PREFACE

This User Manual is a valuable tool which will enable you to learn about the StarTel System 2050 Automatic Call Distributor.

This manual will provide all the information you need to install, operate, and maintain your System 2050. The various sections contain step-by-step instructions with easy to understand pictures. Where appropriate, sample TELCO order forms and customer letters are also included. This manual is organized so that you can either read through it from beginning to end or consult topics as needed. Of course, reading the entire manual will give you an overall understanding, even if you are only just beginning to consider the System 2050.

The following section summary will help you identify those section most important to you.

SECTION I - INTRODUCTION

This section gives you an introduction to the System 2050

SECTION II - SYSTEM OVERVIEW

This section describes to you the physical aspects of the System 2050 as well as its features.

SECTION III - TELEPHONE COMPANY ORDER

This section provides you with the telephone company order information you will need prior to installation of the System 2050.

SECTION IV - SITE PREPARATION

This section provides you with all the information you will need to prepare your site prior to installation of the System 2050.

PREFACE 91-1025-000

SECTION V - INSPECTION

This section describes to you how to inspect your System 2050 upon arrival from StarTel.

SECTION VI - INSTALLATION

This section provides you with step-by-step instructions to install your System 2050.

SECTION VII - TEST PROCEDURES

This section describes to you how to test your System 2050 after installation.

SECTION VIII - OPERATOR FUNCTIONS

This section provides you with the information necessary for training your managers and operators in the use of the System 2050.

SECTION IX - CALL DISTRIBUTION

This section discusses call distribution theory to help give you a better understanding of how the ACD handles calls in your System 2050.

SECTION X - MAINTENANCE AND TROUBLESHOOTING

This section describes to you how to maintain your System 2050 to keep it in good operating condition.

An Appendix and Glossary have also been included for your information and convenience.

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IMPORTANT NOTICE!!!

Before you connect or disconnect this instrument from any telephone lines, it is your responsibility to call your local telephone company and inform them that you intend to do so. At that time you should provide them the following information:

- The telephone number(s) of the loop start telephone lines this instrument connects to as well as the DID Trunk Designators.
- The FCC REGISTRATION and RINGER EQUIVALENCE numbers as they are shown on the label located on the rear panel of the controller cabinet.

Should this equipment cause harm to the telephone network, the telephone company shall, where practicable, notify the customer that temporary discontinuance of service may be required; however, where prior notice is not practicable, the telephone company may temporarily discontinue service forthwith, if such action is reasonable in the circumstances.

The telephone company may make changes in its communications facilities, equipment operations, or procedures where such action is reasonably required in the operation of its business and is not inconsistent with the rules and regulations of the Federal Communications Commission.

DO NOT ATTEMPT TO REPAIR OR MODIFY THIS EQUIPMENT, EXCEPT AS INDICATED IN THE MAINTENANCE SECTION OF THIS MANUAL. THIS EQUIPMENT SHOULD NOT BE USED ON PARTY LINES OR COIN TELEPHONE LINES.

If trouble is experienced, disconnect this equipment from the telephone line to determine if it is causing the malfunction. If equipment is determined to be malfunctioning, its use shall be discontinued until the problem has been corrected.

FCC Registration Number: CJP-79M-11726-CD-E

Ringer Equivalence Number: 0.5A

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1.1 INTRODUCTION

The StarTel System 2050, as shown in Figure 1-1, is an Automatic Call Distributor (ACD). The System 2050 is designed to help telephone answering bureaus begin conversion to Direct Inward Dialing (DID) service. DID service enables bureau clients to avoid costly installation and minimize monthly telephone charges.

Calls are routed to the bureau using a call forwarding feature which is provided by your local Telephone Company (TELCO). If your local TELCO does not provide call forwarding, then the System 2050 can be used in conjunction with the Call Forwarder and Call Diverter equipment sold by StarTel. The System 2050 is designed to reduce the amount of labor necessary to support bureau clients. Time consuming procedures such as counting rings and picking up over clients are eliminated.

The System 2050 consists of a cabinet and up to four Operator Consoles. The cabinet houses four types of circuit cards: a Generator card, a CPU (Central Processing Unit) card, a Trunk card(s), and an Input/Output (I/O) card. The Trunk card contains eight ports which are used for DID trunks, Loop Start lines, and the Operator Consoles. The I/O card is used to connect the Operator Consoles to the ACD which contains the computer logic that directs and identifies the calls to the consoles.

An Operator Console is a small rectangular device with a telephone keypad, four control keys that the operator uses to handle the calls, and a display that identifies the called client. Using the control keys, the operator can answer, hold, patch or disconnect calls.

You will need to provide an operator's headset or handset which will plug into the Operator Console. The Operator Console has two amplification volume control dials which are used for operator speaking and hearing.



Figure 1-1. System 2050

2.1 INTRODUCTION

The System 2050 is an Automatic Call Distributor (ACD). It is designed to handle up to eight DID trunks for approximately 400 DID accounts, with up to four loop start lines for patching and/or client check-ins. Up to four operator stations can be connected to the ACD.

The System 2050 can be upgraded, without becoming obsolete, by adding system components. It is modularly compatible with the entire line of StarTel's large systems which include paperless message entry/delivery and transmission to Alpha Numeric Beepers and/or Printers which are located at the client's office or home.

This following sections outline the major features of the System 2050.

2.2 OPERATOR AMPLIFIER CONTROLS

Calls assigned to the operator are answered via the Operator Console. Each Operator Console has individual controls for the volume of the microphone and the headset used by the operator. This allows the operators to adjust to poor connections as well as helping operators with soft voices.

2.3 DID (DIRECT INWARD DIAL) CAPABILITY

The system will support call forwarding or diverter clients over DID trunks. The system will automatically receive and display client identification (ID) numbers of up to four digits.

2.4 AUTOMATIC CALL DISTRIBUTION

All incoming calls are automatically assigned to the first available operator. If there are one or more operators idle when a new call enters the system, the call is routed to the operator that has been idle the longest. If all operators are busy, the ACD beeps the operator that has been busy the longest. Automatic Call Distribution ensures that the work is evenly distributed to all the operators.

2.5 CALL WAITING TONE

When calls are assigned to the operators, they are notified by a beep(s) in the headset. If the operators do not respond within six seconds, they are beeped again. In addition, if the call is not answered and an operator is available, the available operator's console will begin to beep providing the supervisor with an indication that an incoming call is not being handled.

2.6 CLIENT IDENTIFICATION NUMBER

The System 2050 can recognize client identification (ID) numbers of one to four digits (0 - 4999). These numbers are the last digits of the client DID telephone number. These numbers are displayed on the Operator Console for quick identification.

2.7 SYSTEM HOLD

If all operators are busy and a new call enters the system, the call will be assigned to the operator who has been on a call for the longest period of time. The assigned operator should put the current call on hold, answer the new call, then put the new call on hold until the other call is completed. This is called **system hold**. If another operator becomes available while the new call is still on hold, the new call will be reassigned to that available operator. Each time that a call is assigned to an operator, the client ID number is displayed for the operator. When the operator disconnects from a call, and there are no new unanswered calls waiting to be answered, the call which has been on hold the longest will be assigned to that available operator.

2.8 PATCH HOLD

A second type of hold is called patch hold. If an operator determines for some reason that he/she can best deal with a particular call, that call can be placed in patch hold. When a call is placed in patch hold it stays at that operator station indefinitely. Patch hold is used when patching calls. Only one call per patch can be placed on patch hold at a time. Patch hold should be used sparingly since it defeats the advantages of automatic call distribution.

2.9 PATCHING

Patching or cross-connecting a call to another number can be accomplished from any Operator Console. An incoming call on a DID trunk can be patched to another incoming call on a DID trunk or to an outgoing loop start line.

A call which came in on a loop start line may also be patched to a call that has come in on a DID trunk. Operators can connect as many patched calls as there are loop start lines or DID trunks available. Patches automatically disconnect when either party hangs up.

2.10 CONFERENCE CALLS

Because of the unrestricted patching capability of the system, conference calls may be arranged for your clients. The operator calls the parties for the conference call or the parties call the operator on either the DID trunk or loop start line and the parties are patched together using the patching capabilities of the system.

2.11 STATUS INDICATOR LEDS

The Operator Console has status indicator LEDs (light emitting diodes) that indicate the status of the current calls. These LEDs indicate whether the operator is on a new or hold call, whether there is a call on patch hold, whether there is a call waiting to be answered and whether the station is mute (operator is not on a call) or connected to a call.

2.12 MUSIC-ON-HOLD

The ACD is equipped for a music source to be plugged in. This source can be an FM Tuner, tape recorder or Muzac™.

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3.1 INTRODUCTION

In order for your System 2050 to operate, you will need four items from your local TELCO: DID numbers, DID trunk(s), a TELCO RJ-21X interface block, and loop start lines. At the end of this section you will find a sample order letter with an attachment that details certain technical specifications for TELCO. The following information will help you fill out your order letter.

3.2 DIRECT INWARD DIAL (DID) TELEPHONE NUMBERS

These are the telephone numbers to which your clients will forward or divert their calls (see Item 1 of the sample order letter at the end of this section). You will need a number for each individual client or each joint client user group you intend to serve. You may also use some of your DID numbers as Check-In lines for your clients.

Call your local TELCO to find out how the DID numbers are tariffed. In California, for example, they are sold in groups of 100 numbers. In Indiana you may order them in groups of 20 numbers. Since the system has a client capacity of up to 400 accounts, you could order a small group of numbers initially and add other groups at a later date.

We suggest that you reserve the additional groups when you place your original order so that your DID numbers will be in sequence. You may be required to pay a monthly fee to reserve these additional numbers, so perform a cost evaluation. But, most generally it is worth the additional expense.

The last three and four digits of the DID number that you assign a client is the identification number which will be displayed when a call comes into the system for that client. For example, if your group of numbers is 225-2200 to 225-2299 your 100 clients will be individually identified as 200, 201, 202, etc. up through 299.

NOTE

StarTel systems number clients from 0 - 4999. Therefore, should you request four digit outpulse and be given a bank of DIDs 5000 or higher, the system will subtract 5000. For example, if you are given a bank of DIDs 225-5000 to 225-5999, they will be identified by the ACD as 000 to 999. DID numbers 225-7300 to 225-7399 would be identified as 2300 to 2399.

3.3 DID TRUNKS

These are the telephone lines (in TELCO language they are referred to as trunks) on which the incoming DID calls reach your system (see Item 2 of the sample order letter at the end of this section). The number of trunks will determine how many calls can come in at one time. When all of your trunks are in use, additional callers will get a busy signal. The System 2050 has a maximum capacity of eight trunks. The number of clients you plan to serve determines whether you order from one to four trunks (eight trunks if you have an additional Trunk card). If you are just beginning to offer DID service, we suggest you order a minimum of two trunks. By the time you reach 50 accounts, you will probably want to order an additional trunk. However, this really depends on how much traffic you receive and the quality of service you want to supply. Additional trunks should be added as required. Sometimes, due to construction charges, it is less expensive to order all DID trunks installed at the same time although you may only need one or two active trunks. Ask your TELCO representative what the charges are per trunk per month to help in deciding whether or not you wish to have all the trunks installed.

Typically, you must allow six to eight weeks for TELCO to complete the order for DID trunks.

It is **important** that the System 2050 be installed before TELCO connects the DID trunks so you can test the trunks and the System 2050 while TELCO is there. TELCO will temporarily disable the trunks if a system is not installed and you will need to call and have them re-enabled when you are ready to test the System 2050 and the trunks.

If you already offer DID service at your bureau, you will not have to order groups of numbers and trunks. You will have to place an order to move the existing trunks to a new location on an RJ-21X interface block (discussed in Section 3.4) and make sure that the characteristics of your existing DID trunks are as shown in Attachment A at the end of this Section.

3.4 TELCO RJ-21X INTERFACE BLOCK

This is the **connector** on which TELCO will terminate the DID trunks and the loop start lines (see Item 3 of the sample order letter at the end of this section). This is also where you will connect the System 2050 to the telephone lines. Figure 6-7 in Section 6 has a picture of the RJ-21X interface block. Section 4.1, Site Preparation, has more information on equipment layout. We recommend that you have TELCO install the RJ-21X interface block close to the cabinet, otherwise, you may be required to install costly conduit from the RJ-21X interface block to the cabinet.

3.5 LOOP START LINES

These lines will be used for patching and dialing outgoing calls (see Item 4 of the sample order letter at the end of this section). You may also want to receive check-in calls from your clients on these lines if you elect not to have the clients check-in on DID numbers. The system can have up to two loop start lines (four loop start lines if you have an additional Trunk card). They may be new lines or you may want to move lines that are currently in use in your business. Please indicate in the order letter if these are to be new lines or changing the location of existing lines. If you do not want these numbers advertised, request unpublished numbers.

3.6 SAMPLE TELCO ORDER LETTER

At the end of this section you will find a sample of the order letter that you will need to send to TELCO to order the items needed for your System 2050. This sample letter orders the following items.

NOTE

If you ordered a second Trunk card, then item 2 must reflect the following information: Eight (8) DID trunks should appear on pairs 03, 04, 05, 06, 09, 10, 11, and 12 of the RJ-21X. Item 4 must reflect the following information: These four (4) lines should appear on pairs 01, 02, 07, and 08 on the RJ-21X.

- Item 1. 100 DID Numbers
- Item 2. 4 DID trunks (8 DID trunks if you have a second Trunk card)
- Item 3. The RJ-21X interface block
- Item 4. 2 loop start lines with unpublished numbers (4 loop start lines if you have a second Trunk card)

The sample letter is addressed to a fictitious TELCO representative in California. You need to address it to your local TELCO representative. Request that TELCO respond in writing to confirm your order.

Attachment A, at the end of this section, must go with the order letter to define to TELCO the technical characteristics of the telephone lines you need for the System 2050.

If you have any questions about placing your order after reading this information, call Customer Support at StarTel (714) 863-8700. StarTel will assist you with your TELCO order for a nominal service charge.

SAMPLE TELCO ORDER LETTER

Mr. Jones, Marketing Representative Pacific Bell Los Angeles, CA
Dear Mr. Jones:
Please order the following:
Item 1. New Service, DID Numbers
Enter order for one (1) block of 100 Direct Inward Dialing (DID) numbers out of the serving central office for use by my CPE equipment. Request that a second group of numbers in sequence be held in reserve for my use.
Item 2. New Service, DID Trunks
Enter order for four (4) DID trunks originating in the serving central office. These trunks to terminate on the demarcation device, U.S.O.C. RJ-21X located at our facility which is located at: (Insert the bureau's address here) and ordered in Item 3 below. The four (4) trunks should appear on pairs 03, 04, 05 and 06 of the RJ-21X. Please see Attachment A for technical specification regarding these DID trunks.
Item 3. New Service, Demarcation Facilities
Enter orders for one (1) demarcation wiring device U.S.O.C. RJ-21X (66B split blocks) with bridging clips, for termination of lines and trunks to serve CPE. This device to be installed at our facility located at: (Insert the bureau's address here)
Item 4. New Service, Loop Start Lines
Enter order for two (2) loop start lines with touch tone in rotary hunt sequence. These should be unpublished numbers. These two (2) lines should appear on pairs 01 and 02 on the RJ-21X ordered above as Item 3.
Please provide a due date on the above four items as soon as possible. Written confirmation of this order is requested with scheduled due dates and tariffs. Please call me at (put your telephone number here) if you have any questions.
Sincerely,
(Put your name here)
(Put your name here)

Copy of Attachment A to be included with the TELCO order letter

ATTACHMENT A

TECHNICAL SPECIFICATIONS FOR DID TRUNKS

All Direct Inward Dialing (DID) trunks will terminate on the following equipment:

Mfr: StarTel Corporation 17661 Cowan Irvine, California 92714

Model: Series 1000

FCC Reg: CJP-79M-11726-CD-E

Ringer Equiv: 0.5A

All DID trunks will have the following attributes:

- 2-wire metallic pairs. CPE provides -48Vdc on ring and ground on tip. CPE provides audible ringback.
- Supervision by polarity reversal (normal = idle/drop, reverse = in use/answer).
- 3. Rotary hunt sequence or longest idle.
- Outpulse (using loop-start 10 pps dial pulsing) last three or four digits of 7-digit number. Use immediate start, also called no start (NOT wink start, not delay dial) option.
- Provide Open Circuit Interrupt Protection (OCIP) as a programming and circuit option.

Electrical Characteristics:

Maximum DC Loop Resistance: 2000 ohms (includes TELCO)
Minimum DC Loop Resistance: 500 ohms (includes TELCO)

Maximum AC Loop Loss (dBm @ 600 ohms): (with active gain) 3.5 dBm

(without gain) 4.0 dBm

CPE Battery Voltage (open circuit): minimum -47 volts

maximum -54 volts

CPE Battery Feed Resistance: 600 ohms

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ATTACHMENT

TECHNICAL SPECIFICATIONS FOR DID TRUNKS

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Maximum AC Loop Loss (dBm @ 600 ohms): (with active gain) 3.5 dBm

(without gain) 4.0 dBm

CPE Battery Voltage (open circuit): minimum -47 volts

maximum -54 volts

CPE Battery Feed Resistance: 600 ohms

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4.1 SITE PLANNING

StarTel wants you to derive the maximum benefits from your System 2050. We feel some advance planning will help you accomplish this. Read this entire section, then discuss it with your building manager and electrician. StarTel service personnel are available for assistance or consulting for a nominal service fee.

4.2 PHYSICAL LAYOUT

The System 2050 is designed for maximum flexibility. It may be operated as stand-alone equipment or in conjunction with existing switchboards. Figure 4-1 is a simplified layout diagram of the System 2050 to assist you with planning the physical layout.

The System 2050 consists of a cabinet and up to four Operator Consoles (see Figure 4-2). Calls are answered on the Operator Consoles, so they must be located in your Operations Room. Each Operator Console comes with 25 feet of modular cable and may be easily moved. Additional cable length can be ordered from StarTel for a nominal charge. You may want to experiment at the beginning and see what works best in your operation. For your information, two possible layouts for operator stations are shown in Figures 4-3 and 4-4. Additional layouts of operator stations are shown in the Appendix.

If you are using the System 2050 with existing switchboards, decide which operator will answer calls on the new system. When you first start offering DID service there may not be enough accounts on the new system to justify one dedicated operator. So, an operator will probably be answering calls on the System 2050 in addition to handling calls on a switchboard. You will also want to consider how this might vary during peak and off-peak hours. Calls may be answered by either a handset or headset plugged into the jack on the side of the Operator Console. If you need to purchase headsets, handsets, or selector switches (a device where the operator wears one headset and plugs into both the switchboard and Operator Console), refer to the list of suppliers in the Appendix.

NOTE

Standard handsets are not compatible with the System 2050. If you want to continue using handsets, consult the list of suppliers in the Appendix.

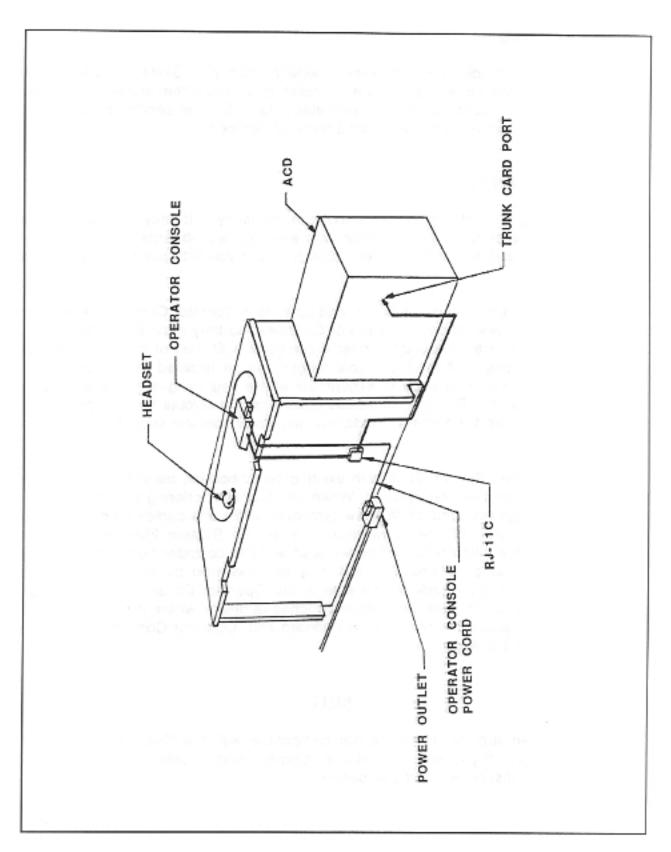


Figure 4-1. Simplified Layout Diagram of the System 2050

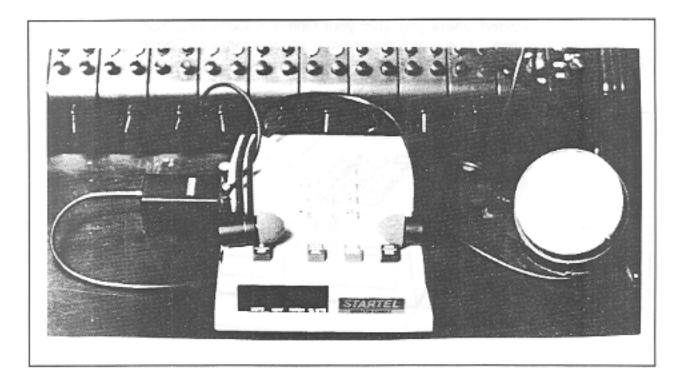


Figure 4-2. Operator Console on a Switchboard



Figure 4-3. Operator Console Between Switchboards

Once you have decided where you want your Operator Consoles, make sure you have adequate table space. The exact dimensions of the Operator Console are shown in Figure 4-4.

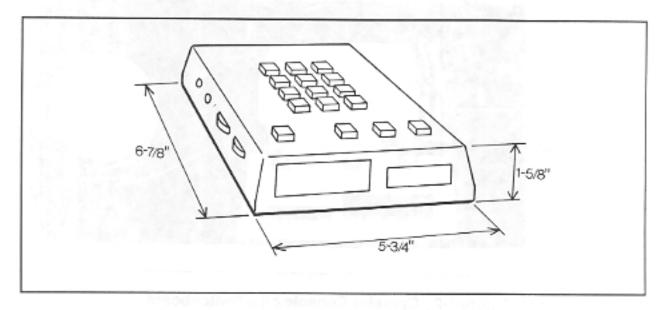


Figure 4-4. Dimensions of Operator Console

The client ID number will appear on the display on the front of the Operator Console, so, you will want your operators to be able to see it without straining. Also, do not forget to make provisions for message racks or slots for the new accounts.

The cabinet, called the ACD, must be placed on the floor. The exact dimensions of the ACD are shown in Figure 4-5. At least two feet of clearance is required behind the ACD and three feet in front of the ACD for maintenance purposes. The ACD will be connected to the TELCO interface block, RJ-21X, for which we provide 25 feet of cabling. Longer cable is available by special order if required. We suggest you have the cabinet placed near the Operator Consoles so that you do not have to run the modular cords (connecting the ACD to the Operator Consoles) over office floor space.

