

# **AT&T System 25**

## **Installation and Maintenance Manual**

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555-540-103 **B**  
November 1995

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Installation and Maintenance Manual  
Prepared by System 25  
Document Development Group and the  
AT&T Documentation  
Management Organization

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## **DANGER**

**Do not open the fan assembly or remove rear cabinet cover before unplugging the cabinet from the electrical outlet. Wait at least five minutes after unplugging the power cord before removing the rear cover or power supply. The AT&T System 25 cabinets are not user serviceable. Some voltages inside the cabinets are hazardous. This equipment is to be serviced only by qualified technicians.**

## **CUSTOMER WARNING**

The Installation and Maintenance Manual is designed for use **by qualified service technicians only**. Technician qualification includes completion of an AT&T hands-on instructor-led course covering installation and maintenance for this product. The use of these documents by anyone else might void the warranty. **Hazardous electrical voltages are present inside this product.**

## **SERVICE TECHNICIAN WARNING**

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4. Use caution when installing or modifying telephone lines.

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THE FOLLOWING SYMBOLS AND PICTOGRAPHS  
APPEAR ON THE EQUIPMENT

SYMBOL



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions

PICTOGRAPHS



ELECTRICAL SHOCK

Warns of the danger of electrical shock from hazardous voltages present within the control unit



Warns of the risk of fire if the air filter is not in place

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# **FCC NOTIFICATION AND REPAIR INFORMATION**

## **AT&T SYSTEM 25**

This telephone equipment is registered with the Federal Communications Commission (FCC) in accordance with Part 68 of its Rules. In compliance with the Rules, be advised of the following:

### **MEANS OF CONNECTION**

Connection of this telephone equipment to the nationwide telecommunications network shall be through a standard network interface USOC RJ21X jack. Connection to private line network channels requires USOC RJ2GX jack for tie lines or USOC RJ21X jack for off-premises station lines. Connection to T1 facilities requires USOC RJ48X or RJ48C jack. These can be ordered from your telephone company.

### **NOTIFICATION TO THE TELEPHONE COMPANY**

If the system is to be connected to off-premises stations (OPSs), you must notify the telephone company of the OPS class of service, OL13C, and the service order code, 9. OF. For R3 systems, the Analog service order code is 9.0Y, the Digital service order code is 6.0Y.

Upon the request of the telephone company, inform them of the following:

- The Public Switched Network “lines” and the Private “lines” to which you will connect the telephone equipment.
- For private line connections, provide the facility interface code, TL31M for tie lines. You must also specify the service order code, 9.0F or 9.0Y for R3 systems.

Customer instructions will advise the customer to provide the telephone company with the registration number (either -MF or -KF, depending on the application of the system) and the ringer equivalency number (REN) from the label on the equipment. In addition, customer will be advised

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that certification in writing may be required when an existing multifunction system is being reconfigured as a Key system, if the customer desires the lower rate.

- For Digital connections with D4 Framing Format provide the Facility interface code 041DU9-B, for digital connections with Extended Framing Format, provide the Facility interface code 04DU9-C. You must also specify the service order code, 6.0Y.
- The quantities and USOC numbers of the jacks required.
- For each jack, provide the sequence in which lines are to be connected; the type lines and the facility interface code and the ringer equivalence number by position, when applicable.

This telephone equipment should not be used on coin telephone lines. Connection to party line service is subject to state tariffs.

## **REPAIR INSTRUCTIONS**

If you experience trouble with this telephone equipment, contact the AT&T Business Customer Service Center on 1-800-242-2121. The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that this equipment is not malfunctioning.

System 25 troubles that must be escalated to a higher level of maintenance should be referred to the National Service Assistance Center on 1-800-628-2888.

## **RIGHTS OF THE TELEPHONE COMPANY**

If your telephone equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice isn't practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

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Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

## HEARING AID COMPATIBILITY

The voice terminals described in this manual are compatible with inductively coupled hearing aids as prescribed by the FCC.

## FCC INFORMATION

FCC REGISTRATION INFORMATION	
Registration Number	AS593M-71565-MF-E
Ringer Equivalence	0.5A
Network Interface	RJ21X, RJ2GX or RJ48X

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PRIVATE LINE SERVICE	
Service Order Code	
• Analog	9.0F
• Analog (R3)	9.0Y
• Digital (R3)	6.0Y
Facility Interface Code	
• Tie Lines	TL31 M
• Off-Premises Stations	OL13C
• Digital D4 Framing	04DU9-B
• Digital ESF	04DU9-C

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## **FCC WARNING STATEMENT**

Federal Communications Commission (FCC) Rules require that you be notified of the following:

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

### **SECURITY OF YOUR SYSTEM-PREVENTING TOLL FRAUD**

As a customer of a new telephone system, you should be aware that there exists an increasing problem of telephone toll fraud. Telephone toll fraud can occur in many forms, despite the numerous efforts of telephone companies and telephone equipment manufacturers to control it. Some individuals use electronic devices to prevent or falsify records of these calls. Others charge calls to someone else's number by illegally using lost or stolen calling cards, billing incorrect parties, clipping on to someone else's line, and breaking into someone else's telephone equipment physically or electronically. In certain instances, unauthorized individuals make connections to the telephone network through the use of remote access features.

The Remote Access feature of your system, if you chose to utilize it, permits off-premises callers to access the system from a remote telephone by using an 800 number or a 7- or 10- digit telephone number. The system returns an acknowledgement signaling the user to key in his or her authorization code, which is selected and administered by the system manager. After the authorization code is accepted, the system returns dial tone to the user. If you do not program specific egress restrictions, the user will be able to place any call

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normally dialed from a telephone associated with the system. Such an off-premises network call is originated at, and will be billed from, the system location.

The Remote Access feature, as designed, helps the customer, through proper administration, to minimize the ability of unauthorized persons to gain access to the network. Most commonly, phone numbers and codes are compromised when overheard in a public location, through theft of a wallet or purse containing access information, or through carelessness (writing codes on a piece of paper and improperly discarding it). Additionally, hackers may use a computer to “dial” an access code and then publish the information to other hackers. Enormous charges can be run up quickly. It is the customer’s responsibility to take the appropriate steps to properly implement the features, evaluate and administer the various restriction levels, protect access codes, and distribute access codes only to individuals who have been fully advised of the sensitive nature of the access information.

Common carriers are required by law to collect their tariffed charges. While these charges are fraudulent charges made by persons with criminal intent, applicable tariffs state that the customer of record is responsible for payment of all long-distance or other network charges. AT&T cannot be responsible for such charges and will not make any allowance or give any credit for charges that result from unauthorized access.

To minimize the risk of unauthorized access to your communications system:

- Use a nonpublished Remote Access number.
- Assign authorization codes randomly to users on a “need-to-have” basis, keeping a log of ALL authorized users and assigning one code per person.
- Use random sequence authorization codes, which are less likely to be broken.
- Deactivate all unassigned codes promptly.
- Ensure that Remote Access users are aware of their responsibility to keep the telephone numbers and any authorization codes secure.
- When possible, restrict the off-network capability of off-premises callers, via use of Call Restrictions and Disallowed List capabilities.

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- When possible, block out-of-hours calling.
  - Frequently monitor system call detail reports for quicker detection of any unauthorized or abnormal calling patterns.
  - Limit Remote Call Forward to persons on a “need-to-know” basis.

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# INTRODUCTION

This manual provides procedures and information for installing, and testing the AT&T System 25 Release 3 and associated equipment. The maintenance information contained in Section 4 pertains to the AT&T System 25 Release 1, Versions 1 and 2 (R1V1 and R1V2), Release 2, Version 1 (R2V1), as well as to AT&T System 25 Release 3, Version 1,2 and 3 (R3V1, R3V2 and R3V3).

Installation and maintenance procedures for the AT&T System 25 Call Management System and Integrated Solution are provided in a separate set of documents for each system.

This manual is intended for use by an installation and/or maintenance technician dispatched to a System 25 site for an installation or in response to an alarm or a user trouble report. This technician must have completed the Tier 1 training course (T-335). Each installed System 25 has a customer-designated System Administrator. The technician should work closely with this System Administrator. The System 25 Administration (555-540-500) and Implementation (555-540-650) Manuals describe the administrator's functions.

In the S25 documentation, the terms "voice terminal", "voice stations", and "telephone" are used to describe the same piece of hardware. The S25 documentation also uses the terms 'Personal Dial Code (PD.)', and 'extension number' interchangeably.

The remainder of this manual is divided into Sections 2 through 6 and six appendices:

- **Section 2. Installation**—Describes the installation of the cabinet(s) wiring, and other components. Certain preinstallation requirements must be met; therefore, read "PREINSTALLATION REQUIREMENTS" before installing any part of System 25.
- **Section 3. System Test**—Describes all the tests necessary to verify that the system is operating correctly.
- **Section 4. Maintenance** — Provides information necessary for monitoring, testing, and maintaining all releases of AT&T System 25.

- **Section 5 References-Lists and describes other related documentation**
- **Section 6 Abbreviations and Acronyms-Lists and describes abbreviations and acronyms frequently encountered in System 25 documentation**
- **Appendix A. System Wiring Table—Lists pinouts and wiring used with System 25**
- **Appendix B. Parts Listing—Lists all related parts of System 25**
- **Appendix C. System Additions and Changes-Describes how to make additions to an existing system**
- **Appendix D. System Upgrade—Describes how to upgrade an R1V1 R1V2 or R2V1 release of System 25 to an R3 release**
- **Appendix E. System Codes and Data Entries—Lists all default codes and data entries for administering the system**
- **Appendix F. Administration Tables—Lists all error messages that can occur when the system is being administered**

## FCC PRECAUTIONS

**Electromagnetic fields radiating from the system cabinets may generate noise in other communications equipment The technician must be sure that all cabinet panels and covers are securely in place after performing maintenance**

**Caution: Electrostatic discharge can destroy or severely damage integrated circuits or CPs.**

**The maintenance technician MUST ALWAYS WEAR A WRIST GROUNDING STRAP when handling CPs The cord must be attached to the grounding block at the back of the cabinet or to a front-cover retainer screw Damage to integrated circuits caused by electrostatic discharge may not be immediately apparent**

**Caution: The wrist grounding strap must not be clipped to any cabinet location other than the grounding block.**

---

# INSTALLATION

Installation of a System 25 requires the completion of a number of basic steps, similar to those required to install any customer switching system. Assuming that the building (station) wiring is already in place, the recommended sequence of steps for installation of the system is as follows:

1. Preinstallation Requirements
2. Install System Cabinets
3. Power Up and Initialize System
4. Install Cross-Connect Equipment (See Note below.)
5. Install Modular Bulk Power Supply (Optional)
6. Connect Cabinets to Trunk Access Equipment
7. Connect Cabinets to Station Interconnect Panel (SIP)
8. Install Customer's Peripheral Equipment
9. Install Terminals
10. Install Auxiliary Equipment
11. Test System

**Note:** Step 4 can be done before Steps 2 and 3 if the cross-connect equipment is delivered before the cabinets.

## TOOLS AND TEST EQUIPMENT

Table 2-A lists tools and test equipment required for installing a System 25.

Table 2-A. Tools and Test Equipment Required for Installation

Tasks	Tools Required	Recommended Type
Install Cross-Connect Field	Push Drill Screwdriver Carpenter's Level Rule Chalk Line 11 O-type Punch-down Tool Adapter	8-inch Flat Blade 30-inch 30-inch AT-8762 D-Impact Tool BR866 JC (403608235)
Unpack Cabinet	Tin Snips Utility Knife Adjustable Wrench	— — 6- or 8-inch
Install Cabinets or Add Carriers	Rule Adjustable Wrench Screwdriver Allen Wrench	30-inch 6- or 8-inch 8-inch Flat Blade 1/8-inch
Add Voice Terminals or Install Auxiliary Equipment	Diagonal Pliers Screwdriver 11 O-type Punch-down Tool	— 8-inch Flat Blade AT-8762 D-impact Tool
Add Circuit Packs (CPs)	Screwdriver	8-inch Flat Blade
Initialize System	System Administration Terminal Digital Tape Unit (not RS-232C)	RS-232C —
Test System*	Test Set	Dracon TS21

\*Used in Section 3 of this manual

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## CROSS-CONNECT EQUIPMENT DESCRIPTION

This section provides a brief description of some of the System 25 cross-connect/interconnect equipment. More details on the System 25 equipment can be found in the Reference Manual (555-540-200). This section describes the following:

- **Trunk Access Equipment**

- 700A Jacks**

- Emergency Transfer Unit**

- **Station Interconnect Panel**

- **617A Panel**

- Adapters**

- Fanning Strip**

- **Cables**

- **Splitter Cables**

- **Octopus Cables**

- **Cable Labels.**

## Trunk Access Equipment

The trunk access equipment (TAE) consists of 700A-I 10-61-25 or 700A-66-B1 -25 (157BF) cut-down jacks, or equivalent, and up to four 10B Emergency Transfer Units (ETUs). The 10B ETU is shown in Figure 2-1.

### *700A- 110-M-25 or 700A-66-B1-25 (157BF) Cut-Down Jack*

Trunk circuits that appear on the network interfaces are grouped by trunk type (Direct Inward Dialing [DID], Central Office [CO], or Tie) and punched down on the 700A jack. One 700A jack is required for each RJ21 X or RJ2GX network interface. The 700A-1 10-B1-25 jack has a 110-type cut-down field, and the 700A-66-B1-25 (157BF) has a 66-type cut-down field. It is important to note that most secondary wiring protectors (sneak current fuses) are compatible only with the 66-type jack.

### *10B Emergency Transfer Unit (ETU)*

During a power failure or system outage, each 10B ETU provides contact closures for bypassing the switch and connecting up to five predesignated FCC registered single-line voice terminals to telephone company trunks. Connectorized cables (25-pair) connect the ETU to the 700A jacks, the system cabinets, and the Station Interconnect Panel. A modular plug-ended cord (part of octopus cable) connects control power (-48 V dc) from the system cabinet.

Screw terminals that connect to relay contacts which may be used for an external alerting device are also provided. The relay contacts close when a failure occurs. (Any alerting device and associated power unit with a dc current requirement less than or equal to 0.5 ampere may be used.) The ETU also controls a DID make-busy contact that connects to the last pair on the 700A jack. For a more detailed drawing of the 10B ETU, see Install Emergency Transfer Units (ETUs) in this part.

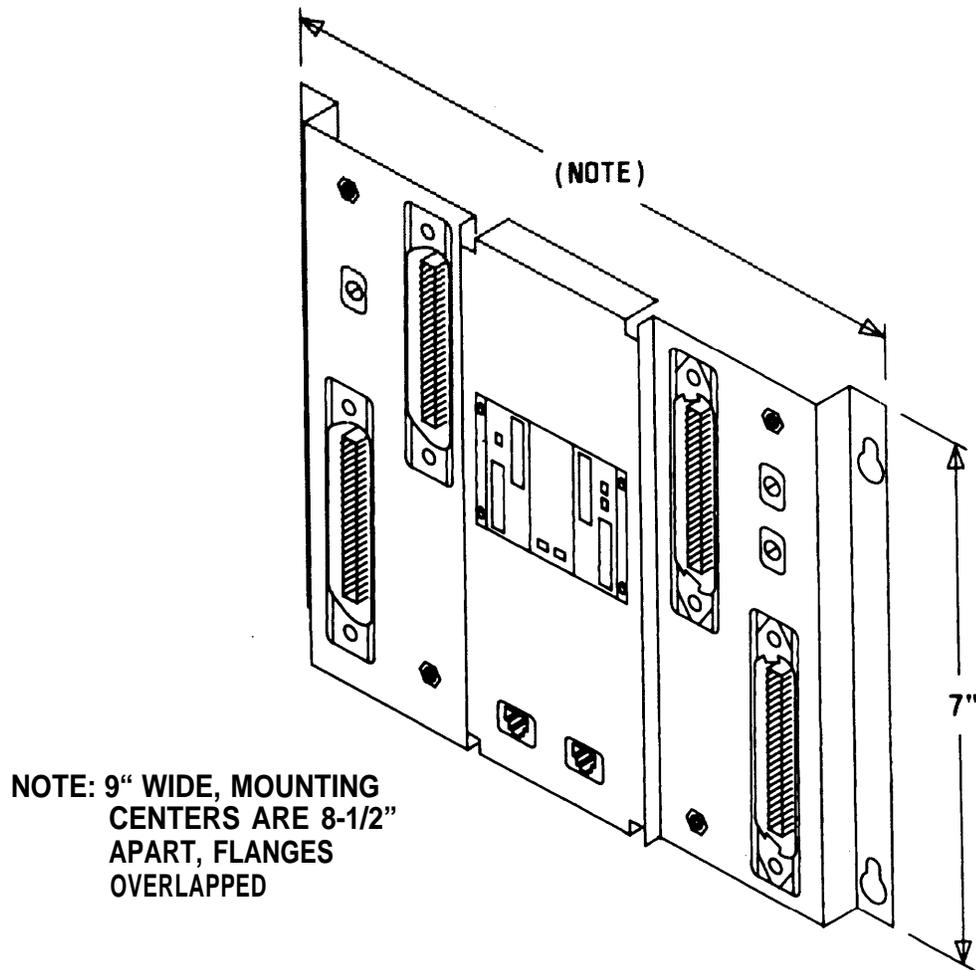


Figure 2-1. 10B ETU

## **Station Interconnect Panel (SIP)**

The SIP is the station cross-connect field and consists of the following equipment:

- 617A Panels
- Adapters
- 50A Fanning Strips.

### ***617A Panel***

The 617A Panel is a metal plate with keyslot holes on each side for mounting on a backboard. (See Figure 2-2.) Each 617A Panel can hold eight 2210A2 or 858A Adapters, each of which can accommodate six connections to the port circuits in the cabinets. As many as five 617A Panels may be required for a maximum size system. The adapters snap into prepunched holes on the 617A Panels. (Reattached spacer buttons keep adapters from touching the metal panels.)

The cable rings located at the top of the 617A Panel route the building wiring cables to the adapters. Purse lock clips hold the building wiring cables in place. The white posts at the bottom of the 617A Panel guide the wiring from the 50A Fanning Strip to each column of adapters.

Preprinted boxes and numbers on the panel identify modular jacks for record-keeping purposes. Letters are marked in the boxes at the top of each column by the installer. The letter (A through J) and the corresponding preprinted row number (1 through 24) identify the port jacks. For example, A1 identifies the modular jack located in column A row 1.

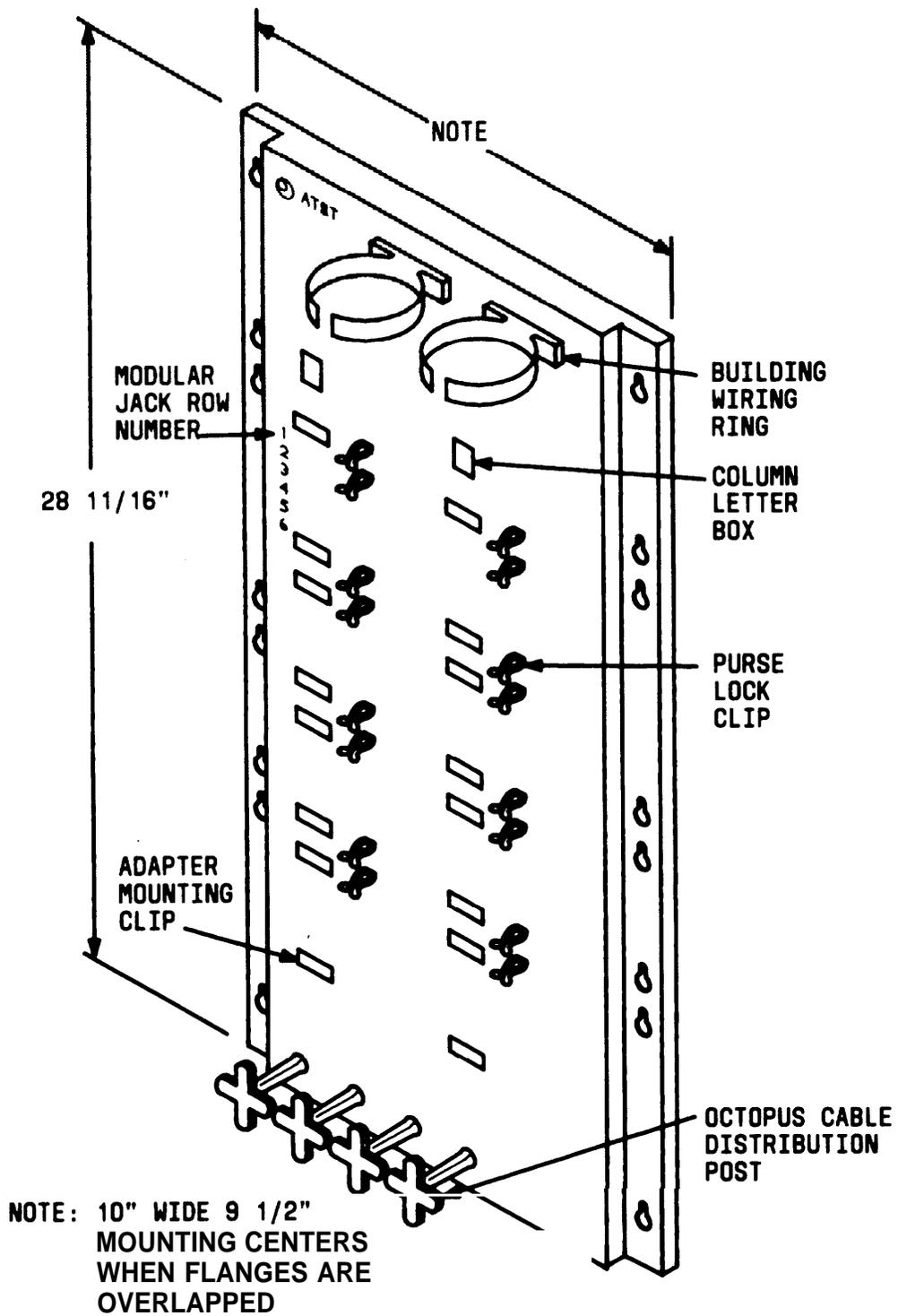


Figure 2-2. 617A Panel

### ***Adapters***

The adapters shown in Figure 2-3 are used at the SIP.

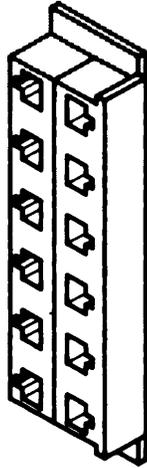
#### **Z210A2 or 858A Adapters**

These adapters connect the building wiring (station runs) to the station port circuit packs (CPs) located in the system cabinets (through octopus cables). As many as 40 of these adapters may be required for a maximum size system. Any combination of the adapters can be used, depending upon the type of building wiring. The port side of the adapters consists of six 8-pin modular jacks. The station side of the adapters is equipped as follows:

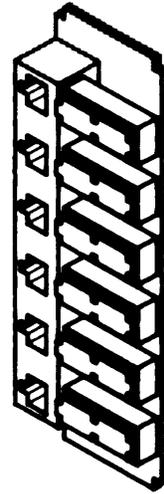
- **Z210A2**—Six 8-pin modular jacks used for terminating 4-pair modular plug-ended D-inside wire (DIW). One of these adapters must be installed at the top of column A on the SIP to provide connections for the System administration Terminal (SAT), Digital Tape Unit (DTU), etc.
- **858A**—Six 11 O-type 8-pin wiring blocks used for terminating 4-pair DIW.

