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key bx 816 Office Telephone System Customer Service Manual

Part 1: System Description

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NOTICE

This manual is applicable to the key bx 816 software version C. Telrad, Ltd., reserves the right to make changes in the equipment described, and in this manual, without notification. However, changes in the equipment do not necessarily render this manual invalid.

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Figure 1-1 key bx 816 Key Switching Unit (KSU), open, with station. (version with separate memory card.)

Section 1 INTRODUCTION

1.1 General

The key bx 816 is an electronic office telephone system which incorporates the sophisticated features of a large EPABX with the simplicity of operation of a key telephone. The key bx 816 provides for up to eight Central Office lines and up to 16 extensions; yet its advanced design offers the user a level of service usually available only from much larger PABXs.

1.2 Purpose of Manual

This manual is for the use Customer Service Representatives and other professional personnel who need detailed knowledge of the key bx 816. It, and its companion volume, key bx 816 Installation and Maintenance (TLRD-884-261-111), contain all information required to operate train purchasers in operation of the system, program all features, equipment. install and maintain the the manual is intended Although for telecommunications primarily specialists, it is written in simple, nontechnical language, and contains no proprietary information -- so it can be provided to a customer who wishes complete documentation of his equipment. This manual is divided into three parts. The first part is a System Description, which explains all the features of the key bx. The second part is Operating Instructions. The third part is the Configuration Guide, which explains how to provision hardware, and how to use the Direct Station Select (DSS) console to configure all the features of the system. Each part stands alone, and can be provided individually to a customer.

This manual supercedes the preliminary Customer Service Manual, issued July 1983. It includes additional information and is in a different format from the preliminary issue.

1.3 The key bx Family

The key bx 816 is the smallest of the key bx family of electronic hybrid exchanges. The family includes the key bx 1632, with up to 16 CO lines and 32 extensions, and the key bx 2864, with up to 28 CO lines and 64 extensions. In addition, special software is available to sdapt the 2864 to customers requiring only 16 CO lines. Thus, the key bx exchanges can serve the needs of any small or medium-sized office.

Appendix A is a comparative chart showing the maximum capacity and other data for each of the key bx exchanges.

1.4 System Advantages

Two features of the key bx 816 design make it outstanding among electronic key systems:

- The system can operate with its own microprocessor-based station, or with ordinary Single-Line Telephones (SLTs). The key bx station communicates with the Key Switching Unit (KSU) over dedicated control link, making possible extremely simple operation PABX advanced features. Virtually all these features are available also at SLTs, by dialing one-digit access codes.
- The system is completely programmable from Direct the Station Select (DSS) console, which is a standard unit purchased by the user for attendant operation. system is extremely easy to learn -- the user need not learn special and needs no specialized codes training in telephony or computers. The customer service representative -- and even the customer himself if chooses -- can program any feature of the system in the office, customer's rather than having to perform programming tasks at the KSU.

1.5 System Components

1.5.1 Switching and Power Equipment. The Key Switching Unit (KSU) of the 816 is a compact unit which is equipped with a main printed circuit board and several expansion boards (see Figure 1-1). In addition, option modules can be added to provide impulse dialing, Call Detail

Recording, and other optional features. A description of each printed circuit card appears in Section 1 of the Configuration Guide.

The KSU is connected to the Main Distribution Frame (MDF) by means of industry-standard 25-pair connectors. In addition, a 36-pin connector leads to the external power supply, and a DB-25 connector provides an interface to a printer or computer for Call Detail Recording (CDR).

There are contacts for connection to external music sources, to provide music on hold and background music through the key bx station speakers. Additional contacts can connect external paging speakers, door units and other office equipment to the telephone exchange.

The Power Supply uses standard 110-V or 220-V current, and produces all the regulated voltages required for operation of the key bx. In case of a power failure, the Power Supply can also be powered by an optional battery backup unit, so that telephone service can be continued uninterrupted.

An optional Power Failure Unit (PFU) provides emergency telephone service, in case battery backup is not provided. The PFU automatically connects all CO lines to up to eight emergency telephone sets on case of power failure.

- 1.5.2 Terminal Equipment. The key bx 816 can operate with its own "smart" terminal equipment, or with ordinary type 500 or type 2500 SLT sets. There are two types of key bx telephone sets: the Standard, and the Feature Phone (with or without display).
- (a) The Standard Station (Figure 1-2) has a standard 12-key dislpsd, plus 11 dedicated feature buttons, eight CO line buttons, and eight Direct Station Select (DSS) buttons. It comes with an internal speaker and microphone for Hands-Free Talk Back (HFTB), and an

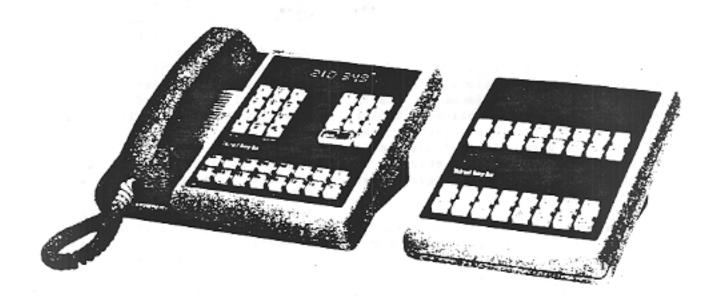


Figure 1-2 Standard Display Station and Direct Station Select Console.

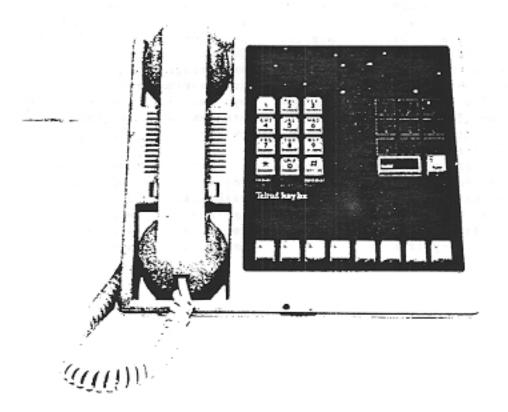


Figure 1-3 Feature Phone.

optional display. There is a speaker volume control and a volume range control readily accessible on the outside of the case.

LEDs, and the optional display, provide visual indications of telephone activity, including incoming calls, messages, and other functions. LEDs in the DSS buttons indicate whether other stations are busy. Several distinctive rings and tones indicate internal and external incoming calls, ringbacks, and other information.

The standard station is connected to the junction box leading to the KSU by means of modular three-pair cable. One pair is for handset conversation; one pair for hands-free conversation; and one pair is for control signals between the station and the KSU.

(b) The Feature Phone (Figure 1-3) provides all the services and features provided by the standard set, but has only two feature buttons, rather than 11, and has only one row of buttons for Direct trunks and "festure" Selection. Pressing the button converts the dial pad into a feature keypad, which can provide all the dedicated functions performed by the function keypad of the standard set. On the front panel the functions performed by the dialpad are clearly marked, and all the LEDs of the standard set are present. The Feature Phone has a speaker, but has no microphone, so it cannot perform hands-free talk back. Like the standard set, it is connected to the KSU by three-pair wire.

(c) Single-Line Telephones (SLT). SLTs may be used for up to 12 of the key bx extensions, either as ordinary extensions or as Off-Premises extensions (OPX) (there is no limit on the number of stations). The SLTs may be either DTMF (tone) or impulse dial telephones. A special line card is required when SLTs or OPXs are installed.

Most of the features available at standard stations are also available at SLT sets, by dialing special access codes. In addition, certain features operate differently at SLTs, which makes inclusion of SLT sets in a key bx system configuration practical.

Section 3 of the Operating Manual provides information on operation of SLT sets in the key bx network.

1.5.3 Direct Station Select (DSS) Console. The DSS console (Figure 1-4) serves a dual function in the key bx system. As an attendant's console, it performs all the call traffic management functions required by a small office. As a programming station, it loads all information required to configure the system. The console is switched from program mode to DSS mode by means of a switch on the rear of the unit.

When functioning as an attendant console, the DSS works in conjunction with station 20. The DSS is installed instead of station 21. It can be replaced with a station with no hardware or software changes.

Section 2 FEATURES AND SERVICES — GENERAL

2.1 General

The features and services of the key be fully to designed are programmable. Many of the features, which in other telephone exchanges are factory set, can be set in the key bx by procedures. programming complete list of programmable parameters is in Section 3 of the Configuration of Sections 4 8 to Guide; Configuration Guide include complete for configuring and instructions programming the system.

Programmable functions include:

 system time functions, such as duration of hold, time to recall, pause time for dialing on CCSA and enhanced dial networks, flash time for operation with PABXs, and other time parameters;

- dialing privileges and restrictions for each telephone extension and CO line;
- Call Detail Recording parameters.
 The system can be configured to print a log of outgoing calls, in any format, on any standard ASCII printer, or to output the log into a computer for sorting.
- call routing and forwarding. The key bx can be configured to route and forward incoming calls to designated stations.

2.2 Features Table

Table 2-1 lists the features available in the key bz 816 system, with a brief description of each feature and programmable options to the feature. The features are described in detail in Sections 3, 4, 5 and 6.

Table 2-1 key bx 816 FEATURES AND SERVICES

Feature	Description	Programmable Options
SYSTEM FEATURES		
Nonblocking line access	Access to CO lines is nonblocking; eight of 16 stations can conduct intercom calls simul- taneously.	
Programmable System Times	All timing parameters can be individually programmed.	Flash times; maximum hold time; recall time for day or night service; recall time for recall to attendant station; transfer recall time; maximum duration of hands free talkback conversation; maximum duration of page announce ment; pause time for CCSA and PABX dialing.
Station Priority Service	System grants trunk services on a priority basis.	
Call Detail Recording	Details of telephone usage can be printed on any asynchronous ASCII printer or dumped to a tape or computer port.	Printer characteristics, including baud rate, parity, page length and width; printout format, including header style, blank lines between call records; minimum duration of local calls required for logging; minimum duration of long-distance calls required for logging; minimum number of dial digits required for logging; choice of listing all extensions participating in a call or only the last party; account coding of calls for billing purposes.

Table 2-1 (continued)

Feature	Description	Programmable Options
PABX and CENTREX Interface	System can be configured to enable interface with CENTREX or PABX system.	Dial signals * and # can be configured to be interpreted by key bx or passed transparently to outer exchanges; flash time can be adjusted to PABX or CENTREX speci- fications; automatic or manual pause can be selected, with pause time programmable; system stations can be program- ed to provide ground to PBXs requiring it.
Split System Configuration	System can be configured to serve as two separate mini- exchanges.	
Open-Loop Detection	System automatically drops CO lines when far-end party terminates.	Open loop time program- mable.
Selectable Dial Signal- ing	System can be configured for DTMF or impulse dialing.	For impulse dialing, make-break ratio and Interdigital pause time are programmable. Option- al hardware is required.
Hybrid Confi- guration	System can be configured as key system, or as hybrid system for use with Single Line Telephones.	
External Inputs	Audio inputs available for music on hold, and two background music channels for broadcast through station speakers.	

Table 2-1 (continued).

Feature	Description	Programmable Options
External Outputs	Audio outputs for external page system or dictation equipment.	
External Relays	Relays, accessible by dialing codes, for door units, external bells, control of electrical equipment.	
CALL ROUTING FEATURES		
Configurable Call Routing	Incoming calls can be routed for efficient CO line service.	CO line ringing and flashing during day and night service; private line service.
Automatic Call Handling	Unanswered calls ring back automatically according to prefixed patterns, so that calls are not dropped.	Ringback and other time parameters of rerouted calls are programmable
Day and Night Service	Two call-routing maps can be programmed for day and night service.	Ringing and Flashing of CO lines can be indivi- dually programmed for each extension, independently for day and night service.
External Bells	Ring signals can be routed to external bells for noisy or open environments.	Each bell can be programed to ring for severa trunks; ringing can be routed independent! for day or night servi
Page Groups	Two groups of stations can receive page messages through their speakers.	Selected stations can denied access to pagin
DND forward and Follow Me	Call forwarding provided for extensions in do-not- disturb mode.	User can select Follow Me extension; otherwis a default extension ca be assigned.

Table 2-1 (continued)

Feature	Description	Programmable Options
STATION USER FEATURES		
Intercom calling	Users can dial other extensions in the key bx network, using normal or handsfree mode.	Dialing to selected ex- tensions can be restric- ted.
On-hook dialing	All function keys can be activated and all dialing done on-hook.	
Hands-free Talkback (HFTB)	Built-in speaker and microphone give station many characteristics of a speakerphone.	Automatic termination after programmable time when in HFTB mode; access to station speaker can be restricted.
Exclusive Hold	A call on hold at a station flashes at that station only.	
Direct Station Selection	Eight station buttons can be configured to direct- dial other stations, or perform special functions. One additional direct station selection is pro- vided by sec'y button.	Button configuration can be programmed by the station. The sec'y button is programmable for each station.
Automatic Answer	Station can answer a ring- ing CO line without press- ing the CO line button.	Automatic Answer is programmable for each station.
Speed Dialing	90 system speed dial numbers and 7 station speed dial numbers are available to each station.	System speed dial numbers can be entered by key bx attendant; station speed dial numbers can be entered at each station; access to system speed dial list can be blocked

Table 2-1 (continued)

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Automatic recall of able unanswered transfers reened. after a programmable time.
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Table 2-1 (continued)

Feature	Description	Programmable Options
Display	10-digit display shows time and date, elapsed time of call, messages, number dialed, CO line or extension ringing, page codes, con- ference parties, pickup extension, call forward extension.	Time and date can be set from attendant station.
Alarm Clock	Station can be set to ring at a selected time.	Alarm is set by station user.
Trunk Queuing	Station can queue for trunk use. Trunk recall is by priority.	Division of CO lines into trunk groups for queuing is programmable.
ATTENDANT FEATURES		
Dedicated Intercom link	Speech link is always re- served for attendant inter- com calls.	
Busy Lamp Field	Direct Station Select (DSS) console shows status of all extensions.	
Digital Display	DSS console display shows CO lines and extensions.	
Handset or headset operation	DSS console works in con- junction with station 20, or with headset connected directly to unit. Release button terminates line use with headset operation.	
Call transfer	by means of dedicated DSS button.	
Call camp-on	by means of dedicated DSS button.	