The ACD contains the four circuit cards which control the automatic call distribution of the system, and also controls the telephone lines and the Operator Consoles. Occasionally you will have to look inside the cabinet, so, it should be in a lighted area, easily accessed.

We recommend you install the ACD and the RJ-21X interface block in the same room, otherwise, you may be required to install costly conduit from the RJ-21X interface block to the ACD. TELCO will normally locate the RJ-21X interface block wherever you specify.

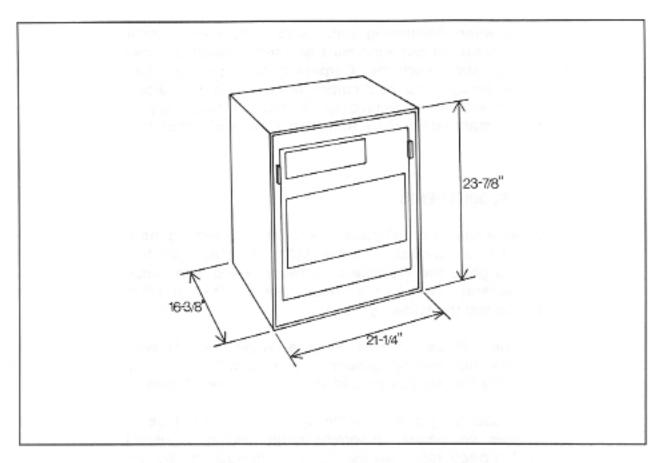


Figure 4-5. Dimensions of the ACD

4.3 STATIC ELECTRICITY

Static electricity is not only an annoyance to personnel, but it can cause electrical malfunction. Minimizing or eliminating sources of static is important.

Here are some suggestions:

- Maintain room humidity higher than 40%. This is particularly important in the winter months when buildings are heated. Heating dries the air and reduces the humidity significantly. Room humidifiers may be purchased very inexpensively.
- Select furniture with anti-static upholstery. Plastic upholstery causes a static electric charge to be built up when clothing moves over it. The discharge of this static electricity, created when the furniture or its occupant comes into contact with the equipment, can cause system malfunction. DO NOT use operator chairs with rubber wheels as rubber wheels can prevent the static electricity from discharging through the floor covering.

 In areas where controlling static is difficult, avoid installing equipment in carpeted areas. If carpeting must be used, it should be specifically designed to minimize static electricity. Carpets containing static reducing properties are available through your local carpet dealer. If normal carpet is used, periodic treatment with an anti-static spray may be necessary. We recommend Staticide, manufactured by Analytical Chemical Laboratories in Elk Grove, Illinois.

4.4 ELECTRICAL REQUIREMENTS

The ACD requires a source of AC power that is free of electrical **noise**. (If you do not have a dedicated circuit available for the ACD, you may want to try operating the system before you go to the expense of installing a separate circuit.) However, we recommend a separate circuit or a circuit free of other interference for optimal operation. We suggest the following:

- The system utilizes 115 volts, 60 cycle, single-phase power. Circuits must be three-wire (hot, neutral, ground). The ground circuit resistance from any outlet to the breaker box ground should not exceed 1 ohm.
- Circuits supplying power to the system should not be shared with other appliances, equipment, or lighting in the building. Unused outlets should be capped to discourage their use for functions such as vacuum cleaners.
- The ACD uses two amps and we suggest a dedicated circuit with standard outlets. The outlet(s) must be located within six feet of the ACD and within four feet of each Operator Console.
- One outlet is required for each Operator Console and should be located within four feet of each console. Do not use power extension cords.

4.5 SYSTEM COMMUNICATION CABLING

Communication cabling consists of the cable connecting the RJ-21X interface block to the ACD and the cables between the Operator Consoles and the ACD. These cables should be routed away from AC power wiring and out of the way of foot traffic. The ACD cable is 50 feet. The Operator Console cables are 25 feet.

System cables running between rooms may require one inch conduit, depending on local fire codes. Within the Operations Room it is customary to run the communications cables along the walls.

4.6 PLANNING CHECK LIST

This check list summarizes the planning tasks and should assist you in achieving the optimum benefits from your System 2050.

- Decide on a layout for your system.
- Determine your immediate and long-range needs relative to operator positions.
- Review this arrangement with your building manager for suitability relative to electrical power distribution and communications cable routing.
- Determine the location of the RJ-21X interface block.
- Order your telephone lines (see sample order letter in Section 3.6).
- Install your System 2050 before TELCO installs the DID trunks and the loop start lines on the RJ-21X interface block.
- Plan to test the lines and the system on the day TELCO installs their lines and the RJ-21X interface block connector.
- Start Business!

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5.1 UNPACKING AND INSPECTION

When your System 2050 arrives at your location and before unpacking, each shipping container should be inspected for signs of mishandling that may indicate damage to the contents. Take note of any container damage and save the containers to support any claims to the carrier. If damage to the contents of the container is found, make note of the damage and contact the shipper so claim action can be initiated.

All shipping materials and containers should be saved for future shipping. The contents of the containers should be compared to the packing list to ensure all listed items are received. Any discrepancies should be reported to StarTel.

A complete System 2050 parts list is found in Figure 5-1.

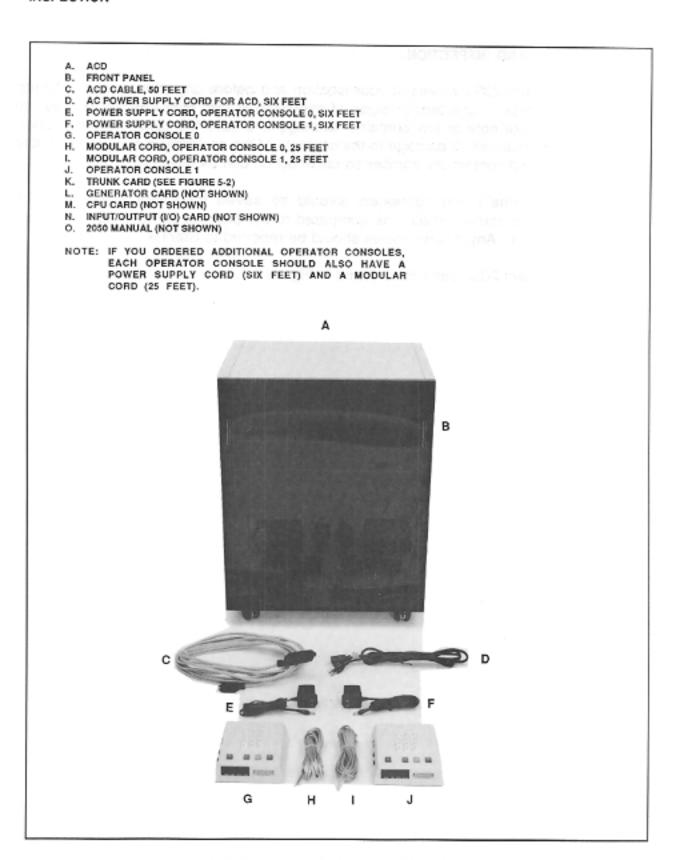


Figure 5-1. System 2050 Parts List

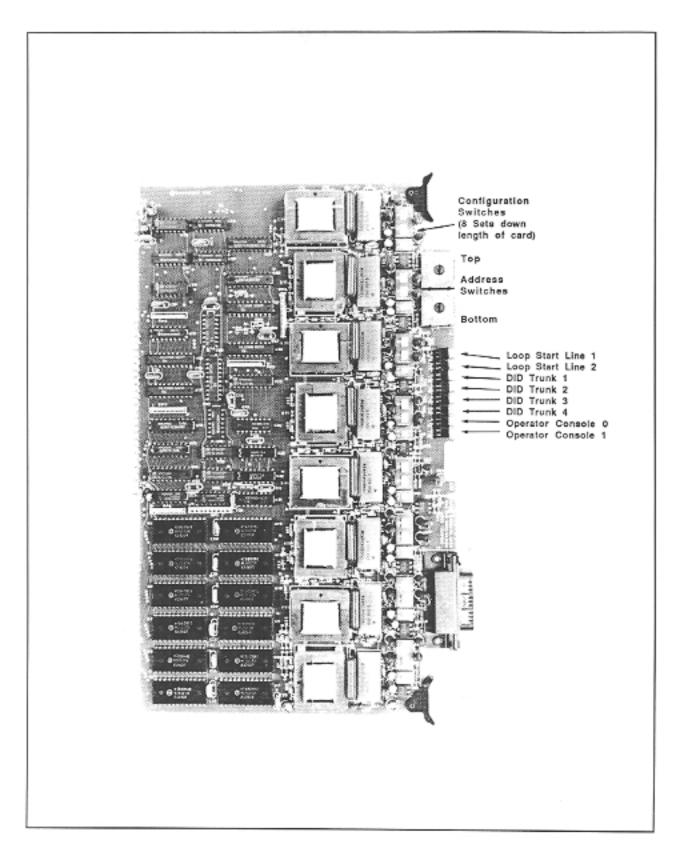


Figure 5-2. Trunk Card

6.1 INTRODUCTION

The System 2050 is shipped with everything you will need for an easy installation. All the circuit cards (CPU, Trunk, Generator and I/O cards) are shipped inside the cabinet. Section 6.2 will give you the step-by-step procedures that you will need to connect your System 2050 to the telephone lines. If at any time the nylon cable tie wraps need to be removed, cut them with a pair of scissors being very careful not to cut any part of the cable.

There are five major steps you will need to perform to install your new system. Each step is described in detail in this section. They are as follows:

WARNING

- Installation of the System 2050 on a shelf should be avoided. The cabinet should be installed on the floor or with caution on a sturdy table or table height stand (31inches maximum height).
 - Should you decide to ignore this warning and install the cabinet on a shelf, then the front (plexiglas) panel should be discarded (to avoid its falling and injuring anyone due to incorrect velcro engagement).
- Whenever the plexiglas panel is being installed, it must be pressed firmly into place to engage the velcro latches.
- Place the cabinet where you want it located in your bureau.
- Check all the circuit cards to make sure they are seated properly and then connect the cables to the cards. You will also need to check the Address Switch settings on the Trunk card and the Generator card at this time.
- Connect the cables to the system and then connect the system to the RJ-21X interface block.
- 4. Check the Operator Consoles and then connect them to the ACD.
- Connect Music-on-Hold to the ACD.

6.2 INSTALLATION PROCEDURES

Follow the steps below in the order given.

STEP 1:

- Set the ACD cabinet where you want it to be located. Make sure it is within six feet of the outlet which you have established as the dedicated AC power outlet. DO NOT plug into outlet.
- Check to see that the white Power Breaker switch on the back panel is in the DOWN position (power is OFF if the breaker is in the DOWN position) as shown in Figure 6-1.

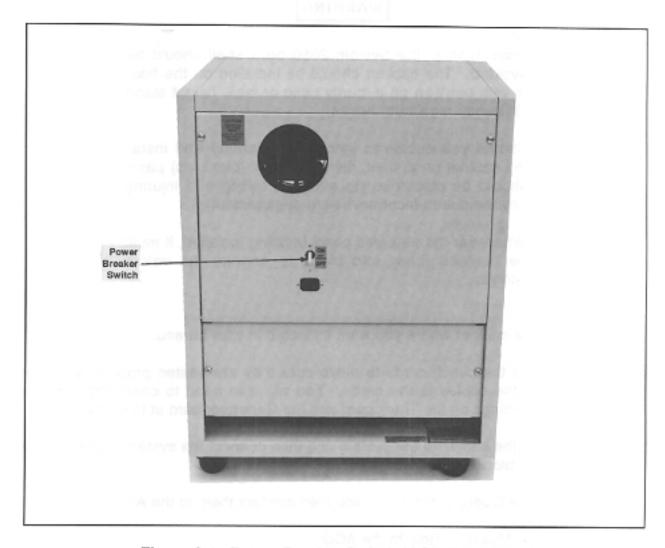


Figure 6-1. Power Breaker Switch (ACD Rear View)

STEP 2:

- The front panel to the cabinet will either come in place or wrapped in brown wrapping paper. If it is in brown wrapping paper, unwrap it and pull off the adhesive paper attached to the front of the panel (if it is still attached to the panel).
- If the front panel is in place, pull it away from the cabinet (it is attached to the cabinet frame with velcro strips) by grasping the panel handles. If there is adhesive paper attached to the front panel, pull it off.
- Look inside the ACD cabinet. You will see four circuit cards (as shown in Figure 6-2) inside the card cage which are connected to connectors in the back of the cabinet. The four cards are as follows: the CPU card in slot 8, the Trunk card in slot 11 (additional Trunk card in slot 12), the Input/Output (I/O) card in slot 14, and the Generator card in slot 18.

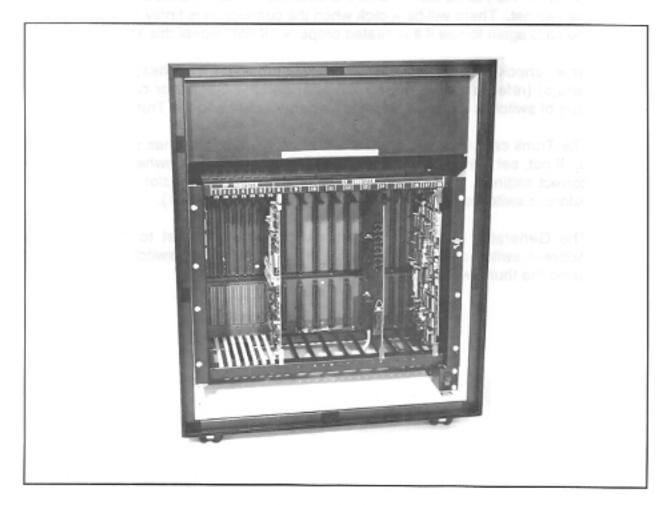


Figure 6-2. ACD Front View

NOTE

Circuit cards should be handled as delicately as possible. Avoid handling the component circuitry on the cards in high static environments.

- 4. Check to make sure that all the cards are seated properly in their slots. This is done by slightly pulling on the edge of each card. If the card is seated properly, you will not be able to pull it out of the slot without pulling up on the plastic tabs (called card ejector levers) that hold the card in place.
- 5. If the card is NOT seated properly, you must pull outward (push up on the top tab and push down on the bottom tab) on the plastic tabs and slide the card part way out of the track. Now, slide the card back into the track and push firmly on the plastic tabs to seat the card into the connectors in the back of the cabinet. There will be a click when the connection is firmly made. Pull on the card again to see if it is seated properly. If not, repeat this step again.
- Now, check the Address switches (Thumbwheel switches) on the Trunk card(s) (refer to Figure 5-2 for location) and the Generator card. The same type of switch is found on both the Generator card and the Trunk card.
- The Trunk card (in slot 11) top and bottom Address switches should be set to 0. If not, set the two switches to read 00, using the thumbwheel to turn to the correct settings. If you have an additional Trunk card (in slot 12), set the two Address switches to read 01 (top switch 0; bottom switch 1).
- The Generator card top Address switch should be set to 3, the bottom Address switch should be set to 0. If not, set the two switches to read 30, using the thumbwheel to turn to the correct settings.

STEP 3:

- Look at the I/O card installed in slot 14. There is an Intercard cable(s) connected to the card. Check to make sure this cable(s) is secure by checking the metal locking tab(s) at the top of the cable. The metal locking tab(s) should be snapped in place.
- If the cable(s) is loose, you must secure it. Lift up on the metal locking tab(s).
 Push in on the cable(s), then snap the metal locking tab(s) back in place. The
 cable end(s) should be threaded down through the metal frame of the cabinet
 as shown in Figure 6-3.



Figure 6-3. Intercard Cable on I/O Card, Slot 14

- 3. Now, you must attach the other end of the Intercard cable (from the I/O card) to the connector on the bottom front of the Trunk card (in slot 11) as shown in Figure 6-4. Push the cable into the connector. If you have an additional Trunk card, the Intercard cable will be attached to the top connector on the I/O card. Push this cable into the connector on the bottom front of the Trunk card in slot 12.
- 4. Close the metal locking tab(s) to secure the cable connection.



Figure 6-4. Intercard Cable Connection to the Trunk Card

- 5. Find the ACD cable (refer to Figure 5-1).
- Locate where TELCO has installed the RJ-21X interface block (see Figure 6-5). This is where your DID lines and loop start lines will be connected. On the right side of the RJ-21X interface block there is a connector. Unfasten the velcro tape that is covering this connector.
- 7. Remove the plastic cover from the RJ-21X interface block connector.



Figure 6-5. RJ-21X Interface Block

- Plug in the large end of the ACD cable into the RJ-21X interface block connector as shown in Figure 6-6.
- Make sure the connection is tight, then secure it with the velcro tape you removed in step 6. If TELCO has not installed the RJ-21X interface block, this step may be completed later.

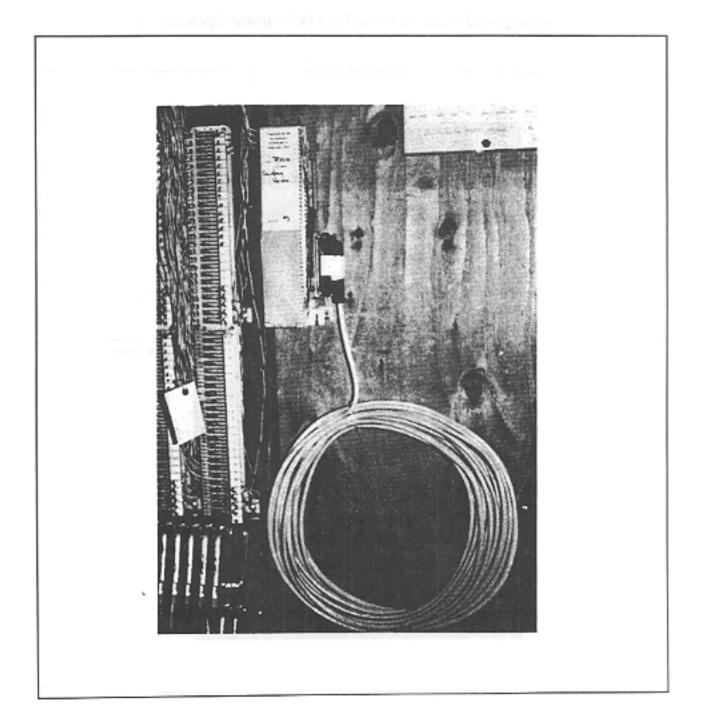


Figure 6-6. ACD Cable Connection to Interface

- 10. Bring the ACD cable from the RJ-21X interface block to the ACD cabinet.
- Thread the ACD cable into the back of the cabinet as shown in Figure 6-7 and pull it through to the front.



Figure 6-7. ACD Cable Connection to ACD

- Plug the connector end of this cable into the front connector on the I/O card in slot 14 as shown in Figure 6-8 (this connector is labeled Telco Input).
- Push firmly on the connector and close the metal locking tab to secure the connection.



Figure 6-8. Communication Cable Connection to I/O Card, Slot 14

STEP 4:

 Find the Operator Consoles (refer to Figure 5-1). On the back of each Operator Console there is a small dial with numbers as shown in Figure 6-9. On one Operator Console the arrow will point to 0. This is Operator Console 0. On the other Operator Console, the arrow will point to 1. This is Operator Console 1. If you have additional Operator Consoles, the arrow will point to 3 and/or 4, respectively



Operator Console 0 Address Dial



Operator Console 1 Address Dial

Figure 6-9. Operator Console Address Dials

- Place the Operator Consoles within six feet of an AC outlet.
- Find the power supply cords (refer to Figure 5-1) for the Operator Consoles.
- Connect the smaller end of each power supply cord into the back of each Operator Console as shown in Figure 6-10.
- 5. Plug the other end of each cord into the AC outlet.

- Find the modular cord (refer to Figure 5-1) for Operator Console 0. The
 modular cord for Operator Console 0 will be unmarked. Now, find the
 modular cord for Operator Console 1. The modular cord for Operator
 Console 1 will be marked as 1. If you have additional Operator Consoles,
 find the modular cables marked as 3 and/or 4, respectively.
- Plug one end of the modular cord into the back of each Operator Console as shown in Figure 6-10.

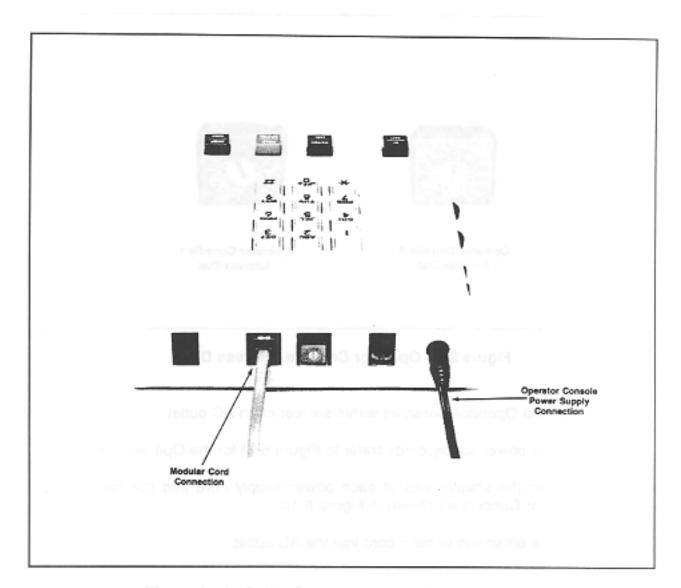


Figure 6-10. Cable Connection to Operator Console

- Bring the modular cable from Operator Console 0 to the back of the ACD cabinet.
- Feed the cable from the back of the cabinet to the front of the cabinet and connect it to the top modular plug on the I/O card in slot 14 as shown in Figure 6-11.

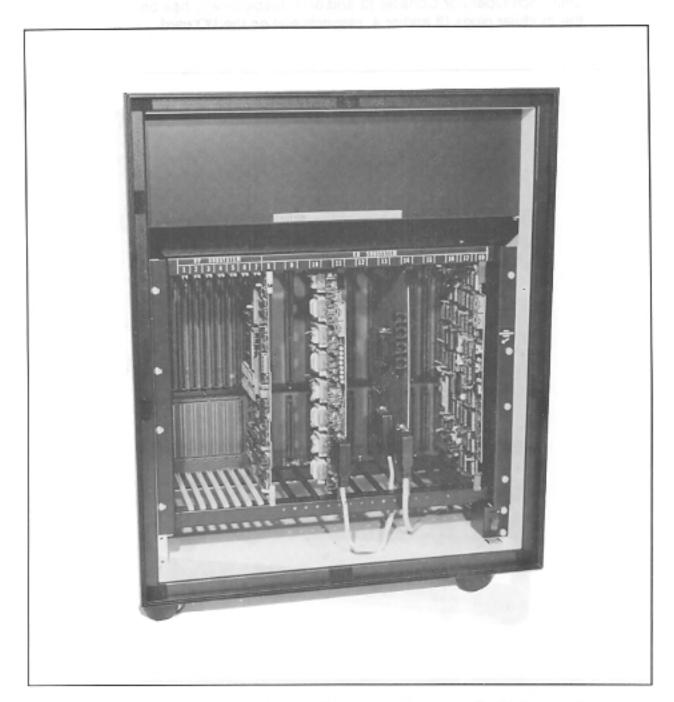


Figure 6-11. Operator Console 0 Connection to I/O Card, Slot 14

- Now, bring the modular cable from Operator Console 1 to the back of the ACD cabinet.
- 11. Feed the cable from the back of the cabinet to the front of the cabinet and connect it to the second modular plug on the I/O card in slot 14 as shown in Figure 6-12. If you have additional Operator Consoles, repeat steps 9 and 10 until each Operator Console (3 and/or 4, respectively) has been connected to the modular plugs (3 and/or 4, respectively) on the I/O card.

