XXXX  TIMES
    CRC ERROR       =         XXXX  TIMES
```

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Figure 11-11
RDTU Performance Monitor Printout

Table 11-5
RDTU T1 Error Record

RDTU T1 ERROR RECORD

(see Section 11.7)

Customer _____

Copy as required for each customer site.

	LATEST[1] DK280 POWER OFF/ON RESET	SYNCRO BIT ERROR	BIPOLAR VIOLATION ERROR	SLIP ERROR	CRC ERROR
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					
DATE/TIME					

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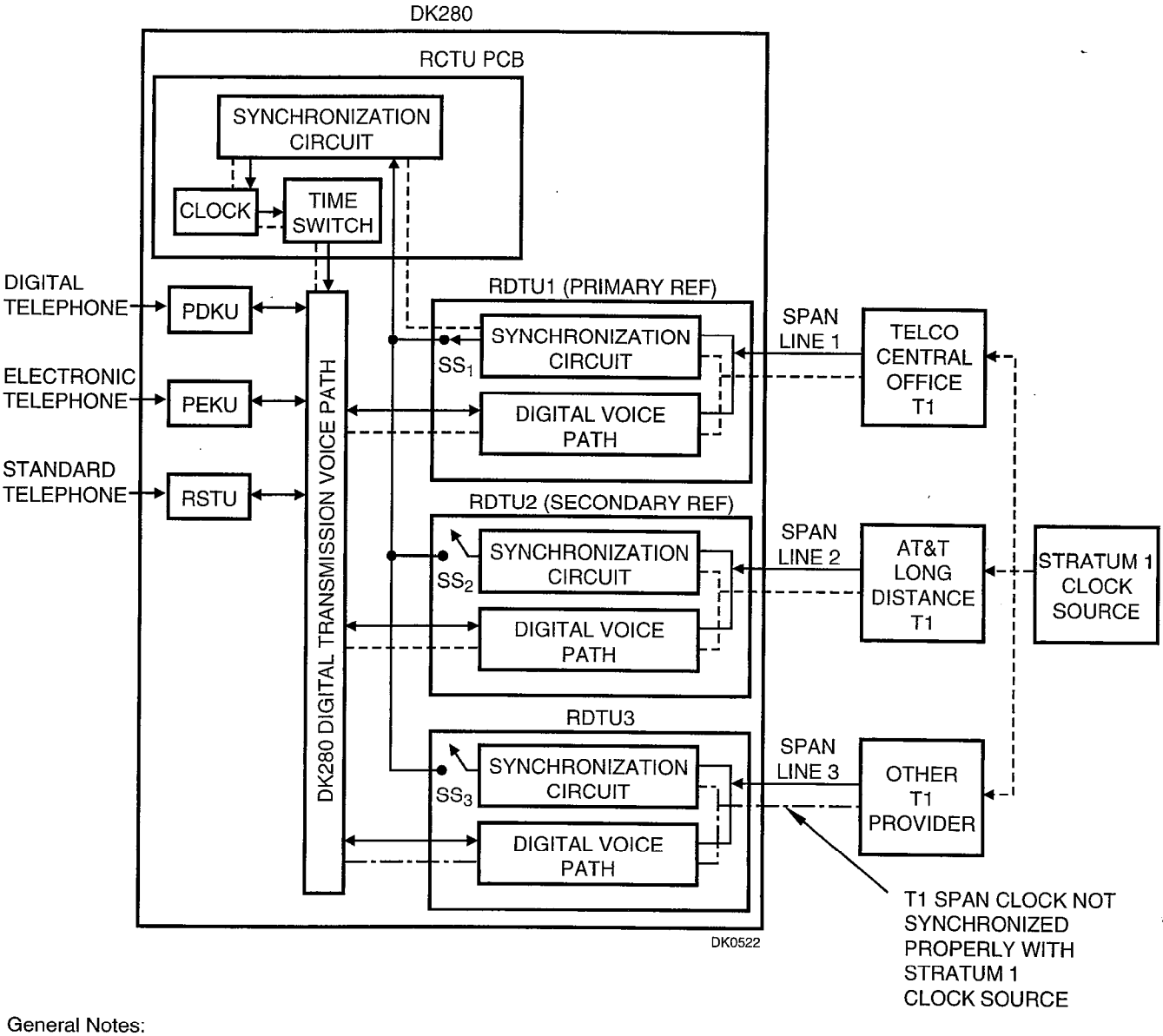
General Notes:

- *Latest DK280 Power ON/OFF Reset: Use this column to record whether the DK280 Power was reset ON or OFF, and the date and time that it was reset.*
- *Use the Synchro Bit Error, Bipolar Violation Error, Slip Error, and CRC Error columns to record the error number, and the date and time that they occurred.*

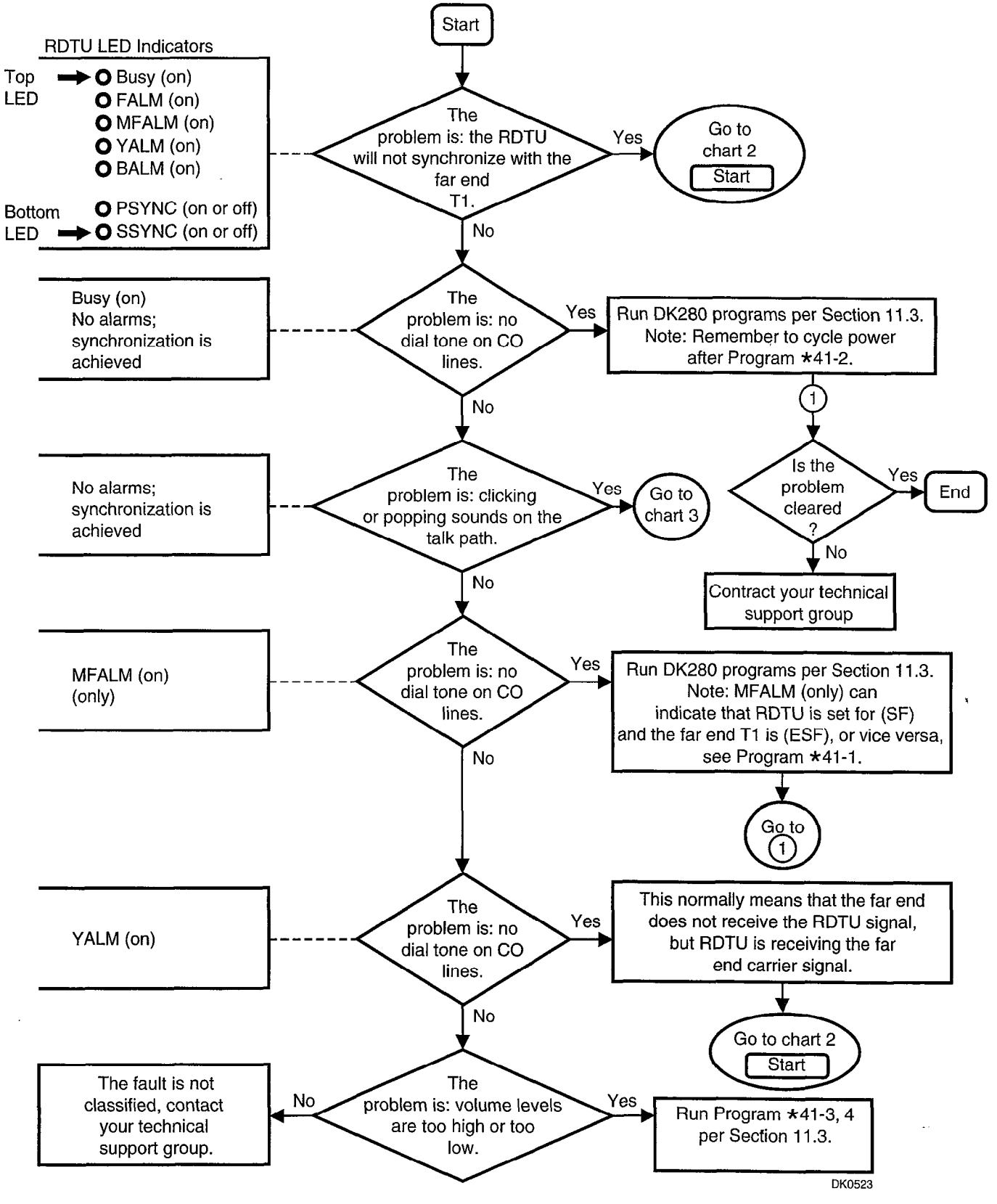


General Notes:

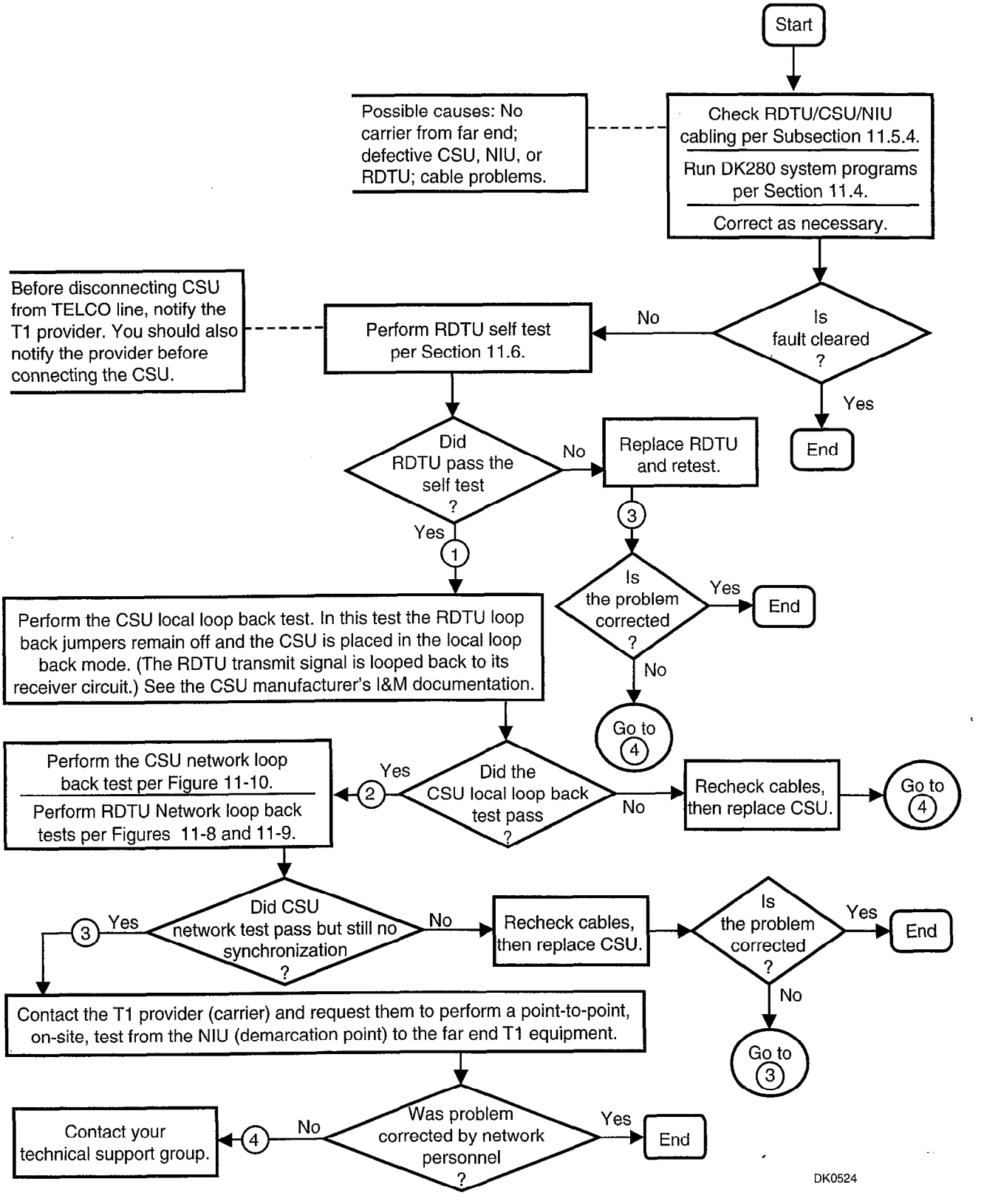
- Primary Reference Syncronization:
  In this diagram RDTU1 is the primary reference, its synchronization circuit sends the clock reference from the TELCO T1 span to the DK280, to the RCTU1 synchronization circuit, via RDTU1 Software Switch (SS). The RCTU clock synchronizes the DK280 digital transmission voice path (via RCTU time switch) to the TELCO/STRATUM1 clock source.
- Secondary Reference Switch-Over:
  If the primary reference T1 (RDTU1) fails, the DK280 will automatically open the RDTU1 primary synchronization circuit (SS_1) and close the RDTU2 secondary synchronization circuit (SS_2). At this time, the DK280 digital voice path will be synchronized to the AT&T/STRATUM1 clock source.
- Slip example:
  In the above diagram the "Other T1 Provider" is not synchronized to the STRATUM1 clock source properly – Slip problems will occur on RDTU3 T1 channels.

Figure 11-12
RDTU Primary/Secondary Reference Block Diagram

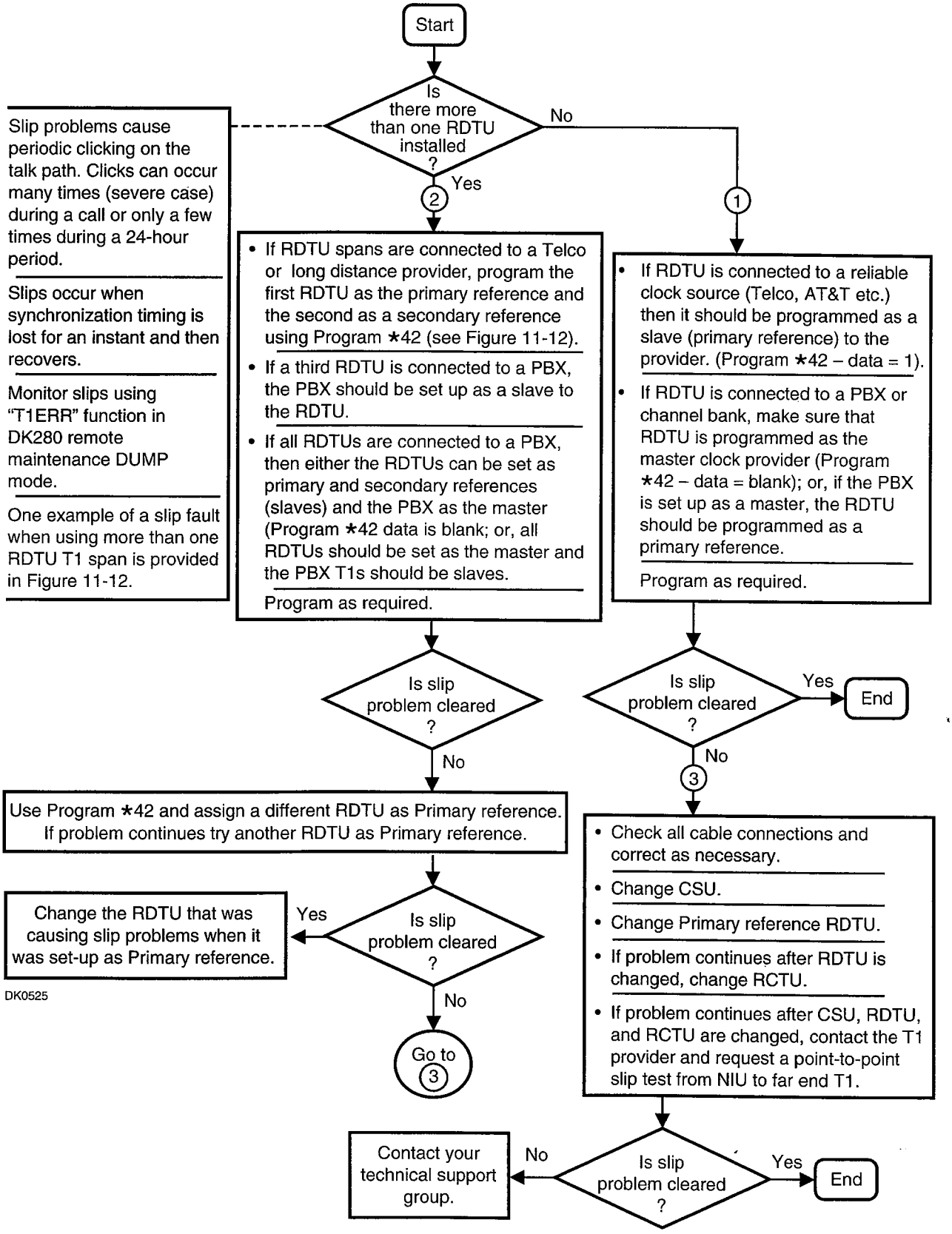
Flowchart 11-1
Fault Classification



Flowchart 11-2
No Synchronization



Flowchart 11-3
Synchronization Slip Problems



Strata® DK280

Digital Business Telephone System

Release 3

Fault Finding

Contents

Flowcharts

Fault Finding 12

This chapter describes the procedures to diagnose faults in the Strata DK280 digital key telephone system. Faults are classified and then cleared by replacing the malfunctioning unit and by performing operational tests in the sequences by prescribed by the fault clearing flowcharts in Section 12.7.

12.1 Fault Classification

A Fault Classification Flowchart is provided to ensure that fault clearing is pursued in a logical sequence (Flowchart 12-1).

The flowcharts assume that the fault was discovered and reported by a digital or electronic telephone user. All faults, therefore, are classified according to the way they would appear at the digital or electronic telephone.

12.2 Fault Clearing Procedures

Before attempting to clear any fault, ensure that it is in the system and not caused by associated external equipment, such as wiring, MOH source, etc.

IMPORTANT !

Many system features are assigned, enabled or disabled using software entries as described in the Programming Part of this manual. It is very important to verify that the system programming is correct and functional before troubleshooting the hardware.

Initialize the system (Programs 91-9 and 03) before testing new systems or when changing the RCTU PCB.

Faults in the DK280 are cleared by replacing PCBs, telephones (digital or electronic) or the power supply, as instructed in the flowcharts.

Five symbols are used in the flowcharts, which are identified in Figure 12-1.

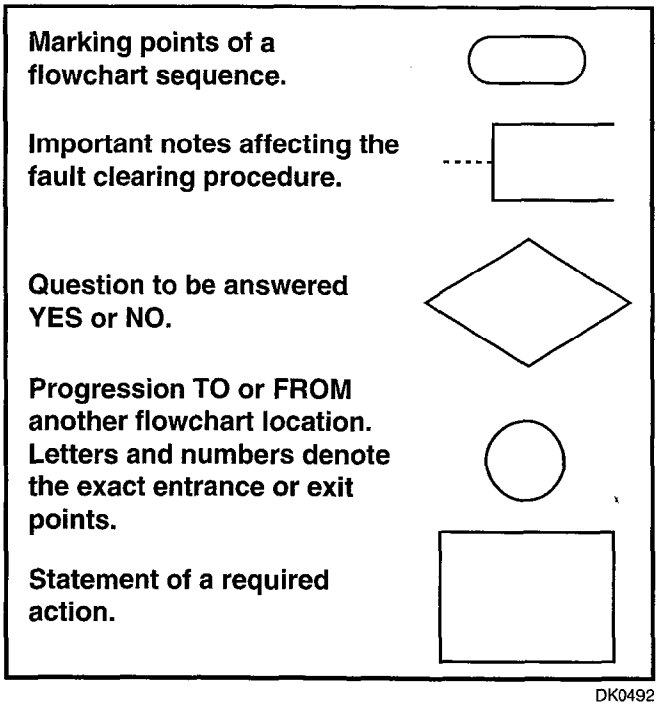


Figure 12-1
Flowchart Symbols

The flowcharts are sequentially arranged to permit rapid fault localization within the system. All fault clearing must begin with the Fault Classification Flowchart, which is arranged in the correct fault locating sequence.

Observe the following precautions when handling PCBs:

CAUTION !

Do not:

- *Drop a PCB.*
- *Stack one PCB on top of another.*
- *Handle a PCB without discharging any static electricity from your person by touching the grounded cabinet.*
- *Touch PCB contacts with your fingers.*

IMPORTANT !

If the fault is not cleared by substituting a PCB, reinstall the original PCB in the KSU before trying another PCB.

12.3 Defective Parts Return

Follow these steps to ship a defective system part for repair:

1. Pack the part in a suitable container (original box is highly recommended). Use anti-static containers for all PCBs and Feature cartridge. Use plastic bags for digital or electronic telephones, KSU, etc.

CAUTION !

To avoid damage, never write on the part itself!

2. Describe the nature of the defect on an information tag. Attach the tag to the front of the unit with string (not wire) so the tag can remain attached during the testing and repair.

   Return tags are available from Toshiba America Information Systems, Inc., TSD Division.

12.4 Common Control Fault Isolation

The DK280 Common Control PCBs, RCTUA, RCTUB, RCTUBA/BB, and RCTUC/D, may contain a "soft" fault due to an extremely high level of static electricity and/or improper or no System Initialization. If it is found defective during the fault finding procedures, attempt to clear a "soft" fault before returning the RCTU PCB for repair. The correct procedure for this is:

1. Verify that the BATT jumper plug on the RCTUA, RCTUB, RCTUBB, RCTUC or RCTUD3 PCB is in the ON position.
2. If the RRCS or RKYS options are installed on the RCTU, verify that they are installed correctly per Chapter 4—Printed Circuit Boards.
3. With system power OFF, install either an RCTUA, B, BB, or D in the "RCTU" slot of the base cabinet. If RCTUD is installed, install RCTUC in the "R11" slot of base cabinet. If RCTUBB is installed in the "RCTU" slot, install RCTUBA in the R11 slot of the base cabinet.
4. If installing RCTUC and D or RCTUBA and BB, connect them together with the two ribbon cables supplied per Chapter 4—Printed Circuit Boards.
5. Verify all other circuit boards are installed in proper slots per Chapter 1—Configuration.
6. Turn system power ON; verify that the heartbeat LED flashes on RCTUA3, RCTUBB, RCTUB, RCTUD (RCTUA1, BA, and C do not have heartbeat LEDs).
7. Run System Initialization Program 91-9 (two times) per Record Sheet Program 91-9.
8. Run Program 03, for all option PCBs installed per Record Sheet Program 03.
9. With DK280 Release 3, run the RCTU RAM tests with Program 00.
10. Enter the customer database (manually or with 280Admin) and retest for fault.
11. If the fault remains, test power supplies per Section 12.5. After doing these procedures and power supplies are within specification, tag the defective RCTU PCB(s) and return for repair.

12.5 RPSU280 Power Supply Test

This test applies to the base and expansion cabinet RPSU280 power supplies. Cabinet Printed Circuit Boards (PCBs) may or may not be installed when beginning this test. Some steps in the test require an AC/DC voltmeter that can measure up to 50 VDC and 150 VAC.

1. Verify that the correct RPSU280 jumper plug is installed in the jumper plug socket. The plug with the wire must be installed on the base cabinet RPSU280 and the plug without the wire must be installed on all expansion cabinet RPSU280s. One of each plug is supplied in a plastic bag attached to each RPSU280 power supply.

2. Verify the power supply ON/OFF switch is in the ON position.

   Note:
   The base cabinet ON/OFF switch must be ON to allow expansion cabinet power supplies to operate.

   Verify that the data ribbon cable is plugged into the base from all expansion cabinets.

3. Ensure the AC power cord is plugged into the RPSU280 AC IN connector and the commercial AC outlet (or power strip (RPSB) if used). The green POWER LED indicator will be on when AC power is connected to the RPSU280 and the power supply ON/OFF switch is ON. Take appropriate action to restore AC power if necessary.

   Note:
   The green power LED indicates that AC voltage is present at the AC IN connector only when the RPSU280 ON/OFF switch ON. This is helpful for battery backup systems—the POWER indicator will be OFF and the +5V and –5V indicators will be ON when the DK280 is operating on reserve power (batteries).

4. Verify that the +5V and –5V green LED indicators are ON. If one or both indicators are OFF, remove cabinet PCBs one at a time and check if +5V or –5V indicators turn on (it may be necessary to turn power OFF and ON to restore ±5 volts). Replace defective PCBs causing ±5 volt fault.

IMPORTANT !
If a CRCU PCB is installed on an RCTU PCB, ±5 volts will turn off. Do not install CRCU on RCTU. Only RRCS DTMF PCBs can be installed on RCTU.

---

5. Lightly press the three –24V circuit breakers to ensure they have not accidentally opened during shipment. If a circuit breaker continues to "trip," remove cabinet PCBs, one at a time, and try to reset the circuit breaker. Replace defective PCBs if causing –24 volt fault. See the 24V circuit breaker assignments in Figure 12-2 below. If breakers continue to trip, go to Step 7.

6. Using a DC voltmeter, measure the power supply DC output voltages at the "DC OUT" connector on the RPSU280. Refer to Figure 12-2 for voltage pin locations and specifications. Place the positive (black) meter lead on the FG screw. Insert the negative (red) meter lead tip into the DC out connector until it makes contact.

   Make sure that +5 volt, –5 volts, and –24 volts are within the range specified in Figure 12-2. Do this test with PCBs inserted; if a voltage(s) is not within specification, remove PCBs, one at a time and recheck the voltage. (Power may have to be turned OFF and ON to restore a voltage.) Replace any PCB which causes a voltage fault. If voltage tests out of specification with all PCBs removed from the cabinet, go to Step 7.

7. Unplug the cabinet DC power connector from the RPSU280 "DC OUT" jack. Attempt to reset -24 volt breakers per Step 5. If breaker cannot be reset replace power supply; if breakers reset go to Step 8.

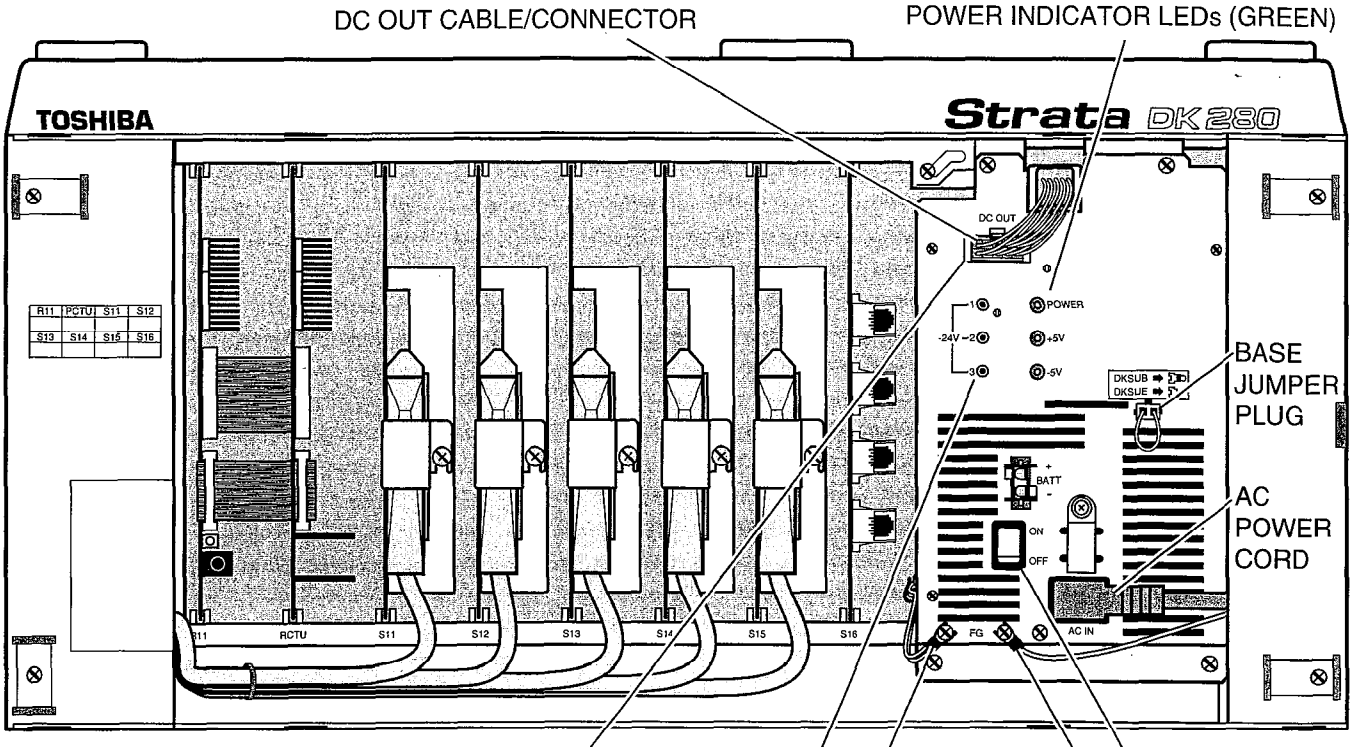
8. Check the power supply DC voltages measuring at the DK280 "DC OUT" jack with the black meter lead on the BATT "+" terminal. If the DC voltages are within specification when the cabinet DC power connector is disconnected but not within specification when the cabinet is connected, the cabinet is probably defective.

   If the DC voltages are not within specification when the cabinet DC power connector is unplugged, the RPSU280 power supply probably is defective. Replace the defective cabinet or RPSU280 power supply per Chapter 3—Cabinet Installation.

IMPORTANT !
+5 Volts (white wire) cannot be checked with the DC out cable disconnected.

---

9. Using the DC voltmeter, check the RPSU280 battery charger as follows: Remove the battery cable from the power supply "BATT" connector. Place the positive (black) meter lead on the "+" BATT pin and the negative (red) meter lead on the "–" BATT pin. The allowed range is (–26.3 volts ~ –27.8 volts). If BATT output is not within specification, replace the RPSU280.



DC VOLTAGE PINS

RED WIRE	NO WIRE	BLUE WIRE	WHITE WIRE	GREEN WIRE
+5 V	0 V	–5 V	+5 V	0 V
GREEN WIRE	GREEN WIRE	YELLOW WIRE	YELLOW WIRE	YELLOW WIRE
0 V	0 V	–24 V	–24 V	–24 V

DC VOLTAGE SPECIFICATION		
+5 VOLTS (+4.5 ~ +5.5)	BATT (VOLTS)	
–5 VOLTS (–4.5 ~ –5.5)	+	0
–24 VOLTS (–26.3 ~ –27.8)	–	–26.3 ~ –27.8

24V CIRCUIT BREAKER ASSIGNMENTS:

BASE CABINET	
24V-1	S15, S16
24V-2	S13, S14
24V-3	S11, S12

EXP. CABINET	
24-1	SX1, SX2
24-2	SX3, SX4, SX5
24-3	SX6, SX7, SX8

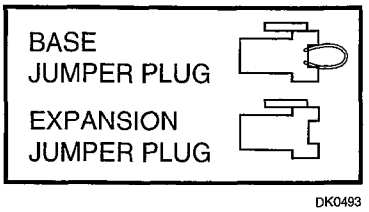


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Figure 12-2
RPSU280 Power Supply Voltage Test Points / Circuit Breakers / Jumper Plugs

12.6 Station Cable Continuity Check

12.6.1 Voltmeter Test

Use a voltmeter to check cable continuity between the DK280 KSU, digital or electronic telephone and the DSS or attendant console. Make tests at the modular block. Refer to Tables 12-1 and 12-3 and follow these steps:

1. Disconnect attendant console from the RJ11 wall jack; with RATU installed, measure each of the two attendant console pairs at the attendant console wall jack. The attendant console loop voltage must be within (±43.2 ~ ±52.6 VDC).
2. Refer to Chapter 7—Wiring Diagrams for appropriate MDF wiring diagrams.
3. Disconnect the digital or electronic telephone, DSS console, PDIU-DS, HDCB, or DDCB.
4. Using a DC voltmeter, measure between the wires of the two pairs to verify the readings shown in Table 12-1 for electronic telephone ports (PEKU or PESU). Refer to Table 12-3 for digital telephone ports. The reading will be a plus or minus depending on meter lead placement.
5. An improper reading indicates an open, crossed or shorted wire.
6. For the MDF-to-telephone (digital or electronic) cable, use an ohmmeter to make a more precise check.

12.6.2 Ohmmeter Test

The continuity of the cable run between the KSU and digital or electronic telephone is checked with an ohmmeter as follows:

1. Disconnect the attendant console, DSS console, electronic or digital telephone.
2. At the MDF, remove the bridging clips.
3. At the MDF, place shorting jumper wires between the T and R of pair #1 (green-red), the T and R of pair #2 (black-yellow) and the T and R of OCA pair #3 (blue-white), for PEKU/PESU only. (For MDF pin numbers, see Chapter 7—Wiring Diagrams.)
4. At the modular block, measure the resistance between all wire combinations. The proper readings are shown in Table 12-2 for electronic telephones and HDSSs, and Table 12-4 for attendant console, digital telephones, DDSSs and DDCBs.

12.6.3 Cable Installation

If cable voltmeter and ohmmeter tests are within limits, digital telephones, attendant consoles, DDCBs, or DDSS consoles may not operate because of the following:

1. Cable runs for the above digital devices must be free of cable splits (single or double). Test for and eliminate all cable splits.
2. Cable bridge taps – Digital telephones will not operate if cable runs contain any type (short or long) of cable bridge. Test for and eliminate all cable bridges.
3. When installing the station cable, do not run parallel to and within 3 feet of an AC power line. AC power lines should be crossed at right (90°) angles only. In particular, avoid running station wire pairs near devices that generate electrical noise, such as neon or fluorescent light fixtures.
4. Check Table 7-4, in Chapter 7—Wiring Diagrams. Verify that your telephone is wired correctly (2-pair or External power) for the options it supports (ADM, RPCI-DI, PDIU-DI, HHEU, DVSU, etc.).

12.7 Fault Isolation Flowcharts

The following troubleshooting flowcharts are available to aid in fault isolation. Toshiba recommends reading Sections 12.1 ~ 12.4 before proceeding to Flowchart 12-1 to begin fault isolation.

Table 12-1
(Electronic Telephone Cables)
Station Cable Continuity Check Using Voltmeter

FROM			TO			VOLTAGE [2]
Pair	Wire	Color	Pair	Wire	Color	
1	T	Green	2	T	Black	24 [2]
1	R	Red	2	T	Black	24 [2]
1	T	Green	2	R	Yellow	24 [2]
1	R	Red	2	R	Yellow	24 [2]
1	T	Green	1	R	Red	0
2	T	Black	2	R	Yellow	0
3	T	White	3	R	Blue	0
3	T	White	1	R	Red	0
3	R	Blue	1	R	Red	0
3	T	White	1	T	Green	0
3	R	Blue	1	T	Green	0
3	T	White	2	T	Black	0
3	R	Blue	2	T	Black	0
3	T	White	2	R	Yellow	0
3	R	Blue	2	R	Yellow	0

Table 12-2
(Electronic Telephone Cables)
Station Cable Continuity Check Using Voltmeter

FROM			TO			Resistance
Pair	Wire	Color	Pair	Wire	Color	
1	T	Green	2	T	Black	open
1	R	Red	2	T	Black	open
1	T	Green	2	R	Yellow	open
1	R	Red	2	R	Yellow	open
1	T	Green	1	R	Red	40 ohms [1]
2	T	Black	2	R	Yellow	40 ohms [1]
3	T	White	3	R	Blue	40 ohms [1]
3	T	White	1	R	Red	open
3	R	Blue	1	R	Red	open
3	T	White	1	T	Green	open
3	R	Blue	1	T	Green	open
3	T	White	2	T	Black	open
3	R	Blue	2	T	Black	open
3	T	White	2	R	Yellow	open

Table 12-3
(Digital Telephone Cables)
Station Cable Continuity Check Using Voltmeter

FROM			TO			VOLTAGE
Pair	Wire	Color	Pair	Wire	Color	
1	T	Green	2	T	Black	0
1	R	Red	2	T	Black	24 [2]
1	T	Green	2	R	Yellow	24 [2]
1	R	Red	2	R	Yellow	0
1	T	Green	1	R	Red	24 [2]
2	T	Black	2	R	Yellow	24 [2]

Table 12-4
(Digital Telephone, Attendant Console, DDSS, or DDCB Cables)
Cable Continuity Check Using Ohmmeter

FROM			TO			Resistance
Pair	Wire	Color	Pair	Wire	Color	
1	T	Green	2	T	Black	open
1	R	Red	2	T	Black	open
1	T	Green	2	R	Yellow	open
1	R	Red	2	R	Yellow	open
1	T	Green	1	R	Red	40 ohms[1]
2	T	Black	2	R	Yellow	40 ohms[1]

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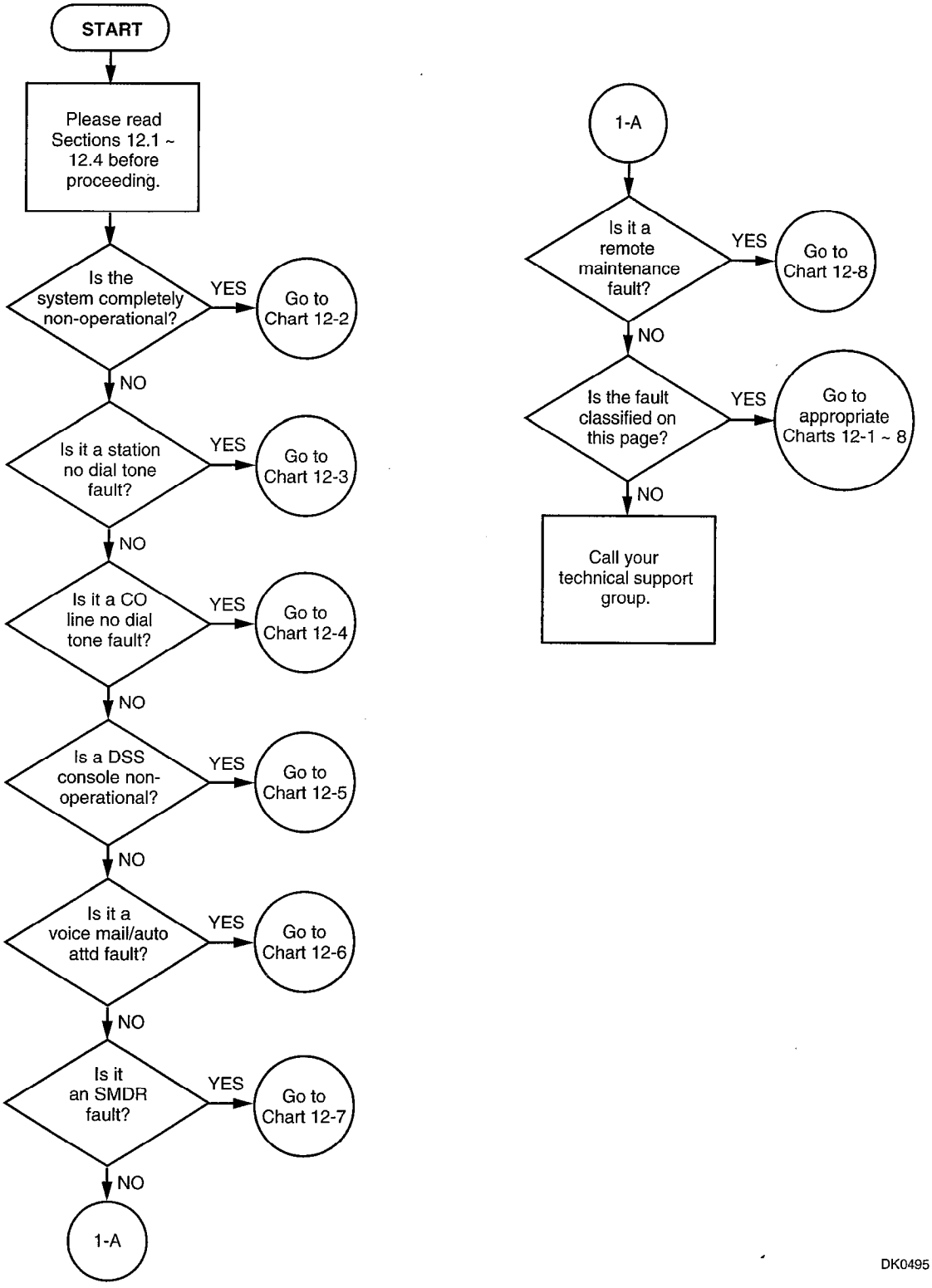
Notes:

1. *This is the maximum allowable reading for all digital and electronic telephone cable runs except if connecting an HDss console to Circuits seven and eight of a PEKU—then the maximum cable restriction is 20 ohms, not 40 ohms.*
2. *Nominal voltage—within the limits of ±26.3 ~ ±27.8 VDC while under AC power, polarity depending on voltmeter lead placements.*

General Note:

- *The green-red, black-yellow, and white-blue measurements should be within 10 percent of each other.*

Flowchart 12-1
Fault Classification



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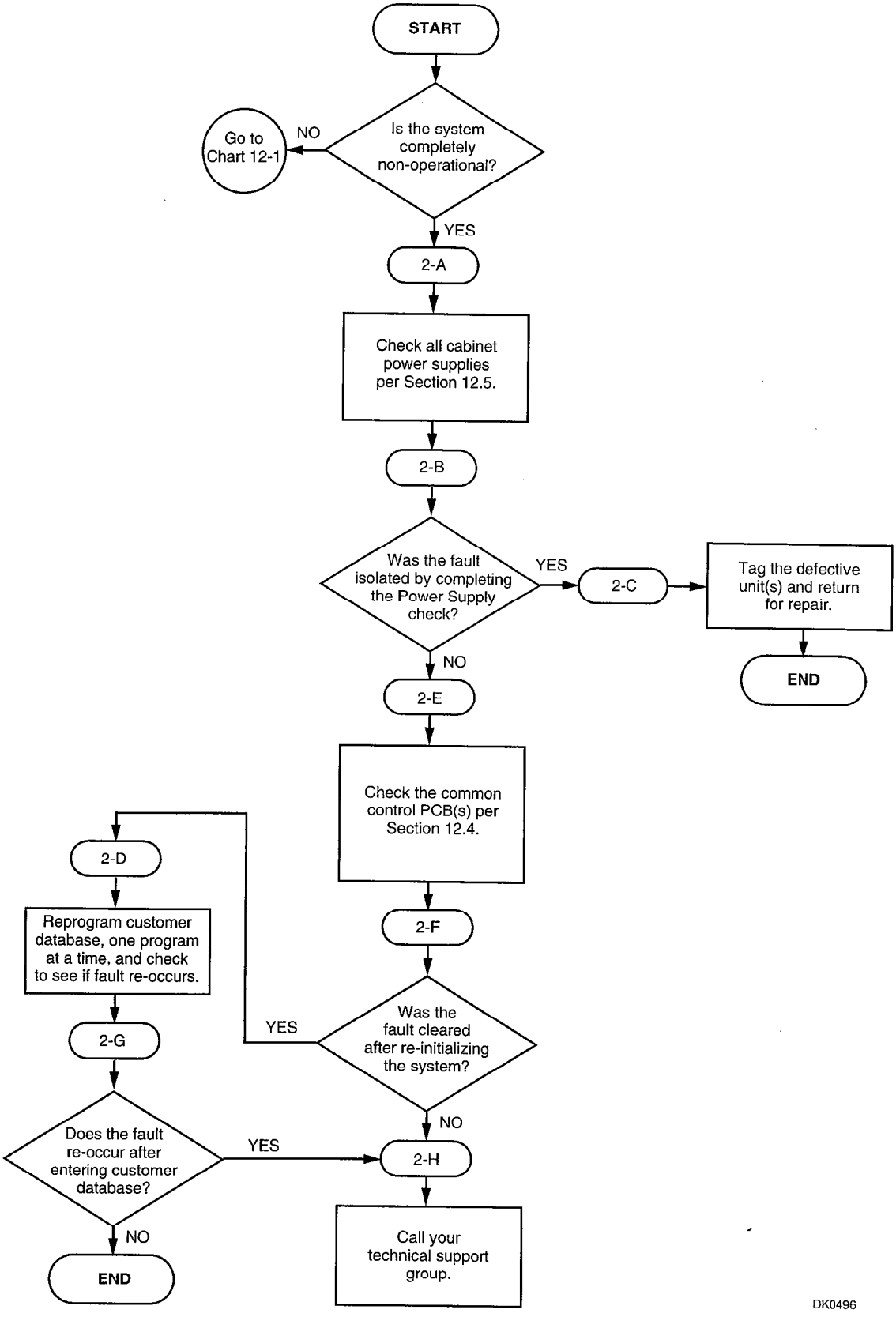
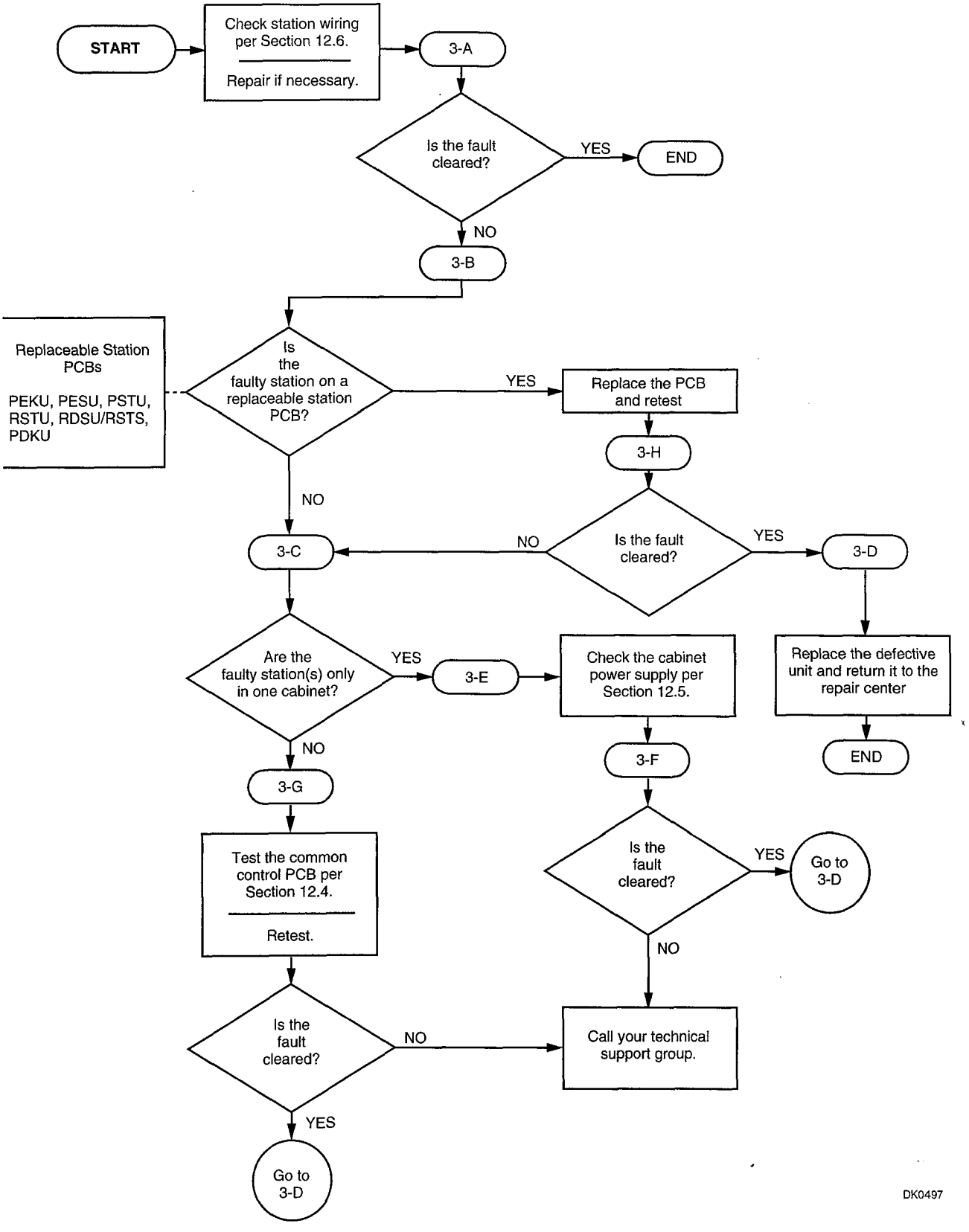
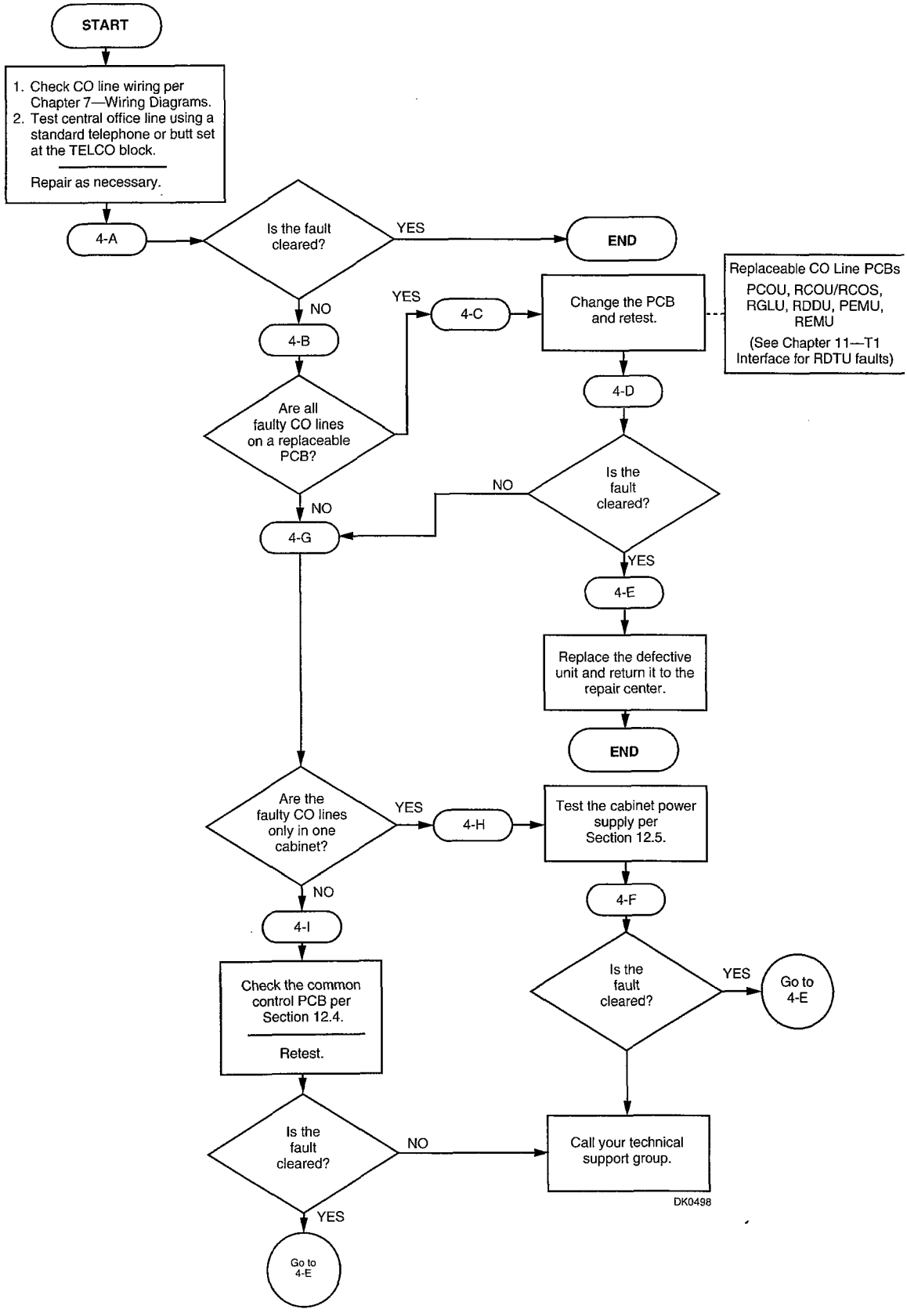
Flowchart 12-2
Catastrophic Faults



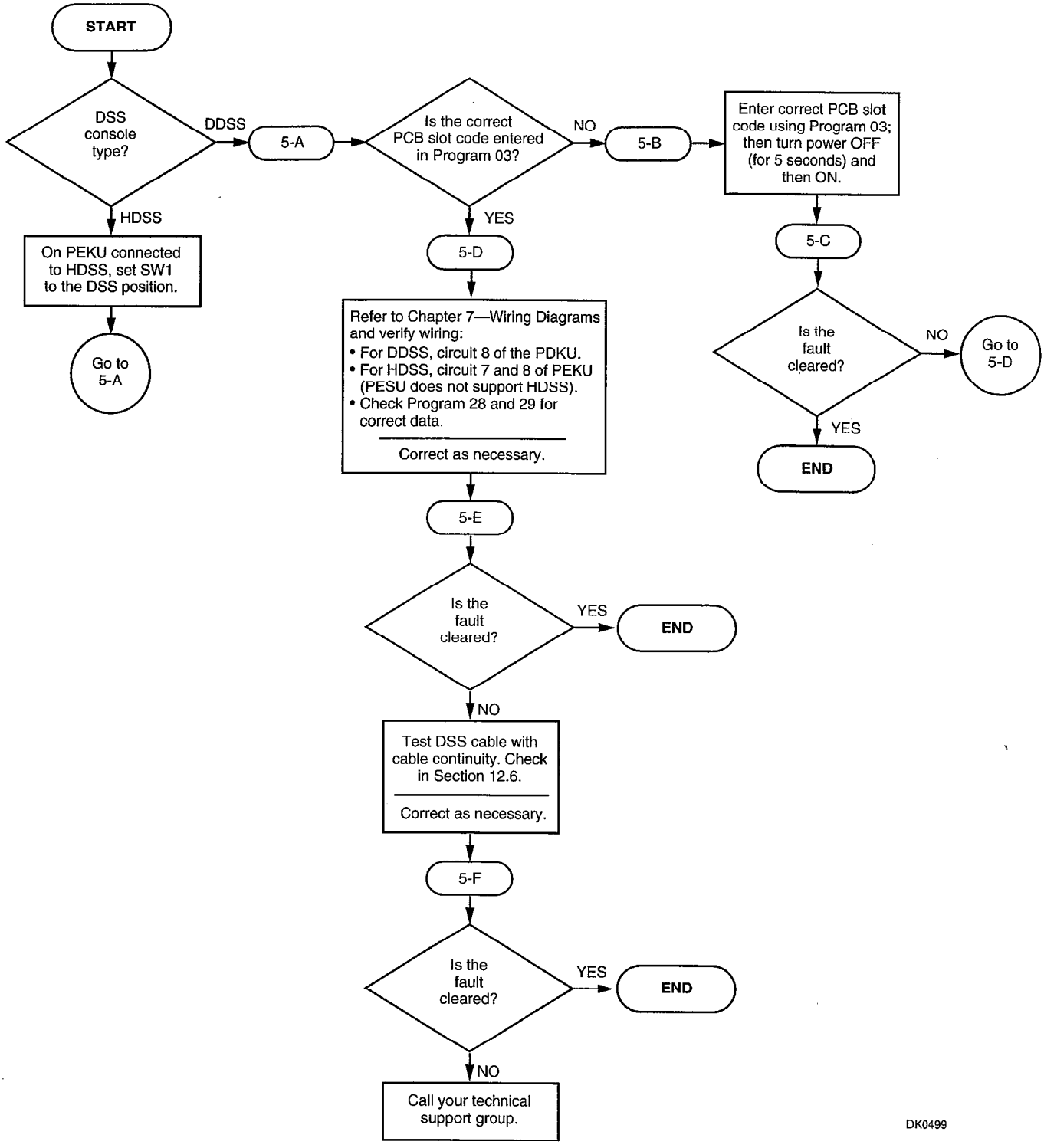
Flowchart 12-3
Station Dial Tone Faults



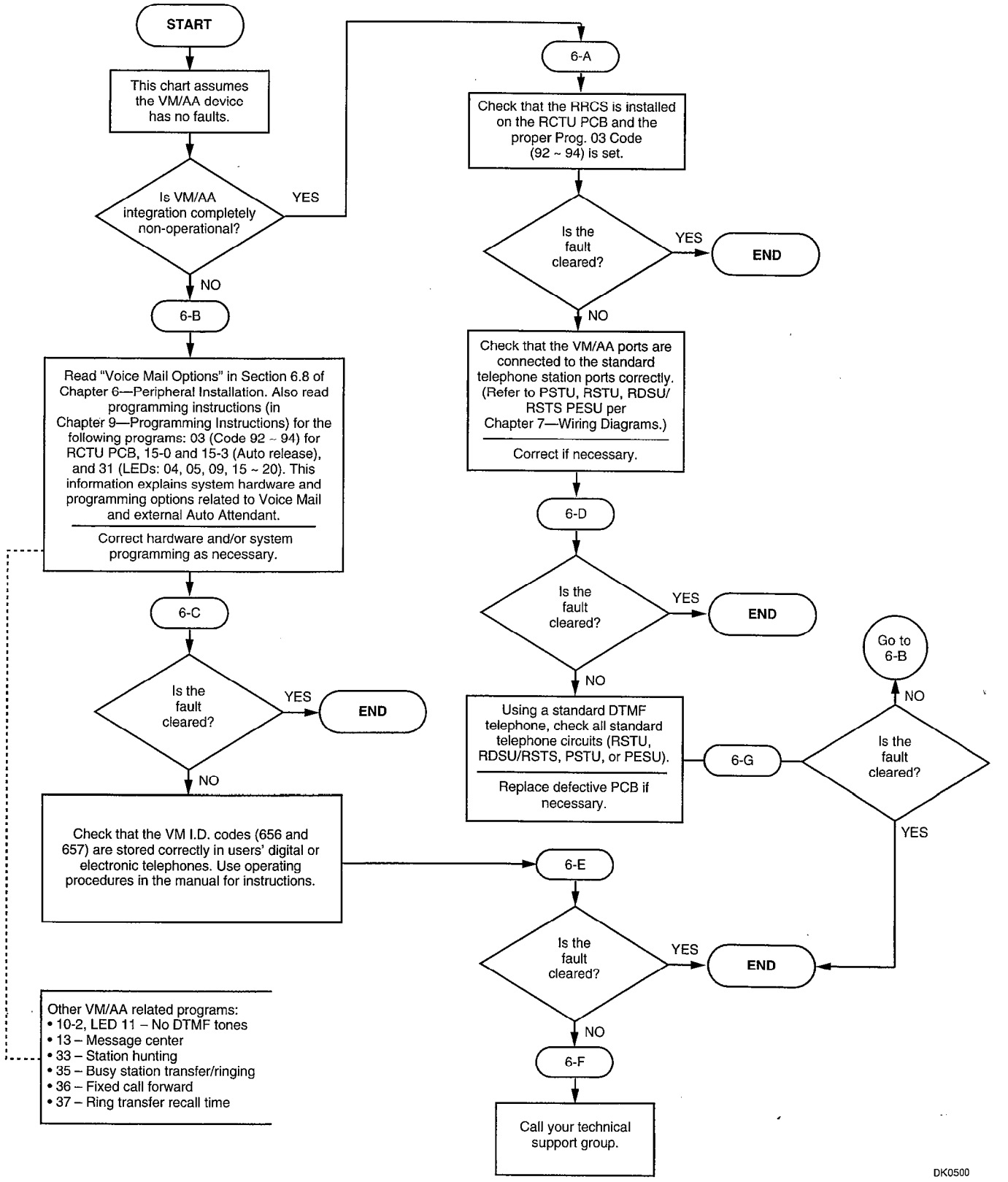
Flowchart 12-4
CO Line Dial Tone Faults
(See Chapter 11—T1 Interface for RDTU Faults)



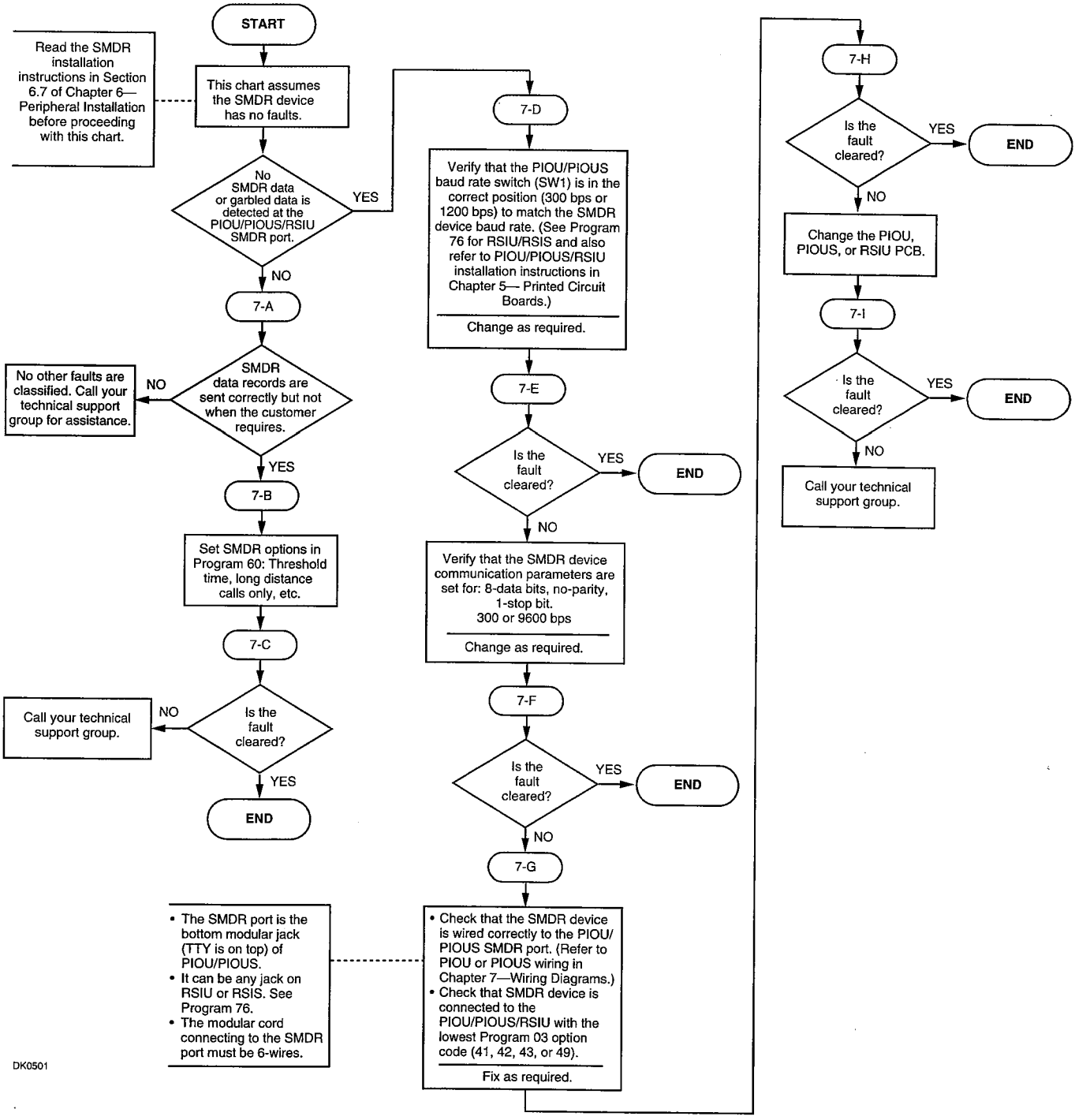
Flowchart 12-5
DSS Console Faults



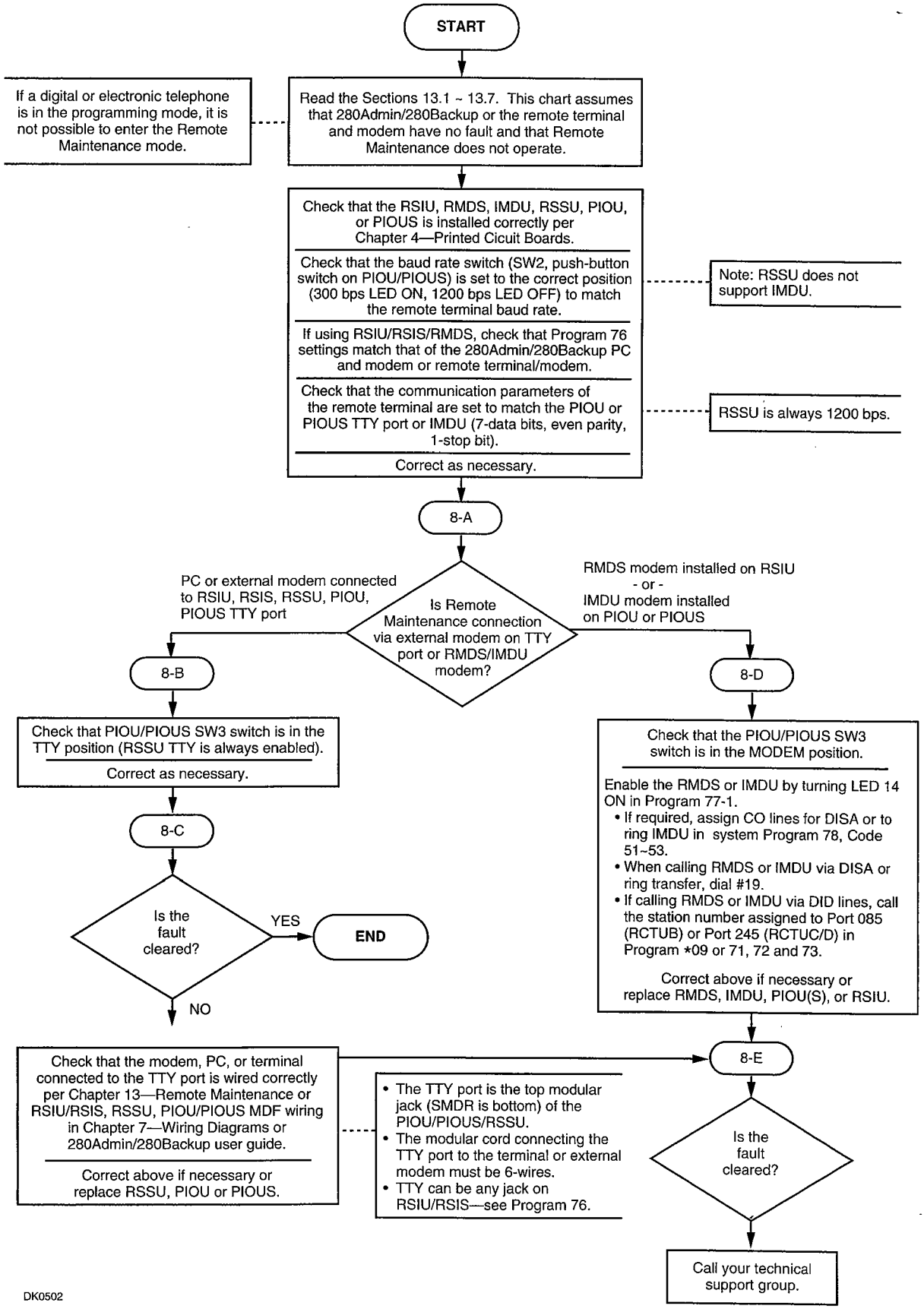
Flowchart 12-6
Voice Mail/(External) Auto Attendant (VM/AA) Faults



Flowchart 12-7
Station Message Detail Recording (SMDR) Faults



Flowchart 12-8
Remote Maintenance Faults



Strata® DK280

Digital Business Telephone System

Release 3

Remote Maintenance

Contents

Chapter 13 - Remote Maintenance

Chapter 13 - Remote Maintenance (continued)

Figures

Tables

Tables (continued)

Remote Maintenance 13

13.1 Using Remote Administration and Maintenance

Figure 13-1 is provided as a quick reference aid in using this section.

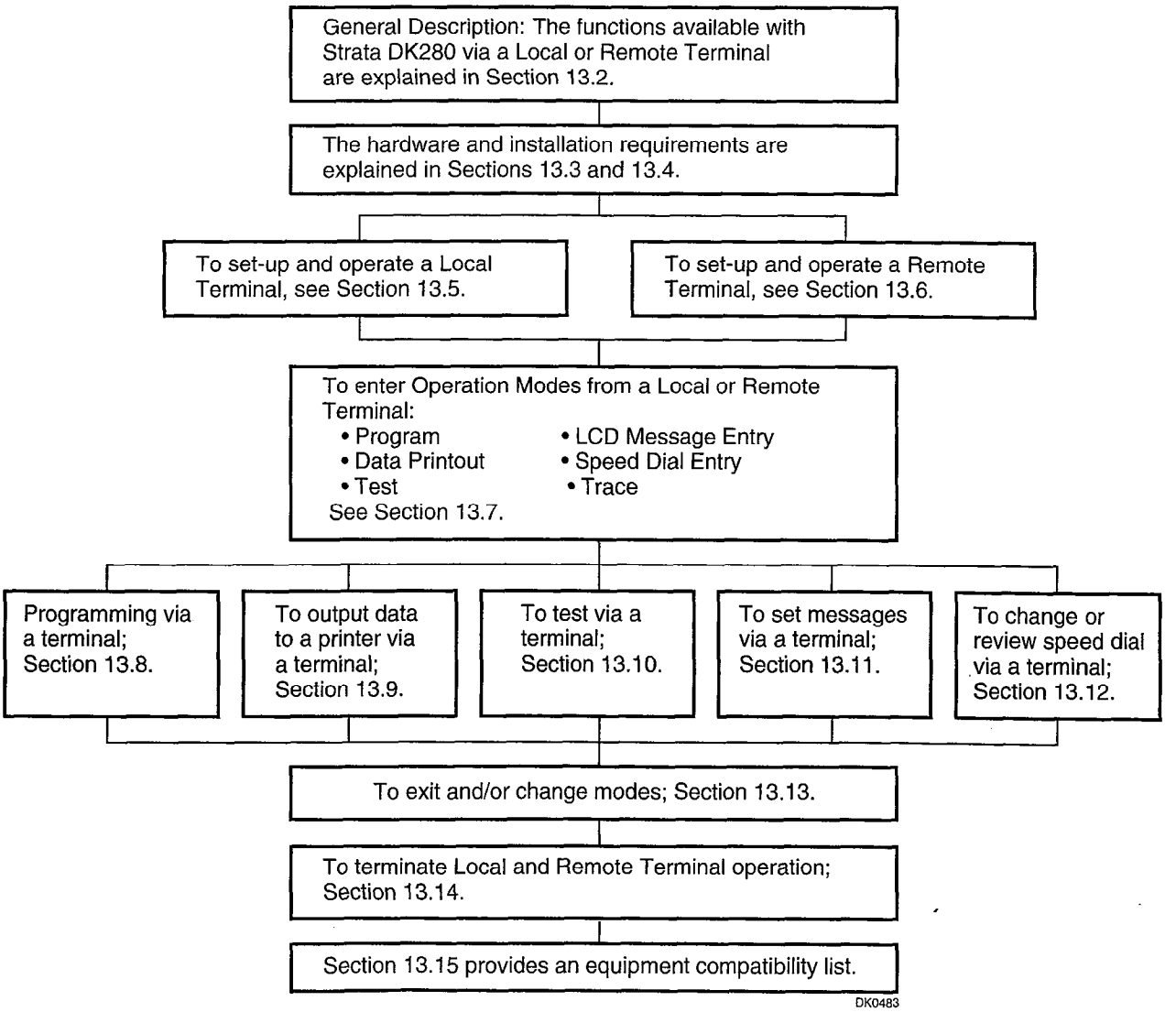


Figure 13-1
Section Flowchart

13.2 General Description

Remote Administration and Maintenance is accomplished with a remote ASCII terminal/modem communicating over the public telephone network via either an external modem (connected to a dedicated CO line or a standard telephone port) or a modem unit (IMDU) installed on a PIOU or PIOUS PCB or an RMDS installed on a RSIU PCB—Release 3 and above. See Figures 13-2 ~ 13-5.

Note:
Using an ASCII terminal for Remote Maintenance (RM) is not recommended. Toshiba recommends that a 280Admin PC be used for RM.

Remote Administration and Maintenance calls may connect to the IMDU or RMDS automatically via programmable CO line ringing assignments (Program 78) for ground/loop start lines or via Program *09 or 71-1 (1~3) for DID/tie/DNIS lines, or manually via the standard call transfer feature at Directory Number #19. Automatic connection allows remote programming to be accomplished after business hours without on-site assistance via night ringing assignments.

Remote Administration and Maintenance allows the following functions to be accomplished remotely:

Program Mode provides for complete programming of all Strata DK280 programs (including Speed Dial adds/changes).

Test Mode provides for testing of Strata DK280 stations and CO lines.

Data Dump Mode provides a complete printout of all or individual Strata DK280 customer database programs, including Speed Dial numbers and LCD messages.

Message Mode provides for sending, adding, or changing digital and electronic telephone LCD messages.

Speed Dial Mode allows Station and System Speed Dial numbers to be programmed remotely.

280Admin/280Backup allows program download, upload and/or editing of DK280 system programs, System Speed Dial, Personal Speed Dial, LCD messages, voice mail codes and more. 280Admin or 280Backup requires a personal computer with Toshiba 280Admin or 280Backup software and an operating key connected to the LPT2 port of the PC. This section of the DK280 I&M manual does not provide instructions regarding the use of 280Admin or 280Backup—refer to the 280Admin or the 280Backup User Guides.

- **Program Download 280Admin and 280Backup** allows the database which is stored on a DK280 RCTU PCB to be sent to (and stored on) a Personal Computer disk. To download an RCTU database to a PC disk, the RCTU must be operating in a DK280 base cabinet; and the PC must have the Toshiba 280Admin or 280 Backup software installed. Also, an RSIU, RSSU, PIOU or PIOUS must be installed in any cabinet.

- **Program Upload 280Admin and 280Backup** allows the database which is stored on a PC disk to be sent to (and stored in) the RAM of an RCTU PCB. To upload an RCTU database from a PC disk, the same requirements necessary for program download are needed.

- Edit of customer database can be accomplished via 280Admin PC software (not 280Backup) on- or off-line with the DK280. Refer to the 280Admin User Guide for more information.

There are two levels of Remote Administration and Maintenance protected by a security code defined in Program 00.

Level 1 allows access to all programs.

Level 2 allows access to Programs 30 ~ 39 and 77 ~ 89, which pertain only to individual station options such as button assignments, Class of Service, etc.

Each Remote Administration and Maintenance level has a different programmable password for customer database protection. This allows a customer to make certain station moves, adds, and changes in Level 2; while protecting the critical system assignments in Level 1 (refer to Program 00).

13.3 Hardware Requirements

The Strata DK280 must be configured with either an IMDU-equipped PIOU or PIOUS, a RMDS-equipped RSIU, or an external modem connected to a dedicated CO line or standard telephone circuit. (A modem is not required for local, on-site, maintenance.)

13.4 Terminal/Modem Installation

Strata DK280 provides customers with a number of Remote Administration and Maintenance configuration options:

- A customer-supplied, 280Admin PC, maintenance terminal, or smart modem can be connected to the TTY port on the optional RSSU, PIOU or PIOUS PCB or to an RSIU or RSIS locally. The remote site requires a terminal or PC with communications or 280Admin software and a modem (see Figures 13-2 ~ 13-5).
- The Toshiba IMDU modem (300 or 1200 baud full-duplex) can be connected to the optional PIOU or PIOUS to allow system programming and testing to be accomplished from a remote location (Figure 13-4).
- The Toshiba RMDS modem can be connected to an optional RMDS (see Figure 13-4) or a RMDS installed on a RSIU PCB—Release 3 and above.
- Instead of a modem or terminal, a Stand-alone Data Interface Unit (PDIU-DS) can be connected to the TTY port on the RSIU, RSIS, PIOU, or PIOUS so that maintenance and programming can be administered internally or externally, internal desktop personal computers or terminals must be connected to Integrated Data Interface Units (PDIU-DI or RCPI-DI).
- Refer to the 280Admin User Guide for more information about connecting the 280Admin PC to the DK280.

  Note:

  An external modem is required for Remote Maintenance if an RMDS or IMDU is not installed on the RSIU, PIOU or PIOUS. The RMDS or IMDU has a built-in maintenance channel for remote connection; however, an external modem requires a CO line or standard telephone port (Figures 13-2 and 13-3).

13.4.1 Maintenance Terminal/External Modem Option System Hardware Requirements

The Strata DK280 must be equipped with a PIOU or PIOUS PCB to support the maintenance terminal/external modem options. Connecting the local maintenance terminal or external maintenance modem to the PIOU or PIOUS PCB is done with a standard three-pair modular cord and a PPTC adapter connected to the PCB TTY jack. (Figures 13-2, 13-3, and 13-5).

13.4.2 Local Maintenance Terminal Installation

See Figure 13-5 and follow these steps to install the ASCII terminal.

1. Connect the three-pair modular cable (24 AWG twisted pairs) and the PPTC or PPTC9 adapter from the RSIU, RSIS, PIOU, or PIOUS TTY port to the remote maintenance terminal DB25 or DB9 connector.
2. Set the PIOU or PIOUS SW2 switch to match the modem or terminal baud rate as follows:
   - Push in for 300 bps (baud rate indicator CD4 is lit); let out (by pushing again) for 1200 bps (CD4 is not lit).
   - Use Program 76 to set the RSIU or RSIS port for TTY operation.
3. Set the PIOU or PIOUS SW3 switch to the TTY position.
4. Set the P13 jumper plug on the PIOU to the BELL configuration, or cut the W4 jumper on the PIOUS (also for BELL configuration).

   Note:

   The P13 (PIOU) and W4 (PIOUS) CCITT configurations are not normally used in the USA.
5. Set terminal communication parameters to seven bits, even parity, one-stop bit (300 ~ 9600 bps).
6. If using RSIU/RSIS/RMDS, see Program 76 for TTY or modem parameter setup.

IMPORTANT !

If a digital or electronic telephone is in the program mode, programming from the maintenance terminal is allowed.

13.4.3 Remote Maintenance Option Installation

RMDS and IMDU Maintenance Modem (Figure 13-4): The RMDS mounts on the RSIU PCB and the IMDU mounts on the PIOU or PIOUS PCB and provides 300 or 1200 bps data transmission. Both

the RMDS and the IMDU operate with full-duplex communication for remote maintenance (seven bits, even parity, one-stop bit). If the IMDU is employed, a dedicated CO line or standard telephone port is not required. Connection of the remote maintenance terminal is through existing system CO lines by transferring the call by dialing **#19** or via Direct Inward Dial (DID) CO lines (see Program *09 or 71-1 (1~3) to program RMDS or IMDU, DID extension number). Refer to the RSIU, RSSU, PIOU or PIOUS portion of Chapter 4—Printed Circuit Boards for hardware installation and programming requirements.

External Maintenance Modem Installation: Refer to Figures 13-2 or 13-3, as applicable, and install the external modem in accordance with the following steps:

Note:
The Toshiba PPTC RS-232 modular-to-DB25 adapter is factory configured for ASCII terminal connection. Pins 2 and 3, and Pins 8 and 20 of the adapter must be reversed for external modem connection (see Table 13-1).

1. Connect the modular cord from the RSIU, RSIS, RSSU, PIOU, or PIOUS TTY port to the PPTC adapter and then to the external maintenance modem RS-232 25-pin connector.

2. Connect the external maintenance modem line-side to a dedicated CO line (tip and ring) or to a dedicated standard telephone port, tip and ring. Refer to Chapter 7—Wiring Diagrams for wiring/interconnecting details.

3. Set the PIOU or PIOUS SW2 switch to match the modem or terminal baud rate:

   Push in for 300 bps (baud rate indicator CD4 is lit); let out (by pushing again) for 1200 bps (CD4 is not lit).

4. Set the PIOU or PIOUS SW3 switch to the TTY position.

   Note:
   The PIOU or PIOUS SW3 switch is set to the MODEM position for IMDU operation only.

5. Set the P13 jumper plug on the PIOU to the BELL configuration, or cut the W4 jumper on the PIOUS (also for BELL configuration).

   Note:
   The P13 (PIOU) and W4 (PIOUS) CCITT configurations are not normally used in the USA.

6. The communication parameters for the terminal that will be used to communicate through the external modem connected to the TTY port should be set to seven-bits, even parity, one-stop bit.

7. Programming and system testing, via the external maintenance modem, is described later in this section. To access to the external maintenance modem:

   - If the modem is connected to a dedicated CO line, call the CO line number to establish modem communication.
   - If the modem is connected to a standard telephone port, call a Strata DK280 CO line that can be transferred to (or programmed to ring) the standard telephone modem port to establish modem communication. It is also possible to establish communications by calling in on a Strata DK280 DNIS, DISA, DID, or Auto Attendant, CO line and dialing the Directory Number of the modem connected to the standard telephone port.

RMDS/IMDU Maintenance Modem Installation: If RMDS or IMDU is used, install the RMDS unit per the instructions provided in the RSIU section of Chapter 4—Printed Circuit Boards.

13.4.4 Programming

If an IMDU or RMDS and/or 280Admin/Backup is used, enable the IMDU or RMDS and/or 280Admin/Backup in Program 77-1 and Program 76 for RMDS.

If Remote Administration and Maintenance calls are to connect to the IMDU or RMDS automatically, assign the designated ground/loop start CO lines to ring the IMDU or RMDS intercom or directory number (#19) in Program 78 as required or assign DID/tie/DNIS CO lines in Program *09 or 71-1 (1 ~ 3) (use standard Strata DK280 programming procedures).

Program the security codes for Levels 1 and 2 as in the Chapter 9—Programming Instructions. Reference Program 00.

Note:
The security codes are initialized as "0000". These codes can also be changed via a local or remote terminal.

13.4.5 IMDU and RMDS On-site Testing

From any working station, test the functioning of the RMDS or IMDU.

1. Press an **Intercom** or **[DN]** button. Receive intercom dial tone.
2. Dial **# 1 9**. Receive modem tone from the IMDU or RMDS after a two-second delay.

   Notes:
   If you do not receive modem tone:
   1. *Check to see that the SW3 switch on the PIOU/PIOUS is set to "MODEM". See Chapter 4—Printed Circuit Boards.*
   2. *Check Program 77-1, LED 14 for IMDU/RMDS assignment.*
   3. *Check Program 03 for the correct RSIU or PIOU/PIOUS/RSSU slot assignment.*
   4. *Check Program 76 for RSIU or RSIS TTY assignment.*
3. Press the **Spkr** button to release.
4. Make an incoming call over each CO line that is programmed to ring the RMDS or IMDU (station #19).

   Receive modem tone from the RMDS or IMDU after a two-second delay with each call.

   Note:
   This test checks basic programming and RMDS or IMDU operation, and should be completed before continuing with Remote Administration and Maintenance installation.
5. If a terminal is to be used on-site, refer to Paragraph 13-5. For off-site programming refer to Paragraph 13-6.

Conventions for Local and Remote Terminal Operation

`Delete`	=	the Delete key
`Enter`	=	the Enter or Return key
`Spacebar`	=	the space bar

13.5 Local Terminal Operation

13.5.1 Requirements

The KSU must have an RSIU, RSIS, RSSU, PIOU, or PIOUS PCB installed per Chapter 4—Printed Circuit Boards. Refer to Paragraph 13-4 and Figure 13-5 for terminal installation details.

The local terminal must have an EIA RS-232 interface, communicate in ASCII code (seven-bit word length/one stop bit/even parity) at 300 ~ 9600 bps, have a standard typewriter-type keyboard, and display data via a CRT display or printer. A personal computer capable of emulating the described terminal may also be used (see Figure 13-5).

Operating the terminals, local or remote, is identical. The only difference is the physical connection and the method used to establish initial communications.

13.5.2 Set-up

Refer to Figure 13-2 and verify that the local terminal is connected and set up as follows:

1. Connect the RS-232 cable to the terminal connector and the RSIU, RSIS, RSSU, or PIOU(S) TTY connector (Figure 13-5).

   Note:
   If a personal computer is being used, connect the cable to the serial "COM" port.
2. Set the terminal baud rate to match the PIOU or PIOUS SW2 setting (300 or 1200 bps with PIOU/PIOUS/RSSU or 1200–9600 bps with RSIU or RSIS).
3. Set the terminal for "Full Duplex" operation.
4. Set the keyboard for **`Caps Lock`** on.

5. Set the terminal parameters to:

   Word length: 7 bits
   Stop bits: 1
   Parity: Even

13.5.3 Local Operation

Use the procedure below to establish communications between the local terminal and the PIOU(S) so that programming may be accomplished via the terminal.

1. Set-up the terminal as described in Paragraph 13.5.2.
2. Set the terminal to on-line.
3. Set **Caps Lock** on.
4. Press **Enter**.
   - The system responds, and the terminal displays:

     DK CONNECT
     > CODE
5. Type the four-digit security code, and press **Enter**.
   - The system responds, and the terminal displays:

     OK
     MODE

   Note:
   The security code can be entered any time the CODE prompt appears.
6. Go to Section 13.7—Selecting a Mode.

13.6 Remote Terminal Operation

13.6.1 Requirements

Terminal: The terminal must interface with an asynchronous modem, communicate in ASCII code at 300 ~ 9600 bps (depending on the TTY port used), have a standard typewriter-type keyboard, and display data via a CRT display or printer. A personal computer capable of emulating the described terminal may also be used (see Figures 13-2, 13-3, or 13-4 and Paragraph 13-15).

Modem: The modem must be full-duplex asynchronous, operate at 300 ~ 2400 bps, and have an RS-232 interface to connect with a terminal or PC (as described in the previous paragraph). It must interface with the public telephone network and be compatible with Bell 103 or 212 modem specifications.

13.6.2 Set-up

Refer to Figures 13-2, 13-3, or 13-4 and verify that the remote terminal is connected and set-up as follows:

1. Connect the terminal and modem together with the RS-232 cable.

   Note:
   If a personal computer is being used, connect the cable to the serial "COM" port.
2. Connect the modem line input to a CO/PBX line for access to the public telephone network.
3. Set the terminal and modem bps rate to match the PIOU(S), RSSU, RSIU, or RSIS setting.
4. Set the terminal and modem for "Full Duplex" operation.
5. Set the terminal parameters to:

   Word length: 7 bits
   Stop bits: 1
   Parity: Even

13.6.3 Remote Operation

Automatic connection via ringing assignments: To establish communication between the remote terminal and the RMDS or IMDU, call the number of the system CO line assigned to ring the RMDS or IMDU via the remote terminal/modem set-up:

1. Observe the following:
   - When the CO line rings-in, it will connect to the RMDS or IMDU and the RMDS or IMDU will respond by returning modem tone to the remote modem.
   - The remote modem will return modem tone to the RMDS or IMDU and communication will be established.
   - When communication is established, the terminal will display: **CONNECTED** or **COMMUNICATIONS** (see Note in the following section).
2. To continue, enter the security code per the following section.

Manual Connection Via Call Transfer

1. Using a telephone (at the remote location) that can switch to the terminal/modem, dial the number of a system CO line.
2. When the call is answered, request that it be transferred to station #19 (the RMDS or IMDU).
3. After the call is transferred and communication is established with the RMDS or IMDU, switch the call from the telephone to the terminal/modem (type **ATD_X3_** and press **Enter** from the remote terminal).
4. Observe the following:
   - ♦ When the CO line is transferred, it will connect to the RMDS or IMDU.
   - ♦ The RMDS or IMDU and the remote modem will respond to each other with modem tone; communication is established.
   - ♦ When communication is established, the terminal will display: **CONNECTED** or **COMMUNICATIONS** (see Note).
5. To continue, enter the security code pas described below.

   Note:
   If the connection is not completed or communication is unsuccessful, the remote terminal will display: **NO CARRIER**. *If this is the case, check that the equipment is installed per Subsection 13.5.2 or 13.6.2 and try again.*

Once communication is established between the remote terminal and the RMDS or IMDU, follow the steps below to enter the security code and receive the **Mode** prompt.

1. Set the keyboard for **Caps Lock** on.
2. Press **Enter**.
   - ♦ The system responds, and the terminal displays:

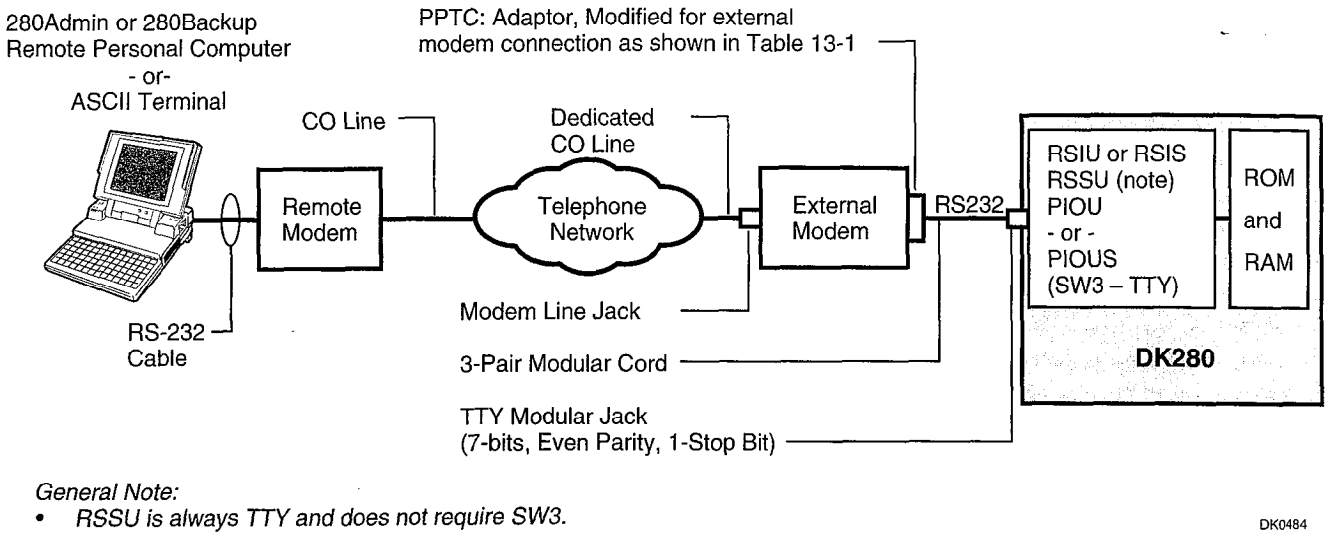
     DK CONNECT

     >CODE

   Note:
   The software version number is identified in Program 00.
3. Enter the four-digit security code and press **Enter**.
   - ♦ The system responds, and the terminal displays:

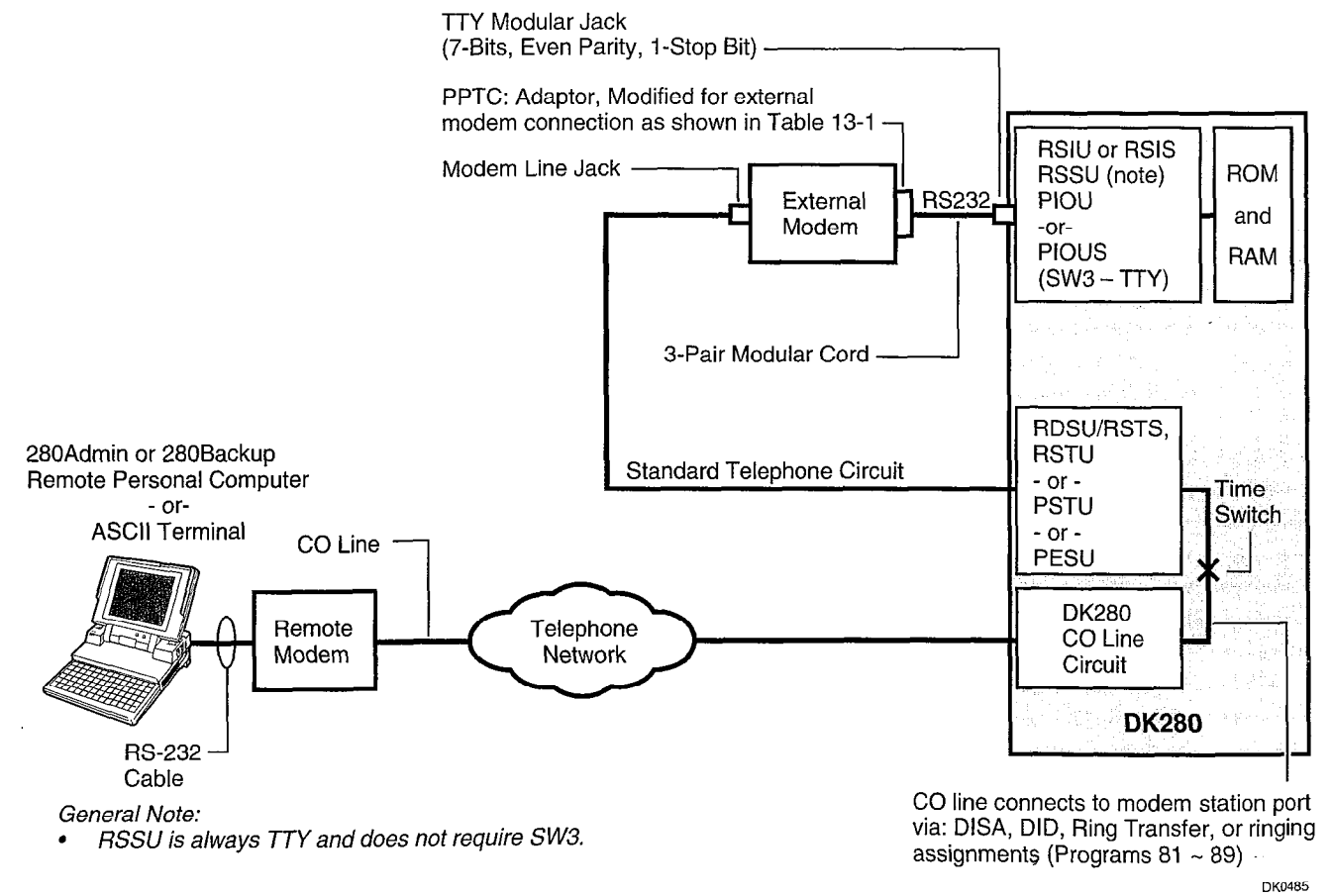
     OK

     MODE



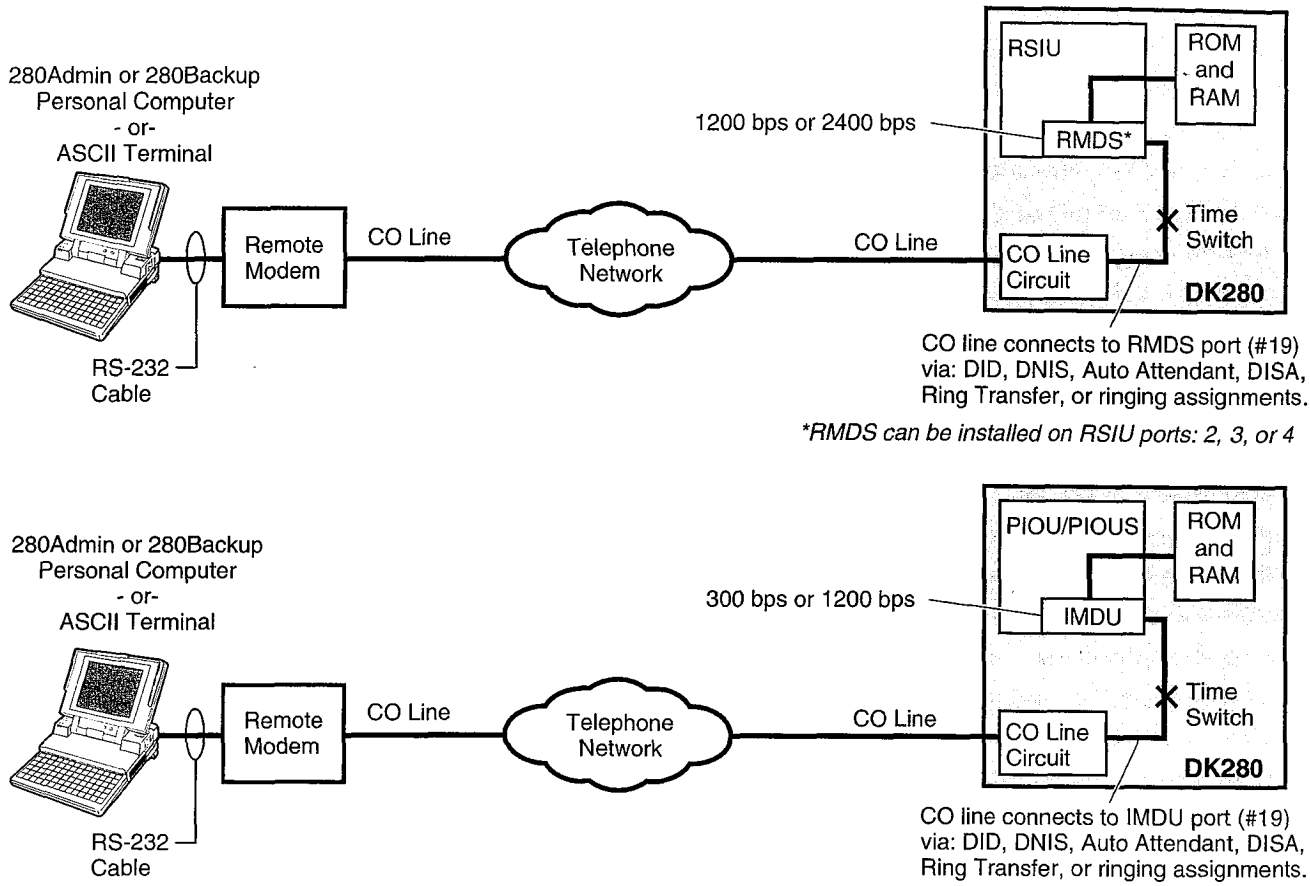
General Note:
- *RSSU is always TTY and does not require SW3.*

Figure 13-2
Remote Maintenance External Modem Connection (Method One of Two)



General Note:
- *RSSU is always TTY and does not require SW3.*

Figure 13-3
Remote Maintenance External Modem Connection (Method Two of Two)

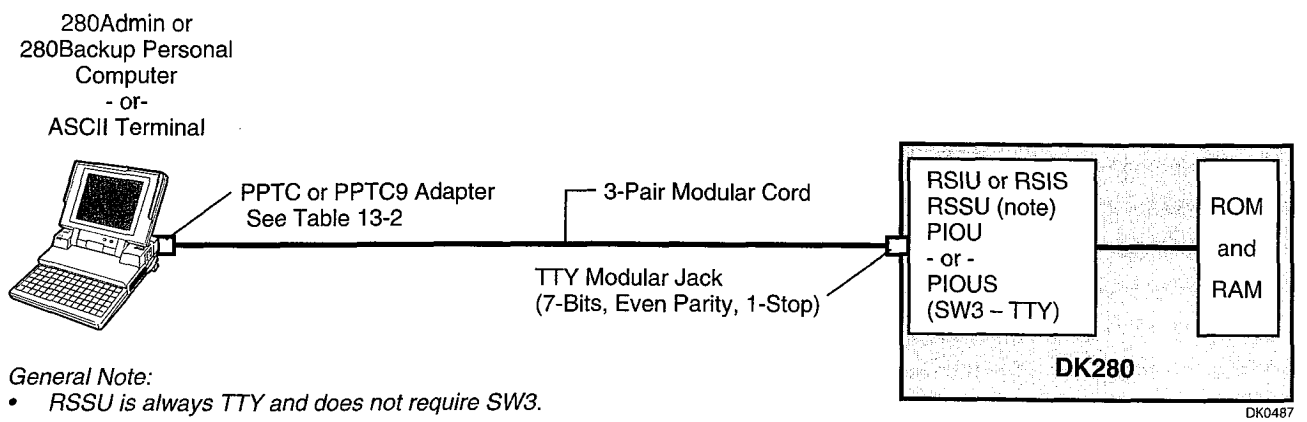


General Note:

- *Only one maintenance modem, RMDS or IMDU, is required on the DK280 system side to provide remote maintenance.*

DK0486

Figure 13-4
DK280 Built-in Remote Maintenance Modem RMDS or IMDU



General Note:

- *RSSU is always TTY and does not require SW3.*

DK0487

Figure 13-5
Local Maintenance Using ASCII Terminal or Personal Computer

Table 13-1
PPTC Modified Wiring for External Modem to TTY Connection

PPCT (Modular to DB25) Adaptor, modified wiring for connecting a TTY jack to an external modem:

PIOU/PIOUS, TTY JACK MODULAR PIN NO.	PPTC1A-5M ADAPTOR		MODEM RS-232 LEAD NAME
	MODULAR PIN NO.	DB25 PIN NO.	
→ 1 to RD	RD, 6 to	3*	RD
← 2 to TD	TD, 5 to	2*	TD
→ 3 to DSR	DSR, 4 to	6	DSR
← 4 to DTR	DTR, 3 to	20*	DTR
→ 5 to DCD	DCD, 2 to	8*	DCD
— 6 to SG	SG, 1 to	7	SG
		4 Jumper to 5	RTS to CTS

DK0454

IMPORTANT !

** PPTC1A-5M, pins 2 & 3 and pins 8 & 20 must be reversed in the field, as shown, for modem connection. Set Hayes modem to track status of carrier detect signal (AT & C1) and to answer (ATS0 = 1).*

Table 13-2
PPTC Wiring for Local Terminal or Personal Computer to TTY Connection

PPTC (Modular to DB25) Adaptor wiring for connecting TTY jack to a local terminal or personal computer serial communications port.

PIOU/PIOUS, TTY JACK MODULAR PIN NO.	PPTC1A-5M ADAPTOR		DTE RS-232 LEAD NAME
	MODULAR PIN NO.	DB25 PIN NO.	
→ 1 to RD	RD 6 to	3	RD
← 2 to TD	TD 5 to	2	TD
→ 3 to DSR	DSR 4 to	6	DSR
← 4 to DTR	DTR 3 to	20	DTR
→ 5 to DCD	DCD 2 to	8	DCD
— 6 to SG	SG 1 to	7	SG
		4 Jumper to 5	RTS to CTS

DK0455

13.7 Selecting a Mode

To enter an operating mode, establish communication with the terminal, enter the security code, and press **Enter** to receive the **Mode** prompt.

Notes:

1. *Refer to 13.5.3 or 13.6.3 to do the above.*
2. *These modes do not apply to 280Admin or 280Backup.*

1. Set the keyboard for **Caps Lock** on (the mode name must be entered in capital letters).
2. At the **Mode** prompt, enter the desired mode name (Table 13-3).
3. Press **Enter**.
4. Verify the correct prompt return (Table 13-3).

Table 13-3
Programming Prompts

Mode Function	Mode Name	Prompt Return
Program	PROG	P
Data Dump	DUMP	D
Test	TEST	T
LCD Messages	MESG	(NONE)
Speed Dial No.	REPT	R

13.8 Program Mode

Data governing overall system operation and feature execution for the systems are stored in read-only memory (ROM) and cannot be altered in the field. However, the data controlling operation of the various options, both system and station, are stored in random-access memory (RAM) and can easily be changed according to individual installation requirements.

All options are controlled by selections made in the System Record Sheets. An initialization process is provided for verifying predetermined system assignments. The installer can then proceed with any necessary changes.

Internal battery power is provided to prevent loss of system data memory in the event of a power failure.

13.8.1 System Record Sheets

Before system data can be programmed, the System Record Sheets which contain the customer database must be available (see Chapter 10—Record Sheets).

13.8.2 Program Types

There are three types of programs:

Type 1: All Type 1 programs use the same procedure; however, each button/LED has a different meaning, depending on the program number. The status of the data is reviewed, changed, and stored in system memory using Type 1 program procedures.

Type 2: All Type 2 programs follow the same entry procedure; however, they require port number and button/LED entries. Each button/LED has a different meaning, depending on the program number.

Type 3: In this type program, the information shown in the System Record Sheet indicates the data to be stored in system memory. Each program has a different meaning, and the data is reviewed, changed or stored in memory using an individual procedure for each program.

13.8.3 Multiple Station (Range) Programming

Some programs select options for individual stations (where ☐ ☐ ☐ represents the port number being programmed). To save time, it is possible to program all ports or a range of ports simultaneously.

Multiple station programming is accomplished by substituting a range of ports (☐ ☐ ☐ ✱ ☐ ☐ ☐) for the port number part (☐ ☐ ☐) of the program.

Example, all ports: **0 0 0 ✱ 2 3 9.**

When the multiple station range is entered, the terminal displays existing data as follows:

Y or N = data is the same for all ports in the dialed group.

Y = buttons/LEDs "ON"

N = buttons/LEDs "OFF".

U = button/LED is "ON" for at least one, but not all ports in that group.

13.8.4 Programming Procedures

1. Refer to a completed System Record Sheet.

2. Place the terminal into the program mode per Section 13.7—Selecting a Mode.

3. Program procedures are categorized and given in the order below. Use these procedures to store System Record Sheet data in working memory.

   Initialization procedures:

   These procedures must be completed whenever a system is first installed.

   Type 1 programs:

   10-1, 10-2, 10-3, 15, 16, 42-0, 46-11, 46-21, 46-31, 46-41, 46-51, 46-61, 46-71, 46-81, 58-1, 58-2, 77-1, 77-2.

   Type 2 programs:

   Station Class of Service:

   17, 20, 30, ★30, 31, ★31, 35, 40, 41, ★41-1 43, 60-8, 79, 81 ~ 89.

   Type 3 programs:

   - Initialization: 90, 91, 91-9, 92.
   - General: 00, 03, 04, 05, ★09, 12, 13, ★15, ★17, 19, ★29, 21, 22, 27, 28, 29, 32, 33, 34, 36, 37, 38, 39, ★41-2, ★41-3, ★42, 42-1 ~ 8, 44, 60, 69, 70, 77-3, 78, 80, 93.
   - Toll Restriction: 45 ~ 48.
   - Least Cost Routing: 50 ~ 56.
   - Auto Attendant: 09, 10-3, 23, 24, 25-1, 26.

13.9 Data Dump Mode

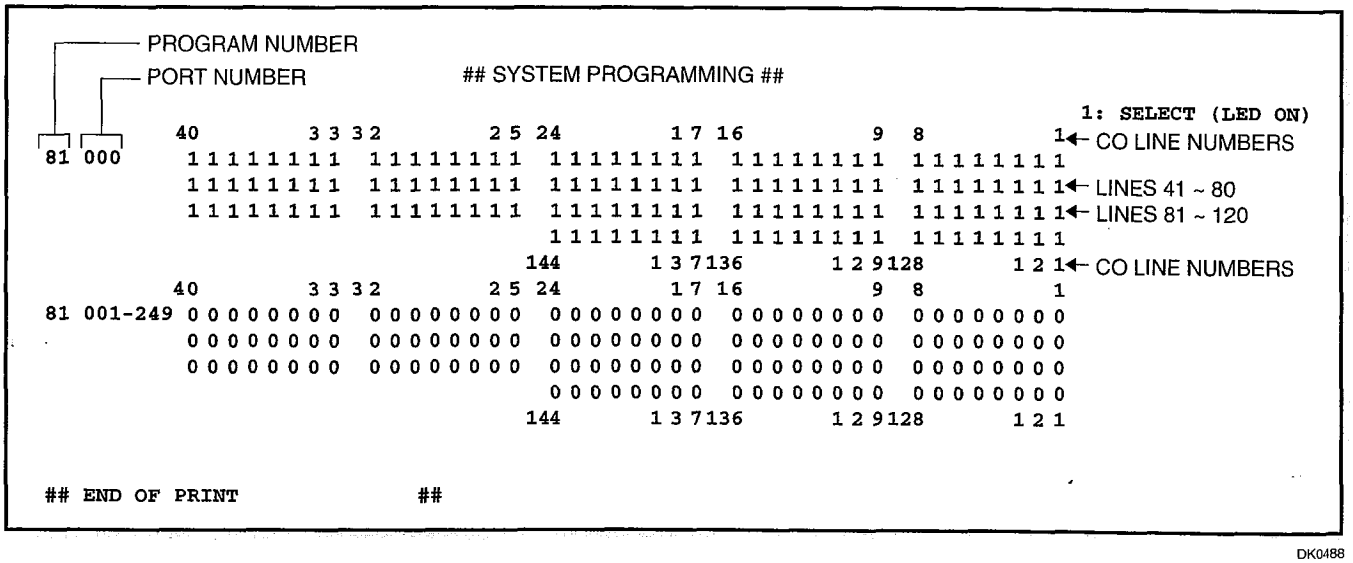
This mode allows four types of data to be displayed or output to a printer: Strata DK280 Programs (Customer Data Base), Speed Dialing Numbers (Station/System), LCD Messages (Station/System), and T1 RDTU PCB error checks.

- Initialization: 90, 91, 91-9, 92.
- General: called: Program Dump, Speed Dialing Dump, LCD Messages Dump, and T1 Error Dump.

Program Dump: While in the Dump mode, type **PRG**, followed by the program number (up to seven characters), then press **Enter**. The alphanumeric characters represent a program group or a particular program, i.e., ALL, 03, 04, 10, 39, etc., or group range (XX ★ YY) where XX (or ★XX) is the low program number and YY (or ★YY) is the high program number. For a printout example, see Figure 13-6.

Note:
Programs are output only in the groups indicated. To print out or review a program not included above, use Program Mode procedures.

Speed Dialing Dump: While in the Dump mode, enter **REP**, three characters, then press **Enter**. The characters represent the Speed Dialing codes for either an individual station port (000 ~ 239), A L L (all stations and system data) or S Y S (system data only).



DK0488

Figure 13-6
Data Dump Printout Example

LCD Messages Dump: While in the Dump mode, enter **MSG**, three characters, then press **Enter**. The characters represent stored messages for either an individual station port (000 ~ 239), **ALL** (all stations and system data) or S Y S (system data only). For a printout example, see Figure 13-7.