Table 2-1 (continued)

Feature	Description	Programmable Options
Paging	by means of dedicated DSS buttons.	
Day alert mode	Attendant can enlist another station as a secondary attendant station during heavy traffic periods.	Secondary station selectable from DSS.
Automatic Recall	Unanswered calls return automatically to attendant station after timeout.	Recall time is program- mable.
Serial Calls	Attendant can request ringback when a conversation is terminated.	
Night Service	selectable by dedicated DSS button.	

Section 3 SYSTEM FEATURES

3.1 Nonblocking Access

The internal switching matrices of the key bx 816 are designed to provide nonblocking telephone service for external communications, and virtually nonblocking internal service. Switching is by means of CMOS integrated space-division components — there are no electromechanical relays, so reliability is extremely high.

There are eight internal links for connection to CO lines (see Figure 3-1), so a link is always available for an extension to connect to a CO line. For internal handset calls, four links are provided. This means four extensions can place internal calls simultaneously, to four or more other extensions. In other words, eight of the 16 extensions can be in use for internal calls simultaneously -- more if the calls are conference calls. In an office with

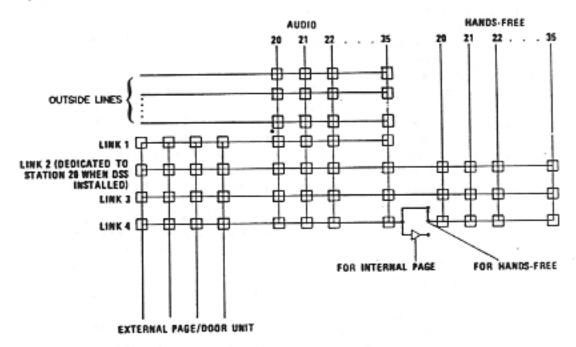


Figure 3-1 Switching matrix architecture.

heavy telephone traffic, this means the probability that a user will be unable to place an internal call is negligible.

If a DSS console is installed in the system, one of the internal links is dedicated to the attendant's use. This means that the attendant can always make an internal call, no matter how many extensions are in use.

3.2 Programmable System Times

All time parameters in the key bx 816 and software, in programmable from the DSS console, changes anv hardware OI specialized equipment. This feature adds a dimension of versatility and makes it possible to interface the key bx with virtually any exchange, public or private.

Two general types of time parameters -internal programmable external call-routing times, and signaling times. Internal call-routing times include the maximum length of a announcement or handsfree call page is automatically call the before ringback times when a call terminated; is on hold or transfered; and other internal parameters. These times can be set to meet the specific traffic needs of the customer. Internal call-routing times are explained in detail in Section 4.2.

include External signaling times flash time, interdigital pause times (for impulse dialing), and durations of other signals which the key bx sends on its CO lines. These parameters serve two purposes -- to adapt the system to the specifications of the telephone network, and to configure the key bx to operate behind & PABX or CENTREX system. When configured behind a private exchange, the key bx can serve as an expansion or an enhancement of the exchange, adding the advanced features of the key bx, without detracting from the features of the larger exchange. Section 3.5 describes how to configure the **key bx** as an enhancement to PABX or CENTREX exchanges.

3.3 Station Priority Service

During heavy usage, when there is competition between extensions for telephone services, the key bx grants services first to the lowest extension numbers. This feature is important for trunk queuing (see Section 5.13). When several stations have requested use of a single trunk or trunk group, the station with the lowest extension number is given the trunk first.

For this reason, when planning an installation, it is desirable to install the lowest numbered extensions in the offices of the most senior personnel.

3.4 Call Detail Recording (CDR)

An optional card with RS-232C port can be installed in the key bx to provide Call Detail Recording. A sample printout appears in Figure 3-2. Any asynchronous ASCII printer can be connected to the port. All interface parameters of the port can be set from the DSS -- no DIP switches need be set or other hardware changes made. You can format the CDR printoutin a number of ways -- the key bx knows how to print each day's calls on a separate page, and you can print page headers, set page length, and other format parameters.

CDR requires installation of a special option card in the KSU.

When CDR is installed, account coding of calls is possible. This means that during a call, a user can enter a charge number, which appears on the printout. A single call can have several account numbers.

The CDR port can also be connected to a computer, which can perform sorts on the output and produce station-

by-station reports on a regular basis.

3.5 PABX and CENTREX Interface

The key bx has special software configurations for installation behind an existing PABX or CENTREX exchange. This feature makes it possible to expand an existing office system, or to enhance an unsophisticated PABX with key bx features. Figure 3-3 shows a typical installation of a key bx behind a PABX. configuration, shown the marketing department of a company has access to the company branch exchange through some of its key bx CO lines, direct external lines on other CO lines, and a WATS line on still another trunk. This configuration has the following advantages:

- the department has its own direct access to the public network. If there is a shortage of CO lines to the PABX, this enables the department to bypass the company exchange;
- the department has direct access to the rest of the company through its CO lines behind the PABX, with the advantage of key bx features. For example, a key bx extension can make a conference call with other key bx stations, PABX extensions in other departments, and outside parties, using the key bx conference feature;
- the department has its own dedicated WATS line. No other company telephone can access this line.

The software configurations for behind PABX and behind CENTREX are designed to make maximum use of the main exchange features. The configurations operate as follows:

					TR		
				T-5:	I/C = 0/G	STA. TORNA. TRANSFORED	
				("	" S-E	STR.	CALL
				1	J- 5-C	S TRANSFERE	
DATE	8/05		TELRAD	Кенрк	SMDR -		PAGE 01
				1 /			
CO	EXT	TIME	DURATION	TYPE	ACCT	CALLED NO.	RING TIME
_				0 S-E	/ WAY- 11 DIG	03949998	
2	23 20	02148 PM	00:27	_	(,	03717770	
1	20	03:23 PM	00:01	0 S-E		y	
	20	03:25 PM	00:02	0 S-E		9	
1 1 1 1 0	27	03:27 PM	00:10	0 S-E		9	
		03:28 PM	00:00	0 S-E		2	
	27		00:04	0 S-E		2	
1	27	03:29 PM		I S-E		33	
1		03:52 PH	03:55	T 2-F		33	
	20		00:18				
•	30		00:18				
1	27	05:16 PM	00:08	I S-E			00:19
2	23	05:30 PM	04:43	0 S-E		9 03949998	
1 2 1 2 2	27	06:36 PM	08:02	I 5-E			00:05
ő	20	07:16 PH	00:26	0 S-E		903949998	
	23	08:09 PK	01:06	0 S-E		9 03949998	
-	6.0	occio, en	01100				

Figure 3-2 Call Detail Recording (CDR) printout.

(a) behind PABX: When dialing on a line behind PABX, all key bx feature buttons except * and # (on the dialpad) These two keys, operate normally. however, are dialed out to the PABX. Many PABXs use these keys to activate features. So the key bx user has at his disposal all the PABX features. Those key bx features which use the * and # keys -- speed disl, account coding, and pause time redial, unavailable on trunks behind PABX. All other key bx features operate normally.

No disling restrictions are applied to CO lines behind PABX, since the PABX itself can usually apply disl restrictions to the line. Flash time can be set to the specifications of the PABX, to make use of this feature.

Some older PBXs require a ground signal to seize an outside line (most modern exchanges require the user to dial 9). The key bx can be configured to send a ground signal to the host exchange. The save/repeat key on the function keypad in this case acts as a ground button; there is then no save/repeat function.

If your PBX has few or no special features, you may find it preferable to configure the key bx trunks as ordinary CO lines, so that the key bx speed dial and other features are available. this case, a special feature -- pause outside calling time -- makes The key bx can insert convenient. pauses into a dial sequence, whether the number is dialed manually or with the system speed dial directory. Pauses are inserted with the # key. When behind PABX which requires 9 to seize a CO' line, a user can enter the number 9#555-1234 in his speed dial directory. The key bx will dial 9, wait for the pause time -- time for the PAEX to seize an outside line and get a dial tone -and then automatically dial the number.

TO OTHER DEPARTMENTS COMPANY PABX LOCALINE COLINE WATS LINE PABX CO LINES

Figure 3-3 key bx installation behind PABX.

The pause time can be configured for automatic use or manual use. Manual pause lets the user enter pauses when redialing or save-repeat dialing, as well as when speed dialing. Specifically, the difference between manual and automatic pause is as follows:

 automatic pause -- during the first four digits of a dial sequence, # is dialed out by the key bx. In the following digits, # causes the key bx to pause for the pause time;

 manual pause -- dialing # at any time causes the key bx to pause; # is never dialed out to the trunk.

(Note that when a trunk is configured as behind PABX, # is always dialed out to the trunk, regardless of whether manual or automatic pause is selected.)

(b) behind CENTREX: All key bx feature buttons operate normally, including the * and # keys. Flash time can be set to CENTREX specifications.

A CO line cannot be programmed to be both behind CENTREX and behind PABX.

3.6 Split Configuration (TENANT SERV.)
Common system functions

The key bx 816 can be configured to serve as a split or tenant exchange, so that it in effect acts as two virtually independent exchanges. Thus, two small businesses can share a single key bx -each business has its own CO lines, and its own extensions.

Split configuration is done by using the following programmable functions:

 CO line access restriction -blocks access of business A's extensions to business B's trunks and vice versa - see Section 6.2; ** Incoming call ringing (day) - see

***** Sections 4.1.1 and 4.1.2;

 incoming call flashing (day) - see Section 4.3;

• incoming call ringing (night) - see

Sections 4.1 and 4.3;

- incoming call flashing (night) -these functions configure business
 A's CO lines to ring and flash only
 at business A extensions, and
 business B's CO lines to ring and
 flash only at business B extensions
 - see Sections 4.1 and 4.3;
- ICM restriction -- blocks business A extensions from making intercom calls to business B extensions and vice versa - see Sections 5.1 and 5.9;
- paging routing see Section 4.7;
- to page access -- these functions must al specific cannot page the other business's extensions -- see Sections 4.7, and bx page Sections 2.15 and 4.2.2 of the poperating Instructions;

day recall time - see Section 4.2; enight recall time -- these times must be set to unlimited, to prevent unanswered calls from transfering automatically to station 20 (see Section 4.2).

Common system functions must be shared by the two exchanges. These include night service (see Section 4.3), Call Detail Recording (Section 3.4), system speed dial directory (Section 5.5), and the attendant console (if one is installed). Certain extensions can be configured as shared extensions—for example, an outside guard can have access to extensions of both businesses, or both businesses can operate a single outside door unit connected to the key bx.

Figure 3-4 shows a typical split configuration for two businesses.

3.7 Open Loop Detection

When an incoming caller terminates a call to the **key bx**, the **key bx** automatically detects the open loop and drops the line. This has two advantages:

- users who are restricted from dialing long-distance calls or from dialing on a given CO line cannot circumvent the restriction by dialing on a line that was already seized for a previous call.
- When an outside caller on hold in the key bx terminates, the line is sutomatically dropped. Without open-loop detection, the unused line would remain on hold, wasting switching facilities and outside access.

DEPAULT = 1 SEC.

NOTE: Open-loop detection requires that the Central Office provide an open-loop signal service.

3.8 Selectable Dial Signaling

The key bx 816 can be configured for DTMF (tone) dialing or impulse dialing. DTMF signaling is standard. Impulse dialing requires the addition of an optional printed circuit card, which sends dial pulses to the trunk.

When the impulse dial option is installed, each trunk and each SLT extension can be configured independently as either DTMF or impulse. The only limitation is that DTMF extensions cannot dial on impulse-dialed trunks.

When the impulse dial option is installed, the signal parameters can be configured to meet the specifications of the Central Office, or PABX the key bx is connected to. Interdigital pause, make/break ratio, and pulses per second can be set when the system is programmed.

When impulse dial is selected and a trunk is configured as behind PABX, the key bx ignores the # and * signals.