#### **WP90851, L1 Y-Adapter**

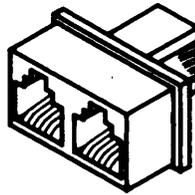
This adapter separates voice and data pairs that are run over the same 4-pair cable for connection through octopus cables to the System 25 port circuits. This adapter plugs into the port side of either of the two adapters described above. It has a DATA and a VOICE modular jack. The DATA jack connects to a TN726 Data Line port circuit pack. The VOICE jack connects to a port circuit on a Tip Ring Line, Analog Line, or ATL Line circuit pack.



Z210A1  
ADAPTER



858A  
ADAPTER



Y-ADAPTER  
WP90851,L1

Figure 2-3. SIP Adapters

**Fanning Strip**

The 50A Fanning Strip (Figure 2-4) is a metal panel with positions to hold 16 octopus (switch) cables. The bundled portion of the octopus cable is anchored at the fanning strip. The eight octopus cable cords hang free. One fanning strip is required for 1-cabinet systems. Two fanning strips are required for 2- or 3-cabinet systems.

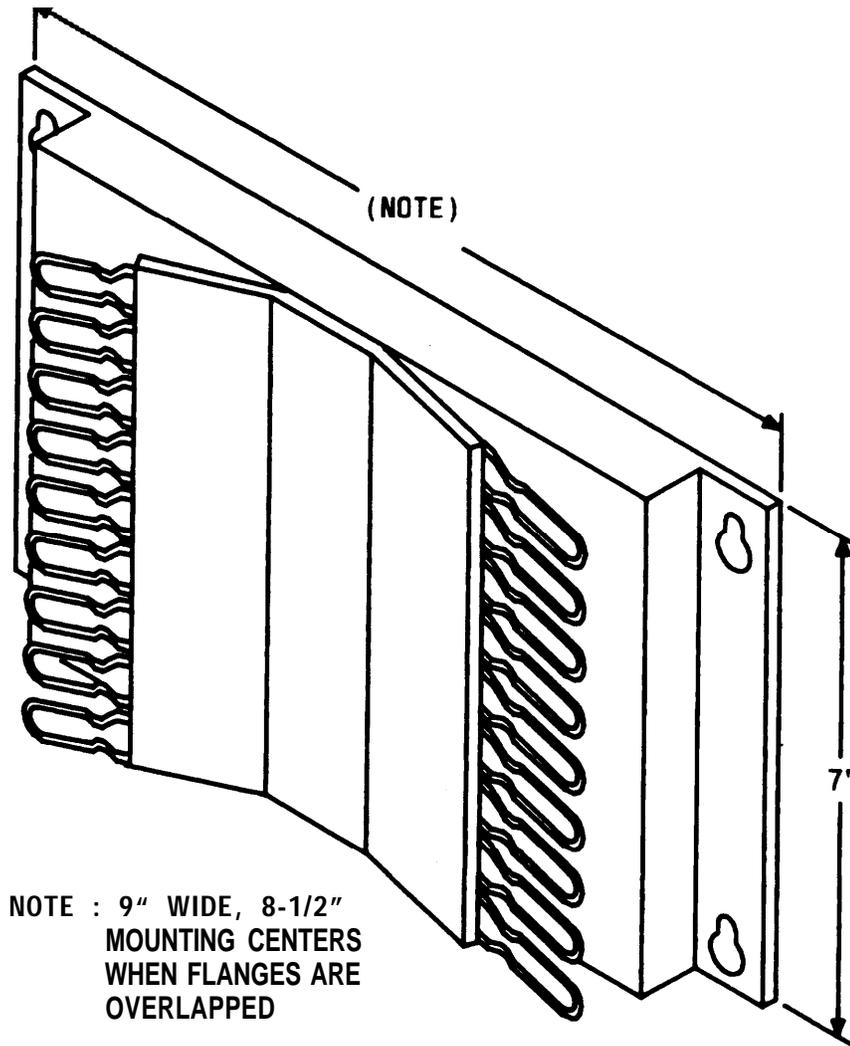


Figure 2-4. 50A Fanning Strip

## Cables

### *Splitter Cables*

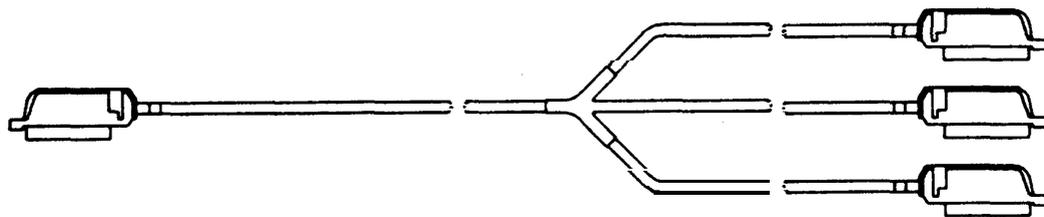
The splitter cables (Figure 2-5) connect trunk circuits from the 700A jacks to the system cabinets or 10B ETU (3:1 only).

#### 3:1 Splitter Cable (WP90929, L1)

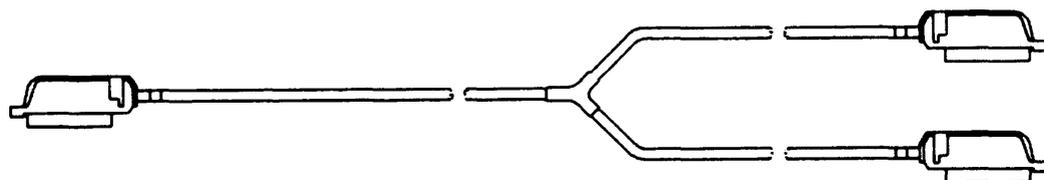
This cable connects the twenty-four 1-pair trunk circuits on a 700A jack to three 8-port trunk circuit packs (loop start, ground start, or DID). The connection may be either director through a 10B ETU. All 25-pair ribbon connectors on the cable are male.

#### 2:1 Splitter Cable (WP90929, L3)

This cable connects eight 3-pair tie trunk circuits on a 700A jack to two 4-port tie trunk circuit packs. All 25-pair connectors on the cable are male.



3:1 SPLITTER CABLE  
WP90929, L1



2:1 SPLITTER CABLE  
WP90929, L3

Figure 2-5. Splitter Cables

### ***Octopus Cables***

Octopus cables (Figure 2-6) connect the station port and CPU/Memory circuit packs to the SIP adapters. Each cable consists of a 25-pair male connector that connects to the switch cabinet and eight modular plugs that connect to the SIP adapters. These cables are provided with all system cabinets.

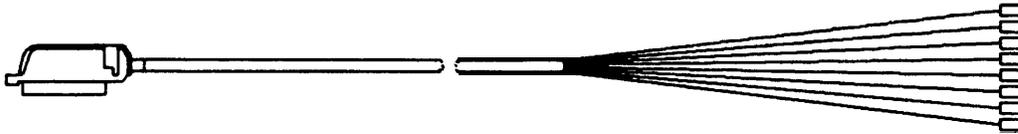


Figure 2-6. Octopus Cable

### ***8536 Adapter Cable***

The 853B Adapter Cable (104305834) connects two octopus cables to a 16-port TN746B Analog Line circuit pack. As shown on Figure 2-6a, each cable consists of one 25-pair male connector (Connector O) and two 25-pair female connectors (Connectors 1 and 2). The cable length is eight feet.

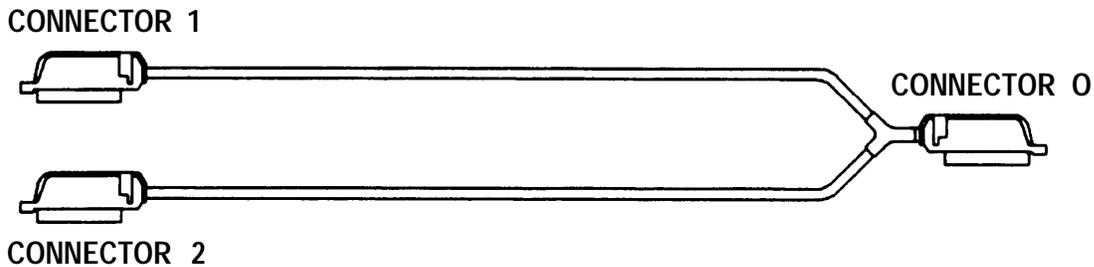


Figure 2-6a. 853B Adapter Cable

### ***DS1 Connector Cables***

The following Connector cables are available to connect the DS1 Interface circuit packs to DS1 digital facilities:

- H600 307, G2—50-foot long shielded cable equipped with a 50-pin male connector on one end and unterminated at the other end. The cable may be cut to length. Shipped loose are a KS23007, L1 15-pin male

connector and a KS23146,L3 50-pin male connector.

To connect a DS1 interface circuit pack to a 551-type Customer Service Unit (CSU), field terminate the 15-pin plug.

To connect DS1 tie trunks on co-located System 25s, field terminate the 50-pin male connector (see Figure 2-1 9).

- C6E connector cable (comcode 104307 434)—1 00-foot long shielded cable equipped with a 50-pin male connector on one end and a 50-pin female connector on the other end. This cable is used as an “extension” cable between the DS1 Interface circuit pack and the other connector cables.

### ***Cable Labels***

A set of preprinted labels for identifying the system cabinet cables and ETU cables are provided (Figure 2-7). The system cable labels are prenumbered to identify the cabinet (1, 2, 3) and circuit pack slot (1-12, - see NOTE) and are also color-coded as follows:

**Note:** Because of the combined CP/Memory board in R2V1 and R3, ten slots are available in Cabinet 1.

Cabinet No.	Color
1	Blue
2	Orange
3	Green

The call processor octopus cable labels and ETU cable labels are white. The use of these labels is discussed in this manual.

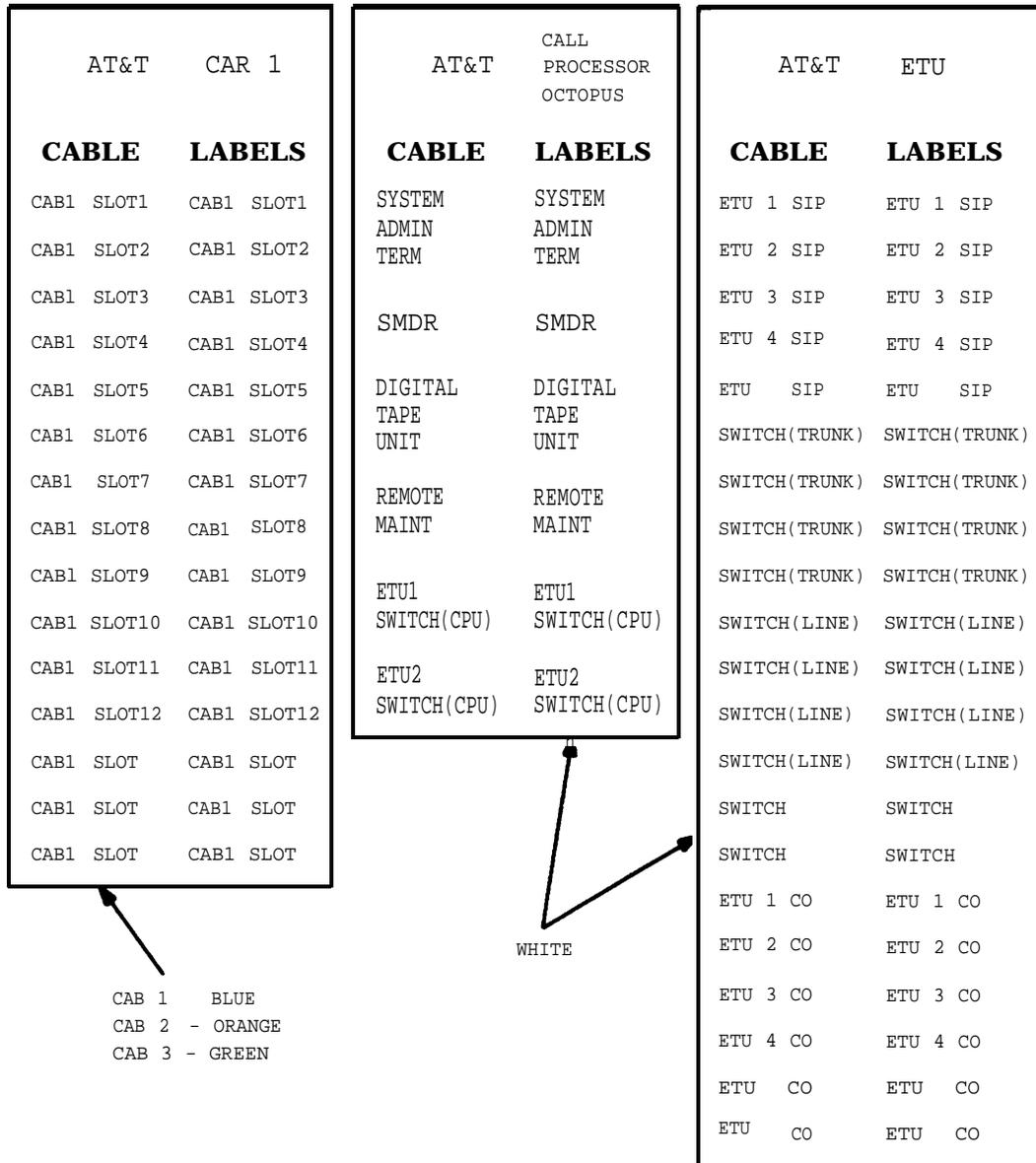


Figure 2-7. Cable Labels

## **Symbols Used in Figures**

**Modular jacks are shown by the triangle symbol. The 25-pair connectors are indicated by shaded blocks. Generally, only one leg of an octopus cable is shown. Unterminated wiring requiring cut down or other termination does not show symbolic designations. The 103A Connecting Block is a typical modular wall jack that provides cut-down connections for building (station) wiring and a modular jack for connection to terminal equipment.**

## PREINSTALLATION REQUIREMENTS

*The AT&T System 25 Reference Manual (555-540-200)* provides a complete listing of System 25 equipment location requirements. Before installation begins, check the items described in this section.

**Caution:** System 25 cross connect hardware must be located in a restricted access area only.

### Table and Backboard

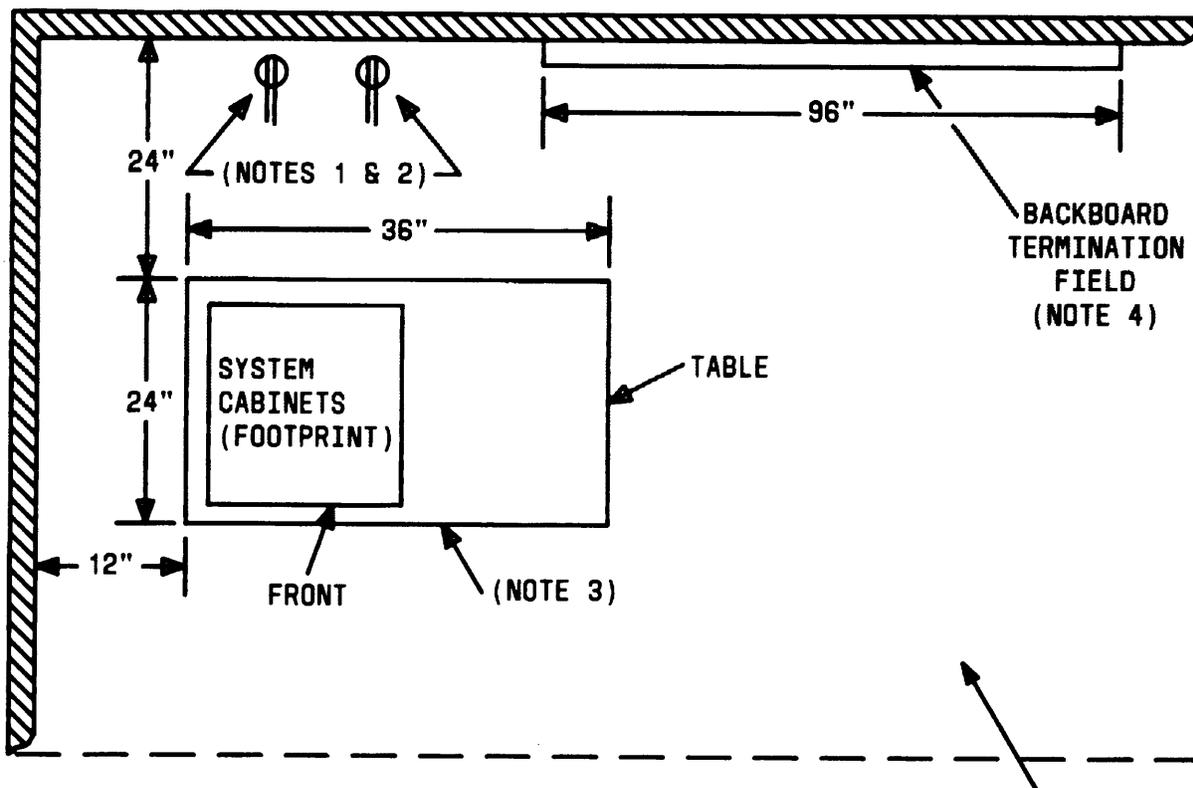
Verify that an equipment table and cross-connect backboard are installed. (See Figure 2-8 for a sample layout.) The cross-connect backboard is a 48-inch by 96-inch by 3/4-inch plywood panel, mounted horizontally 30-inches above the floor and within 5 feet of the location chosen for the cabinets.

If wall space in the equipment room is limited, an alternate layout may be provided. If more than four 617A Panels are required, this alternate layout will require more than one 48-inch by 96-inch plywood panel. See *Install Equipment Room Station Cabling* for details.

### Network Interface

The RJ21X network interface (CO lines) installed by the telephone company must be located within 25 feet of the system cabinets. In addition to the RJ21X network interface, an RJ2GX interface is required for tie lines. For T1 interfaces, RJ48X network interfaces must be provided. If System 25 is replacing another system and no additional lines are required, the network interfaces used with the previous system should already be in place.

The network interfaces should also include a coupled bonding conductor extended from the building service entrance.



**NOTES :**

1. 115V AC, 60 Hz, 15 AMP OUTLETS (HUBBELL 5262 OR EQUIVALENT) MUST BE LOCATED WITHIN 4 FEET OF SYSTEM CABINETS.
2. MULTIPLE CABINET SYSTEMS REQUIRE TWO QUAD OUTLETS, SINGLE CABINET SYSTEMS REQUIRE ONE QUAD OUTLET.
3. ALLOW AT LEAST 24 INCHES OF SPACE IN FRONT OF CABINETS. TABLE MUST BE ABLE TO SUPPORT 250 POUNDS.
4. BACKBOARD IS 3/4 INCHES THICK BY 48 INCHES WIDE BY 96 INCHES LONG (FOR MAXIMUM SYSTEM).
5. SYSTEM 25 CABINETS AND BACKBOARD MUST BE LOCATED IN A RESTRICTED ACCESS AREA.

**RESTRICTED  
ACCESS AREA  
(NOTE 5)**

**Figure 2-8. Typical System 25 Floor Plan**

### AC Power

All cabinets and any locally-connected System 25 peripheral equipment (System Administration Terminal [SAT], Station Message Detail Recording [SMDR] device, Digital Tape Unit [DTU]), and Customer Service Unit (CSU) used for DS1 connections must be plugged into the common ac power outlet. This outlet must have an associated ground block connected to an approved building ground, using #6 AWG copper wire. (This ground block is the system's single-point ground.)

A 1-cabinet system requires one quad ac outlet. A 2- or 3-cabinet system requires a second quad outlet and two separately fused 15-ampere circuits. Additional ac outlets may be needed for auxiliary equipment. All ac outlets must have the safety ground (green wire) cross-connected to the single-point ground block on the first quad outlet. (See Figure 2-9.)

Local options may require that surge protectors be used for all peripheral equipment used with the System 25, including the Customer Service Unit (CSU).

### Grounding

For proper grounding instructions, refer to the *AT&T System 25 Electrical Protection and Exposure Check List* (555-500-1 20).

**Warning:** Verify that the building ground has been provided by one of the methods listed below, that ac power uses approved building ground for its primary ground, and that all voltage limiting devices are grounded to building approved ground. Improper ground can result in equipment failures and service outages from lightning induced surges on the power lines.

An approved building ground for System 25 may be one of the following, listed in decreasing order of preference:

1. Building steel.
2. Acceptable water pipe— a metal underground water pipe at least 1/2 inch in diameter, in direct contact with the earth for at least 10 feet. The pipe must be electrically continuous (or made electrically continuous by bonding around insulated joints, plastic pipe, or plastic water meters) to the point where the protector ground is connected. A metallic underground water pipe must be supplemented by the

metal frame of the building, a concrete encased ground, or a ground ring. If these grounds are not available, the water pipe ground can be supplemented by one of the following types of grounds.

- **Metal underground gas piping system**—an electrically continuous metal underground gas piping system that is uninterrupted with insulating sections or joints and without an outer nonconductive coating.
  - **Other local metal underground systems or structures**—local underground structures such as tanks and piping systems.
  - **Rod and pipe electrodes**—a 5/8-inch (solid rod) or 3/4-inch (conduit or pipe) electrode driven to a minimum depth of 8 feet.
  - **Plate electrode**—expose a minimum of 2 square feet of metallic surface to the exterior soil.
3. **Concrete encased ground**—defined to be an electrode, consisting of at least 20 feet of one or more steel reinforcing rods at least 1/2 inch in diameter, or 20 feet of bare copper conductor not smaller than #4 AWG encased in 2 inches of concrete. This electrode must be located within and near the bottom of a concrete foundation or footing that is in direct contact with the earth.
  4. **Ground ring** consisting of at least 20 feet of bare copper conductor not smaller than #2 AWG encircling the building. The ground ring must be in direct contact with the earth and buried at least 2.5 feet below the earth's surface.

## Lightning Protection

System 25's lightning protection plan involves five distinct but interdependent items required at every installation:

- **Primary protection** in the form of voltage limiters (typically carbon blocks or gas tubes) on all pairs that leave the building, whether aerial or buried. These devices bypass surges to approved building ground and limit potential differences between T/R pairs and building ground to less than 1500 volts.