```
>MODE DUMP
D MSG SYS

SYS  M60  OUT TO LUNCH
SYS  M61  IN A MEETING
SYS  M62  CALL
SYS  M63  BACK AT
SYS  M64  RETURN ON
SYS  M65
SYS  M66
SYS  M67
SYS  M68
SYS  M69
D
```

DK0489

Figure 13-7
Sample Printout of System Messages

T1 Error Dump: While in the Dump mode, enter **T1ERR**; press **Enter**. A T1 error status will then appear on the terminal or PC screen.

Data dump tables later in this chapter provide a quick reference to the step-by-step procedures to output the appropriate data.

Trace Dump: While in the Dump mode, enter TRC, then **Enter**. DK280 data activity will be sent to the terminal or PC. Trace data is intended to be used for troubleshooting by trained engineers, only. To stop Trace, press **Delete** and **Enter**.

13.10 Test Mode

The remote test mode can be used to test Strata DK280 stations and CO line circuits from an off-site location.

This testing function is accomplished by accessing stations from the remote terminal, and activating various buttons on digital and electronic telephones to make telephone calls, set function buttons, change the system time and date, etc. (see Figure 13-8).

IMPORTANT!

Any digital or electronic telephone button can be activated from the remote terminal at any time while in the Test Mode (even while the end user is using the telephone). Therefore, caution must be used to prevent service interruption or interference. The Test Mode provides status tests to check whether or not a station or CO line is in use. The status checks should always be made before performing other tests.

13.10.1 CO Line Testing

To test CO line transmission, two or three CO lines must be available at the remote site (see Figure 13-8).

CO line testing is accomplished by using all of the following three methods:

- Call station B at the remote site via the Strata DK280 system and then place the line on hold (transmission is checked at the remote site via Music-on-Hold).
- Establish a talk path between the two remote stations (B & C) via a CO-to-CO connection through Strata DK.
- Establish a talk path between a remote station and the time or weather service via a CO-to-CO connection through Strata DK.

The procedures in the tables provide examples of the types of tests and functions that can be accomplished with the Test Mode. These procedures do not cover all the possible tests that can be performed remotely; however, by using the principles given, other tests are possible.

13.11 LCD Message Mode

This mode allows a local or remote terminal to set Called and Calling Station LCD messages for station users. The messages may be system or station type and are stored in their respective memory locations when set.

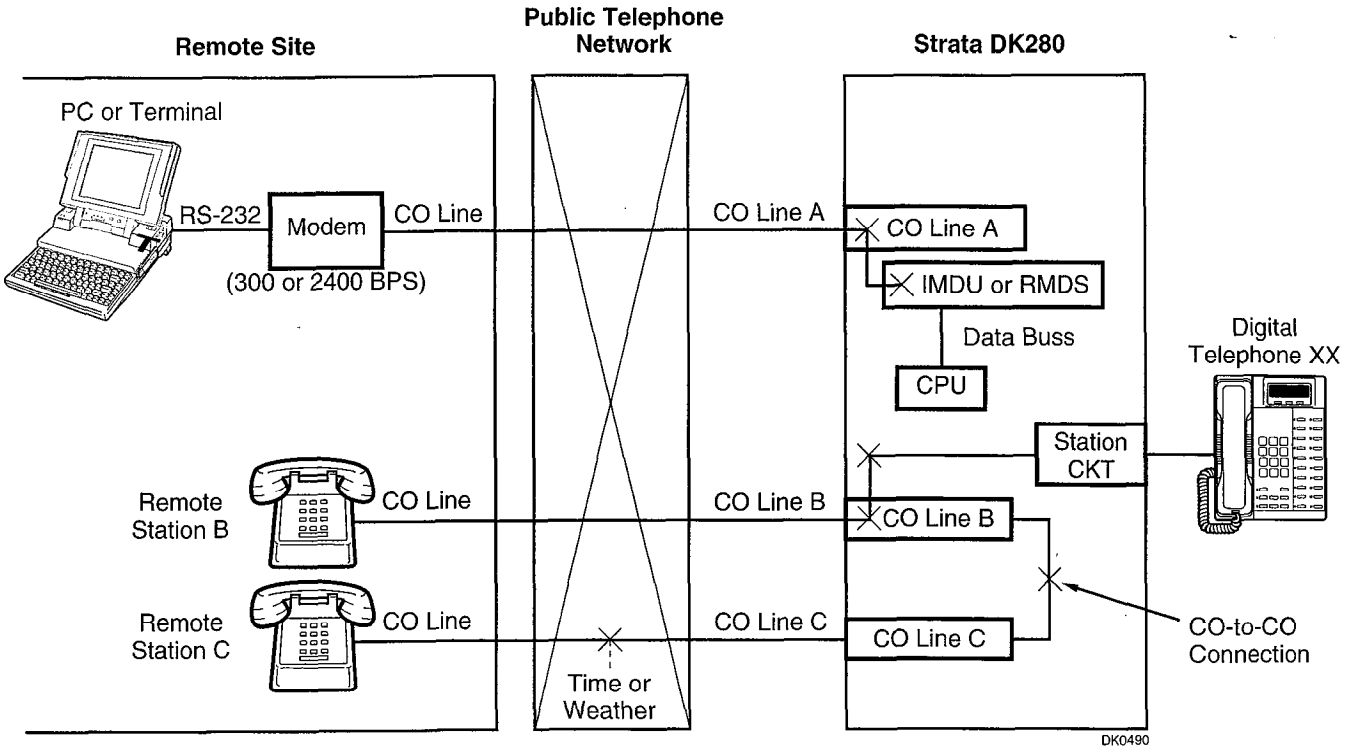


Figure 13-8
Test Mode Function Diagram

13.11.1 Remote Called Station Message Mode

Allows the terminal to set a Called Station Message for an originating station with the destination of the message being a station or group of stations.

When the message is set, the Msg (Message) LED(s) on the destination station(s) flash.

When a destination station calls the originating station, the message is displayed on the destination station's LCD.

Mode 94: To edit and/or review a Called Station Message before setting it, use this mode. It will print out the existing message and allow additions to it (such as a time or a date) before it is set. (The message cannot be changed with this mode—just added to.)

Mode 96: To add or change a Called Station Message before setting it, use this mode. It does not display the existing message, but allows a completely new message to be entered before it is set.

13.11.2 Remote Calling Station Message Mode

Allows the terminal to set a Calling Station Message for a station. The message will be set on the station's LCD and is automatically displayed on other stations' LCDs whenever they call that station.

Mode 95: To edit and/or review a Calling Station Message before setting it, use this mode. It will display the existing message and allow additions to it (such as a time or a date) before it is set. (The message cannot be changed with this mode—just added to.)

Mode 97: To add or change a Calling Station Message before setting it, use this mode. It does not display the existing message, but allows a completely new message to be entered before it is set.

Use the procedures in the tables to set messages via Modes 94/96 and 95/97.

13.12 Speed Dial Mode

The Speed Dial Mode can be used to add or change Speed Dial numbers to any of the System Speed Dial memory locations (600 ~ 699) for RCTUB, RCTUBA/BB and RCTUC/D, or (60 ~ 99) for RCTUA systems; and to any of the station speed dial memory locations (10 ~ 49).

Chain Speed Dial numbers can also be programmed using the Speed Dial Mode. See the Digital or Electronic Telephone User Guide for more information regarding chain Speed Dialing operation.

To program Speed Dial numbers, enter the REPT mode per Paragraph 13-7 of this section. Then use the Speed Dial Mode Procedure at the end of this section.

13.13 Mode Exit

Exit the current mode per the following instructions and select the desired mode per Paragraph 13-7.

To exit the 280Admin PROG, DUMP, TEST or SPEED DIAL mode:

- At the **P**, **D**, **T** or **R** prompt, type **QUIT** and press **Enter**:

  >MODE

To exit the MESG mode:

- At anytime while in the message mode, type: **m 0 q** and observe:

  >MODE

  Note:
  To exit the Message Mode, the terminal keyboard must be in lower case.

13.14 Discontinue Operation

13.14.1 Local Terminal

Exit current operating mode via Section 13.7—Selecting A Mode and observe that the **Mode** prompt is displayed on the terminal.

13.14.2 Remote Terminal

Exit current operating mode per Section 13.7—Selecting A Mode and observe that the **Mode** prompt is displayed on the terminal.

To discontinue remote operation:

1. Take the terminal off-line.
2. Verify that the modem drops the line.

13.15 Equipment Compatibility

Equipment that is known to be compatible with Strata DK280 Remote Administration and Maintenance is listed below. This does not show all of the equipment that will work, only the equipment that has been proven compatible in the field or lab.

Terminals

- Texas Instruments
- Silent 700
- Panasonic KXD-4920

Modems

- Standard Hayes Compatible Data/Fax Modems
- Universal Data Systems: Model 103J LP
- US Robotics: Password

Computers

- Toshiba: Current Toshiba Portable Computers

Software

- Crosstalk
- ProComm Plus

13.16 Remote Maintenance Tutorials

13.16.1 Initialization

Program	Table
♦ Program 91-9—Complete System Initialization	13-1
♦ Program 91-1—Automatic PCB Recognition	13-2
♦ Program 90—Initializing Programs 00 ~ *99	13-3
♦ Program 92—Station Speed Dial, Speed Dial Memo, VM ID Code Initialization	13-4 and 13-5
♦ Program 92 (continued)—LCD Character Message Memory Initialization	13-6
♦ Program 92 (continued)—Timed Reminders Initialization	13-7
♦ Program 92 (continued)—Digital Telephone Level Initialization	13-8
♦ Program 92 (continued)—Call Forward and Message Waiting Backup RAM Initialization	13-9

13.16.2 Programming

Program	Table
♦ Type 1 Programs: 10-1, 10-2, 10-3, 15, 16, 42-0, 46-11, 46-21, 46-31, 46-41, 46-51, 46-61, 46-71, 46-81, 58-1, 58-2, 77-1, 77-2	13-10
♦ Type 2 Programs: 17, 20, 30, *30, 31, *31, 35, 40, 41, *41-1, 43, 60-8, 79, 91 ~ 89	13-11
♦ Type 3 Programs—Program 00: Software Check/Remote Maintenance Security Code Assignments	13-12

13.16.3 Data Dump

Program	Table
♦ Program Data Dump	13-13
♦ Speed Dialing Data Dump	13-14
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13.16.4 Remote LCD Message

Program	Table
♦ Mode 97—Remote Calling Station Messaging (Add/Change)	13-17
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13.16.5 Remote Test

Program	Table
♦ Station/CO Line Status Check	13-21
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♦ System Date/Day/Time Setting Procedure	13-24

13.16.6 Remote Speed Dial Storage

Program	Table
♦ Speed Dial Mode (Change/Review)	13-25

13.16.7 Message Record Sheet

Program	Table
♦ Message Record Sheet	13-26

Table 13-4
Program 91-9 — Complete System Initialization

Step	Action	Display/Printout
1	**Enter Program Mode** At the >MODE prompt, type **PROG**, press **Enter**.	>MODE PROG
2	**Enter Program Number 91** Press **Enter**.	P 91 P91
3	Type **9**.	P 91 P91 9
4	Type button/LED number: **0 1**.	P 91 P91 1 01 N
5	Change LED 01 to "ON" by typing **Y**.	P 91 P91 1 01 N Y
6	Press **Spacebar** two times, and change LED 03 to "ON" by typing **Y**.	P 91 P91 1 01 N Y 02 N 03 N Y
7	Press **Spacebar** two times, and change LED 05 to "ON" by typing **Y**.	P 91 P91 1 01 N Y 02 N 03 N 04 N 05 N Y
8	Press **Spacebar** two times, and change LED 07 to "ON" by typing **Y**.	P 91 P91 1 01 N Y 02 N 03 N Y 04 N 05 N Y 06 N 07 N Y
9	Press **Spacebar** two times, and change LED 09 to "ON" by typing **Y**.	P 91 P91 1 01 N Y 02 N 03 N Y 04 N 05 N Y 06 N 07 N Y 08 N 09 N Y
10	Press **Enter**. Initialization complete. **(Repeat all steps a second time).** *Note:* *If program data is not entered correctly,* **Enter** *will not respond. To retry, press* **Delete+Space** *at the same time.*	

DK0457

CAUTION !

Running this program will erase all system data and drop all calls, including the Remote Maintenance CO line. the communications path between the remote Terminal/Modem and the DK280 remote maintenance modem must be re-established to continue remote maintenance. This will not be possible if the DK280 RMDS or IMDU is used unless the RMDS or IMDU is enabled in Program 77-1 (LED 14 ON) from the on-site programming station (205) after running Program 91-9.

Table 13-5
Program 91-1 — Automatic PCB Recognition/Port Renumber

Step	Action	Display/Printout
1	**Enter Program Mode** At the **>MODE** prompt, type **PROG**, press **Enter**.	**>MODE PROG**
2	**Enter Program Number 91** Press **Enter**.	**P 91** **P91**
3	Type **1**.	**P 91** **P91 1**
4	Type button / LED number **0 1**.	**P 91** **P91 1 01 N**
5	Change LED 01 to "ON" by typing **Y**.	**P 91** **P91 1 01 N Y**
6	Press the **Spacebar** once.	**P 91** **P91 1 01 N Y** **02 N Y**
7	Change LED 02 to "ON" by typing **Y**. *Note:* *If data is not entered correctly, press* **Delete + Enter** *at the same time to return to Step 3.*	**P 91** **P91 1 01 N Y** **02 N Y**
8	Press ENTER twice. You will exit the programming mode after you press **Enter** the second time.	**DK CONNECT** **>CODE**

DK0458

CAUTION !

Running this program will drop all calls, including the remote maintenance CO line. The remote maintenance communication path between the remote terminal/modem and the DK280 remote maintenance modem must be reestablished to continue remote maintenance. This will not be possible if the DK280 RMDS or IMDU is used unless the RMDS or IMDU is enabled in Program 77-1 (LED 14 ON) from the on-site programming station (205) after running Program 91-1.

Table 13-6
Program 90 — Initializing Programs 00 ~ *99

Step	Action	Display/Printout
1	**Enter the Program Mode** At the >MODE prompt type PROG, press Enter.	>MODE PROG
2	**Enter Program Number 90** Press Enter.	P 90 P90
3	**To Initialize All Programs** 1. Type 0 0 * 0 2. 2. Proceed with Steps 4 ~ 8. 3. Return to Step 3 and type Programs 0 4 * * 9 9. 4. Proceed with Steps 4 ~ 8 again. ***IMPORTANT !*** *Do not initialize Program 03 with this program when programming off-site. Program 03 must be initialized on-site.* *Note:* *Single programs can be initialized by entering a single program number plus #. Group numbers are separated by an **.*	P90 00*02
4	Type button/LED number 0 1.	P90 00*02 01 N
5	Change LED 01 to "ON" by typing Y.	P90 00*02 01 N Y
6	Press Spacebar.	P90 00*02 01 N Y 02 N
7	Change LED 02 to "ON" by typing Y.	P90 00*02 01 N Y 02 N Y
8	Press Enter. Initialization complete. *Note:* *If program data is not entered correctly, then Enter will not respond. To retry, press Delete+Enter.*	P90 00*02 01 N Y 02 N Y P90
9	**Exit Program 90** Type # # and then press Enter.	P90 ## P
10	**Enter Program 77** Type 7 7 and then press Enter.	P77
11	Type 1 1 4. Type Y and then press Enter.	P77 1 14 N P77 1 14 N Y P77
12	**To Exit this Program:** Type # # and then press Enter.	

DK0459

IMPORTANT !

Toshiba recommends initializing Program 77-1 remotely. Also if program 01 or 02 is initialized all calls will drop, including the remote maintenance CO line. If all programs are initialized, the "RMDS or IMDU enabled" has also been turned off in Program 77-1, LED 14. If using the RMDS or IMDU for remote programming, go into Program 77-1 and turn Button/LED 14 on as shown in Steps 9, 10, and 11. If this is not completed, remote programming must be reactivated locally from the digital or electronic telephone programming station.

Table 13-7
Program 92 — Station Speed Dial, Speed Dial Memo, VM ID Code Initialization

Step	Action	Display/Printout
1	**Enter Program Mode** At the **>MODE** prompt, type **PROG**, press **Enter**.	**>MODE PROG**
2	**Enter Program Number 92** Press **Enter**.	**P 92** **P92**
3	Type **1**.	**P92** **P92 1**
4	Type button / LED number: **0 1**.	**P92** **P92 1 01 N**
5	Change LED 01 to "ON" by typing **Y**.	**P92** **P92 1 01 N Y**
6	Press **Spacebar** two times.	**P92** **P92 1 01 N Y** **02 N** **03 N**
7	Change LED 03 to "ON" by typing **Y**.	**P92** **P92 1 01 N Y** **02 N** **03 N Y**
8	Press **Enter**. Initialization complete. *Note:* *If program data is not entered correctly,* **Enter** *will not respond. To retry, press* **Delete+Enter** *at the same time.*	**P92** **P92 1 01 N Y** **02 N** **03 N Y** **P92**
9	Clear system speed dial using the procedure on the next page.	

DK0460

Table 13-8
Program 92 (continued) — Station Speed Dial, Speed Dial Memo Initialization

Step	Action	Display/Printout
1	**Enter Program Mode** At the >MODE prompt, type **PROG**, press **Enter**.	>MODE PROG
2	**Enter Program Number 92** Press **Enter**.	P 92 P92
3	Type **2**.	P92 P92 2
4	Type button/LED number **0 1**.	P92 P92 2 01 N
5	Change LED 01 to "ON" by typing **Y**.	P92 P92 2 01 N Y
6	Press **Spacebar** three times.	P92 P92 2 01 N Y 02 N 03 N 04 N
7	Change LED 04 to "ON" by typing **Y**.	P92 P92 2 01 N Y 02 N 03 N 04 N Y
8	Press **Enter**. Initialization complete. *Note:* *If program data is not entered correctly,* **Enter** *will not respond. To retry, press* **Delete+Enter** *at the same time.*	P92 P92 2 01 N Y 02 N 03 N 04 N Y P92
9	Clear LCD message memory, using the procedure on the next page.	

DK0461

Table 13-9
Program 92 (continued) — LCD Character Message Memory Initialization

Step	Action	Display/Printout
1	**Enter Program Mode** At the >MODE prompt, type PROG, press Enter.	>MODE PROG
2	**Enter Program Number 92** Press Enter.	P 92 P92
3	Type 3.	P92 P92 3
4	Type button/LED number 0 2.	P92 P92 3 02 N
5	Change LED 02 to "ON" by typing Y.	P92 P92 3 02 N Y
6	Press Spacebar.	P92 P92 3 02 N Y 03 N
7	Change LED 03 to "ON" by typing Y.	P92 P92 3 02 N Y 03 N Y
8	Press Enter. Initialization complete. *Note:* *If program data is not entered correctly,* Enter *will not respond. To retry, press* Delete+Enter *at the same time.*	P92 P92 3 02 N Y 03 N Y P92
9	Clear the timed reminders using the procedure on the next page.	

DK0462

Table 13-10
Program 92 (continued) — Timed Reminders Initialization

Step	Action	Display/Printout
1	**Enter Program Mode** At the **>MODE** prompt, type **PROG**, press **Enter**.	**>MODE PROG**
2	**Enter Program Number 92** Press **Enter**.	**P 92** **P92**
3	Type **4**.	**P92** **P92 4**
4	Enter button/LED number **0 2**.	**P92** **P92 4 02 N**
5	Change LED 02 to "ON" by typing **Y**.	**P92** **P92 4 02 N Y**
6	Press **Spacebar** two times.	**P92** **P92 4 02 N Y** **03 N** **04 N**
7	Change LED 04 to "ON" by typing **Y**.	**P92** **P92 4 02 N Y** **03 N** **04 N Y**
8	Press **Enter**. Initialization complete. *Note:* *If program data is not entered correctly,* **Enter** *will not respond. To retry, press* **Delete+Enter** *at the same time.*	**P92** **P92 4 02 N Y** **03 N** **04 N Y** **P92**
9	To exit this program, type **# #** and press **Enter**.	

DK0463

Table 13-11
Program 92 (continued) — Digital Telephone Level Initialization

Step	Action	Display/Printout
1	**Enter Program Mode** At the **>MODE** prompt, type **P R O G**, press **Enter**.	**>MODE PROG** **P**
2	**Enter Program Number 92** Press **Enter**.	**P 92** **P92**
3	Type **5**.	**P92 5**
4	Type **0 1** ; change button/LED 01 to "ON" by typing **Y**.	**P92 5 01 N Y**
5	Press **Spacebar** four times.	**P92 5 01 N Y** **02 N** **03 N** **04 N** **05 N**
6	Change LED 05 to "ON" by typing **Y**. *Note:* *If program data is not entered correctly,* **Enter** *will not respond. To retry, press* **Delete+Enter** *at the same time.*	**P92 5 01 N Y** **02 N** **03 N** **04 N** **05 N Y**
7	Press **Enter**. Initialization complete.	**P92 5 01 N Y** **02 N** **03 N** **04 N** **05 N** **P92**
8	To exit this program, type **# #** and press **Enter**.	

DK0464

Table 13-12
Program 92 (continued) — Call Forward and Message Waiting Backup RAM Initialization

Step	Action	Display/Printout
1	**Enter Program Mode** At the **>MODE** prompt, type **PROG**, press **Enter**.	**>MODE PROG**
2	**Enter Program Number 92** Press **Enter**.	**P 92** **P92**
3	Type **9**.	**P92** **P92 9**
4	Type button/LED number **0 3**.	**P92** **P92 9 03 N**
5	Change LED 03 to "ON" by typing **Y**.	**P92** **P92 9 03 N Y**
6	Press **Spacebar**.	**P92** **P92 9 03 N Y** **04 N**
7	Change LED 04 to "ON" by typing **Y**.	**P92** **P92 9 03 N Y** **04 N Y**
8	Press **Enter**. Initialization complete. *Note:* *If program data is not entered correctly,* **Enter** *will not respond. To retry, press* **Delete+Enter**.	**P92** **P92 9 03 N Y** **04 N Y** **P92**
9	To exit this program, type **# #** and press **Enter**.	

DK0465

IMPORTANT !

This program clears Call Forward memory for all stations, but does not reset the Call Forward indication on the station (Call Forward LCD information and/or Call Forward button/LED). To clear station Call Forward indications, system power must be turned OFF for five seconds, then ON. Fixed Call Forward is not cleared by this program.

Table 13-13
Type 1 Programs: 10-1, 10-2, 10-3, 15, 16, 42-0, 46-11, 46-21, 46-31, 46-41, 46-51, 46-61, 46-71, 46-81, 58-1, 58-2, 77-1, 77-2

Step	Action	Display/Printout
1	**Enter Program Mode** At the >MODE prompt, type **PROG**, press **Enter**.	>MODE PROG P
2	**Enter Program Number** Refer to the record sheet and enter the desired program number. Example: **Program 10-1**, type **1 0**, press **Enter**.	P 10 P10
3	**Enter Program Code or Digit(s) Per Record Sheet** **1** or other digit required. *Note: Most programs do not require a second digit.*	P10 1
4	**Enter Button/LED Number (or enter Data and go to Step 7)** Enter the desired button/LED number. Example: Button/LED 01, type **0 1**.	P10 1 01 N (see Note)
5	**To Change Button/LED Status** Refer to the System Record Sheet and change the button/LED status, if required (Y or N). Example: Type **Y**.	P10 1 01 N Y
6	**To Advance to Next Button/LED** Press **Spacebar**. Repeat Step 5 if necessary.	P10 1 01 Y 02 N
7	**To Store Data of Button/LED Status Change** Press **Enter**. Repeat Steps 3 and 4. *Note: This step is optional and not required to save data.*	P10 1 01 Y- Buttton / LED "ON" Button / LED Number Program Code Program Number
8	**To Exit Program/Store Data** A. To exit this program, press **# #**, then press **Enter**. B. Continue returning to Step 2 until all Type 1 programs are completed.	P10 P10 ## P
9	**To Exit the Program Mode** Type **# #** and press **Enter**.	> MODE
10	**To Enter Another Mode** Type: Press: **DUMP** **Enter** (Data Dump) **TEST** **Enter** (Test) **MESG** **Enter** (LCD Messages) **REPT** **Enter** (Speed Dial)	 D T (no prompt) R

DK0466

Legend:
Y = button / LED "ON",
N = button / LED "OFF"

Table 13-14
Type 2 Programs: 17, 20, 30, *30, 31, *31, 35, 40, 41, *41-1, 43, 60-8, 79, 81 ~ 89

Step	Action	Display/Printout
1	**Enter Program Mode** At the >MODE prompt, type P R O G, press Enter.	>MODE PROG P
2	**Enter Program Number** Refer to the record sheet and enter the desired program number. Example: **Program 30**, type 3 0, press Enter.	P 30 P30
3	**Enter Port Number** □□□ **or Port Range** □□□*□□□ Refer to the System Record Sheet and type the desired port number(s). Example: 0 0 4.	P30 P30 004
4	Press # key.	P30 004#
5	**Enter the Desired Button/LED Number (or enter Data and go to Step 8)** Example: Button/LED 01, type: 0 1.	P30 004# 01 N (Note)
6	**To Change Button/LED Status** Refer to the System Record Sheet and change the Button/LED status, if required (Y or N). Example: Type Y.	P30 004# 01 N Y
7	**To Advance to Next Button/LED** Press Spacebar (repeat Step 6 if necessary).	
8	**To Store Data of Button/LED Status Change** Press Enter. Repeat Steps 3 ~ 8 to review or change data.	P30 004# 01 Y- LED "ON" Button/LED Number Port Number Program Number
9	**To Exit Program/Store Data** A. To exit this program, press # #, then press Enter. B. Continue returning to Step 2 until all Type 2 programs are completed.	P10 P10 ## P
10	**To Exit the Program Mode** Type # # and press Enter.	>MODE
11	**To Enter Another Mode,** Press: D U M P ENTER (Data Dump) T E S T ENTER (Test) M E S G ENTER (LCD Messages) R E P T ENTER (Speed Dial)	 D T (no prompt) R

DK0467

Legend:
Y = button / LED(s) "ON",
N = button / LED(s) "OFF",
U = button / LED(s) "ON" some ports and "OFF" other ports.

Table 13-15
Type 3 Programs — Program 00: Software Check/Remote Maintenance Security Code Assignments

Step	Action	Display/Printout
1	**Enter Program Mode** At the **>MODE** prompt, type **PROG**, press **Enter**.	**>MODE PROG** **P**
2	**Enter Program Number 00** Press **Enter**.	**P 00** **P00**
3	**To Check Software Version** **Enter Action Code 0**. System will display the system's software version. Press **Enter**.	**P00 0 Version =** □□□□□□□□□□ **P00** Common Control type Software version Special Feature Code *Note:* *See note below for Common Control Unit and Special Feature Code definitions.*
4	**To Change Level 1 Security Code** **Enter Action Code 1**. The system will display the present level 1 (four-digit) code. Refer to the System Record Sheet and change if required. Press **Enter**.	**P00 1 0000** **P00**
5	**To Change Level 2 Security Code** **Enter Action Code 2**. The system will display the present level 2 (four-digit) code. Refer to the System Record Sheet and change if required. Press **Enter**.	**P00 2 0000** **P00**
6	**To Exit This Program** Type **# #** and press **Enter**.	**P00 ##** **P**

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General Notes:
Common Control Types:
- *RAAX = RCUTA*
- *RBAX = RCTUB*
- *RCAX = RCTUC/D*
- *RAA3X = RCTUA3*
- *RBA3X = RCTUBA3/RCTUBB3*
- *RCA3X = RCTUC3/RCTUD3*

Special Feature Codes:
- *KEY1 = System with Auto Attendant*
- *KEY2 = System with ACD and Auto Attendant*
- *KEY3 = System with MIS and ACD and Auto Attendant*
- *KEY4 = System Open Architecture (Release 3)*

Table 13-16
Program Data Dump

Step	Action	Display/Printout
1	**Enter the Data Dump Mode** At the **>MODE** prompt, type **DUMP**, press **Enter**.	**>MODE DUMP** **D**
2	**To Output Program Data** Type **PRG**□□□, press ENTER, Group □□□ * □□□ range □□□= Program number or **ALL** for all programs.	**D PRG** □□□
3	**To Stop Printout at Any Time** Press **Delete+Enter**.	**D**
4	**To Exit the Dump Mode** Type **QUIT**, then press **Enter**.	**>MODE**

DK0469

Table 13-17
Speed Dialing Data Dump

Step	Action	Display/Printout
1	**Enter the Data Dump Mode** At the **>MODE** prompt, type **DUMP**, press **Enter**.	**>MODE DUMP** **D**
2	**To Output Speed Dialing Data** Type **REP** □□□, press **Enter**. □□□ = **ALL** or **SYS** or port number for individual station.	
3	**To Stop Printout at Any Time** Press **Delete+Enter**.	**D**
4	**To Exit the Dump Mode** Type **QUIT**, then press **Enter**.	

DK0470

Table 13-18
LCD Messaging Data Dump

Step	Action	Display/Printout
1	**Enter the Data Dump Mode** At the **>MODE** prompt, type **DUMP**, press **Enter**.	**>MODE DUMP**
2	**To Output Message Data** Type **MSG** □□□, press **Enter**. □□□ or **ALL** or **SYS** or port number of individual station.	**D MSG** □□□
3	**To Stop Printout at Any Time** Press **Delete+Enter**.	**D**
4	**To Exit the Dump Mode** Type **QUIT**, then press **Enter**.	**>MODE**

DK0471

Table 13-19
T1 Error Status Dump

Step	Action	Display/Printout
1	**Enter the Data Dump Mode** At the **>MODE** prompt, type **DUMP**, press **Enter**.	**>MODE DUMP** **D**
2	**To Output the T1 Error Status** Type **T1ERR**, press **Enter**.	*Note:* *The status for each RDTU will appear as follows:*

T1 ERROR DISPLAY