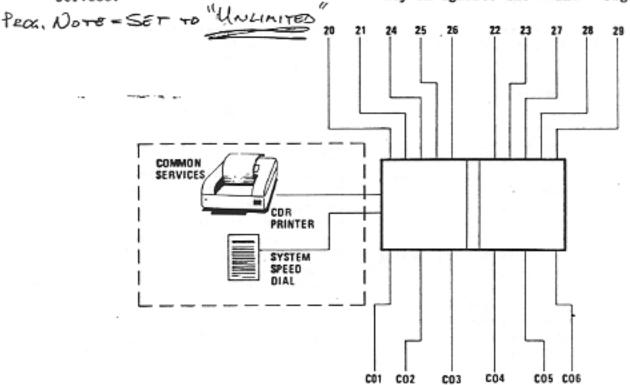


Figure 3-4 Tenant service configuration.

3.9 Hybrid Configuration

The key bx can be used with key bx stations, designed to make maximum use of all the key bx advantages, or with ordinary Single-Line Telephones (SLTs). When used with SLTs, the key bx can be configured to operate as a hybrid key-PABX telephone exchange. In this configuration, the SLT dials 9 to seize The key bx selects an a CO line. available CO line. Ιn configuration, the SLT must dial 9 and the number of the trunk, I through 8, he wishes to dial on.

In hybrid configuration, four trunk groups can be defined. The SLT user can select the trunk group he wishes to use. This makes possible inclusion of special service trunks, such as Foreign Exchange (FX) lines, WATS lines, or CCSA service, in a key bx system in hybrid configuration. It also makes possible tenant service in hybrid configuration—each tenant is assigned a trunk group, and barred access to the other tenant's CO lines.

When trunk groups are defined, the SLT user dials 9 and the number of the trunk group he wants. When no trunk groups are defined, he need dial only 9.

Some state and Federal regulations define key and hybrid systems differently, for approval and tax purposes. The key bx can be configured as either, in order to meet the requirements of these regulations.

3.10 External Inputs (or - ks)

An optional printed circuit card can be installed in the key bx, which makes it possible to connect three outside audio sources to the system. This can be used for background music or music on hold. Two background music channels are available.

3.11 External Outputs (DPT ICA)

When the option card is installed, the key bx can be connected to a four-channel external page system. Each channel can be accessed individually. The key bx can be adapted to virtually any commercially available page system, regardless of electrical characteristics.

3.12 External Relays (OFF PCB)

When the option card is installed, the key bx can activate external relays. A user activates the relays by dialing special codes from an extension. These relays can turn on and off electrical appliances, open doors, and perform other essential office functions. (all relays except door unit are future options.)

The key bx has a special output for installing a door unit. A sensor is applied to the outside bell, which activates the buzzer in the attendant console of the system, when someone rings. Two audio wires connect to an outside speaker-microphone, so that a user, when he hears the bell, can talk to the person at the door through his key bx station. A fourth wire closes a relay which opens an electric lock on the door. The relay is activated with the * key of the key bx station.

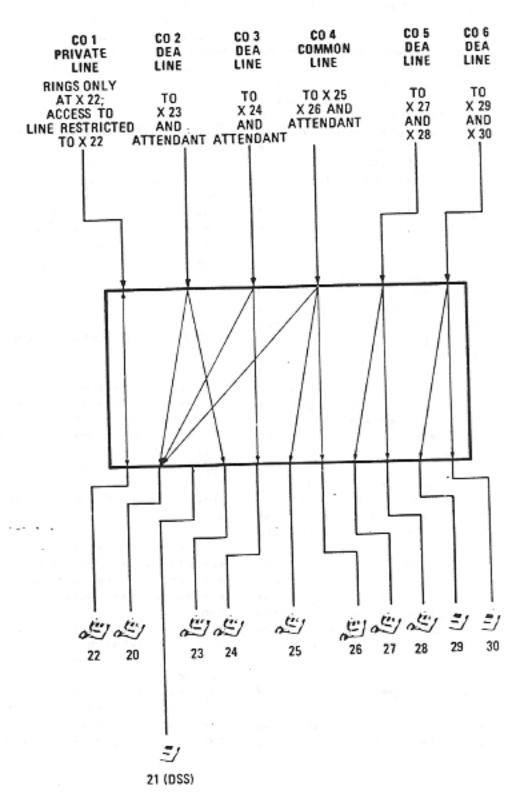


Figure 4-1 Example of a call routing configuration.

Section 4 CALL ROUTING FUNCTIONS

4.1 Configurable Call Routing

Incoming calls on CO lines can be configured to ring at up to four key bx extensions, and to flash at any number of extensions. Call routing can differ for day and night service. This flexibility of call routing makes it possible to configure call routing maps usually possible only in much larger PABX systems.

4.1.1 Direct Extension Access. It is possible to configure Direct Extension Access (DEA), so that an outside caller can dial directly to a given extension or group of extensions. This can be configured using the following programmable functions:

- e incoming call ringing (day);
- incoming call flashing (day);
- incoming call ringing (night);
- incoming call flashing (night);
- · automatic answer

Each CO line can be configured, by means of the first four functions, to ring and flash at certain extensions only. Automatic answer enables the extension to answer an incoming CO call without pressing the CO line button. So for example, if CO line l is configured to ring and flash only at station 23, then a caller has direct extension access to that station by calling on that line.

Figure 4-1 shows a typical configuration with Direct Extension Access provided to a key bx with six CO lines and 10 extensions.

By requesting consecutive telephone numbers from the telephone company, this feature can emulate Direct Inward Dialing (DID). For example, if CO telephone numbers are 799-1520, 799-1522, and 799-1523, configured to ring at stations 20, 22 and 23 respectively, the key bx functions as a DID system.

Sections 3.2.3 to 3.2.6 of the Configuration Guide explain how to program the above functions.

4.1.2 Private Line Service. The key bx can be configured to provide private line service to selected extensions. Private line service means a CO line is available to one extension only, for that extension's exclusive use — the line rings at no other extension, and no other extension can dial on it. A call on the CO line may, however be transferred to another station.

The key bx provides this service by means of seven programmable functions:

- incoming call ringing (day);
- incoming call flashing (day);
- incoming call ringing (night);

- · incoming call flashing (night);
- automatic answer;
- access restriction;
- transfer-dial restriction.

The first five functions perform the same function as for Direct Extension Access -- they make the CO line ring and flash only at the station which is to have private line Access service. restriction blocks other extensions from seizing the CO line. If a restricted extension tries to access the line, he will hear an error tone in the receiver. Transfer-dial restriction prevents an unauthorized extension from dialing on the CO line, if the line has been transfered to him. So for example, if extension 23 has private line service on CO line 1, and transfers a call on that line to extension 24, extension 24 will be unable to dial another call on the line after the calling party terminates.

In Figure 4-1, extension 22 has private line service on CO line 1.

4.2 Automatic Call Handling

The key bx automatically handles unanswered calls which have been placed on hold or transfered. The call is rerouted three times during the day, and twice during night service. If, after the last transfer, no one answers the call, it is automatically dropped. All the time parameters related to call rerouting are programmable. This feature provides the maximum assurance that outside calls will not be dropped.

Figures 4-2 and 4-3 show call handling during day and night service. Figure 4-2(A) shows the rerouting of a call that has been placed on hold during day service. The call remains on hold for the hold time, then automatically rings back the holding extension. The call rings at the extension for the day recall time. If no one answers, the call is automatically transfered to station 20 -- the attendant's station.

The call rings at station 20 for the <u>DSS</u>
recall time. If no one answers after
the DSS recall time, the call is
automatically dropped.

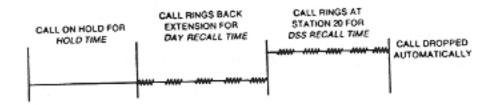
Figure 4-2(B) shows rerouting of the same call during night service. The call rings back at the holding extension after the hold time. It rings at the extension for the night recall time. This time is programmable independent of the day recall time -- normally it is programmed for a longer period. If no one answers within the night recall time, the call is automatically dropped -- it is not transfered on to the attendant station.

Figure 4-3 shows rercuting of transfered calls during day and night service. In Figure 4-3(A), a call that has been transfered during the day to another extension rings at that extension for the <u>unscreened transfer time</u>. If no one answers, the call rings back at the attendant's station, station 20. It continues ringing for the <u>DSS recall time</u> and is then dropped.

In Figure 4-3(B), the call was transfered during night service. It rang at the station for the unscreened transfer time, then rang back at the originating station for the night recall time. After the night recall time, the call was automatically dropped — it was not transfered on to the attendant station.

All the times mentioned above are programmable. When the system is first installed, they are set to default settings — these settings are listed in Section 3.1 of the Configuration Guide. You may program the time parameters for a wide range of values, or you can set any of them to unlimited. In this case, the call will continue to ring (or be held) for an unlimited time, and will not be transferred on.

(A) DAY SERVICE

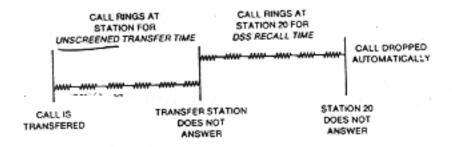


(B) NIGHT SERVICE



Figure 4-2 Call handling during hold.

(A) DAY SERVICE



(B) NIGHT SERVICE

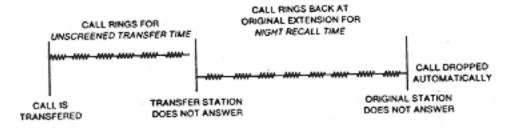


Figure 4-3 Call handling after transfer.

Day and Night Service During night service, all the

completely independent call-routing maps can be defined for the key bx -- one for day service and one for night service. Day and night service are defined by the following functions:

- call ringing and Incoming bе flashing. Each CO line can programmed to ring and flash at certain extensions during day service, and other extensions during night service.
- (b) Call rerouting and time Calls which have parameters. placed on hold or transfered, automatically rerouted if they are unanswered. This rerouting differs for day and night service. Section 4.2 describes this difference in detail. The time parameters which define the programmable rerouting are call independently for day and night service. Figures 4-2 and 4-3 show these time parameters.

The key bx remembers what mode it is in, even if there is a power failure. So, if the system is in night service when the power fails, it will remain in night service when the power comes back on.

Figure 4-4 illustrates two call-route maps for day and night service for a typical office. The key bx system has three CO lines and six extensions. Extension 21 is used for a 26 is an Off-Premises Extension extension (OPX), located in the office managers home. During day service, all the CO lines ring in the office -- CO 1 is a line to the office manager and sales manager, CO 2 and CO 3 are common lines for the sales department. No CO line rings at the OPX during day service, but the extension can still be used for intercom and outside calling.

home, and at the office manager's station. No other extensions ring.

External Bells 4.4

key bx extensions can be configured to ring, not only at the extension or station, but also at an external bell. This is useful when the key bx is installed in noisy or open environments, when a user is likely to be away from his extension, or unable to hear the extension ringing because of background noise.

This feature requires installation of an optional printed circuit card in the

4.5 Pick-up Groups (从tx - こ Girs) (This feature is a future option.)

4.6 Hunt Groups

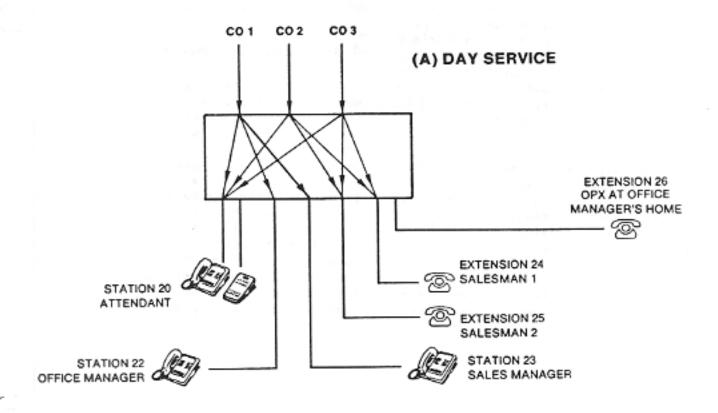
(This feature is a future option.)

Page Groups 4.7

The key bx 816 has the capability of serving as a public address system for paging and announcements. Paging can be by means of the built-in speakers in the key bx stations, or by means of an external page unit with up to four channels. The external page unit must have its own amplification.

Stations and external speakers can be divided into six page groups. Two of these groups are for station speakers and external speakers -- the others are for external speakers only. Any number of stations can be included in each group. Usually, one of the groups is reserved for a general page -- including all key bx stations.

FOR SPAGE ACCESS = WHO CAN MAIRE & FARE



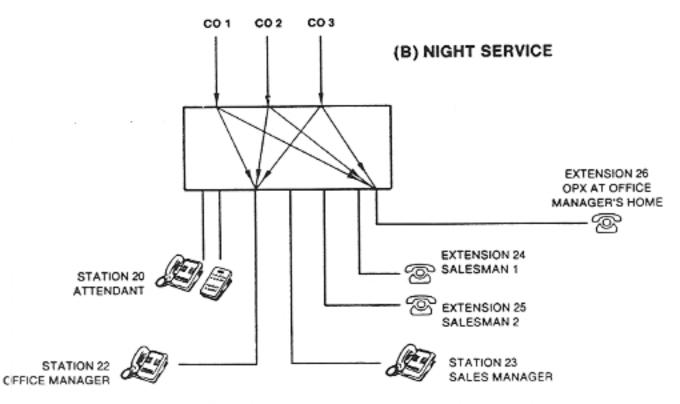


Figure 4-4 Call routing during day and night service.