- A single-point ground (SPG) system in which the green wire ground (system ground) and the telephone company ground are connected to approved building ground.
- The coupled bonding conductor must be connected between the telephone company ground at the building entrance and System 25's SPG.
- Surge protection on the ac power to System 25.

For greater than 99 percent of all lightning strikes, the protection outlined above will do the job. However, there are a few locations where the described protection may not be sufficient. External secondary protection, located at the trunk access area of the System 25 cross-connect field, can be employed.

Several commercial units are available. If 66-type block terminations are used, a very convenient device is the LP5-230-220 Fused Lightning Protector. This unit plugs into the 66-block (in place of the shorting bars) and includes the sneak current fuse. One unit is required per protected pair. A ground bar is provided with the lightning protection units or can be ordered separately (Comcode 901-007-120). All lightning protectors located in the System 25 cross-connect area must be grounded to System 25's SPG via a #6AWG copper wire.

In addition, an AC Surge Suppressor (TII Model 428) may be required. Local practice should be followed. The unit plugs directly into one of the quad outlets and provides a dual outlet to protected equipment. Sufficient units should be provided to protect all at-powered equipment. Each cabinet in the system requires a protected outlet, and in addition, a protected outlet is required for each auxiliary unit, such as the SAT, a tape unit, or a printer. When a Surge Suppressor is used, all peripheral equipment directly connected to System 25 must be connected to alternating current via the Surge Suppressor.

## Secondary Protection

External secondary protection, located at the trunk access area of the System 25 cross-connect field, is required for all trunks and off-premises lines. Refer to Table 2-B for approved trunk protectors.

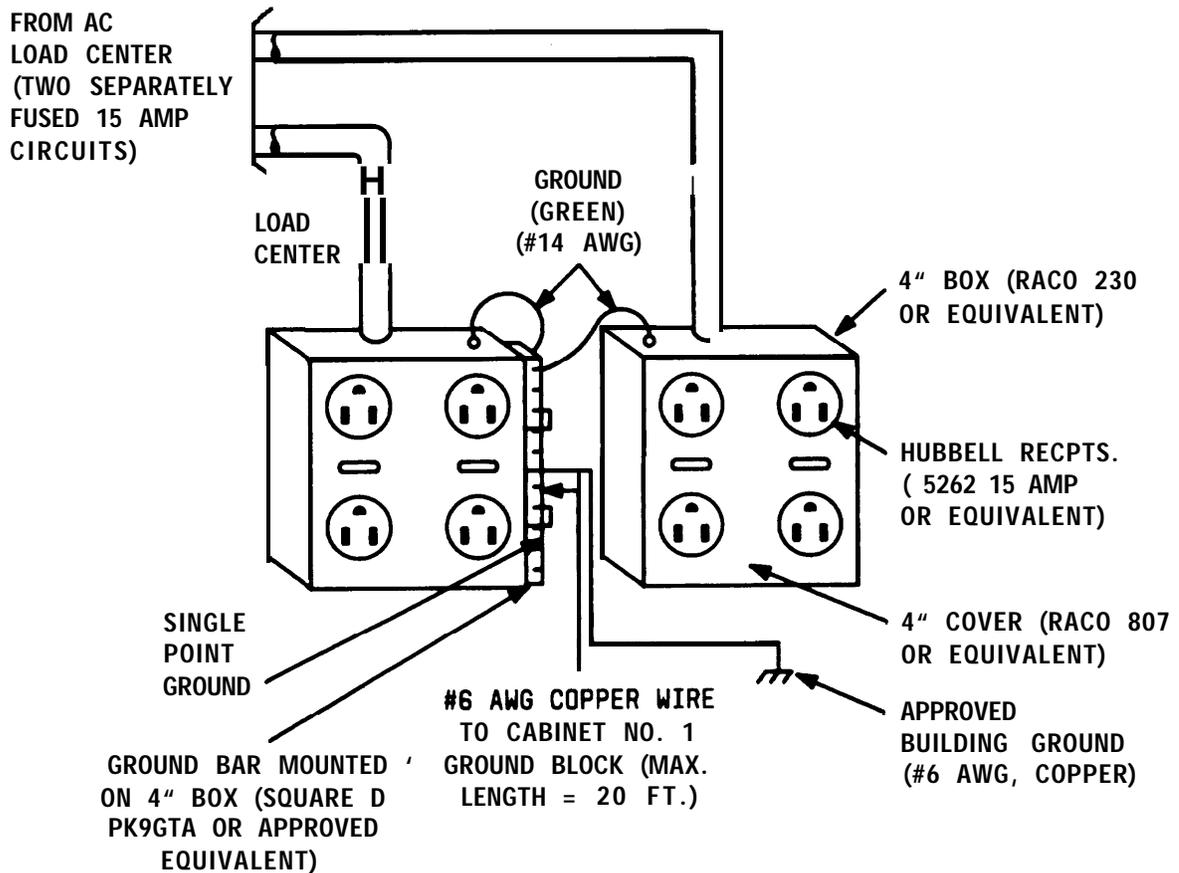


Figure 2-9. AC Power Distribution—Multiple Cabinet System

## Building Wiring

Building (station) wiring (must be 24 AWG or heavier) from voice and data terminals to the equipment location should already be in place. System 25 wiring requires that 4-pair circuits be distributed from the equipment location to each station's wall jack. The SIP hardware (Figures 2-2 through 2-6), designed specifically for this purpose, is furnished with each system. Except in extraordinary circumstances, this cross-connect hardware must be used.

In unusual circumstances where the 617A Panels are not used and some other cross-connect equipment that does not provide a modular jack interface to the port circuits is used, separate 4-pair circuits must be run for the voice and data terminal at the workstation.

All examples and instructions in this manual assume that a SIP is used.

The station wiring terminations in the equipment area should have been labeled to indicate the room location and jack number of the other end of the line. When SIP connections are made, the connection information should be entered on the Voice and Data Station Records Form (see *Install Equipment Room Station Cabling* in this part for details).

---

## INSTALL SYSTEM CABINETS

Before beginning the cabinet installation, position the cabinet table within 2 feet of the ac power receptacle. Make sure that the cabinets are easily accessible from both the front and the back.

### Position Cabinet(s)

**Caution:** A fully-equipped cabinet weighs 80 pounds.

1. Unscrew and remove the upper rear panel of each cabinet. Do not unscrew the lower part with the 12 connectors.
2. Near the center of the backplane, note an address plug in one of the positions marked 1, 2, or 3 on the black address strip. (Position 4 is not used.) This indicates the cabinet number for software purposes. The position of the plug (1, 2, or 3) should agree with the position of the cabinet (Cabinet 1 on the bottom, etc.).
3. Use the CAB 1, CAB 2, and CAB 3 labels from the cable label sheets (Figure 2-7) to label each cabinet. Position the cabinet label in the box adjacent to connector 12 on the lower back panel. (The number may have already been stamped by the factory.)
4. Stack the cabinets on top of one another on the stand. If there is more than one cabinet, stack Cabinet 1 on the bottom and Cabinet 3 on the top. Cabinet 1 contains the CPU/Memory (ZTN129 or ZTN130 [R3]), and Service (ZTN85 or ZTN131 [R3]) circuit packs (Figure 2-1 O). Do not replace the upper back panels yet.

### Check Cabinet Contents

Check to make sure that the cabinets have been delivered with the correct circuit packs (CPs). Table 2-B lists available CPs, their functions, and their protectors. If the system has TN760B Tie Trunk CPs, you may also have to set the option switches on the CPs. See "Set TN760B Option Switches" in Appendix C for details.

**Table 2-B. Circuit Packs, Their Functions, and Protectors**

Approved Secondary Wiring Protector	Circuit Pack	Function
N/A	ZTN78	Supports single-line voice terminals. (Must not be used on out-of-building circuits, )
SCP-1 or 79A	TN742	Supports off-premises, out-of-building, and bridged single-line voice terminals.
ITW/LINX343* I ROB	ZTN79	Supports the 7300H Series voice terminals used with a MERLIN® system. (Requires local (set) power for distances beyond 1000 feet.)
ITWILINX343* IROB	TN735	Supports MET sets.
N/A	TN726	Supports data terminals and computers.
N/A	TN758	Contains pooled modems.
SCP-1 , SCP-2, SCP-3, or LP5-230-220	ZTN76	Supports ground start trunks.
SCP-1 , SCP-2, SCP-3, or LP5-230-220	ZTN77	Supports bop start trunks.
SCP-1 or 79A	TN753	Supports direct inward dialing trunks. (DID)
SCP 1 or 79A	TN760B	Supports tie trunks.
N/A	TN763	Supports auxiliary equipment.
N/A	ZTN130 (R3)	Call processing/memory.
N/A	TN748B	Tone Detector.
SCP-1 or 79A	TN767	Provides DS1 Interface.
N/A	ZTN131 (R3)	Provides system clocks, tone generators, detectors, and DS1 synchronization.
SCP-1 or 79A	TN747E3	Supports ground start or loop start trunks.
ITW/LINX343* I ROB	TN762B	Supports hybrid voice terminals. Must be vintage 4 or later.

\*Note: IROB unit ITW341 has been replaced. Use model ITW/LINX343 only.

Two fans are located on the left-hand front side of each cabinet. The cabinet's power supply is located behind the fans; to the right of the power supply are up to 12 CPs in individual slots. Each CP is identified by a label on the front. See Figure 2-10.

1. Remove the front cover of each cabinet.
2. Note any obviously bent or otherwise damaged circuit packs.
3. Check the CPs against the customer order. In case of irregularities or damage, follow established notification procedures.

**Danger:** The System 25 cabinet contents are not user serviceable. Some voltages inside the cabinets are hazardous. This equipment is to be serviced only by qualified technicians.

The CPU/Memory (ZTN129 or ZTN130 [R3]) circuit pack has two shorting plugs that are used for factory tests (see Figure 2-1 1). They should have been removed at the factory. If these shorting plugs have been accidentally left in by the factory, the system may cold start when it should warm start.

Check the CPU/Memory CP; if the plugs are present, remove them. The shorting plugs are located on the component side of the circuit pack.

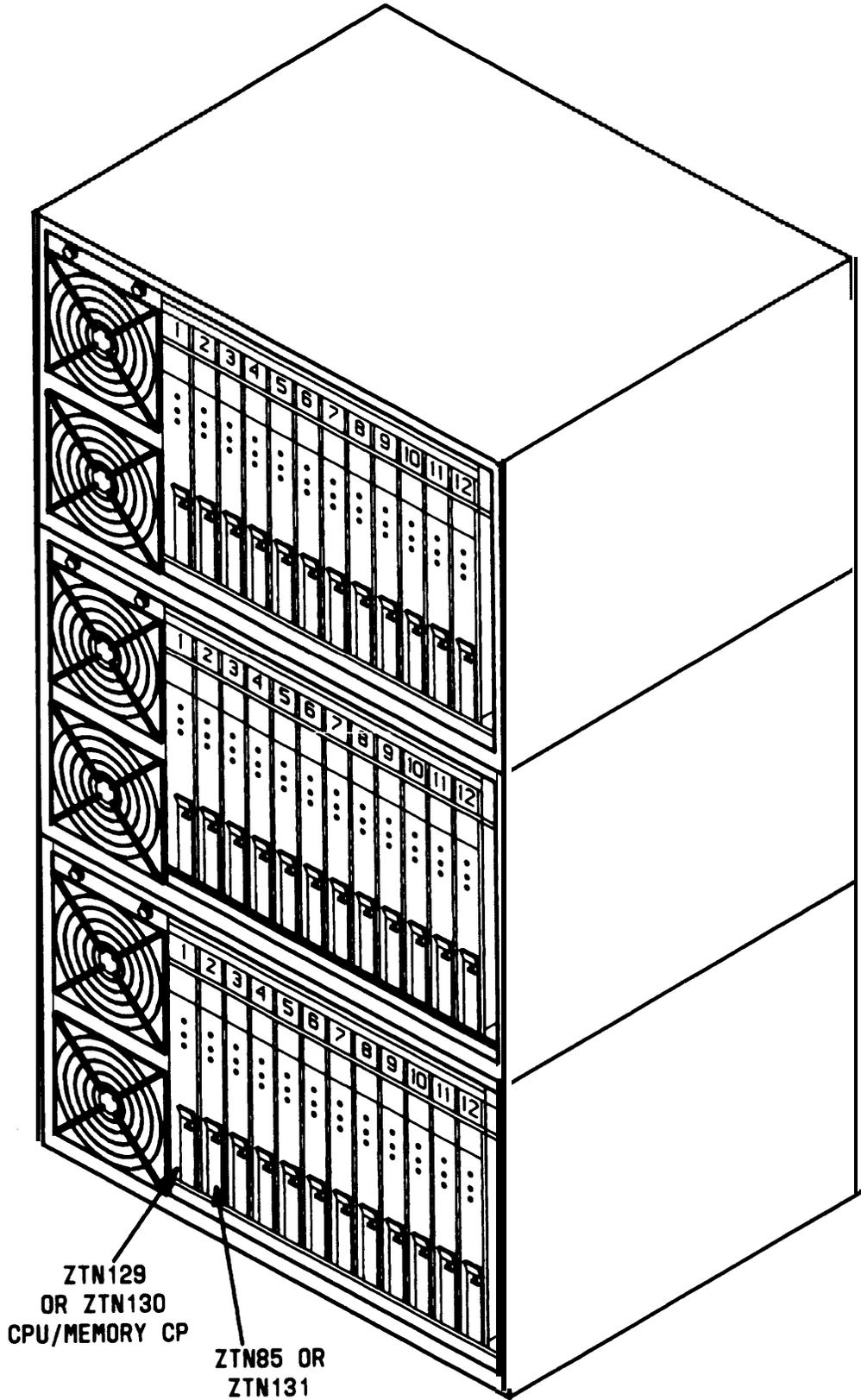


Figure 2-10. Three-Cabinet System, Front View With Covers Removed

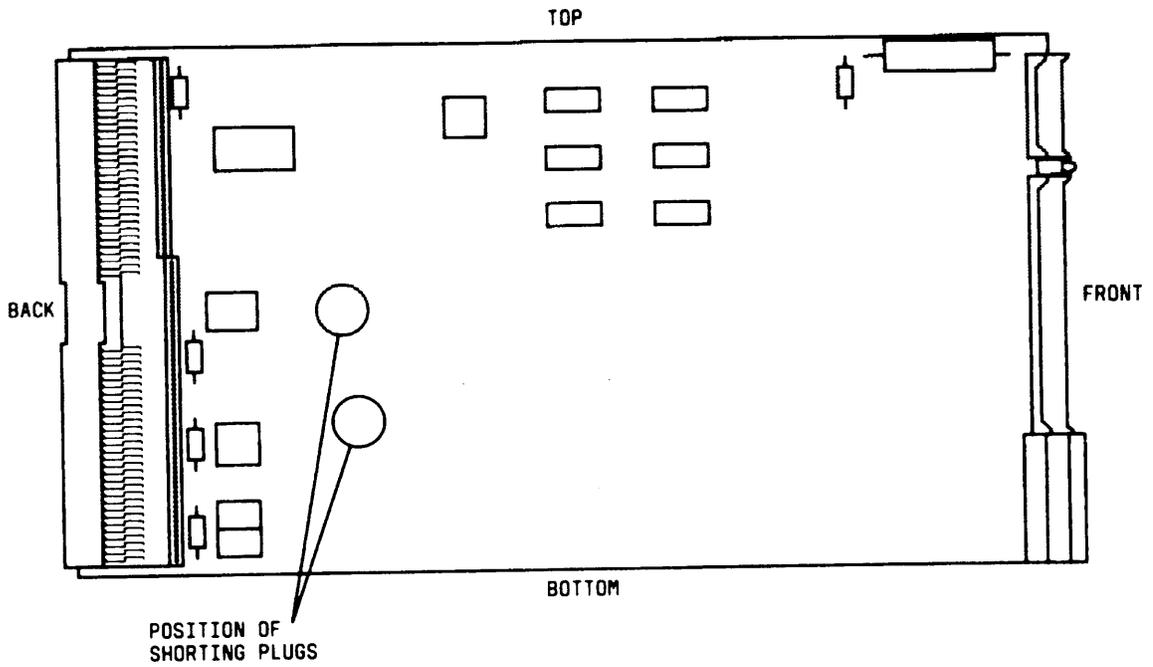


Figure 2-11. Position of Shorting Plugs on CPU/Memory Circuit Pack

### Required Circuit Pack Positions

The required CP positions for Cabinet 1 are:

SLOT	CP
1	ZTN129 or ZTN130 (R3)
2	ZTN85 or ZTN131 (R3)

Also, all DID Trunk circuit packs should be installed in Cabinet 1.

There are no other restrictions on CP position in a single-cabinet or multicabinet system; however, you should refer to the power supply unit load requirements for the maximum unit loads for each CP type within a single cabinet.

**Caution:** Be careful not to exceed unit load restrictions on each cabinet.

### Label Connectors on Back Cover

Each cabinet has twelve 25-pair receptacles across the bottom of the rear panel. These connectors link the CPs inside the cabinet to the Station Interconnect Panel (SIP) and Trunk Access Equipment (TAE). The connectors are numbered from 1 to 12 and correspond to the CP slots.

Using a felt-tipped pen, write the CP code for each slot in the box above the connector number on the lower rear cover.

## Install 4A Retainer Clips

The 4A retainer clips must be installed on each of the 12 receptacles on the lower rear panel of the cabinets. To install a clip, position it and insert the legs in the cabinet as shown in Figure 2-12.

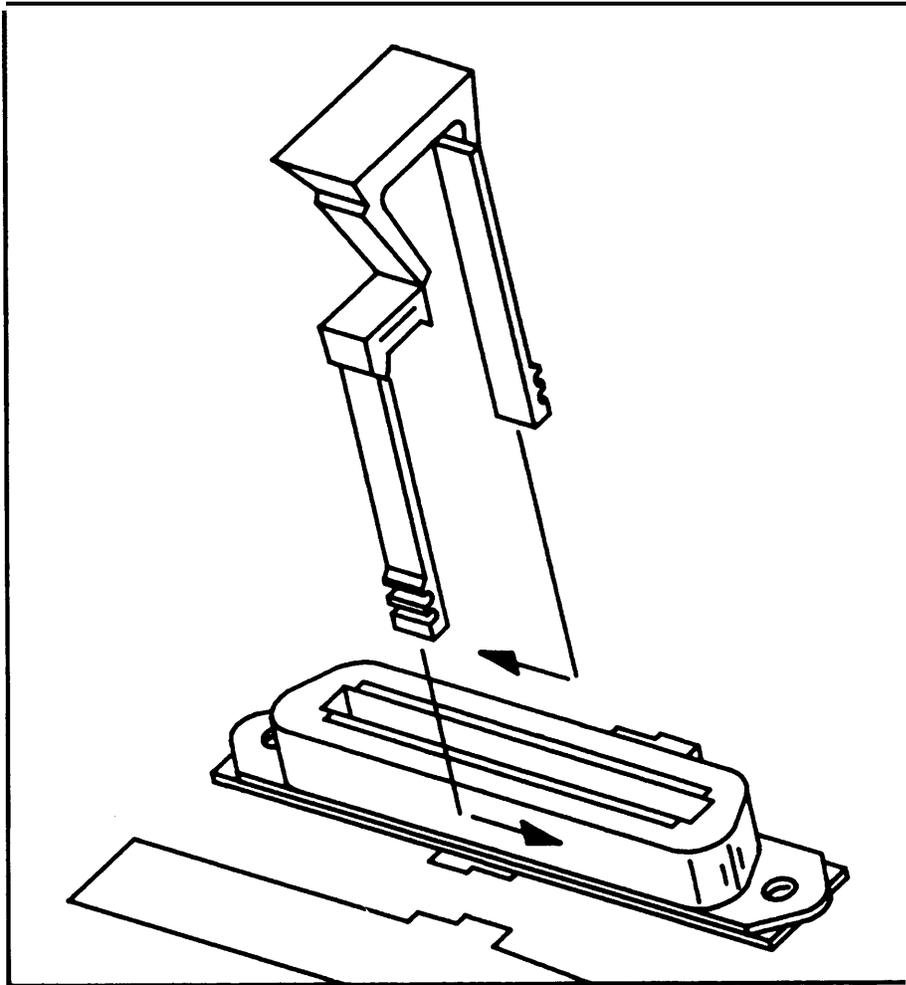


Figure 2-12. 4A Retainer Clip Installation

## Connect Cabinets

The Time Division Multiplex (TDM) bus extender cable and the intercabinet #6 AWG ground wire must be connected between cabinets. The TDM bus terminates on each side of the cabinet, and the intercabinet #6 AWG ground wire connects to the ground block at the rear of each cabinet.

**Note:** Make certain that the address plug is installed in the rear pin field of each cabinet (see Figure 2-13).

### *TDM Bus Connections*

One end of the TDM bus is terminated by resistors mounted on the ZTN129 or ZTN130 (R3) CP. This CP is always in slot 1 of Cabinet 1. The other end of the TDM bus is terminated by a Bus Terminator that plugs into the upper pin field of the topmost carrier (which may, of course, be the only cabinet). These connections are shown in Figure 2-13.

Whenever a cabinet is added, the Bus Terminator must be moved to the end of the bus on the new top cabinet. This can be either slot 1 or slot 12, depending on the number of cabinets and how the TDM bus extender cable is run.

When removing a Bus Terminator and TDM bus extender cable, take care not to bend the backplane pins.

1. Verify that the Bus Terminator is in the proper position:
  - Slot 12 of Cabinet 1 for 1-cabinet systems
  - Slot 1 of Cabinet 2 for 2-cabinet systems
  - Slot 12 of Cabinet 3 for 3-cabinet systems.
2. See Note. For 2- and 3-cabinet systems, install extender cable between slot 12 of Cabinet 1 and slot 12 of Cabinet 2. For 3-cabinet systems, install another extender cable between slot 1 of Cabinet 2 and slot 1 of Cabinet 3.

**Note:** When properly installed, the light blue stripe on the extender cable is at the bottom of the cable and the lettering on the cable (SER=1, for example, is right

side up).