```
T1ERR
DTU NO = 1
   SYNCHRO BIT ERROR          = XXXX TIMES  (1 TIME = 1024 ERRORS)
   BIPOLAR VIOLATION ERROR    = XXXX TIMES  (1 TIME = 256 X 256 ERRORS)
   SLIP ERROR                 = XXXX TIMES  (1 TIME = 256 ERRORS)
   CRC ERROR                  = XXXX TIMES  (1 TIME = 256 ERRORS)
DTU NO = 2
   SYNCHRO BIT ERROR          = XXXX TIMES  (XXXX = 0 ~ 9999)
   BIPOLAR VIOLATION ERROR    = XXXX TIMES
   SLIP ERROR                 = XXXX TIMES
   CRC ERROR                  = XXXX TIMES
DTU NO = 3
   SYNCHRO BIT ERROR          = XXXX TIMES
   BIPOLAR VIOLATION ERROR    = XXXX TIMES
   SLIP ERROR                 = XXXX TIMES
   CRC ERROR                  = XXXX TIMES
DTU NO = 4
   SYNCHRO BIT ERROR          = XXXX TIMES
   BIPOLAR VIOLATION ERROR    = XXXX TIMES
   SLIP ERROR                 = XXXX TIMES
   CRC ERROR                  = XXXX TIMES
DTU NO = 5
   SYNCHRO BIT ERROR          = XXXX TIMES
   BIPOLAR VIOLATION ERROR    = XXXX TIMES
   SLIP ERROR                 = XXXX TIMES
   CRC ERROR                  = XXXX TIMES
DTU NO = 6
   SYNCHRO BIT ERROR          = XXXX TIMES
   BIPOLAR VIOLATION ERROR    = XXXX TIMES
   SLIP ERROR                 = XXXX TIMES
   CRC ERROR                  = XXXX TIMES
```

3	**To Stop Printout at Any Time** Press **Delete+Enter**.	**D**
4	**To Exit the Dump Mode** Type **QUIT**, press **Enter**.	**>MODE**

DK0472

General Note:

- *See T1 Chapter 11-System Record Sheets for information regarding T1 errors.*

Table 13-20
Mode 97 — Remote Calling Station Messaging (Add/Change)

Step	Action	Display/Printout
1	**Enter the Message Mode** At the **>MODE** prompt, type **MESG**, press **Enter**.	**>MODE MESG**
2	**To Add a Message** (or change a previously stored message) Set the terminal keyboard to lower case (caps lock off) and type **m97**. *General Note:* *Type* **m** *at anytime it is desired to start over in this procedure.*	**m 97**
3	Type **x x x** (XXX = station number for which the message will be set and stored).	**m97 XXX**
4	Type: **p** □□ (p = page command and □□ = 2-digit message memory location: 10 ~ 19 personal messages and 60 ~ 99 = system messages). *General Note:* • *To store system message change permanently, DKT/EKT XXX must be station assigned to Port 000.*	**m97 XXX p** □□
5	**To Add a Message** Set the terminal keyboard to upper case and type message (alphanumeric, 32 characters max.). New message displays as it is typed.	**m97 XXX p** □□ **[M]**
6	**To Set the Message on the DKT/EKT LCD** Set the terminal keyboard to lower case and type **pm0**.	**m97 XXX p** □□ **[M] p** **m 0** ← Zero
7	**To Exit the Message Mode** At any time, type **m0q** (lower case).	**m 0** **q** **>MODE**

DK0473

General Notes:

- *To cancel a message set via Mode 95, use Mode 97 with any message number in step 4 and skip Step 5.*
- *[M] represents the message entered.*
- *DKT = digital telephone*
  EKT = electronic telephone

Table 13-21
Mode 95 — Remote Calling Station Messaging (Add/Review/Change)

Step	Action	Display/Printout
1	**Enter the Message Mode** At the **>MODE** prompt, type **MESG**, press **Enter**.	**>MODE MESG**
2	**To Add Or Review a Calling Station Message** Set the terminal keyboard to the lower case (caps lock off) and type **m95**. *General Note:* *Type* **m** *anytime it is desired to start over in this procedure.*	**m 95**
3	Type **X X X** (XXX = station number where the message will be set and stored).	**m95 XXX**
4	Type **p** ☐☐(p = page command and ☐☐ = 2-digit message memory location: 10 ~ 19 personal messages and 60 ~ 99 = system message). *General Notes:* • *To store system messages permanently, DKT or EKT XXX must be the station at port 000.* • *After* **p** ☐☐ *is entered, the previously stored message is displayed. If there is no stored message, nothing is displayed.*	**m95 XXX p ☐☐ [M]**
5	**To Change Previous Message** Set the terminal keyboard to upper case and change message (alphanumeric, 32 characters max.).	**m95 XXX p ☐☐ [M+]**
6	**To Set the Message on DKT or EKT XXX's LCD** Set the terminal keyboard to lower case and type **pm0**.	**m95 XXX p ☐☐ [M+] p** **m 0** └ Zero
7	**To Exit the Message Mode** At any time, type **m0q** (lower case).	**m 0** **q** **> MODE**

DK0474

General Notes:

- *To cancel a message set via Mode 95, use Mode 97.*
- *[M] represents the message entered.*
- *DKT = digital telephone*
  EKT = electronic telephone

Table 13-22
Mode 94 — Remote Called Station Messaging (Add/Review/Change)

Step	Action	Display/Printout
1	**Enter the Message Mode** At the **>MODE** prompt, type **MESG**, press **Enter**.	**>MODE MESG**
2	**To Add Or Review a Called Station Message** Set the terminal keyboard to the lowercase (CAPS LOCK off) and type **m94**.	**m 94**
3	Type **XXX** (XXX = Destination station number or destination group number [30 = all stations, 31-34 per system, Program 31]).	**m94 XXX**
4	Type **p YYY** (p = page command [lowercase] and **YYY** = originating station number).	**m94 XXX p YYY**
5	Type **p** ☐☐ (p = page command [lowercase] and ☐☐ = 2-digit message memory location: 10 ~ 19 personal messages and 60 ~ 99 = system messages). After **p** ☐☐ is typed, the previously stored message (M) is displayed. (If there is no stored message, nothing is displayed.)	**m94 XXX p YYY p** ☐☐ **[M]**
6	**To Change the Message (M+)** Set the terminal keyboard to uppercase and change message as required (alphanumeric, 32 characters max. for total message).	**m94 XXX p YYY p** ☐☐ **[M+]**
7	**To Set Message** Set the terminal keyboard to lowercase and type **pm0**. Destination station: Msg (MESSAGE) LED flashes, "CALL YYYM" is displayed. Origination station: "SENT XXXM" is displayed.	**m94 XXX p YYY p** ☐☐ **[M+] p m 0** └ Zero
8	**To Exit the Message Mode** At any time, type **m0q** (lowercase).	**m 0** **q** **>MODE**

DK0475

General Notes:
- *Press* **m** *at any time to start over.*
- *[M] represents the message entered.*

Table 13-23
Mode 96 — Remote Called Station Messaging (Add/Change)

Step	Action	Display/Printout
1	**Enter the Message Mode** At the **>MODE** prompt, type **MESG**, press **Enter**.	**>MODE MESG**
2	**To Change or Add a New Called Station Message** Set the terminal keyboard to the lowercase (CAPS LOCK off) and type **m96**. *Note:* *Type* **m** *(lowercase) anytime it is desired to start over in this procedure.*	**m 96**
3	Type **XXX** (XXX = destination station number or destination station group number – 30 = all DKTs/EKTs, 31 ~ 34 per system, Program 31).	**m96 XXX**
4	Type **pYYY** (p = page command and YYY = originating station number).	**m96 XXX p YYY**
5	Type **p** □□ (p = page command and □□ = 2-digit message memory location: 10 ~ 19 personal messages and 60 ~ 99 = system messages).	**m96 XXX p YYY p**□□
6	**To Add the New Message [M]** Set the terminal keyboard to uppercase and type message as required (alphanumeric, 32 characters max.). New message displays as it is typed.	**m96 XXX p YYY p**□□**[M]**
7	**To Set the Message** Set the terminal keyboard to lowercase and type **pm0**. Destination station: Msg (MESSAGE) LED flashes, "CALL YYYM" is displayed on LCD. Origination station: "SENT XXXM" is displayed on LCD.	**m96 XXX p YYY p**□□**[M] p** **m 0** └ Zero
8	**To Exit the Message Mode** At any time, type **m0p** (lowercase).	**m 0** **q** **>MODE**

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Legend:
[M] = the message entered.

Table 13-24
Station/CO Line Status Check

Step	Action	Display/Printout
1	**Enter the Test Mode** At the **>MODE** prompt, type **TEST**, press **Enter**.	**>MODE TEST**
2	**To Check Station Line Status** Type **SEKTXXX** (XXX = port number). Possible status: Idle on-hook, idle off-hook, busy on-hook, busy off-hook. ***IMPORTANT!*** *To prevent service interference, station line status must be idle on-hook before initiating a test from that station.*	**T SEKT XXX IDLE ON-HOOK** **T**
3	**To Check CO Line Status** Type **SCOYYY** (YYY = CO line number). Possible status: Idle, busy.	**T SCOYYY - BUSY** **T**
4	**To Exit the Test Mode** At the T prompt, type **QUIT**, press **Enter**.	**T QUIT** **> MODE**

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Table 13-25
General Station Access and Button Activation

Step	Action	Display/Printout
1	**Enter the Test Mode** At the **>MODE** prompt, type **TEST**, press **Enter**.	**>MODE TEST** **T**
2	**To Activate A Button** Type **TKXXXKYY**, press **Enter**. XXX = Port number and YY = button number. *Note: Button numbers begin at 01.*	**T TKXXX KYY** **T**
3	**To Activate A Function Button** Type **TKXXF**, press **Return** F = function button designator SPKR S HOLD H CONF C MIC M } F = S, H, C, M	**TTKXX F** **T**
4	**To Access A CO Line (via CO Access Code) and Dial Out** Type **TKXXK01AAA** □□□□□□□, press **Enter**. AAA = 1, 2, or 3-digit CO line access code and □ = telephone number.	**TTKXX K01 AAA** □□□□□□□ **T**
5	**To Access A CO Line (via CO Line Button) and Dial Out** Type **TKXXKYYY** □□□□□□□, press **Enter**. YYY = CO line number. └Telephone Number	**TTKXX KYYY** □□□□□□□ **T**
6	**To Exit the Test Mode** At **T** prompt, enter **QUIT**, press **Enter**.	

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Table 13-26
CO Line Test

Step	Action	Display/Printout
1	**Enter the Test Mode** At the **>MODE** prompt, type **TEST**, press **Enter**.	**>MODE TEST**
2	**To Verify Station/CO Line Status** Station line status, type **SEKTXXX** (X X X = CO line number). CO line status, type **SCOYYY** (YYY = CO line number).	**T SEKT XXX IDLE ON-HOOK** **T** **T SCO YYY IDLE**
3	**Call Remote Station B** (from SEKT XXX and CO line YYY) Type **TKXXXKYYY** □□□□□□□, press **Enter**. (□= station B's telephone number) Answer station B. *General Note:* • *If the system is equipped with Music-on-Hold, go to Step 4. If the line must be tested via a CO-to-CO connection, go to Step 6.*	**T TK XXX KYYY** □□□□□□□ **T**
4	A. Press the **Hold** button on TKXXX (station B on hold). Type **TKXXXH**, press **Enter**. B. Listen at station B and check that the transmission from the music source is acceptable. C. Press the **Spkr** (**SPEAKER**) button on TKXXX (to release the call). Type **TKXXXS**, press **Enter**.	**T TKXXX H** **T** **T TKXXX S** **T**
5	Continue returning to Step 2 until all CO lines are tested.	
6	**To Set Up A CO-to-CO Connection** Press the **Cnf/Trn** (**CONF/TRNS**) button on **TKXXX**. Type **TKXXXC**, press **Enter**. *General Notes:* • *Station B is connected via Step 3.* • *Verify that **Program 15-5** allows CO-to-CO connections.* • *The next step must be completed immediately to avoid dial tone timeout.*	**T TKXX C** **T**
7	Call Station C (or local time/weather) via CO line C. Type: **TKXXKYYY** □□□□□□□, press **Enter**. **XX** = CO line C's key number and □= telephone number of Station C. Answer Station C (or verify time/weather connection) and go to next step.	**T TKXX KYY**□□□□□□□ **T**
8	Press the **Cnf/Trn** (**CONF/TRNS**) button on STXX to establish a conference between all parties.	**T TKXX C** **T**
9	If you wish to tie the two CO lines together and hang up: Type **TKXXC**, press **Enter**. Type **TKXXS**, press **Enter**.	**T TKXX C** **TTKXX S** **T**
10	Continue returning to Step 2 until all CO lines are tested.	
11	**To Exit the Test Mode,** At the **T** prompt, type **QUIT**, press **Enter**.	

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Table 13-27
System Date/Day/Time Setting Procedure

Step	Action	Display/Printout
1	**Enter the Test Mode** At the >MODE prompt, type **TEST**, press **Enter**.	>MODE TEST T
2	**To Set Date** A. Type: **TK000 K01#651YYMMDD**, press **Enter**. B. Type: **TK000 KXX**, press **Enter**.	T TK000 K01 #651YYMMDD T TK000 KXX
3	**To Set Time Of Day** A. Type: **TK000 K01#652HHMMSS**, press **Enter**. B. Type: **TK000 KXX**, press **Enter**.	T TK000 K01 #652HHMMSS T TK000 KXX
4	**To Set Day of Week** A. Type: **TK000 K01#653D**, press **Enter**. (D = day of week with Sunday = 1 ~ Saturday = 7) B. Type: **TK000 KXX**, press **Enter**.	T TK000 K01 #653D T TK000 KXX
5	**To Exit the Test Mode** At T prompt, type **QUIT**, press **Enter**.	

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Legend:
K 0 1 = Directory Number **[DN]** or **Intercom** Button
K X X = The button that is programmed as the RDL key (code 496 in Program 39)

Table 13-28
Speed Dial Mode (Change/Review)

Step	Action	Display/Printout
1	**Enter the Speed Dial Mode** At the **>MODE** prompt, type **REPT**, press **Enter**.	**>MODE REPT**
2	**Enter the station port number for which the speed dial number will be programmed** Press □□□ └ (000 ~ 239) *General Note:* • *If programming system speed dial, type Port number* **000**.	**R** □□□ └ Station Port Number
3	**Enter Speed Dial Memory Location to be Programmed** A. Press □□□ (current memory will display) └ 10 ~ 49 Station 600 ~ 699 System B. Press SPACE to review each memory location or go to Step 4.	**R** □□□ □□□ **N** Memory location Nothing in memory
4	**1. To enter speed dial number (20 digits max)** Press 20-digit number □□..... □□ . . . . OR . . . **2. To link two speed dial numbers** Press **A** □□ 17-digit number □..... □□ └ System speed dial location (690 ~ 699) (Refer to the Digital or Electronic Telephone User Guide for information regarding chain dialing.) Special Entries: F=Flash; P=1.5 or 3-sec Pause (Prog. 12); L=10-sec Pause; N=Clear Memory. Special code entry: I = Intercom H = Hold C = Conference	**R** □□□ □□□ **N** □□.....□□ New speed dial number
5	**To Store Data, Press Enter.** *General Note:* • *If program entry is not correct,* **Delete** *will not respond. To try again, press* **Delete+Enter** *at the same time.*	**R**
6	**To Exit the Speed Dial Mode** Type **QUIT**, press **Enter**.	**>MODE**

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Table 13-29
Message Record Sheet

Copy several sheets if necessary.

MESG.#_____

MESG.#_____

MESG.#_____

MESG.#_____

MESG.#_____

MESG.#_____

MESG.#_____

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MESG.#_____

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Strata® DK280

Digital Business Telephone System

Release 3

User Guides

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January 1996

TOSHIBA

BUSINESS TELEPHONE SOLUTIONS

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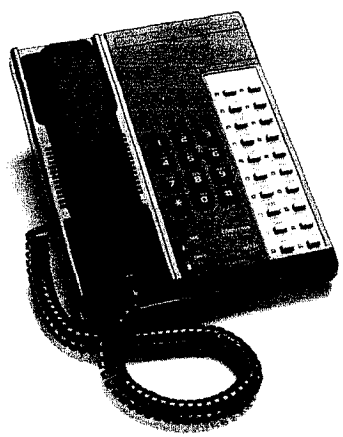
Release 3



Contents

Chapter 2 – Basic Features

Chapter 2 - Basic Features (continued)

Chapter 3 – Advanced Features

Introduction

This user guide shows you how to use Toshiba electronic telephones with the Strata DK280 system. This user guide covers all of the voice calling features, such as Call Holding and Call Forward, available with each of the phones.

Organization

This user guide is divided as follows:

The Introduction consists of a general description of the electronic telephones as well as the purpose and organization of this document.

- **Chapter 1—The Grand Tour** provides an equipment overview, describes the functions of feature buttons and their associated Light Emitting Diodes (LEDs).
- **Chapter 2—Basic Features** contains descriptions and operating procedures for commonly used features. It provides detailed descriptions of the features contained in the *Strata DK280 Electronic Telephone Quick Reference guide*.
- **Chapter 3—Advanced Features** provides detailed operating instructions for the more sophisticated telephone features.
- **Chapter 4—Toshiba Voice Mail Integration** explains how to set up your telephone to forward calls to a Toshiba Voice Processing System and to retrieve recorded messages left by callers.
- **Chapter 5—Centrex Application** describes the Centrex features which may be available with your Strata DK system.

- **Appendix A—Access Code Tables** provides instructions for programming a sequence of steps or access codes onto feature buttons. It includes CO Line Access Codes, Paging Group and Zone Codes, Call Pickup Codes, and Feature Access Codes.
- **Appendix B—Multiple Directory Numbers** defines Primary, Secondary, and Phantom.

Conventions

Bold letters in [brackets] represent buttons which have Directory Numbers on them. For example:

[DN] = any Directory Number button (also known as an Extension or Intercom Number).

[PDN] = Primary Directory Number button (the Extension Number for your telephone).

[SDN] = Secondary appearance of a **[PDN]**. A **[PDN]** which appears on another telephone is considered an **[SDN]**.

[PhDN] = Phantom Directory Number button (an additional Directory Number).

See Appendix B for more information on Multiple Directory Numbers: [DNs], [PDNs] and [PhDNs].

Extra bold letters represent telephone buttons.

Your telephone may not have all of the buttons mentioned in this guide. See your Telephone System Administrator for more information on buttons and access codes.

~ means "through."

\+ is used for multiple key entries.
Example: Press **Speed Dial** + **XX** + **Redial** + **Spkr** (XX=08~60 seconds).

➤ denotes the step in a one-step procedure.

Notes:
Elaborate specific items or reference other information.

IMPORTANT!
Calls attention to important instructions or information.

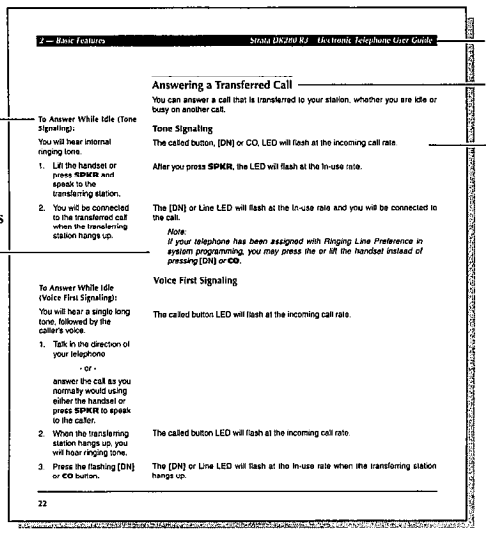
How to Use This Guide

Information in this user guide is divided into two distinct areas. Step-by-step feature instructions appear in the left-hand column of the page. Explanations of these procedures appear in the right-hand column. (See Figure 1.)

Supporting Documentation

Your electronic telephone may have an LCD for message and feature information. Refer to the *Electronic Telephone LCD User Guide.*

Action Text
Specific instructions on how to perform a procedure are numbered and entered in the left-hand column.



Chapter Titles

First Level Headings

Results or Details
Explanations or details of the action text.

Notes and Warning Messages

Figure 1
Sample Page

The Grand Tour 1

Toshiba electronic telephones incorporate state-of-the-art telecommunications technology and provide a vast array of calling features. They are easy to operate, and all features are accessed with a feature button or a brief access code.

This chapter will familiarize you with the controls and indicators located on your telephone. Understanding the function of the feature buttons and their associated LEDs will improve your efficiency in using the telephone and will help you to take advantage of all of the benefits your telephone offers.

Equipment

This guide applies to all electronic telephones (EKTs), (except the 10X and 20X series), connected to a Strata DK280 system with Release 3 software. Electronic telephone model numbers begin with "EKT" and appear on stickers at the bottom of your telephone. Figure 2 depicts a 20-button EKT with a speakerphone which enables users to make and receive outside and internal calls without lifting the handset. Also available are Liquid Crystal Display (LCD) models, 10-button EKTs, and handset EKTs (without speakerphones).

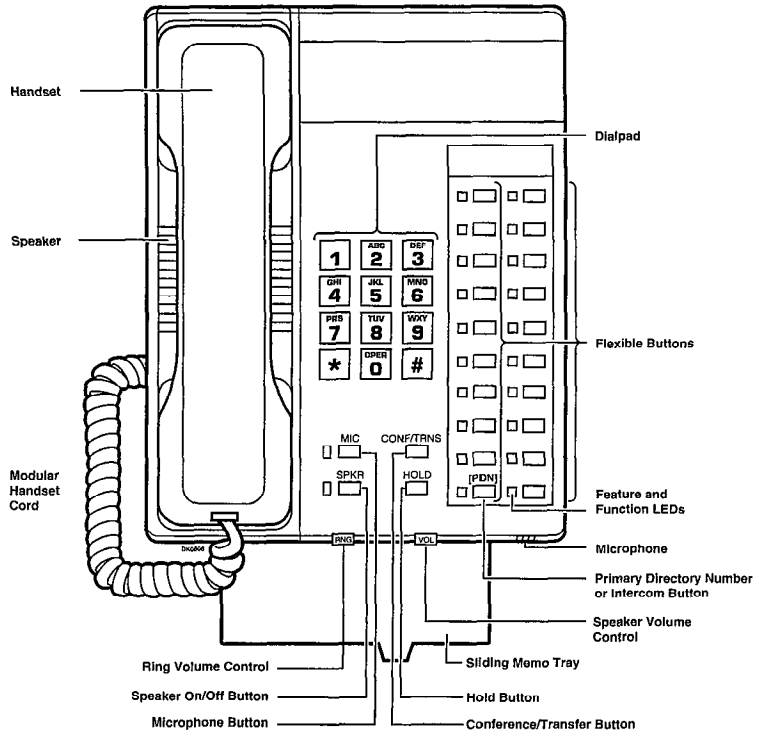


Figure 2
20-button Electronic Telephone

Button Definitions

Button Names	Definitions
ACCNT	**Account Code Button** Press to enter a Voluntary Account Code anytime during a Central Office (CO) line call without interrupting the conversation.
ALRM	**Alarm Reset Button** Press to turn off a telephone alarm connected to a facility alarm mechanism.
ALERT (1 ~ 4)	**Alert Signaling Button** Press to alert with a distinctive sound and to indicate a pre-arranged meaning and visual indication to a predesignated station. Up to four Alert Signal buttons can be assigned to a telephone.
AC	**All Call Voice Page Button** Press to page all of the digital and electronic telephones in the All Call Page group.
ABR	**Automatic Busy Redial Button** Press to set up Automatic Busy Redial after receiving a busy tone on a dialed CO line call (not available on tie or DID CO lines).
ACB	**Automatic Callback Button** Press to recall a busy station or station in the DND as soon as that station becomes idle or deactivates DND. Also used for CO line queuing.
BGM	**Background Music Button** Press to turn Background Music on or off over your station speaker.
CFAC	**Call Forward-All Calls Button** Press to forward all calls to another station or voice mail device.
CFB	**Call Forward-Busy Button** Press to forward calls immediately to another station or voice mail device when your station is busy or in the DND mode.
CFB/NA	**Call Forward-Busy/No Answer Button** Press to forward calls immediately to another station or voice mail device when your station is busy or in DND mode. Also forwards calls when your station is not answered after 8 ~ 60 seconds (set at your station).

Button Names	Button Definitions
CFNA	**Call Forward/No Answer Button** Press to forward calls to another station or voice mail device when your station is not answered after 8 ~ 60 seconds (set at your station).
CF-EXT	**Call Forward External Button** Press to forward Private or DID line calls to an external or internal telephone number.
CFF	**Call Forward-Fixed Button** Press to forward all calls to a station or voice mail device assigned in system programming.
CO	**Line Button** Press to answer or access an outside Central Office (CO) line.
CONF/TRNS	**Conference/Transfer (Fixed)** Press to set up conference and transfer calls.
DND	**Do Not Disturb Button** Press to lock your station in or out of the Do Not Disturb (DND) mode.
[DN]	**Directory Number Button** Press to answer a call to the Directory Number **[DN]** or to initiate a phone call. The **[DN]** is also known as an Extension Number or Intercom Number. You can have multiple **[DN]** buttons on your telephone, including DN's belonging to another telephone (**[SDNs]**). See Appendix B for more information.
DRLK (0 ~ 4)	**Door Lock Button** Press to unlock a door lock mechanism.
DSS	**Direct Station Selection Button(s)** Press to ring a preselected station. The LED associated with each DSS button provides the status (idle/busy) of the station assigned to the button.
GRP/PKUP	**Group Pickup Button** Press to pick up a call that is ringing a station that belongs to a Pickup Group that your station is a member of.
HOLD	**Hold Button (Fixed)** Press to hold internal or outside calls.
LCD M	**Message Select Button** Press to allow system and personal messages to be displayed on the optional 32-character Liquid Crystal Display (LCD).

Button Names	Button Definitions
LCAD	**Unanswered (Lost) Call Automatic Dial Button** Press to automatically dial the stored ANI (Automatic Number Identification) or Caller ID number shown on the LCD. Unanswered calls will be stored on this button and on the LCD.
MIC	**Microphone Button (Fixed)** Press to turn the microphone off/on while telephone is in use.
MCO	**Microphone Cutoff Button** Press to turn the microphone off/on while idle, providing privacy when you receive handsfree internal calls. Also functional when your station receives calls—the MIC button controls the microphone when you originate calls.
MW/FL	**Message Waiting/Flash Button** The MW/FL LED flashes to indicate that a message is waiting. Press the MW/FL button to call back the station or voice mail device that activated the LED. This button performs the following functions: Disconnect and recall dial tone on a CO line; access Centrex or PBX features; enter a pause or flash signal when programming speed dial numbers.
MSG W	**Additional Message Waiting Buttons** Phantom Directory Numbers allow multiple Message Waiting buttons with LED indications for up to four different Directory Numbers **[DNs]** other than your Primary Directory Number **[PDN]**. It performs the same Message Waiting functions as the MW/FL button.
NT	**Night Transfer Buttons** Press to control the system's CO line ringing pattern for after-hours incoming calls.
NT (1 ~ 4)	**Tenant Night Transfer Buttons** Press the appropriate button to control the system's CO line ringing patterns for after hours incoming calls for either of the tenants that share a single Strata DK280 system.
NT L (1 ~ 4)	**Night Transfer Lock Button** Initiates entry of the NT Lock password. NT L LED will be on when the system ring mode (Day/Day2/Night) is locked.
CPD	**Park Orbit Display Button - LCD Telephones Only** Press to display call(s) parked in orbit. If there are multiple parked calls, a + sign appears on the LCD.

Button Names	Button Definitions
CP/PG	**Park/Page Button** Press to park internal or outside call in orbit and announce to other telephones or paging speakers to retrieve the parked calls.
PARK	**Park Button** Press to park internal or outside calls in an orbit. Call retrieval can be made locally from the same parking telephone or remotely from a different telephone.
PAU/L	**Pause (Long) Button** Press to insert a 10-second pause when programming Speed Dial numbers.
PAU	**Pause Button** Press to set either a one-half or two-second pause when programming Speed Dial numbers. (The pause time is set in system programming).
[PDN]	**Primary Directory Number Button** Press to answer a call to the Primary Directory Number or to initiate a phone call. The **[PDN]** is specifically your Extension Number or Intercom Number. Your telephone can have up to four **[PDN]** buttons with your number. See Appendix B for more information.
[PhDN]	**Phantom Directory Number Button** Up to eight Phantom Directory Numbers can be dedicated to a station or shared by a group of stations. See Appendix B for more information on **[PhDNs]**.
PKUP	**Call Pickup Button** Press to initiate a Directed Call Pickup of CO line, **[DN]**, and page calls.
PKUP (**1**, **2**, **3**, or **4**)	**Tenant Call Pickup Buttons** If the system is shared by tenants, the Directed Pickup 1 ~ 4 buttons pick up ringing CO line calls for Tenants 1 ~ 4 respectively.
PL	**Pooled Line Button** Press to access an available CO line from a group of lines appearing under one button.
PRIV	**Privacy Button** Press to block Privacy Override on common CO line buttons. This button does not block Busy Override or Executive Override.
PRV RLS	**Privacy Release Button** Press to release privacy on common CO line buttons, enabling other station users to enter your conversations on those buttons. Privacy release does not apply to common **[DN]** buttons which are always private.

Button Names	Button Definitions
RDL	**Redial Button (Fixed)** Press to have the system redial the last telephone number you dialed, or begin to store a speed dial number.
RLS/ANS	**Release and Answer Button** Press to disconnect or complete the transfer the current CO or **[DN]** call and automatically answer the new incoming CO or **[DN]** call. Operational for Pooled Lines, **[DN]**, and CO line buttons.
RLS	**Release Button** Press to disconnect or complete the transfer of the current CO or **[DN]** call and to place your station in the idle condition.
SAVE	**Save Button** After dialing an outside or internal directory number, press to "save" the number. Later, you can have the system automatically redial the number for you when you press the button after accessing an internal or outside line.
SD	**Speed Dial Button** Press to Speed Dial a telephone number or feature access codes.
SDS	**Speed Dial Select** Press to store and access Speed Dial number.
SPKR	**Speaker Button (Fixed)** Press to turn the speaker on/off. This button will also select a line or the internal **[PDN]** if programmed for auto preference in system programming. Also, used to disconnect on-hook speakerphone calls.
TONE	**Tone Button** Press to change the outgoing dialing of the CO line in use from dial pulse to tone signaling.

LED Indications

Each line and feature button has a Light Emitting Diode (LED) next to it which indicates the status of the line or feature associated with the button.

CO or **[DN]** LEDs flash at varying rates to indicate call status.

CO or **[DN] In-use**—When you access an outside line:

- Your station's CO or **[DN]** LED flashes —2 seconds on—1/8 second off—1/8 second on and 1/8 second off.
- Other stations' CO or **[DN]** LEDs that show your station: steady red.

Incoming Call—While an incoming call is ringing:

- Your station's CO or **[DN]** LED flashes —one second on/one second off.
- Other stations' CO or **[DN]** LEDs that show your station flash red—one second on and one second off.

Camp-on Busy—When another station camps on to your station:

- Your station's CO or **[DN]** LED flashes —1/2 second on/1/2 second off.

On Hold—When you place an outside line on hold:

- Your station's CO or **[DN]** LED flashes —4 pulses per second for 1/8 second then 1/8 second off.
- Other stations' CO or **[DN]** LEDs that show your station flash red—3/4 second on then 1/4 second off.

  Note:
  If using a **PL** *button, the hold indication is only at the station that places the call on hold.*

Consultation Hold—During a consultation or transfer to another station:

- Your station's CO or **[DN]** LED flashes —ten pulses per second.
- Other stations' CO or **[DN]** LEDs that show your station: steady, red.

Exclusive Hold—When you place an outside call on Exclusive Hold:

- Your station's CO or **[DN]** LED flashes —ten pulses per second.
- Other stations' CO or **[DN]** LEDs that show your station: steady, red.
- **Hold Recall/Exclusive Hold Recall**—When a held call is recalling your idle station:
  - Your station's CO or **[DN]** LED flashes —two pulses in the first second, then ton pulses in the next second.
  - Hold Recall: other stations' CO or **[DN]** LEDs that show your station flash red.
  - Exclusive Hold Recall: other stations with the same line number: steady, red.

- **Internal Call**—While another station is ringing your station:
  - Your **[DN]** LED flashes —ten pulses per second—one second off.

- **Busy Station Transfer**—When an outside call is transferred to your busy station (from a designated station or Auto Attendant):
  - Your station's CO or **[DN]** LED flashes —4 pulses per second, 1/8 second on, 1/8 second off.
  - Other stations' CO or **[DN]** LEDs that show your station: 3/4 second on 1/8 second off—red.

  After disconnecting the first call:
  - Your CO or **[DN]** LED flashes —ten pulses per second.
  - Other stations' CO or **[DN]** LEDs that show your station flash —two pulses per second.

- **Alert Signal**—When an Alert Signal is sent to your telephone:
  - Your ALERT LED lights red for four seconds.

  When you send an Alert Signal:
  - Your ALERT LED will flash red for 1/2 second.

On-hook/Off-hook

Some procedures in this user guide instruct you to perform a step while "on-hook" or "off-hook." These terms refer to the position of the handset. "Off-hook" indicates that the handset should be lifted off of the telephone cradle. "On-hook" indicates that the handset should remain in the cradle and should not be lifted.

Volume Controls

Voice and ring tone volume levels are controlled by separate adjustable slides located at the bottom of the front panel. The right **VOL** control adjusts the speaker volume for dial tone, station Background Music, Off-hook Call Announce, and voice. The left **RING** control adjusts the ring tone and handsfree voice announcement levels.

Ring Tone and Incoming Handsfree Answerback Volume

To Adjust Ring Tone and Handsfree Announcement Volume:

➤ With the handset on-hook, slide the **RING** control to adjust ring tone.

Adjusting the ring tone volume also changes the volume level of incoming Handsfree Answerback calls before they are answered by pressing a **[DN]**.

You can adjust the ring tone only if the handset is on-hook and the telephone is in the idle state. You will hear ring tone as long as you slide the **RING** control.

This procedure will also change the volume level of a caller's voice on Handsfree Answerback calls to your telephone. This allows you to walk away from your telephone and test ring volume level.

Handset Receiver Volume

To Adjust Handset Receiver Volume:

➤ While on an off-hook call, slide the **VOL** control to adjust the volume.

The step on the left shows you how to adjust the volume level of your handset receiver.

Note:
After a call is terminated and the handset is placed on-hook, the handset receiver volume level will return to the "original" level for the next call. This "original" level can be adjusted to higher/lower in system programming.

Speaker and Off-hook Call Announce Volume

The steps to adjust the speaker volume level apply to calls originated on-hook from your station, internal and CO dial tone, as well as Off-hook Call Announce (OCA).

To Adjust Speaker and Off-hook Call Announce Volume:

1. With the handset on-hook, press a **[DN]**.
2. Slide the **VOL** control to adjust the volume.

After you press a **[DN]**, you will hear dial tone. You can stop the dial tone by pressing **SPKR**.

Note:
You can control the volume of SP-OCA calls to your station when your station is idle. It is not possible to change the SP-OCA volume when your telephone is in use off-hook.

Background Music (BGM)

Background music over external speakers is controlled by the System Administrator. If BGM is enabled, you can control it through your station speakers.

Background Music (BGM) Over Telephone Speakers

To Listen to BGM on Your Telephone Speaker:

➤ Press **BGM**

- or -

press a **[DN]** + **# 4 8 1**, then press **SPKR**.

You may listen to optional Background Music over your station speaker.

You will hear BGM over your telephone speaker.

To Cancel BGM on Your Telephone Speaker:

1. Press **BGM**

- or -

press a **[DN]** + **# 4 8 0**, then press **SPKR**.

The BGM will quit playing over your telephone speaker.

Background Music Volume

To Control BGM Volume:

1. Press a **[DN]**.
2. Slide the **VOL** control and adjust while listening to the dial tone.
3. Press **SPKR** after setting the volume level.

You will hear dial tone after pressing the button.

The relative volume level of the BGM will be the same as the dial tone.

Note:
The Off-hook Call Announce volume level corresponds with the internal calls and BGM levels.

Basic Features 2

Before You Begin

If you are a new user of the Strata DK digital telephone, lift the handset to find out what kind of line selection your telephone has been set up for.

Automatic Off-hook Selection

This is an optional feature enabled in system programming.

- If you hear dial tone and the **[DN]**, CO (Line), or PL (Pooled Line Group) LED lights steady when you lift the handset, then your telephone has been programmed for Automatic Off-hook Selection. This means that whenever you lift the handset or press the **SPKR** button, you will receive dial tone without having to first press a **[DN]** or **CO** line button.
- If you hear silence after you lift the handset, your telephone does not have Automatic Off-Hook Selection. You will need to press any available **[DN]** or **CO** button before dialing an internal or external number.

Ringing Line Preference

- If your telephone is programmed with Ringing Line Preference, you can answer a line ringing your station by lifting the handset or pressing **SPKR**. If your telephone does not have this feature, you will have to press the button associated with the ringing call (flashing LED) to answer the call.

Dialing Outside Calls

You can make calls to or receive calls from telephones outside of the Strata DK280 system.

Direct Dialing

To Dial an Outside Number (Direct Access):

1. Lift the handset or press **SPKR**.
2. Press any available **[DN]**, **CO**, or **PL** button.
3. Dial a telephone number.

If the **[DN]**, CO, or PL LED lights when you lift the handset, your telephone has Automatic Off-Hook Selection and you can skip Step 2. If the LED does not light, follow Steps 2 and 3.

CO and **PL** buttons access outside CO lines. After selecting a line, you should hear CO line dial tone and the LED will flash at the In-use rate.

Dial tone stops after the first digit is dialed, but the LED will continue to flash during the call.

CO Line Access Code Dialing

To Dial an Outside Number (Access Code):

1. Lift the handset.
2. Press a **[DN]**.
3. Dial a CO line access code.
4. Dial a telephone number.

If the **[DN]**, CO, or PL LED lights when you lift the handset, your telephone is programmed for Automatic Off-Hook Selection and you can go on to Step 3. If it doesn't light, follow Steps 2 and 3.

When you lift the handset, you will hear internal dial tone and the LED will flash at the In-use rate.

You will hear CO line dial tone and the LED continues to flash at the In-use rate.

See Appendix A—Table 1—CO Line Access Codes.

Dial tone stops after the first digit is dialed, but the LED will continue to flash at the In-use rate.

On-hook Dialing

You can dial calls without lifting the handset. You must lift the handset to converse, unless your telephone is a full speakerphone.

To Dial an Outside Call While On-hook:

1. Press any available **CO** or **PL** button

   - or -

   press **[DN]** + **CO**

   - or -

   press a **[DN]** and enter a CO line group access code.
2. Dial a telephone number.
3. Lift the handset when the called party answers.
4. Hang up or press **SPKR** when the call is completed.

You will hear CO line dial tone and the **[DN]**, CO, or PL LED will flash at the In-use rate.

See Appendix A—Table 1—CO Line Access Codes.

You will hear CO line dial tone and the LED continues to flash at the In-use rate. Dial tone stops after the first digit is dialed, but the LED flashes during the call.

The LED will continue to flash. You do not have to lift the handset if you have a full speakerphone.

The LED will turn off. Press **SPKR** to disconnect the call if you did not lift the handset.

Dialing Internal Calls

You can make calls to and receive calls from other stations in the Strata DK280 system

To Dial an Internal Call:

1. Lift the handset.
2. With the handset on-hook press a **[DN]**.
3. Dial a Directory Number.

If you hear CO line dial tone when you lift the handset, then your telephone has Automatic Off-hook Selection, and you can skip Step 2.

After you press a **[DN]**, you will hear the dial tone and the LED will flash at the In-use rate.

Notes:

1. *If the called station is idle:*
   - You can leave a Message Waiting Indication at the called station by pressing **7**.
   - If the system is set for Voice First Signaling, make a voice announcement when you hear a single tone. (After dialing the directory number, you can press **1** to change to Tone Signaling.)
   - If the system is set for Tone Signaling, you will hear repeated ring tones and you should wait for the call to be answered. (After dialing the Directory Number, you can dial **1** to change to Voice First Signaling.)
2. *If you receive busy tone, you can:*
   - *Press **4** to set Automatic Call Back (ACB).*
   - *Leave a Message Waiting Indication at the called station by pressing **7**.*
   - *Activate Busy Override if the called station is not equipped for Off-hook Call Announce (OCA) by pressing **2**.*
3. *To activate OCA:*
   - ***System Voice Signaling:** If your telephone is programmed for automatic OCA, you will be connected as an OCA call immediately; otherwise, when you hear busy tone, you must press **2** to OCA.*
   - ***System Tone Signaling:** If you hear ringback tone, press **1** to OCA; if you hear busy tone after pressing **1**, press **2** to OCA.*

     *If you hear busy tone, press **2** (you will hear ringback tone, then press **1** to OCA).*

Dialing On-hook Internal Calls

To Dial an Internal Call While On-hook:

1. Press a **[DN]**.

   You will hear internal dial tone when you press the button and the LED will flash at the In-use rate.
2. Dial a Directory Number.

   See previous Notes under "Dialing Internal Calls."
3. Lift the handset when the called station is answered.

   The LED will continue to flash. Calling from a speakerphone to a telephone in the Handsfree Answerback mode is not recommended because the characteristics of the two are not matched.
4. Hang up when the call is completed.

   Press **SPKR** to disconnect the call if you did not lift the handset. The LED will turn off.

Answering Calls

Outside Calls Ringing on CO or [DN] Buttons

To Answer a Call on a CO or [DN]:

1. When your telephone rings, press the flashing **[DN]** or **CO** and lift the handset.

If your phone is ringing, the LED will change from the incoming call rate to the in-use rate when you press the button. See Chapter 1—"LED Indications" for rate definitions.

Note:
*If your station is programmed with Ringing Line Preference, you can answer a line ringing your station by lifting the handset or pressing **SPKR**.*

Answering Outside Calls Ringing on a Pooled Group Line Button

To Answer a Call on PL:

1. When your telephone rings, press the flashing **PL** button or lift the handset.

   If another call comes in during the first call, place the call on hold, then answer the second call:

   A. Press **RLS/ANS**

   - or -

   hold down the hookswitch for about 1 second

   - or-

   transfer the current call and answer the incoming call (repeat Step A).

The **PL** button allows you to access or select a CO line from a group of lines.

The LED will change from the Incoming Call rate to the In-use rate when you press the button or lift the handset.

Incoming Call Notification

Muted ringing while you are on a call on a **PL** button indicates an incoming call. (See Step A.)

Answering Voice First Internal Calls

Voice First Signaling is indicated by a long tone, followed by the caller's voice. The other signaling method is called "Tone First," which consists of successive ring tones.

To Answer an Internal [DN] Call (Voice First Signaling):

You will hear a single long tone, followed by the caller's voice.

➤ Talk in the direction of your telephone

- or -

answer the call as you normally would using either the handset or press **SPKR** to speak to the caller.

The called button LED will flash at the incoming call rate.

If your telephone has Automatic Off-hook Selection, just lift the handset or press **SPKR**. If your telephone does not have this feature, press the flashing **[DN]** or **CO** button first, before using the handset or **SPKR** button.

Answering Tone Signaling Internal Calls

To Answer While Idle (Tone Signaling):

You will hear internal ringing tone.

1. Lift the handset or press **SPKR** and speak to the transferring station.
2. You will be connected to the transferred call when the transferring station hangs up.

If the call was made with Tone Signaling instead of Voice First Signaling, your phone would continue to ring until you lift the handset.

Call Transfer with Camp-on

You can transfer calls to idle or busy stations.

Note:
You cannot transfer (or camp-on) to stations that are in the Do Not Disturb (DND) mode.

To Transfer a Call (Voice First Signaling):

1. While on an internal or external call, press **CONF/TRNS**.

After you press **CONF/TRNS**, the Line or **[DN]** LED will flash at the conference rate and the LED will flash at the In-use rate. You will hear internal dial tone.

2. Dial the Directory Number where the call will be transferred.

The Directory Number could be the **[DN]** of a telephone, a Hunt Group Number or ACD Group **[DN]**, etc.

3. Announce the call if the called station is idle

After dialing, you will hear a single tone. (If the call was made with Tone Signaling instead of Voice First Signaling, you would hear ringing tone.)

- The Line or **[DN]** LED will begin to flash at the on-hold rate and the CO line will ring the called station.
- The CO LED will change to steady red when the called station connects with the transferred call.
- If the called station user fails to answer the call, you will receive a recall ring (when your station or **[DN]** is idle) after a time set in system programming.

- or -

hang up if the called station is busy or does not answer

After you hang up, the CO LED will begin to flash at the on-hold rate or if you transferred the call from a **[DN]**, the **[DN]**'s LED would go out. The CO line or Directory Number will camp on to the called station (see previous Note) and the called station will receive a warning tone.

- The Line LED will change to steady red when the called station connects with the transferred call.

- or -

- You will receive a recall ring when your station or **[DN]** is idle and camp-on will be cancelled if the called station user fails to answer within a predetermined time. Answer the recall and inform the caller of the situation and repeat the procedure if necessary.

you may reconnect to a transferred line before it is answered: press **CO**

- or -

press [DN] + **# 4 2**.

Answering a Transferred Call

You can answer a call that is transferred to your station, whether you are idle or busy on another call.

Tone Signaling

To Answer While Idle (Tone Signaling):

You will hear internal ringing tone.

1. Lift the handset or press **SPKR** and speak to the transferring station.
2. You will be connected to the transferred call when the transferring station hangs up.

The called button, **[DN]** or CO, LED will flash at the incoming call rate.

After you press **SPKR**, the LED will flash at the In-use rate.

The **[DN]** or Line LED will flash at the In-use rate and you will be connected to the call.

Note:
If your telephone has been assigned with Ringing Line Preference in system programming, you may press the ringing button or lift the handset instead of pressing **[DN]** *or* **CO**.

Voice First Signaling

To Answer While Idle (Voice First Signaling):

You will hear a single long tone, followed by the caller's voice.

1. Talk in the direction of your telephone

   - or -

   answer the call as you normally would using either the handset or press **SPKR** to speak to the caller.

The called button LED will flash at the incoming call rate.

2. When the transferring station hangs up, you will hear ringing tone.

The called button LED will flash at the incoming call rate.

3. Press the flashing **[DN]** or **CO** button.

The **[DN]** or Line LED will flash at the In-use rate when the transferring station hangs up.

Answer Call Waiting Calls

To Answer an Incoming Call While on Another Call:

You will hear a one second warning tone. You can choose Step A or B below:

A warning tone indicates that another call is camped onto your station. The **[DN]** or CO LED will flash at the on-hold rate.

A. You can place the call on hold—

   1. Press **HOLD**

      The existing call will be put on hold. The camped-on line will ring your station and the CO LED will flash red at the incoming call rate.

   2. Press the flashing **[DN]** or **CO**

      - or -

      if your telephone has the Auto Hold feature, just press the flashing **[DN]** or **CO**

      You will be connected to the transferred call and the **[DN]** or CO LED will flash at the In-use rate.

      With the Automatic Hold feature, the existing call placed on hold and you will be connected to the transferred call. The **[DN]** or Line LED will flash at the In-use rate. See your System Administrator to find out if you have Automatic Hold.

      - or -

B. You can end the current call and answer the next by—

   Pressing the ringing **[DN]** or **CO**

   This will disconnect the current call and connect you to the transferred call and the **[DN]** or Line LED will flash at the In-use rate.

   - or -

   Hanging up the current call; the camped-on call will ring your station. Then press **[DN]** or **CO** or lift the handset

   The existing call will be disconnected. The camped-on line will ring your telephone and the Line LED will flash red at the incoming call rate.

Conference Calls

This feature enables you to add other parties to an existing call. (If you have an LCD telephone, you can use Soft Keys to make a conference call. (See the *DK280 Digital LCD User Guide.*)

Conference with Stations Only

As many as four stations may be conferenced on one internal line.

To Conference with Stations Only:

1. While on an internal Directory Number call, press **CONF/TRNS**.

   After you press the button, you will hear internal dial tone and the LED will flash at the conference rate.

2. Dial a Directory Number.

   The Directory Number could be for a telephone or department.

3. Press **CONF/TRNS** after the party answers.

   Wait for the called station to answer. The **[DN]** LED from which the conference originated will flash at the In-use rate and all parties will be conferenced.

   (To add another **[DN]**, repeat Steps 1 ~ 3.)

Conference with Stations and CO Lines

Adding a Second CO Line

Conference Calls can include up to two stations and two CO lines, or up to three stations and one CO line.

To Add a Second CO Line:

1. While on a CO line call, press **CONF/TRNS**.

   After you press the button, you will hear dial tone. The **[DN]** or Line LED will flash at the conference rate if the call is on a **[DN]** or **CO** button.

2. Access a second CO line and dial the next telephone number.

   See Appendix A—Table 1—CO Line Access Codes .

3. Press **CONF/TRNS** after the party answers.

   Both line LEDs will flash at the In-use rate, if you used **CO** buttons; or if you established the two-CO line call on a single **CO** or **[DN]** button, it will flash at the In-use rate.

   All parties will be conferenced. You may add one more station to a two-CO line conference

   If you receive a busy tone or no answer, return to the original connection by pressing the original **[DN]** or **CO**, or hang up and the original connection will recall you immediately.

Adding a Station to a CO Line Call

To Add a Station to a CO Line Call:

1. While on a CO line call, press **CONF/TRNS**.

   After you press **CONF/TRNS**, you will hear dial tone. The **[DN]** or Line LED will flash at the conference rate.

2. Dial the Directory Number of the station to be added.

   If you receive a busy tone or no answer, press **CONF/TRNS** to return to the original connection.

3. Press **CONF/TRNS** after the party answers.

   All parties will be conferenced. The **[DN]** or Line LED will flash at the In-use rate.

   To add another party, repeat steps 1 ~ 3.

   Up to three stations (including your own) may conference with one CO line.

   Note:
   The new station will not be conferenced, unless its user lifts the handset or presses a **[DN]** *to answer.*

Call Hold

You can place Directory Number and CO line calls on hold.

To Hold a Call that Appears on a CO or DN Button:

➤ While on a CO line or internal call, press **HOLD**.

The Line or **[DN]** LED will flash at the on-hold rate.

You will hear repeated recall tone (when your station is idle or two times only when busy) if you do not retrieve the held call before "Hold the recall" time set in system programming.

The call may be released automatically if the held party hangs up and the CO provides a hold-release signal.

To place a Handsfree Answerback call on hold, you must first answer the call by lifting the handset or pressing the flashing **[DN]**.

Note:
If your station is programmed with Automatic Hold, an existing call will automatically be placed on hold if you answer or make another call. You will not have to press **HOLD**. *(See Chapter 3—Advanced Features—Automatic Hold.)*

To Retrieve the Call:

➤ Press the **CO** or **[DN]** which is on hold.

The Line or **[DN]** LED will flash at the on-hold rate.

Exclusive Hold

To Place a Call on Exclusive Hold:

➤ While on an outside call, press **HOLD** twice.

Exclusive Hold allows you to place a call on hold so that only you or somebody using a Call Pickup code at another station can retrieve it.

After you press **HOLD** the second time, the Line LED will flash at the exclusive hold rate.

To Retrieve a Call on Exclusive Hold

➤ Press the **CO** button that is on Exclusive Hold

Another station user can pick up the call by dialing **# 5** plus your station number, or by dialing **# 5 # 7** plus the CO line number (**0 0 1 - 1 4 4**) that the call is held on.

Call Park Orbits

The Call Park feature allows you to hold a call temporarily in an orbit and then anyone can retrieve the call from the orbit with the same station or with a different station. Orbits are the areas where calls are held. There are 20 General Park Orbits for the system and one Personal Park Orbit for each station. Once you have parked a call in an orbit, you can:

- Hang up and retrieve the parked call at a later time.
- Originate another call.
- Access a voice paging device to announce the parked call for pickup from another station.

To Park a Call:

1. While on a CO line call or an internal call, press **PARK**

   - or -

   CONF/TRNS + **# 3 3 2**.

If you park a call and your station is idle while the system Call Park recall timer expires, the parked call will automatically recall to your station; if your station is busy, the parked call will camp-on to your station. The CO or **[DN]** LED will flash at the consultation-hold rate until you enter the orbit number.

2. Enter a General Orbit Number (**9 0 0 ~ 9 1 9**)

   - or -

   enter a valid **[PDN]**.

After dialing the orbit number, you will hear a short dial tone and the call will be parked and the CO line will flash at the Hold rate, or the **[DN]** LED will go out.

The CO Line LED will flash at an on-hold rate (the **[DN]** LED will be off). The call is parked at the orbit with the orbit number that you have just entered.

3. Hang up.

To Pick Up or Retrieve a Parked Call:

1. Press the parked **CO** or **[DN]** button, or press **PARK**

   - or -

   press **CONF/TRNS** + **# 3 3 2**.

The Orbit Number is usually provided in the paging announcement. The CO Line or **[DN]** LED will flash at the In-use rate when the call is picked up or retrieved.

2. Enter the Orbit Number or valid **[PDN]** at which the call is parked.

Call Park and Page

To Park a Call and Page:

1. While on a CO line call or an internal call, **CP/PG**.

The CO Line or **[DN]** LED will flash at the consultation-hold rate.

2. Enter a General Orbit Number (**9 0 0 ~9 1 9**) or a valid **[DN]**.

The CO Line will flash at an on-hold rate (the **[DN]** LED will be off). You will hear a short dial tone for your paging access.

3. Enter the Paging access code_____.

See Appendix A—Table 2, Paging Group Codes and Paging Zone Codes.

4. Make your announcement.

Remember to include the Orbit Number in your announcement.

5. Hang up to free the paging device.

The paging device will not be released until you hang up.

Repeat Last Number Dialed (Auto Redial)

This feature enables you to automatically redial the last number (outside or [DN]) called by pressing **RDL**.

To Redial the Last Number Dialed:

1. Lift the handset.
2. Press an available [DN] or **CO**.
3. Press **RDL** (or **# #**) and proceed with your call.

Skip this step if your telephone has Automatic Off-hook selection.

Press the same [DN] or **CO** button that you used to dial the telephone number you wish to redial. You will hear dial tone.

The last telephone number you dialed will be automatically redialed.

Call Forward

You can set your telephone [DN] with a variety of Call Forward modes.

General Notes:
If Call Forward is set:

- *CO lines that ring your station only will forward—CO lines that ring more than one station will not forward.*
- *CO line calls transferred to your station will forward.*
- *Internal calls will forward (Handsfree and Off-hook Call Announce (OCA) calls optionally may or may not).*
- *Call Forward has priority over the Station Hunt feature.*
- *Call Forward must be set before the call is received.*
- *Call Forward-All Calls and Call Forward-Busy can be set with the touch on one button. See Appendix A—Table 4—User Programmable Feature Buttons.*

Telephones can have many [DN] buttons; however, a telephone must be the designated owner of a [DN] to be able to Call Forward the [DN]. Each telephone is designated as the owner of at least one [DN] which is called the telephone's Primary Directory Number, [PDN].

Call Forward buttons are used to Call Forward the [PDNs] only. Use the access codes to Call Forward [PDNs] or Phantom Directory Numbers [PhDNs].

Call Forward—All Calls

If your station is idle or busy and has this feature activated, all calls to it will forward immediately. The station will not ring.

To Set Call Forward-All Calls:

1. Press **CFAC**
   - or -
   press a [PDN] or [PhDN] + **# 6 0 1**.

   The CFAC LED will flash red.

   Press the [PDN] or [PhDN] to be forwarded. You will hear a confirmation tone after **# 6 0 1** is dialed.
2. Enter the Directory Number to which calls will forward.
3. Press **CFAC**
   - or -
   press **SPKR** if an access code was used.

   The CFAC LED will light steady red and calls will forward to the stored station number.

Call Forward—Busy

Calls to your telephone while you are busy on another call or in the Do Not Disturb mode will forward immediately if this feature is set. Calls will ring as normal if your telephone is idle.

To Set Call Forward-Busy:

1. Press **CFB**
   - or -
   press a [PDN] or [PhDN] + **# 6 0 2**.

   The CFB LED will flash red.

   You will hear confirmation tone if **# 6 0 2** was dialed in Step 1.
2. Enter the Directory Number to which calls will forward.
3. Press **CFB**, or press **SPKR** if an access code was used.

   The CFB LED will light steady red and calls will forward to the stored station number.

To Cancel Call Forward-All Calls and Call Forward-Busy:

➤ Repeat Step 1 and hang up.

Call Forward—No Answer

All calls to your station when set with this feature will forward to a selected station if you fail to answer within a time that you designate.

Note:
Your station can be assigned in system programming to not Call Forward-No Answer when receiving Voice First (handsfree) or OCA calls. Callers can activate Call Forward-No Answer by dialing **1** *during their voice announcement.*

To Set Call Forward-No Answer:

1. Press **CFNA**
   - or -
   press a **[PDN]** or **[PhDN]** + **# 6 0 3**.

   The CFNA LED will flash red.

   Press the **[PDN]** or **[PhDN]** to be forwarded. You will hear confirmation tone.

2. Enter the Directory Number to which calls will forward.

   You will hear confirmation tone if **# 6 0 3** was dialed in Step 1.

3. Press **SDS**.

   You can omit this step if you pressed **CFNA** in Step 1 and you do not want to change the length of time that your telephone will ring before it forwards. Initially, your telephone will ring 12 seconds before it forwards. Pressing **SDS** is always necessary if you pressed **[PhDN]** + **# 6 0 3** in Step 1.

4. Enter the time at which the call will forward (08 ~ 60 seconds).

   You can omit this step if you do not wish to change the amount of time your telephone will ring before it forwards. Enter two-digits for seconds (0 8 ~ 6 0). If no time is entered, press **RDL** and the ring time will be the same as the last setting.

   Note:
   If no **SDS** *button is programmed on phone, then press* ✱ *instead.*

5. Press **CFNA**
   - or -
   press **RDL**, then press **SPKR**.

   The Call Frwd No Answer LED will become steady red and calls will forward to the stored station number.

To Cancel Call Forward-No Answer:

➤ Repeat Step 1 and hang up.

Call Forward—Busy/No Answer

All calls to your station set with this feature will forward immediately to a selected station whenever you are busy on another call or in the Do Not Disturb mode. Calls will also forward if you do not answer the call within a time that you designate.

Note:
Your station can be assigned in system programming not to Call Forward-No Answer when receiving Voice First (handsfree) calls. Callers can activate Call Forward-No Answer by dialing **1** *during the voice announcement.*

To Set Call Forward-Busy/No Answer:

1. Press **CFB/NA**
   - or -
   press a **[PDN]** or **[PhDN]** to be forwarded + **# 6 0 4**.

   The CFB/NA LED will flash red.

   You will hear a confirmation tone if **# 6 0 4** is dialed.

2. Enter the Directory Number to which calls will forward.

3. Press **SDS**.

   You can omit this step if you pressed **CFB/NA** in Step 1 and you do not want to change the length of time that your telephone will ring before it forwards. Initially, your telephone will ring 12 seconds before it forwards. Pressing **SDS** is always necessary if you pressed **[PhDN]** + **# 6 0 4** in Step 1.

4. Enter the time at which the call will forward (08 ~ 60 seconds).

   You can omit this step if you do not wish to change the amount of time your telephone will ring before it forwards. Enter two-digits for seconds (0 8 ~ 6 0). If no time is entered, press **RDL** and the ring time will be the same as the last setting. The system is initialized with a 12-second setting.

5. Press **CFB/NA**
   - or -
   press **RDL**, then press **SPKR**.

   The CFB/NA LED will become steady red and calls will forward to the stored station number.

Call Forward—Cancel

Any of the Call Forward modes except Call Forward Fixed and Call Forward External can be cancelled by either pressing the applicable Call Forward button so that its associated LED turns off, or by pressing **[PDN]** + **# 6 0 1**, then hanging up.

To Cancel Call Forward-Busy/No Answer:

➤ Press **CFNA**

- or -

press a **[PDN]** + **# 6 0 1**.

The Call Frwd Busy/NAns LED will turn off.

Call Forwarding a Phantom Directory Number

To Call Forward **[PhDNs]**, your telephone must be programmed as the "owner" if those particular **[PhDNs]**. If any of the previous Call Forward instructions do not work on your telephone, see your System Administrator for more information.

Your telephone can be programmed to have up to eight **[PhDNs]**; up to four of these additional **[DNs]** can be programmed to have a dedicated Message Waiting button/LED. Each **[PhDN]** can be set to any mode of Call Forward independent of other **[DNs]** on the telephone.

Calls to your **[PhDNs]** will be forwarded to the destination **[DN]** according to the call forwarding mode you have chosen. Phones equipped with an LCD display will see a message indicating call forward, the call forward type, the **[PhDN]** that the call is being forwarded from and the destination number the call is forwarding to.

Note:
Call Forward can only be set from the station that owns the **[PhDN]** *button (otherwise re-order tone will be returned).*

Call Forward—External

This feature enables you to forward new incoming calls directed to your **[PDN]** to a destination outside of the system. **[PhDNs]** assigned to your telephone will not Call Forward to external destinations. Internal calls and transferred calls to your **[PDN]** also will not forward to external destinations.

Only incoming calls over CO lines dedicated to immediate ring your **[PDN]**, private **CO** button, and/or Direct In Dial line calls will forward. Any of the other Call Forward modes can be set for your **[PDNs]** or **[PhDNs]** simultaneously with Call Forward-External.

To Set Call Forward-External:

1. Store the number that calls will be forwarded to at Station Speed Dial location Code 49. See ***IMPORTANT !***

The Call Forward-External destination can be a telephone number over a CO line, a station over a tie line, or a station within your Strata DK280 system. If the destination is over a CO line, the CO line must only appear at your station.

Use the Speed Dial storage procedures detailed in Chapter 2. When forwarding to a destination over a CO line or tie line, include the CO line or tie line access code. (See Appendix A—Table 1 for access code information.)

IMPORTANT !

You only need to perform Step 1 the first time CF-EXT is set or when you change the destination. It is not necessary to store the CF-EXT destination each time you set CF-EXT; it will remain in system memory.

2. Press **CF-EXT**

- or -

press the **[PDN]** or **[PhDN]** + **# 6 7 0**.

Incoming calls will forward to the destination stored at Station Speed Dial Location 49.

To Cancel Call Forward-External:

➤ Repeat the previous Step 2.

Remote Call Forward—External Destination Change

If Call Forward-External mode is set at your station, you can change the forwarding destination from a telephone outside of the system.

To Change the Destination Number:

1. Call into the DK280 system over a CO line programmed for the Direct Inward System Access (DISA) feature.

   See the System Administrator for DISA telephone numbers.

2. Listen for the ringback tone signal, then internal dial tone.

   Try again if you hear busy tone. Dial tone will be present for ten seconds to allow direct dialing of "Change Call Forward" access code plus your Primary Directory Number. If a number is not dialed, the system automatically causes the DISA CO line to ring at telephones as a normal incoming call. Then, if the call is not answered within 15 seconds after the ringing starts, it will disconnect.

3. Enter **# 6 7 0**, then the Primary Directory Number of your station.

   You will hear a confirmation tone.

4. Enter the Remote Call Forward-External security code.

   You will hear a confirmation tone after entering the code. See the System Administrator for the security code which is assigned to your telephone in system programming.

5. Enter the new destination number.

   You may enter an internal number, Voice Mail number or, a CO line access code plus an external telephone number. With some systems, you can dial a line group code instead of a CO line number access code. (See Appendix A—Table 1 for access code information.)

6. Press **#**.

   You will hear a confirmation tone.

Call Forward—Fixed

If you activate this feature, all internal and Private or Direct Inward Dialed CO line calls to your station will forward immediately to a Primary Directory Number set in system programming. Your station must be assigned with the **CFF** button in system programming to activate this feature.

To Activate/Deactivate Call Forward-Fixed:

➤ Press **CFF**.

The CFF LED will light steady red and all calls will forward to a station Directory Number or voice mail device set in system programming. CFF toggles on/off.

Automatic Callback

After reaching a busy or Do Not Disturb station, you may set Automatic Callback (ACB) to have the system call you back when the called station becomes available.

To Set ACB (to busy or DND station):

1. After reaching a busy station, press **ACB** or **4**.

   Busy tone will stop momentarily, then you will hear two seconds of dial tone, then busy tone will resume.

2. Place the handset on-hook.

   You may make other calls while waiting for the called station to become available.

3. Your telephone will ring at a fast rate when the called station becomes idle.

   The LED will flash at the incoming call rate.

4. Answer within three rings to prevent the callback from being cancelled.

   After you answer the ACB ringing, you will hear a single tone, and the LED will flash at the In-use rate. The called station will receive a voice announce call from your telephone or, with Tone Signaling, you would hear ringback tone and the called station would ring.

5. Make a voice announce and converse.

   If you hear a busy tone after answering a callback, the called party has already received or originated another call. Your request is not cancelled.

To Cancel ACB (to busy or DND station):

➤ Press a **[DN] + # 4 3**.

Automatic Callback will be cancelled.

CO Line Queuing with Automatic Callback

Automatic Callback enables you to be placed in a waiting queue for an available CO line after attempting access to a line group with an access code in which all lines are busy. The system will call you back when a line becomes available.

To Set CO Line Queuing:

1. If all outgoing lines are busy, you will hear busy tone after dialing a line access code.
2. Press **ACB** or **4**. — Busy tone will stop momentarily, then you will hear two seconds of dial tone, then busy tone will resume.
3. Place the handset on-hook. — You may make other calls while waiting for a line to become available.
4. Your telephone will ring at a fast rate when a CO line becomes idle. — The **[DN]** LED from which you attempted to first access the line will flash red at the incoming call rate.
5. Lift the handset immediately, or press the flashing **[DN]**. — Answer within three rings to prevent the callback from being cancelled.

   You will hear CO dial tone. (If you hear a busy tone, the line has already been seized or has received an incoming call. Your request is not cancelled. You will be called again the next time a line becomes idle.) The Line LED will flash at the In-use rate.
6. Dial a telephone number. — If the original call was made using Least Cost Routing (LCR), the telephone number would have been automatically dialed in Step 4.

To Cancel ACB (CO Line Queuing):

➤ Press a **[DN]** + **# 4 3**. — Automatic Callback will be cancelled.

Handsfree Answerback

You can answer internal calls without lifting the handset.

To Receive a Handsfree Internal Call:

1. You will hear a single long tone, followed by the caller's voice. — The LED will flash at the incoming call rate. The MIC LED will light steady, indicating your microphone is active. The SPKR LED will flash.
2. Do not lift the handset; speak toward the telephone in a normal voice level. — If you have a speakerphone, you will have better performance if you press the called **[DN]** button.

Notes:

1. *A* **[DN]** *must be pressed (or the handset must be taken off-hook) before placing an internal call on hold.*
2. *You can slide the RING volume control to affect the volume of the Handsfree Answerback caller's voice and ring tone. See Chapter 1—The Grand Tour for more information on volume control.*

Handsfree Monitoring

Calls placed on hold by an outside party may be monitored handsfree. This feature frees you from having to hold the handset to your ear until the outside party returns to the call, enabling you to take care of other tasks in the meantime.

To Use Handsfree Monitoring:

1. While off-hook on a call, press and hold down **SPKR**. — The SPKR LED will light red.
2. Place the handset on-hook. — The SPKR LED will remain on and sounds from the distant party are heard over your telephone speaker.
3. Release **SPKR**. — The **MIC** button can be used to turn your telephone microphone off to prevent the outside party from monitoring the sound in the area surrounding your telephone.
4. Lift the handset when the distant party returns.

Note:
Your telephone **MIC** *button can be programmed to remain on after you press-and-release it (push ON/push OFF) or to turn on only while you are pressing it. See your System Administrator to change the setting.*

Account Code Calls

Entered before or after a call, Account Codes can be used for a variety of reasons including billing, tracking, and line restriction applications. Account Codes are recorded by the system and can, along with the details of the calls they are associated with, be printed out on a Station Message Detail Recording (SMDR) report.

Forced Account Codes

Some applications may require that you enter an Account Code, called a Forced Account Code, before dialing a telephone number.

To Record a Forced Account Code:

1. Access a CO line.

   See Appendix A—Table 1—CO Line Access Codes. You will hear dial tone after accessing a line. (If you dialed with Least Cost Routing you will not hear dial tone.)

2. Enter the Forced Account Code.

   Dial tone stops after you dial the first digit. You will hear dial tone after you press the last digit of a valid account code, or busy tone if you dial an invalid code. (If you dialed with Least Cost Routing, you will not hear dial tone.)

3. Dial a telephone number.

   Any digits dialed after the code is entered in Step 2 will be treated as part of a telephone number.

Emergency Override of Forced Account Codes

You can bypass Forced Account Code requirements with three emergency numbers, including 911. See your System Administrator for these numbers:

1) 911 2)_____ 3)_____

Voluntary Account Codes

Voluntary Account Codes are optional and can be entered after accessing a CO line or during a call that you originated or received.

To Record a Voluntary Account Code:

1. After accessing a CO line or during a call, press **ACCNT**

   - or -

   press **SDS** + **5 0**.

   - or -

   CONF/TRNS + **4 6**.

   Your conversation will not be interrupted.

   Press * if your telephone does not have an **SDS** button. Some telephones require that you enter the account code before dialing a telephone number. If a valid account code is not entered, dialing external calls may be restricted.

2. Enter the Account Code.

   When your station is set for Verified Account Codes, you will hear a confirmation tone (one-half second duration) if the code is valid (Note 2). If the code is invalid, you will hear two short tones. Repeat Steps 1 and 2 to dial another account code; the last code entered will be recorded.

   Any digits dialed after the code has been entered will be treated as part of the outside telephone number.

Notes:

1. *Voluntary Account Codes can be set in system programming to change the Toll Restriction classification of your station. See your System Administrator for more information.*
2. *If your station is programmed not to verify Account Codes, you will not hear a confirmation tone.*
3. *The outside party will not be able to hear tones when the Account Code digits are being entered or any confirmation tones.*
4. *Voluntary Account Codes must be entered before the call is disconnected.*

Verified Account Codes

If the system is set for Verified Account Codes, station users must enter specific codes when entering Forced or Voluntary Account Codes. Verified Account Codes are established in system programming or by designated stations.

Speed Dial

Speed Dial enables you to call a telephone number with a brief access code or an optional feature button. There are two types of Speed Dial numbers:

- **Station Speed Dial** numbers are assigned by individual station users to their own station and can only be dialed at their station.
- **System Speed Dial** numbers can only be assigned from station 200 (typically the operator's or System Administrator's telephone), but can be used by other stations.

Your station will time out to the idle mode if the following storage procedures are not completed within one or three minutes. The time is set in system programming.

Storing Station Speed Dial Numbers

You can store personal telephone numbers on either Station Speed Dial buttons or access codes. You can call the telephone number by either pressing the button or dialing the access code.

To Store a Station Speed Dial Number:

1. Do not lift the handset.
2. Press **RDL** or **#**.
3. Press the **SD** button you wish to store the telephone number on.

   - or -

   press **SDS** or ***** and enter the code that you want to store the telephone number in.

SD buttons are assigned in system programming.

If your telephone does not have an **SDS** button, enter ***** or access codes instead. Station Speed Dial number codes are 1 0 ~ 4 9.

4. Enter the telephone number.

You can enter up to 20 digits.

Notes:

1. *To store longer dialing strings, see Chapter 3—Advanced Features—Speed Dial Number Linking for instructions on storing additional digits.*
2. *To insert a pause or flash signal in the number, see Chapter 3—Advanced Features—Speed Dial Pause and Flash Storage.*

3. *To store **[DN]** button access, followed by a CO line access code before the telephone number to allow one-touch dialing of telephone numbers, see Appendix A—Table 4—User Programmable Access Codes.*

5. Press **RDL** or **#**.

The number will be stored and will be dialed when **SD** is pressed, or when **SDS** is pressed followed by the Speed Dial access code.

Repeat this procedure to replace stored telephone numbers with new ones. To clear a Speed Dial entry, repeat this procedure, skipping Step 4.

Storing System Speed Dial Numbers

Only attendant consoles and station 200 (typically the System Administrator's phone) can store System Speed Dial numbers, although they are available to all stations for dialing. System Speed Dial buttons can be assigned to station flexible buttons in system programming.

Station 200 is the station that has Directory Number 200 as its **[PDN]**.

To Store a System Speed Dial Number at Station 200:

1. Do **not** lift the handset.
2. Press **RDL** or **#**.
3. Press **SDS** or *****.
4. Enter the Speed Dial code _____ that you want to store the telephone number in.

System Speed Dial number codes are **6 0 0 ~ 6 9 9** or **6 0 ~ 9 9**.

Note:
Some telephone system models provide 100 Speed Dial codes (6 0 0 ~ 6 9 9) and others provide 40 codes (6 0 ~ 9 9).

5. Enter the telephone number.

You can enter up to 20 digits. See Notes in previous section, "Storing Station Speed Dial Numbers."

6. Press **RDL** or **#**.

The number will be stored and will be dialed when the Speed Dial code is entered at a station, or when an **SD** button associated with the code is pressed.

Repeat this procedure to replace the stored telephone numbers with new ones.

To Clear a Speed Dial Entry:

➤ Repeat the preceding procedure, skipping Step 4.

Page Announcements

Station users can make page announcements to telephones and external speakers.

To Make a Page Announcement:

1. Press a **[DN]**, lift the handset, and dial one of the paging access codes.
2. Make your announcement in a normal voice level and repeat it.
3. Hang up when you complete your announcement.

Notes:
1. *See Appendix A—Table 2—Paging Group and Zone Codes.*
2. *Each of the page access codes (including the* **[DN]** *button) can be stored on an* **SD** *button.* See Appendix A—Table 1—User Programmable Feature Buttons.

All Call Page

You can make an All Call Page to digital and electronic telephones assigned to the "All Call Page Group." Stations are assigned to the "All Call Page Group" in system programming.

To Make an All Call Page:

1. Press **AC** and lift the handset

   - or -

   press a **[DN]** + **# 3 9**
2. Make your announcement in a normal voice level and repeat it.
3. Hang up when you finish your announcement.

The **AC** button does not access external page speakers.

Note:
 # 3 9 *may also Page external speakers, depending on system programming.*

Automatic Busy Redial

After reaching a busy outside number, you can activate Automatic Busy Redial (ABR) so that the Strata DK280 system will automatically redial that number for you at regular intervals. ABR is an optional feature enabled in system programming. This feature may not be allowed on some (or all) lines in your system—depending on the telephone line type connected.

To Activate Automatic Busy (ABR) Redial:

While listening to busy tone—

1. Press **ABR**

   - or -

   press **CONF/TRNS** + **# 4 4**.

   The ABR LED will flash red.

   - or -

   You will hear confirmation tone after you press **CONF/TRNS** + **# 4 4**.
2. Hang up or press **SPKR**.

   Hang up if the call was established off-hook; press **SPKR** if the call was established on-hook.
3. The system will redial the number.

   The system will redial every every 30 or 60 seconds (depending on system programming), up to 15 times (See Notes 1 and 2).
4. Your telephone will receive ring tone when ABR dials the number and it is available.

   The **[DN]** or Line and SPKR LEDs will flash. The called telephone number will ring.
5. Lift the handset or press **SPKR** button and wait for the party to answer.

   If you do not pick up the handset or press **SPKR** within 30 seconds after a connection is made, you will hear a muted ring for another 30 seconds, then the call will disconnect.

To Cancel ABR:

➤ Press **ABR**.

- or -

press **[DN]** + **# 4 4**.

Notes:
1. *ABR will not be attempted while your station is busy, but will continue to time-out.*
2. *With each attempt:*
   - *The CO and SPKR LEDs blink when the line is seized.*
   - *Dial tone is heard via the speaker.*
   - *The telephone number is redialed.*
   - *If busy, ABR will reset and try again.*

Saved Number Redial

This feature enables you to store a dialed telephone or station number, then redial that number with the touch of a button. Your telephone must be assigned with the **SAVE** button in system programming.

To Save a Telephone Number:

➤ While on a call that you dialed, press **SAVE**.