The maximum duration of a paging announcement is defined during system programming. When A user makes a page announcement which exceeds the maximum time, the page is automatically terminated. This prevents the possibility of someone making an announcement, and forgetting to hang up his station at the end of it.

During a page, and after it is ended, display stations display the word "PAGE", the station that initiated the page, and the page group. The page is introduced and terminated with a tone burst in the station speakers.

Access to paging can be defined when the system is programmed. Any station can be given or denied the possibility of accessing any of the page groups.

4.8 Call Forwarding

The key bx can forward calls from unattended stations to manned stations. There are two types of forwarding: user can forward his calls using the "follow me" feature, using the DND key and dialing any extension he wants to and a permanent call forward to; forward number can be selected for each station using the Direct Station Select console. In this case, when a call is placed to the station in DND mode, it is automatically forwarded to the forward station. If the caller has a display station, he sees in the display the number of the forward station.

Section 5 USER FEATURES

5.1 Intercom Calling

The key bx has several features for streamlining internal communications. There are two modes of internal calling -- handset to handset, or hands-free, which allows the called party to answer without lifting the handset.

The station has a built-in speaker and microphone, and two independent speech paths, one for handset and one for hands-free operation. This means a caller can reach the station through the speaker, even though the handset is busy. This feature, called intrusion, can be limited on those extensions where the user does not wish to be disturbed during telephone conversations. A station can be configured to have one of three levels of intrusion:

- no intrusion. In this configuration, a caller may not make a hands-free call to the station at any time. The station user may still use the station speaker for onhook dialing.
- on-hook intrusion. A caller may make a hands-free call to the station when the station is not in use; but if the station user is talking through the handset, the caller cannot make the hands-free call. Instead, he hears a busy signal.
- · FOR PINGING ICM CALL-DIAL 1 + EXT = of STA. WILL RING INSTEAD OF CALL ANNOU.

 all intrusion. A caller may make a hands-free call to the station, whether or not the station handset is busy.

Selected stations can be restricted from dialing other extensions. This feature is called ICM (Intercom) restriction.

The maximum duration of hands-free calls is defined during system programming. If a caller tries to talk hands-free for longer than the maximum the call is automatically time, terminated. (The time can also be set to unlimited.) If the called wishes to talk longer than programmed time, he can lift handset, and continue the conversation indefinitely.

5.2 Hold

Any outside call can be placed on hold. Hold is exclusive: the trunk button for the line on hold flashes only at the station which held the call. All other stations will show the line as busy, with a steady light in the button.

A call on hold at one station can be picked up at another station with the pickup function. The user puts a call on hold, hangs up, goes to another extension, and continues the call.

*NOTE - INCLUSIVE HOLD 27 ONLY AVAILABLE IN "D" SOFTWI AND AROUB. Operation of the pickup function is explained in detail in Sections 2.10 to 2.12 of the Operating Instructions.

5.3 Direct Station Selection Proc. → SPKe; # ; Co Burrow; DIAL BXT # ; CO BURROW

The bottom row of eight buttons on the station are Direct Station Select (DSS) buttons. They can be used to dial any two-digit internal code of the key bx, including other extensions, page codes, the codes for night service, and other codes.

When a button is configured to dial another extension, the button also acts as an indicator of the status of the extension. When the extension is busy, the button is lit; when the extension speaker is busy, the button flashes.

These buttons can be essily configured by the user for any two-digit code. Instructions for setting the buttons is in Section 2.17 of the Operating Instructions.

In addition to the eight DSS buttons, the station has a secretary button, which acts as an executive intercom. This button, which is programmed from the DSS console, also serves as a DSS button. This button is usually reserved for dialing a secretary or other frequently used number.

5.4 Automatic Answer

A key bx station can be programmed so that it answers incoming trunk calls by pressing the CO line button, or by simply lifting the handset. The latter method is called automatic answer. This feature, unavailable in most simpler key systems, makes it possible to emulate Direct Inward Dialing (DID) and private line service, described in Sections 4.1.1 and 4.1.2.

Single-Line Telephone extensions (SLTs) are automatically granted sutomatic answer by the key bx.

5.5 Speed Dialing

The key bx 816 has an internal speed dial directory with a maximum capacity sys. of 202 numbers. This includes 90 system 0~99 speed dial numbers, available to allforesource users, and 7-personal speed dial numbers for each extension (112 in all). In addition, each station has a save/repeat dial button, which stores an additional frequently-used number.

The system speed dial directory is more than a simple aid to disling -- it can serve as a method of controling This is because the telephone costs. key bx can be programmed so that dialing a system speed dial number circumvents dialing restrictions. Thus, a user who two or dial only long-distance numbers can be restricted completely from toll disling from his station, but the few numbers he needs can be included in the system speed-dial list. He can then reach those numbers, without being able to use his station for long-distance personal calls. method of dial restriction is explained in more detail in Section 6.

An extension can be restricted altogether from using the system speed dial directory. Or it can be permitted access to the directory, but prevented from circumventing dialing restrictions when using speed dialing. These functions are explained in Section 6.3.

In addition to speed dialing and save/repeat dialing, each extension can redial the last number dialed using the * (asterisk) key on the dialpad.

5.6 Call Transfer

A user can transfer a call from extension to extension by several methods. He can transfer the inscreened -- without announcing the call or making sure the station he is transfering to is manned. He can also make a screened transfer -- he can either with a announce the call, hands-free announcement or by placing a call, before handset to handset methods transfering (these two 2.13 of the explained in Section Operating Instructions). The user can also make a confirmed transfer using the conference feature -- he announces the call, and confirms that the parties are talking before hanging up.

If a call is transfered to an unmanned extension, it does not ring there indefinitely. Instead, after a programmable time, it is transfered to the attendant's station (during day service), or back to the extension which received the call in the first place (during night service). The routing of transfered calls is described in detail in Section 4.2.

5.7 Flash Disconnect

A user can disconnect a call by hanging up (either by going on hook or by pressing the speaker button in the case of a hands-free call), or by pressing flash. When talking on a trunk, pressing flash terminates the call, but keeps the CO line, so the user hears a dial tone.

Two programmable functions make this feature versatile. First, the use of the flash button can be denied to selected extensions. In this case, the user must hang up in order to release the conversation. This is useful to prevent "line hogging," when not enough

CO lines are available to the users. Second, the flash time is programmable. This makes it possible to suit the key bx to the specifications of the Central Office or PABX system it is connected to. Flash time programming is explained in more detail in Section 3.4.16 of the Configuration Guide.

5.8 Conference Calling

A key bx user can initiate call to οf up conference participants The participants. include two trunks. Participants in the conference see the extension or CO line numbers of the other participants in the extension station display. Any participating in the conference may exit the conference and reenter it, and may parties to the additional conference.

One participant in the conference must be a key bx extension. If all extensions exit the conference, so that only trunks are included, all the lines are immediately dropped. this prevents an outside caller from talking to another outside caller on the key bx's bill.

5.9 Do Not Disturb

The key bx has a sophisticated set of programmable functions to ensure office privacy on the one hand, and access in case of need, on the other. These functions include

- DND access -- enables a station to enter do not disturb mode to prevent interruption by outside or internal calls;
- DND forward (see Sections 4.8, 5.9 and 8.21) -- to forward calls to another station;

- DND intrusion -- to permit selected stations to call an extension, even though that extension may be in dnd mode;
- DSS barge-in -- to permit the key bx attendant to make an announcement to an extension, even though the extension may be busy (future option);
- ICM restriction (see Sections 5.1 and 5.9) -- to restrict access to an extension by other extensions.

In addition, the user has a "Follow me" feature, which enables him to forward all his incoming calls to another extension. Follow me can be canceled either from the initiating or the forward extension.

When a station enters DND mode, intercom calls ring twice with a muted ring, and then the caller hears a busy signal. Trunks ring at the station with a muted ring.

5.10 Messages

The key bx has a message service, and automatic ringback. A user can leave a message at a station which does not answer. There is a dedicated function key on the station for this purpose. the MSG button of the station which received the message lights, and the display shows the message "Call XX" (the number of the calling extension). Messages cannot be left at SLT extensions.

A maximum of two messages can be left at a station -- one from station 20 and one from any other extension. If another station attempts to leave a message at the station, it receives an error tone.

Section 2.16, Operating Instructions, explains use of the message function.

If a user calls an extension and it is busy, he can use the message feature

to request automatic ringback. In this case, as soon as both extensions become available, the key bx rings the caller, and automatically redials the called extension.

A user can cancel a message appearing at his station. The attendant can cancel all messages from the attendant console.

5.11 Display

The key bx standard station has an optional display, which shows time, elapsed time of calls, and other information. Figure 5-1 shows the various displays appearing at the station.

Elapsed call time (the third display shown in the Figure) begins running 15 seconds after the last dialed digit. It does not show the exact real time of an outside call.

When the station is not in use, the display shows the time and date. A user can call the time and date onto his display whenever he wants by pressing the time button on the station. During a power failure, the time is stored, and when power is restored the clock continues running from the time when it stopped. This means that, in case of a power failure when no one is in the building, a user can easily know the duration of the failure by noting the hour of the key bx clock.

5.12 Alarm Clock

The key bx station, besides serving as a clock-calendar, has an alarm function. The alarm can be set to any time -- when the time comes, the key by calls back the station with a distinctive alarm ring. Operation of the alarm feature is explained in Section 2.24, Operating Instructions.

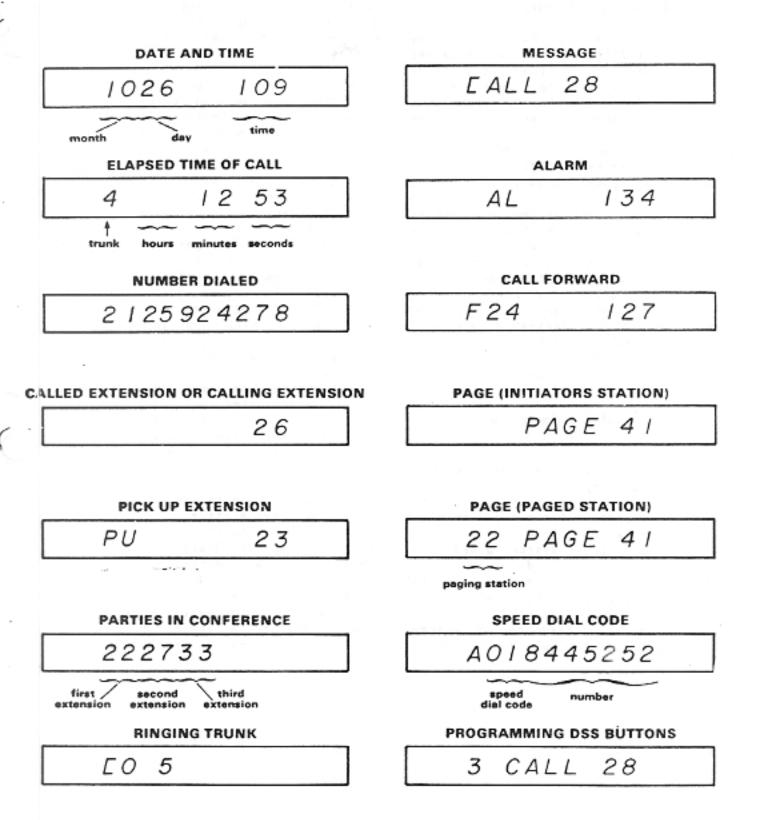


Figure 5-1 Most common displays of standard station.

5.13 Trunk Queuing

During periods of extremely heavy telephone traffic, all outside lines may be busy. Users may order an outside line by trunk queuing. When a line become available, the key bx rings back the ordering extension, and gives it the line.

THERE IS NO DEFAULT PROGRAM
CO lines can be divided into trunk
groups for purposes of queuing.

When several extensions are queued for use of a single trunk or trunk group, service is granted on a priority basis, rather than first come, first serve. Extensions with the lowest extension numbers are granted lines first. Therefore, when planning an installation, it is desirable to install the lowest numbered extensions in the offices of those users with the most urgent need for telephone services.

5.14 Attendant Features

Station 20 serves as an attendant station in the key bx. Unanswered calls are automatically rerouted to this station; system functions, such as setting the system clock and entering numbers in the system speed dial directory, are normally done from this station; in initial configuration, all outside lines ring at this station.

The attendant station can be equipped with an optional Direct Station Select

(DSS) console, which gives the attendant a wide range of special functions for telephone traffic management. These include

- call transfer by means of a dedicated function button;
- camp-on -- automatic call transfer or recall when a busy extension becomes available;
- paging by means of dedicated function buttons;
- day alert mode, which allows the attendant to designate another station as a secondary attendant position, for periods of heavy traffic or when the attendant is away from the console;
- automatic recall of unanswered calls to station 20;
- serial calling -- an incoming call returns automatically to the attendant when the called extension hangs up;
- night service, implemented by means of a dedicated function button;
- barge-in, which allows the attendant to make a brief announcement to a user even though his extension is busy (future).

The DSS console is installed in the same port as station 21. It can be removed and replaced with a station, without any hardware or software changes, if an addition station is needed. When the DSS is installed, an internal link is dedicated to the attendant, so the system is absolutely nonblocking to attendant calls (link design is explained in Section 3.1).