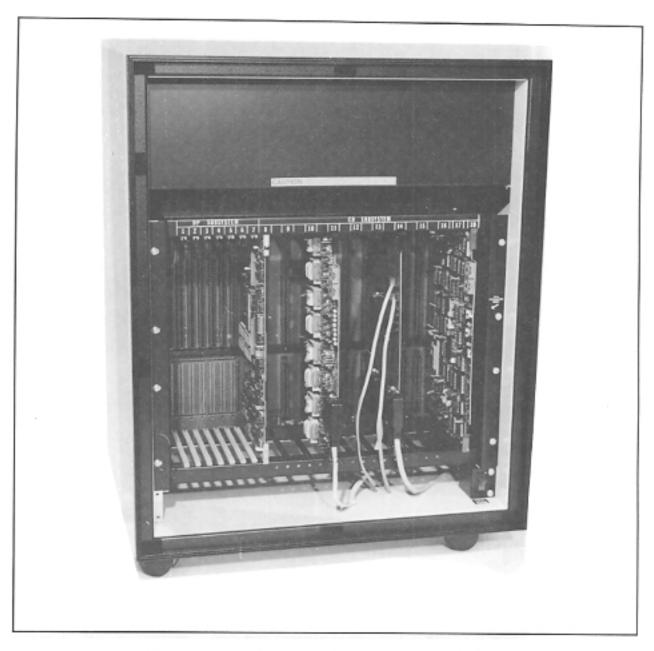


Figure 6-12. Operator Console 1 Connection to I/O Card, Slot 14

NOTE

If you are continuing to Section 7, Test Procedures, do not complete this step now. It will come later in Section 7.

12. Find the ACD front panel (refer to Figure 5-1). Hold it by the two handles and press it onto the front of the cabinet. The velcro tape on the front panel and the ACD cabinet will secure the panel to the ACD as shown in Figure 6-13.

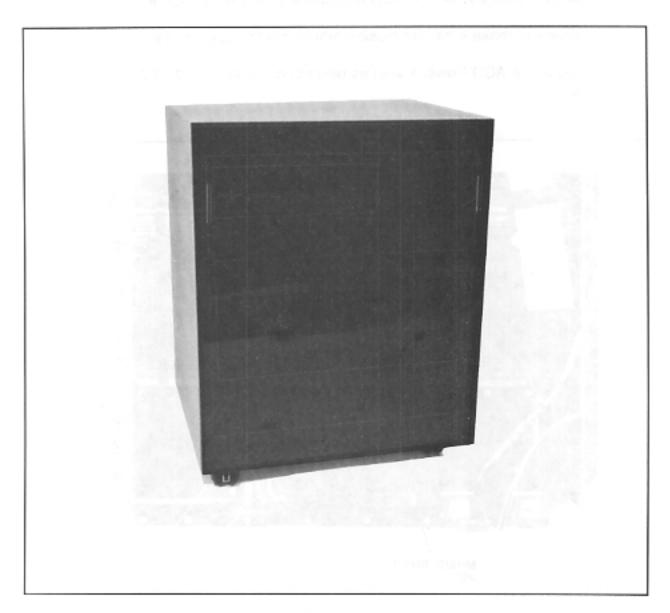


Figure 6-13. ACD with Front Panel

STEP 5:

- Connect an RCA phono cable to the music source jack.
- Open the ACD Power Panel as described in Section 10.11.2, steps 1, 2, and 3 to gain access to the ACD Backplane.
- Feed the RCA phono cable into the bottom opening at the back of the cabinet.
- Pull the cable up to the Backplane and connect the cable (six foot maximum) to connector J51 on the ACD Backplane as shown in Figure 6-14.
- Check to make sure that music-on-hold is working correctly.
- Close the ACD Power Panel as described in Section 10.11.2, steps 6, 7, and 8.

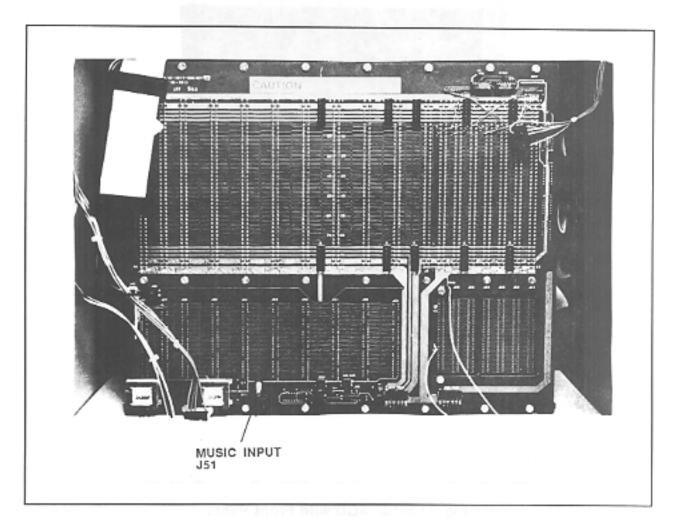


Figure 6-14. ACD Backplane J51 Connector

7.1 INTRODUCTION

Now that you have your system set up and installed, you want to apply power and check that it is operating correctly. There will be five items to check and verify. They are:

- 1. Power Panel Check
- 2. Operator Console Check
- 3. System Configuration Check
- 4. DID Line Check
- Loop Start Line Check

The first three items can be checked when your system is first installed. The last two items should be checked when TELCO has completed its installation.

7.2 POWER PANEL CHECK

Use the following procedure to check and verify that the Power Panel is functioning correctly.

- Make sure that the ACD cabinet is plugged into the designated AC outlet.
 There is a white switch on the back panel of the ACD as shown in Figure 7-1.
 This is called the Power Breaker Switch. It should be in the DOWN position or OFF position.
- Flip the Power Breaker switch to the ON position. Power is now applied to the ACD.

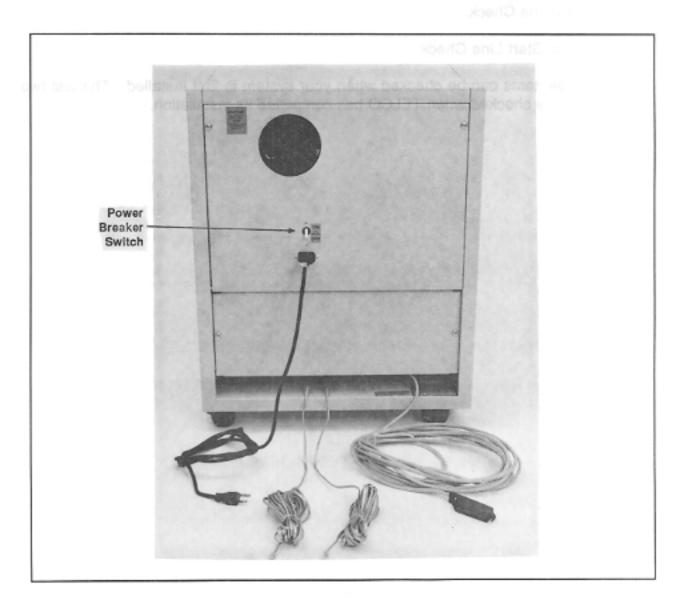


Figure 7-1. Power Breaker Switch

- Take the front panel off of the ACD cabinet. Look at the card with the red plastic tabs in slot 18. This is called the Generator Card (see Figure 7-2).
- Find the silver Toggle switch (Configuration Memory Enable Toggle Switch)
 on the Generator card. In normal operations, this switch should always be in
 the DOWN position. However, to turn on the system for the first time, flip the
 Toggle switch UP.

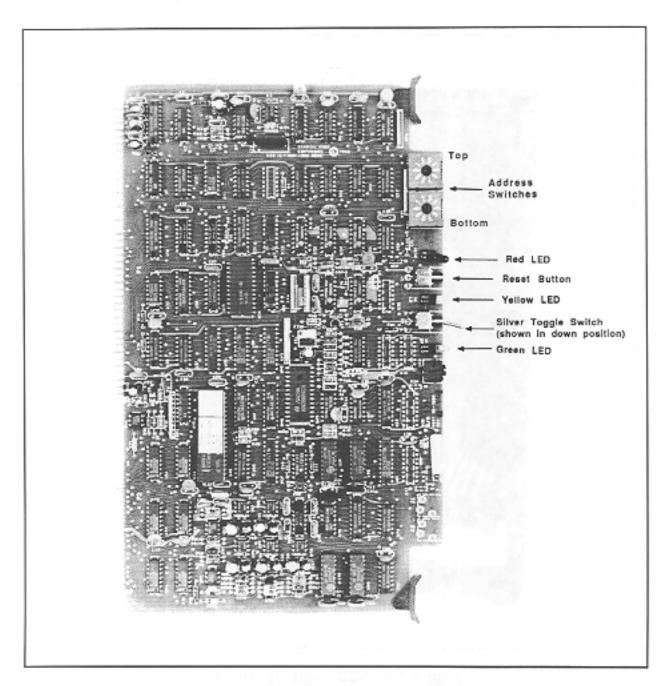


Figure 7-2. Generator Card Switches, LEDs, and Buttons

- Inside the ACD there is a switch in the lower right corner. This is called the Logic Power switch (see Figure 7-3). It should be in the DOWN or OFF position.
- To turn on the system, press the switch to the ON position. When you do this, the yellow and red LEDs on the Generator card should be blinking and the green LED on the Generator card should show steady illumination. This indicates that the configuration for the system is being set.

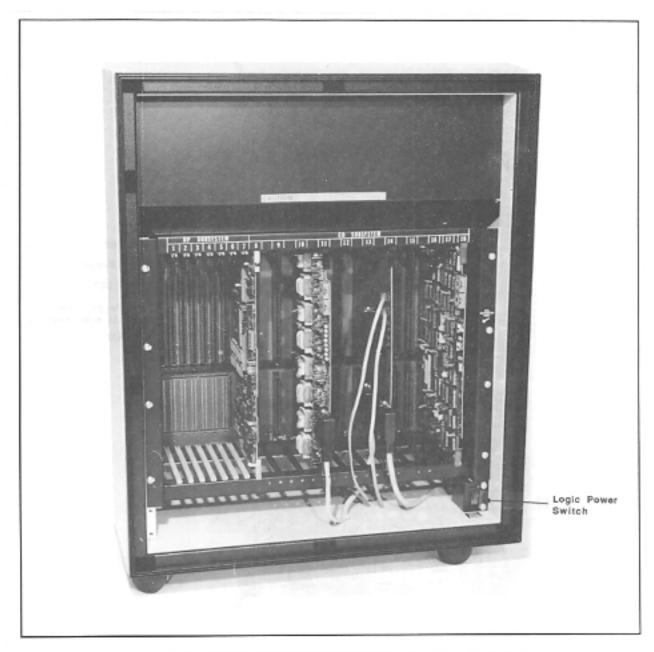


Figure 7-3. ACD Logic Power Switch

- Now, set the Toggle switch on the Generator card to the DOWN position.
 When you do this, the green LED on the Generator card should light. If the
 green LED shows steady illumination, the system Power Panel is functioning
 properly.
- If the green LED is **not** lit or is blinking, there is a problem with the Power Panel. Refer to Section 10, Maintenance and Troubleshooting, for help in isolating the problem. Make sure that the Toggle switch on the Generator card is in the **DOWN** position. If the Toggle switch is **UP**, the system will not function correctly.
- Above the Toggle switch on the Generator card there is a white plastic button. This is called the Reset button (see Figure 7-2).
- 10. Press the Reset button and hold it for a couple of seconds, then release it. This resets (i.e., initializes) and restarts the system. After you press and release the Reset button, a red LED will go on for two seconds indicating that the system is restarting. Then, this LED will be extinguished. If for some reason this does not occur, refer to Section 10, Maintenance and Troubleshooting.

Now you are ready to check out the Operator Consoles.

7.3 OPERATOR CONSOLE CHECK

Use the following procedure to check the Operator Console cables and the basic operation of the consoles. Check out each Operator Console starting with Operator Console 0. Then do the same check for each Operator Console. Remember that Operator Consoles are identified by the Address Dial reading on the back of each console (refer to Figure 6-9).

Section 8, Operator Functions, will have a complete description of how to operate the Operator Console keys. The four keys are: Green IN/OUT key, Blue PATCH/DIAL key, Yellow HOLD/SPFCN key, and Red ANSR/DISC key.

 Make sure that all Operator Consoles are set so that the IN/OUT key is UP or in the OUT position. The display will read OFF as shown in Figure 7-4.

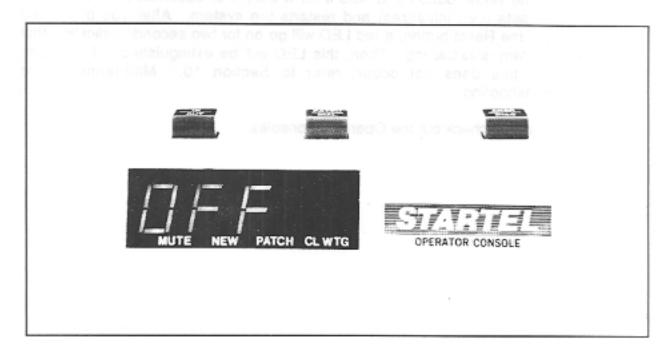


Figure 7-4. Operator Console in OFF

Press the IN/OUT key for Operator Console 0. The key should go down and stay down. The Operator Console is now set to the IN position. Observe that the little light above MUTE is illuminated on the display and OFF is no longer displayed as shown in Figure 7-5.

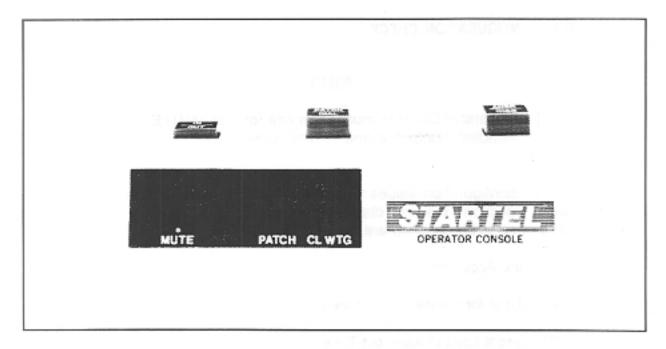


Figure 7-5. Operator Console in MUTE

- Push the IN/OUT key again, the key should come up and stay up. The Operator Console will beep to indicate that all operators are OUT of call rotation.
- Observe that OFF appears on the display as shown in Figure 7-4.
- Repeat what you did in step 2 through step 4 for each Operator Console.

If all the above observations are made, then the Operator Consoles are correctly installed. If not, refer to Section 10, Maintenance and Troubleshooting, to isolate any Operator Console related problems.

Now you are ready to check the System Configuration from your Operator Console.

7.4 SYSTEM CONFIGURATION CHECK

NOTE

The Operator Console must be in call rotation (MUTE light on; headset plugged in and volume turned up).

There are three configuration values that need to be checked upon installation. They are in Special Function 16 which displays special system diagnostic variables. The variables that need to be checked are:

- Dial Tone Accuracy
- Delay Time for Reuse of DID Lines
- DID Current Loss Disconnect Time

To check and/or set the diagnostic variables, proceed as follows:

NOTE

If the current value is larger than two digits (greater than 99) then the two character prompt is removed and only the value is displayed. When the firmware is initially installed, the above value may be set to 255. Instead of seeing the two character prompt, only 255 will be displayed. If so, just enter zero. This will force the prompt to be displayed so that you may check and/or enter the correct value.

If the operator fails to respond to any prompt within 30 seconds, Special Functions automatically exits and returns to call rotation.

The red LED on the Generator card blinks rapidly while the configuration memory is being updated. This will take from 0.1 second to three minutes depending on how much data needs to be changed.

 Place the Toggle switch on the Generator card to the UP position before entering Special Functions. The yellow LED above the switch should now be blinking.

- Press the HOLD/SPFCN key on your Operator Console. Your console will display S.F 0.
- Press 16 to enter Special Function 16.

NOTE

If a variable has already been set, press # to go to the next display to be checked.

- Press # key until you come to d.A_ (where _ is the dial accuracy) on your display. Check and/or enter a value of 6 unless otherwise authorized by StarTel personnel.
- Press # key and I.d_ (where _ is the time in hundredths of seconds to wait before this DID line can be reused) will appear on your display. Check and/or enter a value of 90 unless otherwise authorized by StarTel personnel.
- Press # key until you come to d.L_ (where _ is the number of tenths of seconds to wait after current loss on a DID line to disconnect the line) on your display. Check and/or enter a value of 1 unless otherwise authorized by StarTel personnel.
- Press * key to exit Special Function 16.
- 8. Press * key to exit Special Functions.
- When you are finished with Special Functions, and the red LED on the Generator card has stopped blinking, turn the Toggle switch to the DOWN position.

Now you have checked the System Configuration.

7.5 DID LINE CHECK

This procedure should be completed after TELCO has connected the DID trunks. (If you want to attempt the check before TELCO installs the lines, you may short the line according to the procedure in Section 10.8, DID Port Check.) When your lines have been installed, perform the following procedures. (If you have an additional Trunk card in slot 12, duplicate the steps in the following procedure where they apply.)

- Press the IN/OUT key on one of the Operator Consoles. This connects your operator to the system.
- Have your operator plug a headset into the Operator Console.
- From another telephone, dial one of your DID numbers. When the client ID number displays on the Operator Console, make sure it corresponds to the last digits of the number you dialed.
- Have the operator answer the call by pressing the ANSR/DISC key (see Figure 7-6). Make sure that you can speak to one another.

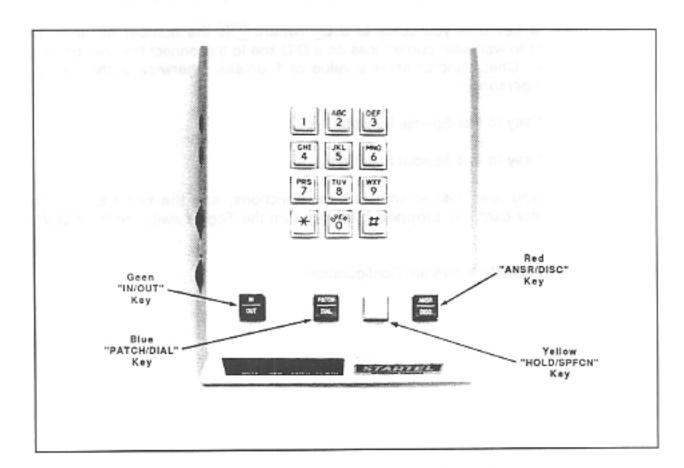


Figure 7-6. Operator Console Control Keys

Now, we are going to check the Operator Console connections to the Trunk card as shown in Figure 7-7. While you are still on the line to your operator, go to the ACD.

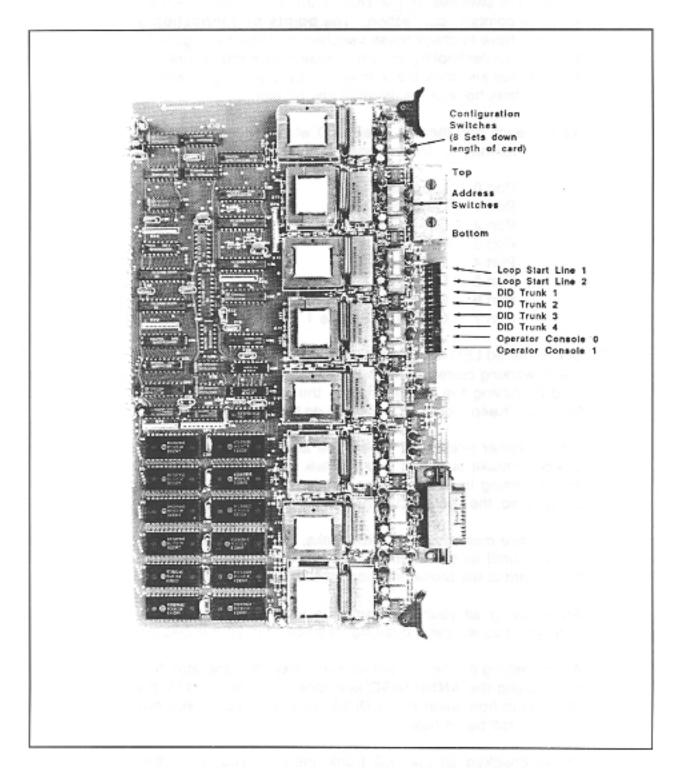


Figure 7-7. Trunk Card Ports and Switches

6. Find the Trunk card in slot 11 (also slot 12 if you have an additional Trunk card). The Trunk card has eight points of connection on it. They are: the two loop start lines, the four DID trunks, and the two Operator Consoles. The factory sets switches on the Trunk card so the system knows what is located on these points of connection. The points of connection are called ports. You may have to check these switches, as shown in Figure 7-7, if you have to do any troubleshooting on your system at some future time. If you know where these switches are and what they are called, it will help us talk to you over the telephone in the event of any problems.

Next to each port there is a red LED which is illuminated when that particular port is in operation. These ports are numbered from top to bottom as follows:

Port 0 Loop Start Line
Port 1 Loop Start Line
Port 2 DID Trunk
Port 3 DID Trunk
Port 4 DID Trunk
Port 5 DID Trunk
Port 6 Operator Console 0
Port 7 Operator Console 1

- See if the red LED for a DID trunk is illuminated. If so, then your first DID trunk line is working correctly. If you have more than one DID trunk, put this line on hold by having the operator press the HOLD/SPFCN key on the Operator Console. Keep it on hold while you do the next step.
- From another telephone, repeat the above steps with another DID number.
 Check to make sure that you can talk on the line. Then make sure that the call is coming in at the proper location for a DID trunk (port 3 on the Trunk card). If so, the second DID trunk is functioning properly.
- If you have more than two DID trunks, put this call on hold and continue this process until all trunks are checked. The next call should come in on the Trunk card at the proper location for a DID trunk (ports 4 and 5).
- After having all your DID trunks in use, call in one more time on a DID number. You will get a busy signal since all of your trunks are in use.
- After finishing this test, make sure you have the operator disconnect each line by pressing the ANSR/DISC key once to answer and then a second time to disconnect from each of the DID lines you called. If you do not do this, your lines will still be on hold.