You can press **SAVE** any time after you have dialed the final digit of the telephone number, but you must do it before you hang up or disconnect the call.

To Call a Saved Telephone Number:

1. Access a CO line.
2. Press **SAVE**.

See Appendix A—Table 1—CO Line Access Codes.

The system will automatically dial the "saved" number.

Call Pickup

You can pick up a call that is ringing another station, a call placed on hold at another station and other types of calls.

Directed Call Pickup

Directed Call Pickup provides you with several ways to pick up calls ringing in, or calls held at other stations. You can also pick up a telephone group page and an external page with Directed Call Pickup.

To Use Directed Pickup:

1. Press **PKUP**

   - or -

   press a [DN] + **# 5**.
2. Dial one of the pickup codes.

See Appendix A—Table 3—Call Pickup Codes.

To Pick Up a Ringing CO Line in a Tenant System:

➤ Press **PKUP1 ~ 4**

- or -

press a [DN] + **# 5 9**.

After you press a particular button, you will be connected to a new incoming CO line call for that particular Tenant Group. **PKUP1 ~ 4** buttons correspond to tenant groups 1 ~ 4. You will be connected to a new incoming ringing call (in any Tenant Group) after dialing the access code.

Notes:

1. *In non-tenant systems, the* **PKUP1** *button will pick up any ringing CO line.*
2. *This feature does not pick up transferred CO lines that are ringing; see "Directed Call Pickup" that follows for instructions on how to pick up transferred CO lines.*

Group Pickup

Stations may be assigned in system programming to Pickup Groups. As many as 20 groups can be created to enable you to easily pickup incoming (new or transferred) or internal calls that are ringing stations that are in your group or in other groups. See your System Administrator for group assignments.

Calls Within Your Group

You can pick up calls ringing stations within your pickup group. You may belong to more than one group.

To Pickup a Call Ringing a Station in Your Group:

➤ Press **GRP/PKUP**

- or -

press a [DN] + **# 5 # 3 4**.

You will be connected to the call after pressing **GRP/PKUP** or entering the access code.

Calls to Other Groups

To Pickup a Call Ringing Another Group:

1. Press a [DN].
2. Enter **# 5**, then the access code (**# 3 2 0 ~ # 3 3 9**) of the group that the station belongs to.

You can pickup calls directed to other pickup groups by following the steps on the left.

You will hear dial tone.

You will be connected to the call after dialing the group access code. If the called station belongs to more than one group, any of the Group Pickup codes associated with those groups will pickup the call.

Do Not Disturb

If your station is in the Do Not Disturb (DND) mode, internal and external calls will not ring your station, calls cannot be transferred to it and Off-hook Call Announce calls will be denied. You can continue to make calls while in the Do Not Disturb mode.

Note:
The **ALERT** *button can be pressed from your "alert partner" telephone to override DND and signal your telephone. Also, telephones with the DND override feature can call and mute ring your telephone when it is in the DND mode.*

To Activate/Deactivate Do Not Disturb:

➤ Press **DND**.

When you press this button once, the LED will light steady red and Do Not Disturb mode will be activated. Press it again to toggle the feature off.

Pressing **DND** while a call is ringing at your station will silence the ringing. The LED will still continue to flash.

Notes:
1. *Calls will forward from your station if it set for Call Forward-Busy or Call Forward-Busy/No Answer while in the Do Not Disturb mode.*
2. *Some stations may be programmed to override Do Not Disturb.*

Message Waiting

If you call a station Directory Number and if it is busy or its user does not answer, you can leave a message waiting indication by pressing the **MW/FL** button. The MSG LED at the called station will flash after you press the button. The user can call you back by pushing the **MW/FL** button with the flashing LED. (Voice mail devices, as well as people, can leave message waiting indications.)

Primary Directory Numbers: All telephones have a standard (fixed) **MW/FL** button/LED for receiving/retrieving messages left by callers that called the telephone's Primary Directory Number **[PDN]**.

Phantom Directory Numbers: Telephones that own **[PhDNs]** can also have up to four additional (flexible) message waiting **[PhDN/MWs]** for receiving/retrieving messages left by callers that called the respective **[PhDNs]**.

Up to four Message Waiting indications may be left at each **[DN]** or **[PhDN]** at one time. One of the indications for each **[DN]** is reserved for the Message Center set in system programming.

MW/FL Message Waiting

Answer Message Waiting for a Primary Directory Number

To Answer a Message Waiting Indication on Your Telephone:

When the MW/FL LED is flashing red —

1. Press **MW/FL**, then lift the handset.

   Your phone will ring the station or voice mail device that set the indication. If there is no answer, hang up and try at a later time. (The LED will continue to flash red.)

2. After receiving the message, place the handset on hook.

   If the MW/FL LED continues to flash, you have more messages—repeat the Steps to retrieve them.

   Voice mail devices may cancel the indication after a short delay.

Cancel Message Waiting Light

To Cancel the MW/FL Indication Set on Your Telephone:

The called party must answer—by either going off-hook or by pressing the **SPKR** button—for the indication to be cancelled automatically.

➤ Answer the indication by pressing **MW/FL** and lifting the handset

The **MW/FL** indication will be cancelled when the called party answers.

- or -

press a [DN] + **# 4 0 9**.

The **MW/FL** indication will cancel without calling the telephone or VM device which set the **MW/FL** indication on your telephone.

Set Message Waiting Light on Another Telephone

To Set a Message Light on another Telephone:

1. Press a **[DN]** and dial a Primary Directory Number or an Phantom Directory Number.

   You will hear ringback tone or busy tone.

2. While listening to the ringback or busy tone, press **MW/FL** or press **7**.

   The MW/FL LED associated with the dialed number will flash red at the called telephone. The MSG LED will light steady red at your telephone.

   - If you dialed a Primary Directory Number, the LED of the fixed **MW/FL** button will flash.
   - If you dialed a Phantom Directory Number and that station has a **MW/FL** button specifically associated with the Phantom Directory Number, then that button's **[PhDN/MW]** LED will flash. If the called station does not have a **[PhDN/MW]** button, then dial the Primary Directory Number to leave a message. (See Appendix B—Multiple Directory Numbers for more information.)

3. Press **SPKR**.

   The MW/FL LED will continue to flash at the called telephone, until the called party retrieves the message by pressing the flashing **MW/FL** button or the **[PhDN/MW]**. After setting a message waiting indication on another telephone, the MW/FL LED will turn off at your station after you press the **SPKR**.

To Cancel a Message Light Set on Another Station:

1. Dial the station number on which you left the indication.
2. Press **MW/FL** twice or press **7** twice.

[PhDN/MW] Message Waiting

To use this feature, your phone must be programmed for both Phantom Directory Numbers **[PhDN]** and corresponding Message Waiting (**MW/FL**) buttons.

Your phone probably has one pre-programmed Message Waiting (**MW/FL**) button that works with your **[PDN]** (see Message Waiting for a detailed explanation of this feature.) The phone can also be programmed to have up to four additional Message Waiting buttons. This allows you to have a separate Message Waiting button for up to four Phantom Directory Numbers programmed into your phone. (See Appendix B—Multiple Directory Numbers for more information.)

To Set a Message Waiting Indication for a [PhDN/MW]:

Follow the same procedure used to set a message light on another telephone.

Phones equipped with an LCD will display the Phantom Directory Number, the station the message is from, and a + sign to indicate if there is more than one message waiting.

Answer [PhDN/MW]

To Respond to [PhDN/MW]:

1. Press the **[PhDN/MW]** indicated by the flashing red LED. You can answer a message in the speaker mode or by lifting the handset.

   Your phone will ring the station or voice mail device that left the message. If there is no answer, hang up and try at a later time. (The red LED on your phone will continue to flash.)

2. After receiving the message, press **SPKR**

   - or-

   place the handset on the hook.

   If you have more than one message waiting indication from different sources, the red LED will continue to flash, after you answer the first message. To answer the next message—repeat Steps 1 and 2.

Cancel [PhDN/MW]

A flashing **[PhDN/MW]** indicates that there is a message waiting on that button; however, if you have listened to that message (which should turn the LED off) or if for some reason you wish to turn it off, you can follow the steps on the left to turn it off.

To Cancel a Message Waiting Light Set on a [PhDN/MW]:

1. Press the **[PhDN/MW]** associated with the flashing.

   You will hear a steady dial tone and the **[PhDN]** LED will light steady.

2. Enter **# 4 0 9**.

   The dial tone will stop.

3. Press **SPKR**.

   The flashing red **[PhDN/MW]** LED will stop, indicating that the message has been canceled.

Advanced Features 3

Alarm Reset

Your Strata DK280 system can be connected to a facility alarm system. All telephones will produce a startling tone whenever this alarm is activated. Stations with an **ALRM** button can reset the alarm by pressing the button.

Alert Signaling

Alert Signaling allows a station user to alert a predesignated (partner) station by pressing a single button.

To Send an Alert Signal:

1. Press **ALERT**.

Each time you press the assigned button, an alert tone will sound at the designated station.

Notes:

1. *You can have as many as four* **ALERT** *buttons to send/receive the Alert Signal to/from up to four other telephones.*
2. *The* **ALERT** *button(s) must be assigned to telephones that will be linked as partners.*
3. *The destination of the* **ALERT** *button also must be programmed as Speed Dial numbers as follows:*

   Alert Signal #1 destination **[PDN]** stored in Speed Dial *** 48**

   Alert Signal #2 destination **[PDN]** stored in Speed Dial *** 47**

   Alert Signal #3 destination **[PDN]** stored in Speed Dial *** 46**

   Alert Signal #4 destination **[PDN]** stored in Speed Dial *** 45**
4. *An Alert Signal will sound even if the alerted telephone is busy (on or off hook) or in the DND mode.*

Attendant Console Calling

Up to four Attendant Consoles can be installed per system. There can be up to three ways to call the Attendant Console, depending upon system programming.

To Call Any Attendant Console:

➤ Press a [DN] + **0**.

The call will ring the Attendant Console's **0** button. Dial **0** calls rotate between the consoles if more than one console is installed.

To Call a Particular Console:

➤ Press a [DN] + the console's Directory Number _____.

The call will ring the console's Incoming Directory Number (**In-DN**) button. Your System Administrator can provide the Attendant Console(s) Incoming Directory Numbers.

Emergency Calls to the Attendant Console

To Make an Emergency Call to a Console:

➤ Press [DN] + the emergency access code **# 4 0 0**.

The call will ring all console's **Emgr** button.

Automatic Hold

Automatic Hold enables you to process calls more quickly. You can automatically place a call on a CO line button or internal DN on-hold by just pressing another outside line or a (Directory Number) [DN] button—there is no need to push the Hold. You can also switch between the new call and the original call without having to press **HOLD**. Automatic Hold is assigned on a station-by-station basis in system programming.

To Use Automatic Hold

➤ While on a call, press another **CO** or [DN] button to receive or originate a new call.

After you press the button, the original Line or [DN] LED will flash at the on-hold rate and the original call will be placed on hold.

The LED of the new call will flash at the in-use rate and the new line will be accessed.

To Switch between Calls:

➤ Press the **CO** or [DN] button of the held call.

The LED of the Line or [DN] just automatically placed on-hold will flash at the on-hold rate, and the LED of the line just accessed will flash at the In-use rate.

Direct Inward System Access (DISA)

Outside callers with telephones that send Dual-tone Multi-frequency (DTMF) tones can call in on CO lines programmed for DISA and dial Directory Number or outgoing CO lines without going through an attendant or operator.

Inward DISA Calls

To Make a Direct Inward Station Call with DISA:

1. From outside the system, call the DISA CO line telephone number:

   ___-_____.

   See the System Administrator for this number.

2. Listen for the ringback tone signal, then listen for internal dial tone.

   Try again if you hear busy tone.

   Dial tone will be present for 10 seconds to allow direct dialing of a station directory number or CO line access code. If a number is not dialed, the system automatically causes the DISA CO line to ring a telephone or group of telephones designated in system programming. Then, if the call is not answered within 15 seconds after the ringing starts, it will disconnect.

3. Dial a Directory Number.

   You hear ring tone and then will be connected when the station answers.

   - If you receive busy tone or wish to dial another number while ringing the station, press the * button to receive dial tone, allowing another number to be dialed.
   - If the call is not answered after six rings or 24 seconds, whichever comes first, busy tone will be sent. Dial * to access dial tone and dial the same or another number.

     To call another station after completing a DISA station call, the internal party must transfer you. Station and System Page cannot be accessed on DISA calls.

Outward DISA Calls

To Make an Outgoing Call with DISA:

1. From outside the system, call the DISA CO line telephone number: _____-_____.	See the System Administrator for this number.
2. Listen for the ringback tone signal, then listen for dial tone.	Try again if you hear busy tone. Dial tone will be present for 10 seconds to allow direct dialing of a Directory Number or CO line access code. If a number is not dialed, the system automatically causes the DISA CO line to ring at telephones as a normal incoming call. Then, if the call is not answered within 15 seconds after the ringing starts, it will disconnect.
3. Dial a CO line or line group access code.	See Appendix A—Table 1—CO Line Access Codes.
4. If a DISA security code is required, dial the code, then listen for CO dial tone - or - if a DISA security code is not required, you should hear CO dial tone.	If required, see the System Administrator for this number. If the correct code is not entered, the call will be disconnected.
5. Dial a telephone number.	A timer tone that is audible to both parties will sound approximately (4, 10, or 20) minutes after the call was made depending on system Programming. Dial 0 to reset the timer each time the tone sounds for an additional (4, 10, or 20) minutes. If you do not dial 0, the call will disconnect approximately one minute after the tone.

Direct Station Selection Buttons (Hotline)

This optional feature allows you to connect directly to another station Primary Directory Number by pressing a Direct Station Selection **[DSS]** button. The LED of the button shows the status (idle/busy) of the station. If connected to a CO line, pressing this button will put the outside party on hold. Transfer the call as you would normally, by voice announcing or camping on by hanging up or by pressing the **RLS/ANS** button.

The station could be busy on its Primary DN, Secondary DN, a Phantom DN, a CO line or in Do Not Disturb mode if the DSS LED is lit. If a station is idle but other stations are using all of the station's **[PDN]** buttons, the station **[DSS]** button will light busy (red).

Door Lock

Your telephone may have an **DRLK** button(s), which will unlock a door lock when pressed.

Door Lock Button	Location
Unlock Door 0	_____
Unlock Door 1	_____
Unlock Door 2	_____
Unlock Door 3	_____
Unlock Door 4	_____

The door lock will unlock for three or six seconds when you press the button, depending on system programming. The Unlock Door LED will turn on for however long the door is unlocked.

Door Phone

Door phones can be used to call digital and electronic telephones selected in system programming. You can call a door phone and monitor the area surrounding the door phone.

To Answer a Door Phone Call:

You will hear a distinctive ringing tone.

Your phone will ring five times or only once, depending on system programming.

Note:
To pick up door phone calls that are ringing at a station other than yours, press a **[DN] + # 5 # 3 0.**

1. Lift the handset.
2. Dial the door phone Directory Number if not connected yet.
3. Hang up when the call is completed.

If you lift the handset while the door phone is still ringing, your **[DN]** LED will flash at the in-use rate and you will be connected to the door phone.

Calling/Monitoring a Door Phone

To Call/Monitor a Door Phone:

1. Lift the handset.
2. Press a **[DN].**
3. Dial the Directory Number for the desired door location.

You will hear dial tone and the LED will flash at the in-use rate.

DN		DN	
#151	Location _____	#157	Location _____
#152	Location _____	#158	Location _____
#153	Location _____	#159	Location _____
#154	Location _____	#161	Location _____
#155	Location _____	#162	Location _____
#156	Location _____	#163	Location _____
Door Phone **[DNs]** _____		Door Phone **[DNs]** _____	

Note:
Door phone **[DNs]** *can be stored on* **SD** *buttons. See Appendix A—Table 4.*

4. Hang up when the call is completed or when you are finished monitoring.

Calling from a Door Phone

To Make a Call from a Door Phone:

1. Press the door phone button and then release it.
2. When answered, speak at a normal voice level in the direction of the door phone.

You will hear a distinctive ringing tone—five times or once, depending on system programming.

DTMF Tone Dialing with * and

You may have to send * and # Dual-tone Multi-frequency (DTMF) tones to some devices or services, such as a voice mail device or computer output service. If you do not have the **SDS** button on your telephone, you must first dial an access code to enable these tones to be transmitted. DTMF tones are automatically enabled on stations with the **SDS** button.

To Output * and # DTMF Tones:

➤ While on an outside call, press *, then press #.

You will now be able to output * and # and DTMF tones, as well as digits 0 ~ 9. These tones do not go out immediately. They will go out after this procedure for the duration of the call.

This feature disables the Speed Dial feature. Speed Dial will be restored when you complete the call or place it on hold.

Group Listening

This feature enables you to set your telephone so that you and people near your telephone can hear the distant party over the speaker, but the distant party will not be able to hear you.

To Activate Group Listening:

1. Establish an off-hook call with a distant party.
2. Hold down **SPKR.**

The SPKR LED will light red and the distant party's voice will be heard over the speaker of the telephone, but the distant party will not hear you.

3. Stop pressing **SPKR** to talk to the distant party through the handset.

The SPKR LED will turn off. The telephone speaker will be deactivated and the handset will be activated. You can alternate between parties as long as the handset is on-hook.

Microphone Control

If you have a speakerphone, press the **MIC** button to switch the microphone on and off while your telephone is in use (see Microphone Cut-off). The MIC LED indicates the status of the microphone:

LED	MICROPHONE
ON	ON
OFF	OFF

To change from speakerphone to handset:

➤ Lift handset.

To change from handset to speakerphone:

1. Press and hold down **SPKR**.
2. Return handset on-hook.
3. Release **SPKR**.

All electronic telephone users can answer internal calls handsfree (on-hook), but only users with a speakerphone can talk handsfree when originating calls while on-hook.

The microphone and accompanying LED are always on when receiving internal **[DN]** calls to allow Handsfree Answerback and may be on or off when placing an on-hook CO line or internal **[DN]** call.

- Each station's microphone may be set in system programming to be either on or off at the start of handsfree dialing.
- Each station's **MIC** button may be set in system programming to switch on/off with one touch or to switch off only while pressed and held.

Note:
The **MIC** *and* **MCO** *buttons function on Handsfree Answerback and Off-hook Call Announce calls for privacy.*

Microphone Cut-Off

Microphone Cut-off prevents callers from monitoring the sounds near your telephone when your telephone receives a Handsfree Call. Your station must be assigned with the **MCO** button in system programming to activate this feature.

When you turn the microphone off, the MCO LED will light steady red and the MIC and SPKR LEDs will not turn on when your telephone is being called. When the microphone is turned on, the MCO LED will turn off.

To Turn the Microphone Off/On:

➤ Press **MCO** to toggle between off and on.

Night Transfer

Incoming calls to your system can be made to route and ring different destinations depending on which ring mode is set using the **NT** button. The **NT** button can be locked into any mode by dialing the Night Transfer lock password.

Your system can operate with two or three call routing (ringing) patterns. Three routing pattern systems feature the Day, Day 2, and Night modes, while two-ringing pattern systems consist of the Day and Night modes. These ringing patterns are chosen by pressing the optional **NT** button, assigned in system programming.

The Night Transfer LED indicates the active routing pattern, as follows:

	Three-pattern	Two pattern
DAY	OFF	OFF
DAY 2	FLASH	N/A
NIGHT	ON	ON

Off-hook Call Announce (OCA)

This feature enables you to call and speak to someone who is off-hook and busy using a digital telephone.

Speaker Off-hook Call Announce (SP-OCA)

This feature enables you to call and speak through the speaker of an off-hook, busy digital telephone. The called telephone must be equipped with optional hardware. You can adjust SP-OCA volume while idle. See Chapter 1—The Grand Tour—Speaker, Background Music, and Off-hook Call Announce.

Notes:

1. *Stations in the Do Not Disturb mode cannot receive OCA calls unless the calling station is programmed for DND override.*
2. *The* **MIC** *and* **MCO** *buttons can prevent an OCA caller from listening to your conversation.*

SP-OCA Voice First Signaling

To Make an SP-OCA Call with Voice First Signaling:

1. Lift the handset and call the desired station.
2. Speak to the called party or press **2** if busy.

You will hear a single tone and will be able to talk to the station if your station is programmed for automatic SP-OCA operation.

If your station is not programmed for automatic SP-OCA operation and if you hear busy tone, you must press **2** to speak to the called station.

SP-OCA Tone First Signaling

To Make an SP-OCA Call with Tone Signaling:

1. Lift the handset and call the desired station.
2. If you receive busy or ring tone, press **2 1**.

Speak to the called station after pressing **2 1**. If you receive busy tone after pressing **2 1**, the called telephone is either busy on a speakerphone call or does not have the OCA option set in system programming.

Answering SP-OCA Calls

To Answer an SP-OCA Talk Back Call:

➤ Speak toward the microphone of your phone to talk back to the SP-OCA caller.

See Figure 2 for the telephone microphone location.

SP-OCA Forced Disconnect

To Force a Disconnect:

➤ Press **SPKR**.

You can disconnect an SP-OCA call made to your station.

The SP-OCA call will be disconnected after you press the button.

SP-OCA Volume Control

To Change the Volume while Idle:

➤ Press a **[DN]** and then slide the **VOL** button left or right until the desired volume is set.

You can control the volume of SP-OCA calls to your station when your station is idle. It is not possible to change the SP-OCA volume when your telephone is in use off-hook.

You will hear ring tone. The volume level of OCA calls to your station will be relatively the same as the ring tone level that you set with this procedure.

Notes:

1. *Stations in the Do Not Disturb mode cannot receive OCA calls unless the calling station is programmed for DND override.*
2. *The* **MIC** *button can be used to prevent an OCA caller from listening to your conversation.*

Override Calls

Busy Override allows you to send a muted ring tone to a busy station to indicate that a call is waiting and Do Not Disturb Override lets you send a tone to an idle or busy station in the Do Not Disturb mode to indicate that a call is coming in. You can enter an established conversation with Executive Override.

Busy Override

To Initiate a Busy Override Signal:

➤ After reaching a busy station, press **2**

- or -

press **2 1**.

After pressing **2**, a tone will be heard at the busy station, indicating that a call is waiting.

- or -

For Off-hook Call Announce activation:

- If your station is equipped for manual Off-hook Call Announce, pressing **2** (with Voice First Signaling) or **2 1** (with Tone Signaling) will make an Off-hook Call Announce call to that station.
- If your station is equipped with automatic Off-hook Call Announce and the called station is able to receive OCA, you will not receive a busy tone and you may converse with the called party after dialing the station number.

Do Not Disturb Override

To Initiate a Do Not Disturb Override Signal:

➤ After reaching a Do Not Disturb station, press **2**.

After pressing **2**, a tone signal will be heard at the Do Not Disturb station, indicating that a call is coming in.

Your station must be enabled in system programming to send a Do Not Disturb Override signal. Also, a telephone can be enabled in system programming to block Do Not Disturb Override from all other telephones.

Note:
Privacy Override is blocked by DND. OCA, however, is possible to DND stations from stations that are allowed DND override.

Executive Override

To Initiate Executive Override:

➤ After reaching a busy station, press **3**.

After pressing **3**, you will enter the conversation. An optional tone signal may be heard by the called parties prior to your entering the conversation.

Your station must be enabled in system programming for Executive Override.

Also, a telephone can be enabled in system programming to block Executive Override from all other telephones.

Privacy On-Line

This option blocks a user at a station programmed with Privacy Override from entering a CO line conversation by pressing a common **CO** button. Your station must be assigned with the **PRIV** button in system programming to activate this feature. The button does not block Busy Override or Executive Override. Busy and Executive Override are described earlier in this guide.

To Make All CO Lines on Your Station Private:

➤ Press **PRIV**.

The LED will light steady red and station users will not be able to enter CO line calls on your station by using Privacy Override.

To Cancel Privacy:

➤ Press **PRIV** again.

The LED will turn off and station users will now be able to enter CO line calls on your station by using Privacy Override.

Privacy Override

This optional feature allows you to enter an established call on a private common **CO** button. Up to two station users may enter an existing CO line-to-station call (allowing up to three stations to be connected to a CO line). To access this feature, your station must be assigned with Privacy Override in system programming, or the station that is already connected to the CO line must be in the Privacy Release mode.

IMPORTANT!

Privacy Override only operates on common **CO** *buttons; it will not operate on common* **[DN]** *buttons which are always private. See "Conference Calls" which allow up to four parties to talk on a* **[DN]** *button.*

To Override Privacy On-line:

➤ Press a busy **CO** button.

You will now be connected to the CO line and will be able to participate in the conversation.

Connected parties may hear an optional tone signal before you enter the conversation.

Note:
Station users with a **PRV RLS** *button can allow stations to enter their conversations on common* **CO** *buttons, even if the station entering the conversation is not programmed for Privacy Override.*

Privacy Release

If you press the optional **PRV RLS** button, any other station user can enter your call on a private common **CO** button just by pressing the **CO** button on their telephone. Your station must be assigned with this button in system programming to activate this feature. Up to two stations can enter an existing CO call (allowing up to three stations to be connected to a CO line).

Note:
Privacy Release only applies to calls on common **CO** *buttons; calls on common (multi-appearing)* **[DN]** *button calls are always private and cannot be accessed by more than one telephone, even if other telephones share a common* **[DN]**.

To Activate Privacy Release:

➤ While on a CO line call, press **PRV RLS**.

The PRV RLS LED will light steady red and the CO line will flash at all appearances. Station users should be able to enter your calls by pressing a common **CO** button. Only one station can enter each time **PRV RLS** is pressed.

You must be on a CO line call to activate this feature. The PRV RLS LED will turn off when another station has entered your CO call.

To Deactivate Privacy Release:

➤ Press **PRV RLS** again.

The PRV RLS LED will turn off and station users without Privacy Override will not be able to enter your calls by pressing a common **CO**. If you do not deactivate PRV RLS while on the call, it will turn off when you hang up.

Note:
Private CO lines deny station users access to busy common **CO** *buttons.*

Release and Answer

This feature enables you to automatically disconnect or transfer an active call and answer a new call via the push of a button, instead of with the handset.

Notes:
1. *This feature requires that you are currently connected to an existing call.*
2. *Your telephone must have been programmed with both the* **PL** *and the* **RLS/ANS** *button.*

To Release a Call and Answer Another:

If you are on a call and a new CO or **[DN]** call is ringing at your station—

➤ Press the **RLS/ANS**

- or -

The PL or **[DN]** LED will flash red to indicate a new incoming call while you are connected to the existing call. You will hear a muted, Busy Override or Camp-on-busy tone.

Releases the original call and answers the new call. The PL LED will light steady.

press the **CONF/TRNS** and dial a "transfer-to" destination. Then press **RLS/ANS**

- or -

press a **DSS** button of a "transfer-to" destination, then press **RLS/ANS**.

Transfers the original call and answers the new call.

Transfers the original call and answers the new call.

Speakerphone

Digital telephones with speakerphones can make and receive calls without lifting the handset. Any digital telephone model with an "S" in the model name is equipped with a speakerphone.

Outside Calls

You can make and receive outside calls without having to lift your handset.

To Make an Outside Call (On-hook Dialing)

1. Leave the handset on-hook.
2. Press any available **CO** button.

   - or -

   press a **[DN]**, then enter a CO line or line group access code.

   After you press the button, the Line or **[DN]** LED will flash at the in-use rate and you will hear dial tone.See Appendix A—Table 1—CO Line Access Codes.
3. Dial a telephone number.

   You will hear ringback tone (or busy tone, if busy).
4. Speak in a normal voice level toward the telephone.
5. Press **SPKR** to disconnect the call.

To Answer an Incoming Call Using Speakerphone:

1. When you will hear a ringing tone, leave the handset on-hook.

   The Line LED will flash at the incoming call rate.
2. Press the **CO** or **[DN]** button next to the flashing LED.

   After you press the button, the Line or **[DN]** LED will flash at the in-use rate and you will be connected to the call.
3. Speak at a normal voice level toward the telephone.
4. Press **SPKR** to disconnect the call.

Internal Calls

You can make and receive internal calls without lifting your handset.

To Dial an Internal Call (On-hook Dialing) with Voice First Signaling:

1. Leave the handset on-hook and press a **[DN]**.

   After pressing the button, the LED will flash at the in-use rate and you will hear internal dial tone.
2. Dial the desired station Directory Number.

Notes:

1. *If the called station is idle:*
   - *You can leave a Message Waiting Indication at the called station by pressing the* **Msg** *button or* **7**.
   - *If the system is set for Voice First Signaling, make a voice announcement when you hear a single tone. (After dialing the directory number, you can press* **1** *to change to Tone Signaling.)*
   - *If the system is set for Tone Signaling, you will hear repeated ring tones and you should wait for the call to be answered. (After dialing the Directory Number, you can dial* **1** *to change to Voice First Signaling.)*
2. *If you receive busy tone, you can:*
   - *Press* **4** *to set Automatic Call Back (ACB).*
   - *Press* **Msg** *or* **7** *to leave a Message Waiting Indication at the called station.*
   - *Activate Busy Override if the called station is not equipped for Off-hook Call Announce (OCA) by pressing* **2**.

- *Use Executive Override (system programmable option) to enter the station's conversation, by pressing* **3**.

3. *To activate OCA:*
   - ***System Voice Signaling:*** *If your telephone is programmed for automatic OCA, you will be connected as an OCA call immediately; otherwise, when you hear busy tone, you must press* **2** *to OCA.*
   - ***System Tone Signaling:*** *If you hear ringback tone, press* **1** *to OCA; if you hear busy tone after pressing* **1**, *press* **2** *to OCA.*

   If you hear busy tone, press **2** *(you will hear ringback tone, then press* **1** *to OCA).*

3. Speak toward the telephone at a normal voice level.
4. Press **SPKR** to disconnect the call.

Tone/Voice First Signaling

Your Strata DK280 system may be set for Tone Signaling or Voice First Signaling as the standard internal call signaling method. The Tone Signal consists of successive ring tones, while the Voice First Signal consists of a tone burst followed by the caller's voice. You can change to the alternate signaling method on a call-by-call basis.

When a telephone user is busy on a **[PDN]** but has another **[PDN]** that is idle, callers will:

1. Receive ring tone and ring the idle **[PDN]** when it is called on tone first systems.
2. Receive busy tone and must press **2** to busy-override and ring the idle **[PDN]** when it is called on voice first systems.

To Change the Signaling Method:

1. Press a **[DN]** button and dial another station Directory Number.
2. Press **1**.
3. Speak to the party when the call is answered.

Depending on the system signaling method, the following will happen:

- If Tone Signaling, you will hear a ring tone (one second) every four seconds.
- If set for Voice First Signaling, you will hear a tone burst and then you will be able to converse over the called telephone's speaker.

After you press **1**, the other method will be activated.

Speed Dial—Advanced Features

Speed Dial Pause and Flash Storage

Some Speed Dial numbers may require that a pause (long or regular) or hookflash be included in the number. For example, you may have to enter a pause at the beginning of a Speed Dial number to allow for dial tone delay.

To Store a Hookflash:

➤ Press **FLASH**.

If you do not have a **FLASH** button, enter the hookflash dial code (**CONF/TRNS** + **# 4 5**) where the flash should be stored in the Speed Dial number string.

Note:
The **FLASH** *button will store a flash signal only if the* **PAU** *button is on the telephone. If the* **PAU** *button is not programmed on a flexible button, pressing* **FLASH** *will store a pause.*

To Store a Regular Pause:

➤ Press **PAU**.

This pause—which will be one-and-a-half or three seconds, depending on system programming—can be entered anywhere in the Speed Dial number. The **PAU** button must be programmed as a flexible button to allow the telephone to store pauses.

To Store a Long Pause:

➤ Press **PAU/L**.

This pause, which is 10 seconds, can be entered anywhere in the Speed Dial number.

Speed Dial Number Linking

You can link any of the Station Speed Dial numbers (1 0 ~ 4 9) to System Speed Dial codes 6 9 0 ~ 6 9 9 or to any of the optional buttons associated with these 10 codes. Station 200 can be used to link System Speed Dial codes 6 0 0 ~ 6 8 9 to codes 6 9 0 ~ 6 9 9. This allows up to 37 digits to be stored under one System Speed Dial button or code.

The number stored in location 6 9 0 ~ 6 9 9 will dial out first, then the number linked to 6 9 0 ~ 6 9 9. Typically, a company's special carrier access telephone numbers are stored in locations 6 9 0 ~ 6 9 9.

Note:
Some telephone system models provide 100 Speed Dial numbers (6 0 0 ~ 6 9 9) and others provide 40 numbers (6 0 ~ 9 9).

To Link a Number:

1. Press **RDL** or **#**.

   Before linking a number to Speed Dial Numbers 6 9 0 ~ 6 9 9, you should store a number, such as a long distance carrier access code, in the linked-to number (6 9 0 ~ 6 9 9) from Station 200 using the Speed Dial storing guide line on the previous page.

2. Press **SD**

   - or -

   press **SDS** or ***** and enter a Speed Dial access code.

   For station 2 0 0, enter a three digit System Speed Dial code.

   Station users may enter Station Speed Dial codes (1 0 ~ 4 9). Station 200 can be used to enter System Speed Dial codes 6 0 0 ~ 6 8 9.

3. Press **SDS** or *****.

4. Enter the three- or two-digit code to which the number will be linked (**6 9 0 ~ 6 9 9**

   - or -

   9 0 ~ 9 9).

   Only 10 System Speed Dial codes may be linked to any other Speed Dial numbers: 6 9 0 ~ 6 9 9, if your system has 100 System Speed Dial codes; or 9 0 ~ 9 9, if your system has 40 codes.

5. Enter the telephone number to be stored.

   Up to 17 digits can be stored.

6. Press **RDL** or **#**.

   The number will be stored and will be dialed out when the optional linked Station or System **SD** button is pressed or the linked System or Station Speed Dial access code is dialed.

   Linked Speed Dial Example:

   Store automatic CO line access plus a long distance carrier access code (10288) in the System Speed Dial location 690 and link this code to a telephone number stored in Speed Dial location 600 of any station.

   1. Store the CO line access code and the long distance carrier code (I910288) in the System Speed Dial location 690 from Station 200:

      Press **RDL** and **SDS** + **6 9 0** + [PDN] + **9 1 0 2 8 8** + **RDL**. The CO line access code is **9**. The long distance carrier access code **1 0 2 8 8**; [PDN] is used to automatically access internal dial tone before dialing **9 1 0 2 8 8**.

   2. Store the System Speed Dial information on Speed Dial Code 10 at Station 201:

      Press **RDL** + **SDS** + **1 0** + **SDS** + **6 9 0 1 7 1 4 5 8 3 3 7 0 0** + **RDL**.

   3. After Steps 1 and 2 of this example are completed, when station 201 uses Speed Dial 10, the telephone will automatically dial **9** to access a CO line, then it will dial the carrier access code plus the telephone number.

Stored Station or System Speed Dial Calling

You can call stored Speed Dial numbers with the touch of a button or by dialing a brief Speed Dial code. To store speed dial numbers onto an **SD** button or access code, see the previous instructions. Speed Dial buttons are assigned to stations in system programming.

To Call with a Speed Dial Button:

1. Access a CO line.

   See Appendix A—Table 1—CO Line Access Codes.

2. Press **SD**.

   The system will dial the telephone number assigned to the button.

To Call with a Speed Dial Access Code:

1. Access a CO line.

   See Appendix A—Table 1—CO Line Access Codes.

2. Press **SDS**.

   Press ***** if your telephone does not have the **SDS** button.

3. Enter the Speed Dial Access code.

   Station Speed Dial codes are 1 0 ~ 4 9 and System Speed Dial codes are 6 0 0 ~ 6 9 9 or 6 0 ~ 9 9. The system will automatically dial the telephone number assigned to the dialed code.

Chain Dialing Speed Dial Numbers

You can call two or more Speed Dial numbers during one call. This enables you, for example, to add additional parties (conference calls) to your conversation with Speed Dialing.

To Chain Dial Speed Dial Numbers:

1. Access a CO line.
2. Press the **SDS** button (or ✱).
3. Press **SDS** and dial the Speed Dial code for the telephone number to be dialed.
4. To dial another telephone number, press **CONF** and repeat Steps 2 and 3.

See Appendix A—Table 1—CO Line Access Codes.

Press ✱ if your telephone does not have the **SDS** button.

Station Speed Dial codes are 1 0 ~ 4 9 and System Speed Dial codes are 6 0 0 ~ 6 9 9 or 6 0 ~ 9 9.

Two (Tandem) CO Line Connection

Using a [DN] Button

This feature allows a station user to connect two CO lines, then drop out of the conversation.

To Connect Two Outside Lines (Using a [DN] button):

1. While talking to an external party on a **[DN]** button, press **CONF/TRNS**.
2. Dial a CO line access code and then the external telephone number of the other party you want connected.

After you press the button, you will hear dial tone, the **[DN]** LED will flash at the conference rate.

See Appendix A—Table 1—CO Line Access Codes. Ask your System Administrator for the proper code to be used for this type of call.

3. Press **CONF/TRNS** after the party answers.

The **[DN]** LED will flash at the in-use rate and all parties will be conferenced.

If you receive a busy tone or no answer, return to the original connection by pressing **[DN]**. You will hear dial tone and the **[DN]** LED will flash at the exclusive hold rate after you press **CONF/TRNS**.

4. Press **CONF/TRNS** and hang-up.

After you hang up, the **[DN]** LED will continue to flash at the exclusive hold rate and the two lines will be connected. The LED will turn off when the external parties hang-up.

If the public telephone company provides auto disconnect, the connection may release automatically when the parties hang up. If not, the lines must be supervised to be disconnected (See "Supervision" following this procedure).

Using **CO** Buttons

This feature allows a station user to connect two CO lines, then drop out of the conversation. Both **CO** buttons (or **PL** buttons) must appear on your telephone to allow Tandem connections to be established from your telephone.

To Connect Two Outside Lines (Using a CO button):

1. While on a CO line call, press **CONF/TRNS**.

After you press the button, you will hear dial tone, the CO Line LED will flash at the conference rate. The new Line LED will flash at the in-use rate.

2. Press another **CO** button and dial a telephone number.

The Line LEDs will both flash at the in-use rate and all parties will be conferenced.

3. Press **CONF/TRNS** after the party answers.

If you receive a busy tone or no answer, return to the original connection by pressing the original Line button.

4. Press **CONF/TRNS**.

You will hear dial tone.

- The Line LEDs will both flash at the exclusive hold rate and the LED will flash at the in-use rate.
- Both Line LEDs will continue to flash at the exclusive hold rate and the two lines will be connected. The LED will turn off.

5. Hang up.

If the public telephone company provides auto disconnect, the connection may release automatically when the parties hang up. If not, the lines must be supervised to be disconnected (See the previous "Supervision" instructions).

Supervision

To Supervise a Tandem Call and Release It:

1. Press either **[DN]** or CO line button.

   After you press the button, you will be connected to both CO lines and both Line LEDs will flash at the In-use rate.

2. If the parties have hung up, go back on-hook

   - or -

   if the parties are still talking, **CONF/TRNS** and hang-up.

   Both Line LEDs will turn off and the connection will be released.

Timed Reminders

You can set five separate reminders at your station. Your telephone will sound a distinct beeping at the exact minute and hour you set for any of these reminders, either one time or daily.

To Enter a Timed Reminder:

1. Press a **[DN]** and dial **# 6 0 5 ~ # 6 0 9**.

   You have a choice of five different reminders.

2. Enter the desired time.

   Set the time by entering two digits for the hour of the day (HH), then two digits for the minute. The timer is based on a 24-hour clock, so for example, to enter a reminder for 8:03 p.m., enter 2 0 for the hour (8 p.m. is the 20th hour of the day), then 0 3 for the minutes.

3. Press **0** for the reminder to be repeated every day, or **1** for a one-time reminder only.

4. Enter desired LCD message number, personal (**1 0 ~ 1 9**) or system (**6 0 ~ 9 9**), or **0 0**.

   Enter **0 0** if your telephone does not have an LCD or if you do not want a message to display when the time reminder tone sounds.

5. Press **RDL**.

   The time will be recorded in memory and you should hear a beeping tone for 30 seconds (or until cancelled by going off-hook) when the hour and minute occur.

To Cancel a Timed Reminder:

1. Press a **[DN]**, then dial **# 6 0 5 ~ # 6 0 9**.

   Dial **# 6 0 5** to cancel the reminder set for **# 6 0 5** or dial **# 6 0 6** to cancel the reminder set for **# 6 0 6**, etc. You can only cancel one reminder at a time.

2. Press **RDL**.

   The reminder will be cancelled.

Toll Restriction Override

Stations can be individually restricted from making toll calls. Each station can be allowed or denied specific area and office codes, long distance information calls, international calls and/or operator-assisted calls. You can completely override Toll Restriction at selected stations or you can change the station's Toll Restriction class. The station will resume its normal class at the conclusion of the call.

To Override/Change Toll Restriction:

1. Access an outgoing line using a CO line or **[DN]**.

   After pressing a CO line button, you will hear dial tone and the Line LED will flash at the in-use rate.

   See Appendix A—Table 1—CO Line Access Codes. Ask your System Administrator for the proper code to be used for this type of call.

2. Press **CONF/TRNS** and enter **# 4 7**.

   You will no longer hear dial tone.

3. Enter the Toll Restriction Override Code (four digits).

   You will hear dial tone. For security reasons, the override codes are only available on a selected basis. See your System Administrator.

4. Dial a telephone number.

Tone/Pulse Dialing

With some older Central Offices, you may have to make calls using rotary dial pulses on CO lines. To access remote equipment (such as an answering machine) requiring Dual-tone Multi-frequency (DTMF) tones while on these lines, you must set your phone for tone dialing after you have dialed the telephone number. Your telephone must have a **TONE** button assigned in system programming to access this feature.

To Change to Tone Dialing:

1. Dial a telephone number on a CO programmed for rotary dial pulses.

   Although the CO line is programmed for rotary dial pulses, access the CO line and dial the telephone number like any other call described in this user guide.

2. While the call is in progress, press **TONE**.

   The TONE LED will light steady red and you will be able to send DTMF tones with your dial pad. If the LED is off, tone dialing is not selected and you will not be able to send DTMF tones.

   Note:
   When originating or receiving a new CO line call, the system will automatically place the line in the dial pulse mode.

Toshiba Voice Mail Integration 4

Using Toshiba Voice Mail Systems

This chapter explains how to program your telephone for Call Forward and message retrieval when using a Toshiba Voice Mail System with your Strata DK280 system.

Refer to the appropriate Toshiba Voice Mail User Guide for more information:

- *Stratagy Voice Processing User Guide*
- *Toshiba VP User Guide*

Setting Call Forward

You can program your telephone to forward to the Toshiba Voice Mail System to answer your calls when you are busy or not available.

Voice Mail Identification Code

To direct forwarded calls to your mailbox—your personal storage space for voice messages—and to ensure that callers receive your personal greeting, you must store a Voice Mail (VM) Identification (I.D.) code once for your Primary Directory Number **[PDN]** and for each Phantom Directory Number **[PhDN]** owned by your telephone from your telephone.

Note:
Your telephone must be the owner of the **[PhDN]** *to store a Voice Mail ID code for the* **[PhDN]**.

To Store the Voice Mail ID Code:

1. Press a **[PDN]** or **[PhDN]**. — After you press the button, you will hear dial tone.
2. Enter **# 6 5 6**. — You will hear confirmation tone. The access code for setting the Voice Mail Call Forward digit sequence is **# 6 5 6**. This code does not forward calls to the Voice Mail system.
3. Enter **9 1**.
4. Enter your mailbox number. — This could be the mailbox number for your **[PDN]**, or if you press a **[PhDN]** in Step 1, a unique (or the same) mailbox number for the **[PhDN]**.
5. Press **RDL**, then press **SPKR**. — You will hear confirmation tone. The VM I.D. code will be automatically sent to the Voice Mail system whenever calls are forwarded to it.

   Note:
   Steps 1 ~ 5 are required for the initial storage of VM I.D. code to the Toshiba Voice Mail system. Once programmed, these digits remain in memory until changed. Repeat Steps 1 ~ 5 to change the code.

To Cancel the Voice Mail I.D. Code:

1. Press the same **[PDN]** or **[PhDN]** button that was used to store the Voice Mail I.D. Code. — You will hear dial tone after you press the button.
2. Enter **# 6 5 6**.
3. Press **RDL**, then press **SPKR**. — You will hear confirmation tone. The I.D. code will be cancelled.

Call Forward To Toshiba Voice Systems

By setting Call Forward to the Toshiba Voice Mail System on your telephone, information about the call will automatically be sent to the Voice Mail system, so that the callers who call your telephone and call forward to voice mail will be automatically connected to your voice mail box.

To Forward Calls to the Toshiba System:

1. Press the desired **CF** button

   - or -

   if you used an access code sequence, press a **[PDN]** or **[PhDN]**, then enter a Call Forward access code *(shown on right).* — The LED associated with the button will flash after you press the button.

   Note:
   "Call Forward" buttons apply only to **[PDNs]** *and not to* **[PhDNs]**. *You can set Call Forward for both* **[PDNs]** *and* **[PhDNs]**, *but Call Forward access codes must not be used for* **[PhDNs]**.

   You will hear confirmation tone after entering the access code.

   Call Forward access codes:

Call Forward-All Calls:	**# 6 0 1**
Call Forward-Busy:	**# 6 0 2**
Call Forward-No Answer:	**# 6 0 3**
Call Forward-Busy-No Answer:	**# 6 0 4**

2. Dial the Voice Mail System Directory number_____. — See your System Administrator for the correct voice mail Directory Number. After dialing, you will hear confirmation tone.
3. Press **CF**

   - or -

   press **SDS** + **RDL** + **SPKR**. — If your phone has a **CF** button assigned, its LED will light steady red.

To Cancel Call Forward to the Toshiba VP System:

1. Press the appropriate Call Forward button

   - or -

   press a **[PDN]** or **[PhDN]** + **# 6 0 1**, then hang up. — The Call Forward LED will turn off, and Call Forward will be cancelled.

   Note:
   "Call Forward" buttons apply only to **[PDNs]** *and not to* **[PhDNs]**.

   You will hear confirmation tone, and Call Forward will be cancelled.

Message Retrieval

You can program your **MSG** button to automatically retrieve your voice mail messages when your press it when it is flashing.

To Program your Msg Button to Retrieve Messages:

1. Press a **[PDN]** or **[PhDN]**. — You will hear confirmation tone after you press the button.
2. Enter **# 6 5 7**. — You will hear confirmation tone. **# 6 5 7** is the access code for setting the Voice Mail message retrieval digit sequence. This code does not not forward calls to the Toshiba Voice Mail system.
3. Enter **9 2**.
4. Enter your mailbox number, then press **# #**. — Your telephone must have the **SDS** button for the **#** button to function properly with the Toshiba Voice Mail system.
5. Enter your security code. — By storing your security code, you avoid having to enter your code every time you access your mailbox; however, this will also allow anyone to retrieve your messages from your phone. If a security code is not desired, do not include it.
6. Press **RDL**. — You will hear confirmation tone.
7. Press **SPKR**.

To Retrieve Messages with the Msg button:

➤ When the Msg LED flashes, press the **MSG** button. — The Voice Mail System will be called and you will be automatically connected to your Voice Mail box.

Centrex Application 5

Your system may be equipped with the Centrex Application, which enhances its feature capability when installed behind a Centrex or PBX system.Your telephone may have access to one or more of the enhanced Centrex features listed below:

Flexible Directory Numbering

A station's **[PDN]** can be three or four digits. It is, therefore, possible to match a station's **[PDN]** and Centrex line extension number. Dial the entire station number when indicated.

Note:
Some access code numbers may have been changed to avoid system numbering plan conflicts.

Centrex Feature Buttons

You may access some Centrex features by pressing a preprogrammed flexible button on your telephone, instead of dialing a Centrex access code. The Centrex access code, including the necessary flash and/or pause sequence, is activated when the button is pressed. See your Centrex or PBX operations manual for specific details.

Ringing Repeat

The distinctive ring patterns available in your Centrex system are automatically repeated with your digital telephone, allowing you to answer appropriately for either outside, inside or callback calls.

Delayed Ringing

CO or Centrex line(s) may be programmed for a 12-second and/or 24-second ring delay at stations to permit alternate answering conditions. Answer the line when your telephone is ringing.

Access Codes

A

This section contains access codes for outside CO lines, Paging Group and Paging Zone Codes, and Call Pickup Codes. It also contains Feature Access Codes and instructions for programming them onto Speed Dial buttons.

Table 1
CO Line Access Codes

With some systems, you may only have to dial one of the codes

9	General group code or Least Cost Routing (LCR)[1]
801~816	Line Group code[2]
#7001~#7144	CO line access code[2] (Use **447001~447144** if your telephone does not have an **SDS** button or when storing on an **SD**, or as a Speed Dial code since **#** indicates the end of a Speed Dial entry.)

Notes:

1. *If you press* **9** *in a system programmed with LCR, you may or may not hear internal dial tone, depending on system programming.*
2. *You can program these longer codes onto an* **SD** *button for easy one-touch access (see Table 4) or request a* **CO** *button from your System Administrator.*

Table 2
Paging Group and Zone Codes

Paging Group Codes		Paging Zone Codes
# 3 1 1—Group A	**# 3 1 5**—Group E	**# 3 5**—Zone A
# 3 1 2—Group B	**# 3 1 6**—Group F	**# 3 6**—Zone B
# 3 1 3—Group C	**# 3 1 7**—Group G	**# 3 7**—Zone C
# 3 1 4—Group D	**# 3 1 8**—Group H	**# 3 8**—Zone D

 # 3 0—All Call Page group.
 # 3 9—All Call Page group and possibly **external page zones**, depending on system programming.

Table 3
Call Pickup Codes

To Pick Up	Dial
■ A call ringing or held at a station	Station Primary Directory Number
■ A telephone group page, internal call, or door phone call ringing a station	**# 5 # 3 0**
■ An external page	**# 5 # 3 5**
■ A CO line on hold	**# 5 + # 7 0 0 1 - # 7 1 4 4**
■ A ringing CO line	**# 5 9**
You can store this sequence onto an **SD** button for one-touch access. See "To Store on a Button" in the following User Programmable Feature Buttons section.	

User Programmable Feature Buttons

You can program Speed Dial buttons or codes to access features, as well as telephone numbers. You can store up to 20 digits, enabling you to access a sequence of features, such as Call Park and Page, with a code in a Speed Dial button. A list of feature access codes in Table 4 follows the storage instructions for this feature.

To Store on a Button:

1. Do not lift the handset.
   If you lifted the handset in Step 1, the system would automatically dial the number that you most recently dialed
2. Press **RDL**.
   You can program the **CONF/TRNS**, **[PDN]** and **HOLD** functions within the Speed Dial sequence.
3. Press one of the **SD** buttons.
   You can only enter 20 digits maximum. Dial pad digits count as 1 digit, while the **CONF/TRNS**, **[PDN]** and **HOLD** feature buttons each count as two.
4. Enter a feature access code or sequence of codes. (See Table 4 on next page.)
   The feature access code or codes should be stored in memory.
   Note:
   If the preceding sequence is not completed within one or three minutes (system programmable time), the operation will time out and your telephone will be placed in the idle condition.
5. Press **RDL**.

To Store in a System or Station Speed Dial Location:

1. Do not lift the handset.
   If you lifted the handset in Step 1, the system would automatically dial the number that you most recently dialed after you press the **RDL** button.
2. Press **RDL**, then press **SD**.
   If your station does not have the **SD** button, dial ***** instead.
3. Dial a Speed Dial access code.
   Station Speed Dial locations are 1 0 ~ 4 9. System Speed Dial locations are 6 0 0 ~ 6 9 9 or 6 0 ~ 9 9 and can only be stored at Station 200 or at Attendant Consoles.
4. Enter a feature access code or sequence of codes.
   You can only enter 20 digits maximum. Dial pad digits count as 1 digit, while the **CONF/TRNS**, **[PDN]**, and **HOLD** feature buttons each count as two.
   Note:
   Refer to Table 4 for a list of access codes, although the sequences in the table tell how to store access codes on **SD** *buttons.*
5. Press **RDL**.
   The feature access code or codes are stored in memory.
   Note:
   To exit the entry mode to answer or make a call, press the **RDL** *button.*

The features shown in Table 4 can be programmed onto your feature buttons for easy, one touch access. To store a feature onto a button, enter the following:

RDL + **SD** + Feature Access Code Sequence + **RDL.**

See your System Administrator to find out which buttons can be programmed on your telephone.

IMPORTANT!

If your telephone does not have an **SDS** *button, enter* **4 4** *instead of* **#** *in all feature sequences.*

Table 4
Feature Access Codes

FEATURES	FEATURE ACCESS CODE SEQUENCE
Account Codes[1] (Frequently used codes)	**CONF/TRNS** + **# 4 6** + Account code digits
Automatic Callback	**4**
Background Music[2] (External Speakers On)	**[PDN]** + **# 4 9 1**
Background Music[2] (External Speakers Off)	**[PDN]** + **# 4 9 0**
Call Forward—All Calls (To Station)	**[PDN]** + **# 6 0 1** + Directory Number
Call Forward—Busy (To Station)	**[PDN]** + **# 6 0 2** + Directory Number
Call Forward Cancel	**[PDN]** + **# 6 0 1**
Call Forward External	**[PDN]** + **# 6 7 0**
Call Forward External Cancel	**[PDN]** + **# 6 7 0**
Door Phone Calling	**[PDN]** + door phone Directory Number
Hookflash Signal[1]	**CONF/TRNS** + **# 4 5**
Off-hook Call Announce (Manual Mode)	**2** (voice first); **1**, **2 1**, or **1 2** (tone first)
Overrides (Busy, DND)	**2**
Overrides (Executive)	**3**
Paging[3] (CO line Auto Hold) (All Call, Digital and Electronic telephones)	**HOLD** + **[PDN]** + **# 3 0**
Paging[3] (Station Group A)	**HOLD** + **[PDN]** + **# 3 1 1**
Paging[3] (Station Group B)	**HOLD** + **[PDN]** + **# 3 1 2**
Paging[3] (Station Group C)	**HOLD** + **[PDN]** + **# 3 1 3**
Paging[3] (Station Group D)	**HOLD** + **[PDN]** + **# 3 1 4**
Paging[3] (Station Group E)	**HOLD** + **[PDN]** + **# 3 1 5**
Paging[3] (Station Group F)	**HOLD** + **[PDN]** + **# 3 1 6**
Paging[3] (Station Group G)	**HOLD** + **[PDN]** + **# 3 1 7**
Paging[3] (Station Group H)	**HOLD** + **[PDN]** + **# 3 1 8**

Table 4 (continued)
Feature Access Codes

FEATURES	FEATURE ACCESS CODE SEQUENCE
Paging[3] (External Page Zone A)	**HOLD** + **[PDN]** + **# 3 5**
Paging[3] (External Page Zone B)	**HOLD** + **[PDN]** + **# 3 6**
Paging[3] (External Page Zone C)	**HOLD** + **[PDN]** + **# 3 7**
Paging[3] (External Page Zone D)	**HOLD** + **[PDN]** + **# 3 8**
Paging[3] (All Call, External Page Zone)	**HOLD** + **[PDN]** + **# 3 9**
Park Call/Access Page	**CONF/TRNS** + **# 3 3 1** + X X X[4] + Y Y Y[5]
Pickup[3] (Directed to station, new, or transferred call)	**HOLD** + **[PDN]** + **# 5** + station number
Pickup[3] Any ringing CO line (new call only)	**HOLD** + **[PDN]** + **# 5 9**
Pickup Station Page or Ringing Door Phone[3]	**HOLD** + **[PDN]** + **# 5 # 3 0**
Pickup[3] External Page	**HOLD** + **[PDN]** + **# 5 # 3 5**
One-touch Voice Mail Access	**[PDN]** + Voice Mail Directory Number
Outgoing Calls	**[PDN]** + CO line access code[6] + telephone number

Notes:

1. *These codes can be used during a CO line call.*
2. *Background music speakers can be turned on or off from Station 200 only.*
3. *This feature will hold an existing call when the button is pressed. If the button is pressed when not on a call, pickup or page will still be accessed. These codes can be used during a CO line call.*
4. *XXX = Auto Park Orbit 9 9 9 (access the next available park orbit), or General Park Zones 9 0 0 ~ 9 1 9, or* **[PDN]** *on which the call should be Parked. Only use 9 9 9 with LCD telephones.*
5. *YYY is the Page Zone or Station Group (# 3 0 ~ # 3 9) that should be paged after the call is Parked.*
6. *CO line access codes: # 7 0 0 1 ~ #7 1 4 4 (maximum) for DK280 individual lines; 8 0 1 ~ 8 1 6 for line group or 9 for general group or LCR.*

Multiple Directory Numbers

B

This appendix defines Primary, Secondary, and Phantom Directory Number buttons, and provides an example of how they appear on a button strip.

Primary Directory Number [PDN] Buttons

You can have up to four **[PDNs]** on your phone. The **[PDN]** is your extension number. You can set Call Forward and Voice Mail ID code for your **[PDN].**

Secondary Directory Number [SDN] Buttons

When someone else's Primary Directory Number appears on your phone, it's an **[SDN].** You cannot set Call Forward and Voice Mail ID code for SDNs on your telephone.

Phantom Directory Number [PhDN] Buttons

Your phone may also have up to eight **[PhDNs],** which may be dedicated to a station or shared by a group of stations. One example of a Phantom Directory Number application is when it is used as a common phone number for an entire department. For instance, when the **[PhDN]** appears on a group of telephones, such as the Sales Department, it will ring on all of the telephones of the group when it is called. You can set Call Forward and Voice Mail ID code for **[PhDNs]** that are owned by your telephone.

Notes:

1. *Incoming calls will come in to your telephone's* **[PDNs]** *from the top down. For example, incoming calls to Station 200's* **[PDNs]** *will first ring the top "200" button, the second call will ring the "200" button below it, and the third call will ring the bottom "200" button.*
2. *Your station is considered busy only when all of the* **[PDNs]** *are being used by your telephone or other telephones and/or when your telephone is on a call on any type of* **CO** *line or* **[DN].**
3. *Up to four* **[PhDNs]** *can have a Message Waiting* **[PhDN/MW]** *button which will be lit when a message has been sent to that* **[PhDN]** *Your telephone must be designated as the owner of the* **[PhDN]** *in system programming to be able to have a* **[PhDN/MW]** *button for a* **[PhDN].**

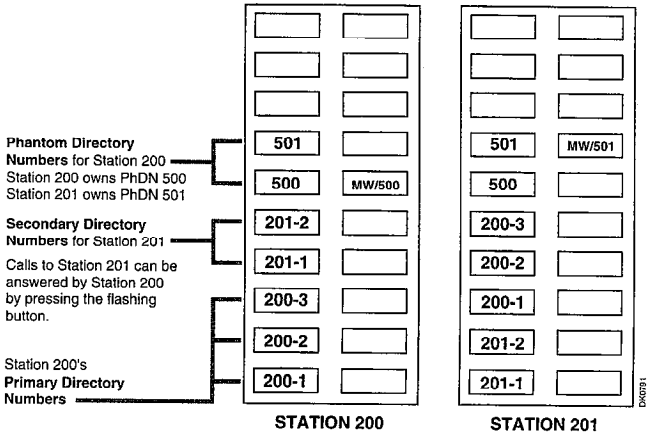


Figure 3
Multiple Directory Numbers Example

January 1996

TOSHIBA

BUSINESS TELEPHONE SOLUTIONS

Liquid Crystal Display Electronic Telephone User Guide

Strata® DK280

Digital Business Telephone Systems
Release 3

Contents

Introduction

This user guide shows you how to operate the Strata DK 6500-series Electronic Liquid Crystal Display (LCD) 20-button Speakerphone with LCD (6520-SD).

IMPORTANT !

This guide only covers the LCD functions of the electronic telephone. Use it with the Strata DK Electronic Telephone User Guide.

Organization

This user guide is divided into these main chapters:

- **Chapter 1—The Grand Tour** shows examples of various LCD displays and explanations of when they display.
- **Chapter 2—Feature Operation** explains the operation of each specific calling feature.
- **Chapter 3—Messages and Memos** covers memo and messaging features.

Conventions

Bold letters in [brackets] represent buttons which have Directory Numbers on them. For example:

[DN] = any Directory Number button (also known as an Extension or Intercom Number).

[PDN] = Primary Directory Number button (the Extension Number for your telephone).

[SDN] = Secondary appearance of a **[PDN]**. A **[PDN]** which appears on another telephone is considered an **[SDN]**.

[PhDN] = Phantom Directory Number button (an additional Directory Number).

Extra bold letters represent telephone buttons.

Your telephone may not have all of the buttons mentioned in this guide. See your Telephone System Administrator for more information on buttons and access codes.

~ means "through."

\+ is used for multiple key entries.
Example: Press **Speed Dial** + **XX** + **Redial** + **Spkr** (XX=08~60 seconds).

➤ denotes the step in a one-step procedure.

Notes:
Elaborate specific items or reference other information.

IMPORTANT !
Calls attention to important instructions or information.

How to Use This Guide

Information in this user guide is divided into two distinct areas. Step-by-step feature instructions appear in the left-hand column of the page. Explanations of these procedures appear in the right-hand column. (See Figure 1.)

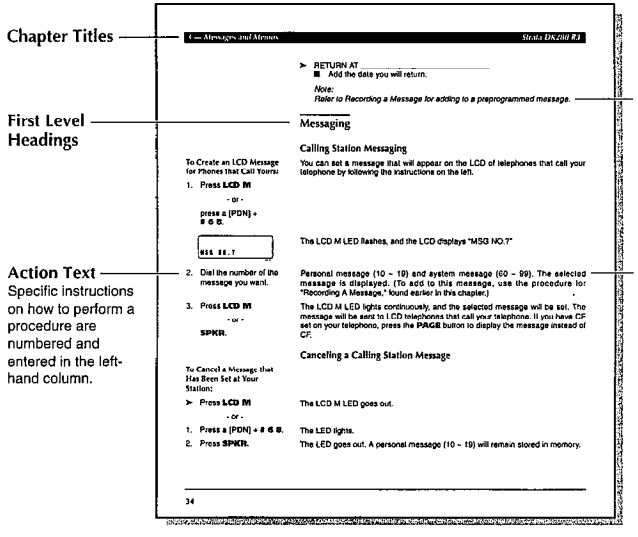


Figure 1
Sample Page

The Grand Tour 1

The Grand Tour provides a practical and detailed overview of the visual and operational features of your Toshiba phone system.

The Strata DK Electronic Liquid Crystal Display (LCD) telephones provide you with display information and feature prompting to make call handling more efficient.

In addition, the LCD telephones provide you with Alphanumeric Messaging, Busy Lamp Field (BLF) Identification, Central Office (CO) Line Identification, Timed Reminders with Messaging, Speed Dial Memo Directory Dialing, Intercom User Name/Number Display, Call Duration Display, and Date/Time of Day Display.

Mode, Page, and Scroll functions of the LCD are summarized in addition to the hardware and button options of the phone itself.

This overview will quickly familiarize you with the various LCD and phone features that may best match your needs.

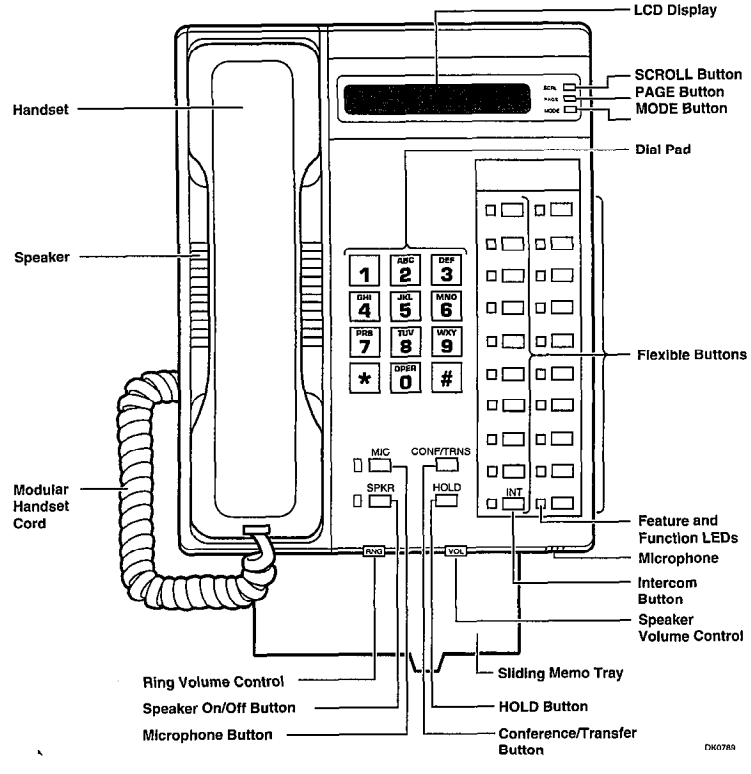


Figure 2
20-button Electronic Liquid Crystal Display

Liquid Crystal Display

In its idle state, the 32-character Liquid Crystal Display (LCD) feature on your digital telephone gives you an accurate desk clock and calendar combination. When you have an outside call in progress, an elapsed time display gives a constant reminder of the call duration. In addition, a variety of information displays and feature prompting makes your call handling more efficient. Alphanumeric messaging capability is also provided. All display functions occur automatically as call processing proceeds.

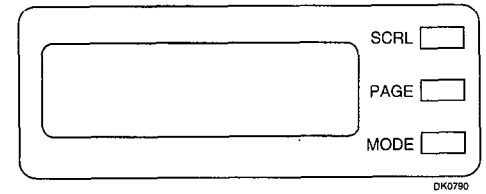


Figure 3
SCRL, PAGE, and MODE Buttons

The uses of the three buttons shown above are:

SCRL:

- Scrolls through Message Waiting station numbers.
- Scrolls through the speed dial digits (if more than 16 digits) when in Mode 8.

PAGE:

- Changes Busy Field groups.
- Used by station 200 to record a user NAME/NUMBER for another station. Station 200 must be an LCD electronic telephone to record a NAME/NUMBER display for any other station type.
- Changes displays (date/time, elapsed time, message, call forward, dialed number).
- Scrolls through speed dial numbers when using Mode 8.

MODE:

- To enter/exit various mode functions. (See "Mode Definitions" later in this chapter.)
- To cancel the beeping tone when using timed reminders.

Mode Definitions

MODE 0	Used to exit another mode and return to clock/calendar display.
MODE 1	Busy Field display.
MODE 2	Busy station messaging.
MODE 4	Called station messaging.
MODE 5	Displays LCD message number NN, where NN can be personal messages (10 ~ 19) or system messages (60 ~ 99). **MODE 5** only displays the selected message. It cannot be used to edit or create a new message.
MODE 8	Speed dial number check and memo dialing.
MODE 6 0	Caller ID/ANI/DNIS information mode OFF.
MODE 6 1	Caller ID/ANI/DNIS information mode ON.
MODE 6 2	Caller ID/ANI/Lost Call stored information display.
MODE 6 4	View Call Park Orbit list.
MODE 7 1	Soft Keys ON.
MODE 7 0	Soft Keys OFF.
MODE 9 4	Remote called station messaging.
MODE 9 5	Remote calling station messaging.

Note:
Although you can turn Soft Keys on, Soft Keys are not recommended for Electronic Telephones.

LCD Function Overview

IMPORTANT !
All Liquid Crystal Display (LCD) examples in this user guide are shown with soft keys turned OFF.

Note:
In the following examples:

NNN = the Directory Number of the party.

MMM = the called party.

Condition Creating Display

Account Codes:

NO. NNN ENTER ACCT CODE	When you press a CO line that requires a forced (verified or nonverified) account code, or **SDS** + **5 0**, or **ACCNT** to enter a voluntary (verified or nonverified) account code.
NO. NNN CODE NOT VALID	When you dial a verified voluntary account code that is not valid.
NO. NNN CODE VERIFIED	When you correctly dial a verified voluntary account code that is set in the system account code memory.
NO. NNN DIAL RESTRICTED	When you dial a verified forced account code that is not valid.
NO. NNN DIAL TEL NUMBER	After you dial a verified forced account code that is valid.

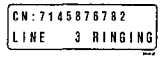
Automatic Number Identification (ANI) and Caller ID calls:

If your telephone has been programmed with ANI capability, you may:

- Activate ANI and/or Caller ID display mode by pressing **MODE** + **6 1**. (System default is ON.)
- Deactivate ANI and/or Caller ID display mode by pressing **MODE** + **6 0.**

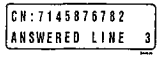
Note:
ANI information cannot co-exist on the same telephone LCD with Dialed Number Identification Service (DNIS) information. (See DNIS.) If your system is programmed to receive both ANI and DNIS information on incoming calls, then when an ANI/DNIS call is ringing, press **PAGE** *to alternate between DNIS and ANI LCD displays.*

ANI Example

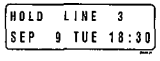


If your telephone has been programmed with ANI capability and you have activated the ANI display feature, the calling party's telephone number (up to 10 digits) will be displayed when the call arrives at your station.

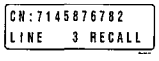
Notes:
1. *The following examples show ANI. If Caller ID was activated, then the caller's name or number would appear on the first line.*
2. *If* **CN:** *is displayed, the calling number is an (ANI) number;* **CN:** *does not precede Caller ID numbers.*



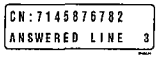
When you answer the incoming call. After you answer a call, call duration will display on LCD.



When you place the call on hold.

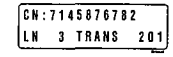


Held call automatically recalls your station after a programmed period of time.

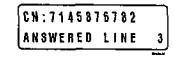


The display changes to indicate calling status.

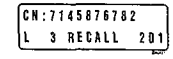
Station 201 is transferring an ANI (or Caller ID) call to you (station 200). For the purpose of demonstration, following screens depict different displays of your station.



After the transferring station (station 201) hangs up.



When you answer the transferred call.

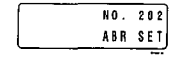


If you do not answer the transferred call within a programmed period of time, the held call will automatically recall the transferring station (i.e., station 201). This screen shows the display of the transferring station (i.e., station 201) as the call recalls.

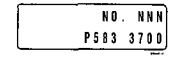
Caller ID Example

If your telephone is programmed with Caller ID capability and you have activated the Caller ID display feature, the telephone number (up to 10 digits) or name (up to 15 characters) of the calling party will be displayed when the call arrives at your station.

Auto Busy Redial (ABR):



After setting Auto Busy Redial, your display prompts you that it has been set.

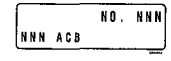


When the system dials the call, your display shows the dialed number. The system inserts a pause (P) before redialing the number.

When the called telephone is ringing, your station's CO Line LED (or **[DN]** LED) and SPKR LED will flash, and a warning beep will sound 30 seconds after the call is completed. You must go off-hook or press **SPKR** to prevent disconnection.

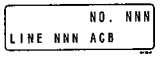
Automatic Callback (ACB):

When you set Automatic Callback at a busy station, its number is displayed.



When you receive an automatic callback, the station number you called is displayed.

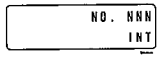
When you set ACB at a busy line group, its access code number is displayed.



When you receive an automatic callback for a CO Line, the seized line's number is displayed.

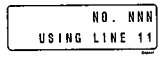
Automatic Line Selection:

1. **[DN]**



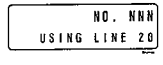
If your station automatically accesses a **[PDN]** when you go off-hook, the three character designation, "INT" (Internal Dial Tone), displays to confirm this status.

2. CO Line



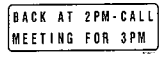
If your station automatically accesses a CO line when you go off-hook, the number of the seized CO line is displayed.

3. Dial Access Code



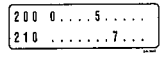
When you access a CO line by dialing a CO line group access code, the accessed CO line number is displayed.

Alphanumeric Messages:

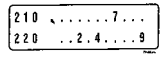


Messages up to 32 characters can be used in alphanumeric messaging. Messages can either be programmed or set as one-time messages. (Messages can also be used with a timed reminder.)

Busy Field:



The Busy Lamp Field (BLF) display indicates, in groups of 10, the last two digits of the station Primary Directory Numbers that are busy on any type of **[DN]** (**[PDN]**, **[SDN]**, or **[PhDN]**) or set for Do Not Disturb (DND). Also, if a telephone's **[PDNs]** are busy because they are in use on other telephones, the telephone will show busy on the BLF, even though it may be idle. The top display indicates that stations 200, 205, and 217 are either in use or in DND mode; the bottom display indicates the same for stations 217, 222, 224, and 229.



If **PAGE** is pressed, the 200/210 group will change to 210/220, and the busy/DND states of that group of stations will be displayed. The station groups will increment each time **PAGE** is pressed, thereby eventually displaying all stations.

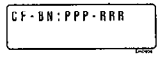
Call Forward for [DNs]:

In the Call Forward examples:

LLL = the calling **[DN]**
PPP, TTT, VVV = the "Call-Forward-From" Directory Number.
RRR, SSS, UUU = the "Call Forward Destination" Directory Number.

Call Forward for

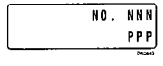
This LCD display appears when you begin to set any type of call forward.



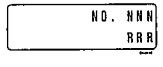
After you set Call Forward, the "forwarded" Directory Number (PPP) and the "forwarded to" Directory Number (MMM) is displayed, along with one of the following abbreviations:

"CF-A"	(Call Forward-All Calls)
"CF-B"	(Call Forward-Busy)
"CF-NA"	(Call Forward-No Answer)
"CF-BN"	(Call Forward-Busy/No Answer)
"CF-F"	(Call Forward-Fixed)
"CF-EXT"	(Call Forward External)

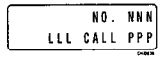
Note:
The CF-EXT display has priority over all other Call Forward displays. Press **SCRL** *to display other Call Forward settings.*



When you call a **[DN]** that is forwarded (PPP), the **[DN]** you called is shown first.



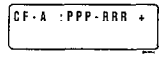
The display changes to the **[DN]** to which your call was forwarded (MMM).



When a call is forwarded to your **[DN]**, the calling **[DN]** (LLL) is displayed on the left and the **[DN]** called is displayed on the right (PPP).

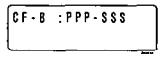
Call Forward for [PhDNs]:

If your telephone is the "owner" of more than one Directory Number, you can assign Call Forward destinations for each **[DN]** on your telephone (up to one **[PDN]** and four **[PhDNs]**). See your System Administrator to find out which **[DNs]** are "owned" by your telephone. After setting different Call Forward Destinations, you can confirm them by pressing **SCRL**. A "+" sign indicates more than one **[DN]** has Call Forward on your telephone.



"CF-A" denotes Call Forward-All Calls from PPP to RRR.

Press **SCRL**.

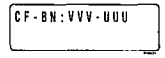


"CF-B" denotes Call Forward-Busy from PPP to SSS.

Press **SCRL**.

"CF-NA" denotes Call Forward-No Answer from TTT to UUU.

Press **SCRL**.



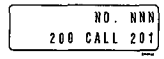
"CF-BN" denotes Call Forward-Busy/No Answer from VVV to UUU.

Press **SCRL**.

Caller ID Calls:

See Automatic Number Identification on page 6.

Call Pickup:



When you pick up an internal ringing call, the calling station's **[PDN]** is displayed on the left and the station number called is displayed on the right.

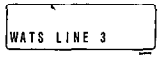
Your LCD telephone displays information noting that your call to station (MMM) was picked up by station (WWW).

Calling Number-Internal:

When you receive an internal call, the calling station's **[PDN]** (LLL) is displayed, even if you were called from a **[PhDN]** on that station.

CO Line Identification:

The CO lines can be programmed to display an identifying name of up to 16 characters. The name will be displayed on outgoing and incoming calls.

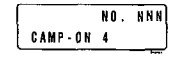


CO Line Number:

1. Incoming Call

Incoming CO call—the system station line number displays if your station is programmed for incoming ringing on that CO line, as long as no CO identification is programmed.

Transferred CO call—CO line is transferred to your station in the ringing state by another station.

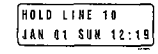


Camped-on CO call—CO line was camped-on to your busy station and rings your station when you hang up.

2. When Call Is Answered

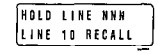
The display changes to indicate calling status.

3. Hold



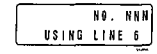
You have put a CO line call on hold at your station.

4. Hold Recall



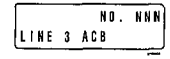
Held call automatically recalls your station after a programmed period of time.

5. Outgoing



When you manually select a CO line, it is displayed. This display is replaced by the dialed number.

6. CO Line Queuing (Callback)



When the CO line queuing feature rings back to your station with an available CO line, that line number will be displayed.

Date/Time:

```
NO. NNN
MAY 24 MON 12:05
```

1. Press **PAGE** to display date/time when talking on a CO line (Soft Keys must be off before the call is started).
2. The date/time is adjusted on a system-wide basis by the station located in port 00 (usually station 200).
3. Continued pressing of **PAGE** toggles the display in succession among: Date/Time, Number Dialed, and Elapsed Time of the present call.

Dialed Number:

1. CO Line

```
NO. NNN
5551374
```

2. Internal **[DN]**

```
NO. NNN
201
```

The digits are displayed as you dial when connected to either a CO Line or the **[DN]** using:

- Manual dialing
- Automatic dialing
- Repeat Last Number Dialed
- Saved Number Redial

Note:
If you are calling on a CO line, the display automatically changes from dialed number to elapsed time after a programmed period.

Dialed Number Identification Service (DNIS) Calls:

Incoming DNIS telephone numbers can be correlated in the system database with assigned DNIS names. These names can have up to 16 alphanumeric characters, and will display on your telephone's LCD. This allows incoming calls to be instantly identified and appropriately answered.

Note:
DNIS information cannot co-exist on the same telephone LCD with Automatic Number Identification (ANI) information. (See ANI.) When an ANI/DNIS incoming call is ringing, press the **PAGE** *button to alternate between ANI and DNIS displays when both types of information is received on an incoming call.*

To activate the DNIS display mode, press **MODE** + **6 1**.

To deactivate the DNIS display mode, press **MODE** + **6 0**.

```
TOSHIBA TSD
LINE  3 RINGING
```

For ACD calls.


```
TOSHIBA TSD
LINE  3 CALLING
```

For DNIS calls.

```
TOSHIBA TSD
LN  3 CALL 201
```

When the call was forwarded to your station.

```
TOSHIBA TSD
LN  3 TRANS 201
```

When the call is transferred.

```
TOSHIBA TSD
ANSWERED LINE  3
```

When the call is answered.

```
TOSHIBA TSD
L  3 RECALL 208
```

For calls that recall the transferring station.

```
TOSHIBA TSD
LINE 3 RECALL
```

Held call automatically recalls your station after a programmed period of time.

Directory Number Display:

```
DN = NNN
```

To find out the actual Directory Number of a **[DN]** button if it does not appear on your display or telephone keystrip label, press the **[DN]** you want to display and dial **# 4 0 7**. The number will display.

To find out the Primary Directory Number **[PDN]** of a telephone, press a **[DN]** + **# 4 0 1**. "INT=" will display, followed by the **[PDN]**.

Door Phone/Monitor:

```
NO. NNN
DOOR PHONE 1A
```

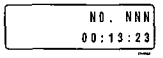
When you are called from a door phone, its designating characters are displayed.

```
NO. NNN
DOOR PHONE 1A
```

When you make a call to a door phone, its designating characters are displayed.

Note:
The door phone designators are NA, NB, and/or NC (N = 1 ~ 4, and indicate which of the 12 possible door phones is calling or is being called).

Elapsed Time:



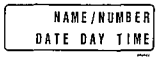
While you are making an outgoing CO line call, the call's elapsed time is displayed. Elapsed time automatically replaces the dialed number on the display after a programmed period of time. (Timing begins when a **CO** button is pressed.)

Notes:

1. *On a CO line call, the display can be alternated between date/time, elapsed time, and dialed number by pressing* **PAGE** *(Soft Keys must be off before the call is started).*
2. *Elapsed time is displayed for 15 seconds after you hang up, and then changes automatically to date/time.*

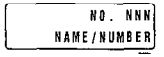
LCD Name/Number Display:

1. Idle Station



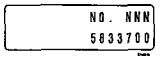
A name or title can be set in memory for each station. When an LCD station is idle, the name displays on the top line of the LCD. When a station calls an LCD station, the name of the calling station displays on the bottom line of the called station's LCD.

2. Called Station



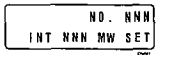
Least Cost Routing (LCR):

When you are making a call via Least Cost Routing (LCR), your display will prompt you to dial a number by displaying "DIAL TEL NUMBER".



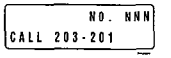
As you dial the number, it is shown on your display.

Message Waiting:



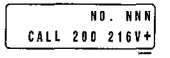
When you set Message Waiting at another station, the number of that station is displayed.

When you hang up after setting Message Waiting at another station, a reminder is shown on the top row of your display. A "+" indicates there are more messages in memory. Press **SCRL** to rotate through more messages.



The display shows the numbers of up to three stations that have left messages for you. Four numbers may be stored in message memory (see Recalling Station). The corresponding LCD display example shows: Station 201 has left a message for station 203. A + indicates there are more messages in memory. Press **SCRL** to rotate.

Message Waiting/Voice Mail:



When a Message Waiting voice mail is displayed, a "V" will follow the station number. A "+" indicates there are more messages in memory. Press **SCRL** to rotate through more numbers. To answer the message, press **MSG** to call the station which is displayed.

Off-hook Call Announce:

When you off-hook call announce to a busy station (MMM), your LCD displays the number of that station.

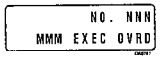
When another station (MMM) off-hook call announces to your station, your LCD displays the number of that station.

Overrides:

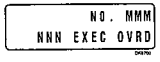
1. Busy Override

When you activate the Busy Override feature after calling a busy station, the station number and the feature are displayed.

2. Executive Override

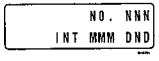


Your LCD telephone displays the number of a station (MMM) initiating executive override when you are on the telephone. The number will remain displayed until override is disconnected.

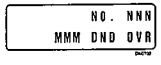


When you initiate Executive Override, your LCD telephone displays the number of the station that is overridden (MMM). The station that receives the override displays your station number. The number will remain displayed until the call is ended.

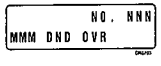
3. Do Not Disturb (DND) Override



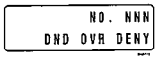
The station you have called (MMM) is in the Do Not Disturb (DND) mode.



When you initiate DND override, the station number (MMM) you have overridden is displayed.

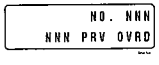


When another station (MMM) overrides DND at your station, its number is displayed. (The display remains until the end of override.)



When DND override is not allowed, "DND OVR DENY" is displayed.

4. Privacy Override



When a station presses a busy **CO** button to enter an existing conversation, the station that initiates the override displays the CO line identification on the LCD. The overridden station's LCD displays the initiating station's number. (The display remains until the end of the call.) Privacy override does not apply to **[DN]** buttons.

Recalling Station:

When a transferred call goes unanswered, it will recall to the station that transferred it. The display shows the CO line number and the station number to which it was originally transferred.

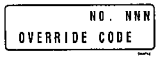
Speed Dial Memo:

When using Speed Dial Memo (**MODE** + **8** + the speed dial number), the name and number are displayed. Press **PAGE** to display more.

TOSHIBA is the memo (up to 12 characters).

714 583 3700 is the number (up to 16 digits).

Toll Restriction and Traveling Class Override Codes:



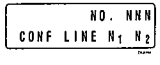
After you access a CO Line and press **CONF/TRNS** + **# 4 7** to dial a complete toll restriction override or traveling class code, your LCD display will prompt you to dial a code.

Two-CO Line Calls:

1. Tandem

After you establish a two-CO line conference call and then release. N_1 and N_2 identify the connected CO lines.

2. Conference



When you are talking with two external parties on two CO lines. N_1 and N_2 identify the connected CO lines.

Feature Operation 2

This chapter provides instructions for LCD telephone features. Consult the *Strata DK280 Digital Telephone User Guide* for instructions about features that apply to both non-LCD and LCD telephones.

Date/Time/Day Adjustment

This operation is possible from port 00 (usually station 200) or attendant consoles, and enables you to set the date, time, and day.

To Set the Date:

1. Place handset on-hook.
2. Press a **[DN] + # 6 5 1**.
3. Enter the date — Dial year/month/day in the format YYMMDD. Enter a leading 0 for any single-digit month or day.
4. Press **RDL**. — You will hear a confirmation tone.
5. Press **SPKR**.

To Set the Time:

1. Place handset on-hook.
2. Press a **[DN] + # 6 5 2**.
3. Enter the time. — Dial hour/minute/second in the 24-hour clock format HHMMSS. Enter a leading 0 for any single digit entered.
4. Press **RDL**. — You will hear a confirmation tone.
5. Press **SPKR**.

To Set the Day:

1. Place handset on-hook.
2. Press a **[DN]** + **# 6 5 3**.
3. Enter the day (see codes on the right).
   - **1** = Sunday
   - **2** = Monday
   - **3** = Tuesday
   - **4** = Wednesday
   - **5** = Thursday
   - **6** = Friday
   - **7** = Saturday
4. Press **RDL**.
5. Press **SPKR**.

You will hear a confirmation tone.

Call Forward Display

When any type of Call Forward is initiated, the "CALL FORWARD TO" prompt displays on the lower row of the LCD. When your station has Call Forward set, the LCD appears as shown in the following examples. For instructions on setting Call Forward, refer to the *Digital Telephone User Guide.*

In the following examples,

NNN = Directory Number which is being forwarded.

MMM = the forward-to number.

Call Forward Displays:

1. Call Forward—All Calls

```
CF-A NNN-MMM+
JAN 26 TUE 01:43
```

Call Forward—All Calls

If your station is idle or busy and has this feature activated, all calls to it will forward immediately. The station will not ring. A "+" indicates more than one **[DN]** is forwarded on your telephone, press **SCRL** to rotate through all Forwarded **[DN]** displays.

2. Call Forward—Busy

```
CF-B :NNN-MMM
JAN 26 TUE 01:43
```

Call Forward—Busy

Calls to your telephone while you are busy on another call or in the Do Not Disturb mode will forward immediately if this feature is set. Calls will ring as normal if your telephone is idle.

3. Call Forward—No Answer

```
CF-NA:NNN-MMM
JAN 26 TUE 01:43
```

Call Forward—No Answer

With this feature, all calls to your station will forward to a selected station if you do not answer within a time that you designate.

4. Call Forward–Busy/No Answer

```
CF-BN:NNN-MMM
JAN 26 TUE 01:43
```

Call Forward—Busy/No Answer

With this feature, all calls to your station will forward immediately to a selected station whenever you are busy on another call or in the Do Not Disturb mode. Calls will also forward if you do not answer the call within a time that you designate.

5. Call Forward–Fixed

```
CF-F:NNN-MMM
JAN 26 TUE 01:43
```

Call Forward—Fixed

If you activate this feature, all internal, private or Direct Inward Dialed CO line calls to your station will forward immediately to a station set in system programming. Your station must be assigned with the **CFF** button in system programming to activate this feature.

6. Call Forward–External

```
CF-EXT
JAN 26 TUE 01:43
```

Call Forward—External

This feature enables you to forward new incoming calls to a destination outside of the system. Internal calls and transferred calls to your **[PDN]** will not forward with Call Forward-External, and only incoming calls over CO lines dedicated to immediate or delay ring only at your station (**[PDN],** private **CO** line, and/or Direct In Dial line calls) will forward. Any of the other Call Forward modes can be set for your **[PDNs]** or **[PhDNs]** simultaneously with Call Forward-External.

Notes:

1. *CO lines that ring at your station only will forward. (CO lines that ring into more than one station will not forward.)*
2. *CO line calls transferred to your station will forward (except Call Forward-External).*
3. *Auto Attendant calls to your station will forward (except Call Forward-External).*
4. *Call forward redirects the station hunt feature.*

Call Forwarding a Primary and/or Phantom Directory Number

Your telephone has a Primary Directory Number **[PDN]** which can only be call forwarded from your telephone.

To set Call Forward for a Phantom **[DN]**, your phone must be programmed as the owner of **[PhDNs]**.

Your telephone can be programmed to have up to eight **[PhDNs]**. Up to eight **[PhDNs]** can be set to Call Forward by entering a specific access code, but only four of them can have dedicated message waiting buttons/LEDs. **[PDNs]** and **[PhDNs]** can be independently set for Call Forward-All Calls, Call Forward-Busy, Call Forward-No Answer, and Call Forward-Busy/No Answer. Calls to your **[PDN]** or **[PhDN]** will be forwarded to the destination phone number according to the call forwarding mode you have chosen.

Call Forwarding a Primary or Phantom Directory Number:

1. Press the **[PDN]** or **[PhDN]** that you want to Call Forward.

```
DIAL STATION NO.
OR ACCESS CODE
```

You will hear a steady dial tone and see a steady LED.

2. Enter a Call Forward Access Code (**# 6 0 1** ~ **# 6 0 4**).

```
CALL FORWARD TO
```

The dial tone will go silent, and the LED will flash intermittently.

3. Dial the number to which calls will forward.

The screen will display the number you are forwarding to and you will hear a short, steady confirmation tone followed by a pulsing Re-order tone. The LED will continue to flash intermittently.

4. Press **SDS** + **RDL** + **SPKR**.

```
CF-A:603-203
JAN 01 SUN 12:19
```

The dial tone will go silent and the LED will go off. The LCD will display a message indicating call forwarding, the Call Forward type, the Phantom Directory Number that the call is being forwarded from, and the destination number to which the call is forwarded.

To Cancel a Call Forward:

1. Press the **[PDN]** or **[PhDN]** you want to cancel Call Forwarding on.

You will hear a steady dial tone and see a steady LED light.

2. Dial **# 6 0 1**.

The dial tone will go silent, and the LED will flash intermittently.

3. Press **SPKR**.

The LED will go off. Call forwarding for the selected **[PDN]** or **[PhDN]** is now canceled.

Call Park/Park and Page

If you have an LCD telephone, you can use code **9 9 9** to let the system automatically select an available orbit when you park a call. The selected orbit number will be shown on your LCD. You can use the Park feature with the Page feature. For more information on Call Park, refer to the *Digital Telephone User Guide*.

To Park and Park/Page (Automatic Orbit Selection):

1. While connected to a calling party, press **PARK** or **CP/PG**.

If your telephone does not have a **PARK** button, press **CONF/TRNS** + **# 3 3 2** to park the call. If your telephone does not have a **CP/PG** button, press **CONF/TRNS** + **# 3 3 1** to park and page.

```
ENTER ORBIT NO.
```

2. Enter **9 9 9** and the system will park the call on an Orbit (**9 0 0** ~ **9 1 9**).

When you press **9 9 9**, the system will automatically select the lowest vacant Orbit Number for your parked call.

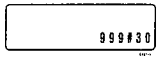
- If you pressed **PARK** in Step 1, your telephone LCD will display the orbit number in which the call is parked.
- If you pressed a **CP/PG** in Step 1, you will hear a short burst of dial tone to prompt you to enter the Page access code. Your telephone LCD will display the orbit number in which your call is parked.

3. To Page, enter a Page Zone access code (see Table 1) or Directory Number.

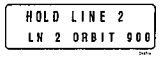
Table 1
Paging Group and Zone Codes

Paging Group Codes		Paging Zone Codes
# 3 1 1—Group A	**# 3 1 5**—Group E	**# 3 5**—Zone A
# 3 1 2—Group B	**# 3 1 6**—Group F	**# 3 6**—Zone B
# 3 1 3—Group C	**# 3 1 7**—Group G	**# 3 7**—Zone C
# 3 1 4—Group D	**# 3 1 8**—Group H	**# 3 8**—Zone D

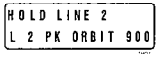
Enter code **# 3 0** to page stations assigned to the **All Call Page** group.
Enter code **# 3 9** to page stations assigned to the **All Call Page** group and possibly **external page zones**, depending on system programming.



The LCD will show the **9 9 9** Auto Park entry plus the entered Page Zone number.



The LCD shows the line number which is being held on a particular orbit number. In this example, Line 2 is held on orbit number 900.



If you do not retrieve the parked call within a specified amount of time, the call will ring back to your phone. When a parked call recalls and rings back to your phone, the LCD will show the line or **[DN]** that is recalling and the orbit number.

Parked Call Retrieval

To Retrieve a Parked Call:

1. Press the parked **CO** line, or press **PARK** or **CP/PG**.
2. Enter the Orbit Number or valid **[PDN]** on which the call is parked.

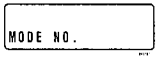
The Orbit Number is usually provided in the paging announcement. The CO line LED or **[PDN]** LED will flash at the In-use rate when the call is picked up or retrieved.

Park Orbit List Display

This feature enables you to monitor (view) the calls that are parked at your station.

To Display Parked Calls:

1. Press **MODE**.



If your telephone has a **CPM** button, press it and go to Step 3.

Your telephone must be idle to use the **MODE** button when displaying the Park Orbit List.

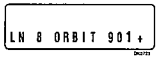
2. Press **6 4**.

The display shows that Line N N (where N N represents the Line number) is parked by you on Orbit XXX (where XXX represents the orbit number). The "+" sign indicates that there is more than one parked call at your station.

3. Press **SCRL** to monitor the next parked call.

This display indicates that CO Line 003 is parked by you at Orbit 900 (where 900 represents a different Orbit number).

4. Press **SCRL** to monitor the next parked call.



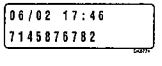
The first parked call is displayed again, indicating there are only two parked calls at your station.

Retrieve and Auto Dial Lost Calls

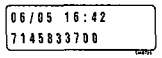
The system automatically saves the number for all ANI and Caller ID calls that ring at your telephone, but are unanswered (abandoned calls). You may view and Auto Dial the saved numbers by following the steps for retrieving lost calls.

To Retrieve Lost Calls:

1. Press **MODE** + **6 2**.



2. Press **SCRL** to view the saved information on the LCD display.



   - Press **#** to delete information on the LCD display.
   - Press ***** to go back to previous LCD screen.

3. Press **LCAD**.

If your telephone is equipped with a **LCAD** (Lost Call Auto Dial) button, you may auto dial a saved number by performing any of the following:

- Enter Class/ANI Information display **MODE** + **6 2**, and choose the number or name of the lost caller you want to contact.
- Press **PL**[2], and then **LCAD**.
- Press a **[DN]** button, enter the appropriate CO or LCR access code[2], then press **LCAD**.
- Press **CO**[2], then press **LCAD**.

Note:

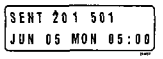
1. *The ANI/Caller ID received telephone numbers always include area codes on local calls as well as long distance calls. The DK280 system will always auto dial the digit "1" before the saved, outgoing telephone number.*
2. *If your telephone requires an account code be entered before dialing outside telephone numbers, enter the account code after access LCR or a CO line, then press the* **LCAD** *button.*

Station-to-Station Message Waiting

If there is no answer (or if the telephone is busy or DND), press the **MW/FL** button (or **7**). This causes the MW/FL LED on the called station to flash. The called station's LCD displays the calling station's number. When the returned call is answered, the flashing MW/FL LED will turn off.

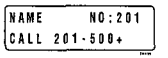
To Use Station-to-Station Message Waiting:

1. Lift the handset or press a **[DN]** to receive internal dial tone.
2. Dial the desired station number.
3. The calling station user presses the **MW/FL** (or **7**) to set the Msg LED on the called station.



The **[DNs]** after **SENT** are the **[DNs]** which received your message waiting indication signal, if you set a message waiting indication signal.

4. To answer the Msg LED indication from the called station, press the flashing **MW/FL** button.



5. To clear the Msg LED that you set on some other telephone's **[DN]** from the **[DN]** that sent the Message Waiting signal, press the **[DN]** button, dial the Directory Number that you set the MW signal on and press **MW/FL** twice (or **7 7**).
6. To clear the Msg LED from the **[DN]** that received the Message Waiting signal, press the **[DN]** + **# 4 0 9**.

Note:
Up to five message waiting displays may be stored on the LCD per each **[DN]** *owned by the telephone (***[PDNs]** and **[PhDNs]***). The station* **[DN]** *in the display will be called when the flashing* **MW/FL** *or* **[PhDN/MW]** *is pressed. To rotate the station numbers, press* **SCRL**. *The fourth message for each* **[DN]** *is reserved for the Message Center. The "+" sign on the LCD indicates that more than one message waiting signal was sent to your telephone.*

In this example, **[201]** received a message signal from **[500]**.

This clears all messages recorded to this station.

Voice Mail (VM)

Whenever your station is call forwarded to voice mail, certain digits will automatically be sent to the voice mail unit to direct the call to your mailbox. These codes require storage one time since they remain in memory until changed. They do not have to be stored each time you Call Forward your telephone. Your Primary Directory Number **[PDN]** and up to four Phantom Directory Numbers **[PhDNs]** can be independently call forwarded to unique or to the same voice mail boxes from your telephone.

Telephones must be programmed as the owners of a **[PhDN]** to be able to call forward the **[PhDN]** to a voice mail box number.

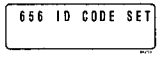
Assign a Voice Mail Message Mailbox

Assigning a mailbox to store messages:

1. Press a **[DN]**.

Press the **[DN]** that you want to assign a mailbox number. When you assign a mailbox for a **[DN]**, calls to that **[DN]** will be able to forward directly to the **[DN]**'s voice mailbox on the Toshiba voice mail system.

2. Press **# 6 5 6**.



3. Dial the digits (up to 16) and pauses to be sent.

The LCD displays the digits and pauses. These digits include special voice mail codes and the **[DN]** voice mailbox number. For example, for Toshiba voice mail systems dial 91NNN, where NNN is the mailbox number of the **[DN]** you pressed in Step 1.

4. Press **RDL** to store data.

You will hear a confirmation tone.

Assign Voice Mail Retrieval Digits

When you want to retrieve your messages from voice mail, certain digits will automatically be sent to the voice mail unit to play back your messages.

Assigning a mailbox for message retrieval for a Directory Number:

1. Press a **[DN]**.

Press the **[DN]** for which you want to retrieve messages.

2. Dial **# 6 5 7**.

The LCD displays "6 5 7 ID CODE SET".

3. Dial the required digits and pauses to be sent.

The LCD displays the data as it is entered. These digits include special voice mail codes and the **[DN]** mailbox number. For example, for Toshiba Systems dial 92NNN, where NNN is the **[DN]** mailbox number.

4. Press **RDL** to store data.

You will hear a confirmation tone—the LCD displays "DATA PROGRAMMED".

Retrieve Voice Mail Messages

To Retrieve Messages:

➤ Press the flashing **MW/FL** button assigned to the **[DN]**.

When a voice message is received for a **[DN]**, the voice mail system will cause the **MW/FL** button/LED to flash.

To Clear All Digits:

1. Press a **[DN]**.
2. Dial **# 6 5 6** or **# 6 5 7**.
3. Press **RDL**.

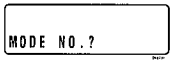
Busy Field Display

Your telephone must be idle to use the **MODE** button when Soft Keys are turned ON.

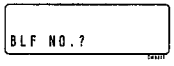
Note:
The Busy Lamp Field (BLF) mode will stop all other displays from appearing on your telephone LCD.

To Display Busy Field Status:

1. Press **MODE**.



2. Press **1**.



3. Enter the first one or two digits of a **[DN]** + **#**.

Enter the first digit of a 3-digit **[DN]** (e.g., 2 for 200) or the first two digits of a four-digit **[DN]** (e.g., 21 for 2100).

4. Press **PAGE** to rotate Busy Field groups.

To Exit Any Mode:

Mode Exit

1. Press **MODE**.

The LCD displays "MODE NO.?" Your telephone must be idle to use the **MODE** button when Soft Keys are turned ON.

2. Press **0**.

The LCD displays date/day/time.

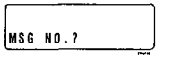
Messages and Memos 3

The LCD on your telephone can be used to send or receive messages to or from other LCD telephone users. The LCD can also display the names/numbers of the person calling your telephone or the name of the person you are calling. Names and memos can also be set to display with speed dial numbers and timed reminders.

Storing a Message in Memory

To Store a Message in Memory:

1. Press **LCD M** (or a **[PDN] + # 6 8**).



The LCD M LED flashes.

2. Enter the 2-digit message number to be stored.

Personal message (10 ~ 19); system message (60 ~ 99 port 00 only). The current message, if any, will be displayed.

3. Use the Recording a Message procedure to enter the message characters.

4. Press **LCD M** (or **SPKR**).

The LCD M LED lights steadily, and the LCD displays the message. The message will now be stored in system memory.

Recording a Message

Recording a Message, Name, or Memo

Use this procedure to enter the characters of a personal message (10 ~ 19) or system message (60 ~ 99, Station 200 only), to add to a preprogrammed message, or to edit and set a new message. After calling up a message on your display (see Storing a Message in Memory, Steps 1 and 2 on the previous page), perform one of the following procedures:

To Record a Message:

1. Press the **#** button to access alpha characters. See Figure 4 for an explanation of the dial pad buttons.
2. Press ✱ or **1** to move the cursor (–) to the desired position (the left edge of the display for a new message, or two spaces to the right of the preprogrammed message to add information).

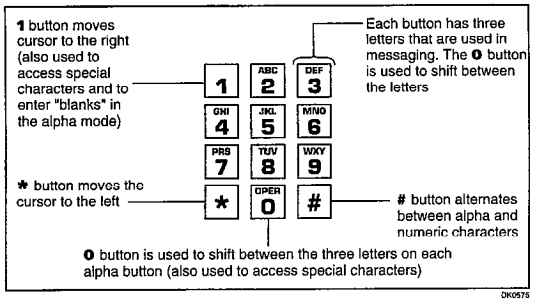


Figure 4
Dial Pad Information

3. Press the button that has the letter you want to enter. Use the **0** button to shift from letter to letter on the button.

   For example: If you press **3**, a "D" is displayed. By pressing **0**, the "D" is changed to "E". By pressing **0** again, the "E" is changed to "F". Press **0** again and the "F" changes to "D". To enter a space, press **1**.
4. If you want to enter a number, press the **#** button to change to numeric characters. Press the **#** button again to return to alpha characters.

   Numbers are also entered on the dial pad.
5. The following special characters are set by pressing **1** and then pressing **0** to step through the available characters:
   Q, Z, :, -, +, /.

Preprogramming System Messages

System messages can only be programmed or permanently changed at port 000, station number _____(usually 200). Five preprogrammed messages are automatically stored in memory when the Alphanumeric Messaging with LCD feature is initialized.

60) OUT TO LUNCH

61) IN A MEETING

62) CALL _____

63) BACK AT _____

64) RETURN ON _____

You can use these messages and add 35 more messages designed specifically for your system, or you can overwrite the initialized messages and program up to 10 of your own. Any messages programmed at port 000 will remain in memory until canceled from port 000 or until the system is reinitialized. After reinitialization, only the original five messages will remain in memory. System messages are written and stored in memory as explained in Storing a Message.

Adding to Preprogrammed Messages

When you select a message, it appears on your station display. A cursor (–) also appears immediately to the right of the last letter in the message. You can now input additional information (up to a total of 32 digits for each message). Some system messages may expect you to add more information. For example:

1. CALL _____
   - Add a station or outside telephone number.
2. BACK AT _____
   - Add the time you will return.

3. RETURN AT _____
   ■ Add the date you will return.

Note:
Refer to Recording a Message for adding to a preprogrammed message.

Messaging

Calling Station Messaging

To Create an LCD Message for Phones that Call Yours:

You can set a message that will appear on the LCD of telephones that call your telephone by following the instructions on the left.

1. Press **LCD M**

   - or -

   press a **[PDN]** + **# 6 8**.

   The LCD M LED flashes, and the LCD displays "MSG NO.?".

   ```
   MSG NO.?
   ```

2. Dial the number of the message you want.

   Personal message (10 ~ 19) and system message (60 ~ 99). The selected message is displayed. (To add to this message, use the procedure for "Recording A Message," found earlier in this chapter.)

3. Press **LCD M**

   - or -

   SPKR.

   The LCD M LED lights continuously, and the selected message will be set. The message will be sent to LCD telephones that call your telephone. If you have CF set on your telephone, press the **PAGE** button to display the message instead of CF.

Canceling a Calling Station Message

To Cancel a Message that Has Been Set at Your Station:

➤ Press **LCD M**

The LCD M LED goes out.

- or -

1. Press a **[PDN]** + **# 6 8**.

   The LED lights.

2. Press **SPKR**.

   The LED goes out. A personal message (10 ~ 19) will remain stored in memory.

Setting/Changing Calling Station Messages

You can set a completely new, personalized message by overwriting any of the existing preprogrammed messages. To do this, simply call up one of the messages as explained previously. When the cursor appears to the right of the message, shift it to the left margin and write your new message over the preprogrammed one. The new message will remain on your station until canceled. It will then be erased and the original preprogrammed message will be restored.

Notes:

1. *Refer to Recording a Message for leaving a new message at your station.*
2. *Messages will remain in memory until changed. The preprogrammed messages are never erased; only the user-added messages are erased.*

Storing LCD Name/Number Display

This feature allows you to use your telephone to store a title (such as your name, telephone number, location, etc.) in system memory. This title (e.g., LOBBY) will display on your station's LCD while it is idle, and it will appear at other stations' LCDs when they are called from your station. Your name will display on other telephone LCDs when they are used to call your telephone (Soft Keys must be turned on).

Name display information for non-LCD telephones or voice mail/auto attendant devices may be stored from station 200. When Name/Number is recorded for non-LCD telephones or other devices, their Name/Number is displayed on LCD telephones when called.

To Enter Name/Number Information:

1. Press a **[DN]** + **# 6 2 1**.

   Current information will appear on the lower line of the LCD.

   ```
   USER NAME?
   ```

2. Enter the new information via the dial pad.

   Refer to "Recording a Message" earlier in this chapter for dial pad instructions. Up to 16 characters can be recorded. It is recommended that you enter the station number along with the user's name (as shown in Step 3).

3. Press **SPKR**.