Section 6 DIALING RESTRICTIONS

6.1 General

The key bx has a sophisticated system of dialing restrictions, which enables the customer to configure his exchange to permit only those toll calls he wants charged to his telephone. General restrictions can be applied to each station individually; exceptions can be defined to every restriction.

The crux of the restriction system is a set of toll tables, definable for each trunk. These tables make possible four-digit toll restriction on a table basis; additional restrictions are possible using other programmable functions.

Ten programmable functions are used to configure dialing restrictions for the 816 system:

- 0/1 Restriction -- configures dial restrictions for the dialing plan of the area where the 816 is installed.
- Table Restriction —
 determines whether the toll
 restriction for a CO line will
 be by means of a Toll Table,
 or by means of the O/I
 restriction.
- Access Restriction -- blocks an extension from accessing a trunk.

- Transfer-Dial Restriction -blocks extension A from
 dialing on a trunk which has
 been transfered from extension
 B, if extension A is normally
 restricted from accessing the
 trunk.
- Toll Restriction —
 determines, for each
 extension, whether a CO line
 will be toll-restricted, or
 dialing on that CO line is
 completely unrestricted.
- Toll Table -- this function is used to load the table of restricted dial prefixes, if Table Restriction is selected for the CO line.
- 411 Restriction -- blocks an extension from accessing Directory Assistance.
- System Speed Dial, speed dial restriction and speed toll restriction -- the system speed dial directory can be used to override other dialing restrictions on a selective basis.

The key bx has sophisticated defenses against attempts to circumvent toll restrictions. For example, disling 10 and 11 is prohibited on any dial-restricted line. This prevents a

caller from using Central Office open loop timeout to circumvent the toll restriction. In addition, access to the Telco (telephone company) operator forbidden On is line. system toll-restricted The nonetheless may permit dialing οf toll-free numbers.

6.2 CO Line Restriction Definition

CO line dial restrictions are defined in the key bx on three levels -- the system level, the trunk level and the extension level. At the system level, dialing restrictions are defined as 0 type or 1 type, depending on the dialing scheme of the area of installation.

 I type restriction is for areas where a caller must dial I or 0 before the area code, to gain access to the long-distance network. When I is selected, dialing I or 0 as the first digit is prohibited, except for

> lxll (x is any digit) 1555 1800

 0 type restriction is for areas where a caller dials the area code without an initial 1 or 0. In this case, dialing 0 or 1 as the first or second digit is prohibited. The following exceptions are permitted:

> xll (x is any digit) 800 1xll 1555 1800

In addition, the 411 restriction is defined at the system level. This restriction blocks extensions from dialing 411 (directory assistance).

At the CO line level, the customer can define general toll dialing restriction for each CO line, or selective restriction. The general restriction is defined by the 0/1 tol1 restriction function. Selective restriction is done be means of a tol1 table, which defines dialing prefixes which may not be dialed on that CO line.

At the extension level, the customer may define, for each extension individually, whether the dialing restriction defined for each CO line applies to that extension. He may also use the access restriction to block all access to a CO line.

Figure 6-1 is a flow chart showing the process of dial restriction checking in the key bx.

6.3 Speed Dial

The system speed dial directory can be used as an effective method of configuring dial restrictions. The system speed dial list can be configured to circumvent dialing restrictions applied to a given extension. Thus, an extension may be restricted from dialing all toll numbers; but when the user dials a speed dial number, the key bx executes the call, regardless of dialing restrictions.

For each extension, all access to the system speed dial directory can be blocked; or, if the customer does not want to use the speed dial directory for the purpose of enabling long distance calls, the system can be configured to check dialing restrictions when a speed dial number is selected.

6.4 Example

Consider the following key bx installation:

 The office manager, who sits at extension 22, needs to call all over the United States.

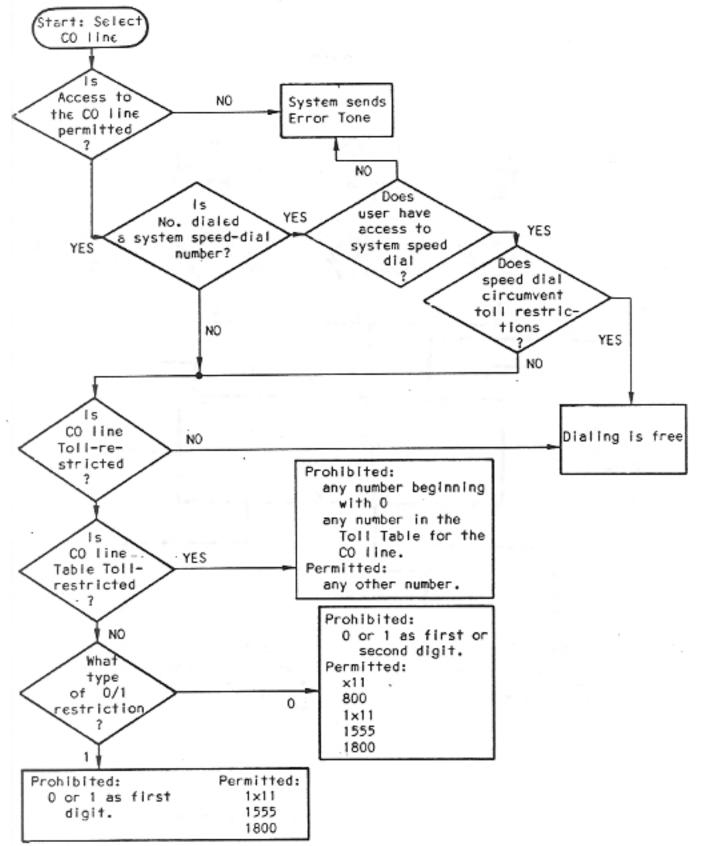


Figure 6-1 Dial restriction flowchart.

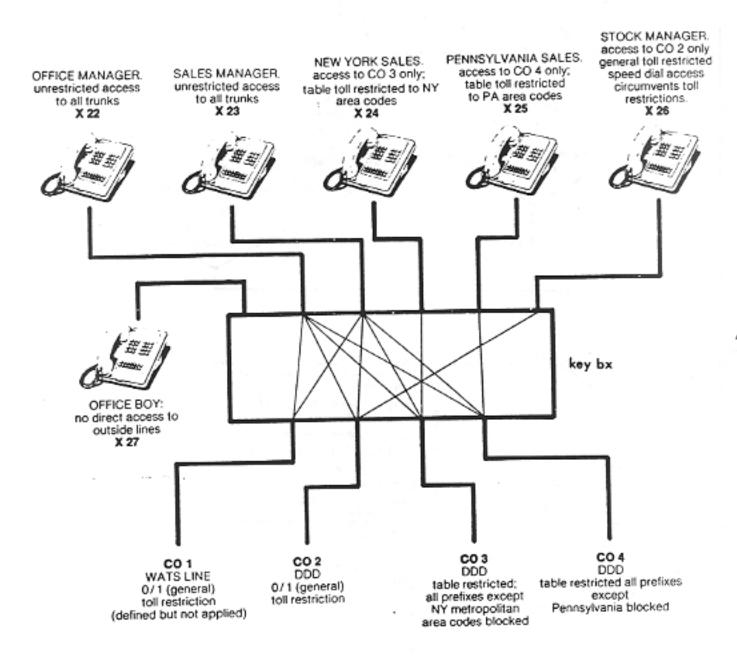


Figure 6-2 Dial restriction configuration example.

- The sales manager, extension 23, also has to call all over the United States.
- There are two regional salesmen.
 The first, at extension 24, must be able to dial anywhere in the New York metropolitan area. The second, extension 25, must be able to dial anywhere in Pennsylvania.
- There is a stock manager who sits at extension 26, who must be able to call the company warehouse in Alexandria, Virginia. He has no need of calling any other toll number.
- A talkative office boy sits at extension 27. The office manager does not want him to have free access to outside lines; but occasionally he must make outside calls.

Figure 6-2 illustrates the installation. Four CO lines installed. CO l is a WATS (Wide Area Telephone Service) line, for long-distance Dialing calls. restriction on this line is the 0/1 type CO 2 is (general restriction). ordinary DDD (Direct Distance Dial) line, with 0/1 type restriction. CO 3, DDD is toll table line, restricted; all dial prefixes are prohibited by the table except 201, 212, and 914. These are the area codes for the New York metropolitan area. CO 2 is a DDD line also toll table restricted. On this line, all prefixes except those for Pennsylvania are prohibited.

CO lines 1, 3, and 4 are transfer-dial restricted. This means no dialing is permitted on those lines by extensions with restricted access, even after the line has been transfered to them. Dialing is permitted on CO line 2 after transfer, even to those extensions which are blocked access to the line.

In the system speed dial directory is the number of the company warehouse in Virginia.

Extension 22 (the office manager) has access to all the CO lines without limitation. None of the dial restrictions apply to him. Likewise, extension 23, the sales manager.

Extensions 24 and 25 are blocked access to CO lines 1 and 2. The New York regional salesman is blocked access to CO 4, and can dial only on CO 3. Toll restrictions for CO 3 are applied to his extension. This means he can only dial toll numbers in the New York area. The Pennsylvania regional salesman can access only CO 4 -- CO 3 is blocked. Toll restrictions are applied, so he can dial only Pennsylvania toll numbers.

The stock manager has access only to CO 2. Toll restrictions apply, so he is unable to dial any toll call. However, he can use the speed dial code for the Virginia warehouse. Using the speed dial list circumvents dialing restrictions, so he can make toll calls to that single number.

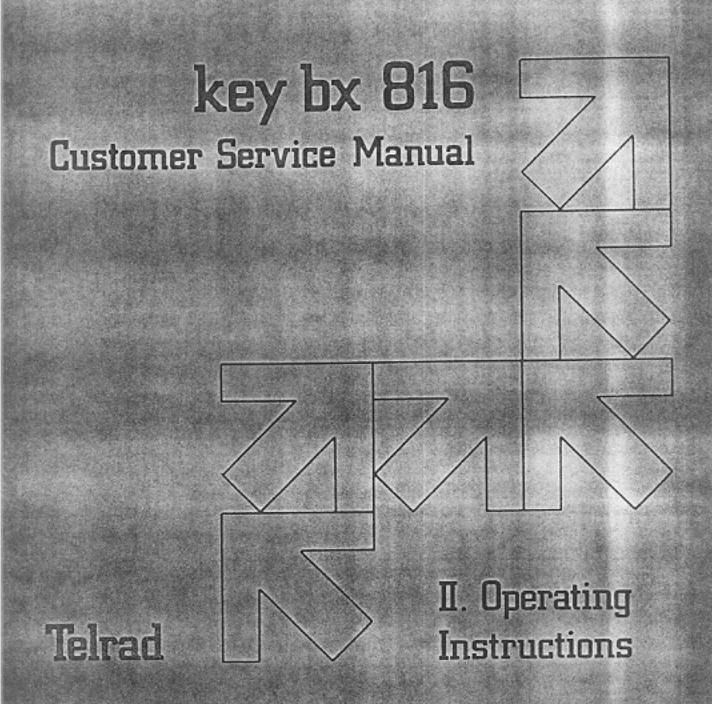
The office boy has no direct access to any CO line. If he must make an outside call, he must ask another extension to transfer CO 2 to his station. He can then dial on that line. Toll restrictions apply, so he can dial no toll numbers.

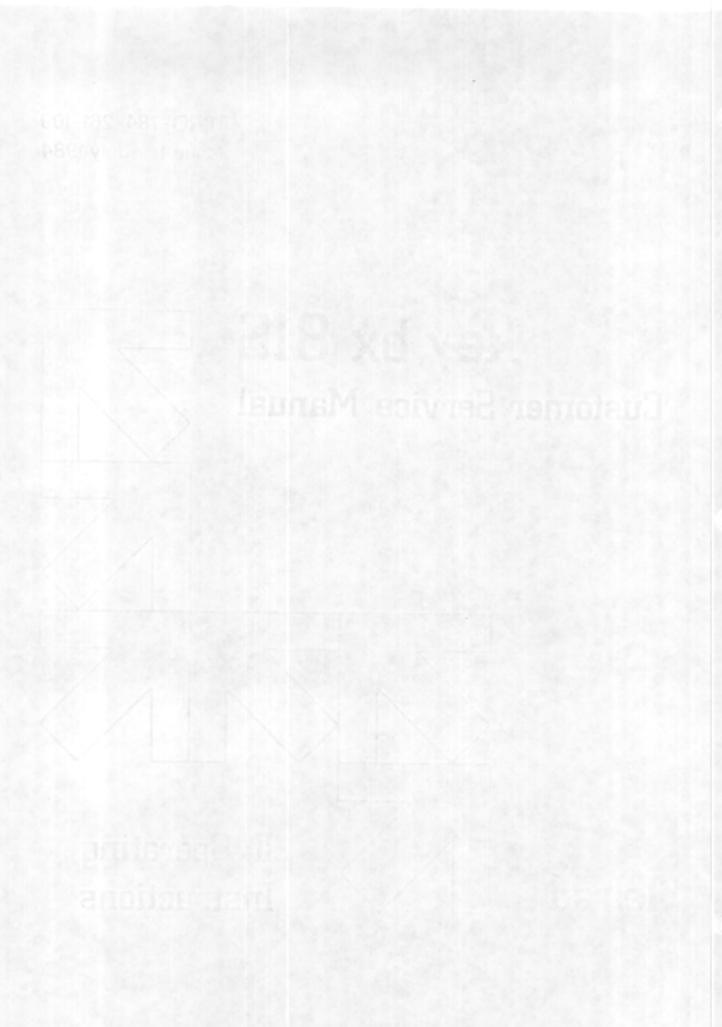
If you wish to actually configure a system according to this example, Section 8 of the System Configuration Guide contains specific instructions.