Now you have checked all the DID trunk lines. If your lines are not functioning correctly, refer to Section 10.8, DID Port Test.

7.6 LOOP START LINE CHECK

This procedure will test the loop start lines used for patching and dialing out. You will not be able to perform this procedure until TELCO has finished its installation. If you want to attempt the check before TELCO installs the lines, you may short the line according to the procedure in Section 10.9, Loop Start Line Port Test. When your lines have been installed, perform the following procedure. (If you have an additional Trunk card in slot 12, duplicate the steps in the following procedure where they apply.)

- Plug the headset into Operator Console 0.
- 2. Press the IN/OUT key to turn the Operator Console on.
- From another telephone, have an operator dial one of the loop start lines connected to the system. When the line rings, the operator at Operator Console 0 will hear a beep in his/her ear.
- Press the ANSR/DISC key. Make sure that you can talk to each other on the line.
- Press the ANSR/DISC key again to disconnect from the call.
- Repeat step 3 through step 5 to test each loop start line.
- From Operator Console 0, press the PATCH/DIAL. You should get a dial tone. The Operator Console will display LP.0 as shown in Figure 7-8.

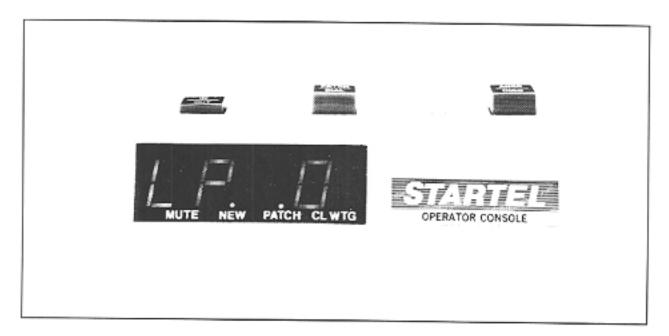


Figure 7-8. Operator Console Display In DIAL/PATCH Mode

- Now, dial a number from the Operator Console and make sure you can talk on the line.
- Press the HOLD/SPFCN key to place the call on hold.
- Repeat step 7 through step 9 to test each loop start line. The Operator Console will display all the loop start lines that are connected to the system, i.e., LP.0 and LP.1 (LP.2 and LP.3 if you have an additional Trunk card).
- Now, press the ANSR/DISC key to connect to the first line that you put on hold, then press the ANSR/DISC key to disconnect this line.
- Repeat step 11 until you have disconnected all the loop start lines that you
 put on hold.

Now you have checked the loop start lines. If your lines are not functioning correctly, refer to Section 10.9, Loop Start Line Port Test.

Now you are ready to begin using your System 2050!

8.1 INTRODUCTION

This section will discuss the various functions of the Operator Console as shown in Figure 8-1 and describe step-by-step instructions for each task that an operator will perform.

In this section we will focus on three basic functions of the Operator Console:

- Operator Connection to the System (Section 8.2)
- Client ID and Call Status Indication (Section 8.3)
- Call Control Keys (Section 8.4)

In addition, a detailed explanation will be given for these typical operator tasks:

- Preparing to Answer Calls (Section 8.5)
- Answering and Disconnecting Calls (Section 8.6)
- Placing Calls on Hold (Sections 8.7 and 8.8)
- Dialing Out (Section 8.9)
- Patching Calls (Section 8.10)

If you are new to the system, it is best to use these instructions while seated at an Operator Console. Often, procedures which sound complicated in print are very simple in practice.

Additionally, you will find that the ACD will reduce the need for manual tracking and as a result, operators can devote their time to answering calls and taking messages. The ACD provides the following benefits:

- No checking for operator overload. The ACD keeps track of which calls have been on hold the longest so that when an operator completes a call, the next call is automatically assigned along with the client ID number.
- Provides simpler, easier patching. Patching can be used for incoming
 or outgoing lines eliminating the need for multiple, and sometimes
 cumbersome, pieces of equipment. No need to monitor a patch. Patches
 disconnect automatically from the system when done. You are limited in the
 number of patches only by the number of trunks you have.



Figure 8-1. System 2050 Operator Console (Headset Not Included)

8.2 OPERATOR CONNECTION TO THE OPERATOR CONSOLE

The Operator Console is a small rectangular box. The left side of the Operator Console has a standard headset jack connector and two volume controls as shown in Figure 8-2. The front dial controls volume for the headset earpiece. The rear dial controls volume for the microphone. Turn the dial towards the back of the Operator Console to increase volume; turn the dial towards the front to decrease volume. The instructions in Section 8.5 will explain how to prepare to answer calls.

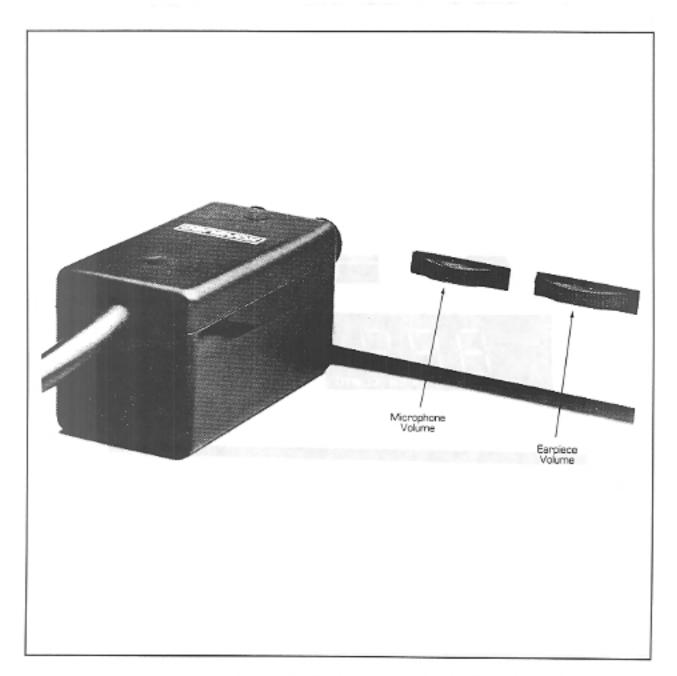


Figure 8-2. Operator Console Jack Connector and Volume Controls

8.3 CLIENT ID AND CALL STATUS INDICATION

On the front of the Operator Console is an LED display which is shown in Figure 8-3. This display is used to indicate the client ID number and to illuminate the four call status indicators. The client ID number corresponds to the last digits of the DID number that was called. Each time a call is assigned, the client ID number is displayed for the operator.

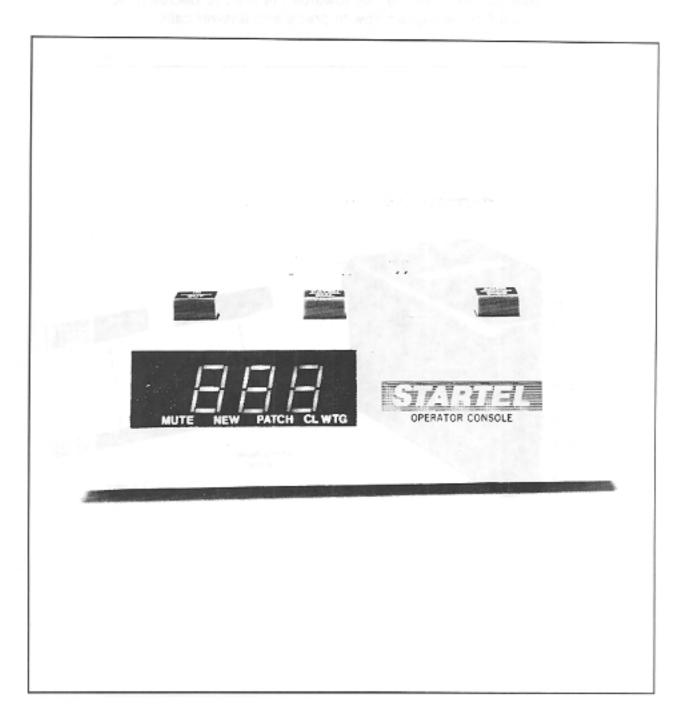


Figure 8-3. Operator Console Display

The four Call Status Indicator lights are as follows:

MUTE Operator Station in Non-Talk State

When the red light is lit above the word MUTE, the operator is not connected to a call. It indicates that the operator is currently available for calls.

NEW New Call

When the red light is lit above the word **NEW**, a new call (one which has not been answered and is still ringing) is waiting to be answered. It will stay lit while you are on a call.

PATCH Patch or Priority Hold

When the red light is lit above the word PATCH, there is a call on patch hold. If the operator is holding a call at his/her station, this light will be lit.

CL WTG Call Waiting

When the red light is lit above the words CL WTG, calls have been put on system hold and are waiting for an available operator. System hold is a term used to describe a hold condition in which the ACD will assign an on-hold call to any available operator.

All of the operations described in this section will be a combination of pressing keys and looking at the display on the Operator Console.

8.4 CALL CONTROL KEYS

Let's take a look at the Call Control Keys as shown in Figure 8-4. These keys control the main tasks on the Operator Consoles. Detailed explanations of specific operator tasks can be found in Sections 8.5 through 8.9.

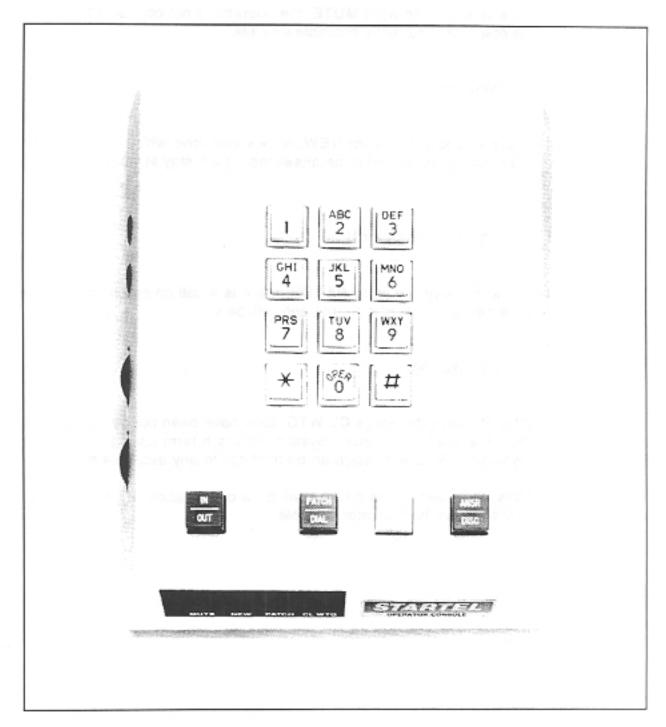


Figure 8-4. Operator Call Control Keys

IN/OUT (GREEN)

OUT

When the green IN/OUT key is pressed down or IN, the station is in call rotation and ready to accept incoming calls. The Operator Console display will show the console in MUTE status. NOTE: The IN/OUT key stays pushed in until the operator is ready to go out of call rotation, in which case, the key is pressed again. In the UP position the Operator Console will no longer be assigned calls. The Operator Console display will read OFF.

PATCH/DIAL (BLUE)

DIAL

The blue PATCH/DIAL key is a dual function key which operates differently, depending on whether the operator is on a call or not. When the operator is on a call, this key is used to place the call on patch hold. This is used when the operator wishes to handle the call and does not want the call to rotate to another operator or when he/she intends to patch. When the operator is not on a call, pressing this key will give the operator a dial tone in order to dial out on another line to complete tasks such as relays, pages, wake-ups and reminders.

HOLD/SPFCN (YELLOW)

HOLD

The yellow HOLD/SPFCN (Hold/Special Function) key is used to place a call on system hold. If a call is placed on system hold and another operator becomes available, the call will automatically rotate to the available operator. If an operator is not connected to a call and presses this key, the Operator Console goes into Special Functions.

ANSR/DISC (RED)

DISC

The red ANSR/DISC (Answer/Disconnect) key is used by the operator to answer and disconnect calls. If the operator is not connected to a call and one is assigned to the station, pressing this key will connect the operator to the call. If the operator is already connected to a call, pressing this key will disconnect the operator from the call.

The operator must always disconnect from a call, even if the caller terminates the call. If an operator is not connected to a call and no calls are waiting, a beep will be heard in the operator's headset when the ANSR/DISC key is pressed.

Now that you are familiar with the basic functions of the Operator Console, let's see how the beeps will help alert you to the calls being assigned to an operator station. There are two different types of beeps: A Headset beep and an External beep from the Operator Console.

HEADSET BEEP

Whether in a mute state or a talk state, the operator can hear beeps in the headset. Both situations indicate a call (new or hold) is waiting to be answered.

If the operator is in a mute state and receives a beep, the call should be promptly answered by pressing and releasing the ANSR/DISC key. The operator should note the status indicator light above the status word NEW to determine whether the call should be answered as a new or hold call.

If the operator is on a call and hears beeps, the current call should be placed on hold. The new call should be answered by pressing and releasing the ANSR/DISC key. Normally, the new call should then be placed on system hold by pressing the HOLD/SPFCN key so the operator can return to finish handling the first call.

EXTERNAL BEEP

An external beep is heard when a call has been assigned to an idle operator station that is in call rotation and the operator has not answered the call in 15 seconds.

When the last operator goes OUT of call rotation, an external beep is also heard as a reminder that all Operator Consoles are OFF and unable to answer calls.

The next sections will discuss step-by-step instructions for carrying out operator tasks.

- Preparing to Answer Calls (Section 8.5)
- Answering and Disconnecting Calls (Section 8.6)
- Placing Calls on Hold (Sections 8.7 and 8.8)
- Dialing Out (Section 8.9)
- Patching Calls (Section 8.10)

8.5 OPERATOR PREPARATION FOR ANSWERING CALLS

Here are several steps that should be taken to ensure that the operator is ready to answer calls.

- Plug the headset into the Operator Console as shown in Figure 8-2.
- 2. Check the volume levels in the headset earpiece and the headset microphone. Volume dials are located on the left side of the Operator Console as shown in Figure 8-2. The front dial is for the volume of the earpiece and may be checked by pressing any of the numeric keys on the Operator Console keypad. The rear dial is for the volume of the microphone and can only be checked by talking to another person through the system.
- Press in the IN/OUT key. OFF will disappear from the display and look like the display shown in Figure 8-5.
- You are now ready to accept calls.

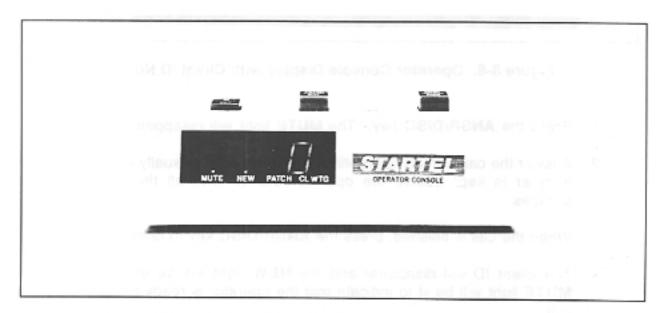


Figure 8-5. Operator Console Display's Operator Idle, Ready to Answer Calls

8.6 ANSWERING AND DISCONNECTING A CALL

In this example, it is assumed that the operator has only one new call to handle. When a call is assigned to the operator, a beep will be heard in the headset earpiece. The client ID number (this may be up to four digits) is displayed on the Operator Console as the call is assigned. The **NEW** light is lit as shown in Figure 8-6.



Figure 8-6. Operator Console Display with Client ID Number

- Press the ANSR/DISC key. The MUTE light will disappear.
- Answer the call with an appropriate answer phrase. Usually a list of clients by number is kept beside the operator station with all the correct answer phrases.
- 3. When the call is finished, press the ANSR/DISC key to disconnect the call.
- The client ID will disappear and the NEW light will be extinguished. The MUTE light will be lit to indicate that the operator is ready to handle another call.

NOTE

If a call is not answered within 15 seconds, the Operator Console will sound an external beep indicating that a call needs to be answered. If the call is not answered within 30 seconds, the call will be reassigned to another operator station (if there is an available operator).

8.7 PLACING CALLS ON SYSTEM HOLD

Calls may be placed on hold in order to answer another call. The following is an example of using the System Hold feature. While the operator is on a call, the headset signals beeps indicating another call is waiting to be answered.

- Prepare the current caller to be placed on hold by saying will you please hold, then wait for a positive response. Press the HOLD/SPFCN key to put the first call on system hold.
- The display will show the client ID number of the new call coming in as shown in Figure 8-4. The NEW light will be lit.
- Press the ANSR/DISC key. Answer the call with the client's answer phrase and then ask the new caller to please hold. Wait for a positive response.
- 4. Press the HOLD/SPFCN key. This places the new call on system hold.
- If new calls keep coming in (i.e., the NEW light is on each time you press ANSR/DISC in response to beeps), put them on hold until you return to a call previously put on system hold (the NEW light will not be lit). The call that has been on hold the longest will automatically return to the operator first.
- Press the ANSR/DISC key to connect to the longest-on-hold caller and take a message.

The first call an operator places on system hold is called the **Primary Hold Call**. The system will hold this call at that operator's station for 30 seconds while the operator handles new incoming calls. The operator can place a series of new calls on system hold and return to the first or Primary Hold Call if less than 30 seconds is used to do these tasks.

If the operator does not return to the caller placed on system hold within 30 seconds, the call will be assigned to another operator, if one is available.

8.8 PLACING CALLS ON PATCH HOLD

If it is necessary to hold a call at a particular operator station, the call may be put on patch hold. Calls waiting to be patched are also placed on patch hold (sometimes referred to as Priority Hold).

In the following example, the operator is currently handling a caller and the headset beeps to indicate that another call is waiting to be answered.

- 1. Prepare the current caller to be put on hold.
- Press the PATCH/DIAL key.
- The display will show which loop start (dial-out) line is being accessed as shown in Figure 8-7. The operator will hear dial tone from the loop start line.
- If you are patching a call, refer to Section 8.9.
- If you are taking a new call, press the ANSR/DISC key to disconnect you from the loop start line. The connection to the loop start line is terminated and the light above PATCH will be lit on the display indicating that the operator has a call on patch hold.
- The client ID number of the new call is shown on the display. You now answer the new call by pressing the ANSR/DISC key again.
- 7. After answering the new call, prepare the new caller to be put on hold by pressing the HOLD/SPFCN key. You may retrieve the first call from patch hold by pressing the PATCH/DIAL key. If no other calls are assigned to your station, you can retrieve a Patch Hold call by pressing the ANSR/DISC key.

NOTE

Before pressing the PATCH/DIAL key to reconnect to the call on patch hold, be sure you are NOT still talking with the new call or the two calls will be patched together. This can be checked by making sure that the light above MUTE is lit as shown in Figure 8-8. If it is, you may return to the call that is on patch hold.

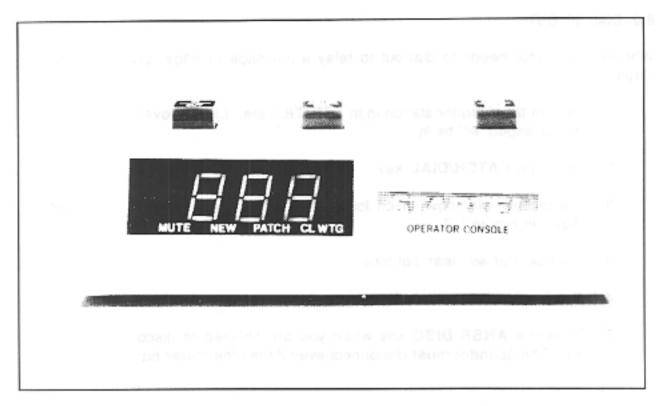


Figure 8-7. Operator Console Display Showing Loop Start Line Used to Dial Out

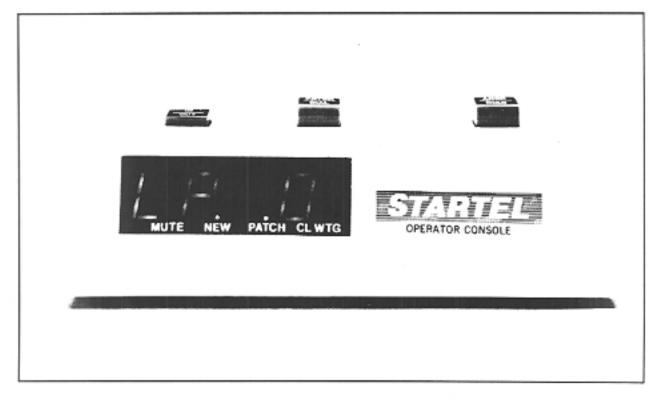


Figure 8-8. New Call Coming In and Call On Patch Hold

8.9 DIALING OUT

When the operator needs to dial out to relay a message or page, use the following steps.

- Be sure the operator station in in a MUTE state. Light above the word MUTE on the display will be lit.
- Press the PATCH/DIAL key.
- The display will show which loop start (dial out) line is being accessed as shown in Figure 8-7.
- 3. The operator will hear dial tone.
- Dial the desired number.
- Press the ANSR/DISC key when you are finished to disconnect from the line. The operator must disconnect even if the other caller hangs up first.

8.10 PATCHING CALLS

Patching or cross-connecting a call to another number can be accomplished from any operator station in the system. Operators can patch incoming lines to outgoing lines, outgoing lines to outgoing lines, or incoming lines to incoming lines. Operators are not limited by position as to how many patched calls they can connect at one time. Patching is limited only by the number of lines/trunks available on the system.

The following is a summary of the general steps involved in patching.

- Place the first party in patch hold.
- Connect to the second party.
- Press the PATCH/DIAL key to connect the two parties. Now both parties and the operator are all on the same line.
- 4. Press the ANSR/DISC key to disconnect the operator from the conversation.
- Patched calls will disconnect from the system when the parties have finished their call. If a patch is longer then 15 minutes, the patched call will automatically disconnect from the system.

8.10.1 Patching an Incoming Line to an Outgoing Line

In the following example, the client ID number is displayed on the Operator Console as a call is assigned to an operator (refer to Figure 8-6).

- Press the ANSR/DISC key. The MUTE light will disappear.
- Press the PATCH/DIAL key to put the call on patch hold. The operator will then be connected to a loop start (dial-out) line and hear dial tone. The display will show which loop start line as been accessed to dial out (refer to Figure 8-7).
- Dial the telephone number of the party to which you need to patch the incoming call.
- 4. When the party you have dialed answers, you may connect the call on patch hold to the dialed party by pressing the PATCH/DIAL key. This patches the caller on the incoming line (which was on PATCH HOLD), the party on the outgoing (dial out) loop start line, and the operator together.
- 5. The operator then disconnects from the parties on the patched call by pressing the ANSR/DISC key. The two lines which have been patched will automatically disconnect from the system when either of the caller's hang up. If a patch is longer than 15 minutes, the patched call will automatically disconnect from the system.

NOTES

- If the person you have dialed does not answer or is not available, the patch will not be able to be completed. Press ANSR/DISC to disconnect from the outgoing line. Press PATCH/DIAL to retrieve the original caller, then press ANSR/DISC when you are ready to release the call.
- When a caller is in patch hold, they cannot hear the operator or the person the operator is trying to reach until the two lines are patched together.