3. **Install the upper rear panels. Route the extender cable between the slots formed by the upper and lower rear panels.**

# INSTALLATION

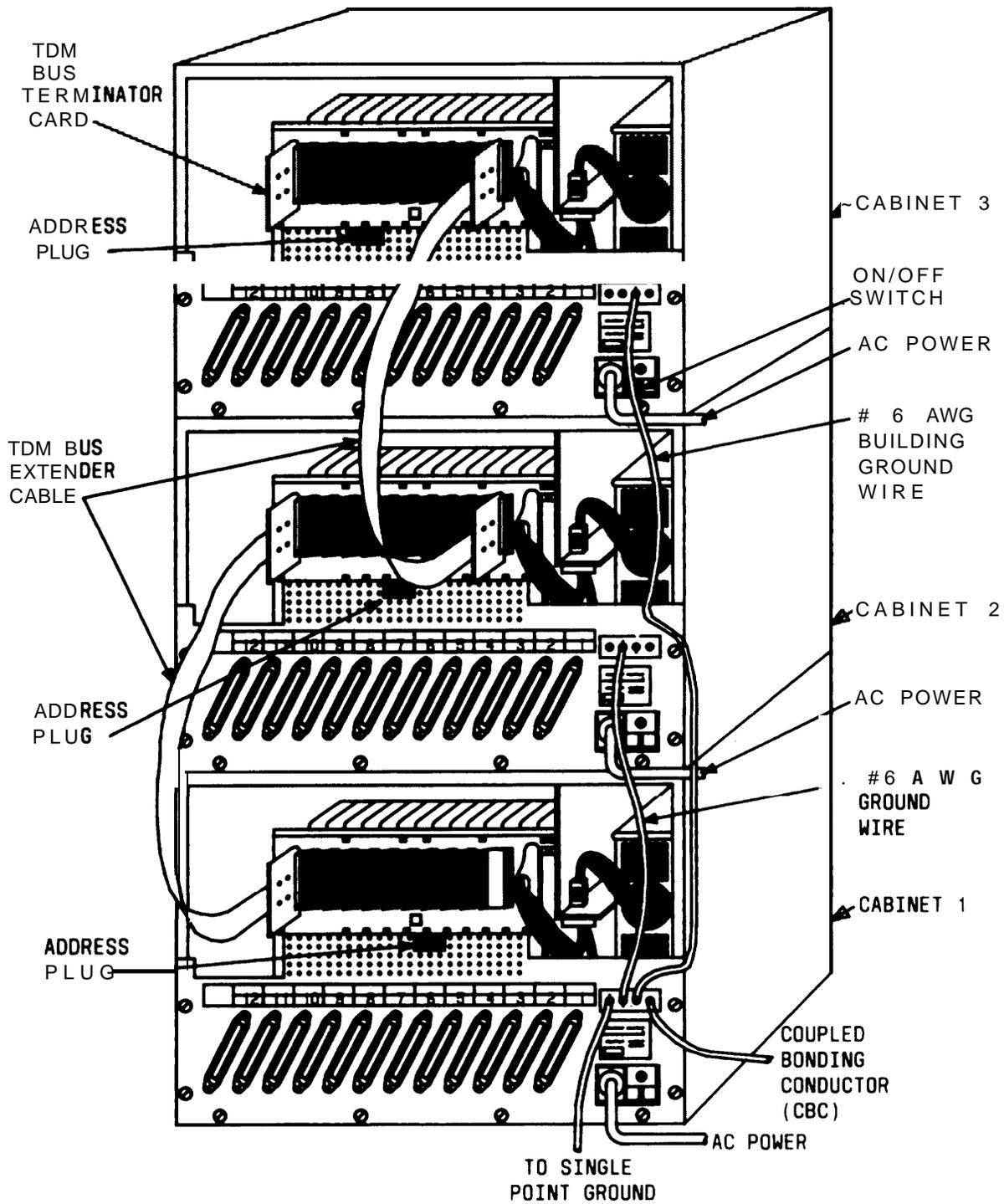


Figure 2-13. TDM Bus Terminations (Rear View of 3-Cabinet System)

### ***Ground Wire Connections***

The cabinets are connected to the single-point ground with #6 AWG copper wires. (Building ground requirements are described in *Preinstallation Requirements* in this section.)

**Warning:** The cabinet power switches must be set to off.

1. In 2- or 3-cabinet systems, connect a #6 AWG wire between the ground blocks of Cabinets 1 and 2 and Cabinets 1 and 3.
2. Connect a #6 AWG wire between the ground block of Cabinet 1 and the single-point ground. (See Figures 2-9 and 2-1 3.)

## **POWER UP AND INITIALIZE SYSTEM**

Separate power cords for each cabinet must be plugged into the designated quad outlets. Peripheral equipment (SAT, SMDR [Station Message Detail Recording], or CAS [Call Accounting System], DTU and CSU [Customer Service Unit]) collocated with the switch cabinet(s) must also be plugged into these ac outlets.

### **Connect Power**

1. Make sure the rear panel is in place on each cabinet.
2. Connect the receptacle end of a 3-wire power cord to the plug at the rear of each cabinet.
3. Connect the power cord's plug end to the quad ac outlet for each cabinet.
4. Recheck the electrical and ground connections.

**Danger:** Once power is applied, do not put your hands or any tools into the cabinet.

- Starting with Cabinet 2 or 3, turn on the power switch on each cabinet [Cabinet 1 must be last).

**IMPORTANT:** If power to Cabinet 1 is not turned on last, the cold start initialization may not occur properly.

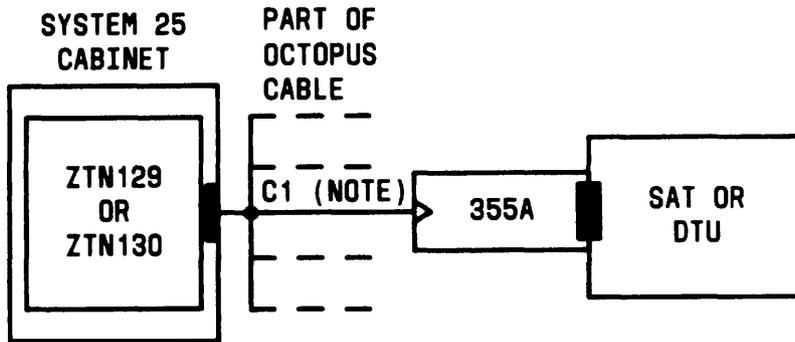
- Check to be sure that the cabinet fans are rotating.

### Connect Administration Equipment

Connect the SAT and DTU to their respective modular jacks on an 858A Adapter at the SIP.

If the SIP has not yet been installed, connect an octopus cable to Cabinet 1, slot 1. Make temporary connections as shown in Figure 2-14 to the SAT and

**Note:** The direct octopus cable connections are only temporary. All permanent connections to peripheral and station equipment should be made using the SIP.



**LEGEND :**

- ZTN129 - CPU/MEMORY CP
- c1 - OCTOPUS CABLE ( WP90780 )
- 355A ADAPTER - RS-232 PLUG TO MODULAR JACK
- 355AF ADAPTER - RS-232 RECEPTACLE TO MODULAR JACK

**NOTE :**

LEG 1 CONNECTS TO SAT; LEG 3 CONNECTS TO DTU.

Figure 2-14. Temporary SAT and DTU Connections

## Cold Start the System

To ensure that the system recognizes the current position of the CPs, you must cold start the system before beginning initialization. A cold start causes the system to check all slots for valid CP types and assign default translations to all ports (except auxiliary trunk ports).

A limited cold start is available. The limited cold start does not assign default translations to ports. The limited cold start is useful if the customer's dial plan is significantly different from the System 25 default plan. You do not have to delete the default codes before you enter the true dial plan. See the *Administration Manual (555-540-500)* for a listing of default translations provided in Release 3 systems.

The time required for a cold start depends on the number of CPs in the system, but is usually several minutes. A limited cold start takes about 30 seconds.

Follow these steps to manually start the system from the SAT:

1. Connect the SAT to the CPU/Memory CP administration port, (leg 1 of the octopus cable).
2. If the SAT has a selectable baud rate, set it to 1200 baud.
3. Be sure transmission parity is set to none, with the parity bit set to space (0).
4. Turn the terminal on and press the carriage return key once or twice. On most terminals, this key is <RETURN> or <ENTER>.

After communication with the system is established, a prompt is displayed:

Enter Password ->

5. Enter SYSTEM25 and press <RETURN>. The main menu will now be displayed along with the prompt:

Make one selection from menu ->

6. Enter 9 (for the SAVE/RESTORE selection) and press <RETURN>.

7. The system will respond with:

Action=

8. Enter 20 for a cold start. The system will respond with:

Save/Restore: Action=20 Data=

9. Enter D. The system will complete the word Data followed by the = sign.

10. Enter 1 for a cold start or 2 for a limited cold start. The system will respond with:

Save/Restore: Action=20 Data=1 (or Data=2)

You are about to initiate a cold start

c to continue, any other key to abort

11. Enter c to initiate the cold start.

Typing errors can be erased by pressing the backspace key. Each time you press the backspace key, one character is erased.

Cold and warm starts both display the same type of information on the SAT. This consists of a listing of the version of the firmware loaded in the CPU/Memory CP, followed by a configuration listing of all CPs recognized by the system. The CPU/Memory CP is not in the configuration listing; however, it is located in slot 1 of Cabinet 1.

Table 2-C provides a listing of SAT messages that may be displayed during a cool or warm start. The displayed message is a result of CP occupancy, type, and port translations.

Table 2-C. Displayed SAT Messages During Cold or Warm Restart

Circuit Pack (CP) in Slot	Port Translated	Displayed Message
No	Yes	Missing †
Yes	No	CP Type Listed #
Yes	Yes	CP Type Listed
Yes	Yes (doesn't match physical CP)	CP Type Listed*
Yes (Unsupported CP Type)	Yes or No	Illegal

† Warm restart only.

# Mark indicating that the CP is unused.

\* Mark indicating that the CP is mismatched.

## INSTALLATION

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The SAT message for a cold or warm start appears after the system has performed all self-tests and reading of its configuration. Typical cold start SAT message is as follows. The example is for a 2-cabinet system.

### *Typical Release 3 Version 3 Cold Start Message*

```
RESTART
TS ROM pair      1:version 3.5 *
FC ROM pair      1:version 3.13 .
FC ROM pair      2:version 3.13'
FC ROM pair      3:version 3.13 *
COLD START
```

Default Password in Effect

SLOT	CABINET 1	CABINET 2	CABINET 3
1			
2	ZTN85 06	TN75304	
3	ZTN79 03	TN760B 05	
4	ZTN79 03	TN760B 05	
5	ZTN79 03	TN760B 05	
6	ZTN79 03	TN760B 05	
7	ZTN78 02		
8	ZTN78 02		
9	ZTN78 02		
10	TN74703		
11	TN74703		
12	TN748 06		

\* This is important information that should be noted in trouble reports.

Message: Type <RETURN> for prompt.

Enter <RETURN>. The system will respond with the administration prompt:

```
SYSTEM 25 ADMINISTRATION
(CPU/Memory release information)
AT&T Copyright 1988
Enter password -->
```

---

## Check Performance of Cabinet Components

Each CP has three colored LEDs on the front panel that indicate whether it is functioning properly or not. When a cold start is performed, the system undergoes a series of self-tests and loads default translations.

Upon initial power application, each CP tests itself. The red LED on the CP lights to indicate that the test is in progress. Once the CP passes its initial tests, the red LED goes off. Then, after the main processor recognizes the CP and can communicate with it, the green LED lights. When all green LEDs are lighted, the testing and loading process is complete. This process takes about 3 minutes.

1. Make sure that both fans in each cabinet are on and operating.
2. Make sure that the green LED on the power unit behind the fan assembly is lighted.
3. Check the CP LEDs. Table 2-D lists the LED status of each type of CP.

**Table 2-D. Circuit Pack LED Status Indications**

Circuit Pack Type	LEDs if Normal	LEDs if Failed
<b>Service Circuit (ZTN85 or ZTN131 [R3])</b>	<b>Steady Green and Flashing or Steady Amber</b>	<b>Steady Red or Amber Off</b>
<b>CPU/Memory (ZTN129 or ZTN130 [R3])</b>	<b>Flashing Green</b>	<b>Steady Green or Off</b>
<b>All Other</b>	<b>Steady Green (Amber Also lighted when CP in use)</b>	<b>Steady Red (see Note below)</b>

**Note:** The red and green LEDs can both be lighted at the same time. In normal operation, a lighted red LED indicates that an alarm has been recorded for that CP. If the green LED is also lighted, the main processor can communicate with the CP. A lighted amber LED indicates that a resource on the CP is being used. A lighted red LED and a dark green LED indicates that the CP diagnosed itself to be so bad that it has removed itself from the system.

If all the CPs are operating properly, only the green LED on the CPU/Memory CP and the amber LED on the Service Circuit should be flashing. If any other CP has a no-lighted LED, the CP may need to be reseted. All port CPs green LED remains dark until at least one port on the CP has been translated.

Except for the CPU/Memory CP and Service Circuit CPs, power can be left on while a CP is reseted. To reset a CP, do the following:

1. See CAUTION. Make sure your hands are clean and dry. Put on a wrist grounding strap, and clip it to the grounding block at the rear of the cabinet.

**Caution: Static electricity can damage a CP.**

2. With your thumb, pull up on the latch pin of the removal lever. (See Figure 2-15.)
3. When the latch pin is up, pull the removal lever down until it stops, at an angle of about 30 degrees to the floor.
4. Tugging hard, pull the CP out a few inches. Leave it out for at least 30 seconds, and then push it back firmly into its slot. When it is almost back in place, you'll feel resistance. The removal lever will start to return to its vertical position.
5. Push the lever all the way to vertical until it catches on the latch pin.
6. After the power-up, repeat this process for each CP with dark LEDs (except for ZTN129 or ZTN130 [R3] and TN763s).
7. Recheck the LEDs on all CPs. (If a CP's LEDs are not lighted, the CPs are considered "unadministered" by the CPU. ) A lighted red LED on any CP indicated that it is faulty.

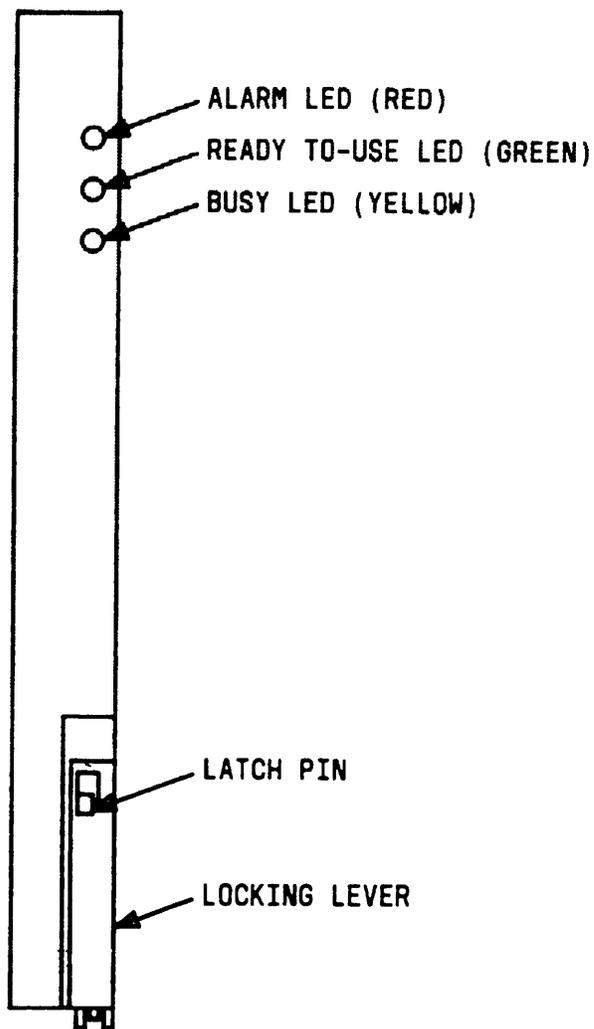


Figure 2-15. Typical System 25 Port Circuit Pack

### Report Problems

Follow local procedures to report faulty or damaged equipment.

## Initialize System

Instructions for initializing the system (based on the completed implementation forms) are provided in the *Administration Manual* (555-540-500).

**Note:** Before trunks using DS1 Signaling are administered, all link level parameters such as signaling and framing and all link level alarms must be cleared. If this is not possible, PBXs at each end will not work. If this condition exists, clear a maintenance busy condition that exists at each end.

## INSTALL CROSS-CONNECT EQUIPMENT

Before starting, familiarize yourself with the following equipment described in *CROSS-CONNECT EQUIPMENT DESCRIPTION*:

- **Trunk Access Equipment (TAE)**

700 A-110-B1 -25 or 700A-66-B1-25 Wiring Jacks

10B Emergency Transfer Units

- **Station Interconnect Panel (SIP)**

617A Panels

858A or Z210A2 Adapters

50A Fanning Strips.

Figure 2-16 shows a typical SIP and TAE backboard layout. Figure 2-17 shows an alternate layout that can be used when horizontal wall space is limited. These layouts can be reversed when the switch cabinet(s) must be installed to the right of the backboard.

### Install TAE, 617A Panels, and Fanning Strips

To install this equipment, proceed as follows:

1. For each RJ21X, RJ2GX, and RJ48X network interface, install one 700A Jack 1/2-inch from the edge of the backboard closest to the switch cabinet(s).
2. Mount the first 617A Panel.
3. Position and mount the first 50A Fanning Strip next to the 617A Panel. The edges should overlap so that the same screws will go through the overlapping key slots in the 50A Fanning Strip and the 617A Panel. The bottoms of the fanning strip and panel are flush.
4. If required, mount a second 50A Fanning Strip above the first.
5. Mount the first 10B Emergency Transfer Unit (ETU) in the position shown in Figure 2-16 or Figure 2-17. Overlap the edges of the ETU and the panel so that the same screws will go through the overlapped key slots.
6. Mount the remaining 617A Panels. Overlap the panels to conserve space and to reduce the number of screws required; however, do not mount more than three panels on either side of the 50A Fanning Strip.
7. If required, install the second ETU above the first.
8. If additional ETUs are required, install them close to the 700A Jacks (Figure 2-16). If the alternate SIP arrangement (Figure 2-17) is used, install additional ETUs above the second ETU.
9. Using a felt-tipped pen, letter the adapter columns (A through J) on the 617A Panels, starting with the left side. For the alternate arrangement, start with the left side on the lower row.
10. Using a #12 AWG ground wire, connect the ground points on the ETUs (screw terminal on the upper left side) and link them to the single-point ground.
11. Install D rings as required below the 700A Jacks and 617A Panels.

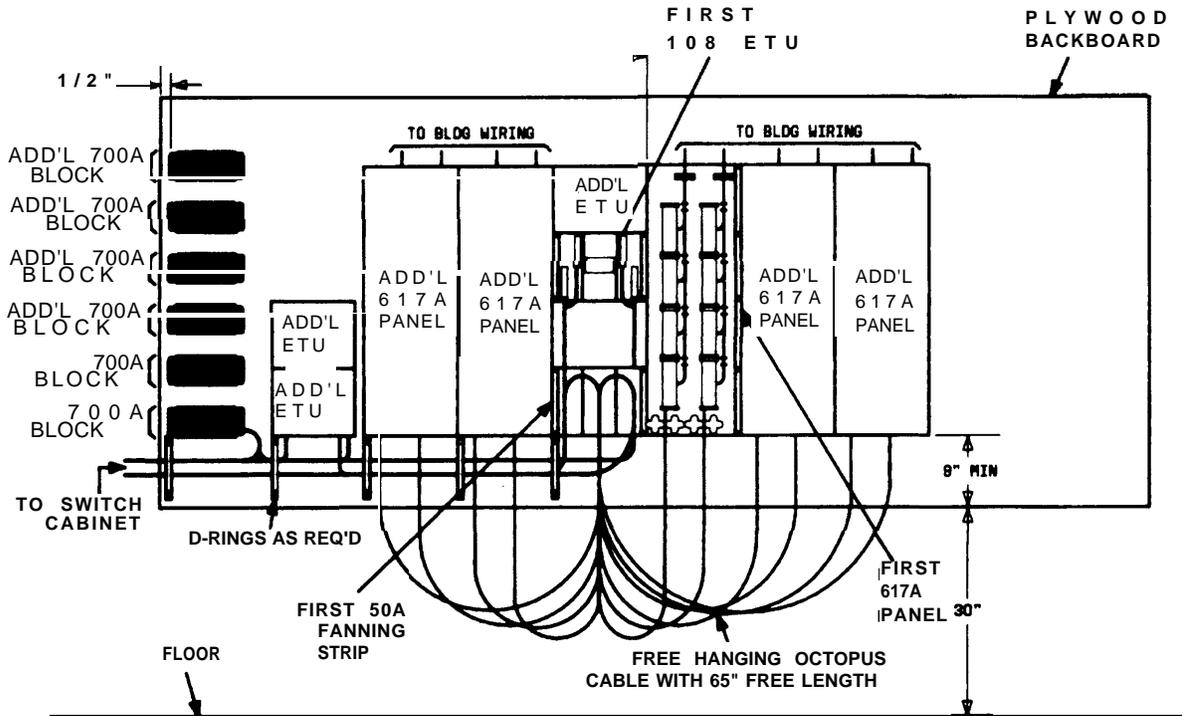


Figure 2-16. SIP and TAE Backboard Layout

# INSTALLATION

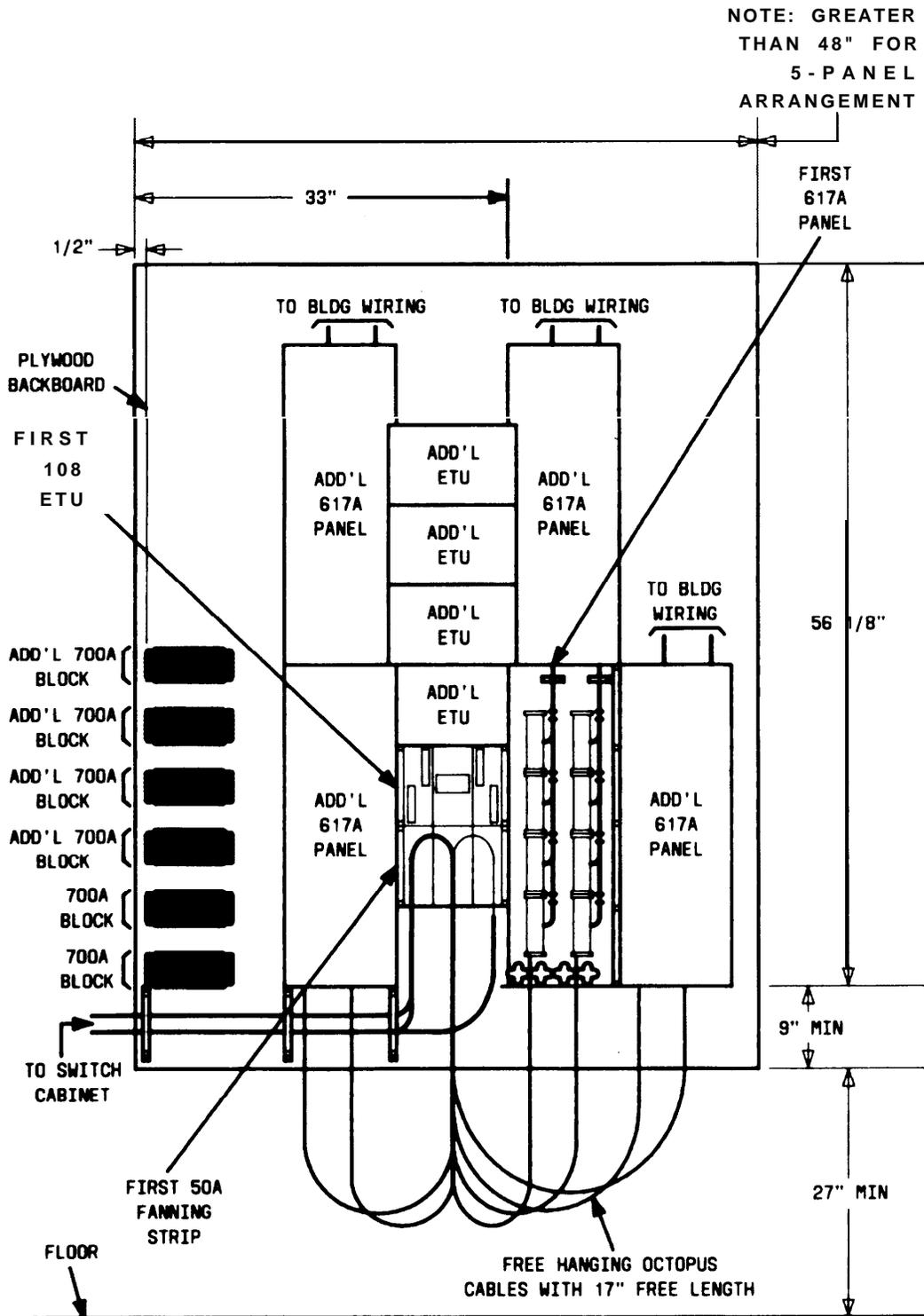


Figure 2-17. Alternate SIP and TAE Backboard Layout

## **Mount 858A or 2210A2 Adapters**

To install these adapters, proceed as follows:

- 1. Using a wide blade screwdriver, pry off the upper adapter mounting clip on the 617A Panel (Figure 2-18).**
- 2. Fit the mounting clip on the top of the adapter.**
- 3. Fit the adapter in the slot of the lower mounting clip.**
- 4. Press the upper mounting clip back into the panel.**

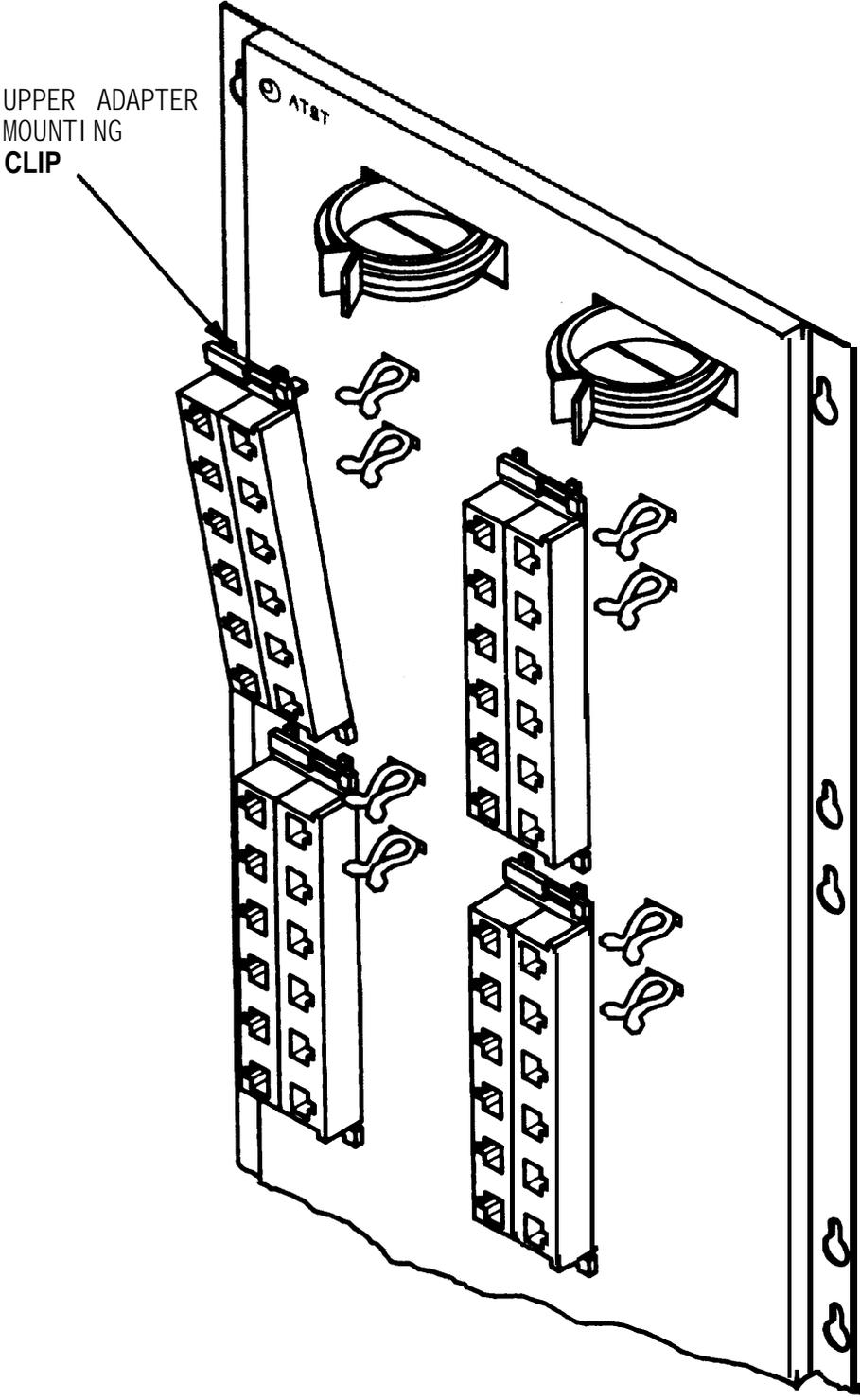


Figure 2-18. Mounting Adapters

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## INSTALL MODULAR BULK POWER SUPPLY (Optimal)

The 346 Modular Bulk Power Supply (MBPS) is a cost-effective and flexible alternative to the KS-2291 1 power supply. The 346 MBPS can be used where the wall-mounted (outlet) KS-2291 1 power supply cannot be used or where multiple KS-2291 1 power supplies are required.

The 346 MBPS consists of the 346A Power Unit and 346A1 Power Panel. Up to three 346A Power Units can be mounted in a power panel. Each 346A Power Unit is capable of powering four terminals with adjuncts (“1 O w” position), for a total of 12 terminals. Terminals powered by the 346A Power Unit can be located up to 1000 feet from the unit.

The 346 MBPS should be installed near the SIP. Service to the ac outlet powering the 346 MBPS must be a dedicated (nonswitched) 20-ampere line. A maximum of four power panels can be connected to the 20-ampere line. The AC Surge Suppressor (T11 Model 428) should be used with the 346A1 Power Panel.

## INSTALL EQUIPMENT ROOM TRUNK CABLING

As mentioned earlier, all outside lines must be connected to the system through connectorized network interfaces. These interfaces are connected to wall-mounted trunk access equipment (TAE), and from there to the cabinets.

### Connect Network Interfaces to TAE Blocks

The trunks and off-premises stations from the network interface must be cut down on the TAE's connecting blocks so that the trunks are grouped by type (loop start, ground start, DID, and tie) at the connecting block. Each connecting block can handle up to three groups of eight trunks or two groups of four tie trunks.

Each group *can contain only one type of trunk*. For loop start, ground start, and DID trunks, the first group of eight trunks goes to leg 1 of the splitter cable; the second group of eight trunks goes to leg 2; and the third group of eight trunks goes to leg 3. For tie trunks, the first group of four trunks goes to leg 1 of the splitter cable; and the second group of four trunks goes to leg 2.

Tie trunks must be segregated on a separate block because a different splitter cable is used. Also, off-premises stations must be segregated one 700A Jack.

The first five trunks in each group of eight (loop start or ground start trunks only) can be connected through an ETU to five power failure transfer stations. However, all eight trunks are connected to, and pass through, the ETU.

The ETU also supports a DID make-busy function to the central office's extra pair (if required). Relay contacts for the DID make-busy function appear on the 25th pair on the TAE block. The relay contacts are normally open. When power fails, the contacts close, making all DID trunks appear busy to the central office. This prevents the central office from taking the DID trunks out of service.

A maximum of four ETUs are supported. For a system with more than one ETU, apportion the emergency transfer trunks so that they are in the first subgroup of five in each subgroup of eight trunks on a connecting block.

1. Connect an A25D 25-pair single-ended cable to each network interface receptacle.
2. Cut down the other end of each cable on the top terminal row of a 700A Jack in groups of eight trunks (four for tie trunks), as described above (see Note). Cut down the DID make-busy pair (if provided) to terminals 49 and 50 on the block.

**Note:** Facilities used for off-premises stations, must be segregated on one 700A Jack.

3. Install secondary wiring protectors (sneak current fuses) between the bottom terminal rows on the 700A Jacks for each trunk cut down on the top row. (Approved protectors are listed in Table 2-B, along with their respective CPs.)

---

## Connect Cabinets to TAE Blocks

The connections between the cabinets and the TAE blocks are made using connectorized splitter cables. Make sure that each trunk group on each connecting block is connected to the correct type of CP and protected with its approved secondary protector (as shown in Table 2-B).

Central office trunks associated with emergency transfer and off-premises stations (OPSS) are not connected directly to the cabinets. If you are installing trunks that are to be used for OPS, see *Off-Premises Stations* in this part. Also, to complete the procedure for installing trunks used for emergency transfer, you must go to *Install Emergency Transfer Units (ETUS)* in this part.

### *Connect Ground Start, Loop Start, and DID Trunks*

A 3:1 connectorized splitter cable, WP90929, L1, is required to connect the 700A Jack to the cabinet for these trunks.

1. Install secondary protectors (see Table 2-B).
2. Using the cable label sheets provided (Figure 2-7), label the back of the hood of each of the connectors (1, 2, and 3) on the three legs of the splitter cable (see Note). Use an appropriate cabinet and slot number label (CAB 1 SLOT9, for example).

**Note:** If one or more of the legs contain trunks that are to be used for emergency transfer, do not label these legs. Set the legs aside and go to *Install Emergency Transfer Units (HUS)* in this part to complete the installation of these trunks.

3. On connector O, install labels that correspond to those used on each of the three splitter cable legs. Position the labels so that they will be clearly visible after the cable is plugged in.
4. Plug connector O into the 700A Jack.
5. Except for legs containing trunks to be used for emergency transfer, connect connectors 1, 2, and 3 to the cabinet. Connect only to ZTN76 Ground Start, ZTN77 Loop Start, or TN753 DID CPs.
6. Repeat procedure as required.

### ***Connect Tie Trunks***

A 2:1 connectorized splitter cable, WP90929, L3, is required to connect the 700A Jack to the cabinet for tie trunks.

1. Install secondary protectors (see Table 2-B).
2. Using the cable label sheets provided (Figure 2-7), label the back of the hood of each of the connectors (1 and 2) on the two legs of the splitter cable. Use an appropriate cabinet and slot number label (CAB 1 SLOT8, for example).
3. On connector 0, install labels that correspond to those used on each of the two splitter cable legs. Position the labels so that they will be clearly visible after the cable is plugged in.
4. Plug connector 0 into the 700A Jack.
5. Plug connectors 1 and 2 into the cabinet. Connect only to a TN760B Tie Trunk CP.
6. Repeat procedure as required.

## Install DS1

DS1 signaling allows a digital connection between the System 25 and other PBXs, Central Offices, Toll Offices, off premise stations, and data end points such as host computers. The TN767 emulates ground start, loopstart, tie and DID Trunks in addition to off premises stations. The ZTN131 circuit pack provides the required digital synchronization. The TN748 circuit pack will provide the Touch Tone registers.

The term synchronization refers to an arrangement where by digital facilities operate from a common clock. This allows the receiving facilities to keep the digital signals in step or synchronized. Synchronization can be provided by the system 25 any other PBX it is connected to, or by the CO being used by the network, Synchronization must be properly engineered before installation is begun. Each node must be aware of the synchronization plan so that it may be properly administered.

The TN767 circuit pack generates a signal that is shaped in a manner that when it reaches the cable it conforms to power specifications. The level of the signal must be adjusted according to the cable distance. If the DS1 Interface terminates at the cross connect field or at a CSU, the total cabling distance must be used. If the DS1 Interface terminates on another PBX (direct connection), a phantom point midway between the two PBXs should be used as the reference point. The line equalization/compensation for S25 is set via administration procedures from the SAT.

### *Connect S25 to Another On Premises PBX*

When the S25 and the other PBX are in the same building, the cabling is broken down into three different distance ranges. The first connection is for distances of 1310 feet or less. The second distance range is 1311 to 4310 feet which requires the use of a Customer Service Unit (CSU) equipped with an Office Repeater. The third distance range is greater than 4311 feet. It uses a CSU and T1 line repeaters as required.

#### **Direct Connection—Less Than 1310 Feet**

Figures 2-19 and 2-20 show two different direct connections. Figure 2-19 is normally used for connecting a S25 to another PBX that is virtually side by side.

Figure 2-20 is used for direct connections that involve more distance. Figure 2-20 shows two S25s but a DEFINITY G1 or G2, System 75, or System 85 can be connected directly to the S25. Consult the System 85 installation manual (555-103-104) or the DEFINITY G1 Wiring Guide (555-204-111) or the System 75 Wiring Guide (555-200-111) for the connection information for those PBXs.

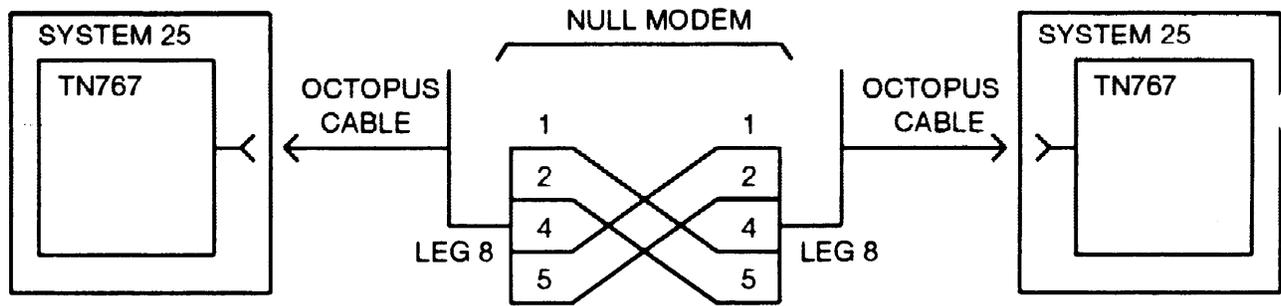
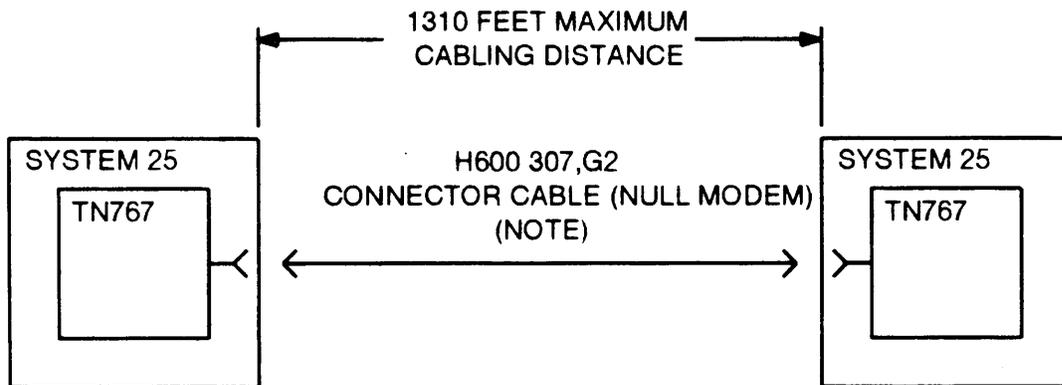


Figure 2-19. Direct Connection (Side by Side)

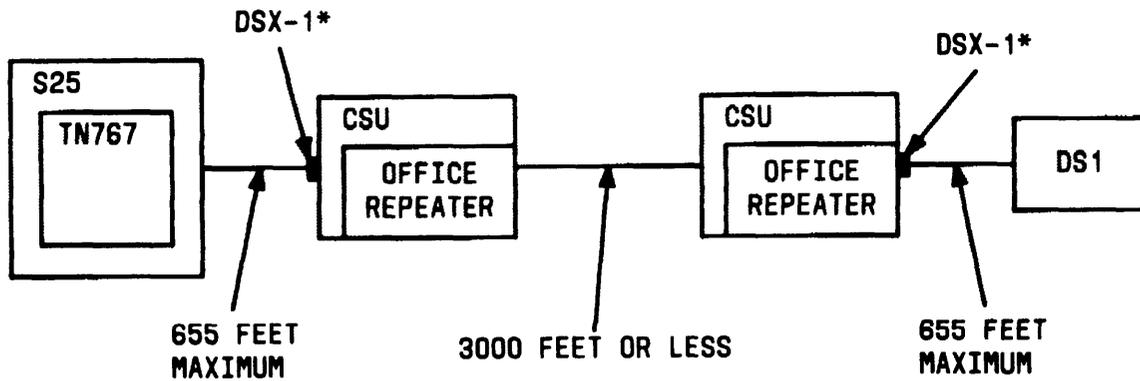


NOTE: FOR DISTANCES OVER 50 FEET (15.2 M)  
 USE C6E CONNECTOR CABLE(S) BETWEEN  
 H600 307,G2 CONNECTOR CABLE AND DS1  
 TRUNK CIRCUIT PACK.

Figure 2-20. Direction Connection (Side by Side)

**Connections Between 1311 and 4310 Feet**

For distances between 1311 and 4310 feet, CSUs equipped with Office repeaters must be used to regenerate the DS1 signal. See "Install CSU" section of this manual for the installation instructions for the CSU. Figure 2-21 shows a functional diagram of this connection. If the connection is being made between the S25 and a DEFINITY G1 or G2, System 75, or System 85, refer to the System 85 Installation Manual (555-1 03-104) or the DEFINITY G1 Wiring Guide (555-201-1 11) or the System 75 Wiring Guide (555-200-111) for the connecting information.

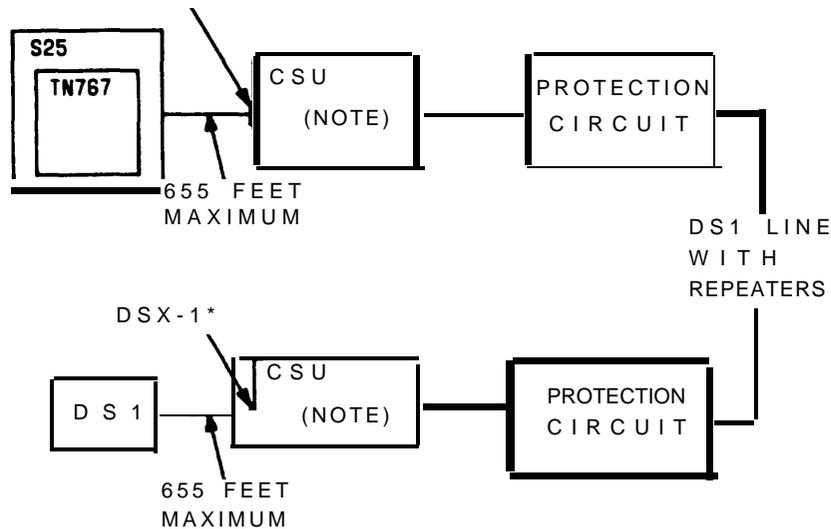


\* DSX-1 REFERS TO A PHYSICAL CROSS-CONNECT FOR DS1 SIGNALS

Figure 2-21. DS1 Connections—1311 to 4310 Feet

**DS1 Connections—4311 Feet or More**

For distances of more than 4311 feet, T1 line repeaters are required in addition to the CSUs. See the "Install CSU" section of this manual for installing the CSU. Figure 2-22 shows a functional diagram of this connection. If the connection is being made between the S25 and a DEFINITY G1 or G2, System 75, or System 85, refer to the System 85 Installation Manual (555-1 03-1 04) or the DEFINITY G1 Wiring Guide (555-204-111) or the System 75 Wiring Guide (555-200-111) for the connecting information.



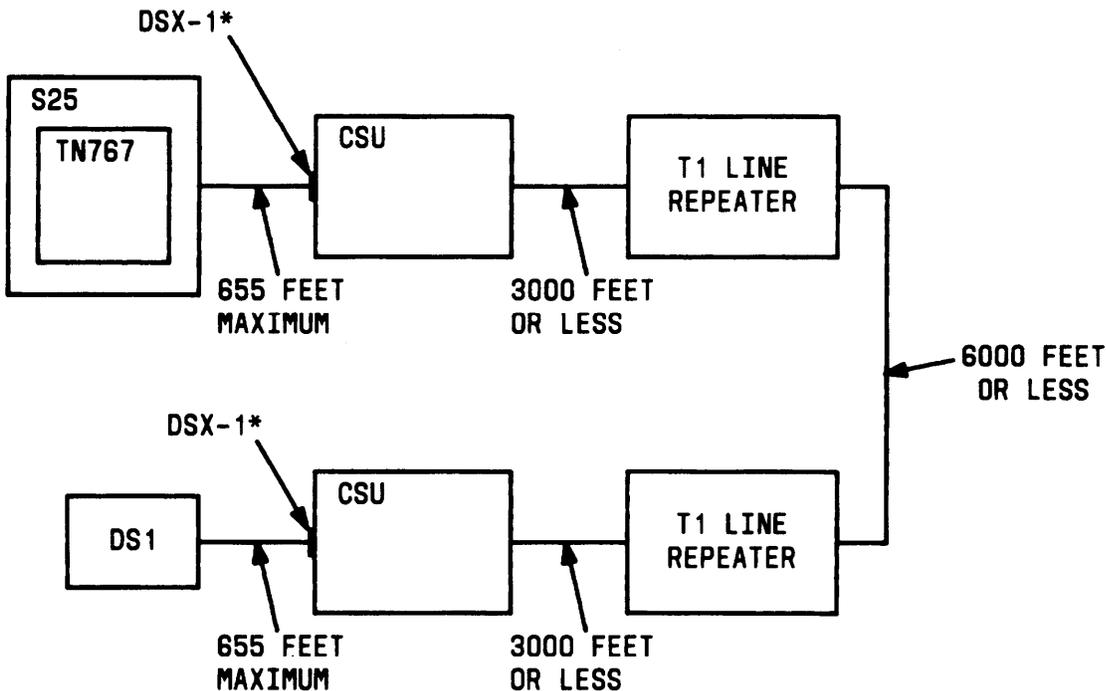
NOTE : USE OF THE OFFICE REPEATER IS OPTIONAL DEPENDING UPON THE DISTANCE TO THE FIRST T 1 REPEATER

\*DSX-1 REFERS TO A PHYSICAL CROSS-CONNECT FOR DS1 SIGNALS

Figure 2-22. DS1 connections—4311 Feet or More

**Off Premises Metallic (Cable) Connections**

The connection between the System 25 and another DS1 interface is in most cases a T1 line with repeaters. The proper lightning protection must be provided (as shown in Table 2-B). Figure 2-23 shows a diagram of the off premise cabling. See the “install CSU” section of this manual for the installation instructions for the CSU.