APPENDIX A key bx Comparative Chart

(to be provided)

TLRD-784-261-109 Issue 1, July 1984





TLRD-784-261-109 Issue1, July 1984

key bx 816 Office Telephone System Customer Service Manual

Part 2: Operating Instructions

Telrad Telecommunications and Electronics Industries, Ltd. POB 50, Lod, Israel

NOTICE

This manual is applicable to the key bx 816 software version C. Telrad, Ltd., reserves the right to make changes in the equipment described, and in this manual, without notification. However, changes in the equipment do not necessarily render this manual invalid.

Additional copies of this manual may be obtained from Telrad, Ltd. Reproduction of this manual, without written permission from Telrad, Ltd., is strictly prohibited.

Warning: This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case, the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

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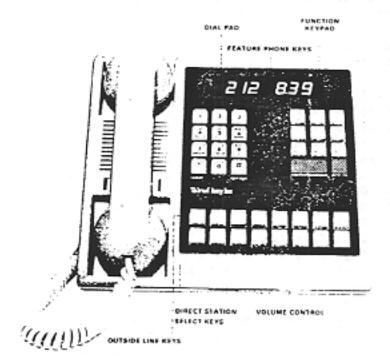
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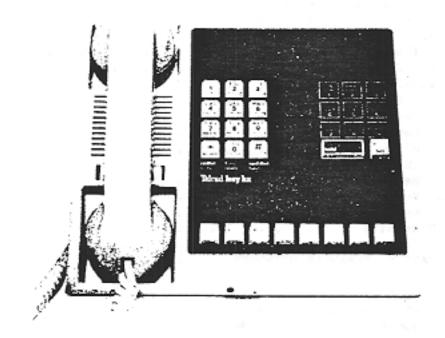
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The key bx standard station.



(ATTI)

The FEATUREFONE.

Section 1 INTRODUCTING THE key bx

1.1 Meet Your key bx Station

You may have one of several types of telephone stations at your desk. The STANDARD STATION (see the Figure) has a dial pad, a keypad for special functions, and two rows of keys at the bottom. The first of the bottom two rows is for accessing outside lines, for calling or answering calls. The bottom row has Direct Station Select (DSS) buttons, which connect you directly to other key bx stations. You can set these buttons to any two-digit code used by the key bx.

The FEATUREFONE is similar to the standard station, except for two differences:

- the special function keypad consists of only two buttons -- hold and function;
- there is only one row of buttons at the bottom of the station.

Yet, despite its simplicity, the Featurefone can perform all the functions which the standard station can perform, by a simple trick: pressing the function button turns the dialpad into the equivalent of the standard station's function keypad. For example, on the standard station there is a special conference button for making conference calls (the leftmost button in the second row). To make a conference call with the Featurefone, press function and 4 -- the equivalent button on the dialpad.

The bottom row of the Featurefone serves as both outside line buttons and DSS buttons. To turn them into DSS buttons, press function and *. To turn them back into outside line buttons, press function and * again.

You may have an ordinary telephone -- a pushbutton telephone or a telephone with a rotary dial. Even though you have no special feature buttons, you can still use many of the features described in this booklet, by dialing special codes. Section 3 explains how to use your telephone with the key bx.

1.2 What Your key bx Is Telling You

When your station rings like this:	it means:
******	There is an external call for you.
**** ****	There is an internal call for you.
****	This is a callback signal: an outside line you asked for is available; or you left a call on hold for too long; or
	an internal telephone where you left a message is calling you back automatically; or a call is being transfered to you from another extension.
	This is a tone burst. It means someone is trying to reach you: there is an internal call which you can answer HANDS-FREE; or there is an outside call for you but your telephone is busy. The operator has
	put the call on camp-on, and it will ring you automatically when you finish your conversation. you are being paged.
***************************************	No one is calling! The key bx alarm clock has gone off.
When you are dialing or this sound:	using a key bx special feature, and you hear
(a series of short beep a mistake. Check what	s followed by a dial tone) it means you have made you are doing, and try again.
When an external line button lights	
like this:	it means:
	someone else is using the line.
	you are using the line.
	the line is on hold.
	someone is calling you on this line.

Section 2 OPERATING INSTRUCTIONS: STATIONS

2.1 To Make an Outside Call

2.1.1 For CO lines:

Lift the handset.

Press the button of an available outside line (any button which is not lit). The button lights.

When you hear the dial tone, dial the number on the dial pad. As you dial, the number appears on your station display. About 15 seconds after you have finished dialing, the display shows elapsed time, so you can tell the approximate duration of your call.

IF YOU HEAR AN ERROR TONE

to dial on an outside line that you are not permitted access to, or you have tried to dial an international, long-distance, or toll call on a station with limited service. Check with your telephone attendant to see what types of calls you may make from your telephone and on which lines.





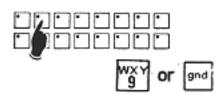


Lift the handset.

Select an available outside line.

Dial 9; or, if your system is behind a PBX which requires a ground signal to receive a CO line, press the gnd button.

When you hear the dial tone, dial the number.



MM I * 7 11

2.2 To Answer an Outside Call

When an outside line rings station, the button of that line flashes, and the number of the line appears on the display.

Lift the handset, and, if necessary, press the flashing button.







2.3 To Make an Internal Call

2.3.1 To call someone through his speaker (HANDS-FREE call)

Lift the handset.



Dial the extension on the dial pad. extension number appears on the display.

Talk after you hear the splash tone. will talk to you through his microphone.





2.3.2 To call someone through his handset

Lift the handset.



Dial I and the extension number.

His telephone will ring. When he answers, talk.



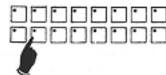


2.3.3 To make an internal call using the DSS button:

Lift the handset.



Press the DSS button of the extension you want to call. This makes a handsfree call.



or

Dial I and press the DSS button. This causes the station to ring.



2.4 To Disconnect a Conversation

Hang up, or press flash.



2.5 Using Your key bx Hands-free

One of the most useful features of your key bx station is its HANDS-FREE operating mode. Besides a handset like other telephones, your key bx has a built-in speaker and microphone. This enables you

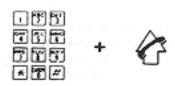
- to answer internal handsfree calls and use most of the key bx features, without lifting the handset;
- to receive announcements and answer urgent calls, while you are carrying on a conversation with the handset.

2.6 To Dial an Outside or Inside Call Hands-free

Press spkr.



Place the call as you would normally. You will hear the telephone ring through the key bx speaker. When you hear someone answer, lift the handset and talk normally.



2.7 To Answer an Internal Call Handsfree

When you hear the tone burst, you can converse without lifting the handset. The spkr button on your telephone will light automatically.



You can converse hands-free, even though you are talking to someone else through the handset.



If you forget to end the call, it will end automatically after a short time (the time depends on your system setup). If you wish to talk longer, lift the handset and talk normally.

2.8 To Use a key bx Feature Handsfree

Press spkr.



Follow the same procedure you would follow if you had lifted the handset.

2.9 To Put an External Call on Hold

Press hold. The outside line button will flash slowly.



While the call is on hold, you can use your key bx to make other calls.

To pick up a call on hold, lift the handset and press the flashing outside line button.

If you do not pick up the call, after a short time the line on hold will ring back (the time depends on your system setup). If you do not answer, the call will be automatically transfered to the attendant (or dropped, if the system is in night service).



2.10 To Pick Up a Call on Hold or Ringing at Another Station

Press pickup and press the outside line button that is ringing or on hold. Talk + pick + pick

or

Lift the handset. Press pickup and the number of the extension where a call is + pick up + Tinging or on hold. Talk normally.

2.11 To Pick Up a Call Transfered by Page

The key bx attendant, or a station, may transfer a call to you by page (see Sections 2.13.5 and 2.2.2, in this booklet). You will hear the page announcement, and then see the CO line which is ringing for you flash. You can pick up the call by pressing the flashing CO line button.

2.12 To Pick Up a Call Camped On at Your Station

If you are talking on the phone when another call for you comes, the key bx attendant can put the call on Camp-on at your station. You will hear a warning tone burst in the station speaker, and the CO line which is ringing for you will flash. When you finish your first call, the call rings automatically at your station.

2.13 To Transfer a Call to Another key bx Station

2.13.1 To make an unscreened transfer:

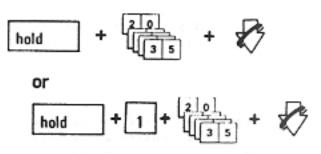
Press hold.

Dial the number of the extension you want to transfer to, or I and the number.

Hang up. The call will ring at the new extension.

If the extension does not answer the call, it will ring back at the attendant station after a short time. If the system is in night service (see Section 4.3, System Description), the call will ring back at your extension after a short time.

If no one answers the transfered call (you can tell because the outside line button continues to flash), you can always pick up the call yourself, by pressing the outside line button.





2.13.2 To make a screened transfer:

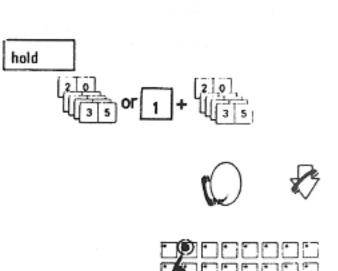
Press hold.

Dial the number of the extension you want to transfer to; or dial I and the extension.

When someone answers, announce the call.

lf he wants to accept the call, hang up
-- the call is transfered automatically.

If he does not want to accept the call, press the flashing outside line button of the call on hold. Now, instead of transfering the call, you have returned to the outside caller.

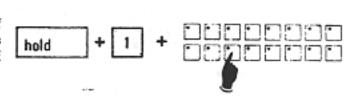


2.13.3 To transfer using the DSS buttons:

Press the DSS button of the extension you want to transfer to. You don't have to put the call on hold first.

Hang up, or announce the call, and then hang up. The call is transfered automatically to the new extension.

To ring the extension instead of transfering the call handsfree, press hold, dial I and press the DSS button of the extension you want.



2.13.4 To transfer a call using Page:

If the person you want to transfer to is not at his extension, press hold, and dial 40 or 41 -- the codes for internal paging.

After the tone burst, announce the call. Be sure to say which CO line the call is on.

Hang up. The call is now on hold at all the stations in the page group. The person you sought can pick up the call at any station by pressing the button of the CO line calling him.





2.14 To Make a Conference Call

You can make conference calls from your key bx with up to five participants, two of whom may be calls from outside.

2.14.1 Placing a Conference Call

055 5055

Place the first call.

55

Press conf. You will hear a dial tone.

conf

133 733 733

Call the next conferee.

77 M 57

Press conf again. Now you and both conferees are on the line.

conf

You can add parties to the call until four people, in addition to yourself, are talking.

2.14.2 Exiting a Conference Temporarily

Press conf. You will hear a dial tonc.

conf

You may now use your key bx station to make other calls, answer incoming calls, and use any other key bx feature.

DON'T HANG UP THE TELEPHONE. If you do, you will be permanently disconnected from the conference. If you wish to disconnect a conversation, press flash.

When you want to return to the conference call, press conf.

If you have tried to add a second outside party to your call, but the line was busy or there was no answer, you can return to the first outside party by pressing his outside line button. Use this method, rather than repressing conf. Otherwise, you may include a dial tone or busy signal in your call.







2.15 To Page Someone

You can use your **key bx** station to make a general announcement or to page someone.

Lift the handset.

Dial the page zone code. Zone codes for internal paging (through the speakers of key bx stations and outside speakers) are 40 and 41. External speakers can be accessed by codes 42, 43, 44 and 45. Find out which speakers are activated by each code.



Make your announcement after the tone burst.

YOU HEAR AN ERROR TONE probably You have dialed a wrong zone code, or the code of a zone which you are not permitted to dial from your station. Some page zones be dialed only from certain telephones, depending on the setup.



2.16 Messages

lf you try to call another station and the line is busy or there is no answer, you can leave a message. Press msg before you hang up.



When someone -- say station 23 --leaves a message at your station, the msg button lights and on the display appears the message

CALL 23

To answer the message, lift the handset and press msg. Your station automatically dials the extension that left the message.

If no one answers, and you hang up, the message remains at your station. You can return the message, by pressing your msg button.

If the extension you called was busy, you can request automatic ringback with the msg button. This means that, as soon as both your extension and the extension you called are available, the key bx will ring you, and connect you automatically to the extension you wanted.

You cannot leave a message at an extension which has an ordinary telephone (instead of a key bx station). You can, however, use the msg key to request automatic ringback if the extension is busy.

lf there is an old message at your station, you can cancel it by pressing * and msg.