```
TOSHIBA EXT.200
DATE DAY TIME
```

The new information is stored and will appear on the top line of the display. For example, if you entered "TOSHIBA EXT. 200", that will appear above the date/day/time on the display.

To Clear Name/Number Display:

1. Press a [DN] + **# 6 2 0**.
2. Press **SPKR**.

During clear:

```
      NO. NNN
USER NAME RESET
```

After clear:

```
      NO. 200
DATE DAY TIME
```

You will hear a confirmation tone, then a busy tone.

Notes:

1. *When user name is set, your title will appear on the LCD during direct, forwarded, and hunted calls. On override or OCA calls, the LCD will not display the title.*
2. *After a name is cleared, it may be redisplayed at any time by pressing a* [DN] + **# 6 2 1**.
3. *A name is displaced by message and call forward settings if they are set.*

To Erase Name/Number Display:

1. Press a [DN] + **# 6 2 1**.

```
USER NAME?
```

Current information will appear on the lower line of the LCD.

2. Press **1** in the alpha mode to enter blanks.

To erase Name/Number information from memory, enter blanks at the "User Name" prompt. Refer to "Recording a Message" earlier in this chapter for more information.

3. Press **SPKR**

The erased Name/Number information should be gone.

To Enter Name/Number Information for Other Stations/Devices

1. Turn off Soft Keys by pressing **MODE** + **7 0**, when your telephone is idle.

Entering Name/Number information for other stations or devices is only allowed from Station 200.

2. Press a [DN] + **# 6 2 1**.

```
USER NAME?
```

Current information for station 200 will appear on the lower line of the LCD.

3. Press **PAGE**.

```
DEST EKT NO.?
```

In this display, "EKT" stands for the Primary Directory Number of the digital, electronic or standard telephone.

4. Dial the [PDN] of the station for which the Name/Number information is to be recorded.

```
DEST EKT NO.NNN
```

5. Press **PAGE**.

```
USER NAME?
_
```

"USER NAME?" appears on the upper line of the LCD, and current information for station NNN appears on the lower line of the LCD.

6. Enter the new information via the dial pad (refer to Recording a Message for method)

Up to 16 characters can be recorded. It is recommended that you enter the station number along with the user's name.

7. Press the **SPKR** button.

The new information is stored and appears on the top line of station NNN's LCD. Station 200's LCD returns to the normal idle display.

8. Repeat Steps 2 ~ 7 to enter more names/numbers.
9. To turn Soft Keys on again, press **MODE** + **7 1** when your telephone is idle.

To Erase Other Station's Name/Number Display:

➤ From station 200, repeat steps one through six of the previous procedure and press **1** in the alpha mode in Step 5.

Note:
You can set and clear the Name/Number feature anytime through Station NNN by :

- *Set: Press a* **[DN] + # 6 2 1**.
- *Clear: Press a* **[DN] + # 6 2 0**. *"Clear" eliminates the display when calling, but does not erase it from memory.*

Speed Dial Memo

This feature enables you to program a 12-character name for each of 40 personal speed dial numbers. The memo pad of names may be stepped through to select the appropriate party. Memos may also be added to the 40 or 100 system speed dial codes, depending on your system's size, via the station connected to port 000, station number _____ (usually 200).

To Program Speed Dial Names and Numbers:

1. Press **RDL**, then press **SDS**.

Press * if your telephone is not equipped with an **SDS** button.

2. Dial the desired speed dial code.

NN or NNN = Speed Dial Code. (10 ~ 49 from any station) or (60 ~ 99 or 600 ~ 699, depending on your particular system size, from station 200 only)

```
#-NN SPEED DIAL
```

3. Press **MODE**.

If a name was previously stored on this code, it will display on the top line of the LCD.

```
*10 NAME
    SPEED DIAL
```


4. Enter the name or memo (refer to Recording a Message for method).

The name will appear on the bottom line of the LCD as you enter it.

5. Press **MODE**.

The number will appear on the top line of the LCD as you enter it.

6. Enter the desired telephone number (16 digits maximum).
7. Press **RDL** to record data in memory.

The name can be up to 12 characters.

To Dial a Speed Dial Number:

1. Press **MODE** when telephone is idle.

The LCD displays "MODE NO.?".

2. Dial **8** NN or NNN.

The speed dial number appears with name or memo. NN or NNN = personal or system speed dial codes. Personal speed dial code numbers are 10 ~ 49, and system numbers, stored from station 200 only, are 60 ~ 99 or 600 ~ 699, depending on your system size.

3. Press **PAGE** to scan the directory for the appropriate number/memo.
4. Press any available **CO** button

   - or -

   press **[DN]** and press the CO line access code.
5. The number is dialed.

To Check a Speed Dial Number:

1. Press **MODE** + **8** when telephone is idle.

Note:
The station must be enabled via system programming for LCD message memory.

2. Dial a two-digit speed dial number.

Personal speed dial number (10 ~ 49) or system number (600 ~ 699).

3. Press **PAGE** to scan the directory for the appropriate number/memo.

If the number is longer than 16 digits, a "+" will appear in the far right corner of the display. Press **SCRL** to display the remaining digits.

Timed Reminders with Memo

This feature allows five separate messages to be set at each LCD station. These messages will be displayed at the times (hour and minute) set by the station user. They can either be displayed just once or repeated on a daily basis.

To Set a Timed Reminder with Memo:

1. Press a **[DN]**.
2. Dial a three-digit reminder number (**#605** ~ **#609**).
3. Enter the desired time for the message to be displayed.

The message time must be in 24-hour clock format (i.e., HHMM).

4. Dial **0** if the message is to be repeated every day, or **1** if it is a one-time message only.
5. Enter the desired message number, or 00 if no message should be stored.

Personal message (10 ~ 19) and system (60 ~ 99). The message does not display when setting a timed reminder—it displays when the reminder activates. Messages are set using the Record a Message method.

6. Press **RDL** to record the data in memory.

The LCD displays "DATA PROGRAMMED". You will hear a confirmation tone. The message will be displayed at the specified time, and a beeping tone will be heard for 30 seconds (or until it is canceled by pressing **MODE** + **0**).

Message Sending

The Alphanumeric Messaging feature on your LCD digital telephone enables you to set short text (up to 32 characters) at your station to ensure that you do not miss important calls. Any station may record a message; however, only stations with the LCD are able to display messages.

Stations that do not use Soft Keys (Soft Keys Off: **MODE** + **7 0**) may send messages "live" to other LCD station users. Soft Keys are not recommended for electronic telephones. To record messages, see the "Recording a Message" section in this guide.

Your system has up to 40 preprogrammed messages that may be sent to other LCD digital or electronic telephones. In order to leave a personalized message at your station, you can temporarily add or change any of these messages.

Some stations may record and save up to 10 personal messages to be used for all types of station messaging. This is a station option that is enabled in system programming.

Called Station Messaging

Your station number and a message indication may be sent to another LCD station. When that station responds, it will receive the message.

To Set a Called Station Message:

1. Press **MODE** + **7 0** to ensure that Soft Keys are off.
2. Dial the station Directory Number (station does not answer or is busy).
3. Press **MODE**.

The LCD displays "MODE?".

4. Press **4**.

The LCD displays "MW TO STNNN MSG NO?".

5. Enter the desired message number.

Personal message (10 ~ 19), system message (60 ~ 99). The LCD displays the message.

6. Press **MW/FL**.
7. Press **SPKR** or hang up to release.

"CALL XXX-YYYM" is displayed at the called station and the MW/FL LED flashes; "SENT MMM" is displayed at your station. XXX = the called **[DN]**, YYY = the **[PDN]** of the station that sent the message, M indicates that a message has been sent.

To Receive a Called Station Message:

➤ Press the **MW/FL** button. — Press these buttons when your telephone MW/FL LED is flashing

Group Called Station Messaging

This feature allows a station to set a Called Station Message for a group of stations.

To Set a Calling Station Message for Another Station:

1. Press **MODE**. — The LCD displays "MODE?".
2. Press **9 4**. — The LCD displays "MODE 94 DEST EKT NO. NNN?".
3. Dial the "destination" Directory Number (or enter **# 3 0** for all stations, or **# 3 1** ~ **# 3 8** for groups). — The LCD displays "MODE 94 DEST EKT NO.NNN" or the Station Group number. Enter **# 3 0** for all call page stations, or **# 3 1** ~ **# 3 8** to send the message to a group of stations.

   Station groups correspond to the same stations that are in respective Page groups assigned in system programming.
4. Press **PAGE**. — The LCD displays "MODE 94 ORG EKT NO.?".
5. Dial the "originating" **[PDN]**. — Your number or another station number. The LCD displays "MODE 94 ORG EKT NO.NN".
6. Press **PAGE**. — The LCD displays "MSG NO.?".
7. Enter the desired message's number. — The LCD displays the message.
8. Press **PAGE**. — The LCD displays "MSG NO.?".
9. Press **MODE**. — The LCD displays "MODE NO.?".
10. Press **0**. — At originating station, the LCD displays date/day/time, and then displays "SENT NNNM". At the destination station, the LCD displays the originating station number and a message indication.

To Receive a Called Station Message:

➤ Press **MW/FL**.

Remote Calling Station Messaging

To Set a Calling Station Message for Another Station:

1. Press **MODE** when your telephone is idle. — The LCD displays "MODE?".
2. Press **9 5**.
3. Dial the destination **[PDN]**. — The LCD displays "MODE 95 DEST EKT NO.NNN". This is the **[PDN]** to which the Calling Station message will be set.
4. Press **PAGE**. — The LCD displays "MSG NO.?".
5. Enter the desired message number. — The LCD displays the message.
6. Press **PAGE**. — The LCD displays "MSG NO.?".

   Note:
   Remote calling station messaging allows you to set a Calling Station message for only one station at a time.
7. Press **MODE**. — The LCD displays "MODE NO.?".
8. Press **0**. — Your LCD shows the time and date. The message is displayed at the "destination" station. Any station calling the "destination" station receives the message.

Busy Station Messaging

When reaching a busy LCD station, a message can be sent to that station (an audible tone will be heard). The busy station may also return a message to the calling station's LCD. The two stations may continue this procedure to carry on a "silent" conversation.

Note:
During this procedure, Soft Keys can be on; however, use of Soft Keys is not recommended on electronic telephones.

To Send a Message to a Busy Station:

1. Call the desired station.	Listen for a busy tone.
2. Press **MODE**.	The LCD displays "MODE NO.?".
3. Press **2**.	The LCD displays "OVER TO STNN MSG NO?".
4. Enter the desired message number.	Personal message (10 ~ 19) and system message (60 ~ 99). The LCD displays the message.
5. Press **PAGE**.	The LCD displays "MSG SEND". The destination station beeps four times and the message is displayed for 30 seconds, or until the originating station hangs up.

Return a Busy Station Message

You can return a Busy Station message after receiving a Busy Station message by following the steps on the left.

To Return a Busy Station Message:

1. Press **MODE**.	The LCD displays "MODE NO?".
2. Press **2**.	The LCD displays "OVER TO STNN MSG NO?".
3. Enter the desired message number.	Personal message (10 ~ 19) and system message (60 ~ 99). The LCD displays the message.
4. Press **PAGE**.	The LCD displays "MSG SEND".

January 1996

TOSHIBA

BUSINESS TELEPHONE SOLUTIONS

Standard Telephone User Guide

Strata® DK280

Digital Business Telephone Systems
Release 3

Contents

Introduction

This guide will acquaint you with the various features that are available to your telephone and will provide you with the necessary instructions to perform each feature. It contains instructions for operating a standard model 500/2500 telephone.

Organization

This user guide is comprised mainly of feature operation information:

- **Feature Operation** provides descriptions and operating procedures for all of the features available with standard telephones.

Conventions

Extra bold letters represent telephone buttons.

Your telephone may not have all of the buttons mentioned in this guide. See your Telephone System Administrator for more information on buttons and access codes.

~ means "through."

\+ is used for multiple key entries.
Example: Press **Speed Dial** + **XX** + **Redial** + **Spkr** (XX=08~60 seconds).

➤ denotes the step in a one-step procedure

Notes:
Elaborate specific items or reference other information.

IMPORTANT !
Calls attention to important instructions or information.

How to Use This Guide

Your telephone's specific calling allowances are determined by assignments made in system programming. Your System Administrator can tell you which features are actually accessible from your specific telephone. Once you are aware of these features, review each feature's description and operational procedure contained in this guide.

Information in this user guide is divided into two distinct areas. Step-by-step feature instructions appear in the left-hand column of the page. Explanations of these procedures appear in the right-hand column. (See Figure 1.)

Action Text
Specific instructions on how to perform a procedure are numbered and entered in the left-hand column.

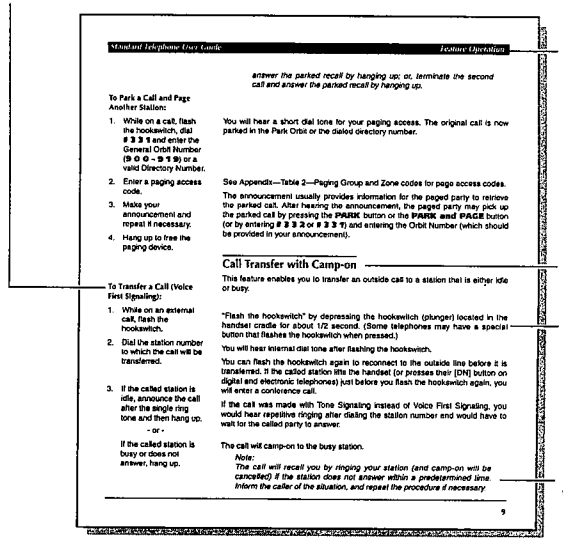


Figure 1
Sample Page

Feature Operation

Outside Calls

You can make calls to or receive calls from telephones outside of the Strata DK280 system.

To Make an Outside Call:

1. Lift the handset.

   You will hear internal dial tone.
2. Dial a CO line number access code.

   See Appendix—Table1—CO Line Access Codes. You will hear CO line dial tone after dialing the access code.
3. Dial the desired telephone number.

To Answer an Incoming Call:

1. You will hear ringing.

   The ringing pattern depends on parameters set in system programming. A distinct outside call ring pattern—0.4 seconds on, 0.2 seconds off, 0.4 seconds on, three seconds off—is available. Some systems may use the internal call ring pattern—one second on, three seconds off—for incoming outside calls.
2. Lift the handset and speak.

Internal Calls

You can make calls to and receive calls from other stations in the Strata DK280 system.

To Make an Internal Call (Voice First Signaling):

1. Lift the handset.

   You will hear internal dial tone.

2. Dial the desired station number.

If the called station is idle:

- If the system is set for Voice First Signaling, you will hear a single tone and should then make a voice announcement. (After dialing the directory number, you can dial **1** to change to the other signaling method, Tone Signaling.)
- If the system is set for Tone Signaling, you will hear repeated ring tones and you should wait for the call to be answered. (After dialing the directory number, you can dial **1** to change to the other signaling method, Voice First Signaling.)
- To leave a Message Waiting Indication at the called station, dial **7** or press **Msg**.

If you receive busy tone:

- To set Automatic Call Back (ACB), dial **4**.
- To activate Busy Override if the called digital or electronic telephone station is not equipped for Off-hook Call Announce (OCA), dial **2**. (Standard telephones cannot be equipped to receive OCA.)
- To activate OCA when calling digital or electronic telephones: For Voice First Signaling and if the called station is equipped for OCA, dial **2**. For Tone Signaling and if the called station is equipped for OCA.
  - Dial **2 1** if you hear busy tone.

  - or -

  - Dial **1 2** if you hear ringback tone (busy tone will be sent after dialing **1**, then OCA will be active after dialing **2**.)
- To leave a Message Waiting Indication at the called station, dial **7**.
- Hang up and try again later.

To Answer an Internal Call:

1. You will hear ringing.

   The internal ring pattern is one second ringing, three seconds of silence.
2. Lift the handset and speak.

   You will be connected to the calling party.

Automatic Callback

After reaching a busy or the Do Not Disturb (DND) mode, you may set Automatic Callback to have the system call you back when the called station is no longer busy or in the DND mode. Automatic Callback does not apply to outside calls.

To Set Automatic Callback (Voice First Signaling):

1. After reaching a busy station, press **4**.

   The busy tone will stop. You will hear dial tone for two seconds, then the busy tone will resume.
2. Hang up.

   You may make other calls while waiting for the called station to become available.
3. Your telephone will ring at a fast rate when the called station becomes idle.
4. Answer within three rings to prevent the callback from being cancelled.

   You will hear a single tone, as if making a regular internal call. (If you used Tone Signaling instead of Voice First Signaling, you would hear repetitive ringing.)

   If you hear busy tone after answering, it means the called party has already received or originated another call. Your request is not cancelled. You will be called again when the station becomes idle.
5. Make voice announcement and then converse.

To Cancel Callback:

1. Lift handset.
2. Dial **# 4 3**.
3. Hang up.

Call Forward

You can set your station to call forward to another station or voice mail under a variety of conditions, described in Step 2.

To Set Call Forward:

1. Lift the handset.

   You will hear internal dial tone.

2. Dial one of the following Call Forward access code:

   # 6 0 1 = CF-All Calls

   - **Call Forward-All Calls**—If your station is idle or busy and has this feature activated, all calls to it will forward immediately to another station that you preselect. Your station will not ring.

   # 6 0 2 = CF-Busy

   - **Call Forward-Busy**—Calls to your telephone while you are busy on another call will forward immediately to another station that you preselect if this feature is set. Calls will ring as normal if your telephone is idle.

   # 6 0 3 = CF-No Answer

   - **Call Forward-No Answer**—When this feature is set calls to your station will forward to another station that you preselect if you do not answer within a time that you designate.

   # 6 0 4 = CF-Busy/ No Answer

   - **Call Forward-Busy/No Answer**—When this feature is set calls to your station will forward immediately to a station that you preselect whenever you are busy on another call. Calls will also forward if you do not answer within a time that you designate.

   You will hear confirmation tone after dialing the access code.

3. Enter the Directory Number to which calls will forward.

4. If setting the No Answer or Busy/No Answer mode, press ✱ and enter the time in seconds, then press #.

   You can enter the amount of time that your telephone will ring before it forwards (08 ~ 60 seconds). Always enter two digits. If you do not wish to change the ring time, press ✱ then # to make the ring time the same as the last setting.

   You will hear a confirmation tone after pressing ✱ and then after pressing #.

5. Hang up.

Notes:

1. *You may continue using your phone in the usual manner while Call Forward is in effect.*
2. *If Call Forward is set:*
   - *CO lines that ring your station exclusively will forward—CO lines that ring more than one station will not forward.*
   - *CO line calls transferred to your station will forward.*
   - *Internal calls will forward.*
   - *Call Forward has priority over the hunt feature set in system programming.*

To Cancel Call Forward:

1. Lift the handset.

   You will hear internal dial tone.

2. Dial **# 6 0 1**.

   This code will cancel any of the Call Forward modes.

3. Hang up.

   You will hear confirmation tone again.

Call Forward—External

This feature enables you to forward new incoming calls to a destination outside of the system. Internal calls and transferred calls to your station will not forward with Call Forward-External, and only incoming Direct-In-Dial (DID) calls and calls over CO lines dedicated to ring your station will forward. Any of the other Call Forward modes can be set simultaneously with Call Forward-External. The other Call Forward modes will be active for internal and transferred calls.

To Set Call Forward-External:

1. Store the number that calls will be forwarded to at Station Speed Dial location 49. See ***IMPORTANT!***

   The Call Forward destination can be a telephone number over a CO line, a station over a tie line, or a station within your Strata DK280 system. Use the Speed Dial storage procedures detailed later in this guide to store the destination number.

   If the Call Forward destination is over a CO line, the CO line must appear only at your station. When forwarding to a destination over a CO line or tie line, include the appropriate CO line or tie line access code. See Appendix—Table 1—CO Line Access Codes.

   IMPORTANT !

   It is not necessary to store the CF-ext destination each time you set CF-ext; it will remain in system memory. Storing the CF-ext destination is only necessary the first time CF-ext is set or when the destination must be changed.

2. Lift the handset and dial **# 6 7 0**.

3. Hang up.

   Incoming calls will forward to the destination stored at Station Speed Dial Location 49.

To Cancel—Call Forward-External:

➤ Lift the handset and dial **# 6 7 0** to cancel Call Forward External.

Remote Call Forward—External Destination Change

If Call Forward-External mode is set at your station, you can change the forwarding destination from a telephone outside of the system.

The destination is normally an external Public Telephone Network Number, but could also be an internal Directory Number.

To Change the Destination Number:

1. Call into the Strata DK280 system over a CO line programmed for the Direct System Inward Access (DISA) feature.

   See the System Administrator for DISA telephone numbers.

2. Listen for ringback tone signal, then dial tone.

   Dial tone will be present for 10 seconds to allow direct dialing of **# 6 7 0** + the **[PDN]**. If a number is not dialed, the system automatically causes the DISA CO line to ring at telephones as a normal incoming call. Then, if the call is not answered within 15 seconds after the ringing starts, it will disconnect.

3. Enter **# 6 7 0**, then the Primary Directory Number of your station.

   You will hear a confirmation tone after entering **# 6 7 0** + your **[PDN]**.

4. Enter the Remote Call Forward-External security code (1 to 15 digits).

   You will hear a confirmation tone after entering the security code. See the System Administrator for the access code.

5. Enter the new destination number.

   Enter an internal Directory Number or enter a CO or tie line access code plus a public network telephone number (see Appendix—Table 1—CO Line Access Codes).

6. Press **#**.

To Cancel CF-ext Remotely:

➤ Enter **# 6 7 0** + your Primary Directory Number+ Remote Call Forward Security Code, then press **#**.

Call Hold

To Place a Call On Hold:

You can place a call on hold and then make another call.

1. While on a call, flash the hookswitch.

   "Flash the hookswitch" by pressing the hookswitch (plunger) located in the handset cradle for about 1/2 second. You will hear internal dial tone after hookflashing (Some telephones may have a special button which flashes the hookswitch when pressed.)

2. Dial **# 4 1** and hang up.

   You will hear a one-second burst of dial tone to confirm the call will be placed on hold. You may now originate or receive other calls.

To Return to the Held Call:

1. Lift the handset.

   You will hear dial tone.

2. Dial **# 4 2**.

   You will be reconnected with the held call.

Notes:

1. *If you do not return to the call within a designated time period, your telephone will ring to recall you.*
2. *If you are busy on another call when the held call recalls your station, you will hear two tone bursts of two beeps each, three seconds apart, in your handset.*
   - *The call will remain camped-on to your station indefinitely. When you terminate the second call, the first call will ring to your station.*
   - *You may put the second call on hold with Flash **# 4 1** and go back to the original call with Flash **# 4 2**. However, the only way to get back to the second call is to terminate that original call. Then use **# 4 2** to retrieve the second call or wait for it to recall.*

Call Park

By using the Call Park feature, you can hold an active call at any station or General Park Orbit, and then retrieve the call at the same or another station. Each parked call is assigned a unique orbit number, which will be used to retrieve the call. The orbit number can be assigned by you. Once you have parked a call, you may:

- Hang up and retrieve the parked call at a later time.
- Originate another call.
- Access a voice paging device to announce the parked call for pickup from another station.

To Park a Call:

1. While on a call, flash the hookswitch. — "Flash the hookswitch" by pressing the hookswitch located in the handset cradle for about 1/2 second. (Some telephones may have a special button which flashes the hookswitch when pressed.) You will hear dial tone.
2. Dial **# 3 3 2** and enter a General Orbit Number (**9 0 0** ~ **9 1 9**) or a valid Primary Directory Number. — You will hear a one second confirmation tone and the call will be parked at the orbit or Directory Number which is assigned with the orbit number that you have just entered. You may now originate or receive other calls. If an orbit number is busy, enter another number.
3. Hang up.

Notes:

1. *If your station is idle when the system timer expires, the parked call will automatically recall to your station.*
2. *If you make a new call and your station is busy when the parked call recalls, you will hear two tones of two short beeps, three seconds apart in your handset. You may then place the new call on hold and answer the parked recall by hanging up; or, terminate the second call and answer the parked recall by hanging up.*

To Retrieve a Parked Call:

1. Lift the handset. — You will hear dial tone.
2. Dial **# 3 3 2** and enter the Orbit Number that you used to park the call. — You will be reconnected to the parked call.

To Park a Call and Originate a New Call:

1. While on a call, flash the hookswitch, dial **# 3 3 1** and enter the General Orbit Number (**9 0 0** ~ **9 1 9**) or a valid Directory Number. — You will hear a short dial tone for your new call. The original call is now parked at the orbit with the orbit number that you have just entered. If an orbit number is busy, enter another number.
2. Dial the desired number. — You will be connected to the new call once the dialed destination answers. The original call remains parked at the Orbit with the Orbit Number that you have entered.

Notes:

1. *If your station is idle when the system timer expires, the parked call will automatically recall to your station.*
2. *If you make a new call and your station is busy when the parked call recalls, you will hear two tones of two short beeps, three seconds apart in your handset. You may then place the new call on hold and answer the parked recall by hanging up, or terminate the second call and answer the parked recall by hanging up.*

To Park a Call and Page Another Station:

1. While on a call, flash the hookswitch, dial **# 3 3 1** and enter the General Orbit Number (**9 0 0** ~ **9 1 9**) or a valid Directory Number. — You will hear a short dial tone for your paging access. The original call is now parked in the Park Orbit or the dialed directory number.
2. Enter a paging access code. — See Appendix—Table 2—Paging Group and Zone codes for page access codes.
3. Make your announcement and repeat if necessary. — The announcement usually provides information for the paged party to retrieve the parked call. After hearing the announcement, the paged party may pick up the parked call by pressing the **PARK** button or the **PARK and PAGE** button (or by entering **# 3 3 2** or **# 3 3 1**) and entering the Orbit Number (which should be provided in your announcement).
4. Hang up to free the paging device.

Call Transfer with Camp-on

This feature enables you to transfer an outside call to a station that is either idle or busy.

To Transfer a Call (Voice First Signaling):

1. While on an external call, flash the hookswitch. — "Flash the hookswitch" by pressing the hookswitch (plunger) located in the handset cradle for about 1/2 second. Some telephones may have a special button that flashes the hookswitch when pressed.
2. Dial the station number to which the call will be transferred. — You will hear internal dial tone after flashing the hookswitch.

   You can flash the hookswitch again to reconnect to the outside line before it is transferred. If the called station lifts the handset (or presses their **[DN]** button on digital and electronic telephones) just before you flash the hookswitch again, you will enter a conference call.
3. If the called station is idle, announce the call after the single ring tone and then hang up. — If the call was made with Tone Signaling instead of Voice First Signaling, you would hear repetitive ringing after dialing the station number and would have to wait for the called party to answer.

   - or -

   If the called station is busy or does not answer, hang up. — The call will camp-on to the busy station.

Note:
The call will recall you by ringing your station (and camp-on will be cancelled) if the station does not answer within a predetermined time. Inform the caller of the situation, and repeat the procedure if necessary.

Conference Calls

Strata DK280 enables you to participate in a variety of conference calls:

- Up to four stations (including your own) may be conferenced on internal.
- Up to three stations (including your own) may be conferenced with one CO line.
- Up to two stations (including your own) may be conferenced with two CO lines.

To Add a Station to an Existing Call:

1. While on either an external call or internal call, flash the hookswitch.

   "Flash the hookswitch" by pressing the hookswitch (plunger) located in the handset cradle for about 1/2 second. Some telephones may have a special button that flashes the hookswitch when pressed.

   You will hear internal dial tone after flashing the hookswitch and the call will be placed on hold. You will not hear the held party again until Step 4.

2. Dial the number of the station that you want to add to the call.

3. If you hear a single tone, voice announce the call and ask the party to pick up.

   The new party must pick up the handset or press their **[DN]** button to participate in a conference call.

   If the called station is busy, you can flash the hookswitch to return to the existing call.

4. Flash the hookswitch when the party answers.

   All parties will be conferenced.

5. Repeat Steps one to four to add another station to the conference.

To Conference By Adding a CO Line to a Call:

1. While on a CO line or internal call, flash the hookswitch.

   "Flash the hookswitch" by pressing the hookswitch (plunger) located in the handset cradle for about 1/2 second. Some telephones may have a special button which flashes the hookswitch when pressed.

   You will hear dial tone, and the existing call will be placed on hold. You will not hear the held party again until Step 4.

2. Dial a CO line number access code.

   See Appendix—Table 1—CO Line Access Codes.

   If the party is busy or does not answer, hang up to receive an immediate recall to return to the existing call.

3. Dial the desired telephone number you wish to add to the call.

   All parties will be conferenced. See Note 3 below.

4. Flash the hookswitch when the party answers.

   Two CO lines maximum can be conferenced. If only your telephone is connected with two parties on external CO lines, you must remain in the connection; if you hang up your telephone, the call will disconnect.

5. Repeat Steps one to four to add another CO line to the conference.

Notes:
1. *While a conference is being set up, all outside parties are held separately and cannot converse with each other.*
2. *If a four-party conference is set, either inside station will maintain the conference if the other hangs up. However, note that one station must remain in the conference to maintain the outside connections.*
3. *If the external telephone number is busy, hookflash to return to the original call.*

Door Phone

You can call a door phone and monitor the immediate area surrounding the door phone. Only digital and electronic telephone stations can be called by door phone users, but you can pick up these calls when they are incoming by lifting your handset and dialing a pick up access code.

To Call/Monitor a Door Phone:

1. Lift the handset.

   You will hear dial tone.

2. Dial the internal number for the desired door location.

DN		DN	
#151	Location _____	#157	Location _____
#152	Location _____	#158	Location _____
#153	Location _____	#159	Location _____
#154	Location _____	#161	Location _____
#155	Location _____	#162	Location _____
#156	Location _____	#163	Location _____

3. Hang up when the call is completed or when you no longer wish to monitor the door phone.

To Pick Up a Door Phone Call That Is Ringing Another Station:

1. You will hear a distinct ringing tone at a digital or electronic telephone, or on the paging speaker.
2. Lift the handset.
3. Dial **# 5 # 3 0**.

The phone will ring from one to five times, depending on system programming.

You will hear dial tone.

You will be connected to the door phone.

Flash CO Line

Some CO line features, such as conferencing, Centrex, or behind PBX operation require "flashing the CO line," to dial Centrex/PBX feature access code or extension numbers.

To Flash a CO Line:

1. Momentarily press the hookswitch for about 1/2 second.
2. Dial **# 4 5**.

The hookswitch is located in the handset cradle of your telephone. After you press the hookswitch, you will hear dial tone. This hookflashes the Toshiba system only.

You will hear Centrex or PBX dial tone. This hookflashes the Centrex or PBX system CO line. You may now dial a Centrex or PBX feature access code or extension number.

Account Code Calls

Account Codes can be used for a variety of reasons, including billing, call tracking, and line restriction applications. The system records the Account Codes and can print them out along with other call details on a Station Message Detail Recording (SMDR) report.

Forced Account Codes

Some applications may require that you enter an Account Code, called a Forced Account Code, before dialing a telephone number. Forced Account Codes can be recorded for outgoing calls only.

To Record a Forced Account Code:

1. Lift the handset.
2. Dial a CO line number access code.
3. Enter the Forced Account Code.
4. Dial the telephone number.

You will hear dial tone.

See Appendix—Table1—CO Line Access Codes. The CO line accessed must be set to require a forced Account Code in system programming.

You will hear dial tone after you press the last digit of a valid account code or busy tone after you press the last digit of an invalid code.

Emergency Override of Forced Account Code Dialing Requirements

Forced Account Code requirements can be bypassed by three emergency numbers, including 911. See your system administrator for these numbers:

1) 911 2) _____ 3) _____

Voluntary Account Codes

Voluntary Account Codes are optional and can be entered anytime after accessing a CO line or during a call.

To Record a Voluntary Account Code:

1. After accessing a CO line or while talking on a line, flash the hookswitch.
2. Dial **# 4 6**.

"Flash the hookswitch" by pressing the hookswitch (plunger) located in the handset cradle for about 1/2 second. Some telephones may have a special button that flashes the hookswitch when pressed.

You will hear dial tone; the CO line will be on Hold.

You will hear CO dial tone after dialing **# 4 6** or if you were talking, the speech path to you will be reconnected in one direction only so the outside caller cannot hear you or the account code entry, but you will still be able hear the outside caller.

3. Enter the Voluntary Account Code.

If dialing a Verified Voluntary Account Code, you will hear one confirmation burst tone if you dial a valid number. If you dial an invalid code, you will hear two burst tones. (Repeat Steps 1 ~ 3 to try again.) Voluntary account codes must be entered before the call is disconnected. CO dial tone will stop after you dial the first digit of the telephone number.

If you enter the code after accessing a CO line, you will hear CO line dial tone after entering the code. If you enter the code while talking, the speech path will be restored in both directions after you enter the valid account code.

4. Dial a telephone number if you entered the code after accessing the CO line

   - or -

   resume talking or hang up if you entered the code after you finished talking.

Verified Account Codes

Some Strata DK280 systems require that specific codes (called Verified Account Codes) set in system memory must be entered when inputting Forced or Voluntary Account Codes.

Message Waiting Indication

If your station is idle or busy on a call while another station tries to contact you, the calling station can leave a message waiting indication on your telephone by activating the message waiting lamp. Once activated, the message waiting lamp will flash. You can call the station that has left the message waiting indication, or turn off the flashing light by entering the appropriate access code. Voice mail devices, as well as people, can leave message waiting indications.

Up to four Message Waiting indications may be left at a station at one time. One of the indications is reserved for the Message Center set in system programming.

To Answer a Message Waiting Indication on Your Telephone:

1. Lift the handset.

   You will hear dial tone.

2. Dial **# 4 0 8**.

   Your phone will ring the station or voice mail device that set the indication. If there is no answer, hang up and try at a later time. (The LED will continue to flash red.)

3. After receiving the message, hang up.

   If the message waiting lamp continues to flash, you have more messages—repeat Steps 1 ~ 3 to retrieve them.

To Cancel the Indication Set on Your Telephone:

1. Lift the handset.

   You will hear dial tone.

2. Dial **# 4 0 9**.

   All Message Waiting indications will be cancelled.

Set Message Waiting On Other Telephones

After reaching a busy or unanswered telephone equipped with a message waiting indicator, you can set a Message Waiting Indication on the called telephone. A flashing lamp or LED at the called telephone will indicate that a call is waiting. The station user can press the button associated with the flashing LED or enter **# 4 0 8** to call you back.

To Set a Message Waiting Indication on Another Telephones:

1. If a called telephone station is busy or doesn't answer, dial **7**.

   The Message Waiting indication will be set at the station. If you are calling a standard telephone, the telephone must be equipped with a message waiting lamp. All Toshiba digital or electronic telephones have message waiting indications.

2. Hang up.

To Cancel the Message Waiting Indication on Another Telephone:

1. Lift the handset and dial the station number on which you left the indication

   You will hear busy tone if the called station is busy, or you will hear repetitive ringing or a single tone if the called station is idle.

2. Dial **7 7**.

   The Message Waiting indication on the station will be turned off.

Override Calls

Busy Override enables you to send a tone to a busy station to indicate that a call is waiting, and Do Not Disturb Override lets you send a tone to an idle station in the Do Not Disturb mode to indicate that a call is coming in. Executive Override enables you to enter an established conversation. Executive Override and Do Not Disturb Override are optional features enabled in system programming. Any station can initiate Busy Override.

Busy Override

To Initiate a Busy Override Signal:

➤ After reaching a busy station, dial **2** or if you have OCA, dial **2 1** or **1 2**.

After you dial **2**, a tone signal will be heard at the busy station, indicating a waiting call.

If the Off-hook Call Announce (OCA) option is installed on the busy station, then you may talk.

Do Not Disturb Override

To Initiate a Do Not Disturb Override Signal:

➤ After reaching a Do Not Disturb station, dial **2**.

After you dial **2**, a tone signal will be heard at the Do Not Disturb station, indicating that a call is coming in.

Your station must be enabled in system programming to initiate a Do Not Disturb Override signal.

Executive Override

To Initiate Executive Override:

➤ After reaching a busy station, dial **3**.

After you dial **3**, you will enter the conversation. An optional tone signal may be heard by the called parties prior to your entrance.

Your station must be enabled in system programming to initiate Executive Override.

Paging Announcements

You can make page announcements to digital and electronic telephone speakers and external speakers. Telephones are assigned to specific page groups in system programming. A page can be sent to external speakers (all zones), if enabled in system programming.

To Page:

1. Lift the handset. — You will hear dial tone.
2. Enter a page access code. — See Appendix—Table 2—Paging Group and Zone Codes.
3. Make your announcement in a normal voice level and then repeat the announcement.
4. Hang up when you have completed your announcement.

Repeat Last Number Dialed

This feature enables you to automatically redial the last number called with the touch of a button.

To Redial the Last Number Dialed:

1. Lift the handset. — You will hear dial tone.
2. Dial the **# #**. — The system will automatically dial the last telephone number you dialed.

Speed Dial

Speed Dial enables you to call a telephone number by dialing a brief access code, instead of having to dial the entire telephone number. There are two types of Speed Dial numbers: Station Speed Dial numbers, which you can assign to buttons on your own station and System Speed Dial numbers, which are assigned from Station 200 only (typically the system administrator's or operator's station), but they can be used by other stations.

To Store a Station Speed Dial Number:

1. Lift the handset. — You will hear dial tone after you lift the handset.
2. Dial **# 6 6**. — You will hear a short tone after you dial **# 6 6**.
3. Dial **# ✱**.
4. Enter the access code (1 0 ~ 4 9) where you wish to store the telephone number. — Station Speed Dial number access codes are 1 0 ~ 4 9.
5. Dial the CO line number access code to be stored. — See Appendix—Table 1—CO Line Access Codes.
6. Enter the telephone number. — The number can be up to 20 digits, including the CO line access code.
7. Dial **#**. — You will hear confirmation tone once the CO line access code and the telephone number are stored. They will be automatically dialed when you enter the Speed Dial access code.

   Repeat this procedure to replace the stored telephone number with a new one.

To Make a Call with a Station or System Speed Dial Code:

1. Lift the handset. — You will hear dial tone after you lift the handset.
2. Dial **✱**. — You will continue to hear dial tone.
3. Dial a Speed Dial access code. — Personal Speed Dial codes are 1 0 ~ 4 9, and System Speed Dial codes are 6 0 ~ 9 9 or 6 0 0 ~ 6 9 9 depending on your system size. (Dial tone continues as you dial the access code.)

   The system will automatically dial the telephone number assigned to the dialed code.

Tone/Voice First Signaling

Your Strata DK280 system may be set for Tone Signaling or Voice First Signaling as the standard internal call signaling method for calls to digital and electronic telephones. The Tone Signal consists of repetitive ring tones, while the Voice First Signal consists of a tone burst followed by the caller's voice. Standard telephones always ring with Tone Signaling, no matter what the system signaling method. When you initiate a call, you can change to the alternate signaling method.

To Change the Signaling Mode:

1. Call an internal digital/electronic telephone. — If the signaling mode is set for Voice First Signaling, you will hear a single tone burst followed by the caller's voice or sounds from the surrounding area of the called telephone. If the signaling mode is set for Tone Signaling, you will hear repetitive ringback tone.
2. To change the mode, dial **1**. — The call will stop ringing, and you will hear a tone burst, if you changed from Tone Signaling to Voice First Signaling. You can converse after the tone burst.

   The call will begin to ring at the station, if you changed from Voice First Signaling to Tone Signaling.

CO Line Queuing

CO Line Queuing enables you to be placed in a waiting queue for a CO line after dialing a line group in which all lines are busy. You will be called back when a line in the group becomes available.

To Set CO Line Queuing:

1. If all outgoing lines are busy, you will hear busy tone after dialing a CO line access code.
2. Dial **4**. — The busy tone will stop when you dial **4**. You will hear dial tone for two seconds, then the busy tone will resume.
3. Hang up. — You may make other calls while waiting for a line to become available.
4. Your telephone will ring at a fast rate when a CO line becomes idle.

5. Answer within three rings to prevent the callback from being cancelled.

   You will hear CO dial tone. (If you hear busy tone, it means the line has already been seized or has received an incoming call. Your request is not cancelled. You will be called again the next time a line becomes idle.)

6. Dial the desired telephone number.

   If the original call was made using Least Cost Routing (LCR) by dialing **9**, the telephone number will have been automatically dialed in Step 4.

7. Hang up when the call is completed.

To Cancel CO Line Queuing:

➤ Lift the handset and dial **# 4 3**.

CO Line queuing will be cancelled.

Call Pickup

You can pick up a call that is ringing another station, a call placed on hold at another station, and other types of calls with the Call Pickup feature.

To Use Call Pickup:

1. Lift the handset and dial **# 5**.

   See Appendix—Table 3—Call Pickup Codes.

2. Enter a Call Pickup code.

Pickup Calls Within Your Group

Stations may be assigned in system programming to Pickup Groups. As many as 20 groups can be created to enable you to easily pick up incoming (new or transferred) or internal calls that are ringing stations in your group or in other groups. You may belong to more than one group. See the System Administrator for group assignments.

To Pick Up a Call that is Ringing in your Pick Up Group(s):

➤ Lift the handset, then dial **# 5 # 3 4**.

You will be connected to the call after dialing the access code.

Pickup Calls to Other Groups

To Pick Up a Call that is Ringing in Another Group:

1. Lift the handset.

   You will hear dial tone.

2. Dial **# 5**, then the access code of the group that the station belongs to (**# 3 2 0** ~ **# 3 3 9**).

   You will be connected to the call after dialing the group access code. If the called station belongs to more than one group, any of the Group Pickup codes associated with those groups will pick up the call.

   Note:
   These group pickup access codes can be entered into a speed dial location for easier access.

Direct Inward System Access (DISA)

Outside callers with telephones that send Dual-tone Multi-frequency (DTMF) tones (push-button dialing) can call in on CO lines programmed for DISA and dial stations or outgoing CO lines without going through an attendant or operator.

To Make a Direct Inward Station Call with DISA:

1. From outside the system, call the DISA CO line telephone number:

   ——-————.

   See the System Administrator for this number.

2. Listen for the repetitive ringback tone signal, then listen for the dial tone.

   Try again if you hear busy tone.

   Dial tone will be present for 10 seconds to allow direct dialing of a station internal number or CO line access code. If a number is not dialed, the system automatically causes the DISA CO line to ring at telephones as a normal incoming call. Then, if the call is not answered within 15 seconds after the ringing starts it will be disconnected.

   You will be connected when the station answers.

3. Dial the Directory Number of the desired station.

   If you receive busy tone or wish to dial another number while ringing the station, press the ✱ button to receive dial tone.

   If the call is not answered after 6 rings or 24 seconds, whichever occurs first, busy tone will be sent. Dial ✱ to access dial tone, then dial the same or another number. To call another station after completing a DISA station call, the internal party must transfer you. Station and System Page cannot be accessed on DISA calls.

To Make an Outgoing Call with DISA:

1. From outside the system, call the DISA CO line telephone number:
   ____-_____.

   See the System Administrator for this number.

2. Listen for repetitive ringback tone, then listen for dial tone.

   Try again if you hear busy tone.

   The dial tone will be present for 10 seconds to allow direct dialing of a station internal number or CO line access code. If a number is not dialed, the system automatically causes the DISA CO line to ring at telephones as a normal incoming call. Then, if the call is not answered within 15 seconds after the ringing starts it will disconnect.

3. Dial a CO line number or line group access code.

   See Appendix—Table1—CO Line Access Codes.

4. If a DISA security code is required, dial the code and listen for CO dial tone.

   If required, see the system administrator for this number. If the correct code is not entered, the call will be disconnected.

   -or-

   If a DISA security code is not required, you will hear CO dial tone.

   A timer tone that is audible to both parties will sound approximately four minutes after the call was made. Dial 0 to reset the timer each time the tone sounds for an additional four minutes. If you fail to dial 0, the call will disconnect approximately one minute after the tone.

5. Dial a telephone number.

Attendant Console Calling

Up to four Attendant Consoles can be installed per system. There can be up to three ways to call the Attendant Console, depending upon system programming.

To Call Any Attendant Console:

➤ Lift the receiver and dial **0**.

The call will ring the Attendant Console's **0** button. Dialing **0** calls rotate between the consoles if more than one console is installed.

To Call a Particular Console:

➤ Lift the receiver and dial the console's Directory Number
   _____.

The call will ring the console's **[DN]** button. Your System Administrator can provide the Attendant Console(s) internal number(s).

Emergency Calls to the Attendant Console

To Make an Emergency Call to a Console:

➤ Lift the receiver and dial the emergency access code **# 4 0 0**.

The call will ring the console's EMGR button.

Appendix

This Appendix contains access codes which are used in some procedures. They can be stored individually or as part of a sequence on speed dial locations for easier use.

Table 1
CO Line Access Codes

With some systems, you may only have to dial one of the codes

9	General group code or Least Cost Routing (LCR)[1]
801-816	Line Group code[2]
#7001-#7144	CO line access code[2] (Use **447001-447144** if you have a rotary telephone or when you are storing on an **SD** or as a Speed Dial code since **#** indicates the end of a Speed Dial entry.)

Notes:

1. *If you press* **9** *in a system programmed with LCR, you may or may not hear internal dial tone, depending on system programming.*
2. *You can program these longer codes onto an* **SD** *button for easy one-touch access (see Table 4) or request a* CO **Line** *button from your System Administrator.*

Table 2
Paging Group and Zone Codes

Paging Group Codes		Paging Zone Codes
#311—Group A	**#315**—Group E	**#35**—Zone A
#312—Group B	**#316**—Group F	**#36**—Zone B
#313—Group C	**#317**—Group G	**#37**—Zone C
#314—Group D	**#318**—Group H	**#38**—Zone D

Enter code **#30** to page stations assigned to the **All Call Page** group.
Enter code **#39** to page stations assigned to the **All Call Page** group and possibly **external page zones**, depending on system programming.

Table 3
Call Pickup Codes

To Pick Up	Dial
■ A call ringing or held at a station	Station Primary Directory Number
■ A telephone group page, internal call, or door phone call ringing a station	**#30**
■ An external page	**#35**
■ A CO line on hold. Substitute **44** for **#** if you are storing on an **SD** or as a Speed Dial Code.	**#7001 ~ #7144**
■ A ringing CO line	**9**

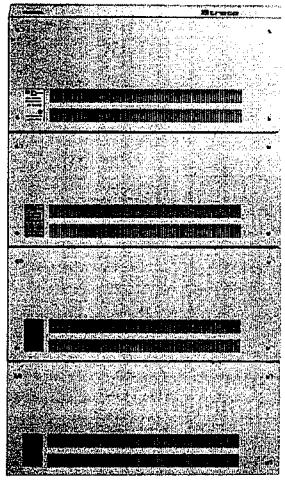
TOSHIBA

BUSINESS TELEPHONE SOLUTIONS

System Administrator Guide

Strata® DK280

Digital Business Telephone Systems
Release 3



Contents

Introduction

This guide is designed for the telephone System Administrator of the Strata DK280 systems. The telephone System Administrator is generally the individual responsible for assigning the user names that appear on the station display, managing station relocation, assigning Direct Inward System Access (DISA) security codes, toll restriction override access codes, and verified account codes.

IMPORTANT !

This System Administrator Guide contains information and procedures that are not available to the average telephone user. These procedures are meant to be performed by the System Administrator or by someone designated to have access to a specific System Administrator's telephone. The System Administrator has the responsibility of using certain proprietary codes for providing or restricting features to telephones with the Strata DK280 systems. This guide is not intended for general use and should be kept in a secure place.

The System Administrator should have a copy of the *Strata DK280 General Description* for Release 3 software as well as any appropriate user guides. See "Reference Documentation" later in this chapter.

Equipment Notes

1. Most of the operations in this guide require a Liquid Crystal Display (LCD) digital telephone at the System Administrator's work station.
2. Typically, station 200 is used to perform the functions in this guide. However, a different digital station may have been assigned by the system installer.

Organization

This guide is divided as follows:

- **Chapter 1—Setting System Parameters** contains descriptions and procedures for Changing Codes, Date/Time/Day Adjustment, Speed Dial and Button Programming.
- **Chapter 2—Station Relocation** describes how to reassign a station's features to another location through Automatic Relocation (which generally involves physically moving a telephone to its new location), or through Special Dial Relocation, which allows you to reassign telephone features through programming.
- **Chapter 3—Auto Attendant** describes the Auto Attendant CO line assignments, the Dialing Plan, and contains recommendations for recording Auto Attendant messages.
- **Appendix A**—provides blank directories for recording User Names/Numbers and Speed Dial memos.
- **Appendix B**—provides a blank chart for recording telephone locations and instructions for displaying **[DN]**, physical port, and logical port information.
- **Appendix C**—provides feature access code sequences which can be stored onto **SD** buttons for one-touch feature access.

Conventions

Bold letters in [brackets] represent buttons which have Directory Numbers on them. For example:

[DN] = any Directory Number button (also known as an Extension or Intercom Number).

[PDN] = Primary Directory Number button (the Extension Number for your telephone).

[PhDN] = Phantom Directory Number button (an additional Directory Number).

Extra bold letters represent telephone buttons.

~ means "through."

\+ is used for multiple key entries.
Example: Press **Speed Dial** + **XX** + **Redial** + **Spkr** (XX=08~60 seconds).

➤ denotes the step in a one-step procedure.

Notes:
Elaborate specific items or reference other information. Within some tables, General Notes apply to the entire table and numbered Notes apply to specific items.

IMPORTANT !
Calls attention to important instructions or information.

Technical Notes

Your telephone may not have all of the buttons mentioned in this guide. Refer to the Feature Access Code Table in the back of this book for access codes and speed dial code storage. Use the **#** button if your telephone does not have a **Redial** button.

How to Use This Guide

Information in this user guide is divided into two distinct areas. Step-by-step feature instructions appear in the left-hand column of the page. Explanations of these procedures appear in the right-hand column. (See Figure 1.)

Supporting Documentation

Other Strata DK280 documentation which may be helpful is listed below:

- General Description
- Digital Telephone User Guide
- Digital LCD Telephone User Guide
- Electronic Telephone User Guide
- Electronic LCD Telephone User Guide
- Standard Telephone User Guide
- Add-on Module/DSS Console User Guide
- PC/Data Interface User Guide

Action Text
Specific instructions on how to perform a procedure are numbered and entered in the left-hand column.

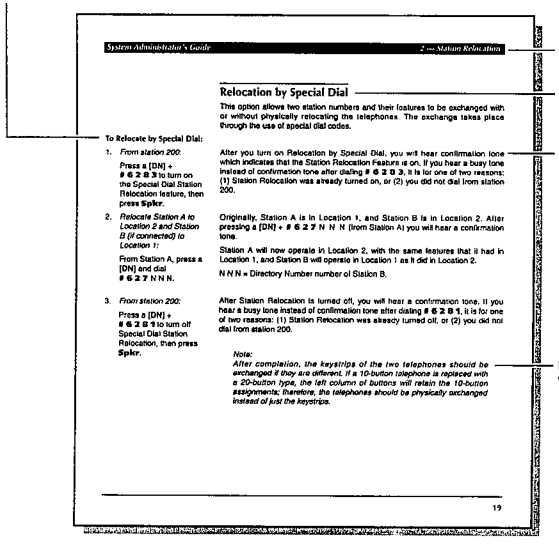


Figure 1
Sample Page

Setting System Parameters 1

For security reasons, some codes can be added, deleted, or changed **only by the Administrator**. The System Administrator's telephone must be enabled in system programming to change each of the following codes. The following codes fall under the above mentioned category:

- Direct Inward System Access (DISA) Codes
- Toll Restriction Override/Traveling Class Codes
- Verified Account Code
- Night Transfer Lock Security Codes

To Turn Soft Keys On:

➤ Press **Mode** + **7 1**.

To Turn Soft Keys Off:

➤ Press **Mode** + **7 0**.

IMPORTANT !

The Liquid Crystal Display (LCD) examples in this guide are shown with soft keys turned OFF. If your telephone has soft keys turned ON, the displays may be different, but they will still allow you to follow the steps in this guide. Generally, the information shown on line 2 will display on line 1 when soft keys are on.

Direct Inward System Access (DISA) Security Code

The Direct Inward System Access feature is used when calling into your system from the outside. This feature is available on certain CO lines or designated stations, and is assigned by the system programmer. CO lines can be DISA lines in the Day, Day 2, or Night mode, or any combination of these modes.

If a caller enters the system via a DISA line, the caller can then access another line to exit the system, in which case the outgoing line call will be charged as a call made from the DK280 system. To prevent unauthorized outgoing calls through the system using the DISA feature, enter a DISA security code as shown in the following numbered steps (on the left):

IMPORTANT !

Whenever the DK280 built-in Auto Attendant is installed, the DISA security code should be used (and changed periodically) to prevent unauthorized access of outgoing CO lines via the Auto Attendant DISA access feature.

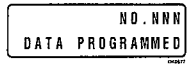
To Enter or Change the DISA Security Code:

1. Press a **[DN]** + **# 6 5 8.**

   You will hear a confirmation tone.

2. Dial the new DISA security code (1 ~ 15 digits).

   The DISA security code digit length is a system program option. The code will appear on the LCD as you enter it.



3. Press **Redial**.

   You will hear a confirmation tone. If your telephone does not have the **Redial** button, press **#**.

4. Press **Spkr**.

   The telephone will return to the idle mode after you press the button.

To Cancel the DISA Security Code:

1. Press a **[DN]** + **# 6 5 8**.

   You will hear a confirmation tone. If the DISA code is canceled, outgoing access of CO lines on DISA calls will not require a security code.

2. Press **Redial**.

   The telephone will return to the idle mode after you press the button.

3. Press **Spkr**.

Toll Restriction Override/Traveling Class Codes

As a System Administrator, you can provide Toll Restriction Override for any station or change a station's normal class to another class (Traveling Class). To add, change or delete Toll Restriction Override or a Traveling Class code, the following steps must be performed from a station that was selected in system programming (usually station 200).

To Add/ Delete/Change Toll Restriction Override or Traveling Class Codes:

1. Press a **[DN]** and dial Traveling Class Codes or Toll Restriction Override change access code.

   You will hear a confirmation tone.

   The codes are as follows:

   - For Traveling Class 1, dial **# 6 9 1**.
   - For Traveling Class 2, dial **# 6 9 2**.
   - For Traveling Class 3, dial **# 6 9 3**.
   - For Traveling Class 4, dial **# 6 9 4**.
   - For Traveling Classes 5 ~ 8, dial **# 6 9 5** ~ **# 6 9 8**. (Not available on all systems.)
   - For "Override All" Code 1, dial **# 6 5 4**.
   - For "Override All" Code 2, dial **# 6 5 5**.

2. Dial a desired four-digit override code.

   The code will appear on the LCD as you enter it and you will hear a dial tone.

3. Press **Redial** to store the code.

   You will hear a confirmation tone and the code will be stored in memory. Press **RDL** or **#** if your telephone does not have a **Redial** button.

Notes:

1. *When making outgoing calls, dialing the Traveling Class code will put the telephone in the Toll Restriction class of the code that was dialed.*
2. *When making outgoing calls, dialing the Override All code, overrides all toll restrictions that may be normally applied to the telephone.*

4. Repeat Steps 1 ~ 3 to enter up to eight Traveling Class codes and two Toll Restriction Override codes.
5. Press **Spkr**.

The telephone will return to the idle mode after you press the button.

Note:
The LCD responses shown in this procedure are the ones that are displayed when the Soft Key feature is deactivated.

To Delete Toll Restriction Override or Traveling Class Code:

1. Press a **[DN]** and dial the assigned Toll Restriction Override change access code.
2. Press **Redial**.
3. Press **Spkr**.

You will hear a confirmation tone.

You will hear confirmation tone.

The telephone will return to the idle mode after you press the button.

Verified Account Codes

Adding, deleting, or changing Verified Account Codes can be done at designated stations only. The privileged stations are assigned by the system programmer.

To Add or Change Verified Account Codes:

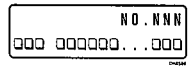
1. Press a **[DN]** + **# 6 5 9**.

You will hear a confirmation tone.

2. Dial the desired three-digit verified account code reference number (**0 0 0 ~ 2 9 9**).

The system memory can store a total of 300 account code numbers for the DK280. The numbers are referenced sequentially from 000 through 299. The account code number will appear on the LCD as you enter it. As you enter the account code, the words "VERIFY ACC SET" scroll to the left as the numbers appear on the display.

3. Dial the verified account code. The system is programmed for __ digits.



The account code digit length is assigned in the system programming. Account codes can be 4 ~ 15 digits long; the number of digits is set system wide for all account codes in system programming. The code will appear on the LCD as you enter it.

4. Press **Redial** to store the code.

You will hear a confirmation tone.

5. Press **Spkr**.
6. Repeat Steps 1 ~ 4 to enter more verified account codes.

The telephone will return to the idle mode after you press the button.

Note:
The LCD responses shown in this procedure are the ones that are displayed when the Soft Key feature is deactivated.

To Delete Verified Account Codes:

1. Press a **[DN]** + **# 6 5 9**.
2. Dial the three-digit verified account code reference number (000 ~ 299) to be deleted.
3. Press **Redial**.
4. Press **Spkr**.

You will hear a confirmation tone.

You will hear a confirmation tone.

The telephone will return to the idle mode after you press the button.

Night Transfer

This feature button enables you to forward Strata DK280 system CO line calls to an after-hours destination, as assigned in programming. There is an associated lock and password for this feature.

To Forward CO Calls for Night Transfer:

➤ Press **Night Transfer**.

Night Transfer Lock/Unlock Password

The Night (NT) Lock/Unlock Mode enables a designated station (usually station 200) or an attendant console to lock the system into the Day, Day 2, or Night mode. By setting the system into different modes, incoming CO calls can be routed to different destinations. In order for station 200 or the attendant console to perform such routing, it must be assigned with **Night Transfer** and **Night Lock** buttons via system programming. Up to four **Night Transfer** and **Night Lock** buttons are allowed. Check with the system installer for any additional information.

To Assign or Change Night Lock/Unlock Password:

1. Do not lift the handset.
2. Press **[DN]** + **# 6 2 2 X**.

   After you press a **[DN]**, the LCD will prompt you to enter a four-digit password.

   X = 1 ~ 4, representing Tenant 1 ~ Tenant 4 CO line groups.