8.10.2 Patching an Outgoing Line to an Outgoing Line

In the following example, assume that no calls are being handled by the operator.

- Press the PATCH/DIAL key to obtain one of the loop start lines and get dial tone. Dial the first parties number.
- When the first party answers, prepare them to be put on hold and press the PATCH/DIAL key to place the call on patch hold. The system will automatically connect you to the other loop start line and give you a dial tone. Dial the second parties number.
- When the second party answers, explain why you are calling, and then press the PATCH/DIAL key again. The two parties and the operator will be patched on the line together.
- 4. Press the ANSR/DISC key to disconnect the operator from the patched call.
- The call will automatically disconnect from the system when either party hangs up or if the patch is longer than 15 minutes.

8.10.3 Patching an Incoming Line to an Incoming Line

In the following example, a sick person calls for the doctor and wants to stay on the line until the doctor calls responding to a page.

- Press the ANSR/DISC key to answer the first call.
- Press the PATCH/DIAL key to put the first call on patch hold.
- Press the ANSR/DISC key to disconnect the operator from the line to be available for the second call.
- When the second call comes in (if assigned to the same operator station), press the ANSR/DISC key to answer the call.
 - If the call is assigned to another operator station, have that operator press HOLD/SPFCN so the call will be reassigned to the original operator. After it is reassigned, press the ANSR/DISC key to answer the call.
- Press the PATCH/DIAL key to connect the second incoming call and the call on patch hold.
- 6. Press the ANSR/DISC key to disconnect the operator from the patched call.
- The patch will disconnect automatically when one party hangs up or at the end of 15 minutes.

You are now ready to start accepting calls on your System 2050!

9.1 INTRODUCTION

In this section we will discuss how the ACD handles calls. Calls are handled differently depending on these factors:

- · Calls are New/Fresh
- Status of Hold calls

Since call distributing is the basis of all call handling, it is important to understand how it works. A good understanding of call distribution will also help you in operating your system more efficiently.

The best way to explain call distribution is through the use of situation examples. Throughout this section we will be referring to three operator stations numbered 0, 1, and 2. Assume that they are all in call rotation and ready to accept calls.

9.2 NEW/FRESH CALLS

It is important to understand how calls are handled when they first enter the system. New or fresh calls are calls that have never been answered and are still ringing.

- RULE 1 Only one call can be assigned to an operator at any one time.
- RULE 2 Calls are assigned to the longest idle operator.

When a call comes into the system, it first enters the rear of New Call Queue as shown in Figure 9-1. A queue is a holding device and, in this case, handles new calls coming into the system. The New Call Queue handles calls on a first in, first out basis.

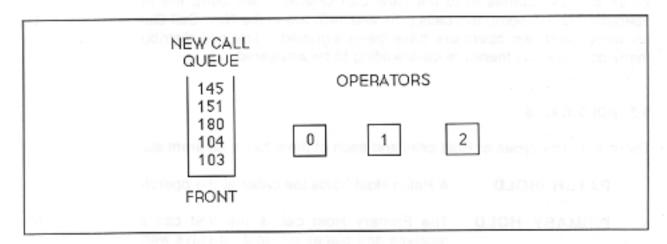


Figure 9-1. New Call Queue - When New Call Enters Queue

In this example, as shown in Figure 9-2, call 103 (Client ID 103) comes into the New Call Queue, it will be the first call assigned to an operator. Then the next call (Client ID 104) is in the front of the queue and is the next to be assigned. Call 180 will be assigned to operator 2 assuming that the operator is the last idle operator. If another call (Client ID 151) comes into the system, it will beep the longest busy operator.

RULE 3 A call will beep the longest busy operator if all operators are busy.

This does not mean the call is assigned. In the event the operator does not answer the call and another operator becomes available, it will be assigned to the idle operator.

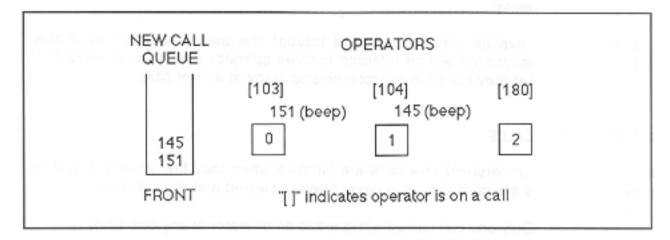


Figure 9-2. New Call Queue - Assignment of Calls

In this example, as shown in Figure 9-2, call 151 (Client ID 151) will beep (not be assigned to) operator 0 since that operator has been busy the longest.

When call 145 comes in to the New Call Queue, it will beep the next longest busy operator. At this point, two calls (151 and 145) are in the New Call Queue waiting to be answered and two operators have been signaled. The call distributor will beep as many operators as there are calls waiting to be answered.

9.3 HOLD CALLS

There are three types of Hold calls and each of them has a different status. They are:

PATCH HOLD A Patch Hold holds the caller at the operator's station.

PRIMARY HOLD The Primary Hold call is the first call an idle operator receives and places on Hold. It stays with the operator for 30 seconds before it goes into System Hold.

SYSTEM HOLD

A call which has been placed in System Hold will be assigned to the first available operator or if no operators are idle, it will beep the longest busy operator. If that operator does not respond to the call, it will be assigned to the first available operator.

We mentioned earlier that Hold calls have a different status. We will discuss the differences in status now.

RULE 4 A New call placed on Hold with the HOLD/SPFCN key is placed in the operator's Primary Hold only if System Hold queue is empty. Otherwise, the call is placed at the rear of the System Hold queue.

> A caller placed on Hold for the second time will be placed in the operator's Primary Hold unless the Primary Hold already contains a call.

A Primary Hold call is the first call an operator receives and places on Hold using the HOLD/SPFCN key. It stays for 30 seconds at the operator's station. If the operator has answered several more new calls, they will be placed on System Hold (meaning the rear of the System Hold queue). The next call to be assigned to the operator after the New Call Queue is emptied will be the Primary Hold call. If the Primary Hold call timed out because it took the operator too long to come back to it, it will go to the front of the System Hold queue instead of the rear as System Hold calls normally do.

If an operator is idle and is assigned a new call but there are calls in the System Hold queue, the New call when placed on Hold will not be handled as a Primary Hold call. The New call gets placed in Primary Hold only if the System Hold queue is empty.

If an operator is idle and is assigned a Hold call, the call, when placed on Hold, will be handled as a Primary Hold regardless of the condition of the Hold call queue.

RULE 5 All calls are assigned according to their call priority. New calls receive first priority. Primary Hold calls receive second priority and System Hold calls are handled last.

NOTE

New calls will always be assigned and beeped before Hold calls. Because a call on Patch Hold is being held at the operator station indefinitely, it is not in a queue and, therefore, is never assigned to another operator. An operator can choose to answer a Patch Hold overriding the operator's assigned call.

If a call is on Patch Hold, the LED will show that a call is in Patch Hold. An operator with no calls assigned can answer a call in Patch Hold by pressing PATCH/DIAL or ANSR/DISC.

10.1 INTRODUCTION

In this section we will be discussing general preventive maintenance tasks and simple troubleshooting. If you need more advanced information, check with your Customer Support Representative for the schedule of classes on Maintenance and Troubleshooting. Always feel free to call StarTel when you need assistance.

Client-performed maintenance/troubleshooting is limited to inspecting and cleaning your system and circuit board and/or Operator Console replacement. Only StarTel produced replacement parts should be used for this purpose. Call StarTel Field Service to receive Return Authorization Service tags for faulty cards. When these tags are received, attach them to the equipment and return them to StarTel for repair. It is against StarTel policy and FCC regulations for customers to modify or repair any circuit card.

10.2 PREVENTIVE MAINTENANCE

Preventive maintenance consists of inspecting and cleaning the system. These procedures should be performed at regular intervals as specified in Table 10-1.

Table 10-1. Preventive Maintenance Checklist

Task	Interval	Procedure
Power Supply Check	Weekly	Observe green LED on Generator card. A blinking green LED indicates that a Logic Power Supply is out of tolerance (see Section 10.5). Steady illumination of the green LED indicates that the Logic Power Supply is functioning correctly.
Inspect Cables	6 months	Look for frayed cables and wires. Check that no wires are squeezed between structural members. Inspect connectors for damage.

Table 10-1. Preventive Maintenance Checklist (continued)

Task	Interval	Procedure
Inspect Circuit Cards	12 months	Inspect circuit cards for excessive dust and lint accumulation. If necessary, remove card and blow away dust and lint.
		In excessively greasy or corrosive environments only: Inspect circuit card edge connector for grease and corrosion. If necessary, remove grease and corrosion from card edge and backplane connectors with a soft toothbrush dipped in Freon TF or alcohol. Before re-inserting circuit card,
	manga a specifie	re-clean connector with a clean toothbrush. Connectors are gold plated and should not be burnished.
Clean Fan	12 months	Remove dust from guard screen and fan blades with a vacuum cleaner.
Clean Chassis	12 months	Remove dust with a vacuum cleaner. Wipe the chassis interior and exterior with a cloth moistened in Freon TF or alcohol.

10.3 TROUBLESHOOTING

The following sections contain testing and troubleshooting procedures to help isolate the source of a problem in the System 2050. Also included are removal/replacement procedures.

- Status Indicators (Section 10.4)
- Basic System Operation Test (Section 10.5)
- Fault Isolation (Section 10.6)
- Power Supply Test (Section 10.7)
- DID Port Test (Section 10.8)
- Loop Start Port Test (Section 10.9)
- Operator Console Test (Section 10.10)
- Removal/Replacement Procedures (Section 10.11)

The Basic System Operation Test should be performed first in the event of a major System 2050 failure.

10.4 STATUS INDICATORS

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The indicator lights on the System 2050 are devices known as **Light Emitting Diodes** and in the following discussions a light will be called a **LED**. A LED lasts much longer than a normal light, therefore, StarTel uses them for higher reliability.

The Generator card and Trunk card(s) contain status indicator LEDs which are useful during troubleshooting.

Tables 10-2 and 10-3 define the status for each indicator state. Note that the operation of each of the eight Trunk card indicator LEDs are identical. Remember, the ports are the points of connection on the Trunk card which designate the connection as a loop start line, DID trunk, or Operator Console. Each indicator LED monitors the status of a particular port by emitting one of three colors. Status indicator LED definitions vary according to the port type (DID, Loop Start, Operator Console).

Other than cables and Operator Consoles, there are only five major components in your System 2050. They are:

- Power Panel
- 2. Generator Card red plastic tabs
- 3. CPU Card white plastic tabs
- 4. Trunk Card(s) black plastic tabs
- Input/Output (I/O) Card red and black plastic tabs

We will repeatedly refer to these components throughout the troubleshooting section.

Table 10-2. Generator Card Status Indicator LEDs

Color	State	Status
Green	ON	Power supplies OK
	Blinking	One or more power supply voltages out of tolerance
	OFF	See Section 10.5
Red	Blinking	Power failure occurred (automatically clears after 10 min.)
	ON	Watch dog timer* expired (automatically clears after 10 min.)
	OFF	System operation normal
Yellow	Blinking	Configuration Memory Enable Toggle switch is ON**
	OFF	Configuration Memory Enable Toggle switch is OFF
	ON	Generator card defective

^{*}The watch dog timer on the Generator card monitors the operation of the CPU card. It automatically resets the system and disconnects the current calls if the control program should fail. If this problem occurs frequently, the CPU card is defective.

^{**}This should happen only on the first power-up of the System 2050 or when a Generator card is replaced. At all other times, this would indicate that the silver Toggle switch is set incorrectly in the **UP** position.

Table 10-3. Trunk Card Port Status Indicator LEDs

	807977	Status		
State	DID	Loop Start	Operator Console	
OFF	Idle (on hook)	Idle (on hook)	Out of call rotation	
ON Red	Call (off hook)	Call (off hook)	In call rotation	
ON Green	Anim , u o m micca	Wiring reversed	t o salar -	
Blink Red	Incoming ID digits	ngxe Sumi ro co i see	Operator Console external beep or key activity	
Blink Yellow	rwa o god i dool	Loop Start Line ringing in		

10.5 BASIC SYSTEM OPERATION TEST

Use the following procedure to test and/or troubleshoot the System 2050 when a major system failure occurs (i.e., all Operator Consoles inoperable).

- Observe the green LED on the Generator card.
 - a. If LED is ON: The power supply is OK. Proceed to step 2.
 - If LED is blinking: Check, and, if necessary, replace the Power Panel (see Section 10.11).
 - c. If LED is OFF:
 - Check that the System 2050 Power switch is ON.
 - (2) Check that the power cord is connected to both the System 2050 and AC outlet.
 - (3) Check that both the building and System 2050 circuit breakers are ON.
 - (4) Set the Configuration Memory Enable Toggle switch (on the Generator card) to the UP position. If the yellow LED starts blinking, replace the CPU card. Then, if necessary, replace the Generator card.

If the yellow LED remains **OFF**, replace the Power Panel (defective power supply).

- Observe the red LED on the CPU card (near the bottom front edge).
 - a. If LED is blinking: The CPU card is OK. Proceed to step 3.
 - If LED is ON or OFF: Replace the CPU card, then, if necessary, the Generator card.
- Press the Operator Console IN/OUT switch down and then up while observing the corresponding Trunk card LED.
 - a. If LED turns ON and OFF, proceed to step 4.
 - If LED does NOT turn ON and OFF, repeat step 3 using another Operator Console.

- If both Operator Consoles operate as described above in item b, replace the Power Panel (defective power supply).
- (2) If only one Operator Console operates as described above in item b, check the cabling and if the problem still exists, replace the Operator Console.
- Press the Operator Console IN/OUT switch down and, after approximately two seconds, up while observing the Operator Console Display.
 - a. If the display shows MUTE and OUT, check out is complete.
 - b. If the display does NOT show MUTE and OUT:
 - (1) Replace the Generator card.
 - (2) If the problem still exists, replace the corresponding Trunk card.
 - (3) If the problem still exists, unplug the modular cord from one of the Operator Consoles and test another one for proper display. Repeat the process for each Operator Console. Replace the Operator Console that causes the display to operate incorrectly when it's modular cord is connected.

Basic operation of the System 2050 is verified. Isolation of other problems are described in Section 10.6.

10.6 FAULT ISOLATION

Fault isolation consists of identifying the source of a System 2050 operational problem. Table 10-4 lists problem symptoms and problem sources (a major assembly or cable) and references test procedures and corrective actions.

NOTE

The Basic System Operation Test (Section 10.5) should be performed first in the event of a major system failure.

Table 10-4. System 2050 Fault Isolation

Symptom	Possible Problem Source	Test Procedure	Corrective Action	
All DID lines inoperative	Trunk card failure if all Trunks on one card	Check one Trunk (see Section 10.8) to determine if bad card/ cable or TELCO problem	Replace Trunk card (see Section 10.11)	
	TELCO problem (lines marked down)	Isolate and check DID port (see Section 10.8)	Contact TELCO	
One DID line inoperative	TELCO problem (lines marked down)	Isolate and check DID port (see Section 10.8)	Contact TELCO	
	Trunk card port failure	Isolate and check DID port (see Section 10.8)	Replace Trunk card (see Section 10.11)	
	Broken or shorted line	Isolate and check DID port (see Section 10.8)	Repair line wiring as necessary	

Table 10-4. System 2050 Fault Isolation (continued)

Possible Problem Source	Test Procedure	Corrective Action
TELCO problem	Isolate and check Loop Start port (see Section 10.9)	Contact TELCO
Trunk card port failure	Isolate and check Loop Start port (see Section 10.9)	Replace Trunk card (see Section 10.11)
Broken or shorted line wire	Isolate and check Loop Start port (see Section 10.9)	Repair line wiring as necessary
Console failure or headset failure	Use another headset to determine console or headset failure	Replace console or headset (see Section 10.11)
Generator card failure	CC problem Isolate	Replace Generator card (see Section 10.11)
Broken, shorted, or reversed data	Check all data cable terminations (see Section 10.10)	Repair or replace as necessary
Modular Cable open	etidael —no citio An ire port (s	Replace Modular Cable
Operator Console failure	etricel between new	Replace Operator Console (see Section 10.11)
	Problem Source TELCO problem Trunk card port failure Broken or shorted line wire Console failure or headset failure Generator card failure Broken, shorted, or reversed data Modular Cable open Operator Console	TELCO problem Isolate and check Loop Start port (see Section 10.9) Trunk card port failure Isolate and check Loop Start port (see Section 10.9) Broken or shorted line wire Isolate and check Loop Start port (see Section 10.9) Console failure or headset failure Use another headset to determine console or headset failure Generator card failure Broken, shorted, or reversed data Check all data cable terminations (see Section 10.10) Modular Cable open Operator Console

Table 10-4. System 2050 Fault Isolation (continued)

Symptom	Possible Problem Source	Test Procedure	Corrective Action
Static noise on all Operator Consoles	Audio to digital cable coupling	- b-sering is	Install audio and data lines on separate cables
whenever console displays are updated	196 100 100	tor Consule	meoC AIC muliet val 1 1 AC
Static noise on all consoles at all times	Power Supply (-5V or +12V) failure	Power Supply Test (see Section 10.7)	Replace Power Panel (see Section 10.11)
Ringback, and/or busy signal inoperative on DID trunks	Generator card failure	memicujbs e	Replace Generator card (see Section 10.11)
DID port LED always ON	TELCO problem	Remove bridge clips from port Term on Interface Block. If light extinguishes, it is a TELCO problem.	Contact TELCO
	Trunk card or cable failure	DID Port Test (see Section 10.8)	Replace Trunk card (see Section 10.11) or cable
Loop Start LED illuminates green	Reversed Tip and Ring wires		Reverse Tip and Ring wires at Interface Block

Table 10-4. System 2050 Fault Isolation (continued)

Symptom	Possible Problem Source	Test Procedure	Corrective Action
Call is oc- casionally disconnect- ed when	Key not pressed long enough	fangit o poliquo	Key should be pressed for at least 1/10 second
DIAL/ PATCH key is pressed	Operator Console failure		Replace Operator Console (see Section 10.11)
Call is oc- casionally disconnect-	Double key depression	Source Power Source S	Press key once only
ed when ANSR/ DISC key is pressed	Operator Console failure	- Inspirit	Replace Operator Console (see Section 10.11)
Operator Console external beep-tone not audible	Volume adjustment too low	- maldasi	Increase volume level at the rear of the Operator Console
not addible	Operator Console failure	og ment oshetni bee triple LET is air	Replace Operator Console (see Section 10.11)
Dial tone cannot be broken or TELCO recording	Transmit level adjustment set too low	or I QIO — no three no the section of the section o	
is reached when dialing out from Operator Console	onisi nemi		Revers v pn F

Table 10-4. System 2050 Fault Isolation (continued)

Symptom	Possible Problem Source	Test Procedure	Corrective Action
Music-on- hold	Music source failure	Check music source	Contact music source vendor
inoperative on all incoming calls	Music level adjustment too low	PECIAL FUNCTION &	Increase music level on Generator card
	Generator card failure	by The display shows r	Replace Generator card (see Section 10.11)
Music-on- hold inoperative for some incoming calls only	Trunk card failure	so's Disputy = W X YZ with a lost graph of tool being it spot of the V autput V autput V autput V autput V autput V	Replace Trunk card (see Section 10.11)

10.7 POWER SUPPLY TEST

Use the procedures in the following sections to check the Logic and Battery (48 volts) Power Supplies.

10.7.1 Logic Power Supply

Use the following procedure to observe the output voltages of the Logic Power Supply.

- Press the SPECIAL FUNCTION key on any Operator Console; S.F 0 appears on the display.
- Press the 9 key.
- Press the # key. The display shows information regarding each power supply output as follows:

Operator Console Display = W X YZ where:

W = Power Supply output being displayed:

1 = +5V output

2 = -5V output (not adjustable)

3 = +12V output

4 = -12V output

7 = Internal reference (not adjustable)

Each depression of the # key displays the next output voltage.

X = Direction of voltage deviation:

blank = more positive than nominal voltage
 = more negative than nominal voltage

XY = Percentage of deviation from nominal voltage:

Y = ten's digit

Z = one's digit

For example, WXYZ = 1-38 indicates that the +5V supply is 3.8 percent under nominal voltage (4.81V)

Table 10-5 lists the display number, nominal voltage, and allowable tolerance for each Logic Power Supply output.

Table 10-5.	Logic	Power	Supply	Test	Values
-------------	-------	-------	--------	------	--------

Power Supply Number	Nominal Voltage	Acceptable Tolerance
1	+5V	±5%
2	-5V (not adjustable)	±15%
3	+12V	±10%
at 10 4 1 pc 11	-12V	±12.5%
Section 10.11)	Internal Reference (not adjustable)	±1%

- 4. Cancel the SPECIAL FUNCTION mode by pressing the * key twice.
- If necessary, replace the Power Panel as described in Section 10.11.

10.7.2 BATTERY (48V) POWER SUPPLY TEST

NOTE

TO BE PERFORMED BY TRAINED PERSONNEL

Use the following procedure to measure the output of the Battery (48 volts) Power Supply. If the Operator Consoles are operating correctly, the Battery Power Supply is near 48 volts.

WARNING

To prevent shock and possible injury, avoid contact between 48 volts and wet ground.

- 1. Remove one bridge clip from a DID line (Tip or Ring).
- Using a high impedance voltmeter, measure between Tip and Ring. 45 to 51 volts is acceptable.
- 3. If necessary, replace the Power Panel as described in Section 10.11.
- 4. Re-install the bridge clip after replacement.

10.8 DID PORT TEST

Use the following procedure to verify correct DID port wiring or to isolate a DID port failure.

- At the Interface Block, remove both bridge clips from the DID port to be checked.
- Observe that the port LED on the Trunk card is extinguished. If the LED is illuminated with bridge clips removed, a wiring short or failure of the Trunk card is indicated. First, check the cable with an ohmmeter for shorted wires. If no short exists, replace the Trunk card (see Section 10.11).
- Short the port terminals (Tip and Ring) on the ACD side of the Interface Block (typically the left side of the block) with a piece of wire. By shorting Tip and Ring of the DID port, a call is generated on account 0 and assigned to an Operator Console.
- Observe the corresponding Trunk card port LED.
 - If the LED illuminates red and a call is assigned to an Operator Console, the port wiring is correct and the Trunk card is functioning properly. A telephone line problem is indicated.
 - b. If the LED does NOT illuminate, the port wiring is incorrect or the Trunk card has malfunctioned. Use a voltmeter to verify proper battery polarity (red lead to top terminal, black lead to bottom terminal). The battery voltage should be 48 ± 3 volts. Reverse Tip and Ring wires at the Interface Block if a polarity reversal is indicated. If necessary, replace the Trunk card as described in Section 10.11.
 - If the LED illuminates but a call is not processed and assigned to an Operator Console, replace the Trunk card as described in Section 10.11.
- Remove the shorting wire from the Interface Block and replace the bridge clips when the test is complete.