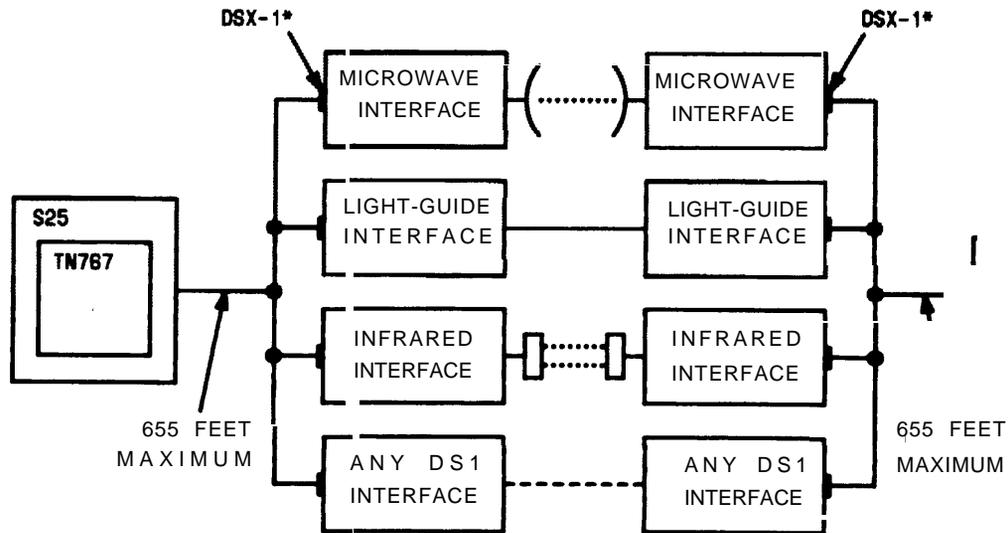


\*DSX-1 REFERS TO A PHYSICAL CROSS-CONNECT FOR DS1 SIGNALS

Figure 2-23. DS1 Connections—Off Premise Cabling

**Off Premises Non Metallic Connections**

Many alternatives to DS1 metallic transmission facilities exist. Some of these systems include lightguide (fiber optics), microwave, infrared, and radio waves. Other type transmission facilities can be used as long as they are technically compatible and connected via the DS1 cross connect point. Figure 2-24 shows a block diagram of non metallic cabling transmission systems.



\*DSX-1 REFERS TO A PHYSICAL CROSS-CONNECT FOR DS1 SIGNALS

Figure 2-24. DS1 Connections—Non Metallic Connections

**Install Customer Service Unit (CSU)**

The CSU may either be rack mounted or mounted as a standalone unit. It can be equipped with several different plug in units, the Signal Monitor Unit, T1 Office Repeater, and a Fault Location Filter.

**Install the Plug In Units**

Refer to the documentation provided with the CSU for the information for setting the options and installing the plug in units.

**Mount the CSU**

The CSU may either be rackmounted or mounted as a standalone unit. If the CSU is to be rack mounted, insert the unit and attach it to the cabinet uprights using four screws. If the unit is a standalone unit, place it in the designated location. The CSU should be mounted as close to the network interface as possible.

**Connect the CSU**

The CSU can be powered by the line or from a locally provided -48 V dc power supply. Figure 2-25 shows the connections for connecting the CSU. The 48 V and GRD leads are optional according to how the CSU is powered.

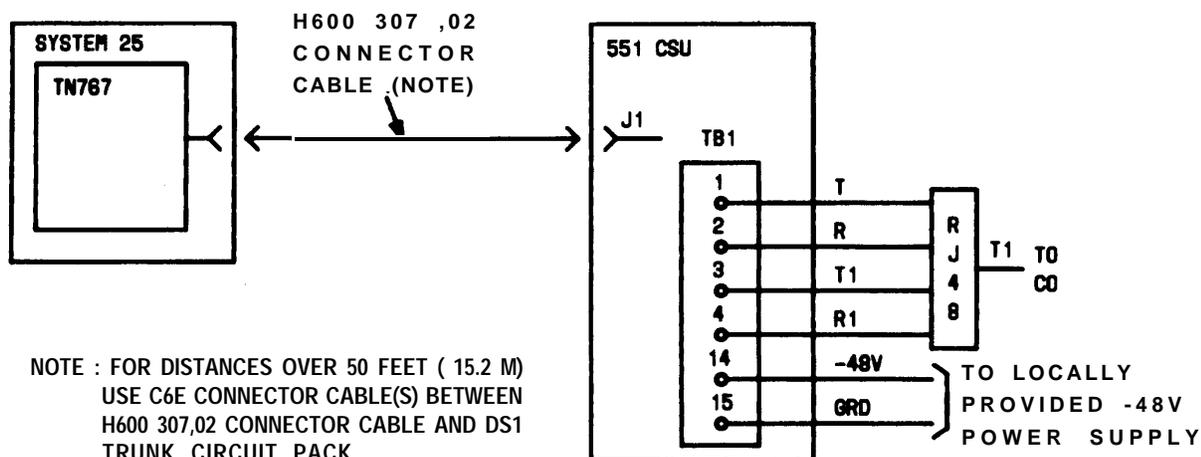


Figure 2-25. CSU Connections

**Line Compensation/Equalization**

Determine the cable distance of the line, either to the line termination or “phantom” midpoint of a direct connection. Refer to the System 25 Administration Manual (555-540-650) for instructions on setting the line equalization.

**Connect Coupled Bonding Conductor (CBC)**

Each network interface (RJ48X) is associated with a service entrance (protector block) ground. A CBC should be connected to this ground. If the local telephone company has not run a CBC up to the network interface, you should run it yourself. Use #12, #14, or #16 AWG wire. Start the CBC at the protector block ground, and run it as close as possible to the facilities cable. If possible, tie wrap the CBC to the facilities cable. Do not use spare pairs in the telephone company cable for this purpose.

Consideration should be given to installing secondary protection on each out-of-building facility connected to the TAE if any of the following conditions exist:

- The service entrance (protector block) ground is not properly installed (bonded to building ground, for example).
- The local telephone company does not permit access to the protector block.
- High-voltage surge protection is not provided.

Install the CBC as follows:

1. Connect one end of the CBC to the ground point at the network interface.
2. Wrap the CBC loosely around the cable from the network interface to the TAE and then around a splitter cable to the cabinet. If possible, tie wrap the CBC to the cables.
3. Connect the end of the CBC to the ground block on Cabinet 1. See Figure 2-13.

## **INSTALL EQUIPMENT ROOM STATION CABLING**

System 25 is connected to the building (station) wiring in two stages. First, the building wiring is connected to the Station Interconnect Panel (SIP). Then, the octopus cables from the back of the cabinets are connected to the SIP.

Accurate documentation during installation is essential to the performance and maintenance of System 25 and will make initialization and administration much easier to perform. The Voice and Data Station Records Form (Figure 2-26) traces the connection from the workstation where the voice or data terminal is located to the SIP. Obtain this form from the Implementation forms that the TC or TCSS has prepared for system initialization. When you install the station wiring, enter the jack number and SIP number for each terminal to identify each end of the cable run. Number and label the station jacks per local practice.

As the octopus cables are connected to the SIP, the port assignment for each station should be added to the Voice and Data Station Records Form. Port assignments are identified by cabinet number (1, 2, or 3), circuit pack slot number (1 through 12), and port number (1 through 8). For example 1-10-06 or 11006 identifies port number 6 in the circuit pack located in slot number 10 of Cabinet 1. The port number is the same as the octopus cable leg number.



### Connect Building Wiring to SIP

The type of building wiring termination determines what types of adapters are used. Two types are supported: 4-pair cable (cut down) and modular jack. Any combination of adapters may be mounted on a 617A Panel. Cluster the connection on the SIP by voice terminal type: single-line, 7300H Series\*, Multibutton Electronic Telephone (MET), and voice/data.

#### *Modular Plug Termination*

Each 4-pair modular plug supports one station (Figure 2-27). It connects to a modular jack in a Z210A2 Adapter.

1. Run the 4-pair cable through the rings at the top of the 617A Panels.
2. Connect the plug to any Z210A2 Adapter.
3. Feed the cable into the two purse lock clips at the adapter.
4. Using a felt-tipped pen, record the building wiring destination on the adapter's grey modular jack.
5. Repeat the process until all of the 4-pair building cables are connected to the SIP. Some spare adapters should be left on the SIP to accommodate growth.
6. Twist the purse lock clips closed.
7. Document the connections you have made on the Voice and Data Station Records Form (Figure 2-26).

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\* These terminals are also used in a MERLIN communications system.

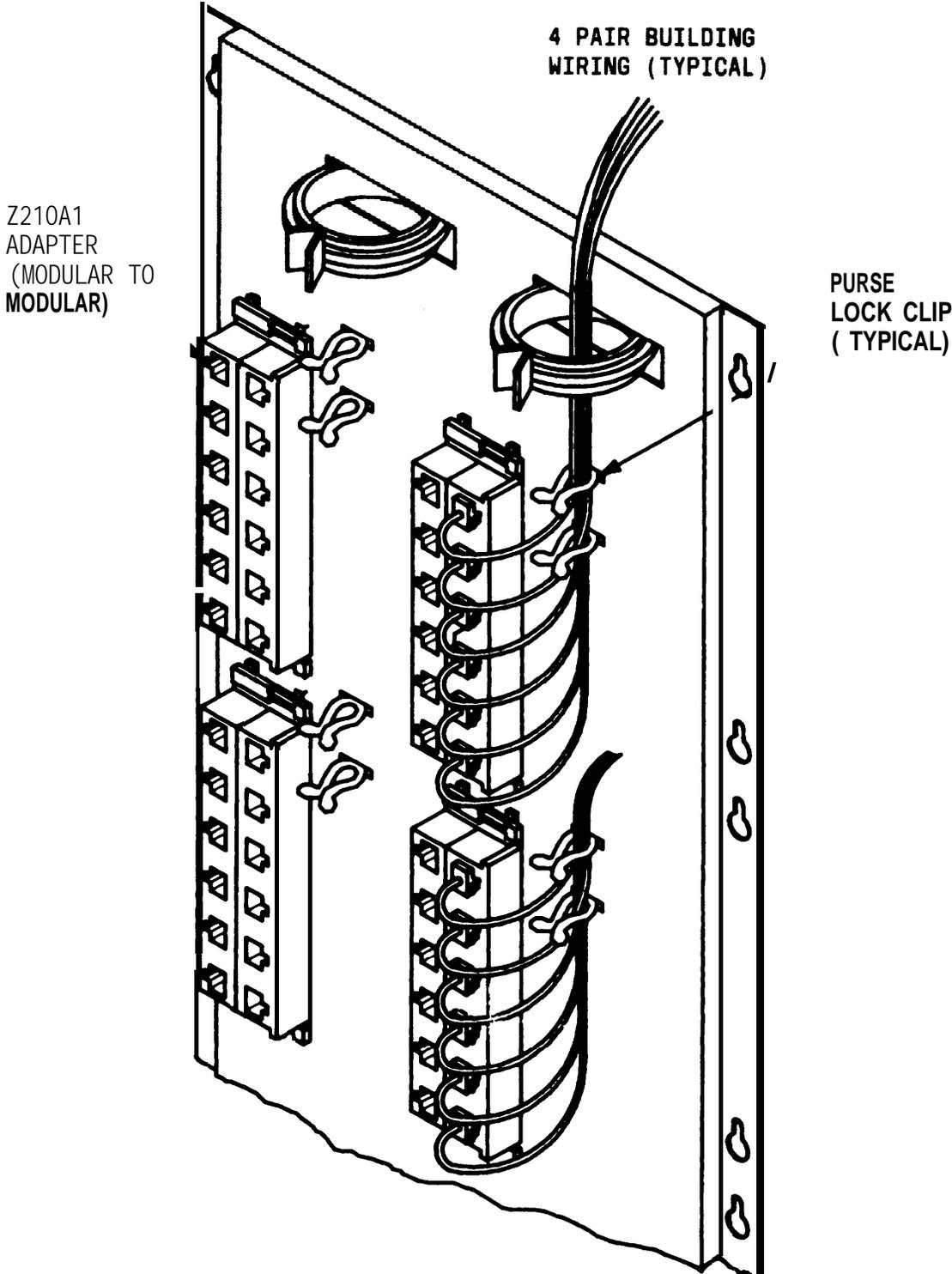


Figure 2-27. Modular Plug Terminations Connected to the SIP

**4-Pair Cable Terminations**

Each 4-pair cable supports one station (Figure 2-28). It connects to a wiring block on a 858A Adapter.

1. Run the 4-pair cable through the rings at the top of the 617A Panels.
2. Cut down the leads starting with Pin 1 of the wiring block located beside the modular jack (Figure 2-28).

Wiring Block Pin No.	DIW Cable Color Code
1	W-BL
2	BL-W
3	W-O
4	O-W
5	W-G
6	G-W
7	W-BR
8	BR-W

3. Using a felt-tipped pen, record the building wiring destination on the wiring block caps.
4. Repeat the process until all of the 4-pair building cables are connected to the SIP. Some spare adapters should be left on the SIP to accommodate growth.
5. Feed the six cables for each adapter into the two purse lock clips at the adapter. Twist the clips closed.
6. Document the connections you have made on the Voice and Data Station Records Form (Figure 2-26).

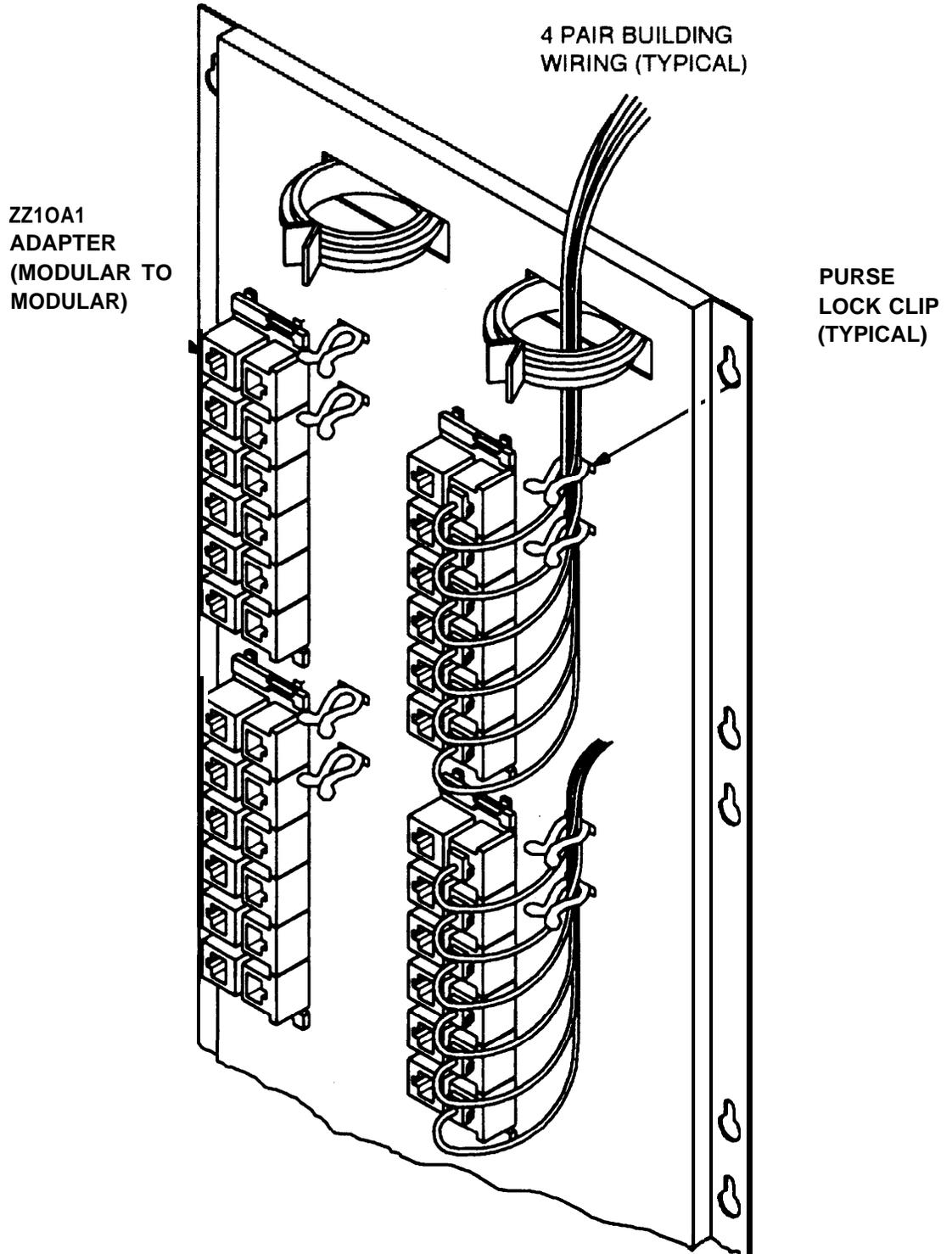


Figure 2-28. Cut Down Terminations Connected to the SIP

**Connect Cabinets to SIP**

Table 2-E shows the type of terminals that can be connected to each CP type and the maximum allowable cabling distances to the system cabinets. Refer to the Voice and Data Station Records Form for the terminal types assigned to each workstation.

**Caution:** Connecting a terminal to the wrong type of CP can damage the pack.

**Table 2-E. Circuit Pack Versus Terminal Type**

Circuit Pack	Terminal Type	Distance (in feet) From Cabinets Using 24 AWG Wire
ZTN79 TN762	7300H Series and ATL Cordless Telephone	2,000 (See Note 1 )
TN735	MET (4 Ports)	1,000 (in-Building Only)
ZTN78	Single-Line	2,000 (in-Building Only, Non-Bridged)
TN742 TN746B	Single-Line (Out-of-Building, extended, or off-premises)	24,000 (or Class COPS)  (Note 2)
TN726	Data Terminals and Computers	2,000 (in-Building Only, (Note 3)
TN767	Single-Line Off Premises	655 (Note 4)

**Note 1:** Local (set) power is required for distances beyond 1,000 feet.

**Note 2:** Only five sets can be bridged, and only two can be off-hook at the same time.

**Note 3:** This distance is for 19.2 Kbps data rate. At lower speeds, the distance is greater. Also, this distance can be limited by the terminal type. See the *Reference Manual(555-540-200)* for details.

**Note 4:** DS1 signaling for off-premises station. The distance from the cabinet to the CSU is 655 feet.

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### ***Prepare Carrier Loading Labels***

As you connect the port CPs in each cabinet to the SIP, list the connections on the Carrier Loading label. This label is mounted on the inside of the front cover of the cabinet. (See Figure 2-29.) Keep track of –48 volt power usage so that the power supply is not overloaded.

1. Enter, the CP type under the appropriate slot number.
2. For each port, enter the terminal type and the unit load, referring to the Unit Load by Station Set Type label attached near the Carrier Loading label. (This information is also contained in Appendix C of this manual.) No port can have a unit load greater than 2.
3. When you have made entries for all the ports of a CP, calculate the total unit load for that CP and enter the calculation in the appropriately marked square.
4. When you have made and documented all the connections for a cabinet, check the total unit load to make sure that it does not exceed the maximum of 80. (See Appendix C for more information on evaluating unit load.)

CARRIER LOADING → CARRIER LOADING AND →48 VOLT UNIT LOAD

AT&T	1	2	3	4	5	6	7	8	9	10	11	12
SLOT #												
CIRCUIT PACK												
P	UL											
O	SY											
R	EP											
T	TE											
1												
2												
3												
4												
5												
6												
7												
8												
TOTAL CIRCUIT PACK UNIT LOAD												
TOTAL CABINET UNIT LOAD (MAX. 80 UNIT LOAD)												

Figure 2-29. Carrier Loading Label

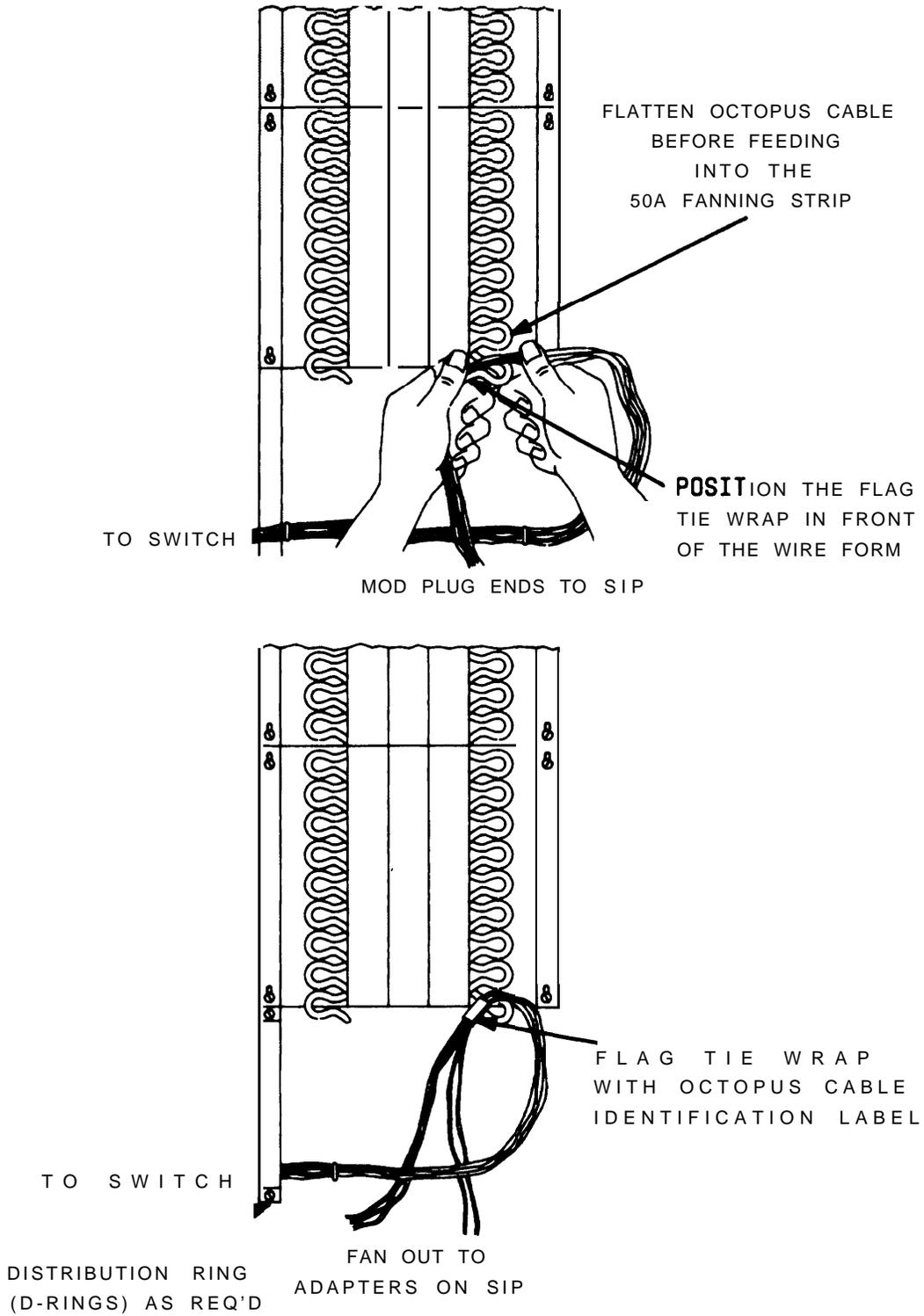
***Modify Octopus Cables if Required***

If flag--type cable ties are shipped loose, they must be installed on the early production octopus cables. The flag-type cable tie location depends on the type of SIP arrangement (Figures 2-16 and 2-17). Also, if the alternate SIP arrangement is used, later production octopus cables must be modified.