2.17 Direct Station Links

The bottom row of buttons on your station is for Direct Station Selection (DSS). Each button connects you directly with another key bx station in the office, or dials a two-digit key bx code.

The DSS buttons tell you if the extensions they are connected to are busy. The lights have three states:

- · off: the station is not in use;
- flashing: the station speaker is busy. You will hear a busy signal if you try to call.
- steady light: Someone is speaking at the station. You can still make a hands-free announcement to the station.

2.17.1 Setting the DSS Buttons

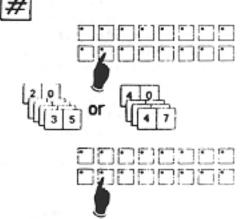
You can set each button to ring any two-digit code used by the key bx (including extensions, page zones, or other codes) by the following procedure:

Press spkr and 🛊.

Press a DSS button (one of the buttons in the bottom row).

Dial the number of the extension or code you want direct link to. The display shows the number you have chosen.

Press the DSS button again. This locks the link you selected in the system memory.



2.17.2 Calling with the DSS button

To make a handsfree call:

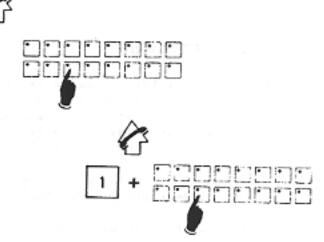
Lift the handset.

Press the DSS button of the station you want to reach. The number will be dialed automatically.

To make a handset-to-handset call:

Lift the handset.

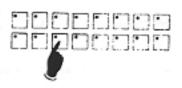
Dial I and press the DSS button. The station you want will ring.



2.17.3 To Transfer a Call Using the DSS Button

Press the DSS button of the station you want to transfer to. There is no need to place the call on hold first.

Hang up. The call will ring at the new station.





2.17.4 Using the DSS buttons for requesting special key bx services

You can set a DSS button to dial numbers 42 through 47. These are the codes for special services, such as external paging, listening to background music at your station, opening the front door, and other functions. The use of these codes depends on your system setup.

2.17.5 The Secretary Button

In addition to the eight DSS buttons, your station has a secretary button on the function keypad. This button dials a special frequently used two-digit code. It may be another extension, or a service code. The code is preset from the attendant's station; you cannot change it, as you can the DSS buttons. You may, however, be able to request that it be changed. Section 7 of the Configuration Guide explains how to set the secretary buttons of the system.

2.18 Redial

You can automatically redial the last outside number you dialed with the * button on the dialpad.

2.19 Speed Dialing

The key bx system has a built-in telephone directory memory, which allows you to dial frequently called outside numbers with codes of only two digits. You can make your own personal directory, with up to seven numbers; and you may be able to use the key bx system speed dial directory, which may have up to 90 numbers.

Codes for your personal speed-dial numbers are 01 to 07. System speed-dial numbers are from 10 to 99.

2.19.1 To Dial a Speed-Dial Number

Lift the handset, and press an outside line button.

Press # and the the two-digit code of the number you want to dial.

2.19.2 To Enter a Speed-Dial Number in Your Directory

Press spkr.

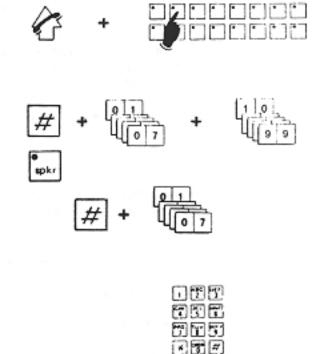
Press # and the code you want to use for the number you are entering. The code must be from 01 to 07. If a code has already been assigned a number, the number appears on the display of your station.

Enter the number on the dialpad. The old number is erased and the new number appears in the display.

You can enter up to 16 digits in a single number.

Press *. This locks the number in the speed-dial memory.

If you make a mistake, press flash. This aborts the process, and you will hear a dial tone in the station speaker.





Hash

If your key bx system is connected to an enhanced telephone network service, or to a private branch exchange, you may have to pause while dialing a number (for example, after dialing an access code). You can include pauses when you enter a speed-dial number, by pressing the # key. Each & causes the key bx to pause for a few seconds before dialing the rest of the number. You can enter several consecutive pauses for a long break.

Section 5 in this volume explains how to use your key bx station with enhanced telephone networks.

2.20 Save/Repeat Dialing

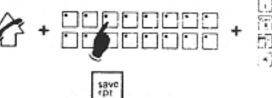
Your key bx has a special memory for a telephone number which you must call frequently. This number is stored in the save-repeat memory, and you dial it using the save-repeat button. (Stations with a ground button do not have the save-repeat function.) To use the save-repeat

Lift the handset, select an outside line, and dial a number.

Before you hang up, press save/rpt. This stores the number in the save-repeat memory.

Whenever you wish to dial that number, lift the handset, select the outside line, and simply press save-repeat. Your station dials the number automatically.

The number will remain in the save-repeat memory until you replace it with another number.





2.21 Do Not Disturb

If you are busy and do not wish to be disturbed, you may be able to mute or silence all incoming calls, and you may be able to forward calls to another station.

2.21.1 To Mute Incoming Calls

Press dnd. All voice announcements are now blocked. Internal calls ring twice quietly, and then the caller hears a busy signal. You may answer the call during the first two rings. External calls still ring at your station, but with a muted ring. If your station is set up for call forwarding, all calls to your extension will be automatically transfered to the forward extension.

To resume normal telephone service, press dnd again.

2.21.2 Call Forwarding with "Follow Me"

You may be able to forward calls to your station to another key bx extension. Press speaker or lift the handset. Press dnd and dial the extension you want to forward to.

You can cancel "follow me" from your own extension, or from the extension which you assigned. At your extension, press the flashing dnd button. From the follow me extension, simply call your extension — your phone will ring and follow me will be canceled.









2.22 Opening the Front Door

if a door unit is installed as part of your key bx system, you can talk to people at the front door, and open the door using your key bx station.

If you hear the front door unit ring (either the door bell, or the buzzer of the attendant's console), dial 45. This connects you to the speaker at the front door.



Talk to the person at the door. If you want to open the door, press the * key on your station. This opens the electric lock.



2.23 To Adjust Volume

Use the adjustment wheel on the front of the telephone set to change the volume of the speaker and ringing of your station.

If you want to make the volume quieter than the minimum or louder than the maximum that you can get with the adjustment wheel, you can use the range adjustment screw on the bottom of the telephone.





2.24 Trunk Queuing

You may occasionally find that all outside lines are busy when you want to make a call. You may be able to order an outside line so that when one becomes available for your use your telephone will ring and the line will be provided to you.

Lift the handset.

Press tk queue, and any of your outside line buttons.

Hang up. When a line becomes available for you, your station will ring.



spkr



2.25 Setting the Alarm Clock

Press spkr.

Press # and time.

Enter the time you want the alarm to ring on the dialpad. Use two digits for the hour two digits for the minutes.

Press time again. Press spkr.

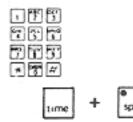
When the alarm rings, stop it by lifting the handset, or pressing time.

For example to set the alarm to 2:30 PM, key in the following sequence:



You can also use the time button to see the time and date in the display of your station while you are talking.





Section 3 OPERATING INSTRUCTIONS: SINGLE-LINE TELEPHONES

3.1 Meet Your Smart key bx Telephone

The **key bx** extension on your desk may look like an ordinary telephone -- but it has all the flexibility and virtually all the outstanding call features of the more elegant **key bx** station.

The exact way your telephone operates depends on how your key bx system has been set up. Specifically, it depends on three things:

- whether your telephone is pulse dialed (usually with a rotary dial), or tone dialed (most pushbutton phones are tone, or DTMF, dialed). You can tell if your telephone is a tone-dialed, if you hear tones when you press the buttons;
- whether your key bx is set up as a "key" or "hybrid" system. In a key system setup, you may have several outside lines, and you can select which outside line you want to make a call on. In a hybrid setup, you need not select the outside line; but you may be able to select a group of outside lines.
- whether your key bx is installed by itself, or in an office behind a large Private Branch Exchange. If your office is connected to a larger telephone network, there are special features which let you take advantage of all the large exchange's advantages, without losing the features of the key bx.

You need not know how your system is set up in order to work your telephone. Just be aware that if a feature fails to work the way you expected, it may be due to the key bx configuration.

In some of the instructions that follow, you may have several choices, depending on your system setup. The possibilities are

- setup 1 -- hybrid configuration with no trunk groups defined;
- setup 2 -- hybrid configuration with trunk groups;
- setup 3 -- key configuration.

Only one of the choices will work at your phone. If you wish to understand the exact differences between these setups, you can read Section 3.9 of the System Description.

3.2 Operating Instructions

3.2.1 To Call Another key bx Extension

Dial 1 and the number of the extension.

(You cannot dial an extension handsfree, like you can from a key bx station.)

3.2.2 To Make an Outside Call

Dial 9 . When you hear the dial tone of the outside line, dial the number you want (setup 1 only).

or

Dial 9 and the number of the trunk group you want to dial on. When you hear a dial tone, dial the number (setup 2 only).

or

Dial 9 and the number of the outside line you want to dial on. When you hear a dial tone, dial the number (setup 3 only).

NOTE: If you hear an error tone, it may be because you do not have access to the outside line you selected.

3.2.3 Dialing Behind PABX

If your key bx is connected to a larger private telephone exchange, you may have to dial 9 after hearing the outside dial tone, before you can dial a number outside the office.

Some older types of private exchanges require a special ground signal to connect an outside line. If your key bx is commected to an exchange that needs ground, dial [7] to get an outside line.

NOTE: If you must dial 7 for an outside line, then you cannot use the save-repeat feature (save-repeat is explained in Section 3.2.11).

3.2.4 Hold and Conference

To place a call on hold use hookflash -- that is, hang up the phone momentarily -- and you will hear an internal dial tone.

If you have a pulse telephone (usually with a rotary dial), disl 1 to place a call on hold.

While the call is on hold, you may use your extension to make other internal calls, or use a key bx feature. You cannot, however, make another outside call.

When you want to return to the call on hold, do another hookflash. If you have pulse dialing, dial 1 .

If you hang up the phone while a call is on hold, the phone will immediately ring. This is the call on hold, calling you back.

You can make a conference call by placing a call on hold with hookflash, dialing another extension, and then pressing hookflash again. You can include up to four participants, plus yourself, in a conference call. (You cannot add an outside line to a conference call, but if you are already talking on an outside line, you can add extensions to the call.)

3.2.5 Pickup

To pick up a call ringing at another extension, dial 3 and the number of the extension which is ringing.

3.2.6 Call Transfer

To transfer a call to another key bx extension, put the call on hold, using hookflash or I, and dial the number of the extension. Wait for someone to answer, and then hang up -- the call will be automatically transfered.

You cannot transfer a call unscreened, as you can with a key bx station (unscreened transfer is explained in Section 2.13.1).

3.2.7 Paging

You can page a group of key bx stations by dialing the codes 140 or 141. You can make external page announcements by dialing 142, 143, 144 or 145. (These options may not exist from your telephone).

3.2.8 Messages and Trunk Queuing

You can leave a message at another station if there is no answer; or you can request automatic ringback if an extension you called is busy. Call the extension. If you have a tone-dialing telephone (DTMF), press hookflash and dial 4. If you have pulse dialing, simply dial 4.

If there was no answer at the station, then the **key bx** writes a message in the station's display to call you back. If the extension was busy, then as soon as it becomes available, the **key bx** will ring you back, and automatically dial the extension.

You cannot leave a message at an extension which is not a key bx station.

If you have tried to make an outside call, but all the key bx outside lines are busy, you can have the trunk you want ring you back automatically when it becomes available. After dialing the code for the trunk you want (9 or 9 and the trunk group or trunk number), hookflash and dial 4 (or dial 4 on your rotary dial phone).

3.2.9 Redial

To redial the last number you dialed, seize an outside line, and dial

You can also redial the last number by dialing 6 (setup 1 only);

or

6 and the trunk group you want to use (setup 2 only).

or

6 and the outside line you want to use (setup 3 only);

3.2.10 Speed Dialing

You can dial speed dial numbers. Seize an outside line, and dial #

You can also speed dial by dialing [5], and the speed dial code (setup I only);

or

dial [5], the trunk group you want, and the speed dial code (setup 2 only);

OΓ

dial 5 and an outside line number, and then the speed dial code (setup 3 only).

If you have a tone-dialing telephone (DTMF type), you can also dial a speed dial code using the * key. Get an outside line, dial * , and dial the speed dial code.

You can use the system speed dial directory, or your personal speed dial directory. If you have a tone-dialing telephone, you can also store speed dial numbers. Dial \$\frac{\psi}{2}\$, the speed dial code you want to use, and the number you want to store, followed by \$\frac{\psi}{2}\$.

If you have a pulse dial telephone, you cannot store speed dial numbers. (In this case, you can temporarily install a tone-dialing phone, enter the speed dial number, and reinstall your phone. You must define the extension as tone or pulse dial each time you replace the phone.

3.2.11 Save-Repeat Dialing

You may be able to perform save-repeat dialing. After dialing the number you want to save and repeat, press hookflash, and dial [7]. (If you have a pulse-dialing telephone, you don't have to press bookflash.)