10.9 LOOP START PORT TEST

NOTE

TO BE PERFORMED BY TRAINED PERSONNEL

Use the following procedure to verify correct Loop Start port operation, installation, or source of Loop Start port failure.

- At the Interface Block, remove both bridge clips from the terminal of the Loop Start line to be checked.
- Connect a line simulator (Siemens Model 282 or equivalent) to the equipment connectors of the Interface Block (Tip on top, Ring on bottom).
- Turn ON the simulator and observe the corresponding Trunk card port LED.
 - a. If the LED blinks yellow (ON two seconds, OFF four seconds), go to step
 4.
 - If the LED remains extinguished, an open cable or Trunk card failure is indicated. Using an ohmmeter, check the port wiring and correct as required. If necessary, replace the Trunk card as described in Section 10.11.
- Press the Operator Console ANSR/DISC key and observe the Trunk card port LED.
 - a. If the LED illuminates red and the tone supplied by the simulator is heard on the Operator Console headset, the Loop Start port wiring is correct and the Trunk card is functioning properly. A telephone line problem is indicated.
 - If the LED illuminates green, the Tip and Ring wires of the Loop Start port are reversed. Reverse the Tip and Ring wires at the Interface Block.
- Remove the line simulator and replace the Interface Block bridge clips when the Loop Start-line malfunction has been corrected.

10.10 OPERATOR CONSOLE TEST

Use the following procedures to check the proper function of the Operator Console(s) and to isolate Operator Console related malfunctions. Operator Consoles are checked one at a time beginning with Operator Console 0. Only the Operator Console being checked may be placed in call rotation (IN/OUT switch to IN position); all other consoles should be out of call rotation (IN/OUT switch to OUT position).

- With the Operator Console IN/OUT switch in the OUT position, observe the corresponding Trunk card port LED.
- If the LED is extinguished, proceed with step 2 of the checkout.
 - If the LED illuminates red, a reversal of the Trunk card cable wires is indicated. Reverse the Trunk card cable wires on the Operator Console RJ-11C block.
 - Press the Operator Console IN/OUT switch to the IN position and observe the corresponding Trunk card port LED.
 - a. If the LED illuminates red, the Operator Console is correctly installed. Proceed to step 3.
 - b. If the LED remains extinguished:
 - (1) Unplug the modular cable.
 - (2) Short G and R terminals on the RJ-11C block.
 - (3) If the Trunk card port LED illuminates red, replace the modular cable, then the power transformer, then the Operator Console to isolate the problem source.
 - (4) If LED is still extinguished, short T and R terminals at the Interface Block.
 - (5) If LED illuminates red, check and, if necessary, repair or replace the cabling between the RJ-11C block and the Interface Block.
 - (6) If LED is still extinguished, check and, if necessary, repair or replace the cable between the Trunk card and the Interface Block.
 - (7) If LED is still extinguished, check and, if necessary, set the Trunk card port switches (refer to Figure 7-8), or replace the Trunk card as described in Section 10.11.

- With the Operator Console IN/OUT switch in the OUT position, observe the console display.
 - a. If OFF is displayed, checkout is complete.
 - b. If OFF is NOT displayed:
 - (1) Check and, if necessary, set the Operator Console Address switch, then Trunk card port switches, then replace the modular cable, then replace the Operator Console to isolate the problem source.
 - (2) If OFF is still NOT displayed, measure the voltage between Y and B terminals of the RJ-11C block.
 - (3) If 0 volts is measured, replace the modular cable, then replace the Operator Console to isolate the problem source.
 - (4) If 5 volts is measured, check and, if necessary, repair or replace the open cable between the RJ-11C block and the ACD, then, if necessary, replace the Generator card as described in Section 10.11.
 - (5) If 0.7 volt is measured, reverse Y and B terminals of the RJ-11C block, then, if necessary, replace the Generator card as described in Section 10.11.

10.11 REMOVAL/REPLACEMENT PROCEDURES

This section provides the Removal/Replacement procedures for the major assemblies of the System 2050.

Please note and follow these guidelines:

- When removing cables from their connections, if there is more than one cable, always remember to mark the location of the cables.
- When replacing cables, insert into connectors carefully. Most cable connectors are keyed and can only be inserted one way, so if a cable is turned upside down it will not go into the connector. The same comment applies to the power cable connectors.
- When removing a circuit card it is a good idea to write down the slot location the card was removed from.
- Always remember to handle circuit card's carefully and do not lay them on top
 of each other as components, jumper wires, and switch settings can be
 loosened and cause a malfunction of the card.
- It is important to remember to turn OFF the Power Breaker switch when removing and replacing the Power Panel. Failure to do so could result in personal electrical shock.
- Always unplug the AC power cord before opening the ACD cabinet rear panel. Failure to do so could result in personal electrical shock. Hazardous voltages exist within the cabinet.

WARNING

Hazardous voltage and current levels are present within this system. To avoid risks of electric shock or fire, only qualified technical persons should attempt these procedures.

10.11.1 Circuit Cards

Use the following procedure to remove and replace an ACD circuit card.

REMOVAL

- Remove the front panel of the ACD.
- Set the Logic Power switch to the OFF position. This switch is located at the front (lower right) of the card cage. It is NOT recommended to turn OFF the ACD Power Breaker switch.
- For Trunk cards, remove and, if necessary, mark the cable connected to the Trunk card.
- 4. Pull both card ejector levers outward.

REPLACEMENT

- Set all Address and Configuration switches present on the replacement card to the correct positions.
- 2. For the Generator card, install shorting clip E7 if required.
- Insert the circuit card in the correct card cage slot.
- Seat the circuit card edge connector in the backplane by pressing firmly on the card ejector levers.
- For a Trunk card, reconnect the cable.
- 6. Set the Logic Power switch to the ON position.
- Set the Toggle switch on the Generator card to the UP position. When the yellow LED starts blinking, flip the Toggle switch to the DOWN position.

10.11.2 Power Panel

Use the following procedure to remove and replace the Power Panel.

REMOVAL

WARNING

The Power Breaker switch located on the back of the cabinet must be turned OFF and the AC power cord must be unplugged from the AC outlet before removing the Power Panel. Hazardous voltages exist within the ACD cabinet. Failure to unplug the AC power cord can result in serious personal electrical shock.

CAUTION

The Power Panel weighs approximately 25 pounds. When removing, it may become awkward to handle. Be careful not to drop the panel, as possible damage may occur to the power supplies.

- Turn OFF the Power Breaker switch and disconnect the AC power cord.
- Remove the two phillips-head screws, lock washers, and washers from rear cabinet panel.
- Pull Power Panel in downward position and let rest on cabinet panel restraint cord.
- Disconnect power interconnect (12-pin connector) cable on left side of panel by squeezing together the two latches on the connector shell and pulling on the connectors.
- Disconnect power harness (left and right) from the backplane noting location of connectors.
- Disconnect ground wire on left side of cabinet frame by removing phillips-head screw, lockwasher, and washer.

- Unclip door restraint cord on left side of Power Panel. Be sure to support the Power Panel when unclipping the door restraint cord.
- Pull back on one of the spring latches to release Power Panel from cabinet frame. Slide away from cabinet and second spring latch will release from cabinet frame.
- Remove Power Panel from cabinet.

REPLACEMENT

- Replace Power Panel by sliding into cabinet frame and pulling back on one of the spring latches. Allow latches to snap into place.
- Clip door restraint cord back into place. Let Power Panel rest on door restraint cord.
- Reconnect ground wire and replace phillips-head screw, lock washer, and washer and screw down tight.
- Reconnect power harness (left and right) to the backplane.
- Reconnect power interconnect (12-pin connector) cable on left side of panel by pressing firmly until fully seated.
- 6. Close Power Panel by pressing firmly on panel until fully seated.
- Replace the two phillips-head screws, lockwashers, and washers and screw down tight.
- Replace AC power cord and turn ON Power Breaker switch.

10.11.3 Operator Console

Use the following procedure to remove and replace an Operator Console.

REMOVAL

- Disconnect the headset from the Operator Console.
- Disconnect the power transformer cable connector from the Operator Console.
- 3. Disconnect the modular cable connector from the Operator Console.

REPLACEMENT

- Use a small screwdriver to set the Operator Console Address switch to the correct position.
- Set the external beeper (buzzer) Volume control to the maximum position (turn clockwise toward the modular cable).
- 3. Make sure the power transformer is plugged into the AC outlet.
- Connect the power transformer cable connector to the jack in the Operator Console.
- Connect the modular cable connector (from the RJ-11C Connector Block) to the Operator Console.
- Connect the headset to the Operator Console.

SUPPLIERS LIST

HEADSETS:

Type:

PLANTRONICS-STARSET

Supplier:

PLANTRONICS 345 Encinal St.

Santa Cruz, CA 95060

Phone:

In California - 800-662-3902

Outside California - 800-538-0748

Model:

Starset II Series: HS0307-4C

Supra Series Model HS0555-4C (This headset does not reproduce the

operator beeps)

There are also two models that are specially built. They have a 10-foot

cord and quick disconnect feature. Starset II Series: SHS1217-01/02

Type:

DANAVOX

Supplier:

PHONE SOLUTIONS

17662 Irvine Blvd., #7 Tustin, CA 92680

Phone:

714-525-3020

Outside California - 800-742-0800

Products:

Headsets

Type:

TELECTRET

Supplier:

ANIXTER

2220 S. Ritchey St.

ACS COMMUNICATIONS

250 Technology Circle

Santa Ana, CA 92705

Scotts Valley, CA 95066-3575

Outside California - 800-538-0742

714-556-4600 or

In California - 408-438-3883

213-589-5035

Models:

Phone:

All Models have the quick disconnect feature.

Type:

EARBORNE

Supplier:

STARKEY

6700 Washington Ave. South Eden Prairie, MN 55344

Phone:

800-328-8602

Model:

One Model with custom-molded ear piece.

OTHER EQUIPMENT:

Supplier:

PHONE SOLUTIONS

17662 Irvine Blvd. #7

Tustin, CA 92680

Phone:

714-525-3020

Products:

Training Jacks, Selector Switch, Modified Handsets*, Test Sets, etc.

STATIC ELECTRICITY PRODUCTS:

Type:

STATICIDE

Supplier:

ACL INC.

1960 E. Devon Ave.

Elk Grove Village, IL 60007

Phone:

800-782-8420

Supplier:

GOLDEN STAR, INC.

400 E. 10th Ave.

North Kansas City, MO 64116

Phone:

800-821-2792

Supplier:

INMAC

Corporate Office: 2465 Augustine Dr. Santa Clara, CA 95054

Sales Offices in most major cities.

^{*}Handsets must be modified to work with StarTel.

ATTACHMENT

Technical Specifications for Reverse Battery Talk Paths when using StarTel Call Distributor Unit with StarTel Electronic Concentrators.

Overview:

This specification describes the electrical requirements of a channel for communicating between the StarTel Call Distributor Unit (Series 1000) and the StarTel Concentrator (Series 4000). The channel is a two wire (Tip and Ring) pair. This pair is commonly called a Talk Path.

Definitions:

The NEAR END equipment is the CONCENTRATOR.

The FAR END equipment is the CALL DISTRIBUTOR UNIT.

Description:

STARTEL CONCENTRATOR - The near end provides loop seizure and dial pulsing. The near end recognizes loop current and battery reversal from the far end.

MFR:

StarTel Corporation

Model #: Series 4000

17661 Cowan

FCC Reg #: CJP-79M-13271-CT-E

Irvine, CA 92714

Ringer Equiv: 0.1A

STARTEL CALL DISTRIBUTOR - The far end registers the dial pulses sent by the near end. The far end also provides balanced battery feed, and battery reversal to signal to the near end the talking state. Normal battery indicates to the near end that the channel is idle.

MFR:

StarTel Corporation

Model #: Series 1000

17661 Cowan

FCC Reg #: CJP-79M-11726-CD-E

Irvine, CA 92714

Electrical Characteristics: Maximum DC Loop Resistance: 2000 ohms Maximum AC Loop Loss (dBm @ 600 ohms):

(with active gain)......3.5 dBm (without gain)...... 4.0 dBm

DC Loop Current:

Near end

Far end

minimum

15mA

15mA

maximum

40mA

80mA

Near end tip to ring voltage:

maximum

±105V

Far end battery voltage (open circuit):

minimum

-47V

maximum

-54V

Far end battery feed resistance: 600 ohms Near end DC Termination resistance: 350 ohms

USOC: 1LJJY

FIC: OL13C

Suggested Carrier: DPO at NEAR end

Interfaces: DPT at FAR end

Metallic: LSE or LSO units (must repeat battery reversal)

MFT hybrid amplifiers

ATTACHMENT

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Α

- Answer Phrase The actual words the operator is instructed to use when answering a client's line, typically the name of a business or residence.
- Automatic Call Distribution (ACD) A computerized telephone system function which routes calls to available operators. Automatic Call Distribution systems can handle call routing based on any number of priorities.

В

Beeps - The audible tones which signal to an operator that calls be being assigned. There are two kinds of beeps on the System 2050, a headset beep and an external beep on the Operator Console.

C

- Call Control Keys The four keys on the Operator Console which control operator actions. They are: IN/OUT (green), PATCH/DIAL (blue), ANSR/DISC (red), and HOLD/SPFCN (yellow).
- Call Diverter A piece of equipment which redirects calls from one telephone number to another prearranged telephone number. It is used when call forwarding is not available through your central office. The equipment is designed so that when incoming calls are received on the line, they are automatically patched (via a second line) to another telephone number which is programmed by the customer.
- Call Forwarder A piece of equipment used in conjunction with telephone call forwarding. It automatically enables or disables call forwarding via the activities of a single ON/OFF switch.
- Call Forwarding A custom calling feature offered by a local telephone company in areas where there is an electronic switching system (ESS) central office. Incoming calls are rerouted in the central office to ring another location according to instructions from the customer. The customer sends these instructions to the central office by dialing in a code on his/her telephone keypad and then entering the telephone number to which his calls are being redirected.
- Call Hold Duration An automatic feature of the StarTel ACD. It is the predetermined time a call is held at an operator station. After this period of time, the call will be reassigned to another available operator if the call is still on hold.

- Call Identifier A general term for all automatic telephone equipment that displays a number which individually identifies the client to the operator.
- Call Rotation A feature of the StarTel ACD by which calls are reassigned to another operator if the original operator does not answer within a preset period of time. On the System 2050, the time is 15 seconds.
- Call Waiting Indicator The status indicator light on the Operator Console which signifies that a call has been placed in system hold and is waiting for an available operator.
- Central Office The place where customer lines terminate and the switching equipment which interconnects those lines is located. Also referred to as an exchange, end office, local central office, TELCO, or wire center.
- Check-In Line Loop Start lines are normally used as check-in lines. These lines are used for clients to call in to obtain messages or for general information calls to the answering service.
- Client/Customer A person who employs the use of the telephone answering service (TAS).
- Client Identification (ID) Number The two, three, or four digit number which displays on the Operator Console and individually identifies the call to the operator.
- Concentrator A switching device which acts like a funnel: a large number of customers are hardwired to the concentrator which funnels incoming calls over a small number of trunks, and carries the calls to the TAS bureau to be answered.
- Conference Call A conference call is a call involving three or more parties all talking on the same line. It is arranged via the PATCH/HOLD key.
- CPE (Customer Premises Equipment) Term used by the local telephone company to designate equipment at the user's location. CPE may be either privately owned or the property of TELCO. The System 2050 is CPE.
- CPU (Central Processing Unit) Card The circuit card with white plastic tabs located in slot 8 of the ACD. If performs the data processing function of the system. It is the central "brain" which controls the flow of information through the system.
- Cross Connect/CCX To connect a call to another party (same as patch).

GLOSSARY 91-1025-000

CRT (Cathode Ray Tube) - An electronic vacuum tube, such as a television picture tube, that can be used to display images. The display used on a computer terminal is a CRT.

Cutover - The physical changing of lines from one system to another (usually at the time of a new system installation).

D

- Dedicated Power Line An electrical circuit used exclusively for one piece of equipment.
- Demarcation The dividing point (mark) between the telephone company network and the customer premises equipment.
- Dial Tone A 90Hz (Hertz) signal (the difference between 350 Hz and 440 Hz) sent to an operator or subscriber indicating that the receiving end is ready to receive dial pulses.
- DID (Direct Inward Dial) A capability offered by an electronic switching system (ESS) and some crossbar central offices. It consists of one or more DID trunks in a rotary and blocks of sequential telephone numbers. A client can then forward all their calls to one of these DID numbers.

F

- FCC Registration A number provided by the Federal Communication Commission indicating that a particular company has complied with required registration regulations covering the direct connection of the equipment. This indicates it meets technical standards developed by the FCC. The System 2050 FCC Registration number is CJP79M-11726-CD-E.
- Firmware Firmware has characteristics of both hardware and software. Usually, it is a set of software instructions encoded onto a physical device known as a "chip". This chip is then placed on a computer card where it will control the sequencing of computer circuits.

G

Generator Card - The circuit card with red plastic tabs located in slot 18 of the ACD. It produces the tones including the headset beep, the line ringing, and the busy signal. It also holds the system configuration.

Н

- Handset That portion of the telephone containing the transmitter and receiver which is handled when the telephone is used.
- Hardware The physical components of a system including all it's mechanical and electrical parts.
- Headset An operator's telephone set which consists of a telephone transmitter, a receiver, cord, and plug designed to leave the operator's hand free.
- Hold A situation where a call which has been answered is placed in queue so that it is still in the system although not connected to an operator or another party.

I

- Interconnect Company An organization which supplies telephone equipment by sale, rental or leasing other than the serving telephone company.
- Input/Output (I/O) Card The circuit card with red and black plastic tabs located in slot 14 of the ACD of the System 2050 which provides for easy connection to the Operator Consoles and TELCO lines.

K

Keypad - The 10 numeric keys and two symbol keys found on the Operator Console.

J

Jack Connector - This is where the operator connects to the Operator Console and it is similar to a jack on a PBX switchboard. There are also jack connectors for the Operator Console modular cord plugs on the I/O card which are used when installing the equipment.

L

LED (Light Emitting Diode) - An electronic "lamp" with almost infinite life. On the System 2050 there are LED lights on the Trunk card and the Generator card. The LEDs on the Trunk card indicate if a particular port is in use. The LEDs on the Generator card indicate if the power supplies are functioning correctly and if the configuration memory is enabled.

Line - Same as port or trunk.

- Logic Power Switch The ON/OFF power switch found on the inside of the ACD cabinet. On the System 2050 it does NOT effect the 48V supply, however, it is used for powering the DID trunks. This will prevent the telephone company from turning off the DID trunks if power is switched off at the ACD.
- Loop Start A Loop Start line is a regular telephone line like those used in residential telephones. Used for incoming and outgoing calls. A Loop Start line is a standard two-wire circuit. When the circuit is put in an offhook state, a loop is created. The circuit, when activated, is supplied with dial tone and is ready for anyone to make a call.

M

- Marked Down This means that TELCO has placed this line in an inactive state. On DID trunks this would be a result of not seeing battery on the line.
- Mute Indicator The status indicator light on the Operator Console which signifies that an operator is in call rotation but is not connected to a call. The operator is currently available for calls. Also referred to as a non-talk state.

Ν

New Call Indicator - The status indicator light on the Operator Console signifies if a call at the console is new or out of a hold condition.

0

Operator Console - The small rectangular box which contains the telephone keypad and the four function keys which control operator actions. The Operator Console also includes the operator jack connector, volume controls, and display.

Р

- Patch Hold Same as station hold. This is the hold function used when patching calls.
- Patch Indicator The status indicator light on the Operator Console which signifies if there is a call being patched.
- Patching To cross-connect a call (to connect a call to another line), either incoming or outgoing.
- Port These are the points of connection on the Trunk card. Each port can be configured as a DID trunk, a Loop Start line, or an Operator Console. This allows the different lines to interface.
- Primary Hold The primary hold call is the first call an idle operator receives and places on hold. It stays with the operator for 30 seconds before it goes into system hold.
- Power Supplies These are the various circuits which convert the AC power to DC power. They provide the electrical energy necessary to operate the System 2050. The voltage they generate is generally measured in units called volts.

Q

Queue - A queue is a holding device which, on the StarTel system, holds calls not being answered on a first in, first out basis, i.e., New Call queue, System Hold queue, Primary Hold queue.

R

- Ringer Equivalency A number assigned by the FCC to indicate the load presented by the equipment to the TELCO when a telephone line is ringing.
- RJ-21X See TELCO Interface Block.

S

- Secretarial Line An extension of the TAS bureau customer's business or residence lines bridged at the central office and extended to a telephone answering service either directly or through concentrator equipment. Sometimes called intercept, off-premises, or extension lines.
- Station Hold One of the hold features of the StarTel system. Since it is used in patching calls, it is also called "patch hold". When a call is placed on station hold it stays at that operator station indefinitely. Only one call can be placed on station hold at a time. Station hold should be used with discretion since it defeats some of the advantages of call rotation.
- Status Indicator Lights The four lights on the Operator Console display which designate the condition of calls. The four specific indicators are mute, new, patch, and call waiting. For further information on these indicators refer to the individual definitions listed.
- System Hold A call which has been placed in system hold will be assigned to the first available operator or if no operators are idle, it will beep the longest busy operator. If that operator does not respond to the call, it will be assigned to the first available operator.

Т

- Talk Path A talk path is a telephone line or cable by which a call is sent from a concentrator to the ACD.
- TELCO Another term used for the telephone company.
- TELCO Interface Block The telephone company demarcation connector or RJ-21X. The left side of the device contains telephone company wiring for the lines and the right side of the device is wired for the CPE lines. On the System 2050, the right side of the device contains a plug connector for a cable which is connected to the system. The cable is pre-wired at StarTel for the configuration of the equipment lines.
- Trunk A telephone circuit or channel connecting two switching systems, i.e., between a telephone company central office and a TAS computerized answering system.
- Trunk Card The circuit card with black plastic tabs located in slot 11 of the ACD. This card contains the points or channels for the telephone lines and Operator Consoles. A total of eight ports are provided.

ν

Volume Controls - The dials which are located on the left side of the Operator Console. These dials increase or decrease the earpiece and microphone volume for the operator.

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IMPORTANT NOTICE!!!

Before you connect or disconnect this instrument from any telephone lines, it is your responsibility to call your local telephone company and inform them that you intend to do so. At that time you should provide them the following information:

- The telephone number(s) of the loop start telephone lines this instrument connects to as well as the DID Trunk Designators.
- The FCC REGISTRATION and RINGER EQUIVALENCE numbers as they are shown on the label located on the rear panel of the controller cabinet.

Should this equipment cause harm to the telephone network, the telephone company shall, where practicable, notify the customer that temporary discontinuance of service may be required; however, where prior notice is not practicable, the telephone company may temporarily discontinue service forthwith, if such action is reasonable in the circumstances.

The telephone company may make changes in its communications facilities, equipment operations, or procedures where such action is reasonably required in the operation of its business and is not inconsistent with the rules and regulations of the Federal Communications Commission.