1. Check the octopus cables, if they have flag-type cable ties, go to Step 3. Otherwise, go to step 2.
2. Install flag-type cable tie so that the eight free ends of the octopus cable are 65 inches long for the standard SIP arrangement or 77 inches long for the alternate SIP arrangement.
3. If the alternate SIP arrangement (Figure 2-17) is used, clip off the last flag-type cable tie so that the eight free ends of the octopus cable are 77 inches long (Figure 2-30).

# INSTALLATION

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**Figure 2-30. Standard and Modified Octopus Cables**

***Make SIP Connection for CPU/Memory***

In all cases, the CPU/Memory is connected to the SIP via an octopus cable. Since there are four ports on the CPU/Memory (port 1 for the SAT, port 2 for SMDR, port 3 for the DTU, and port 4 [reserved]), plugs 1 through 3 on the octopus cable are used to connect the peripheral equipment. (Plugs 7 and 8 connect to the ETU; plugs 4, 5, and 6 are not used.) Plugs 1, 2, 3, 7, and 8 plug into a designated adapter on the SIP.

1. Before installing the octopus cable for the CPU/Memory CP, label the 25-pair connector and flag-type tie wrap with a CAB 1 SLOT1 label from the cable label sheets (Figure 2-7). Position the label on the back of the hood of the 25-pair connector.
2. Label the octopus cable legs, close to the modular plugs, as follows:

L e g	L a b e l
1	SYSTEM ADMIN. TERM
2	SMDR
3	DIGITAL TAPE UNIT
7	ETU 1 SWITCH (CPU)
8	ETU 2 SWITCH (CPU)

3. Connect the cable to Cabinet 1, slot 1, and run the cable horizontally through the D-rings to the 50A Fanning Strip.
4. Mount the cable in the fanning strip (Figure 2-31).
5. Insert the octopus modular plugs into the Z210A2 Adapter jacks on the SIP per the Voice and Data Station Records Form (Figure 2-26).
6. If an ETU is provided, connect modular plug 7 to SWITCH (cpu) jack on the ETU.
7. If a second ETU is provided, connect modular plug 8 to SWITCH (cpu) jack on second ETU.

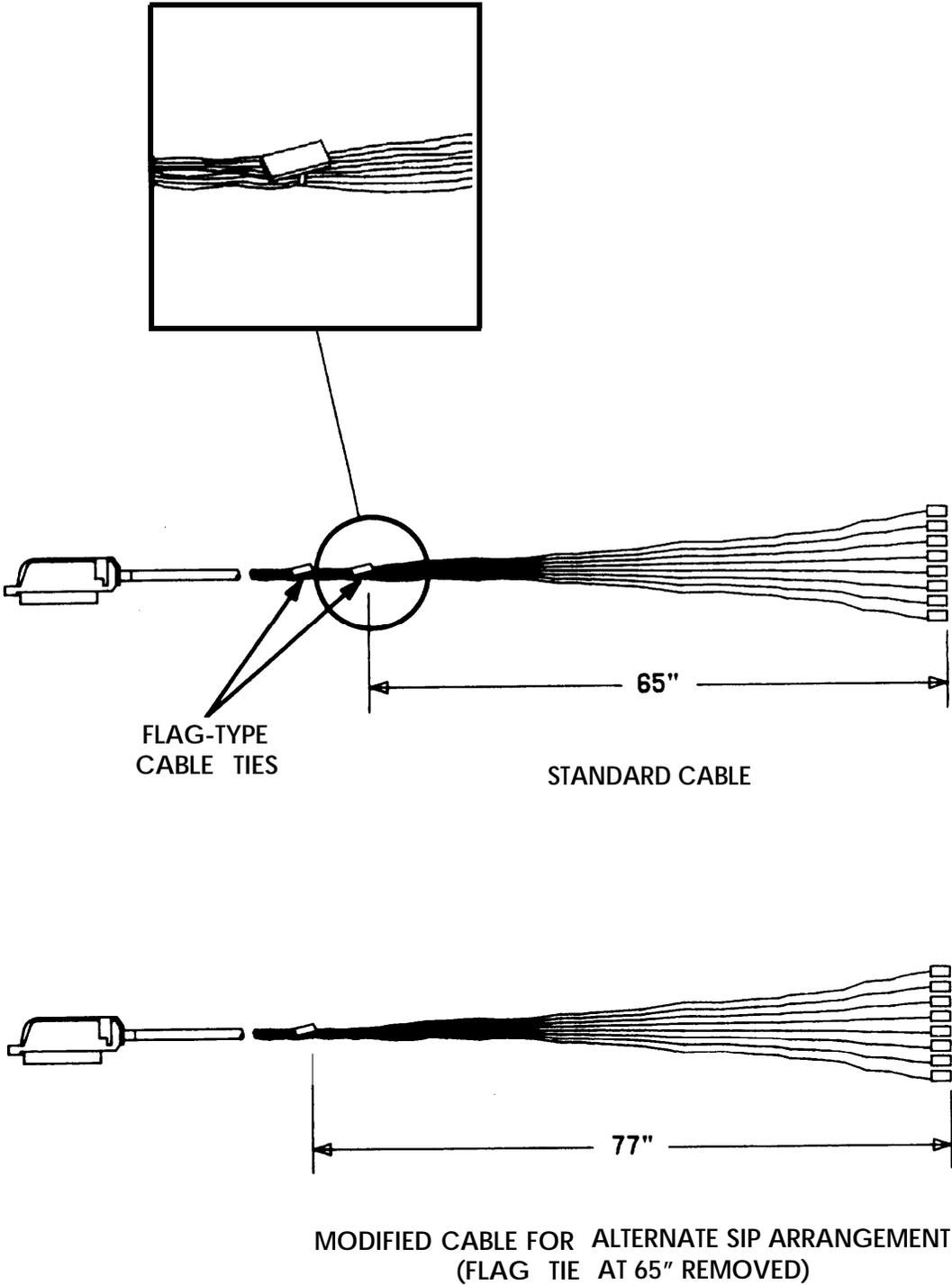


Figure 2-31. Mounting Octopus Cable on Fanning Strip

***Make SIP Connections to Cabinet for 7300H Series Terminals***

1. Select the cable label sheet (Figure 2-7) that identifies the cabinet (blue for #1, orange for #2, and green for #3).
2. On an octopus cable, attach an appropriate label (CAB1 SLOT8, for example) on the last flag-type cable tie and on the back of the hood of the 25-pair connector.
3. Connect the 25-pair connector end of the octopus cable to an appropriate receptacle (ZTN79) on the switch cabinet.
4. Run the octopus cable horizontally through the D-rings and mount it on the 50A Fanning Strip as shown in Figure 2-31.
5. Repeat the previous steps for each ZTN79 receptacle, so that all octopus cables linking 7300H Series terminals to the cabinet are labeled and run to the 50A Fanning Strip.
6. Check the Voice and Data Station Records Form to see which SIP adapter jacks are connected to 7300H Series terminals.
7. Connect port 1 of the first ZTN79 to the primary attendant console. Connect port 2 of the same CP to the primary attendant's Direct Extension Selector (DXS) console (if present).
8. Connect the remaining plugs on the octopus cable to other 7300H Series terminal SIP jacks. Connect other ZTN79 CPs to other 7300H Series terminal adapters. Distribute the 34-button Deluxe and BIS terminals equally among all ZTN79 circuit packs.
9. Fill in the port ID of each station on the Voice and Data Station Records Form (Figure 2-26).

### *Make SIP Connections to Cabinet for MET Sets*

Follow the same procedure as for 7300H Series terminals to connect MET set SIP appearances to the appropriate CPs as outlined below:

- Connect the 25-pair connector to a TN735 CP
- Attach a cable label to the octopus cable 25-pair connector and flag-type tie wrap
- Run the cable to the 50A Fanning Strip
- Plug cable ends into the appropriate SIP adapters
- Complete the Voice and Data Station Records Form.

**Note:** Each *TN735* CP supports only four MET sets. Therefore, only the first four modular plugs on each octopus cable should be connected to the SIP adapters.

### *Make SIP Connections to Cabinet for Single-Line Sets*

Follow the same procedure as for 7300H Series terminals to connect single-line voice terminal SIP appearances to the appropriate CPs as outlined below:

- Connect the 25-pair connector of the octopus cable to a ZTN78 CP
- Attach a cable label to the octopus cable 25-pair connector and flagtype tie wrap
- Run the cable to the 50A Fanning Strip
- Plug the cable ends into the appropriate adapters, and complete the Voice and Data Station Records Form.

For extended, off-premises, and out of-building stations, follow the same procedure as above, except connect the octopus cable to a TN742/TN746 CP. For Connection to a TN746 CP, follow the procedure outlined below.

- Attach the connector marked "0" of the 853B adapter to a TN746 CP ("0")

- **Attach cable labels to the two octopus cable 25-pair connectors and flag-type tie wrap.**
- **Attach octopus cables to the 853B adapter**
- **Run the cables to the 50A Fanning Strip.**
- **Plug the cable ends into the appropriate adapters, and complete the Voice and Data Station Records Form.**

---

### ***Make SIP Connections for Data Terminals and Computers***

Any RS-232C compatible data terminal, personal computer host computer, or a STAR LAN NETWORK workstation can be connected in one of four ways:

- If the terminal has a modem, it should be connected to a ZTN78 CP in the same way as a single-line voice terminal.
- The terminal's RS-232C port may be connected to an Asynchronous Data Unit (ADU) and then to the SIP over standard building wiring. Use an octopus cable to connect the SIP appearance to a TN726 CP.
- The terminal may be linked to a voice terminal at the workstation via an ADU and connected to the SIP using the same cable run as the associated voice terminal. (See Note below.)
- A STARLAN NETWORK workstation equipped with a Network Access Unit (NAU) may be linked to a voice terminal and connected to the SIP using the same cable run as the associated voice terminal. This arrangement is described under Install STARLAN NETWORK Interface. (see Note.)

**Note:** MET sets cannot share the cable run with an ADU. Use separate 4-pair cable runs for the MET set and ADU. The 7300H Series voice terminals that share a cable run with an ADU require local power.

The installation procedure for the last two types of connections listed is as follows:

1. Determine the type of connection required for each data terminal and computer from the Voice and Data Station Records Form (Figure 2-26).
2. At the SIP, identify all wiring for voice/data connections. Remove the octopus cable plug (if already inserted for a voice terminal). Insert a WP90851, L1 Y adapter into each of the adapter jacks. Re-insert the (voice circuit) octopus cable plug into the voice side of the Y adapter.
3. For STARLAN NETWORK workstations, connect the data side of the Y adapters to IN jacks on a STARLAN NETWORK Network Extension Unit (NEU). For all other terminals, connect TN726 CP ports to the data side of the Y adapters (or to standard SIP adapter jacks for data-only connections) with an appropriately labeled octopus cable.

4. Complete the Voice and Data Station Records Form (Figure 2-26).

***Make SIP Connections to Cabinet for ATL Cordless Telephones***

Follow the same procedure as for 7300H Series terminals to connect ATL Cordless Telephone SIP appearances to the appropriate CPs as outlined below:

- Connect the 25-pair connector to a ZTN79 CP
- Attach a cable label to the octopus cable 25-pair connector and flag-type tie wrap
- Run the cable to the 50A Fanning Strip
- Plug cable ends into the appropriate SIP adapters
- Complete the Voice and Data Station Records Form.

***Perform SIP Housekeeping***

Before continuing, make the SIP wiring neat:

1. Make sure that the cables connecting the SIP to building wiring run neatly through the rings at the top of the SIP. Check that all building wiring cables connected to an adapter are run through the two adjoining purse-lock clips and that the clips are twisted closed.
2. Bundle and tie by circuit type all octopus cable ends not connected to the SIP. Place unused octopus ends for each cable in a plastic bag and tie the bagged ends to one of the cables connected to the SIP.
3. Make sure that octopus cables hang between the two cable management posts at the bottom of each column of adapters.
4. Check that the octopus cables are properly dressed through the fanning strips (Figure 2-31 ) and that the cables hang neatly between the fanning strip and 617A Panels. Do not bundle and tie wrap octopus cables between the fanning strip and SIP unless they are unused.
5. Check that all octopus cables are run through the D-rings between the fanning strips and the cabinet.

6. Check that all cables are labeled.

## **INSTALL EMERGENCY TRANSFER UNITS (ETUs)**

The 106 Emergency Transfer Unit (ETU) (Figure 2-32) supports up to five Power Failure Transfer (PFT) sets and a DID make-busy function. Up to four ETUs can be supported for a maximum of 20 PFT sets. The sets can be connected to selected loop-start or ground start trunks. PFT sets must be FCC registered single-line sets. If ground start trunks are used, a ground start button must be provided at each PFT set.

**IMPORTANT:** Only 2500MMGB, 2500MMGT, or 500MM sets may be used as PFT sets. Only loop-start and ground start trunks can be used for PFT service (no DID or tie trunks). Also, voice terminals that share a cable with an ADU may not be used as PFT sets.

If power fails (switch has lost power or a major fault has occurred), a contact closure is provided to the Central Office (CO) over a dedicated pair of wires. The CO then makes all DID trunks busy. When power is restored, the closure is removed and the CO restores DID service. External alarm contacts are provided on the front of the ETU for use as required.

**Note:** It is recommended that customers with DID service make provisions with their CO to provide this arrangement.

The ETUs are mounted on the cross-connect backboard. Connections are through 25-pair receptacle-ended (CO and SIP) and plug-ended (switch line and trunk) connectors. Modular jacks are provided for the -48 V control signal from the CPU/Memory and for additional ETUs. Screw terminals are provided for the connection of external alarms.

Figure 2-33 shows a single-line voice terminal that has been connected as a Power Failure Transfer station. In normal operation, the CPU/Memory CP supplies -48 Vdc to the ETU. The voice terminal is connected through the ETU to the station port CP and can support all calling activities. The trunk connection through the ETU to the trunk port supports normal trunk calls.

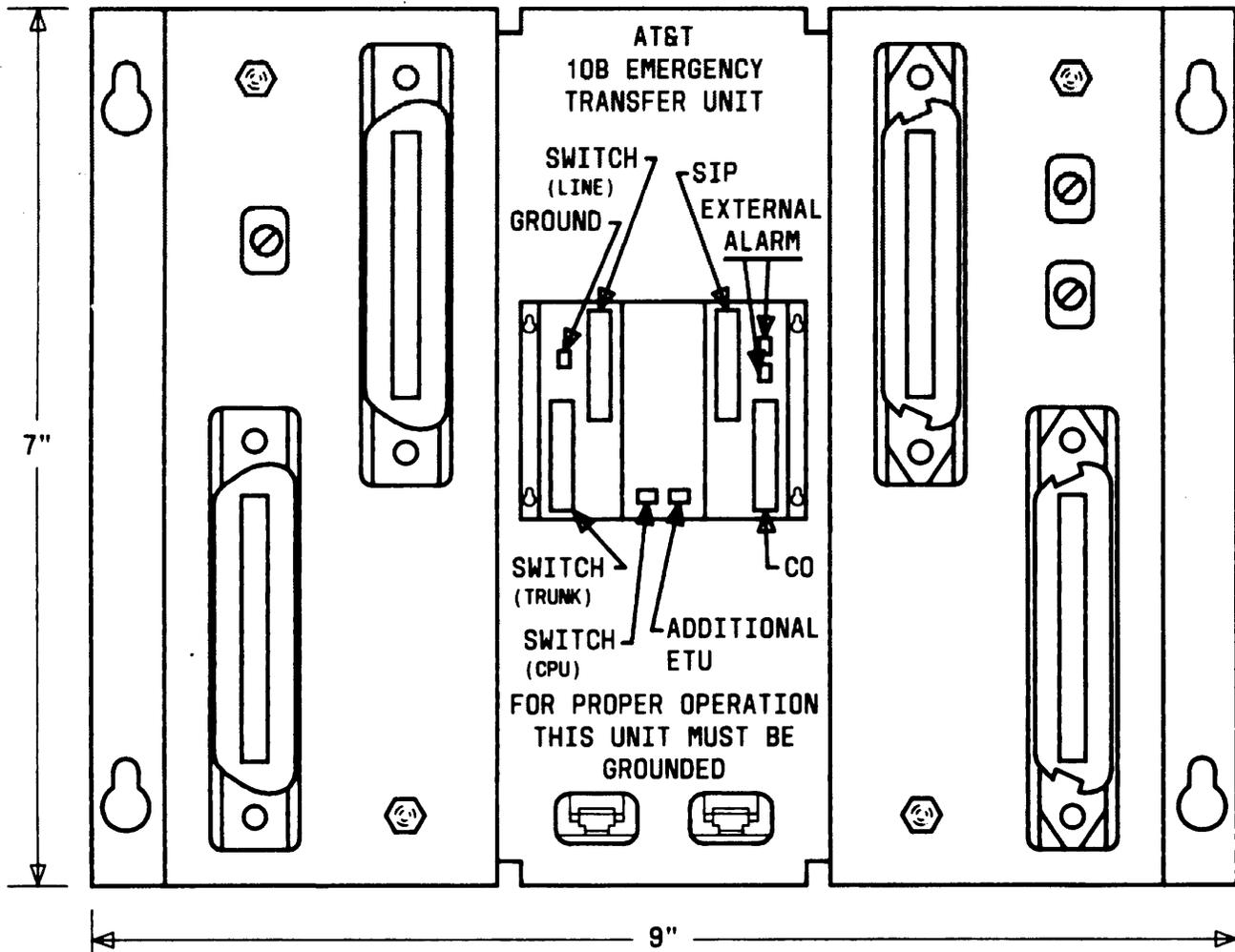


Figure 2-32. 10B Emergency Transfer Unit

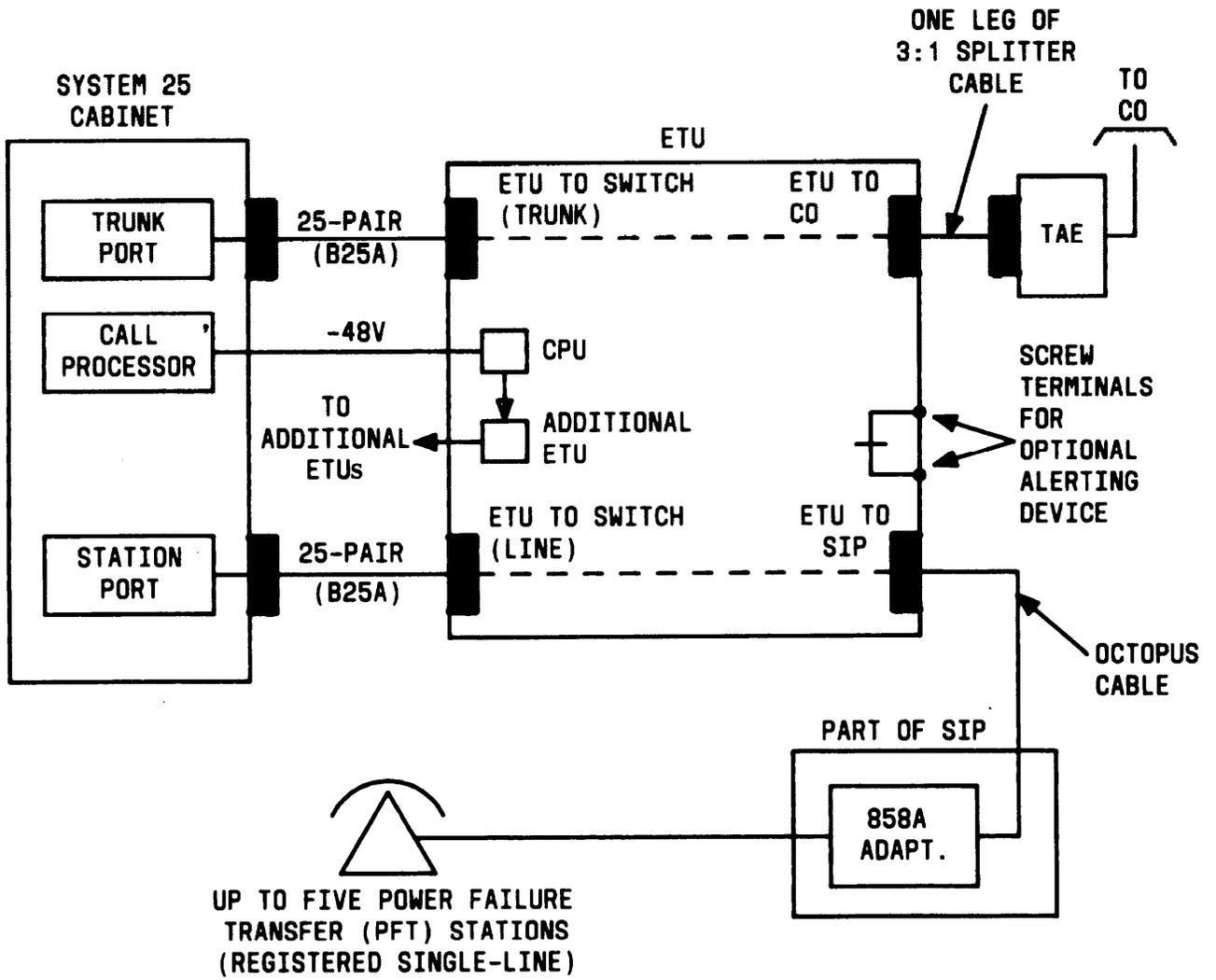


Figure 2-33. Emergency Transfer Unit Connections

### Make Emergency Transfer Connections

**Note:** The following procedure assumes that the network interfaces are connected to the 700A jacks and connector 0 of the 3:1 splitter cables has been connected to the jack. See *Install Equipment Room Trunk Cabling* in this part.