```
        NO.200
ENTER PASS CODE
```

3. Enter a four-digit password.

   As you are enter the password, the digits will be displayed on the LCD.

```
        NO.200
          XXXX
```

4. Press **Redial**.

   You will hear confirmation tone.

```
        NO.200
DATA PROGRAMMED
```

5. Hang up.

   You have now assigned the password for using the NT Lock/Unlock function.

```
        NO. 200
DEC 15 WED 02:00
```


Night Transfer Lock Mode

After setting the **Night Transfer** button into the desired ring mode (Day/Day2/Night), you may lock **Night Transfer** using the accompanying steps below.

To Set the System in Night Lock Mode:

1. Do not lift the handset. Press **Night Transfer** to set the system into the Day or Day2 or Night Mode.
2. Press **Night Lock**.

   The Night Lock LED will flash. The LCD will prompt you to enter your password.

```
        NO. 200
ENTER PASSWORD
```

```
        NO.200
          YYYY
```

   Y = Password digits

3. Enter your password and press **Night Lock** again.

   If the correct password has been entered, the Night Lock LED will remain. If an incorrect password has been entered, the Night Lock LED turn off and the LCD will display "PASSWORD ERROR".

```
NT LOCK
DEC 15 WED 02:00
```

Date/Time/Day Adjustment

The Date/Time/Day display which appears on all LCD telephones can only be set from station 200 or an attendant console.

To Set Date:

1. Leave the handset on-hook and press a **[DN]** + **# 6 5 1**.
2. Dial the date (YYMMDD).

   Dial year/month/day in the format YYMMDD. Enter a leading 0 for any single-digit month or day.

3. Press **Redial**.

   You will hear a confirmation tone.

4. Press **Spkr**. — The telephone will return to the idle mode after you press the button.

To Set Time:

1. Place the handset on-hook.
2. Press a **[DN] + # 6 5 2**.
3. Dial the time (HHMMSS). — Dial hour/minute/ second in the 24-hour clock format HHMMSS. Enter a leading 0 for any single digit entered.
4. Press **Redial**. — You will hear a confirmation tone.
5. Press **Spkr**. — The telephone will return to the idle mode after you press **Spkr**.

To Set Day of the Week:

1. Place handset on-hook.
2. Press a **[DN] + # 6 5 3**.
3. Enter the number which corresponds to the appropriate day of the week.
   - **1** = Sunday
   - **2** = Monday
   - **3** = Tuesday
   - **4** = Wednesday
   - **5** = Thursday
   - **6** = Friday
   - **7** = Saturday
4. Press **Redial**. — You will hear a confirmation tone.
5. Press **Spkr**. — The telephone will return to the idle mode after you press the button.

User Name/Number Display

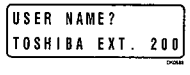
This feature allows you to store a name (such as your name, telephone number, location, etc.) in the system memory for each station or device. This name (e.g., LOBBY) will display on the station's LCD while it is idle and it will appear at other stations' LCDs when they are called. The name will also appear on the LCD during direct internal, forwarded, and hunted calls. However, on Override or Off-hook Call Announce (OCA) calls, the LCD will not display the name.

Name display information for non-LCD telephones or voice mail/auto attendant devices may be stored from the Administrator's digital station (station 200). When Name/Number is recorded for non-LCD telephones or other devices, their Name/Number is displayed on LCD telephones when called. The name of a called telephone displays on the calling telephone's LCD when the calling telephone has the Soft Key feature activated.

Note:
Before entering names for other users, the Soft Key feature must be turned off by pressing **Mode + 7 0** *when your telephone is idle. After the names have been entered, turn the feature back on by pressing* **Mode + 7 1** *when your telephone is idle.*

To Enter Name/Number Information for Another Station/ Voice Mail from Station 200:

1. Press **[PDN] + # 6 2 1**. — Station NNN may set and clear the Name/Number feature anytime:
   - To set Name/Number, press **[PDN] + # 6 2 1**.
   - To clear Name/Number, press **[PDN] + # 6 2 0**. "Clear" eliminates the display when calling, but does not erase it from memory. Only station 200 can set or clear the Name/Number of a non-LCD station.
2. Press **Page**. — The LCD displays "DEST. EKT NO.?"
3. Dial the **[PDN]** of the telephone or device for which Name/Number information will be recorded. — The LCD displays "DEST EKT NO. NNN." NNN = the Primary Directory Number entered.
4. Press **Page**. — The cursor will appear to the right of the last character of the current information.



5. Enter the new information via the dial pad. — Up to 16 characters can be recorded. See the following "To Record a Name/Number" procedure. Toshiba recommends recording the **[PDN]** of the telephone along with the name. See Appendix A for a directory form you can use to record other station Name/Number information for future reference.
6. Press **Spkr**. — The new information is stored and appears on the top line of station NNN's LCD. Station 200's LCD returns to the normal idle display.

Notes:

1. *To erase the Name/Number information of another station from station 200, repeat Steps 1 ~ 6 and enter blanks in Step 5. Blanks are entered by pressing* **1** *in the alpha mode.*
2. *If the system power is removed, the Name/Number information will* ***not*** *display when the system power is returned. To restore the Name/Number of another telephone or device after power interruption, repeat Steps 1, 2, 3, 4, and 6, or dial* **# 6 2 1** *from that station.*
3. *If Name/Number display is 16 characters, the cursor will move one character to the right. Press* ***** *to restore the cursor.*

Refer to Figure 2 for an explanation of the dial pad buttons.

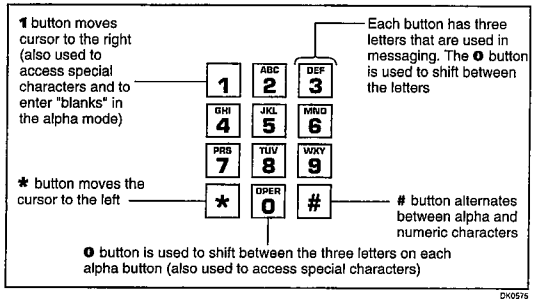


Figure 2
Dial Pad Information

To Record a Name/Number:

1. Press **#** to access alpha characters.
2. Move the cursor (-) to the desired position.

For a new name, move the cursor to the left edge of the display, or two spaces to the right of the preprogrammed Name to add information.

3. Press button that has the letter you want to enter.

Use the **0** button to shift from letter to letter on the button. For example:

- If you press **3**, a D will be displayed. By pressing **0**, the D is changed to E. By pressing **0** again, the E is changed to F. Press **0** again and the F changes to D.

4. Press **#** again to return to alpha characters. Default mode of operation is "Numeric".

- To enter a space, press **1**. Numbers are also entered on the dial pad. You can continue to press **#** each time you want to to switch from numeric to alpha, and back again.

Note:
When in the alpha character mode, the following special characters are set by pressing **1** *and then pressing* **0** *to step through the available characters:* ***Q, Z, :, -, +, /.***

System Speed Dial Numbers

System Speed Dial telephone numbers can be stored in the system memory by station 200 only.

To Store a Feature or System Speed Dial Number in a System Speed Dial Code:

1. **Do not** lift the handset.
2. Press **Redial** (or **#**).
3. Press **Speed Dial** (or *****).
4. Dial a two-digit or three-digit System Speed Dial code.

System Speed Dial codes run consecutively from 60 ~ 99 or 600 ~ 699 depending on your system size.

5. Dial the telephone number to be stored

   - or -

   enter the feature code sequence.

A maximum of 20 digits can be stored. See the *Strata DK280 Digital* or *Electronic Telephone User Guide*—Chapter 3—Advanced Features—Speed Dial Number Linking for instructions on storing long dialing strings or Speed Dial Pause and Flash to insert a pause or flash signal in the number.

Refer to Appendix C—Table 2—Feature Access Codes.

6. Press **Redial** to record the information in memory.

A maximum of 40 (60 ~ 99) or 100 (600 ~ 699) telephone numbers can be stored in the system memory, depending on your system size.

7. Repeat Steps 1 ~ 5 above for every telephone number to be stored.
8. Write down the Speed Dial codes and telephone numbers for future reference.

To Clear a Speed Dial Entry:

➤ Repeat the preceding procedure, skipping Step 4.

To Store Pauses and Flashes With Speed Dial Numbers:

1. Press **Spd Dial Pause** (or **Spd Dial Lng Pause**) to store a pause.
2. Press **Flash** to store a flash.

The number will be stored and will be dialed when the Speed Dial access code is dialed at a station, or when an **SD** button associated with the code is pressed.

If the **Spd Dial Pause** button is not available, the **Flash** button will store pauses only, **not** flashes.

The **Spd Dial Pause** button is used to program a 1/2-second or 2-second pause per system program assignment. A 10-second pause is programmed using the **Spd Dial Lng Pause** button.

Pause timing is set by the telephone installer and can either be 1/2 second, or 2 seconds. A long pause is always 10 seconds. Flashes referred to here are hookflashes.

The telephone must have a **Spd Dial Pause** button and a **Flash** button to allow this button to store flashes. The LCD will display "F-" for Flash, "P-" for Pause and "L-" for Long Pause.

Programmable Feature Buttons

In addition to station Speed Dial buttons for personal user programmable features, System Speed Dial buttons and codes can be assigned by the System Administrator. These Speed Dial buttons can store fixed button functions—**Conf/Trns**, [PDN], and **Hold**—enabling users to program feature buttons such as **Park and Page**. A button can have just one or a sequence of assigned features. A maximum of 20 digits can be stored for each button. Fixed buttons count as two digits.

To Store a Feature on a Button from the Administrator's Telephone:

1. Do **not** lift the handset.
2. Press **Redial**.
3. Press **SD** you wish to use.
4. Enter the desired code or sequence of codes (20 digits maximum).
5. Press **Redial** to record the code or codes in memory.

This procedure must be performed at the Administrator's station (station 200).

You have to exit this mode to make and answer a call. To exit the mode, press the **Redial** or **#** button.

Codes must be assigned to **SD** buttons associated with Speed Dial codes 60 ~ 99 or 600 ~ 699, depending on your system size.

Refer to Appendix C—Table 2—Feature Access Codes.

Speed Dial Memo

This feature allows the Administrator (usually station 200) to program an 11- or 12-character name for each of the 40 or 100 system Speed Dial numbers (60 ~ 99 or 600 ~ 699), depending on your system size. The memo pad of names may be scrolled to select the appropriate party.

Notes:

1. *Before entering names for Speed Dial Numbers, the Soft Key feature must be turned off by pressing the* **Mode + 7 0** *when the telephone is idle. After the names have been entered, turn the feature back on by pressing the* **Mode + 7 1** *when the telephone is idle.*
2. *For your convenience, a speed dial memo directory form is provided in Appendix A for recording speed dial numbers with memos from station 200.*

To Program Names and Numbers:

1. Press **Redial** then press **Speed Dial**.
2. Dial the desired Speed Dial number.
3. Press **Mode**.

The LCD will display "# * NNN SPEED DIAL". NNN represents the entered Speed Dial number.

If a name/memo is currently stored with its code, it will be displayed. Speed Dial numbers can be 40 ~ 49, 60 ~ 99, or 600 ~ 699.

The name/memo will appear on the LCD as you enter it.

4. Enter the name or memo.
   See Figure 2—Dial Pad Information. The name can be up to 12-characters long.
5. Press **Mode.**
6. Enter the desired CO line access code plus the telephone number (20 digits maximum).
   The number will appear on the LCD as you enter it. Speed Dial numbers and memos and their corresponding two- or three-digit codes may be recorded on the Speed Dial Memo Directory at the back of this guide. If telephones use direct appearing CO line buttons to place outgoing calls (rather than the **[DN]** button plus a CO line access code) it is not necessary to enter the CO line access code in Step 6.
7. Press **Redial** to record the data in memory.
8. Repeat Steps 1 ~ 7 to enter more names/memos.

To Dial a Speed Dial Number:

1. Press **Mode**.
   The LCD displays "MODE NO.?"
2. Dial **8 X X X**
   X X X = **1 0 ~ 4 9** Personal Speed Dial Codes
   - or -
   6 0 ~ 9 9 or **6 0 0 ~ 6 9 9** System Speed Dial Codes.
   The Speed Dial number appears with a name or memo. Speed Dial numbers and memos and their corresponding three-digit codes may be recorded on the Speed Dial Memo Directory at the back of this guide.
3. Press **Page** to scan the directory for the appropriate number/memo.
4. Press any available **Line** or **[DN]** button.
5. The number will be dialed.

To Check a Speed Dial Number:

1. Press **Mode** + **8**.
   See the previous System Speed Dial Codes. The LCD displays a "+" sign if there are more than 16 digits.
2. Dial a two- or three-digit speed dial number **X X X**.
3. If the number is longer than 16 digits, press **Scroll** to display the remaining digits.
4. To see the next number, press **Page**.

Attendant Console Calling

Up to four Attendant Consoles can be installed per system. Up to three ways are available to call the Attendant Console, depending upon system programming.

To Call Any Attendant Console:

➤ Press **[DN]** + **0**.
The call will ring the Attendant Console's **0** button. Dial **0** calls rotate between the consoles if more than one console is installed.

To Call a Particular Console:

➤ Press a **[DN]** and dial the console's Directory Number _____.
The call will ring the console's **[DN]**.

Emergency Calls to the Attendant Console

To Make an Emergency Call to a Console:

➤ Press a **[DN]** and dial the emergency access code **# 4 0 0**.
The call will ring the console's EMGR button.

Changing the System Dialing Plan for the North American Dialing Plan

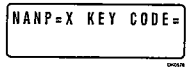
System Dialing Plan Change

The system dialing plan may only be changed from station 200.

To Change the System Dialing Plan:

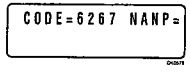
1. Place the handset on-hook.
2. Press a **[DN]** + **#650**.

   You will hear a confirmation tone. X is the current system dialing plan 1, 2, 3, 7, 8, or 9.



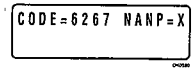
3. Dial **6267**.

   You will hear a confirmation tone.



4. Enter the one-digit **X** for the system dialing plan (**X** = 1, 2, 3, 7, 8, or 9).

   You will hear a confirmation tone.



5. Press **Redial** (or **RDL**).

   The telephone will return to the idle mode after you press the button.

6. Press **Spkr**.

Station Relocation 2

The Station Relocation feature allows you to relocate an electronic, digital, or standard telephone without requiring reprogramming of the station's features. When relocated, the telephone retains its station number and all programmed features, including personal messages, feature buttons, and Speed Dial numbers.

One station at a time can be easily relocated. If two stations are unplugged at the same time, the telephone that was unplugged **last** will relocate when plugged back in. Station Relocation works only with the **same type** of station.

For example, moving electronic telephone to electronic telephone, digital to digital, and standard to standard. The label on the bottom of your telephone will indicate "Electronic" or "Digital" key telephone. If a 10-button telephone is replaced with a 20-button type, the left column of buttons will retain the 10 button assignments. With Liquid Crystal Display (LCD) telephones, you use the LCD after relocation, to confirm the desired location of the calling or called **[PDNs]**. See Appendix B—Telephone Location Record for instructions.

CAUTION !

Always turn this feature off promptly after relocation is finished to avoid accidental relocation.

Automatic Relocation

This function allows the System Administrator to physically move a telephone from one location to another while maintaining all of the telephone's programmed features. A "Telephone Location Record" sheet is provided in Appendix B at the back of this guide for telephone location tracking.

To Automatically Relocate a Station:

1 From station 200, press a **[DN]** + **# 6 2 8 2** to turn on the Auto Station Relocation feature, then press **Spkr**.

After you turn on Auto Station Relocation, you will hear a confirmation tone which indicates the Station Relocation feature is on. If you hear a busy tone instead of confirmation tone after dialing **# 6 2 8 2**, it is for one of two reasons: (1) Station Relocation was already turned on, or (2) you did not dial from station 200.

2. Make sure that the phone jack that the phone is moving to in Location 2 is already vacant.

   See the adjacent **IMPORTANT !** before proceeding to Step 3, below.

IMPORTANT !

If relocating a telephone (Station A) to a location (Location 2) that already has a telephone (Station B), first disconnect Station B from its telephone jack before you disconnect Station A. In other words, you must configure the moving location to a "vacant" state before you unplug the moving phone.

3. Unplug Station A's modular cord from the wall jack of Location 1.

4. Plug in Station A's modular cord to the wall jack of its new location (Location 2).

Station A is now moved to its new location while retaining its original Directory Numbers and features.

5. If there is a second station (Station B) that you want to relocate, then plug in Station B to Location 1.

Station B's Primary Directory Number and feature button information is moved to Location 1 when Station A is relocated to Location 2.

6. From station 200, press **[DN]** + **# 6 2 8 1** to turn off Auto Station Relocation, then press **Spkr**.

After you turn off Auto Station Relocation, you will hear confirmation tone. If you hear a busy tone instead of confirmation tone after dialing **# 6 2 8 1**, it is for one of two reasons: (1) Station Relocation was already turned off, or (2) you did not dial from logical port 000 (usually Station 200).

Relocation by Special Dial

This option allows two station numbers and their features to be exchanged with or without physically relocating the telephones. The exchange takes place through the use of special dial codes.

To Relocate by Special Dial:

1. *From station 200:*

   Press a **[DN]** + **# 6 2 8 3** to turn on the Special Dial Station Relocation feature, then press **Spkr**.

After you turn on Relocation by Special Dial, you will hear confirmation tone which indicates that the Station Relocation feature is on. If you hear a busy tone instead of confirmation tone after dialing **# 6 2 8 3**, it is for one of two reasons: (1) Station Relocation was already turned on, or (2) you did not dial from station 200.

2. *Relocate Station A to Location 2 and Station B (if connected) to Location 1:*

   From Station A, press a **[DN]** and dial **# 6 2 7** N N N.

Originally, Station A is in Location 1, and Station B is in Location 2. After pressing a **[DN]** + **# 6 2 7** N N N (from Station A) you will hear a confirmation tone.

Station A will now operate in Location 2, with the same features that it had in Location 1, and Station B will operate in Location 1 as it did in Location 2.

N N N = Directory Number number of Station B.

3. *From station 200:*

   Press a **[DN]** + **# 6 2 8 1** to turn off Special Dial Station Relocation, then press **Spkr**.

After Station Relocation is turned off, you will hear a confirmation tone. If you hear a busy tone instead of confirmation tone after dialing **# 6 2 8 1**, it is for one of two reasons: (1) Station Relocation was already turned off, or (2) you did not dial from station 200.

Note:
After completion, the keystrips of the two telephones should be exchanged if they are different. If a 10-button telephone is replaced with a 20-button type, the left column of buttons will retain the 10-button assignments; therefore, the telephones should be physically exchanged instead of just the keystrips.

Auto Attendant 3

The Auto Attendant feature tells the system where to direct incoming Auto Attendant calls. Auto Attendant is licensed by Dytel, Inc. under United States Patent No. 4,975,941. There are two announcements that will greet callers. The primary announcement contains the company greeting, followed by a menu. The secondary announcement, which is optional, plays when the station or department called is not available. It is then followed by a menu.

An Auto Attendant's primary announcement may sound as follows:

"Hello, you have reached Toshiba.
If you know the number of the party you are calling, please dial it now.
For operator assistance, dial 0 or please wait.
For Sales, dial 3.
For Marketing, dial 4.
And for Technical Support, dial 5."

The following is an example of an Auto Attendant's secondary announcement:

"The party is unavailable ...
For operator assistance, dial 0 or wait for assistance.
For Sales, dial 3.
For Marketing, dial 4.
And for Technical Support, dial 5."

Auto Attendant CO Line Assignments

CO lines may be assigned as Auto Attendant lines on any of the three system modes (Day, Day 2, and Night) by the system programmer. The **Night Transfer** button can be used to switch the CO lines to ring the Auto Attendant or to ring stations that are preassigned in system programming.

The Auto Attendant can be configured (in system programming) to answer CO line calls on a delayed basis (12 or 24 seconds) if the call is not answered at a ringing station(s).

System Auto Attendant Dialing Plan

The Auto Attendant dialing plan is assigned in system programming. The following Auto Attendant Menu table is provided for recording your system Auto Attendant dialing plan. It is recommended that no single digit be used as a station number, but rather used for direct dialing of station Directory Numbers (200 ~ 439, or 500 ~ 739) as shown in Table 1. Callers can access DISA by dialing ✱. Toshiba recommends that you do not include this information in the Auto Attendant announcement. Always program a DISA security code when using the DK280 built-in Auto Attendant to prevent unauthorized use of outgoing CO lines via the Auto Attendant DISA access feature.

Table 1
Auto Attendant Menu

Dialed Digit (Menu Prompts)	Station (Directory) Number	Department, Division, etc.
0		
1		
2	(200 ~ 299)	
3	(300 ~ 399)	
4	(400 ~ 439)	
5	(500 ~ 599)	
6	(600 ~ 699)	
7	(700 ~ 739)	
8		
9		

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Auto Attendant Announcement Recording Recommendations

Primary announcements are played to the caller when the Auto Attendant first answers a CO line. Secondary announcements (optional) are played to the caller after dialing a busy or unanswered station. Announcements should be kept as short as possible to allow fast call handling, and to eliminate overflow situations. Typical announcements should run between 10 and 20 seconds. Both primary and secondary announcements should play the Auto Attendant dialing plan options.

If recorded announcements need to be long, multiple announcement machines can be installed to accommodate quick pickup. Announcements can be up to 60 seconds in length. The system can support up to four primary announcements and up to four secondary announcements, thereby making a 15-second call answering time possible. All primary announcements should play the same message/dial prompts, and all secondary should play the same secondary announcement. Follow the announcement device manufacturer's instructions to record the auto attendant announcements.

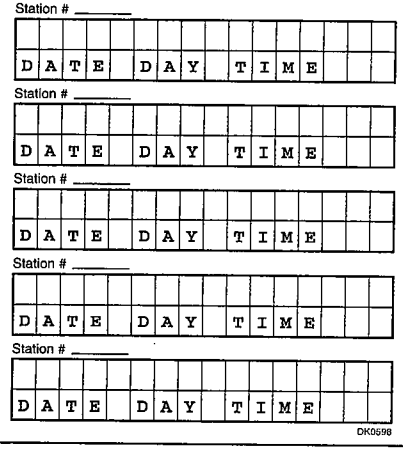
Directories

A

User Name/Number Directory

Name/Numbers are limited to 16 alphanumeric characters and are displayed on the top row of idle LCD stations and the bottom row of called LCD stations.

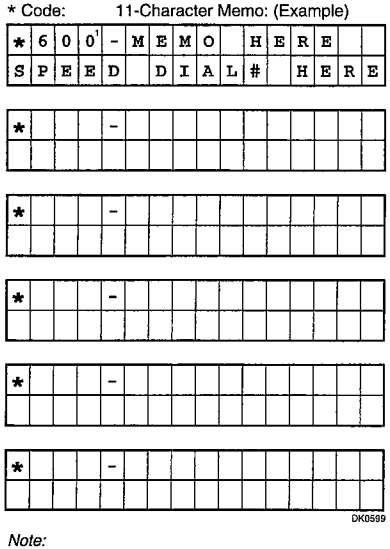
This directory is provided for station 200, the Administrator's station, reference and recording of other station Name/Numbers.



Speed Dial Memo Directory

Speed Dial memos are limited to 12 characters for the memo (top row of LCD) and 16 digits/pauses for the dial number (bottom row of LCD).

This directory is provided for recording Speed Dial numbers with memos from station 200, the Administrator's station.



Note:
1. *Speed dial numbers may be 60 ~ 99 or 600 ~ 699 depending on the system size.*

Telephone Location Record

B

Room/Office Location	Primary Directory Number	User's Name

Press a **[DN]** + **# 4 0 1** to see the Primary Directory Number of an LCD telephone.

Press a **[DN]** + **# 4 0 2** to see the "Physical" port number and the "Logical" port number on an LCD telephone.

Press any **[DN]** + **# 4 0 7** to display the button directory number.

Room/Office Location	Primary Directory Number	User's Name

DK0600

Press a **[DN] + # 4 0 1** to see the Primary Directory Number of an LCD telephone.

Press a **[DN] + # 4 0 2** to see the "Physical" port number and the "Logical" port number on an LCD telephone.

Press any **[DN] + # 4 0 7** to display the button directory number.

Access Codes

C

Table 2
Feature Access Code

FEATURES	FEATURE ACCESS CODE SEQUENCE
Account Codes[1] (Frequently used codes)	**Cnf/Trn** + **# 4 6** + Account code digits
Automatic Callback	**4**
Background Music[2] (External Speakers On)	**[PDN] + # 4 9 1**
Background Music[2] (External Speakers Off)	**[PDN] + # 4 9 0**
Call Forward—All Calls (To Station)	**[PDN] + # 6 0 1** + Directory Number
Call Forward—Busy (To Station)	**[PDN] + # 6 0 2** + Directory Number
Call Forward Cancel	**[PDN] + # 6 0 1**
Call Forward External	**[PDN] + # 6 7 0**
Call Forward External Cancel	**[PDN] + # 6 7 0**
Door Phone Calling	[PDN] + door phone Directory Number
Hookflash Signal[1]	**Cnf/Trn** + **# 4 5**
Off-hook Call Announce (Manual Mode)	**2** (voice first); **1, 2 1**, or **1 2** (tone first)
Overrides (Busy, DND)	**2**
Overrides (Executive)	**3**
Paging[3] (CO line Auto Hold) (All Call, Digital and Electronic telephones)	**Hold** + [PDN] + **# 3 0**
Paging[3] (Station Group A)	**Hold** + [PDN] + **# 3 1 1**
Paging[3] (Station Group B)	**Hold** + [PDN] + **# 3 1 2**
Paging[3] (Station Group C)	**Hold** + [PDN] + **# 3 1 3**
Paging[3] (Station Group D)	**Hold** + [PDN] + **# 3 1 4**
Paging[3] (Station Group E)	**Hold** + [PDN] + **# 3 1 5**
Paging[3] (Station Group F)	**Hold** + [PDN] + **# 3 1 6**
Paging[3] (Station Group G)	**Hold** + [PDN] + **# 3 1 7**
Paging[3] (Station Group H)	**Hold** + [PDN] + **# 3 1 8**

Table 2
Feature Access Codes (continued)

FEATURES	FEATURE ACCESS CODE SEQUENCE
Paging[3] (External Page Zone A)	**Hold** + [PDN] + **# 3 5**
Paging[3] (External Page Zone B)	**Hold** + [PDN] + **# 3 6**
Paging[3] (External Page Zone C)	**Hold** + [PDN] + **# 3 7**
Paging[3] (External Page Zone D)	**Hold** + [PDN] + **# 3 8**
Paging[3] (All Call, External Page Zone)	**Hold** + [PDN] + **# 3 9**
Park Call/Access Page	**Cnf/Trn** + **# 3 3 1** + X X X[4] + Y Y Y[5]
Pickup[3] (Directed to station, new, or transferred call)	**Hold** + [PDN] + **# 5** + station number
Pickup[3] Any ringing CO line (new call only)	**Hold** + [PDN] + **# 5 9**
Pickup Station Page or Ringing Door Phone[3]	**Hold** + [PDN] + **# 5 # 3 0**
Pickup[3] External Page	**Hold** + [PDN] + **# 5 # 3 5**
One-touch Voice Mail Access	[PDN] + Voice Mail Directory Number
Outgoing Calls	[PDN] + CO line access code[6] + telephone number

IMPORTANT !
If your telephone does not have a **Speed Dial** *button, enter* **4 4** *instead of* **#** *in all feature sequences.*

Notes:
1. *These codes can be used during a CO line call.*
2. *Background music speakers can be turned on or off from Station 200 only.*
3. *This feature will hold an existing call when the button is pressed. If the button is pressed when not on a call, pickup or page will still be accessed. These codes can be used during a CO line call.*
4. *XXX = Auto Park Orbit 9 9 9 (access the next available park orbit), or General Park Zones 9 0 0 ~ 9 1 9, or* **[PDN]** *on which the call should be Parked. Only use 9 9 9 with LCD telephones.*
5. *YYY is the Page Zone or Station Group (# 3 0 ~ # 3 9) that should be paged after the call is Parked.*
6. *CO line access codes: # 7 0 0 1 ~ # 7 1 4 4 (maximum) for DK280 individual lines; 8 0 1 ~ 8 1 6 for line group or 9 for general group or LCR.*

General Note:

- **[PDNs]** *can be stored in speed dial sequences but* **[PhDNs]** *and* **[SDNs]** *cannot.*

January 1996

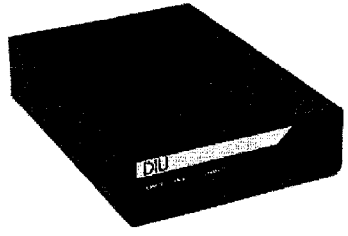
TOSHIBA

BUSINESS TELEPHONE SOLUTIONS

Personal Computer/ Data Interface User Guide

Strata® DK280

Digital Business Telephone Systems
Release 3



Contents

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Introduction

This user guide contains instructions on how to implement the features of the Strata DK Personal Computer (RCPI-DI) and Data Interface Units (PDIU-DS) These two Toshiba interface units that integrate the Strata DK280 telephone system with Personal Computers, printers, and modems for a variety of applications.

All the features in this guide have practical applications for a diversity of office environments. Instructions are provided on how to use the RCPIs and DIUs to connect personal computers together to exchange files, to share a printer or a modem, to access a mainframe, and more.

Organization

This user guide is divided into the following chapters.

- **Chapter 1—The Grand Tour** provides an overview of DIU Hardware.
- **Chapter 2—User Instructions** provides a description of the DIUs: their function, controls, and applicable indicators.
- **Chapter 3—Mode Definitions** contains the calling procedures.

Conventions

Bold letters in [brackets] represent buttons which have Directory Numbers on them. For example:

[DN] = any Directory Number button (also known as an Extension or Intercom Number).

[PDN] = Primary Directory Number button (the Extension Number for your telephone).

[PhDN] = Phantom Directory Number button (an additional Directory Number).

Extra bold letters represent telephone buttons.

Your telephone may not have all of the buttons mentioned in this guide. See your Telephone System Administrator for more information on buttons and access codes.

~ means "through."

\+ is used for multiple key entries.
Example: Press **Speed Dial** + **XX** + **Redial** + **Spkr** (XX=08~60 seconds).

➤ denotes the step in a one-step procedure.

Notes:
Elaborate specific items or reference other information. Within some tables,

IMPORTANT !
Calls attention to important instructions or information.

Acronyms

Acronyms appearing in the user guide are defined below:

BPS	Bits per second
DIU	Data Interface Unit
LCD	Liquid Crystal Display
LED	Light Emitting Diode
PC	Personal Computer
PDIU-DS	Stand-alone Data Interface Unit
RPCI-DI	Personal Computer/Data Interface Unit

How to Use This Guide

Information in this user guide is divided into two distinct areas. Step-by-step feature instructions appear in the left-hand column of the page. Explanations of these procedures appear in the right-hand column. (See Figure 1.)

Supporting Documentation

The following documents can be used to reference further information about the DIUs and the Strata DK system:

- **Strata DK Digital Telephone User Guide** explains the procedures necessary to operate all the voice features on the digital telephone.
- **Strata DK General Description** includes general information on DIUs and all other system components.

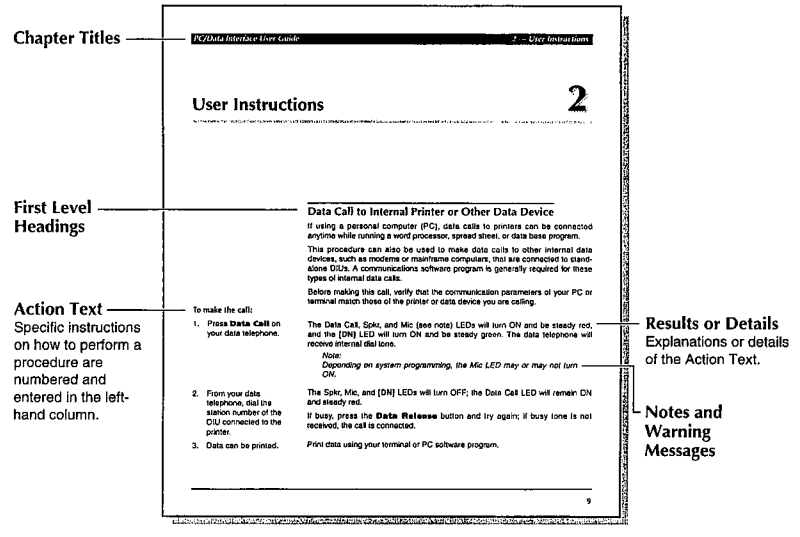

Figure 1
Sample Page

The Grand Tour 1

Toshiba provides two interface units that integrate the Strata DK280 telephone system with Personal Computers, printers, and modems for a variety of applications.

The Stand-alone Data Interface Units (PDIU-DS) normally connects to printers and modems so that they can be shared by all users via data calls through the DK280 telephone system.

The telephone Personal Computer Interface Unit (RPCI-DI) is built into the base of the digital telephone and connects to the COM port of a personal computer. The RPCI-DI has two modes of operation:

- Telephone Application Program Interface (TAPI) mode
- Data communication mode

The PC TAPI software program automatically controls the operation mode (TAPI or Data Communications) of the RPCI. This user guide provides instructions on using the RPCI for Data Communication applications. This user guide is not needed to use a TAPI software application. See the application program user guide for the software application program being used.

A 2B+D ISDN-type digital link in conjunction with the RCPIs and DIUs enable digital telephones to participate in simultaneous voice and data calls. Voice and data calls are transmitted over the same digital telephone wire pair. This offers users a number of calling options. For example, a digital telephone user can place a voice call while in the middle of a data call to a printer or host computer, etc. This type of call and many more are easily accessed with the help of this guide.

This chapter lists all the equipment required to originate or receive a data call. In addition, it explains the function and configuration of the data interface units (DIUs), both the Integrated-into-the-telephone (RPCI-DI) and Stand-alone (PDIU-DS) types.

Hardware Requirements

The following hardware is required to originate a data call:

- A RPCI-DI (replaces digital telephone base)
- A Personal Computer or ASCII Terminal
- One of the following Toshiba 2000- or 1000 Series Digital Telephones:
  - DKT2010-H (10-button model)
  - DKT2010-SD (10-button model with a Liquid Crystal Display (LCD) and speakerphone)
  - DKT2020-S (20-button model)
  - DKT2020-SD (10-button model equipped with LCD and speakerphone)
  - DKT1010-H (10-button model)
  - DKT1020-SD (10-button model equipped with LCD and speakerphone)

A data call can be made to a device connected to a DIU (RPCI-DI or PDIU-DS). These devices include the following.

- Mainframe Computers
- Printers
- Modems
- Personal Computers
- ASCII Terminals

Integrated Data Interface Unit (RPCI-DI)

A telephone within the Strata DK system that participates in a data call must be a Toshiba digital telephone equipped with an integrated DIU (RPCI-DI). A label reading "MODEL RPCI-DI" on the the bottom of the telephone and an RS-232 connector on the back of the telephone both indicate that a telephone is equipped with a RPCI-DI.

Note:
Throughout this guide, RPCI-DI-equipped digital telephones that are connected to ASCII terminals or personal computers are referred to as data telephones.

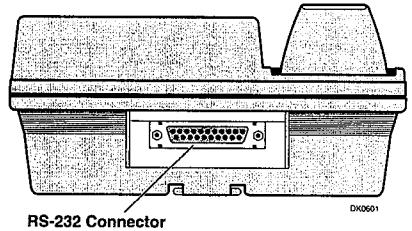

Figure 2
Data Telephone (Integrated DIU) Connector

Data Telephone (RPCI-DI) Buttons and LEDs

In system programming, the data telephone can be assigned the following data feature buttons:

Data Call—Enables a digital telephone's RPCI-DI to be connected with another DIU in the system when manually dialing from the telephone. When **Data Call** is pressed on an idle data telephone, the system sends intercom dial tone to the telephone to prompt dialing. **Data Call** also can be used to switch data telephones and CO lines from voice to data on external calls.

The Data Call LED lights when you receive a data call from another data telephone or when you make a call from your data telephone, personal computer, or ASCII terminal. The Data Call LED will always be red when lit (ON).

Data Release—Terminates data calls. The Data Release LED never illuminates.

Modem—Reserves a system modem for 60 seconds. If a modem is not accessed within this time limit, press this button again to reserve for another 60 seconds.

The Modem LED indicates modem status: a flashing LED indicates that a modem is currently reserved for your telephone; a continuously lit LED indicates that you have actually accessed a modem or that all modems are busy. The Modem LED will always be red when ON or flashing.

RPCI-DI Data Connections

If a data terminal is connected to a data telephone, the terminal must be an ASCII type with a standard keyboard and a display screen or printer display.

If a personal computer is connected to a data telephone, the personal computer must be running at least one of the following types of programs: word processor, desk organizer dialer, or communications software. Also, the personal computer must be active (on-line) on its COM port connected to the data telephone's RPCI-DI.

Note:
It is not possible to establish data call connections from your personal computer DOS prompt.

The data telephone (RPCI-DI) is connected to the personal computer serial communications port (COMX, where X = 1, 2, 3, or 4) or terminal with an RS-232 cable and connector. It is connected to the Strata DK system like any other digital telephone with a modular cord.

Communication Parameters

Before a data connection is established, the communication parameters—data speed (baud rate or bps), parity, data bits, stop bits—of the terminal or personal computer must be the same as the data device that is calling or being called. To set the personal computer communication parameters, use the following MS-DOS MODE commands:

MODE LPTx:=COMx (x = 1, 2, 3, or 4) only if you connect to your printer via an RPCI to DIU-DS data call connection.

MODE COMx: baud rate, parity, data bits, stop bits

Stand-alone Data Interface Unit (PDIU-DS) Connections

Data devices, such as printers, modems, mainframe computers, etc., must be connected to a PDIU-DS with an RS-232 cable and connector.

Table 1
Communication Parameter Options

Option	Legal Values	Meaning
Baud Rate	110 150 300 600 1200* 2400 4800 9600	Transmission speed in bits per second
Parity	N* O E	No parity Odd parity Even parity
Data Bits	7 8*	
Stop Bits	1*	

*Default settings

DK0602

Note:
In most cases, it is recommended to enter the above two MODE command lines into the personal computer's DOS AUTOEXEC.BAT file. Also, in most communications software, desktop, and word processor programs, the COM port number and communication parameters must be set to allow proper operation of data calls.

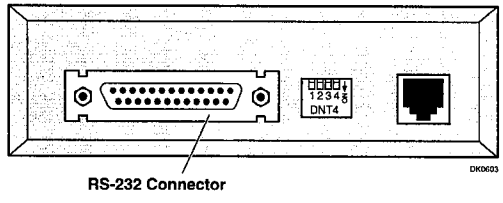

Figure 3
Stand-alone DIU Connector

Notes:
1. *The PDIU-DS must be connected to the Strata DK system with a modular cord. The PDIU-DS, like a regular station, is assigned a station number, which must be known by people who will use the device connected to the PDIU-DS.*
2. *It is recommended that the line sides of modems be connected to standard telephone ports to ensure access to the complete set of modem pooling features. Modems with their line sides connected to a dedicated CO line may not have access to the whole set.*

PDIU-DS LEDs

The PDIU-DS has three green LEDS on its front panel which indicate transmission status.

POWER LED—When the PDIU-DS is connected to the Strata DK system with a modular cord, the POWER LED will be ON (lit).

READY LED—The READY LED will be ON (lit) when the PDIU-DS is connected to a device that is turned on and ready to exchange data.

CONNECT LED—When a data call is established (ringing or answered), the CONNECT LED will be ON (lit).

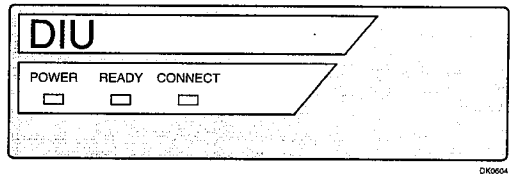

Figure 4
PDIU-DS LEDs

User Instructions 2

Data Call to Internal Printer or Other Data Device

If using a personal computer (PC), data calls to printers can be connected anytime while running a word processor, spread sheet, or data base program.

This procedure can also be used to make data calls to other internal data devices, such as modems or mainframe computers, that are connected to stand-alone DIUs. A communications software program is generally required for these types of internal data calls.

Before making this call, verify that the communication parameters of your PC or terminal match those of the printer or data device you are calling.

To make the call:

1. Press **Data Call** on your data telephone.

   The Data Call, Spkr, and Mic (see note) LEDs will turn ON and be steady red, and the **[DN]** LED will turn ON and be steady green. The data telephone will receive internal dial tone.

   Note:
   Depending on system programming, the Mic LED may or may not turn ON.

2. From your data telephone, dial the station number of the DIU connected to the printer.

   The Spkr, Mic, and **[DN]** LEDs will turn OFF; the Data Call LED will remain ON and steady red.

   If busy, press the **Data Release** button and try again; if busy tone is not received, the call is connected.

3. Data can be printed.

   Print data using your terminal or PC software program.

To terminate the call:

➤ Press **Data Release** on your data telephone.

The Data Call LED will turn OFF and the call will be terminated.

Data Call to Another Internal Data Telephone's PC or Terminal

Personal Computers (PCs) involved in this call must be running a communications software program.

Before making this call, verify that the communication parameters of your PC or terminal match those of the PC or terminal that you are calling.

The following instructions work with typical communications software programs. Higher-level software may integrate these low-level communications dialing commands to provide more automated operation.

To verify communications from your PC or terminal:

➤ Type `AT` and then press `Enter` on your PC or terminal.

Wait for:

```
AT
OK
```

To display on your PC or terminal screen

This display verifies that communications exist between your PC or terminal and your data telephone.

Notes:

1. *AT commands must be typed as capital letters (use caps lock).*
2. *AT commands will appear on your PC or terminal as you type them.*

To make the call from your PC or terminal:

1. Type `ATDD`, the Primary Directory Number of the other data telephone, and then press `Enter`.

The Data Call LED will turn ON and be steady red after you press `Enter`.

Wait for:

```
ATDDYYY
CONNECTXXXX
```

To display on your PC or terminal screen

This display indicates that a connection has been established between the called and calling terminals and/or PCs. XXXX indicates the data transmission speed, and YYY is the called data telephone number. The directory number of a data telephone's RPCI-DI is the same as its voice Primary Directory Number.

Note:
If the called Data telephone is busy, "BUSY" will display on your terminal or PC screen and the call will be automatically terminated. You may then try to originate again.

Entry example: If the other data telephone's **[PDN]** is 209, type `ATDD209` and press `Enter`. (`ATDD` is the DIU command for data call dialing, and 209 represents the **[PDN]** of the other data telephone).

2. Data can be exchanged.

Exchange data using your terminal or PC software program as required.

To make the call from your data telephone:

1. Press **Data Call**.

The Data Call, Spkr, and Mic (see note) LEDs will turn ON and be steady red, and the **[PDN]** LED will turn ON and be steady green. The data telephone will receive internal dial tone.

Note:
Depending on system programming, the Mic LED may or may not turn ON.

2. Dial the Primary Directory Number of the other data telephone.

The Spkr, Mic, and **[PDN]** LEDs will turn off. The Data Call LED will remain ON and steady red.

Wait for:

```
CONNECTXXXX
```

To display on your PC or terminal screen

3. If the called number is busy, press **Data Release** and try again.
4. Data can be exchanged.

This message, which will appear on both sending and destination locations, indicates that a connection has been established between the called and calling terminals and/or PCs. XXXX indicates the data transmission speed.

Exchange data using your terminal or PC software program as required. Either the calling or called data user can terminate the data call using the following procedures.

To terminate the call from your PC or terminal:

1. Hold the shift key down and type `+++`.

Wait for:

```
+++
OK
```

To display on your PC or terminal screen

This display indicates that the RPCI-DI connected to your terminal or PC is now in the command mode and can accept AT commands.

```
+++
```

Will display on the other PC or terminal screen

The Data Call LED on both data telephones will turn off.

2. Type `ATH`, and then press `Enter`.

Wait for:

```
ATH
OK
```

To display on your PC or terminal screen

This display indicates that the call is terminated.

- or -

To terminate the call from either data telephone:

➤ Press **Data Release**.

The Data Call LED on both data telephones will turn off.

Wait for:

```
NO CARRIER
```

To display on both PCs and/or terminal screens

This display indicates that the call is terminated.

Voice Call While On Data Call

Simultaneous Voice and Data Between the Same or Different Telephones

While on a data call, a data telephone can originate, answer, and disconnect any type of voice call without interrupting the data call. For example, Phone 1 can be on a voice call with Phone 2, and during the call, Phone 1 can also send data to Phone 2.

To make a voice call while on a data call:

➤ While on a data call, make a voice call in the normal manner.

To make a data call, see "Data Call to Internal Printer or Other Data Device" or "Data Call to Another Internal Data Telephone's PC" or "Terminal," earlier in this chapter.

Data Call While On a Voice Call

Simultaneous Voice and Data Transmission Between the Same Data Telephones

Without interrupting their voice conversation, two data telephones can establish a data call between each other.

To make a data call while on a voice call:

1. While on a voice call with another data telephone, press **Data Call** on your data telephone.
2. Data can be exchanged.

The Data Call LED will turn ON and be steady red.

A data path will automatically be established between the personal computers and/or terminals connected to the two data telephones. The voice call will continue uninterrupted.

Exchange data using your terminal or PC software program as required. While data is being exchanged, the voice call will continue uninterrupted.

Terminating the Call

To terminate the voice or data call:

➤ Press **Data Release** on either data telephone

- or -

press **Spkr** on your data telephone or hang up.

The data call will be terminated; the voice call, if not terminated earlier, will continue.

The voice call will be terminated; the data call, if not terminated earlier, will continue.

Data Call to Data Telephone While on a Voice Call to Another Telephone

Simultaneous Voice and Data Transmission to Different Data Telephones

While established on an internal or external voice call, a data telephone can make a data call to another internal or external data telephone or data device. For example, Phone 1 can be on a voice call to Phone 2. At the same time, Phone 1 can also be transmitting data to Phone 3.

To make a data call while on a voice call:

1. While on a voice call, press **Hold** on your data telephone.

   The voice call will be placed on hold.

2. Make a data call to a different data telephone or data device.

   To make a data call, see "Data Call to Internal Printer or Other Data Device" or "Data Call to Another Internal Data Telephone's PC or Terminal" earlier in this chapter.

3. Data can be exchanged.

   Exchange data using your terminal or PC software program as required.

To return to the voice call:

➤ Press the held CO **Line** or **[DN]** button on your data telephone.

The voice call will be reestablished and the data call will continue uninterrupted.

To terminate the voice or data call:

➤ Press **Data Release** on your data telephone

- or -

press **Spkr** on your data telephone or hang up.

The data call will be terminated; the voice call, if not terminated earlier, will continue.

The voice call will be terminated; the data call, if not terminated earlier, will continue.

Outgoing Data Call — Dialing Through the System Modem Pool

A PC involved in this type of call must be running a communications software program.

Before making this call, verify that the communication parameters of your PC or terminal match those of the device that your are calling.

Note:
*To place the RPCI-DI into the command mode while keeping the modem in the communications mode, Toshiba recommends that the RPCI-DI escape sequence be changed from **+++** to some other sequence before beginning. For example: Using the **ATS2** command, send **ATS2=36** to the RPCI-DI to change its escape sequence to **$$$**. Store these commands in the PC communication software modem initialization sequence - this will set the RPCI-DI escape sequence each time the communication software is run.*

Verifying Communications

To verify communications from your PC or terminal:

➤ Type `AT`, and press `Enter` on your PC or terminal.

Wait for:

```
AT
OK
```

To display on your PC or terminal screen

This display verifies that communications exist between your PC or terminal and your data telephone.

Notes:
1. *AT commands must be typed as capital letters (use caps lock).*
2. *AT commands will appear on your PC or terminal screen as you type them.*

Dialing an Internal Modem

To dial an internal modem from your PC or terminal:

➤ Type ATDD, the **[PDN]** of the DIU connected to the system modem (pool), and then press Enter.

The Data Call and Modem LEDs will turn ON and be steady red after you press Enter.

Wait for:

```
ATDDYYY
CONNECTXXXX
```

To display on your PC or terminal screen

This display indicates that a connection has been established between your PC or terminal and the PDIU-DS connected to the system modem (pool). XXXX indicates the data transmission speed, and YYY is the **[PDN]** of the PDIU-DS connected to the system modem (pool).

The system DIUs at this time are transparent and in the communication mode, ready to pass data. The system modem is in the command mode, ready to receive AT dialing commands.

Entry Example: If the station number of the DIU connected to the system modem is 208, type ATDD208 and press Enter. (ATDD is the DIU command for data call dialing, and 208 is the station number of the DIU connected to the system modem).

Sending Commands to a Modem

To issue commands to the modem:

1. From your PC or terminal keyboard, type ATDT, a system CO line access code, the telephone number of the external modem or data service, and then press Enter.

Wait for 5 ~ 30 seconds:

```
ATDTYYYYYYYYYYYYYY
CONNECTXXXX
```

To display on your PC or terminal screen

This display indicates that a connection has been established between the Strata DK system modem and the external modem. XXXX indicates the data transmission speed, and YYYYYYYYYYYYYY is the external telephone number, including a CO line access code (See Table 2, later in this chapter) for CO line access codes.

The commands issued and the telephone number dialed in this step are sent to the system modem transparently through the system DIUs.

Note:
If the modem seizes a CO line that appears on your data telephone, the CO line LED will turn ON and be steady red.

Entry Example: If the telephone number is (714) 837-4408 and the call is made on CO line 1, type ATDT80117148374408 and press Enter. (ATDT is the modem dial command; 801 is the access code for system CO line Group 1; and 7148374408 is the telephone number).

2. Data can be exchanged.

Exchange data by using your terminal or PC software program.

Terminating a Call to a Modem

This sequence should only be used if your modem is connected to a system station port. This sequence should not be used if your modem is connected directly to a CO line.

To terminate a call to an internal modem from your terminal or PC:

1. Hold down the shift key and type +++.

Wait for:

```
+++
OK
```

To display on your PC or terminal screen

The Data and Modem LEDs will turn OFF.

2. Type ATH, and then press Enter.

Wait for:

```
ATH
OK
```

To display on your PC or terminal screen

- or -

This display indicates that the call is terminated.

To terminate the call from your data telephone:

➤ Press **Data Release**.

If your modem is connected to a system station port directly to an outside line. The Data Call and Modem LEDs will turn OFF.

Wait for:

```
NO CARRIER
```

To display on your PC or terminal screen

This display indicates that the call is terminated.

Incoming Data Call (External)

A Data Call originated from the outside can be made into the Strata DK system. Before making the call, verify that the communication parameters of the external PC or terminal and modem match those of the internal device (PC, terminal, or host computer) and modem that you are calling.

PCs involved in this call must be running a communications software program.

To verify communications from your external PC or terminal:

➤ From the external PC or terminal, type `AT` and press `Enter`.

Wait for:

```
AT
OK
```

To display on your (external) PC or terminal screen

This display verifies that communications exist between your PC or terminal and your modem.

Notes:

1. *AT commands must be typed as capital letters (use caps lock).*
2. *AT commands will appear on your PC or terminal screen as you type them.*

To make the call from the external PC or terminal:

1. Type `ATDT`, the number of the CO line that will ring the DK system internal modem, and then press `Enter` on the external PC or terminal.

The internal modem will ring and auto answer.

Wait for 5 ~ 30 seconds:

```
ATDTYYYYYYY
CONNECTXXXX
```

To display on your (external) PC or terminal screen

This display indicates that the external and internal modems are connected and in the communication mode. XXXX is the data transmission speed, and YYYYYYY is the telephone number of the internal modem.

The PDIU-DS connected to the internal modem is in the command mode, ready to accept AT commands from the external PC or terminal. The internal and external modems are in the communication mode, ready to pass data.

Entry example: If the telephone number is 1213-4567, type `ATDT12134567` and press `Enter`. (`ATDT` is the dial command, and `12134567` is the telephone number).

2. Type `ATDD`, the **[PDN]** of the PDIU-DS or data telephone connected to the internal device you wish to connect to, and then press `Enter` on the external PC or terminal.

Wait for:

```
ATDDYYY
CONNECTXXXX
```

To display on your (external) PC or terminal screen

This display indicates that the external PC or terminal and the internal data device are connected. XXXX indicates the data transmission speed, and YYY is the station number of the DIU.

If calling a device connected to a PDIU-DS, the CONNECT LED will turn ON; if calling a device connected to a data telephone, the Data Call LED will turn ON and be steady red.

Entry example: If the station number of the DIU is 210, type `ATDD210` and press `Enter`. (`ATDD` is the DIU command for data dialing, and `210` is the number of the DIU).

3. Data can be exchanged.

Exchange data by using your terminal or PC software program.

To terminate the call from the external PC or terminal:

1. Hold down the `Shift` key and type `+++` on the external PC or terminal.

   Wait for:

   ```
   +++
   OK
   ```

   To display on your (external) PC or terminal screen

2. Type `ATH` and then press `Enter` on the external PC or terminal.

   Wait for:

   ```
   ATH
   OK
   ```

   To display on your (external) PC or terminal screen

   This display indicates that the call is terminated.

Note:
Always terminate incoming data calls from the external PC or terminal.

Switch From Outside Voice Call to Data Call

While on a CO line voice call, an internal (Strata DK system) data telephone can switch to a data call on the same line.

Before making the call, verify that the communication parameters of your internal PC or terminal match those of the external modem and PC or terminal. PCs involved in this call must be running a communications software program.

The external telephone must share its CO line with a modem connected to a PC or terminal. The external CO line must be plugged into the external modem jack labeled "LINE", and the external telephone must be plugged into the modem jack labeled "PHONE". The internal modem must be installed and programmed in the system modem pool configuration (i.e., the modem is connected to a system standard telephone port, not a CO line).

To switch from a voice call to a data call:

1. First, verify communications from your PC or terminal by typing `AT` and pressing `Enter` on your PC or terminal.

   Wait for:

   ```
   AT
   OK
   ```

   To display on your PC or terminal screen

   This display verifies that communications exist between your PC or terminal and your data telephone.

Notes:
1. *AT commands must be typed as capital letters (use caps lock).*
2. *AT commands will appear on your PC or terminal screen as you type them.*

2. Establish an external voice call.

   Use a normal method to establish the call. You can do this before verifying communications.

3. Press **Modem** on your data telephone.

   The Modem LED will flash and be red.

   This flash indicates that a system modem is reserved. The modem will be reserved for 60 seconds. If the LED turns off before a modem is actually accessed, press the **Modem** button again to reserve for another 60 seconds. The voice call will continue during this time.

4. Press **Data Call** on your data telephone.

   The Data Call LED will turn ON and be steady red. The Modem LED becomes steady.

   The CO line you were talking on is now transferred from the data telephone to the internal modem. The CO line LED will blink and will change from green to red, or, if the call was on the **[DN]** button, the **[DN]** LED will turn OFF.

5. From your PC or terminal, type `ATD42` and then press `Enter`.

   Wait for:

   ```
   ATD42
   CONNECTXXXX
   ```

   To display on your PC or terminal screen

6. From the external terminal or PC, type `ATA`, and then press `Enter` (do not hang up the external telephone).

   This display indicates that the internal modem has gone off-hook and originated. XXXX indicates the data transmission speed.

   The external modem will answer.

   Wait for 3 ~ 20 seconds:

   ```
   ATA
   CONNECTXXXX
   ```

   To display on the external PC or terminal screen

7. Data can be exchanged.

   This display indicates that a data path has been established. XXXX indicates the data transmission speed.

   Exchange data using your terminal or PC software program. The voice call will be on-hold during the data exchange. The external telephone can be placed on-hook or remain off-hook during data transmission.

Switch Back to the Voice Call Using Privacy Override

To switch back to the voice call using Privacy Override:

1. Make sure that the external telephone is off-hook.
2. Press the busy CO **Line** button on the data telephone.

To perform this function, your telephone must have this feature. If the voice call is on a CO Line that appears on your **[DN]** button, refer to the following section, "Switch back to the voice call using Executive Override."

The Data and Modem LEDs will turn off, and the CO line LED will change from red to green.

Wait for:

```
NO CARRIER
```

To display on both PC and/or terminal screens

The system modem will be dropped, and the CO line will be transferred to the voice path. The external modem will go on-hook, and the voice path will be connected to the external telephone.

Switch Back to the Voice Call Using Executive Override

To switch back to the voice call using Executive Override:

1. Make sure that the external telephone is off-hook.
2. On the data telephone, press a **[DN]**, dial the modem's standard telephone port station number, then press **3** when you hear busy tone.

If the voice call is on a CO line that appears on your **[DN]** button, follow the instructions on the left. If the voice call did not appear on your **[DN]** button, refer to the previous section, "Switch back to the Voice Call using Privacy Override."

The Data and Modem LEDs will turn OFF, and the CO line LED will change from red to green.

Wait for:

```
NO CARRIER
```

To display on both PC and/or terminal screens

The system modem will be dropped, and the CO line will be transferred to the voice path. The external modem will go on-hook, and the voice path will be connected to the external telephone.

Note:
If you are on a data call, you can switch back to a voice call from a data call using Privacy or Executive Override, but the data telephone must be allowed Privacy or Executive Override in system programming.

To terminate the call when in the voice connection state:

➤ Press **Spkr** on your data telephone or go on-hook.

The CO line (or **[DN]**) LED will turn off and the voice call will be terminated.

To terminate the call if in the data connection state:

➤ Press **Data Release** on your data telephone.

The Data, Modem, and CO line LEDs will turn off and the data call will be terminated.

Personal Computer Dialing of Voice Calls

A personal computer which contains a software package that provides a dialing feature can be used to place outgoing voice calls. Typically, Personal Information Management or Appointment type software packages contain dialing programs. The dialing program must be Hayes modem compatible; however, when using the Toshiba Data Telephone, a modem or special line is not required.

Dialing programs vary, but most of them require that you enter the telephone number that should be dialed in a designated field or space. When using a Toshiba Data Telephone you must also enter the outgoing call access code in front of the telephone number to be dialed.

Example: If the telephone number to be dialed is 1-714-583-3700, the following sequence should be entered in the telephone number field:

X ~ X17145833700

where X ~ X is the telephone system CO line access code.

Table 2
CO Line Access Codes

	CO Line Access Codes (X ~ X)		
	Line Groups	LCR or General Group	Individual CO Line Numbers
DK8	81 ~ 84	9	701 ~ 704
DK16	81 ~ 88	9	701 ~ 708
DK280	801 ~ 816	9	#7001 ~ #7144

DK001E

When the CO line access code and telephone number is entered into the dialing field properly and the computer software dialing is initiated, the Personal Computer should automatically send the following sequence to the Data Telephone:

ATDTX ~ X17145833700 (X~X)=the CO line Access code

where ATDT is the Hayes modem dialing command automatically inserted by the computer dialing software.

When the Data Telephone receives the above dialing command, it will automatically access an outgoing CO line (X~X) and dial 17145833700. The Data Telephone's **[DN]** or CO line button LED will turn on (green), and its LCD (if equipped) will display the dialed digits.

Mode Definitions 3

This chapter contains advanced information for the sophisticated data communication user. The contents are not required for typical operation.

Data Communications Mode

When in the Data Communications mode, the RPCI and DIU can operate in either the Command Mode or the Communication Mode. All the dialing, answering, and disconnecting activities related to a data call take place during the command mode using standard Hayes "AT" commands. The actual data operation—file transferring, printing, etc.—takes place during the communication mode.

Switching the RPCI Between the Data Communications and TAPI Modes

The PC software normally controls the RPCI operating mode (TAPI or DATA). To switch between modes, the PC software or manual keyboard must send the following chapters to the RPCI:

- When in the TAPI mode, send the HEX (F0), decimal 240, or the ≡ ASCII character) to the RPCI to switch it to the Data Communications mode. (Unplugging the telephone cord and then reconnecting it also resets the RPCI to the Data Communications mode.)
- When in the Data Communications mode, send (ATC0) to the RPCI to switch it to the TAPI mode.

Data Communications Command Mode

A RPCI or DIU must be told what number to dial, whether to answer, or whether to disconnect. These instructions, when typed from the keyboard of a PC or terminal, are called AT commands. A complete list of RPCI or DIU-supported AT Commands is provided in Table 3 at the end of this chapter. Other Command Mode features—Result Codes, S-Registers, and Dialing Modifiers—are discussed below. RPCIs or DIUs remain in or enter into the Command Mode when any of the following actions occur.

- The RPCI and DIU are powered up by connecting it to the Strata DK system via the modular jack/cord. The RPCI powers up in the Data Communications mode as opposed to the TAPI mode.
- The reset (Z) AT command is issued.
- No carrier is detected while originating or answering a data call.
- The carrier signal from a remote DIU or modem is lost.
- A semicolon (;) is entered at the end of the dial (D) command.
- The escape sequence (+++) is entered while the RPCI or DIU is in the Communication Mode (on-line mode).

  Note:
  Always change the escape sequence of a RPCI-DI connected to your PC to avoid operation conflicts. Consult the documentation provided by the modem manufacturer for documentation on the ATS2 command.

Result Codes: Displayed on the terminal or personal computer screen, Result Codes are RPCI and DIU responses to AT Commands and end-to-end connections and disconnections. DIUs support the Result Codes in Table 4 at the end of this chapter.

S-Registers: RPCIs and DIUs can be configured for specific applications with S-Registers, which can only be changed or checked during the Command Mode. When power is first applied to it and whenever its modular line cord is temporarily disconnected and then reconnected, the RPCI and DIU initializes the S-Registers to the default values and enters the Command Mode. DIUs support the S-Registers listed in Table 5 at the end of this chapter. To check or change an S-Register, follow the procedures below:

- **To check the value of an S-Register**: Type `ATSX?` and press `Enter` (X being the specific S-Register you want to check). The value along with the "OK" Result Code will be displayed.

- **To change the value of an S-Register:** Type `ATSX=Y` and press `Enter` (X being the specific S-Register you want to change and Y being its value). The S-Register's value will now be changed, and the screen will display "OK". (If the entry is invalid, "ERROR" will be displayed in most cases.)

Dialing Modifiers. Dialing Modifiers do exactly what their name indicates. They can be issued anywhere in the dialing string and provide additional dialing instructions. Dialing Modifiers can be used for a variety of applications, including tone dialing, dial pulse dialing, and pause and flash inserting. DIUs support the Dialing Modifiers listed in Table 6 at the end of this guide.

Notes:

1. *A personal computer must be running communications software or a desk organizer dialing program (be on-line) to issue AT Commands. AT Commands cannot be issued from a data telephone's dialpad, a personal computer's DOS prompt, or from word processor, data base, or spread sheet-type programs.*
2. *AT commands are executed by the DIUs only after the carriage return key is pressed. The carriage return is referred to as* `Enter` *in this guide. On some keyboards, though, this key may have a different designation, such as* `RETURN`, `<CR>`, `ENTER`, *etc.*
3. *All AT commands must be typed as capital letters.*
4. *DIUs can operate at up to 19,200 bps with manual dialing (from a data telephone). If keyboard dialing with AT commands, the DIUs can operate at up to 9600 bps.*

Data Communications Mode (on-line state)

A PDIU-DI automatically enters the communication mode when its call to another DIU is answered. At this point, the desired data operation—file transfer, printing, etc., can begin. DIUs remain in the Communications Mode until the data operation is manually terminated or the escape sequence (see the following "Switching Between Modes" section) is issued. A calling PDIU-DI switches to the Communication Mode from the Command Mode when the following sequences occur:

- When the `ATD Enter` or `ATDD Enter` command string is issued and the called DIU answers (manually or automatically).
- When the `ATO Enter` command string is issued while a DIU-to-DIU data connection is established (see Switching Between Modes).
- When a remote modem issues the `ATA Enter` command string after the calling DIU issues the `ATD42 Enter` command string, switching a CO line voice call to a data call using the system modem pool.

Note:
A called DIU switches to the Communication Mode when it answers, automatically or manually.

Switching Between Data Communication Modes

Once a PRCI or DIU is connected to another RPCI or DIU and in the Communication Mode, it can be switched back to the Command Mode with the escape sequence and then back again to the Communication Mode with the reenter command. This feature is helpful when a user needs to change a parameter after having established a data call. Parameters can only be changed while in the Command Mode.

- **Escape Sequence:** To escape from the Communication Mode, hold down the shift key and type `+++` (it is not necessary to press `Enter`).
- **Re-enter Sequence:** To re-enter the Communication Mode, type `ATO` and press `Enter`.

RPCI/DIU Data Speed (Baud Rate)

DIUs will pass data at a baud rate of up to 19,200 bits per second (bps), if the call was established by manually dialing from a data telephone. If the call was established with AT commands from a personal computer or terminal, the DIU will pass data at up to 9600 bps. The baud rate of a DIU will be transparent when originating calls with the data telephone or when receiving data calls, manually and automatically. When originating data calls with AT commands from a personal computer or terminal, the DIU's speed will be the same as the rate of the first AT command. When answering data calls with the `ATA` command string, the DIU baud rate will be the same as the command string; the AT command baud rate is determined by software running the terminal or PC.

RPCI/DIU Default Communication Parameters

Default parameters for the DIUs are shown below; however, they are transparent or changed by the first AT commands issued, as described above. A DIU will assume these default parameters when power is initially applied to it, or after the modular cord is disconnected and then reconnected.

- Baud rate: 1200 bps
- Data bits: 8 bits
- Parity: none
- Stop bits: 1 stop bit

Table 3
DIU AT Command Set

Command	Description
AT	Command prefix
ATDY...Y	Voice call to telephone number (Y...Y = any number of digits), internal or external
ATDDXXXX	Data call to DIU station number XXXX (1 ~ 4 digits)
`Enter`	Carriage return character
A	Go into the answer mode; attempt to go to Communication Mode
A/	Reexecute previous command line; not preceded with AT nor followed by `Enter`
D	Go into originate mode; dial number that follows; attempt to go to on-line state
E0	Disable character echo in Command Mode
E1*	Enable character echo in Command Mode
H0	Go on-hook (hang up)
H1	Go off-hook
O	Go to Communication Mode
Q0*	DIU returns Result Codes
Q1	DIU does not return Result Codes
SR = n	Set Register "R" to value "n" (R = 0 ~ 12)
SR?	Display value stored in Register "R" (R = 0 ~ 12)
V0	Display Result Codes in numeric form
V1*	Display Result Codes in words
X0	Enable features represented by Result Codes 0 ~ 4
X1	Enable features represented by Result Codes 0 ~ 7, 10 ~ 12
X2	Enable features represented by Result Codes 0 ~ 5, 10 ~ 12
X3	Enable features represented by Result Codes 0 ~ 7, 10 ~ 12
X4	Enable features represented by Result Codes 0 ~ 7, 10 ~ 12

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**Default value: A DIU will assume this default value when power is initially applied to it or when the modular line cord is disconnected and then reconnected.*

Table 4
DIU Result Code Set

No.	Word	Description
0	OK	Command executed
1	CONNECT	Connection at 0 to 300 bps
2	RING	Ring Signal Detected
3	NO CARRIER	Carrier signal not detected, or lost
4	ERROR	Invalid command, checksum. Error in command line, or command line exceeds 255 characters
5	CONNECT 1200	Connection at 1200 bps
7	BUSY	Busy signal detected
10	CONNECT 2400	Connection at 2400 bps
11	CONNECT 4800	Connection at 4800 bps
12	CONNECT 9600	Connection at 9600 bps

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Table 5
DIU S-Register Set

Register	Range	Description
S0	0-255 rings	Select ring to answer on specific number of rings
S1	0-255 rings	Ring count (increment with each ring)
S2	0-127 ASCII	Define escape sequence character
S3	0-127 ASCII	Define carriage return character
S4	0-127 ASCII	Define line feed character
S5	0-32, 127 ASCII	Define back space character
S7	1-255 sec.	Select wait time for carrier/dial tone
S9	1-255 .10 sec.	Select carrier detect response time
S10	1-255 .10 sec.	Select-delay between carrier loss/hang-up
S12	0-255 .02 sec.	Define escape sequence guard time

Default Values

Register	Value	S-Register Control
S0	Auto answer enabled	S0 = 1
S1	0 rings	S1 = 0
S2	ASCII 43	S2 = 43
S3	ASCII 13	S3 = 13
S4	ASCII 10	S4 = 10
S5	ASCII 08	S5 = 8
S7	30 sec.	S7 = 30
S9	0.6 sec.	S9 = 6
S10	0.7 sec.	S10 = 7
S12	1 sec.	S12 = 50

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Note:
A DIU will assume these default values when power is initially applied to it or when the modular line cord is disconnected and then reconnected.

Table 6
DIU Dialing Modifier Set

Modifier	Description
0 ~ 9 * #	Digits/characters for dialing
A B C D	Digits/characters for dialing
P	Pulse dial
T	Tone dial
,	Delay processing of next character (1 second)
!	Hookflash
;	Return to Command Mode after dialing

DK062G

January 1996

TOSHIBA

BUSINESS TELEPHONE SOLUTIONS

Add-on Module and Direct Station Selection Console User Guide

Strata® DK280

Digital Business Telephone Systems
Release 3

Contents

U-215

Figures

Introduction

This user guide provides a complete description of both the Digital Add-on Module (DADM) and the Direct Station Selection (DSS) console. It also provides instructions on how to operate all of the features available with them.

Organization

This user guide is divided into the following chapters

- **Chapter 1—The Grand Tour** provides an equipment overview, and describes the features buttons and their associated Light Emitting Diodes (LEDs).
- **Chapter 2—Feature Operation** provides operating procedures for all of the features available with DADMs and DSS consoles.

Conventions

Bold letters in [brackets] represent buttons which have Directory Numbers on them. For example:

[DN] = any Directory Number button (also known as an Extension or Intercom Number).

[PDN] = Primary Directory Number button (the Extension Number for your telephone).

[PhDN] = Phantom Directory Number button (an additional Directory Number).

[DSS] = the Directory Number of another station which will be accessed when this button is pressed.

Extra bold letters represent telephone buttons.

~ means "through."

+ is used for multiple key entries.
Example: Press **Speed Dial** + **XX** + **Redial** + **Spkr** (XX=08~60 seconds).

➤ denotes the step in a one-step procedure.

Notes:
Elaborate specific items or reference other information. Within some tables, General Notes apply to the entire table and numbered Notes apply to specific items.

IMPORTANT !
Calls attention to important instructions or information.

Technical Notes

Your telephone may not have all of the buttons mentioned in this guide. Refer to the Feature Access Code Table in the back of this book for access codes and speed dial code storage. Use the **#** button if your telephone does not have a **Redial** button.

How to Use This Guide

Your DSS Console's or DADM's features are determined by assignments made in system programming. Your System Administrator can inform you as to which features are actually accessible from your DSS console or DADM. Once you are aware of the features that are available to you, review each feature's description and operational procedure contained in this guide.

Information in this user guide is divided into two distinct areas. Step-by-step feature instructions appear in the left-hand column of the page. Explanations of these procedures appear in the right-hand column. (See Figure 1.)

Action Text
Specific instructions on how to perform a procedure are numbered and entered in the left-hand column.

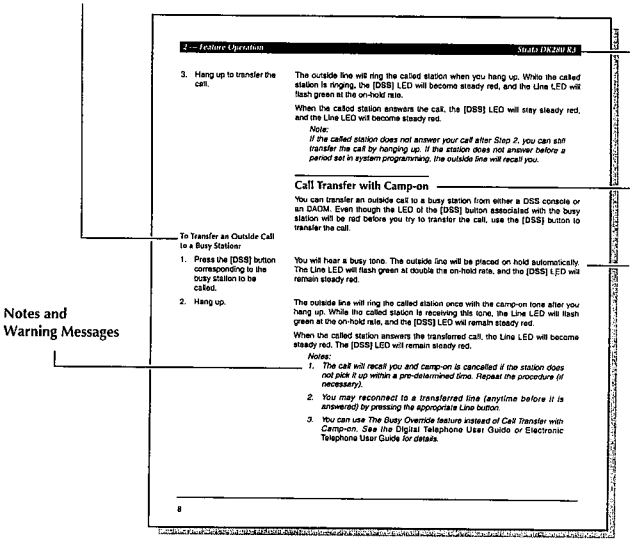


Figure 1
Sample Page

Supporting Documentation

- Digital Telephone User Guide
- Digital Telephone LCD User Guide
- Electronic Telephone User Guide
- Electronic Telephone LCD User Guide

The Grand Tour 1

This chapter provides an equipment overview of the following two optional units and describes the features buttons and their associated Light Emitting Diodes (LEDs).

- **Digital Add-on Modules (DADMs)** that add 20 feature buttons to 2000-series digital telephones.
- **Direct Station Selection (DSS) consoles** that are available for system operators who do not have an attendant console.

Add-on Module

The Digital Add-on Module (DADM), model DADM2020, is shown in Figure 2. As many as two DADMs can be connected to a telephone.

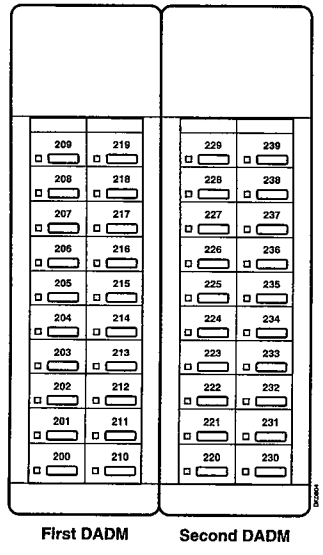
Depending on system programming, the following feature buttons may appear on the DADM. See "Button Definitions" later in this chapter for more information.

- **[DSS]** – Directory Number
- **Line** (or **CO**) – Outside Line
- **SD** – Speed Dial

Directory Numbers or other functions; however, cannot be assigned to DADMs.

Each DSS and Line button has an LED that provides a status of the CO line or station assigned to it.

- The **[DSS]** LED will be green and flashing when the station equipped with an DADM is calling or transferring an outside call to a station. (If calling a station, the LED will turn red and steady when the called station answers; if transferring to a station, the LED will turn red and steady when you hang up to complete the transfer.)
- A Line (CO) LED will be green when the CO line is in use by the DADM console user.



Note:
If only one Add-on Module is connected to the telephone, then the button assignments are the same as those shown on the first DADM.

Figure 2
Button Assignments for the Strata DK280 Add-on Modules (DADMs)

Direct Station Selection (DSS) Console

The DSS console operates alongside of a digital or electronic telephone to provide the telephone with 60 additional feature buttons. This guide applies to the DDSS2060, DDSS1060, and HDSS6560 DSS Console models. An illustration of the DSS console is shown in Figure 3.

Depending on system programming, the following feature buttons may appear on the DSS console. See "Button Definitions" later in this chapter for more information.

- **[DSS]**
- **Line** (or **CO**)
- **SD**
- **All Call** (or **AC**)
- **Night Transfer** (**1** ~ **4**) (or **NT 1** ~ **4**)

DSS console buttons have LEDs that indicate feature status. LEDs on the DDSS2060 and DDSS1060 models light or flash red or green, and LEDs on the HDSS6560 model light or flash red. For the DDSS2060 and DDSS1060 models, the Line (CO) and **[DSS]** LEDs act in the same manner as these LEDs do on the DADM; other feature button LEDs on both of these models will be red when activated.

Note:
The LED color indications described in the Feature Operation chapter apply specifically to the DDSS2060 and DDSS1060 DSS Console models and the DADM. Flash conditions described in this chapter apply to all DSS console models and the DADM.

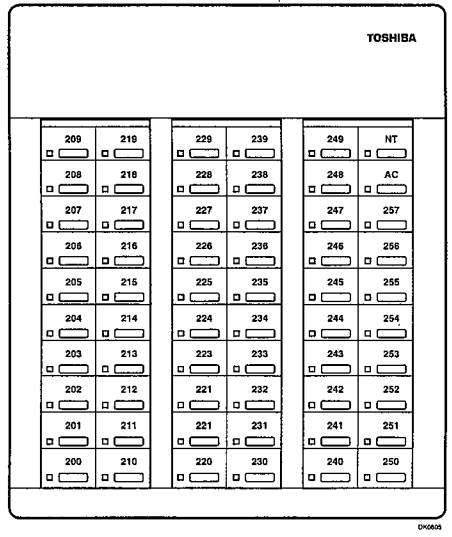


Figure 3
Strata DK Initialized DSS Console Button Assignments (DDSS2060 shown)

Button Definitions

ADM and DSS Buttons	Definitions
[DSS]	Press this button to transfer an outside call to a station or to make a call to a station. The label of each **[DSS]** button shows the **[PDN]** that it will ring. **[DSS]** buttons cannot call station **[PhDNs]**, Distributed Hunt Group **[DNs]**, or ACD Groups.
Line (or **CO**)	Press this button to answer an incoming call or to seize a CO line to make an outgoing call.
SD	Press this button to use the speed dial feature or to automatically dial feature access code(s) assigned to the button. **SD** buttons can be used as either System Speed Dial numbers or Station Speed Dial numbers.

IMPORTANT!

[DSS] buttons on the DSS console can be set in programming to ring stations that are in the Call Forward mode, instead of being forwarded. [DSS] buttons on ADMs cannot override Call Forward.

DSS Only Buttons	Definitions
All Call (or **AC**)	Press this button to page a group of telephone speakers assigned in system programming.
Night Transfer (**1 - 4**) (or **NT 1 - 4**)	Press this button to change the ringing pattern of incoming calls.

Feature Operation 2

Calling a Station

To call a station's **[PDN]** with a **[DSS]** button from either a Direct Station Selection (DSS) console or a Digital Add-on Module (DADM), only press the button associated with the station—do not press a **[DN]** button on your telephone. A station call with a **[DSS]** button can be made on-hook or off-hook, and with Voice First signaling or Tone signaling. After pressing the button, treat the call like any other station call made from a digital or electronic telephone.

[DSS] LEDs indicate whether the associated station is idle or busy. The LED will be lit and red if the station is busy, and unlit if idle. A lit LED may indicate that the station is idle, but all of its buttons are being used by other stations.

Transfer to an Idle Station

You can transfer outside calls to an idle station from either a DSS console or a DADM.

To Transfer an Outside Call to an Idle Station:

1. Press the **[DSS]** button corresponding to the station to be called.

   The outside line is placed on hold automatically. The Line LED will flash green at double the on-hold rate, and the **[DSS]** LED will flash green.

   You will hear a single-ring tone. (If using the Tone signaling mode, you will hear successive ring tones.)

2. Announce the call. You do not have to press any other button.

   With Tone signaling, you would have to wait for the called station to answer before announcing the call.

3. Hang up to transfer the call.

The outside line will ring the called station when you hang up. While the called station is ringing, the **[DSS]** LED will become steady red, and the Line LED will flash green at the on-hold rate.

When the called station answers the call, the **[DSS]** LED will stay steady red, and the Line LED will become steady red.

Note:
If the called station does not answer your call after Step 2, you can still transfer the call by hanging up. If the station does not answer before a period set in system programming, the outside line will recall you.

Call Transfer with Camp-on

You can transfer an outside call to a busy station from either a DSS console or an DADM. Even though the LED of the **[DSS]** button associated with the busy station will be red before you try to transfer the call, use the **[DSS]** button to transfer the call.

To Transfer an Outside Call to a Busy Station:

1. Press the **[DSS]** button corresponding to the busy station to be called.

You will hear a busy tone. The outside line will be placed on hold automatically. The Line LED will flash green at double the on-hold rate, and the **[DSS]** LED will remain steady red.

2. Hang up.

The outside line will ring the called station once with the camp-on tone after you hang up. While the called station is receiving this tone, the Line LED will flash green at the on-hold rate, and the **[DSS]** LED will remain steady red.

When the called station answers the transferred call, the Line LED will become steady red. The **[DSS]** LED will remain steady red.

Notes:
1. *The call will recall you and camp-on is cancelled if the station does not pick it up within a pre-determined time. Repeat the procedure (if necessary).*
2. *You may reconnect to a transferred line (anytime before it is answered) by pressing the appropriate* **Line** *button.*
3. *You can use The Busy Override feature instead of Call Transfer with Camp-on. See the Digital Telephone User Guide or Electronic Telephone User Guide for details.*

Call Answering (CO Line)

To Answer an Incoming CO Line Call to a DADM or DSS Console:

➤ Press the flashing **CO** or **Line** button.

If your DADM or DSS console is equipped with **CO** or **Line** buttons, you can answer CO line calls from the DADM or DSS console as you would from a digital or electronic telephone. See the *Digital Telephone User Guide* or *Electronic Telephone User Guide* for more details.

Speed Dial

Your DADM or DSS console may be equipped with **SD** (Speed Dial select) buttons that can be programmed to dial telephone numbers or to access features. **SD** buttons on either the DADM or DSS console function like **SD** buttons on digital or electronic telephones. Refer to "User Programmable Feature Buttons" in the *Digital* or *Electronic Telephone User Guide* for instructions.

Paging

You can make an announcement page to a group of station telephone speakers selected in system programming with the **All Call** button on the DSS console. **SD** buttons (if programmed) on either the DSS console or the DADM can be used for page announcements. Refer to "User Programmable Feature Buttons" in the *Digital* or *Electronic Telephone User Guide* for programming instructions.

To Deliver an All Call Page Announcement From a DSS Console:

1. Lift the telephone handset.
2. If on a CO line, press the **Hold** button on the telephone.
3. Press the **All Call** button on the DSS console.

The All Call LED will light continuously red.

4. Make your announcement in a normal voice level.
5. Hang up when you have completed your announcement.

The LED will turn off.

DSS Console (Only) Call Forward Override

Either your telephone or your DSS console can be set in system programming to ring stations that are in the Call Forward mode, instead of being forwarded. Typically, the telephone will be provided with this override feature. Among other applications, this feature can be used to notify a person who forgets to deactivate the Call Forward feature after returning to the office.

IMPORTANT!

DADMs cannot override Call Forward.

To Override Call Forward With Your Telephone Dial pad:

➤ Call the station set for Call Forward by dialing from your telephone.

or, if system programming allows:

Make this call like you would any other station call. Your call will forward if you attempt to call the station by pressing a **[DSS]** button on the DSS console. This procedure assumes your station has a typical program setting.

To Override Call Forward With Your DSS Console:

➤ Call the station set for Call Forward by pressing the associated **[DSS]** button on your DSS console.

Your call will forward if you attempt to call the station by dialing from your telephone.

Night Transfer

You can use the DSS console to make the system ring different telephones for incoming calls during different times of the day. The set of telephones ringing is referred to as a ringing pattern.

Different ringing patterns are chosen by pressing the **Night** button (or the **Night 1** ~ **4** button; see notes that follow). Each ringing pattern has distinct CO line-to-station ringing assignments.

Depending upon system programming, either two or three ringing patterns are available. The active pattern is shown by the state of the Night LED:

	Two-pattern	Three-pattern
DAY	OFF	OFF
DAY 2	N/A	FLASH
NIGHT	ON	ON

Notes:

1. *For Non-tenant Service: The ringing state can be changed by any DSS console(s).*
2. *For Tenant Service: CO lines are assigned and controlled independently:*

   Night 1, Tenant 1 CO Lines

   Night 2, Tenant 2 CO Lines

   Night 3, Tenant 3 CO LInes

   Night 4, Tenant 4 CO Lines
3. *In Tenant Service, one system is divided so up to four businesses can use their telephones independently of each other.*

Date/Time/Day Adjustment

The system date, time, and day can be set from a designated station, usually Station 200. Station 200 is typically an attendant station with a DSS console or Add-on Module (DADM). The date, time, and day appear on digital and electronic telephone LCDs.

Date Setting

To Set the Date:

1. Make sure the handset is on-hook.
2. Press a **[DN]** + **# 6 5 1**. — Listen for confirmation tone.
3. Enter the date in the "YYMMDD" format. — YYMMDD = Year/Month/Day. Enter a leading 0 for any single digit entered. Example: To enter January 2, 1993, enter "930102".
4. Press **Redial** (or **RDL**). — Listen for confirmation tone. Press the **#** button if you do not have a **Redial** (**RDL**) button.

Time Setting

To Set the Time:

1. Make sure the handset is on-hook.	
2. Press a **[DN]** + **# 6 5 2**.	Listen for confirmation tone.
3. Enter the time in the 24-hour clock format (HHMMSS).	HHMMSS = Hour/Minutes/Seconds. Enter a leading 0 for any single digit entered. Example: To enter 1:30 p.m and 07 seconds, enter "133007".
4. Press **Redial** (or **RDL**).	Listen for confirmation tone. Press the **#** button if you do not have a **Redial** (**RDL**) button.

Day of the Week Setting

To set the Day of the Week:

1. Make sure the handset is on-hook.	
2. Press a **[DN]** + **# 6 5 3**.	Listen for confirmation tone.
3. Enter the code representing the day that you wish to set (1 ~ 7).	Use the following codes in Step 3 for setting the day of the week. 1 = Sunday 2 = Monday 3 = Tuesday 4 = Wednesday 5 = Thursday 6 = Friday 7 = Saturday
4. Press **Redial** (or **RDL**).	Listen for confirmation tone. Press the **#** button if you do not have a **Redial** (**RDL**) button.

Strata DK280
Digital Business Telephone Systems
Release 3

DKT 2000-Series Telephone Quick Reference Guide

Telephone Directory

Name	*Number*

Telephones

This guide applies to DKT 2000-series digital telephones connected to a Strata DK280 system with Release 3 software.

Conventions

Bold letters in **[brackets]** represent buttons which have Directory Numbers on them. For example:

[DN] = any Directory Number button (also known as an Extension or Intercom Number).

[PDN] = Primary Directory Number button (the Extension Number for your telephone).

[PhDN] = Phantom Directory Number button (an additional Directory Number).

Extra bold letters represent telephone buttons.

Your telephone may not have all of the buttons mentioned in this guide. See your Telephone System Administrator for more information on buttons and access codes.

~ means "through."

\+ is used for multiple key entries.
For example: Press **Cnf/Trn** + **# 4 4**.

➤ indicates a single step.

Before You Begin

If you hear dial tone when you lift the handset, then you do not need to press any available **[DN]** or CO **Line** button before dialing an internal or external number.

Outside Line Access

To access an outside line, you may need to press one of these options: **Line**, **Pooled Line Grp**

\- or -

press a **[DN]** and dial a line access code (**9**, **# 7 0 0 1** ~ **# 7 1 4 4**, or **8 0 1** ~ **8 1 6** - depends on the system's max. number of lines).

Basic Calling

To make an Outside Call:

1. Access an outside line.
2. Dial a telephone number.

To call to Another Station:

1. Lift the handset or press a **[DN]**.
2. Dial a Directory Number.
3. Make a voice announcement after you hear single tone when the called party answers.

Account Code Calls

To enter a Forced Account Code:

1. Access an outside line.
2. Enter the Forced Account Code.
3. Listen for dial tone. Busy tone indicates an invalid code. If you are dialing with Least Cost Routing, you will not hear dial tone.
4. Dial a telephone number.

To enter a Voluntary Account Code:

1. While on a call connected to a CO or other outside line, press **Account Code**

   -or-

   press **Speed Dial** (or ✱) + **5 0**.
2. Dial the Account Code.

Automatic Busy Redial

To activate Automatic Busy Redial:

➤ After dialing an outside telephone number, press **Auto Busy Redial**

-or-

press **Cnf/Trn** + **# 4 4** then hang up.

Your telephone will signal you when the called number becomes available.

To cancel Automatic Busy Redial:

➤ Press **Auto Busy Redial**

-or-

press **[DN]** + **# 4 4**.

Automatic Callback

To activate Automatic Callback:

1. After dialing a busy station or a station in the Do Not Disturb mode, press **Auto Callback** or **4**.
2. Hang up. The system will call you back when the station becomes available.

To cancel Automatic Busy Redial:

➤ Press **Auto Callback**

-or-

press a **[DN]** + **# 4 3**.

Call Forward

To Call Forward your [PDN] with a Call Forward button:

1. Press a Call Forward button:

   Call Frwd All Calls
   Call Frwd Busy
   Call Frwd No Answer
   Call Frwd Busy/NAns
2. Enter the **[PDN]** where calls will forward.
3. Press the Call Forward button again.

To Call Forward your [PDN] with an access code:

1. Press the **[PDN]** or **[PhDN]** button that you want to Call Forward.
2. Enter a Call Forward access code sequence:

   Call Forward-All Calls
   # 6 0 1 + NNN + **Spkr**

   Call Forward-Busy
   # 6 0 2 + NNN + **Spkr**

   Call Forward-No Answer
   # 6 0 3 + NNN + **Speed Dial** (or ✱) + XX + **Redial** (or #) + **Spkr**

   Call Forward-Busy/No Answer
   # 6 0 4 + NNN + **Speed Dial** (or ✱) + XX + **Redial** (or #) + **Spkr**

   NNN = Directory Number where calls will be forwarded.

   XX = The amount of time (08 ~ 60 seconds) that the telephone should ring before it forwards. This entry is optional: you can skip XX + **Redial** (or **#**).

Note:
*You can only Call Forward a **[PDN]** or **[PhDN]** that is "owned" by your telephone. See your System Administrator for more information.*

To cancel Call Forward:

➤ Press the same Call Forward button that you used to set Call Forward

-or-

press a **[DN]** + **# 6 0 1** and hang up.

Call Park Orbits

To Park a call:

1. While on a CO line call or internal call, press **Park in Orbit**

   -or-

   press **Cnf/Trn** + **# 3 3 2**.
2. Enter a General Orbit Number (**9 0 0** ~ **9 1 9**) or a valid Directory Number.

   If you have an LCD telephone, enter **9 9 9** and the system will automatically select an available orbit.
3. Hang up.

To retrieve a Parked call:

1. Press **Park in Orbit**

   -or-

   press **[DN]** + **# 3 3 2**.
2. Enter the Orbit Number or Primary Directory Number where the call is parked.

To Park a call and Page

1. While on a CO line call or internal call, press **Park and Page**

   -or-

   press **Cnf/Trn** + **# 3 3 1**.
2. Enter a General Orbit Number (**9 0 0** ~ **9 1 9**) or a valid Primary Directory Number.
3. Enter the Paging Access Code and make your announcement.
4. Hang up.

Call Pickup

To Pick Up a call:

Applies to calls which are ringing or on hold, not parked.

1. Press **Directed Pickup**
   - or -
   press **[DN]** + **#5**.
2. Enter one of the following:
   A Directory Number - to pick up a call that is ringing or held at a station.
   #30 to pick up a page or ringing door phone. This also picks up any ringing **[DN]**.
   #35 to pick up an external page.
   9 to pickup any ringing CO line.
   801~**816** or **#7001**~**#7144** to pickup a CO line on hold.

Call Transfer With Camp-on

To Transfer a call:

1. While on a call, press **Cnf/Trn**.
2. Dial a Directory Number.
3. Announce the call, then hang up.

   If the station is busy, hang up and the original call will "camp on" the called number. When the called number is available, the "camped on" party will be connected. If the called party does not answer after a certain time, the call will ring back to you.

Conference Calls

To make a Conference Call:

1. While on a call, press **Cnf/Trn**.
2. Dial a Directory Number (or access an outside line, and dial an external telephone number).
3. Press the **Cnf/Trn** button after the called party answers. All parties are conferenced together.

   If you added an **outside** line to the call, press **Cnf/Trn** again before hanging up to allow the outside parties to continue talking. (If you do not, the call will be disconnected).

Note:
Some types of outside lines ("unsupervised") do not automatically disconnect when conferenced parties hang up. If this is the case, occasionally monitor the conference by pressing one of the flashing buttons.

If the parties are still on the line, press **Cnf/Trn** *+* **Spkr**, *then hang up. When no one is on the line, press* **Spkr** *to disconnect the lines.*

Do Not Disturb

To activate/deactivate Do Not Disturb:

- ➤ To activate, press **Do Not Disturb** (LED lights)
- ➤ To deactivate, press **Do Not Disturb** again (LED off).

Hold

To place a call on Hold:

- ➤ Press **Hold**.

To retrieve a Held call:

- ➤ Press the held (flashing) **Line** or **[DN]**.

To place a call on Exclusive Hold:

- ➤ While on a call, press **Hold** twice. (No one can accidentally pick up your call.)

Handsfree Answerback

To receive a Handsfree Answerback call:

You will hear a single warning tone followed by the caller's voice.

- ➤ Without lifting the handset, speak toward the telephone at a normal voice level.

Handsfree Monitoring

To use Handsfree Monitoring:

1. While on a call, hold down **Spkr** and place the handset on-hook.
2. Release **Spkr**.
3. Lift the handset to resume the conversation.

Message Waiting

To leave a Message Waiting Indication at another station:

- ➤ After reaching a busy or unanswered station, press **Msg** or **7**.

To answer a Message Waiting Indication at your station:

The Message Waiting Indication is indicated by a flashing Msg LED.

- ➤ Press **Msg**, lift the handset.

Override

To make a Busy or Executive Override call:

1. To make a Busy Override call, dial **2** after dialing a busy station
   -or-
   press **21** or **12** if your telephone has Off-hook Call announce.
2. To make an Executive Override (barge-in) call, dial **3** after reaching a busy station.

Paging

To make a Page announcement:

1. Press a **[DN]**.
2. Enter a page zone code:

#30	All Call Page group
#311~**#318**	Station groups
#39	All Call Page group with external page zones.
#35~**#38**	External Page zones.

Repeat Last Number Dialed

To redial the last number dialed:

1. Lift the handset and press any available **[DN]** or **Line** button.
2. Press **Redial**.

Saved Number Redial

To "Save" a number to redial later:

➤ Anytime after dialing a telephone number and before disconnecting the call, press **Save Last Number**.

To redial a "Saved" number:

➤ Access an outside line, then press **Save Last Number**.

Soft Keys

Soft keys are prompts which appear on an LCD screen. When they are "on," the **Mode**, **Page**, and **Scroll** buttons perform the action described by the soft key. (See example titled "Using Soft Keys.")

To turn Soft Keys on:

Press **Mode** + **7 1** (when telephone is idle).

To turn Soft Keys off:

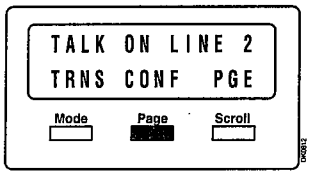
Press **Mode** + **7 0** (when telephone is idle).

Using Soft Keys:

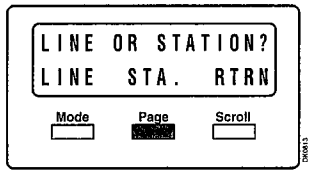
In this example of conferencing using the soft keys, grey indicates which soft key button should be pressed. Soft key abbreviations shown in this example are:

TRNS	= Transfer	PGE	= Page
CONF	= Conference	STA.	= Station
JOIN	= Join Parties	RTRN	= End procedure and return to previous state

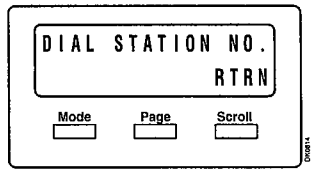
1. While talking on a CO (outside) line, the TRNS, CONF, and PGE soft keys appear.



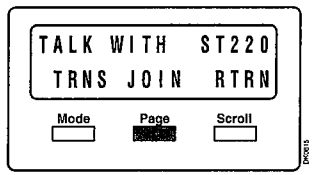
2. After pressing the button under the CONF soft key, the following appears. Press the STA. soft key to conference to another station.



3. Dial the station number of the party that you wish to add to the conference call.



4. Once the called party answers, the LCD appears as follows. Your station is connected to the called station 220 and the outside call remains on hold. The JOIN soft key would be pressed to join all parties in a conference.



Speed Dial

To store a Speed Dial number:

1. Do **not** lift the handset.
2. Press **Redial**, then press **Speed Dial** (or ✱).
3. Press the **SD** button that you want to store the telephone number on

   - or -

   dial a Speed Dial access code (**1 0** ~ **4 9** for Station Speed Dial), which will be used in place of the number once it is stored in memory.

   To store a System Speed Dial number, you must enter the access codes (**6 0** ~ **9 9** or **6 0 0** ~ **6 9 9***) from station 200.
4. Press the **[PDN]** button.
5. Enter a CO line access code plus the telephone number, then press **Redial**.

To make a call with Speed Dial:

➤ Press an **SD** button

Note:
*You may have to first access a line (press **[DN]** or **Line**, or enter an access code before pressing **SD**.)*

- or -

press **Speed Dial** (or ✱) and dial a Speed Dial access code (**1 0** ~ **4 9** for Station Speed Dial, or a System Speed Dial access code **6 0** ~ **9 9** or **6 0 0** ~ **6 9 9***).

**The number of System Speed Dial numbers, 40 or 100, depends on the system's size. See your System Administrator for information on System Speed Dial codes.*

TOSHIBA Toshiba America Information Systems, Inc.
Telecommunication Systems Division
9740 Irvine Boulevard, Irvine, CA 92718
Part Number: D28-QR-DKTEL-R3
Item Number: 4010344

Strata DK280
Digital Business Telephone Systems
Release 3

EKT-Series
Electronic Telephone
Quick Reference Guide

Telephone Directory

Name	*Number*

Telephones

This guide applies to all electronic telephones (EKTs), except the 10X and 20X series, connected to a Strata DK280 system with Release 3 software. Electronic telephone model numbers begin with "EKT" and appear on stickers shown on the bottom of your telephone.

Conventions

Bold letters in **[brackets]** represent buttons which have Directory Numbers on them. For example:

[DN] = any Directory Number button (also known as an Extension or Intercom Number).

[PDN] = Primary Directory Number button (the Extension Number for your telephone).

[PhDN] = Phantom Directory Number button (an additional Directory Number).

Extra bold letters represent telephone buttons.

Your telephone may not have all of the buttons mentioned in this guide. See your Telephone System Administrator for more information on buttons and access codes.

~ means "through."

+ is used for multiple key entries.
For example: Press **CONF/TRNS** + **# 4 4**.

➤ indicates a single step.

Before You Begin

If you hear dial tone when you lift the handset, then you do not need to press any available **[DN]** or **CO** line button before dialing an internal or external number.

Outside Line Access

To access an outside line, you may need to press one of these options: **CO**, **PL**

- or -

press a **[DN]** and dial a line access code (**9**, **# 7 0 0 1** ~ **# 7 1 4 4**, or **8 0 1** ~ **8 1 6** - depends on the system's max. number of lines).

Basic Calling

To make an outside call:

1. Access an outside line.
2. Dial a telephone number and lift the handset when the called party answers.

To make a call to another station:

1. Press a **[DN]** and lift the handset.
2. Dial a Directory Number.
3. Make a voice announcement after you hear the single tone, or if ringing, wait for the called station to answer.

Account Code Calls

To enter a Forced Account Code:

1. Access an outside line.
2. Enter the Forced Account Code.
3. Listen for dial tone. Busy tone indicates an invalid code. If you are dialing with Least Cost Routing, you will not hear dial tone.
4. Dial a telephone number.

To enter a Voluntary Account Code:

1. While connected to a CO line or other outside line, press **ACCNT**

   -or-

   press **SDS** (or ✱) + **5 0**

   -or-

   press **CONF/TRNS** + **# 4 6**.
2. Enter the Account Code.

Automatic Busy Redial

To activate Automatic Busy Redial:

➤ After dialing an outside telephone number and receiving busy tone, press **ABR**

-or-

press **CONF/TRNS** + **# 4 4** then hang up.

Your telephone will signal you when the called number is available.

To cancel Automatic Busy Redial:

➤ Press **ABR**

-or-

press a **[DN]** + **# 4 4**.

Automatic Callback

To activate Automatic Callback:

1. After dialing a busy station or station in the Do Not Disturb mode, press **ACB** or **4**.
2. Hang up. The system will call you back when the station becomes available.

To cancel Automatic Callback:

➤ Press **ACB**

-or-

press a **[DN]** + **# 4 3**.

Call Forward

To set Call Forward with a Call Forward button:

1. Press a Call Forward button:

   CFAC Call Forward-All Calls

   CFB Call Forward-Busy

   CFNA Call Forward-No Answer

   CFB/NA Call Forward-Busy/No Answer
2. Enter the **[PDN]** to which calls will forward.
3. Press the same Call Forward button again.

To set Call Forward with an access code:

1. Press the **[PDN]** or **[PhDN]** button that you want to Call Forward.
2. Enter a Call Forward access code sequence:

Call Forward-All Calls
 # 6 0 1 + NNN + **SPKR**

Call Forward-Busy
 # 6 0 2 + NNN + **SPKR**

Call Forward-No Answer
 # 6 0 3 + NNN + **SDS** (or ✱) + XX + **RDL** (or #) + **SPKR**

Call Forward-Busy/No Answer
 # 6 0 4 + NNN + **SDS** (or ✱) + XX + **RDL** (or #) + **SPKR**

NNN = Directory Number where calls will be forwarded.

XX = The amount of time (08 ~ 60 seconds) that the telephone should ring before it forwards. This entry is optional: you can skip XX + **RDL** (or #).

Note:
*You can only Call Forward a **[PDN]** or **[PhDN]** that is "owned" by your telephone. See your System Administrator for more information.*

To cancel Call Forward:

➤ Press the same Call Forward button that you used to set Call Forward

-or-

press a **[DN]** + **# 6 0 1**, then hang up.

Call Park Orbits

To Park a call:

1. While on a CO line call or an internal call, press **PARK**

   -or-

   press **CONF/TRNS** + **# 3 3 2**.
2. Enter a General Orbit Number (**9 0 0** ~ **9 1 9**) or a valid Primary Directory Number.

   If you have an LCD telephone, enter **9 9 9** and the system will automatically select an available orbit.
3. Hang up.

To retrieve a Parked call:

1. Press **Park**

   -or-

   press a **[DN]** + **# 3 3 2**.
2. Enter the Orbit Number or Primary Directory Number where the call is parked.

To Park a Call and Page

1. While on a CO line call or an internal call, press **CP/PG**

   -or-

   press **CONF/TRNS** + **# 3 3 1**.
2. Enter a General Orbit Number (**9 0 0 ~ 9 1 9**) or a valid Primary Directory Number.
3. Enter the Paging Access Code and make your announcement.
4. Hang up.

Call Pickup

To Pick Up a ringing line or a call on hold:

This feature is for calls that are not parked.

1. Press the **PKUP** button

   -or-

   press **[DN]** + **# 5**.
2. Enter one of the following:

   A Directory Number - to pick up a call that is ringing or held at a station.

   # 3 0 to pick up a page or ringing door phone. This also picks up any ringing **[DN]**.

   # 3 5 to pick up an external page.

   9 to pick up any ringing CO line.

   8 0 1 ~ 8 1 6 or **# 7 0 0 1 ~ # 7 1 4 4** to pickup a CO line on hold.

Call Transfer with Camp On

To Transfer a call:

1. While on a call, press **CONF/TRNS**.
2. Dial the Directory Number where the call will be transferred.
3. Announce the call, then hang up.

   If the station is busy, hang up and the original call will "camp on" the called number. When the called number is available, the "camped on" party will be connected. If the called party does not answer after a certain time, the call will ring back to you.

Conference Calls

To make a Conference Call:

1. While on a call, press **CONF/TRNS**.
2. Dial a Directory Number (or access an outside line and dial an external telephone number).
3. Press the **CONF/TRNS** button after the called party answers. All parties are conferenced together.

   If you added an **outside** line to the call, press **CONF/TRNS** again before hanging up to allow the outside parties to continue talking. (If you do not, the call will be disconnected).

   Note:
   Some outside lines ("unsupervised") do not automatically disconnect when conferenced parties hang up. If this is the case, occasionally monitor the conference by pressing one of the flashing buttons.

   If the parties are still on the line, press **CONF/TRNS** + **SPKR**, *then hang up. When no one is on the line, press* **SPKR** *to disconnect the lines.*

Do Not Disturb

To activate/deactivate Do Not Disturb:

- ➤ To activate, press **DND** (LED lights).
- ➤ To deactivate, press **DND** again (LED off).

Hold

To place a call on Hold:

- ➤ Press **HOLD**.

To retrieve a Held call:

- ➤ Press the held (flashing) **CO** or **[DN]**.

To place a call on Exclusive Hold:

- ➤ While on an outside call, press **HOLD** twice. No one can accidentally pick up your call.

Handsfree Answerback

To receive a Handsfree Answerback call:

You will hear a single warning tone followed by the caller's voice.

- ➤ Without lifting the handset, speak toward the telephone at a normal voice level.

Handsfree Monitoring

To use Handsfree Monitoring:

1. While holding down the **SPKR** button during a call, place the handset on-hook.
2. Release the **SPKR** button.
3. Lift the handset to resume the conversation.

Message Waiting

To leave a Message Waiting Indication at another station:

After reaching a busy or unanswered station, press **MW/FL**.

To answer a Message Waiting Indication at your station:

The Message Waiting Indication is indicated by a flashing MW/FL LED.

- ➤ Lift the handset, press **MW/FL**.

Override

To make a Busy Override or Executive Override call:

1. To make a Busy Override call, press **2** after dialing a busy station

   -or-

   press **2 1** or **1 2** if your telephone has Off-hook Call announce.
2. To make an Executive Override (barge-in) call, dial **3** after reaching a busy station.

Paging

To make a Page announcement:

1. Lift the handset and press a **[DN]**.
2. Enter a page zone code:

# 3 0	All Call Page group
# 3 1 1 ~ # 3 1 8	Station groups
# 3 9	All Call Page group with external page zones.
# 3 5 ~ # 3 8	External Page zones.

Repeat Last Number Dialed

To redial the Last Number Dialed:

1. Lift the handset and press any available **[DN]** or **CO** button.
2. Press **RDL** (or **# #**).

Saved Number Redial

To Save a number to redial later:

➤ Any time after dialing a telephone number and before disconnecting the call, press **SAVE**.

To redial a Saved number:

➤ Access an outside line, then press **SAVE**.

Speed Dial

To store a Speed Dial number:

1. Do **not** lift the handset.
2. Press **RDL** (or **#**).
3. Press the **SD** button that you want to store the telephone number on

   - or -

   press **SDS** (or ✱) and enter a Speed Dial access code (**1 0 ~ 4 9** for Station Speed Dial), which will be used in place of the number once it is stored in memory.
4. Enter the telephone number that you want to store.

   Note:
   If you need to press [DN] or **CO** *before dialing an internal or external number, you can store it as part of the speed dial number. Just press [DN] or* **CO**, *followed by the telephone number.*
5. Press **RDL** (or **#**).

To make a call with Speed Dial:

➤ Press an **SD** button

- or -

press the **SDS** (or ✱) and enter a Speed Dial access code (**1 0 ~ 4 9** for Station Speed Dial

- or -

press the **SDS** (or ✱) and enter a System Speed Dial code **6 0 ~ 9 9** or **6 0 0 ~ 6 9 9** *).

* *The number of System Speed Dial numbers, 40 or 100, depends on the system's size. See your System Administrator for information on System Speed Dial codes.*

TOSHIBA
Toshiba America Information Systems, Inc.
Telecommunication Systems Division
9740 Irvine Boulevard, Irvine, CA 92718
Part Number: D28-QR-EKTEL-R3
Item Number: 4010345

Glossary

AA: Auto Attendant (built-in or external). This feature acts as an automatic operator that directs incoming callers to stations by offering a menu of dialing prompts.

ACD: Automatic Call Distribution. Allows incoming calls to be distributed to a group of ACD agents. The ACD supervisor's LCD telephone displays ACD Agent and Group information which allows the supervisor to monitor calls and assist agents.

ACD/MIS: Automatic Call Distribution (ACD) with Management Information System (MIS).

ADM: Add-on Module—See DADM.

280ADMIN: Toshiba's customer data base programming and upload/download software package for Strata DK280.

ANI: Automatic Number Identification—Telephone number of the calling party is sent to the DK280 over incoming DID or tie lines. This feature is provided by some long distance telephone service companies.

280BACKUP: Toshiba's customer data base upload/download software package for Strata DK280.

BGM: Background Music—Allows customer-supplied music to be sent to telephone speakers and external speakers.

BPS: Bits Per Second—Unit of measure that refers to the transmission speed (baud rate) of electronic signals. It is used when describing data interface unit and modem operation.

CLASS: Custom Local Area Signaling Services—Defines a number of features offered by local telephone companies.

CLID or **CND**: Calling Line Identification or Calling Number Delivery—Telephone number or name of the calling party is sent to the DK280 over incoming ground or loop start CO lines. This feature is one "CLASS" feature offered by some local telephone companies.

CO: Central Office—The facility which houses switching equipment that provides telephone service (CO lines, E & M tie lines, DID lines, Centrex lines, etc.) for the immediate geographical area.

CO Line: A term used to define the Strata DK280 hardware circuits that connect to the Central Office network line pair. Each CO line, DID and tie line circuit is assigned a CO line number in system software.

CODECs: Coder/Decoder—Semiconductors that allow the system to process analog-to-digital and digital-to-analog conversions.

DADM: Digital Add-on-Module—Optional device that connects to 2000-series digital telephones to provide the telephones with 20 flexible feature buttons that can be assigned individually for Direct Station Selection, System and Personal Speed Dial, and CO line access.

DDCB: Digital Door Phone/Lock Control Unit—A peripheral hardware unit compatible with designated digital telephone circuits that supports optional door phones (MDFBs) and provides door lock control.

DDSS: Digital Direct Station Selection Console—A device that helps facilitate the processing of a heavy load of incoming calls. The DDSS connects only to designated digital telephone circuits, and is associated with a digital telephone.

DID Line: Direct Inward Dialing line.

DISA: Direct Inward System Access—A feature that allows an outside party to access Strata DK280 internal stations or outgoing CO lines without having to go through an operator or automated attendant. An optional security code may be set to prevent unauthorized access to outgoing CO lines for through system calling.

DK: Digital Key.

DKT: Digital Telephone.

DKSUB280: Base Cabinet—Unit that houses the Common Control Unit (RCTU), as well as six universal slots for station, line, and option PCBs. The Base Cabinet also contains a power supply that provides power for all of the stations and peripherals connected to the base cabinet PCBs.

DKSUE280 or DKSUE424: Expansion Cabinet—Optional unit that has six universal slots for station, line, and option PCBs. The expansion cabinet has a power supply that furnishes power for all of the stations and peripherals connected to the expansion cabinet PCBs. As many as five expansion cabinets can be added to the system.

[DN]: Directory Number.

DNIS: Dialed Number Identification Service—Telephone number of called party is sent to the DK280 over incoming DID or tie lines. This feature is provided by some long distance telephone companies.

DPFT: Power Failure/Emergency Transfer Unit—An optional backup unit that provides emergency service during power failures by automatically connecting up to eight standard telephones to designated CO lines.

DSS: Direct Station Selection—Feature which allows a telephone user (as well as a DSS console and ADM user) to call another station with the touch of a flexible feature button.

DTMF: Dual-tone Multi-frequency—Push-button tone dialing.

DVSU: A subassembly that equips a digital telephone with the capability to receive Speaker Off-hook Call Announce (OCA) calls. DVSU is not required to receive Handset OCA (HS-OCA).

EKT: Electronic Telephone.

EOCU: Off-hook Call Announce Subassembly—An optional upgrade to the Electronic Telephone Interface Unit (PEKU) or Electronic Telephone/Standard Telephone Interface Unit (PESU) that enables properly configured telephones (see HVSU2) to receive Off-hook Call Announce (OCA) calls.

FCC: Federal Communications Commission—The federal agency which regulates the telecommunication industry. All Toshiba hardware is FCC listed or approved.

HDCB: Electronic Door Phone/Lock Control Unit—A peripheral hardware unit compatible with designated electronic telephone circuits that supports optional door phones (MDFBs) and provides door lock control.

HDSS: Electronic Direct Station Selection Console—A device that helps facilitate the processing of a heavy load of incoming calls. The HDSS console connects only to designated electronic telephone circuits, and is associated with electronic telephones.

HESB: External Speaker Box—A speaker/amplifier that can be configured with the system to provide a variety of functions, such as a paging speaker and/or Background Music (BGM) speaker.

HESC-65A: A cable used to connect an HHEU-equipped digital telephone or an HHEU-equipped electronic telephone to the external speaker box (HESB) for the Loud Ringing Bell feature.

HHEU: Headset/Loud Ringing Bell Interface—Subassembly that fits inside a digital telephone or a 6500-series electronic telephone to allow a headset or an external speaker box (HESB) to be connected to the telephone.

HVSU2: Subassembly that fits into a 6500-series electronic telephone enabling it to receive Off-hook Call Announce (OCA) calls. The telephone must be connected to an Electronic Telephone Interface Unit (PEKU) or a Standard Telephone/Electronic Telephone Interface Unit (PESU) equipped with an Off-hook Call Announce Subassembly (EOCU) to receive OCA, and must have three-pair wiring.

IMDU: Remote Maintenance Modem Subassembly—A subassembly installed on an Option Interface Unit (PIOU or PIOUS) that allows the system to be connected with a remote administration/

maintenance terminal or 280Admin/280Backup personal computer.

LCD: Liquid Crystal Display—The optional display on digital and electronic telephones that displays calling information.

LCR: Least Cost Routing.

LDI: Long Distance Information.

LED: Light Emitting Diode—Status indicators located on printed circuit boards (PCBs), digital telephones, and electronic telephones.

LSI: Large Scale Integration—Related to circuit design technology. Strata DK280 printed circuit boards (PCBs) use LSI circuit design.

MDF: Main Distribution Frame—The wiring frame usually located in a phone closet.

MDFB: Door Phone Box—A peripheral two-way speaker box option.

MOH: Music on Hold—Customer-supplied music or announcements can be sent to parties on-hold on CO lines or the intercom.

OCA: Off-hook Call Announce. There are two types: Handset OCA and Speaker OCA.

OPS: Off-premises Station.

PBTC: A Toshiba-supplied cable used to connect customer-supplied batteries to a cabinet power supply in a one- or two-cabinet system for emergency reserve power for the entire system.

PBX: Private Branch Exchange—Industry-standard term which refers to a telephone switch, usually on-premises, which serves an individual company, and is connected to a public telephone exchange through the Central Office (CO).

PCB: Printed Circuit Board.

PCM: Pulse Code Modulation—A widely-used form of digital telephone switching.

PCOU: CO Line Interface Unit—An optional printed circuit board (PCB) that provides the system with four loop start CO lines. Supports Caller ID when used with RCIU/RCIS circuits.

PDIU-DI2: Integrated Data Interface Unit—Replaces the normal digital telephone base so that the telephone can be used for the transmission and reception of data between a terminal/personal computer connected to the telephone and devices connected to other PDIU-DIs or to modems, printers, and computers which are in turn connected to PDIU-DSs. The PDIU-DI is also used to provide personal computer auto dialing of voice calls without a modem; and, access to outside dial-up data services and/or bulletin boards via modem pooling.

Note:
PDIU-DI2 is replaced with RPCI-DI.

PDIU-DS: Stand-alone Data Interface Unit—Used for modem pooling, printer sharing, and accessing host/mainframe computer.

PDKU2: Digital Telephone Interface Unit—An optional printed circuit board (PCB) that provides the system with eight digital telephone circuits. In addition to digital telephones, the PDKU can support data interface units (stand-alone and integrated), a digital DSS console (DDSS), RPCI, ADM, and a digital door phone/lock control unit (DDCB).

[PDN]: Primary Directory Number.

PEKU: Electronic Telephone Interface Unit—An optional printed circuit board (PCB) that provides the system with eight electronic telephone circuits, which can support electronic telephones, a Background Music source, a door phone/lock control unit (HDCB), an electronic DSS console (HDSS), and amplifiers for two CO-line conference calls. The PEKU is also used with older Strata systems.

PEMU: E & M Tie Line Unit—An optional printed circuit board (PCB) that provides the system with support for four E & M Type I tie lines. The PEMU is also used with older Strata systems.

PEPU: External Page Interface Unit—An optional printed circuit board (PCB) that provides support and/or circuit interface mainly for optional hardware peripherals and upgrades associated with external paging functions.

PESU: Standard/Electronic Telephone Interface Unit—An optional printed circuit board (PCB) that provides the system with a combination of two standard and four electronic telephone circuits. The standard telephone circuits can support standard telephones and optional hardware peripherals, such as voice mail devices and Fax machines. Except for the electronic DSS console, the PESU electronic telephone circuits can support the same stations and peripherals that the

PEKU does. The PESU is also used with older Strata systems.

[PhDN]: Phantom Directory Number.

PIOU: Option Interface Unit—An optional printed circuit board (PCB) that provides support and/or circuit interface for optional hardware peripherals and upgrades.

PIOUS: The same as the PIOU, with some exceptions; most notably, the PIOUS has one external paging interface zone, while the PIOU has four.

PORT: A term used to identify a station circuit or CO line circuit location.

PBTC1A-3M: Battery cable that connects reserve power batteries to cabinet RPSU280 power supplies (102 cabinet installations).

PPTC: A Toshiba-supplied Adapter—An adapter that is used to connect: an SMDR device, ASCII maintenance terminal, or remote maintenance external modem.

PPTC-9: A Toshiba-supplied Adapter—An adapter that is used to connect: the modular SMDR, SMDI, MIS for ACD, Open Architecture (OA), maintenance ports of the PIOU, PIOUS, RSSU, RSIU, or RSIS to the DB-9 (PPTC-9) connector of a call accounting machine, 280Admin, 280Backup personal computer (PC), SMIS personal computer or Open Architecture personal computer.

Note:
PPTC9 is designed to connect directly to the DB9 connector of PC COM ports, while PPTC connects directly to an ASCII terminal female DB25, not a PC COM port male DB25.

PSTU2: Standard Telephone Interface Unit—An optional printed circuit board (PCB) with a built-in ring generator that provides interface for eight standard telephones or optional hardware peripherals (voice mail devices, Background Music source, fax machines, etc.). The PSTU2 has a square wave ring generator that can be set for 190V peak-to-peak or 130V peak-to-peak. The PSTU2 is also used with older Strata systems.

RAM: Random Access Memory—Refers to the type of system memory that holds individual system configuration and feature programming. RAM is read/write memory, and can be easily revised in programming.

RATU: Attendant Console Interface Unit—Optional printed circuit board (PCB) that can support up to four attendant consoles and/or PC attendant consoles.

RBDB: Battery Distribution Box—Interface used to connect reserve power batteries to systems with three or more cabinets (also provides six RBTC1A-1.5M cables to connect RBDB to cabinet RPSU280 power supplies).

RBTC1A-2M: Battery cable that connects reserve power batteries to RBDB battery distribution box (3 or more cabinet installations).

RCCB: Conduit Connection Box—Device required for floor-mounted systems with three or more cabinets to connect AC power and reserve power battery cabling to the system. Cabling from the AC power source and from the reserve power battery source can only be installed by a licensed electrician.

RCIU/RCIS: Four-circuit plug-in PCB/four-circuit piggy-back PCB, each of which receives and decodes FSK Caller ID (CLID or CND) information from the Central Office ground or loops Caller ID lines. Each RCIU/RCIS circuit works in conjunction with a DK280 RGLU/RCOU/RCOS line PCB circuit.

RCOS: Loop Start CO Line Interface Subassembly—Optional subassembly that attaches to the RCOU PCB to provide four additional CO analog line circuits to the PCB. Supports Caller ID when used with RCIU/RCIS circuits.

RCOU: CO Line Interface Unit—An optional printed circuit board (PCB) that provides the system with four loop start CO lines. An optional RCOS subassembly can be attached to the RCOU for four more loop start analog CO lines. Supports Caller ID when used with RCIU/RCIS circuits.

RCTU: Common Control Unit—The system's controller printed circuit board (PCB) that contains the system's main microprocessor and microprocessor bus, ROM, RAM, time switch logic, busy tone detectors, system tones and MOH/BGM Interface. RCTUs include: RCTUA1, RCTUB1, RCTUC1/ RCTUD1 for DK280 Release 1, RCTUB2 and RCTU C1/D2 for Release 2, and RCTUA3, RCUBA/BB, and RCTUC3/D3 for 280 Release 3. Each RCTU supports different station

and line capacities. The RCTU PCBs also provide interface for the optional RRCS PCB and RKYS key.

RDDU: Direct Inward Dialing Interface Unit—Optional printed circuit board (PCB) that provides four analog Direct Inward Dialing line circuits. Supports ANI and DNIS with DK280 Release 3.

RDSU: Digital/Standard Telephone Interface Unit—Optional printed circuit board (PCB) that provides two standard telephone and four digital telephone circuits in its basic configuration. An RSTS can be attached to the RDSU for two additional standard telephone circuits.

RDTU: T1/DS-1 Interface Unit—Optional printed circuit board (PCB) that provides up to 24-digital channels that can individually be assigned for loop start CO line, ground start CO line, E & M tie line, or DID line operation. Supports ANI and DNIS with DK280 Release 3.

REMU: E & M Tie Line Unit—An optional printed circuit board (PCB) that provides the system with support for four E & M Type I or Type II, Immediate or Wink Start tie lines. Supports ANI and DNIS with DK280 Release 3.

RFIF: Floor Mount Installation Kit—Kit that is used to floor mount systems.

RGLU: Analog Ground/Loop Start CO Line Interface Unit—Provides four CO line circuits that can be individually configured for loop start or ground start CO line operation. Supports Caller ID when used with RCIU/RCIS circuits.

RKYS: Feature Key Upgrade—Subassembly that attaches to the common control unit to provide the system with optional features. There are four versions of the RKYS: the RKYS1, the RKYS2, the RKYS3 and the RKYS4, each of which provides a distinct set of features.

RMDS: Remote Maintenance Modem Subassembly—A subassembly installed on the RSIU Optional Interface Unit that allows the system to be connected with a remote administration/ maintenance terminal or 280Admin/280Backup personal computer.

RPCI-DI: Computer Data Interface Unit—Replaces the normal telephone base and provides all the functions of PDIU-D12. In addition, it can be switched to a second mode automatically and used with a Telephone Application Program Interface (TAPI) software application.

ROM: Read Only Memory—Refers to the type of system memory that holds static software that comprises the mechanics of the features' functions. ROM is only revised by Toshiba software engineers.

RPSB (1 and 2): Power Strip—Interface between cabinet power supplies and the commercial AC power source. The RPSB provides outlets for three power supplies. One RSPS is required for systems with three or four cabinets, two or three RSPSs for five- or six-cabinet systems.

RPSU280: Cabinet Power Supply—Furnishes power to all of the stations and peripherals connected to the cabinet PCBs. Each Base and optional expansion cabinet has a separate power supply.

RRCS: Dual-tone Multi-frequency Receiver—An optional upgrade to the system Common Control Unit (RCTU) that provides Dual-tone Multi-Frequency (DTMF) receivers for system Direct Inward System Access (DISA) CO lines, E&M tie lines, DID, DNIS and ANI lines, Auto attendant announcement devices, remote change of call forward-external destination, DNIS external call routing, and stations and other peripherals that connect to standard telephone circuits. The RRCS comes in three models: the RRCS-4 (provides four DTMF receivers), the RRCS-8 (eight DTMF receivers), and the RRCS-12 (12 DTMF receivers).

RSIS: Optional RS-232 Serial Interface Unit—A subassembly installed on the RSIU optional interface unit that allows the system to be connected to any of the following features: voice mail SMDI, MIS for ACD, SMDR, local 280Admin/ 280Backup personal computer, external maintenance modem, Open Architecture personal computer.

RSIU: Optional RS-232 Serial Interface Unit—An optional printed circuit board (PCB) that provides interface to any of the following features: voice mail SMDI, MIS for ACD, SMDR, local or remote 280Admin/ 280Backup Personal computer, built-in (RMDS) or external system maintenance modem, Open Architecture personal computer. By itself, the RSIU PCB provides one interface port. With up to three RSIU/RMDS subassemblies, it can provide up to four interface ports.

RSTU: Standard Telephone Interface Unit—An optional printed circuit board (PCB) with a built-in ring generator that provides interface for eight-standard telephones or optional hardware peripherals (voice mail devices, Background music source, fax machines, etc.). The RSTU has a built-in 80V RMS sine wave ring generator. The RSTU also has connectors for the R48S, which extends station loop length and is described in this section.

RSTU2: Standard Telephone Interface Unit—An optional printed circuit board (PCB) functionally identical to the RSTU. RSTU2 also contains a 90-volt DC message waiting/generator/switching circuit to operate standard telephone message waiting lamps.

RWBF1: Wall bracket Fixture—Bracket that is part of an installation kit (RFIF) that is used to floor mount systems.

RFMF: Floor Mount Fixture—Fixture that is part of an installation kit (RFIF) that is used to floor mount systems.

R48S: Optional 48V Power Supply—Subassembly that can be connected to the RSTU or RDSU to extend the loop length of standard telephone circuits (including the resistance of the phone) from 600 ohms to 1200 ohms.

[SDN]: Secondary Directory Number.

SMDI: Simplified Message Desk Interface: RS-232 link from PIOU, PIOUS, RSSU, RSIS, or RSIU modular jack connected to a voice mail machine to provide DK280 voice mail integration.

SMIS: Software MIS for ACD.

T1/DS-1: See RDTU.

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