DO NOT ATTEMPT TO REPAIR OR MODIFY THIS EQUIPMENT, EXCEPT AS INDICATED IN THE MAINTENANCE SECTION OF THIS MANUAL. THIS EQUIPMENT SHOULD NOT BE USED ON PARTY LINES OR COIN TELEPHONE LINES.

If trouble is experienced, disconnect this equipment from the telephone line to determine if it is causing the malfunction. If equipment is determined to be malfunctioning, its use shall be discontinued until the problem has been corrected.

FCC Registration Number:

Ringer Equivalence Number:

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SECTION I

INTRODUCTION

1.1 GENERAL

This manual will give you the information necessary for you to install, operate, and maintain the StarTel Video Display Option for the Series 1000 Automatic Call Distribution Systems. It is recommended that you review this manual thoroughly before attempting to install, troubleshoot, or repair the Video Display Option.

This section will give you a physical and functional description of the Video Display Option and it's assemblies. Also included for your information are performance, environmental, and physical specifications in table format.

1.2 PHYSICAL DESCRIPTION

The Video Display Option, as shown in Figures 1-1 and 1-2, consists of the following assemblies: from one to four Video Display Terminals (VDTs), one keyboard, one Identification (ID) Module card, up to four modular cables/modular adapters and on upgraded systems, a replacement Central Processing Unit (CPU) card with new firmware. An optional Copy Feature is available to back up client information. An optional Printer is available to print client information for record keeping purposes. An optional Client Account Expansion Feature, which will not be discussed in this manual, is available for the System 2200+ to add an additional 400 client accounts.

1.3 FUNCTIONAL DESCRIPTION

The following sections will provide you with a functional description of the Video Display Option and it's assemblies. The block diagram in Figure 1-3 will illustrate to you the functional relationship among the assemblies of the Video Display Option.

1.3.1 Video Display Terminal

The Video Display Terminal (VDT) is a stand alone terminal with a detached keyboard. The VDT's main function is to display incoming calls with the client answer phrase. The main purpose of the keyboard is to input client answer phrases and special client information into the system. Each VDT has its own modular cable/adapter which plugs into the ID Module card.

The Video Display Option will support up to four operator positions with the ability to handle 400 client accounts.

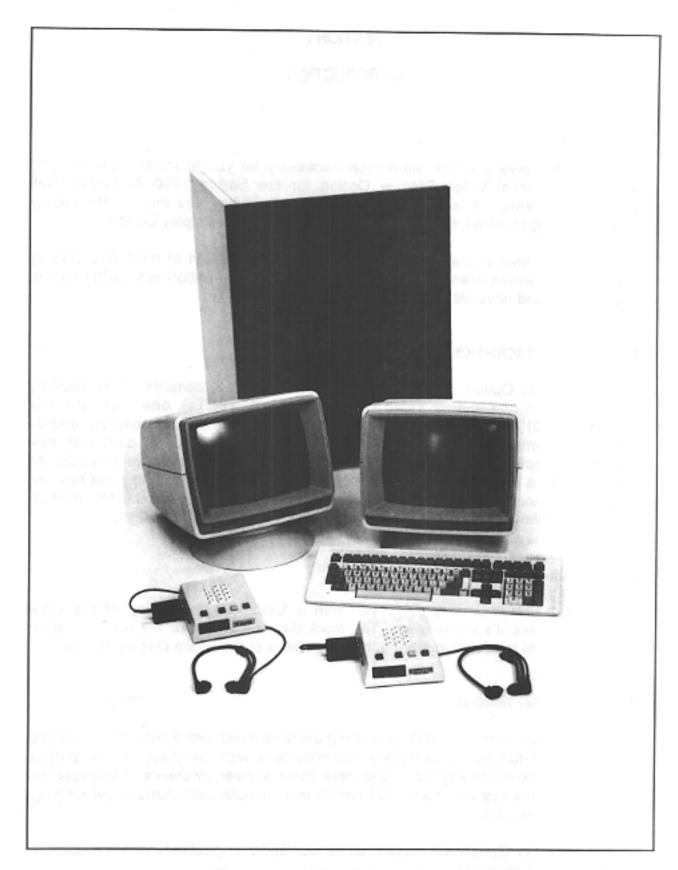


Figure 1-1. Video Display Option

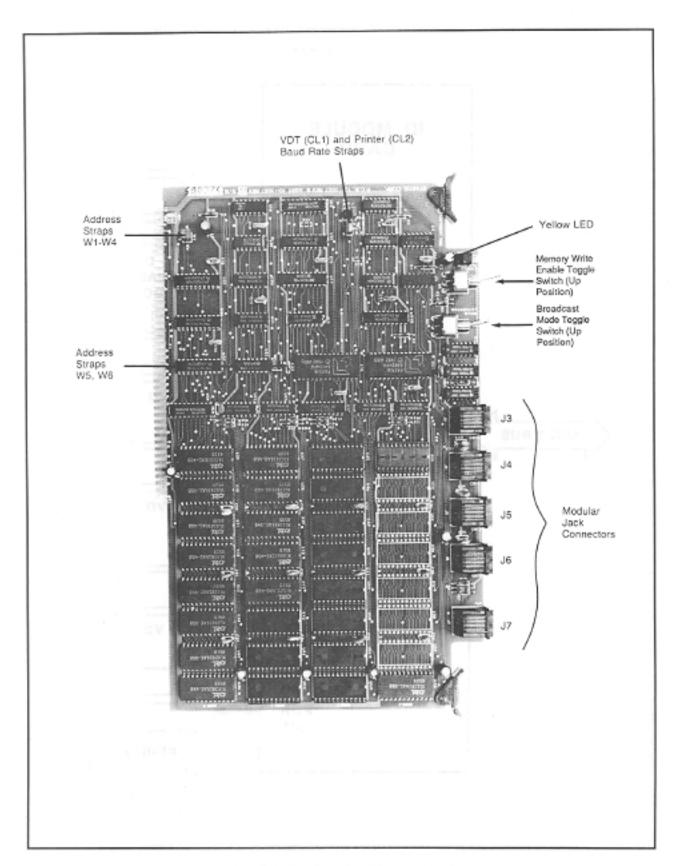


Figure 1-2. ID Module Card

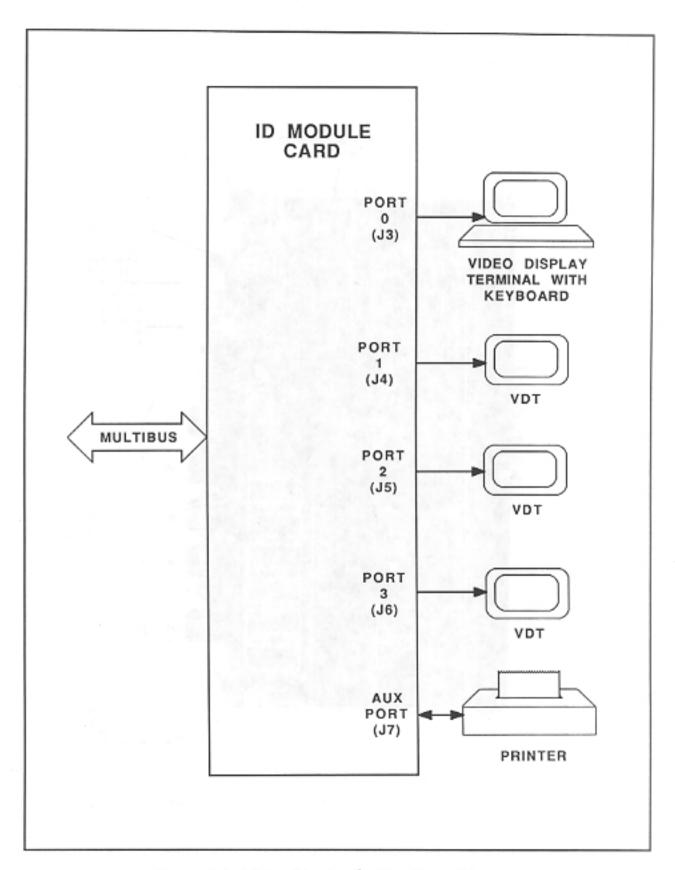


Figure 1-3. Video Display Option Block Diagram

1.3.2 ID Module Card

The ID Module card is a general purpose Multibus™ Controller with up to 65 KBytes of non-volatile memory. It provides an RS-232C serial port which connects the VDTs via the modular cables to the system. There is also an available port to connect an optional printer.

Contained on the ID Module card are two Toggle switches; a Memory Write Enable switch and a Broadcast Mode switch. A yellow indicator LED is illuminated when the memory is enabled for writing/changing information.

In addition, ID Module Address straps and Baud Rate straps are provided. These straps are factory set and should not be changed unless it is so instructed in Section II of this manual.

1.3.3 Optional Copy Feature

The Copy Feature is implemented with a spare ID Module card. This feature allows client information to be backed up and saved for future use should a hardware failure occur to minimize system downtime.

1.3.4 Optional Printer

The Printer is a high performance, dot-matrix impact printer. It is equipped with a serial interface, and offers forms control and bidirectional printing.

The Printer features 150 characters per second (cps), 10 or 12 characters per inch (cpi), double-width and compressed print, and 6 or 8 lines per inch (lpi). It can print on continuous fan-fold paper with up to two copies.

1.4 SPECIFICATIONS

Table 1-1 gives you complete specifications for the Video Display Option and it's assemblies.

Table 1-1. Video Display Option Specifications

Parameters	Characteristics
VDT TERMINAL	
	Brigget Control and a mineral subject of the Collage of the Collag
VDT Screen	12 inch (30.5 cm) diagonal; green phosphor with non-glare surface (Amber optional). Optional 14 inch (35.6 cm) display with green or amber phosphor with non-glare screen.
Display Area	8.25" W (21 cm) x 5.75" H (14.6 cm)
VDT Console	Tilt and Swivel mechanism with positive detents. 360 degrees swivel capacity tilt 5 degrees forward to 15 degrees back of vertical. Removable base.
Horizontal Refresh Rate	17.7 kHz
Vertical Refresh Rate	50 Hz or 60 Hz, selectable, depending on line frequency
Display Formats	24 lines of data 80 characters wide can b displayed
Display Page Density	1920 characters
Character Field	8 x 11 dot matrix
Character Matrix	7 x 10 dot matrix with descenders
Cursor	8 x 11 steady or blinking block or underline; can be turned OFF or ON
Character Sets	128 displayable characters including control codes. Optional international character sets available

Table 1-1. Video Display Option Specifications (continued)

Parameters	Detached, low-profile, DIN standard with six-foot coiled cord. Sculptured keys, selectric-type layout. Calculator format numeric keypad. Two tone keycaps, by function; rib dividers to separate three major groupings of keys. 11 degree keyboard tilt mechanism. Keys are autorepeating (15 cps). 32 character keystroke buffer.	
Keyboard		
Primary Port	RS-232C, serial asynchronous ASCII communications	
Auxiliary Port	RS-232C with page print, line print, display and print and transparent print	
Data Rates	300, 600, 1200, 4800, 9600, and 19200 Baud	
Operating Environment	MODUCE CARD	
Temperature	41°F to 104°F (5°C to 40°C)	
Humidity	10% to 85% non-condensing	
Power Requirements	115 VAC ± 10%, 50/60 Hz (230 VAC ± 10%, 50/60 Hz optional) 50 Watts	
Physical Dimensions	or tor	
Weight	34 pounds	
Height, Depth, Width	see drawing	
	nt (8.5 t) dusty	

Table 1-1. Video Display Option Specifications (continued)

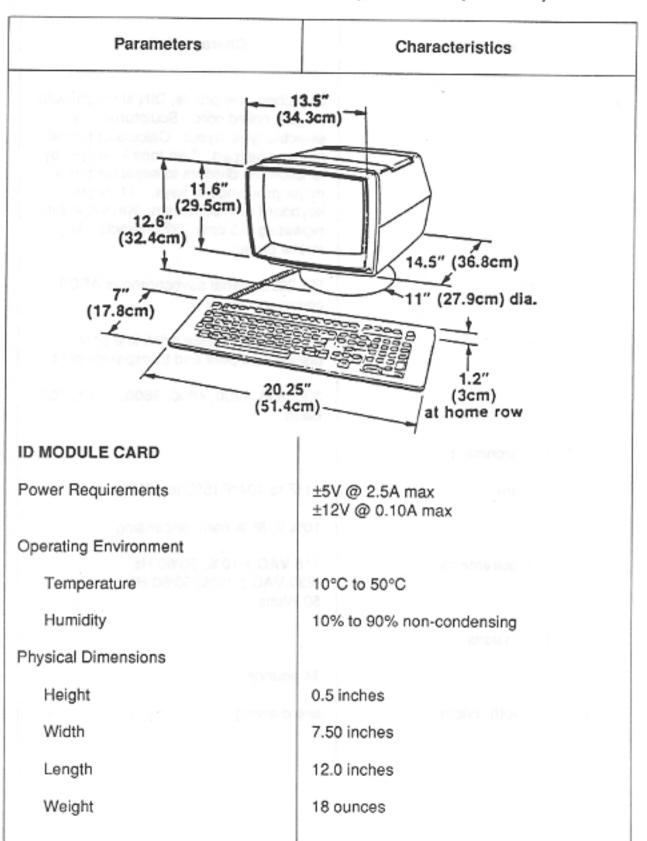


Table 1-1. Video Display Option Specifications (continued)

Parameters	Characteristics
PRINTER	memopoly 15-on mag()
Print Speed	Up to 150 characters per seconds (cps)
Characters Per Inch (cpi)	10 cpi and 12 cpi 16.7 cpi (compressed) 5, 6, and 8.33 cpi (double-wide)
Characters Per Line	66 char. at 8.33 cpi
Line Length	Full line at 10, 12, or 16.7 cpi requires 8 inches
Lines Per Inch (Ipi)	6 lpi or 8 lpi
Paper Drives	Friction - roller or tractor
Paper Width	3 inches to 10 inches
Paper Type	Sheet, roll, or fanfold (single or original and up to 2 copies)
Paper Weight	Single part - 15 lbs.
	Original and up to 2 copies - 12 lbs.
Power Requirements	
Voltage	90-132 VAC, 47/63 Hz, single phase or 187-264 VAC, 47/63 Hz, single phase
Input	100 watts max.

Table 1-1. Video Display Option Specifications (continued)

Parameters	Characteristics	
Operating Environment		
Temperature	41°F to 104°F (5°C to 40°C)	
Relative Humidity	10% to 90% non-condensing	
Physical Dimensions	91	
Height	5.0 inches (127mm)	
Width	16.2 inches (412mm)	
Depth	13.0 inches (330mm)	
Weight		

SECTION II

INSTALLATION

2.1 GENERAL

This section will give you complete installation instructions for the Video Display Option and its optional features.

2.2 UNPACKING AND INSPECTION

Before unpacking, each shipping container should be inspected for signs of mishandling that may indicate damage to the contents. Take note of any container damage and save the containers to support any claims to the carrier. If damage to the contents of the container is found, make note of the damage and contact the shipper so claim action can be initiated.

All shipping materials and containers should be saved for future reshipping. The contents of each container should be compared to the packing list to ensure all listed items are received. Any discrepancies should be reported immediately to StarTel.

2.3 INSTALLATION OF VIDEO DISPLAY OPTION

To install the Video Display Option into the Series 1000 Automatic Call Distribution Systems, proceed as follows:

2.3.1 Installation of VDT(s)

NOTE

Depending on the type of Video Display Option you purchased, you may have from one to four VDTs. However, only one keyboard is supplied (supported). This keyboard is connected to the VDT which will become the Main System VDT and must be connected to connector J3 on the ID Module card.

The keyboard can be connected to any of the other VDTs to perform VDT configuration procedures.

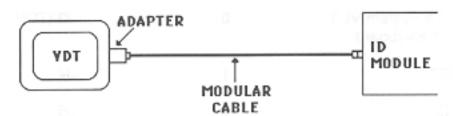
- Place the VDT(s) on the operator work station(s).
- Plug the AC power cord(s) into the wall outlet(s).
- 3. The VDT(s) must now be configured. Plug the keyboard cable plug into the connector marked KEYBOARD on the back of the VDT and perform the following VDT configuration procedure. If you have more than one VDT, you must perform the same procedure on each VDT until all the VDTs have been configured. Proceed as follows:

Press the SHIFT key, the CTRL key, and the SET UP STATUS key simultaneously. In the lower left corner, CLK N Y will appear on the VDT screen. To go through this test, use the UP ARROW on the keyboard as a Return key. Use the LEFT and RIGHT ARROWS to move forward or backward. The bold letters indicate the position the cursor should be in before pressing the UP ARROW. An or means doesn't matter which selection is made.

CLK N or Y BIT8 0 1 PTY EV OD BPS 9600 HNDSHK NO HDX FDX CNV BLK NEWLN N Y WRAP Y N PG CNFG 2PG ONLN LOCL HORZ SCRL LN PG SMOOTH SCRL N Y SCRN SAVE N Y CRSR BLK UND CRSR BLINK N Y STS NRM BLANK

When you are finished, CLK N Y will appear on the VDT screen. Press CTRL + S simultaneously, the VDT screen will prompt: Wait. The VDT screen will again display CLK N Y. Press the SET UP STATUS key to exit back to the VDT display screen.

 After the VDT(s) has been configured, unplug the keyboard and continue to step 5. Plug the Modular Adapter(s) into the Modem port(s) on the back of the VDT(s) as shown below. (This adapter can only be plugged in one way.)



- Using a small screwdriver, screw in the two screws on the Modular Adapter(s) until they are tight.
- Plug the keyboard cable plug into the connector marked KEYBOARD at the back of the Main System VDT.
- Plug the Modular Cable(s) into the adapter(s). Now continue to Section 2.3.2, Installation of Cards.

2.3.2 Installation of Cards



The **Logic Power** switch, which is located inside the front panel of the cabinet, **must** be in the **OFF** (down) position before installation of the cards. Cards should be handled as delicately as possible. Avoid handling component circuitry on the cards in high static environments.

- 1. Set the Logic Power switch to the OFF (down) position.
- Insert the ID Module card into card cage slot 15 of the system cabinet making sure that the card ejector levers are in the outward position.
- Seat the ID Module card edge connector into the backplane by pressing firmly on the card ejector levers.
- Now plug the other end of the Modular Cable(s), which you already attached
 to the VDT(s), into its assigned port on the edge of the ID Module card (refer
 to Figure 1-2 for location) as shown below.

	Operator Conso Address Setting	
Main System VDT with Keyboard	0 93	J3 (TOP)
VDT 2	1	J4
VDT 3	2	J5
VDT 4	3	J6
Optional Equip.		J7 (BOTTOM)

NOTE

The VDT(s) must be placed next to the Operator Console(s) as shown in the table above. To determine the Operator Console Address, simply look at the rotary switch setting at the rear of the Operator Console.

If this is an upgraded system, then continue with the following steps, otherwise, set the Logic Power switch to the ON (up) position and reset the system with the Reset switch on the Generator card.

If the system is upgraded, then perform the following steps.

 Remove the existing CPU card from card cage slot 8 by pulling out on the card ejector levers and sliding the card out of the system cabinet.

NOTE

The existing CPU card must be returned to StarTel Corporation within 10 days to avoid being invoiced. Please package this CPU card in the container received with the new CPU card. It is your responsibility to return the CPU card to StarTel in working order.

Insert the new CPU card into card cage slot 8 of the system cabinet making sure that the card ejector levers are in the outward position.

- Seat the CPU card edge connector into the backplane by pressing firmly on the card ejector levers.
- Set the Logic Power switch to the ON (up) position and reset the system with the Reset switch on the Generator card.

Installation is now complete. Next you will need to enter the client information into the system memory using the Main System VDT (see Section III, Operation).

2.4 INSTALLATION OF OPTIONAL COPY FEATURE

All client information **must** be entered on the ID Module card before you install the Copy Feature. In this section the ID Module card will be referred to as the **primary** ID Module card and the Copy Feature ID Module card will be referred to as the **spare** ID Module card.



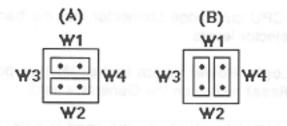
The cards should be handled as delicately as possible. Avoid handling component circuitry on the cards in high static environments. Keep the card container box for use in storing the spare ID Module card.

To perform this procedure, three requirements must first be met. They are:

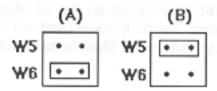
- Configure the spare ID Module card with the alternate address straps (blue jumpers).
- Check to see that the VDT baud rate strap (blue jumpers) settings on both the primary and spare ID Module cards match.
- Check that the Memory Write Enable Toggle switch on the spare ID Module card is in the UP position (refer to Section 3.2.1).

To install the Copy Feature, proceed as follows:

- To configure the spare ID Module card to the alternate address straps (blue jumpers), proceed as follows:
 - a. Remove the blue jumpers (A) from jumper prongs W1 and W2 (refer to Figure 1-2 for location) and place the blue jumpers (B) on jumper prongs W3 and W4 as shown below.



b. Remove the blue jumper (A) from jumper prongs W6 (refer to Figure 1-2 for location) and place the blue jumper (B) on jumper prongs W5 as shown below.



- To configure the spare ID Module card to the correct VDT baud rate setting (blue jumper), proceed as follows:
 - a. Check the jumper setting at location CL1 (refer to Figure 1-2 for location).
 The jumper setting should be set at 9.6.
 - If the jumper setting is not set at 9.6, then remove the blue jumper from the jumper prongs and place on the correct setting of 9.6 as shown below.



- 3. Set the Logic Power switch to the OFF (down) position.
- Insert the spare ID Module card into card cage slot 14 or 16 (it should be inserted next to the primary ID Module card) making sure that the card ejector levers are in the outward position.
- Seat the spare ID Module card edge connectors into the backplane by pressing firmly on the card ejector levers.
- Set the Logic Power switch to the ON (up) position and reset the system with the Reset switch on the Generator card.

- Set the Memory Write Enable Toggle switch to the UP position on the spare ID Module card. The Memory Write Enable Toggle switch on the primary ID Module card should be in the DOWN (protected) position (refer to Section 3.2.1).
- The system will now accept a Copy Request command (^C) from the Main System VDT (refer to Section 3.1.7).

This procedure will take approximately 50 minutes (maximum) depending on how many changes have been made since the last backup in the system. Upon completion of this procedure, the system will report **DONE** or an error count, if errors are encountered. Error reporting has the format of **Exxx**, where **xxx** equals the number of bytes unsuccessfully copied.

When the Copy Request procedure is completed, confirm that the information was copied correctly by performing the following procedure.

- Remove the spare ID Module card from the card cage slot which it was inserted into by pulling out on the card ejector levers and sliding the card out of the system cabinet.
- Remove the blue jumpers from jumper prongs W3 and W4 and replace the blue jumpers back onto jumper prongs W1 and W2.
- Remove the blue jumper from jumper prongs W5 and replace the blue jumper back onto jumper prongs W6. If no errors were encountered, proceed to step 10. If errors were encountered, continue with step 4.
- Unseat the primary ID Module card from the backplane by pulling out on the card ejector levers and pulling on the edge of the card carefully. Do not remove the card from the card cage, but make sure that it is disconnected from the backplane.
- Reinsert the spare ID Module card back into the card cage slot it was taken from.
- Reset the Memory Write Enable Toggle switch to the UP position to make your corrections.
- From the Main System VDT, start checking the client information to see if the
 errors can be corrected (refer to Section 3.1.7). If the errors can be corrected,
 make all the corrections, then continue with step 8. If the errors cannot be
 corrected, call StarTel personnel, then continue with step 8.
- Reseat the primary ID Module card back into the backplane by pressing firmly on the card ejector levers.