To dial the save-repeat number, dial [7] (setup 1 only);

or

dial [7] and a trunk group number (setup 2 only).

or

dial [7] and an outside line number (setup 3 only);

The save-repeat number is stored until you store another number in the save-repeat memory.

NOTE: If your **key** bx is installed behind a private telephone exchange that uses ground signaling (see Section 3.2.3), the save-repeat feature is not available to you.

3,2,12 Follow Me

If you are going to be away from your telephone, you can reroute incoming calls to another **key bx** extension. Dial 2 and the number of the extension you want to forward to.

To cancel call forward from your own telephone, dial 2.

You can cancel call forward from the forward extension, by dialing your own extension number.

3.2.13 Account Coding

You can account code a telephone call. Hookflash, then dial * and your account code, followed by *. You can record your account code either during a call, or before dialing.

If you have a pulse dialing telephone, you cannot enter account codes.

Section 4 OPERATING INSTRUCTIONS: ATTENDANT OPERATION

4.1 Meet Your key bx Attendant Console

Station 20 of the key bx is designated as the attendant's station. This station has certain privileges over other extensions -- outside lines ring first at this station, and this is usually the station which can set the key bx clock and enter system speed dial numbers. In addition, a Direct Station Select (DSS) console can be installed instead of station 21, which works, together with station 20, to provide numerous call switching and dialing functions.

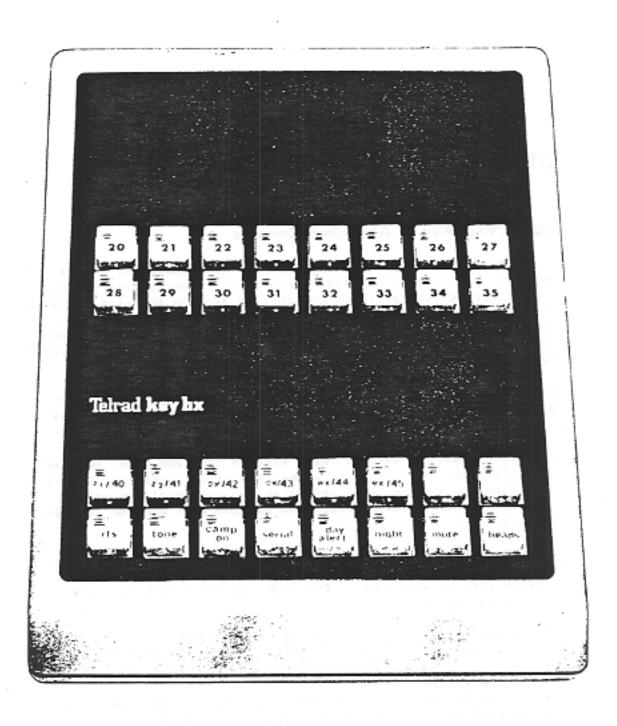
In all other respects, station 20 works like any other station. Section 2, Operating Instructions, contains operating instructions for key bx stations.

This section explains how to use station 20 and the DSS as a telephone attendant station. Note that two of the functions described here -- setting the key bx clock and entering speed dial numbers -- can also be done from another designated station (the station depends on your system setup).

The Figure overleaf shows the DSS console. There are two sets of buttons. The top set has 16 DSS buttons. When you press one, you automatically ring an extension. The light in the button indicates the status of the extension:

- unlit means the extension is not in use;
- lit means someone is using the extension. The station speaker, however, is not in use, and you can make a handsfree announcement or ring the station;
- flashing means the station speaker is busy. The user may be talking handsfree at the station, or dialing onhook. If you try to dial the station, you will hear a busy signal.

The buttons in the bottom two rows perform special functions. These functions are explained in the rest of this section.



The Direct Station Select (DSS) console.

On the rear of the DSS console is a switch, marked PROG and DSS. When the console is used as an attendant station, the switch must be in the DSS position. The console can also be used to program system configuration and telephone features and services; this is done with the switch at PROG. Sections 3 and 4.2 of the Configuration Guide explain how to use the DSS console as a programming station.

4.2 Call Transfering

There are four ways you can transfer a call using the DSS console.

4.2.1 Screened or Unscreened Transfer

Press the DSS button of the station you want to transfer to. There is no need to place the call on hold. When you press the button, it starts to flash, indicating that that station is speaker-busy (because you are talking to it through its speaker.)

You may announce the call, through the handset of station 20, or through the headset, if your attendant station is equipped with one.

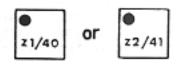
Disconnect, by hanging up the handset or by pressing RLS if you are using the headset. The call is automatically transferred to the new station.

or ris

4.2.2 Page Transfer

Suppose you try calling the station, but there is no one there. You can transfer the call using the page feature of the key bx.

Press z1/40 or z2/41, in the bottom set of buttons. This lets you page a group of stations around the office (which stations depends on your system setup). In the DSS button field, all the buttons in the page group begin to flash.



Announce the call. Be sure to say in your announcement which CO line the call is on. Terminate, by hanging up your handset or pressing rls if you are using a headset. The call is now on hold at all the stations in the page group.

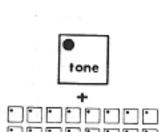
The person whom you paged can pick up the call at any station in the page group by pressing the CO line button of the call on hold.

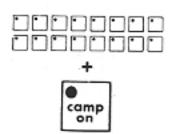
4.2.3 Tone Transfer

If the call is personal, or you do not wish to disturb the person you are trying to reach with a handsfree announcement, you can press tone and the DSS button for his station. Instead of making a handsfree call, the system will now ring his extension with the normal internal ring.

4.2.4 Camp-On

If the person you want to reach is talking on his extension, you can put the call on camp-on at his station. Press the DSS button for his station, and then camp on. A warning tone burst will tell him that a call is camped on at his station, and the call will be placed on hold at his station. When he completes his first call and hangs up, the call will ring at his station.

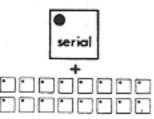




4.3 Serial Calls

Suppose a caller wishes to speak to several people in the office; or he doesn't know exactly to whom he wants to speak, but asks for someone "in the accounts department." You can make a serial transfer, so that when he finishes talking with the first person, the call is automatically transferred back to station 20, and you can pass the call on to the next person.

Press serial, and then the DSS button for the first station. When the first extension hangs up, the call rings back at station 20, and the serial button flashes. Press serial again to answer the call.



day

alert

Repeat this procedure as long as the caller wants to talk with people in the office.

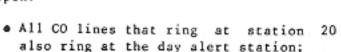
4.4 Day Alert

If you have to leave your desk, or if there is exceptionally heavy telephone traffic during the day -- more than you can handle alone -you can assign another key bx station to help out.

Press spkr .

Press day alert, and the DSS button of the station you want to help.

The light in the day alert button lights with a steady light. Now the following will happen:



 All recalls ring at the day alert station, as well as at the attendant position.

When you return to your desk, or telephone traffic slows, you can cancel day alert by pressing spkr, and the lit day alert button again. The light in the button goes out.

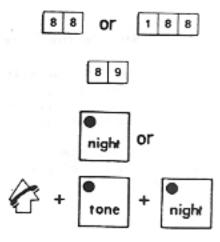


4.5 Night Service

The key bx has a special night service mode. Incoming calls are routed to extensions which are manned during the night, and other features are changed to make it easier to answer and make calls when only a few people are in the office. Night service is explained in detail in Section 4.3, System Description.

If you do not have a DSS console, you can initiate might service by disling 88 from station 20 or station 21. If you want to cancel all key bx messages left during the day, dial 188. To resume ordinary day service, dial 89.

The DSS console has a special night button to initiate night service. Simply press the button to set the key bx in night service mode. The button lights. If you want to cancel messages, you must first lift the handset of station 20 (or press the speaker button). Then press tone and night.



To return to day service, press the night button again. The light in the button goes out.



4.6 The Buzzer

The DSS console has an internal buzzer, which supplements the speaker in station 20. The buzzer sounds

- when someone tries to disl station 20, and 20 is speaker-busy;
- when an outside call is recalling. That is, if an outside call was transferred, and no one answered, it automatically rings back at station 20; or if a call was placed on hold at station 20 for too long, it rings back at the station, and the buzzer sounds as well;
- when the attendant makes a serial call using the DSS (see Section 4.3, in this volume).

You can silence the buzzer by pressing the mute button on the DSS. To reactivate the buzzer, press mute a second time.



4.7 Headset

The DSS console can be equipped with an optional headset, which the attendant can use instead of the handset of station 20. This can be a real convenience during periods of heavy telephone traffic.

If you want to use the headset, press the heads button on the DSS. Now all audio signals are rerouted from the handset of station 20 to the headset. The light in the headset button goes on.



When you have a headset, pressing rls disconnects a call and turns off the sound of the dial tone.



4.8 Setting the Time

Station 20 is usually the station designated to set the time and date of the **key bx** display clock. However, another station may be assigned this privilege, depending on the system setup. The time must be set if there is a power failure.

To set the time press speaker, # , and time . In the display you see the following display:



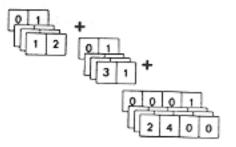
t AL

Now enter the date and time in the following order:

- the month, two digits (for months January to September, enter 01 to 09);
- the day of the month, two digits (01 to 31);
- the time, using four digits, from 0001 to 2400.

Press time again. This enters the date into the system memory, and starts the clock running from the time you entered.

If you hear an error tone, it probably means that you have not entered enough digits (did you use only one digit for the month or day?) or that you entered an invalid value. For example, you may not set the date to 0230 (February 30) -- the key bx is smart enough to know there are only 28 days in February. The key bx also knows that there are 29 days in February on leap years; so 0229 is permitted.



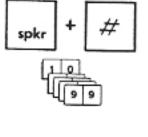
4.9 Entering Speed Dial Numbers

Station 20 is usually the station that can enter speed dial numbers in the system speed dial directory. This privilege may be assigned to a different extension, depending on the system setup. You enter system speed dial numbers exactly as you would for your personal speed dial list (see Section 5.5, System Description).

Press speaker and θ . In the display you see the letter A.

Enter the speed dial code you want to use, from 10 to 99. Then enter the number.

Press * . This locks the number in the key bx memory.



4.10 Recalls

Calls which are unanswered or forgotten are automatically transferred to the attendant station. If a an outside call is transferred to another extension, and no one answers at that extension, the call rings automatically at station 20 after a short time. If a call is placed on hold, it rings back at the extension which put the call on hold. Then,

if no one answers, it is automatically transferred to station 20. (During night service, calls do not ring back at station 20.) These calls ring with a special ring, twice as fast as the normal ringing. This way you know that the call has been unattended, and you should answer it immediately.

Section 5 OPERATING INSTRUCTIONS: VALUE-ADDED NETWORKS

5.1 General

One or more of your key bx outside lines may be special lines. A line may be a Foreign Exchange (FX), which is directly connected to the telephone network of another city or area. It may be a WATS line, which enables you to make long-distance calls at reduced rates. Or it may be a Common Carrier Specialized Access (CCSA) line, which lets you make certain long-distance calls after dialing access and other codes. The key bx has special features for helping you use all these enhanced telephone network services. This Section describes these features.

5.2 Dialing Restrictions

Frequently, dialing restrictions are placed on specialized outside lines. You may be unable to access certain lines, and on others you may be unable to dial long distance numbers. For example, dialing of an area code may be prohibited on FX lines.

If you attempt to access a line which is blocked to your extension, or you try to dial a number prohibited by the key bx, you will hear an error tone:

and you will lose the outside line. This will alert you that you have attempted a restricted action. Check with the telephone attendant or office manager to find out what outside lines and toll calls are permitted at your extension.

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5.3 Speed Dialing CCSA Codes

Some CCSA lines, like those provided by SPRINT and MCI, require the dialing of digit, access, and authorization codes to place a call. You can store some of these codes in the key bx speed dial memory, and dial others using the dial pad. If you are required to pause after dialing a telephone number, and before entering the authorization code, you can enter pauses in the key bx memory, along with the number. This is done with the * key.

For example, suppose you must dial the number 771-9900, and then a four-digit access code, 1234. You must pause between the number and the access code. Enter the number as follows:

Press # and the two-digit speed dial code you want to use (01 to 07 for personal speed dial, or 10 to 99 for system speed dial).



Enter the number -- 771-9900 -- using the dial pad. In the display appears the speed-dial code and the number.

미르크 전에면 데메데 (C#)(M

Press # . This enters a pause in the speed-dial memory. When the number is dialed, the system will pause for a short time (the exact time depends on your system setup), before continuing. In the display there appears an A, indicating a pause.



Enter your authorization code -- 1234 -- and * on the dial pad.



When you wish to speed-dial the number and authorization code, press the outside line button, and dial # , and the two-digit speed-dial code. On the display appears only the number. Your authorization code (the digits after the pause) does not appear on the display, so no one can peek and copy it.



If you wish, you can store your authorization code using a separate speed-dial code. Then you can dial a speed-dial number as follows:

Select the outside line.

display.

Dial * and the two-digit code of the number you want. The number appears in the # + Or

Wait for the confirmation tone on the line. Then dial # and the speed-dial code for your authorization code.