- Remove the spare ID Module card from the card cage by pulling out on the card ejector levers and sliding the card out of the system cabinet.
 - Place the spare ID Module card in the card container box and store it in a safe place.
 - Set the Logic Power switch to the ON (up) position and reset the system with the Reset switch on the Generator card.

2.5 INSTALLATION OF OPTIONAL PRINTER

Before installing the Printer to the Video Display Option, follow the assembly instructions in the Printer Manual. When the assembly instructions are completed, proceed as follows:

At this time, check the Printer baud rate (blue jumper) setting at location CL2 on the ID Module card. It must be set at 9600 Baud. Proceed as follows:

Set the Logic Power switch to the OFF (down) position.

NOTE

The cards should be handled as delicately as possible.

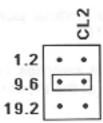
Avoid handling component circuitry on the cards in high static environments.

Remove the ID Module card from card cage slot 15 by pulling out the card ejector levers and sliding the card out of the system cabinet.

NOTE MANAGEMENT OF THE PROPERTY OF THE PROPERT

If the spare ID Module card is available, set Printer baud rate setting to 9.6 at this time.

 Check the blue jumper setting at location CL2 (refer to Figure 1-2 for location). If it is not set at 9.6, then remove the blue jumper from the jumper prongs and place the blue jumper on the correct setting of 9.6 as shown below.



- Insert the ID Module card into card cage slot 15 making sure that the card ejector levers are in the outward position.
- Seat the ID Module card edge connector into the backplane by pressing firmly on the card ejector levers.
- Set the Logic Power switch to the ON (up) position and reset the system with the RESET switch on the Generator card.

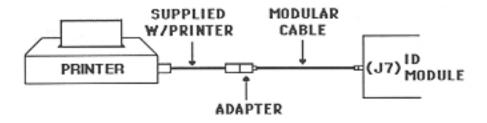
To install the Printer, proceed as follows:

 Plug in the 12-inch, 36-pin, cable connector (marked PRINTER PORT) into the connector receptacle in the back of the Printer. Lock the wire clips on the side of the connector receptacle into place on the cable connector.

NOTE

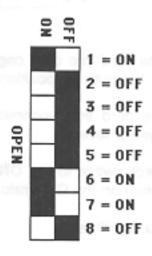
The cable connectors are keyed so they can not be plugged in incorrectly.

Plug in the modular cable adapter into the 26-pin cable connector (the other end of the 12-inch cable) as shown below.



- Screw in tightly the two screws (one on each side of the cable connector) to secure the modular cable adapter.
- Plug in the modular jack cable into the modular cable adapter.

- Plug in the other end of the modular jack cable into connector J7 on the ID Module card located in slot 15.
- Set the Printer Baud Rate switches (which are located inside the front access cover) on the bottom of the Printer to 9600 baud as shown below.



BLACK = SWITCH POSITION

7. Plug in the AC power cord into the wall outlet.

Now, the system will accept a Print command (^P) from the Main System VDT (refer to Section 3.1.7). Be sure to set the Top of Form with the TOF switch before printing.

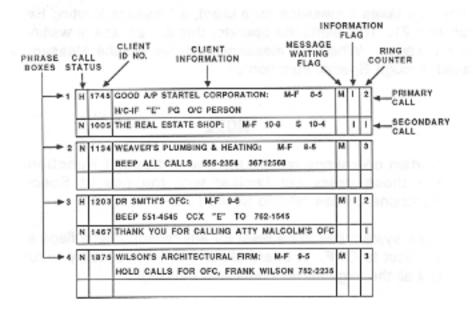
SECTION III

OPERATION

3.1 INTRODUCTION

The Video Display Option gives the operator a comprehensive summary of each clients account when answering a call. The VDT displays the following primary and secondary call information on each operator screen.

- Call Status (New or Hold Call)
- Client ID Number
- Answer Phrase
- Additional Client Information (on Primary Call ONLY)
- Message Waiting Flag
- Information Flag
- Ring Counter



In addition, an operator may optionally view all operator phrase boxes as described in Section 3.2.2.

Please read Sections 3.1.1 through 3.1.9 to familiarize yourself with the various characteristics of the VDT Option before entering any client information.

3.1.1 Call Status

The Call Status field displays an H for a hold call and an N for a new call.

3.1.2 Client ID

The Video Display Option supports up to 400 client accounts. The system requires the actual configuration of the starting client ID number (refer to Section 3.3.1).

3.1.3 Client Information

The VDT allows up to 128 characters of client information for each client. This information is displayed on two separate lines. The top line contains the answer phrase which is displayed for both primary and secondary calls. The second line is used for any additional information requested by the client and is displayed for primary calls only.

3.1.4 Message Waiting Flag

When an operator takes a message for a client, a Message Waiting Flag is set by using Special Function 21. This alerts the operator that a message is waiting when the client calls in for messages. When the message is delivered, the Message Waiting Flag is then released through Special Function 21.

NOTE

Certain operations require the use of Special Functions. For those users not familiar with the use of Special Functions, please refer to Section 3.5.

If the system has to be reset for any reason, these flags are all reset to OFF. A board check will be necessary to turn ON all the flags for accounts with messages.

3.1.5 Information Flag

When a client has requested some type of special handling, on a temporary basis, it is necessary to set the Information Flag in order to alert the operators. This flag is set and released through Special Function 22.

NOTE

Certain operations require the use of Special Functions. For those users not familiar with the use of Special Functions, please refer to Section 3.5.

If the system has to be reset for any reason, these flags are all reset to OFF. A board check will be necessary to turn ON all the flags for accounts which require special handling, i.e., IF.

3.1.6 Ring Counter

The system reports the number of rings which have been detected on a new call. This alerts the operator when to put a primary call on hold and answer the secondary call to eliminate overring situations. Any prior rings before the system received the call are not counted.

3.1.7 Client Maintenance

Client Maintenance allows an operator to input or update all 128 characters of client information. While using this feature, the secondary call display is used as a command line to display the function being performed. There is also a **HELP** function to display the commands available while editing.

The keyboard, as shown in Figure 3-1, is used to enter client information into the system. The following commands are executed by pressing the specified keys on the keyboard.

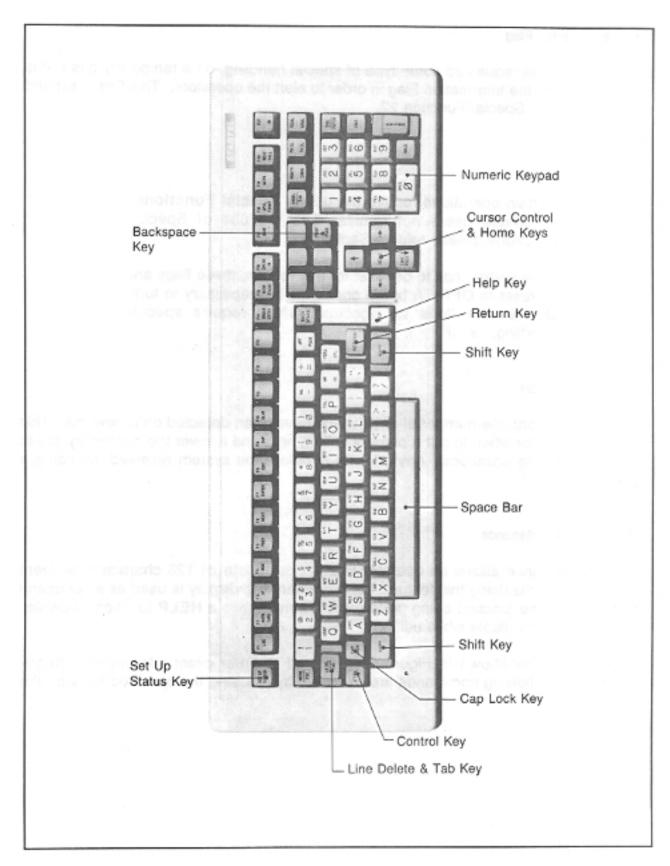


Figure 3-1. VDT Keyboard

NOTE

CTRL + E (or any specified alphabetic key) means that the key labeled CTRL and the key E must be pressed simultaneously.

The cursor is a bright rectangle on the screen that indicates where the next character will appear on the screen.

Controls with an asterisk (*) can only be accessed when in Client Maintenance.

- CTRL + E, To enter the Client Maintenance function.
- CTRL + Z To update the starting client ID. You must be in Client Maintenance before entering this function.
- CTRL + S* Inserts characters where the cursor is positioned until another CTRL + S is entered (any characters which scroll off the right border of the line being edited are lost).
- CTRL + F* Deletes the character where the cursor is positioned and compresses text to the cursor position.
- CTRL + Q* To exit the Client Maintenance function.
- CTRL + T Displays the Client Call Counts.
- CTRL + P To initiate a Print Client Information request. (For optional Printer ONLY.)
- CTRL + B Repaints border on the screen when the VDT is turned OFF and then turned back ON.
- CTRL + C To initiate a copy request for the ID Module card. (For optional Copy Feature ONLY.)
- LN DEL* Deletes entire line to the right of where the cursor is positioned.
- RETURN* Accepts information on the line currently being edited and advances the cursor to the next line. Keying RETURN while on the second line of the Client Information Field will automatically save the client information and then display the next client.
- HELP* Displays the available editor commands (* is notation for CTRL).

CURSOR - Use the keys labeled with directional arrows to move the cursor to the desired location on the screen.

HOME* - Moves the cursor to the top left corner of the field that is being displayed.

CAPS - In entering mode, the Caps Lock key will convert all typing to upper case.

SHIFT - Used to make a letter upper case.

3.2 TOGGLE SWITCH SETTINGS

The following Toggle switch settings must be set by the supervisor when operating the system. These switch settings are located on the ID Module card (refer to Figure 1-2 for location).

3.2.1 Memory Write Enable Toggle Switch and LED

The Memory Write Enable Toggle switch is labeled S1 and it is located at the front top edge of the ID Module card (just below the yellow LED).

Place this switch in the UP position to enter client information into the system (yellow LED will be illuminated).

After entering all client information, place this switch in the **DOWN** position to protect the memory (yellow LED will be extinguished) against accidental or unauthorized changes. It is strongly recommended that this switch should be in the **DOWN** position except when information is being entered/changed.

3.2.2 Broadcast Mode Toggle Switch

The Broadcast Mode Toggle switch is labeled S2 and it is located just below S1 on the ID Module card.

Place this switch in the **DOWN** position to have each operator view **only** their own station information (Display Segment 1, 2, 3, or 4).

Place this switch in the **UP** position to have all operators receive all station information (Display Segments 1 through 4).

3.3 OPERATING PROCEDURES

To operate the Video Display Option which has been added to your system, follow the instructions in the following sections.

NOTE

Upon initial installation of the system, the Client Call Counts feature **must** be reset to clear any erroneous totals that may be in memory. To perform this procedure, refer to Section 3.3.2, Client Call Counts Reset.

Press the **HELP** key at any time for a HELP explanation of the editing functions.

3.3.1 To Enter Starting Client ID Numbers

This procedure enables you to add groups of DIDs which are not consecutive to your existing DIDs. For each group, you enter the number of clients and a Starting Client ID number. These IDs are stored on the ID Module card

NOTE

Before entering the Starting Client IDs, place the Memory Write Enable Toggle switch on the ID Module card in the UP position. When you are finished entering your clients, place this Toggle switch in the DOWN position. A system prompt will be given if the switch is not set. If you press CTRL + Z accidently, press the RETURN key to exit.

 To enter the Starting Client IDs, you must first enter Client Maintenance by pressing the CTRL + E keys. The following display will appear on your screen.

1	Е	0000	Kinth 2 etc.	ed in the Clean is be-	noule > . ec.			
			Client MaIntenance	400 Client System	Vers. X.X	H	\forall	\forall

After you have entered Client Maintenance, press the CTRL + Z keys to
enter the client range(s) and the Starting Client ID(s). The following display
will appear on your screen. If your system is configured for 200 clients, it will
say 200 clients instead of 400 clients in the display.

1	Е		2,1500	П	П
		a O I Inte	Range of 400 clients starts with Client ID 0000		П
		Blo! B	Update Starting Client ID	\sqcap	П

3. The cursor will be positioned at the number of clients in this range (400). You may change this by typing over the existing number (400) or leave the number unchanged by pressing the RETURN key. The cursor will then be positioned over the Client ID (0000) for this range. You may change the Starting Client ID by typing over the existing number (0000) or leave the number unchanged by pressing the RETURN key.

Example:

If you have 200 DID clients on your system, beginning with Client ID 700, and you are now adding an additional 200 DID numbers beginning with Client ID 200, you would enter 200 (the original 200 clients) where the cursor is positioned, then press the RETURN key. The cursor will move to the Client ID number. You would enter 700 (the original Client ID) where the cursor is positioned, then press the RETURN key. The following display will appear on your screen.

1	Е	.th	Range of 200 clients starts with Client ID 0700 Range of 200 clients starts with Client ID 0000		
	вħ	mailC	Update Starting Client ID		

The cursor will be positioned at the new range of 200 client accounts. Press the **RETURN** key to leave the client range unchanged. The cursor will then be positioned at the Client ID number (0000). Enter **200** for the new group of 200 clients. The display will then look like the following:

1	E	Range of 200 clients starts with Client ID 0700	П
	ete	Range of 200 clients starts with Client ID 0200	П
	. 97	Update Starting Client ID	П

NOTE

The method above is the simplest method for adding a new range of DID numbers. If you do not choose to follow the example above, then you must not overlap existing Client IDs. The system will automatically assign a Starting Client ID of 0 to the last group of 100 clients (unused). Take the unused client range (100) and enter a fictitious Starting Client ID number to prevent a conflict with your existing Client ID numbers. It can be any number from 0 to 4999 that is not already used for your existing clients. There is a limit of eight client groups.

- 4. Press the RETURN key. You will now be returned to Client Maintenance.
- 5. Press the CTRL + Q keys to exit Client Maintenance.
- Be sure to place the Memory Write Enable Toggle switch to the DOWN position.

3.3.2 Client Call Counts Reset

This procedure enables you to reset Client Call Counts. This procedure can be performed at any time, but it is especially important to do so when you initially install the system.

Because the screen display for this feature utilizes the entire screen, you should take the system out of broadcast mode before entering the Client Call Counts feature. If you do not do this, the display will be broadcast to all screens and any incoming call information will overwrite portions of the display.

- Set the Broadcast Mode Toggle switch to the DOWN position.
- Press the CTRL + T keys to enter Client Call Counts. The Client Totals screen will appear on the VDT screen. The screen will prompt: Enter Next, Previous, Clear, Print or Quit (N, P, C, Ctrl P, Q):_.
- Type C, then press the RETURN key. The screen will prompt: This will reset all totals to 0. Proceed? (Y/N):_.

- Type Y for yes or N for no.
 - a. If you typed Y, the screen will prompt: Clearing totals Please wait. The totals will be reset and the Client Totals screen will then be redisplayed with the cleared totals.
 - If you typed N, the original prompt will be redisplayed and the totals remain unaffected.
- Press the CTRL + Q keys to exit Client Call Counts.
- 6. Set the Broadcast Mode Toggle switch back to the UP position.

3.3.3 To Enter New Client Information

NOTE

Set the Memory Write Enable Toggle switch on the ID Module card in the UP (LED will be lit) position before entering client information. Place the Memory Write Enable Toggle switch in the DOWN position when you are finished entering all client information. A prompt will be given if the switch is not set.

- Set the Memory Write Enable Toggle switch in the UP position.
- Press the CTRL + E keys to enter Client Maintenance. The starting client ID number is displayed and the command line will prompt: Client Maintenance.
- Press the RETURN key. The cursor will move to the Client Information Field and the screen will prompt: Exchange.
- Type in the client information.

NOTE

To Save client information, the RETURN key must be pressed when the cursor is in the second line of the Client Information Field. This will put the cursor at the ID number of the next client.

Press the RETURN key. The cursor will move to the next client ID number. The screen will prompt: Client Maintenance.

NOTE

You may select any client to edit by entering the desired client ID number while Client Maintenance is displayed in the command line.

Continue with steps 3, 4, and 5 until all clients have been entered into the system, then proceed to step 7.

NOTE

Save client information before using the CTRL + Q command. This command does not save.

- Press the CTRL + Q keys to exit Client Maintenance. Screen will prompt: Quit?.
- Type Y for yes or N for no.
 - If you typed Y, you will exit the program.
 - b. If you typed N, you can continue entering client information.
- Reset the Memory Write Enable Toggle switch in the DOWN position to protect the memory.

NOTE

If you want to view client information without the danger of altering it, leave the Memory Write Enable Toggle switch in the DOWN position, then press the CTRL + E keys. The prompt to set the toggle switch will be displayed on the screen. Ignore the prompt and press the CTRL + E keys again. You can view all the clients or only one client by following steps 3, 4, 6 and 7 in Section 3.3.4, To Edit Client Information.

3.3.4 To Edit Client Information

NOTE

If your system has the capability of handling 400 client accounts, the following statement applies:

When you edit the 400th client (depending on the starting client ID, the 400th client will vary), an asterisk (*) will be in the last position of the Client Information Field. **DO NOT** edit this asterisk out of this field. This asterisk determines the system size. If the asterisk is accidently edited out, reset the system with the **Memory Write Enable Toggle** switch on the ID Module card.

If this character (*) is missing, you will not be able to access above the first 200 client accounts.

- Set the Memory Write Enable Toggle switch in the UP position.
- Press the CTRL + E keys to enter Client Maintenance. The screen will prompt: Client Maintenance. The cursor will move to the first digit of the starting client ID number.
- Type in the client ID number of the client to change (i.e., 50).
- Press the RETURN key. The client will appear on the screen and the cursor will be positioned in the Client Information Field.
- Type in the new information using the editing control keys (refer to Section 3.1.7) or retype all information.

NOTE

To Save client information, the RETURN key must be pressed when the cursor is in the second line of the Client Information Field. This will put the cursor at the ID number of the next client. You must also Save client information before using the CTRL + Q command.

Press the CTRL + Q keys to exit Client Maintenance. The screen will prompt: Quit?.

- 7. Type Y for yes or N for no.
 - If you typed Y, you will exit the program.
 - If you typed N, you can continue editing client information.
- Reset the Memory Write Enable Toggle switch in the DOWN position to protect the memory.

3.4 CLIENT CALL COUNTS

Client Call Counts is an operational mode of the system that is used to keep count of all calls answered for each client either by an operator or by the auto answer tape. These totals can be viewed, printed, reset, and used for billing purposes.

The clients will be displayed on the screen 75 at a time. You may view all clients by paging through the screens using the N(ext) and P(revious) keys. You can print all clients by using the CTRL + P(rint) keys and quit the program by using the CTRL + Q(uit) keys. You can reset all totals to 0 using the C(lear) key. If you want to reset the Client Call Counts, refer to Section 3.3.2, Client Call Counts Reset.

To Enter Client Call Counts:

- 1. Set the Broadcast Mode Toggle switch in the DOWN position.
- Press the CTRL + T keys to enter the Client Call Counts feature. The Client Totals screen will appear on the VDT.

To View All Clients:

- Press the N key to page forward through the screens.
- 2. Press the P key to page backward through the screens.

To Print All Clients:

- Press the P key to print client totals. The screen will prompt: Printing totals.
- 2. When all information has been printed, the original prompt will be displayed.

To Exit Client Call Counts:

 Press the Q key to exit Client Call Counts. The operator call processing box will be redisplayed.

- Set the Broadcast Mode Toggle switch to the UP position if you wish to be in broadcast mode.
- Press the CTRL + B keys to repaint the screens. This should be done when there are no calls in the system. This command erases the information on the screen.

3.5 SPECIAL FUNCTIONS

Special Functions is an operational mode of the system that is used for setting and releasing the Information and Message Waiting Flags.

The Special Functions mode can **only** be entered when the operator is **IN** call rotation and the Mute light is lit (not in a **talk-state**). Other mode light settings (NEW, PATCH, or CL WTG) are not relevant to enter the Special Functions mode.

To enter the Special Functions mode, you must be disconnected from the client. When you are disconnected from the client, proceed as follows:

- Press the SP FCN key on the Operator Console. The digital display will show S.F.O.
- Enter the Special Function number from the numeric keypad on the Operator Console; 21 for Message Waiting Flag or 22 for Information Flag.
- Press the # key to enter the selected Special Function number.
- The VDT screen will display the client ID number of the last call answered by the operator.

NOTE

If the client ID number is not the right client, enter the client ID number from the numeric keypad on the Operator Console and then press the # key to enter the selected client ID. After the # key has been pressed, FL0 or FL1 will be displayed on the screen. FL0 means flag is OFF, FL1 means flag is ON.

- To set the flag, press 1 on the Operator Console.
 To release the flag, press 0 on the Operator Console.
- 6. Press the # key to enter the selected flag value.
- 7. To exit Special Functions, press the * key.

Construction of the Construction Constructio

SECTION IV

MAINTENANCE/PARTS LIST

4.1 MAINTENANCE

Maintenance on the Video Display Option is limited. If a malfunction occurs, check the following:

- Check that all modular cables are plugged into the VDT and ID Module card correctly.
- Check that the modular cable adapter on the VDT is plugged in correctly.
- Check the keyboard AC plug at the back of the VDT.
- Check that the CPU and ID Module cards are seated properly.
- If the Operator Display borders disappear, press CTRL + B to repaint the borders.
- If a VDT malfunctions (hangs-up), power it OFF for two seconds, then power it back ON. When the VDT is turned back on, a Self-Test will be executed. The Self-Test will verify the integrity of the display memory, the program memory, non-volatile memory, and the associated internal control logic. Upon completion of the Self-Test, the VDT will display the OK message.

If the VDT is still not working, check the AC power plug to make sure it is plugged in. If it is plugged in, swap it with a functioning VDT to determine if the fault lies in the VDT or the cable. Also verify the VDT configuration in Section 2.3.1, step 3.

4.2 PARTS LIST

Table 4-1 lists the parts in the Video Display Option kit.

Table 4-1. Parts List

Description	Order Number	
Identification Module (MIO card) (200 Clients)	10-1027-001	
Identification Module (MIO card) (400 Clients)	10-1027-002	
VDT, Connector Adapter	27-1031-001	
VDT, LSI (VDT Only)	23-1004-001	
VDT/Keyboard, LSI	23-1004-000	
VDT, Modular Cable	1 1.	
25 ft. 40 ft. 75 ft.	27-1022-025 27-1022-040	
Printer, 850XL (Optional)	22-1015-001	
Printer, Connector Adapter (Optional)	27-1032-002	