#### Connect Trunk Lines From Cabinet to ETU

1. Using the cable label sheets provided (Figure 2-7), label both ends of a B25A cable. Use a cabinet number and slot number (CAB1 SLOT8, for example) and the label SWITCH (TRUNK) on each end. Position the labels on the rear hood of the connectors.
2. Connect the female end of the B25A cable to the connector marked SWITCH (TRUNK) and the male end to the appropriate CO trunk CP (ZTN76 or ZTN77) on the rear of the system cabinet.

#### Connect Port Lines From Cabinet to ETU

3. Label both ends of a B25A cable. Use a cabinet number and slot number (CAB1 SLOT8, for example) and the label SWITCH (LINE) on each end. Position the labels on the rear hood of the connectors.
4. Connect the female end of the B25A cable to the connector marked SWITCH (LINE) and the male end to the appropriate station CP (TN742 or ZTN78) on the rear of the system cabinet.

#### Connect 3:1 Splitter Cable to ETU

5. Label both ends of a 3:1 splitter cable. Use the label that identifies the ETU number (ETU1 CO, for example) on connector 0 end and on one leg of the cable (leg 3 contains the DID make-busy pair, if provided). Position the labels on the rear hood of the connectors.
6. Connect the appropriate leg (1, 2, or 3) of the splitter cable to the CO receptacle on the ETU.

#### Connect ETU to SIP

7. Label the flag tie-wrap and 25-pair connector of an octopus cable. Use label that identifies ETU number (ETU1 SIP, for example) on the connector. Position the label on the rear hood of the connector.

8. **Connect a 25-pair plug on octopus cable to the SIP receptacle on the ETU.**
9. **Mount the octopus cable on the 50A Fanning Strip (Figure 2-31).**
10. **Connect all eight legs of the octopus cable to adapters (port side) at the SIP. The first five stations (legs 1 through 5) are the Power Failure Transfer stations.**
11. **Document the connections on the Voice and Data Station Record Form (Figure 2-26).**

**Connect ETUs (Optional)**

12. **For systems having three or four ETUs connect ETU 1 to ETU 3 using a D8W-87 cord. Plug one end into the modular jack labeled ADDITIONAL ETU on ETU 1 and the other end into the modular jack labeled SWITCH (cpu) on ETU 3. Connect ETUs2 and 4 the same way.**

**Connect External Alarm (Optional)**

13. **Connect the external alarm (if required) to the two screw terminations labeled EXTERNAL ALARM on the upper right of the ETU.**

## Install Ground-Start Key

If trunks are ground start (ZTN76 used), a ground-start key must be installed on the Power Failure Transfer voice terminals. This key can only be installed on voice terminals that have modular jacks.

1. Unplug modular line cord from voice terminal.
2. Plug KS23566, L1 key into voice terminal line cord jack.
3. Plug line cord into KS23566, L1 key.

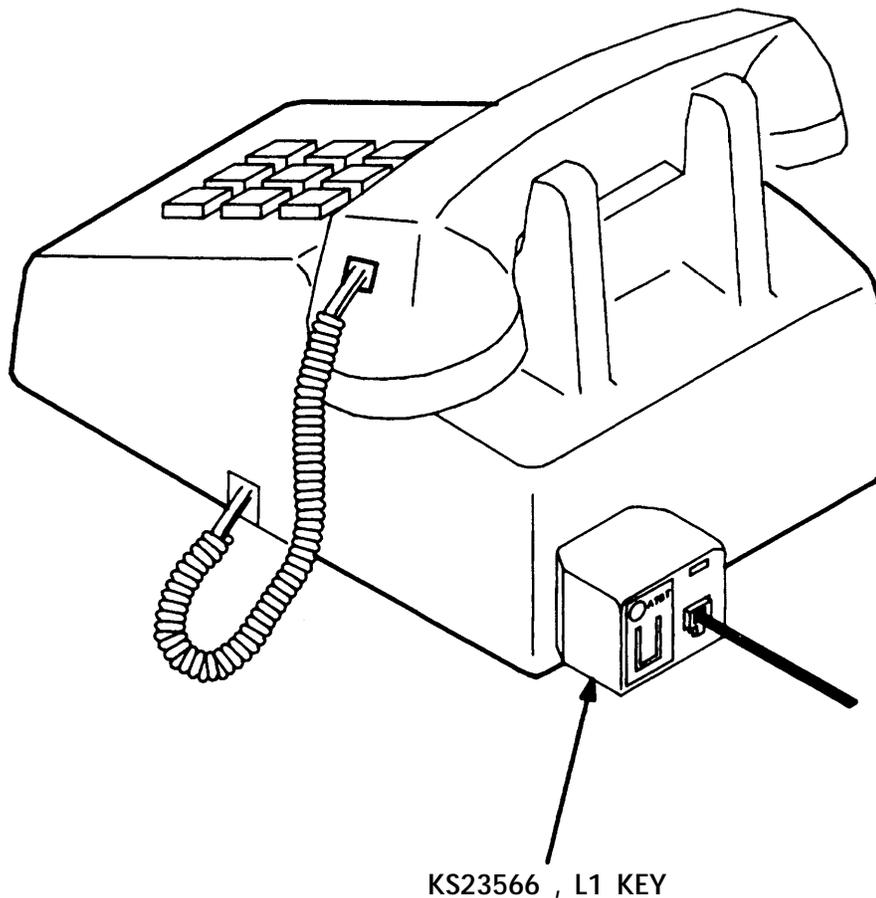


Figure 2-34. Ground Start Key Installation

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## INSTALL ATTENDANT CONSOLE

Most systems will have one or two attendant consoles. Release 2 Version 1 and Release 3 systems support direct trunk attendant consoles (DTAC) or switched loop attendant consoles (SLAC). The system can support either one or two of the DTAC or SLAC consoles but not a combination of DTACs and SLACs. The installation procedures for the DTAC and SLAC are the same.

The primary (or first) attendant console is a DTAC and is located (by default translation) at the first port on the first ZTN79. (This can be changed to an SLAC console using the SAT.)

In some cases, a DXS console (Figure 2-35) may also be used. The DXS is the same for the DTAC and SLAC. The DXS is translated by default at the second port of the same ZTN79. Its port number can also be changed using the SAT.

1. Unpack the attendant console and DXS console (if supplied) and examine for damage.
2. Take the attendant console and a telephone line cord (D8W-87) with modular plugs on both ends (or two cords if a DXS is supplied) to the workstation where the attendant console will be used. The DXS also requires a KS-22911, L1 power supply for local power, a 400B2 Adapter, and a D6AP-87 Cord (all included with the DXS).
3. Insert one end of the D8W-87 Cord into the designated modular jack on the attendant console and the other end into a modular wall jack.

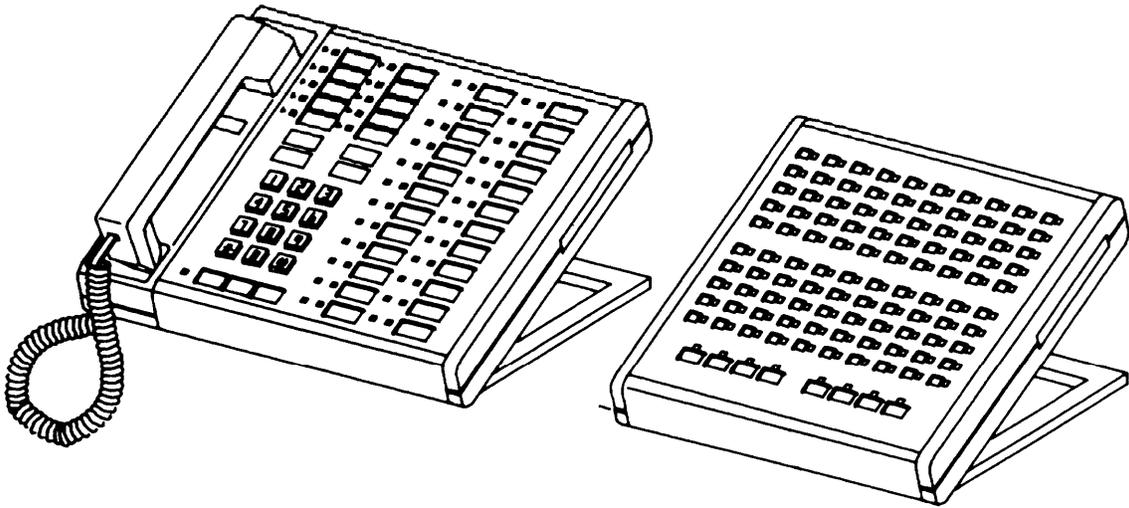


Figure 2-35. Attendant Console With DXS Console

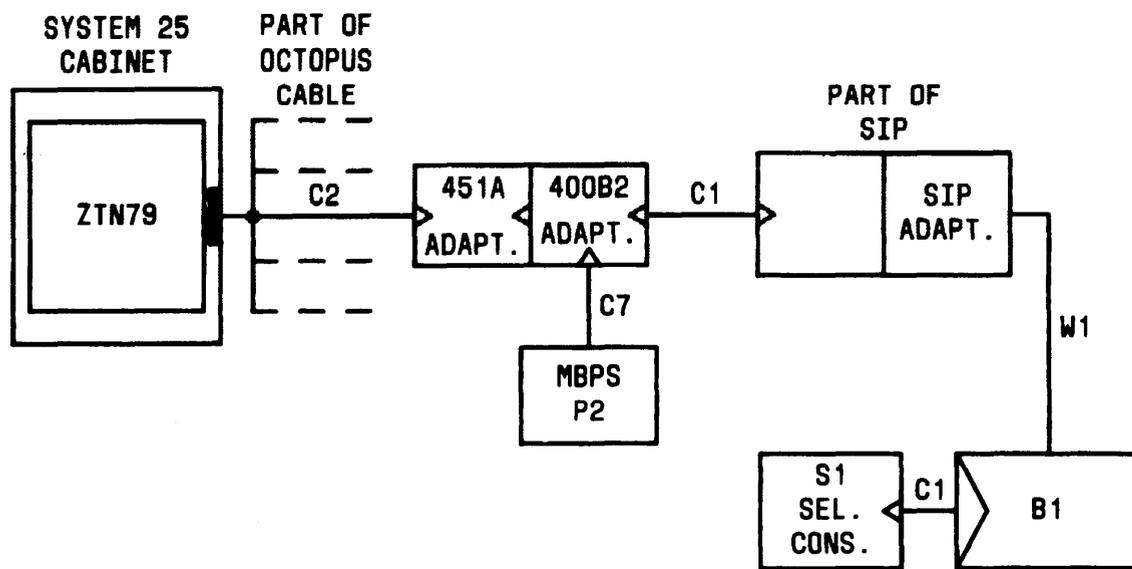
4. **If a DXS is supplied, place it beside the attendant console. For locally powered DXS, do Steps 5 through 8. For remotely powered DXS, do Steps 9 through 13.**

#### **Locally Powered DXS**

5. **Plug the 400B2 Adapter into the wall jack.**
6. **Plug one end of the D6AP-87 Cord into the 6-conductor modular jack of the 400B2 Adapter; plug the other end into the KS-22911, L1 power supply.**
7. **Plug one end of the second D8W-87 Cord into the 8-conductor jack of the 400B2 Adapter; plug the other end into the modular jack on the bottom of the DXS.**
8. **Plug the power supply into an AC outlet.**

#### **Remotely Powered DXS (Figure 2-35)**

9. **At the SIP, locate the DXS appearance and disconnect the octopus cable plug.**
10. **Insert one end of a D8W-87 Cord into the SIP adapter jack; plug the other end into the 8-conductor modular jack on the 40062 Adapter.**
11. **Insert one end of the D6AP Cord into the 6-conductor modular jack on the 400B2 Adapter; plug the other end into one of the modular jacks on the 346A Power Unit.**
12. **Connect the modular plug on the 400B2 Adapter to one of the modular jacks on the 451A Adapter.**
13. **Connect the octopus cable plug to the other modular jack on the 451A Adapter.**



LEGEND :

- ZTN79 - HYBRID LINE CP
- B1 - TYPICAL - 103A CONNECTING BLOCK
- c1 - MODULAR CORD (D8W-87)
- C2 - OCTOPUS CABLE (WP90780)
- C7 - MODULAR CORD (D6AP-87)
- P2 - NODULAR BULK POWER SUPPLY  
POWER UNIT (346A)  
POWER PANEL (346A-1)
- S1 - 23A1 SELECTOR CONSOLE-USED IN  
CONJUNCTION WITH EITHER SLAC OR DTAC
- W1 - INSIDE WIRING CABLE

Figure 2-36. Remotely Powered DXS Console Connection

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## INSTALL TERMINALS

When installing terminals at workstations, consult the Voice and Data Station Records Form to make sure that you are connecting the right terminal type at each workstation.

In a replacement installation, single-line and MET voice terminals already in place may not need to be replaced, although the MET labels change. Installation is required only for new terminals ordered. Standard MET sets (2990 Series) require a ZD8AJ-87 (grey) or ZD8AJ-50 (beige) adapter cord between the modular cord and the wall jack. The 12-button MET set does not need the ZD8AJ-87 adapter cord. (Only 10-button and 12-button MET sets may be used with System 25. Also, the set with busy lamp field will not work unless modified.)

Terminals located in the same building can be connected to the system as follows:

- Stand-alone voice terminals (all types)
- Single-line voice terminals linked to data terminals or personal computers with ADUs
- The 7300H Series voice terminals linked to data terminals or personal computers with ADUs
- Data terminals or computers connected to the system with modems (to ZTN78 CPs), ADUs (to TN726 CPs), or Multiple Asynchronous Data Unit (MADU) (to TN726 CPs)
- Extended stations
- ATL Cordless Telephone.

7300H Series 34-Button Deluxe and BIS voice terminals equipped with an adjunct (for example, an HFU) require auxiliary power. Other 7300H series terminal/adjunct combinations do not.

For MET sets, use a 400B2 Adapter and a 2012D Power Unit. See Figure 2-37.

The ATL Cordless Telephone is powered by 110 V ac provided by a wall receptacle that is not under control of a wall switch.

**Label Terminals**

Be sure to label the feature buttons of 7300H Series voice terminals and replace labels on MET sets per Table 2-F.

**Table 2-F. Feature Button Abbreviations and Labels**

Feature Name	Administration Button Code	Button Label [ ]*
Account Code Entry	15	ACCT ENTRY
Agent Status for CMS	42	MONITOR [PDC]*
Agent Status for CMS	42	AVAILABLE
Agent Status for CMS	42	ACW
Agent Status for CMS	42	LOG-OUT
Attendant Message Waiting	19	ATT MSG
Automatic Intercom	8	AUTO ICOM [Name]'
Bridged Access	37	BRIDGE [PDC]*
Call	40	CALL
Call Coverage—Group	10	COVER-GRP [Name]'
Call Coverage—Individual	12	COVER-IND [Name]*
Coverage Message Waiting	6	COVER MSG
Cancel (Att.) †	25	CANCEL
Destination (Att.) †	32	DEST
Directory	39	DIRECTORY
Direct Facility Access	2	FACILITY [Facility ID]*
Direct Station Selection (Flex)	13	FLEX DSS [Name]'
Direct Station Selection	14	DSS [Name]''
Exclusion	4	EXCLUSION
Forced Release (Att.) †	30	FORCE RELEASE
Hands Free Answer on Intercom	21	AUTO ANS

Table 2-F. Feature Button Abbreviations and Labels (Contd.)

Feature Name	Administration Button Code	Button Label [ ]*
Inspect	28	INSPECT
Join (Att.) †	31	JOIN
Last Number Dialed	35	LAST# DIALED
Leave Word Calling	38	LEAVE WORD
Local † (Att.)	33	LOCAL
Loop † (Att.)	27	LOOP
Manual Signaling	7	SIGNAL [Name]*
Next	41	NEXT
Night Service (Att.)	17	NIGHT
Personal Line	3	PERS LINE [LDN]*
Position Busy (Att.)	18	POS BUSY
Transfer to Data	9	DATA [DDC]*
Release (Att.) †	26	RELEASE
Repertory Dialing	20	REP DIAL [Name]*
Return on Busy (Att.) †	23	RTNBUSY
Return on Don't Answer (Att.) †	22	RTNDA
Scroll (Att.) †	34	SCROLL
Send All Calls	11	SEND ALL CALLS
Source (Att.) †	29	SOURCE
Start (Att.) †	24	START
Station-to-Station Message Waiting	5	MSG WAIT [Name]*
System Access	36	SYS ACCESS [PD.]*
System Access (Originate)	1	SYS ACC-O [PD.]*
System Alarm † (Att.)	16	ALARM

\* [ ] Indicates that a meaningful value for this item should be substituted.

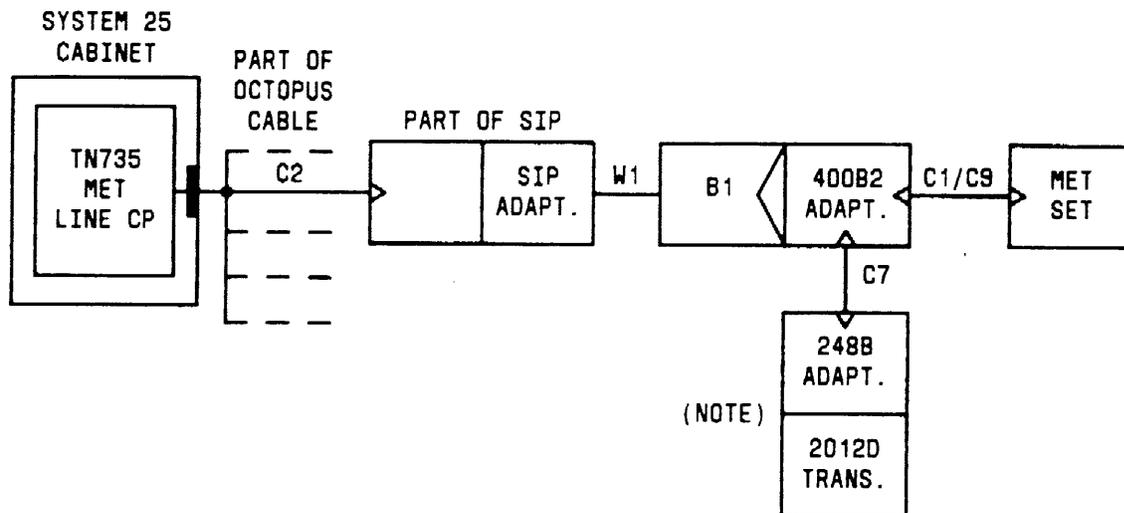
† These features cannot be changed or reassigned.

Att.-Attendant Console

## Stand-Alone Voice Terminals

See Figure 2-37.

1. **Unpack each terminal and examine it for damage. On Model 420 voice terminals, set the TONE/PULSE switch to TONE.**
2. **At the workstation, connect one end of the terminal line cord to the terminal and the other end to the modular wall jack.**



**LEGEND:**

- B1 - TYPICAL-103A CONNECTING BLOCK\*
- C1 - MODULAR CORD (D8W-87) - FURNISHED WITH SET
- C2 - OCTOPUS CABLE (WP90780) - PEC 2720-05P
- C9 - ADAPTER CORD (ZD8AJ-87) - PEC 2750-A17
- MET SETS - 2991C05, 2993C04, AND 2991D05 10-BUTTON MET SETS-  
USE C9 AND C1
- MET SETS - 7203M 12-BUTTON MET SET - USES C1 ONLY
- W 1 - 4-PAIR INSIDE WIRING CABLE \*
- 248B ADAPTER - MODULARIZES 2012D TRANSFORMER
- 400B2 ADAPTER - POWER ADAPTER
- 2012D TRANSFORMER - 15-18V AC SOURCE
- C7 - MODULAR CORD (D6AP-87)

**NOTE: ONLY MET SET WITH BUILT-IN SPEAKERPHONE (2993C04) REQUIRES TRANSFORMER AND ADAPTERS. OTHERWISE, PLUG C1 INTO B1 DIRECTLY.**

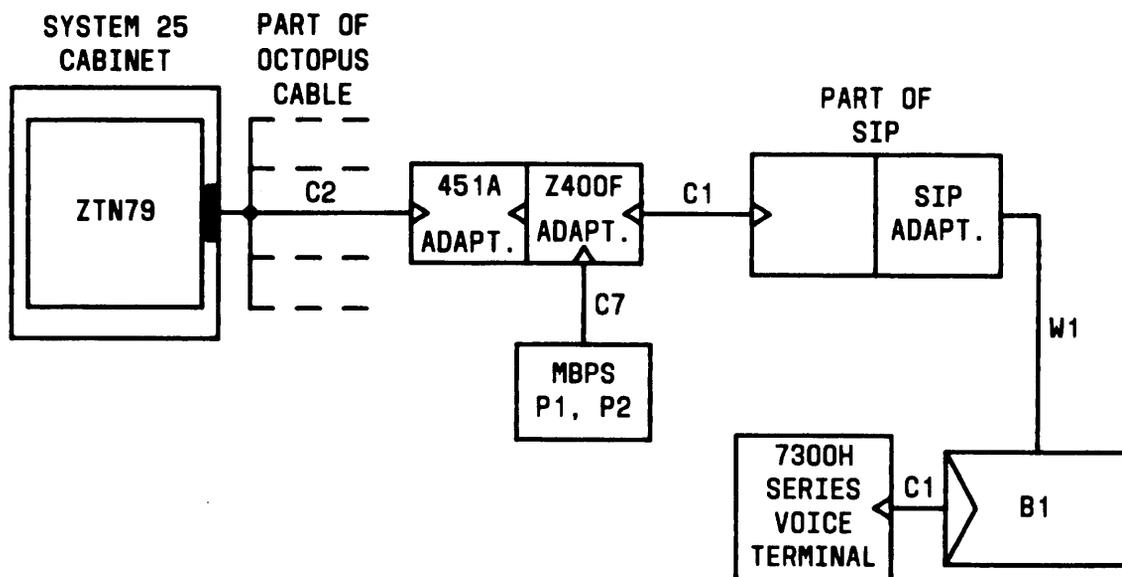
\*- FURNISHED BY INSTALLER

**Figure 2-37. Stand-Alone Voice Terminal Connections**

## Stand-Alone Remotely Powered Voice Terminals

See Figure 2-38.

1. Unpack each terminal and examine it for damage.
2. At the workstation, connect one end of the terminal line cord to the terminal and the other end to the modular wall jack.



LEGEND:

- ZTN79 - HYBRID LINE CP
- B1 - TYPICAL - 103A CONNECTING BLOCK
- c1 - MODULAR CORD ( D8W-87 )
- C2 - OCTOPUS CABLE ( WP90780 )
- C7 - MODULAR CORD ( D6AP-87 )
- P2 - MODULAR BULK POWER SUPPLY  
POWER UNIT ( 346A )  
POWER PANEL ( 346A-1 )
- P1 - KS22911L POWER SUPPLY
- W1 - INSIDE WIRING CABLE

Figure 2-38. Stand-Alone Remotely Powered Voice Terminal Connections

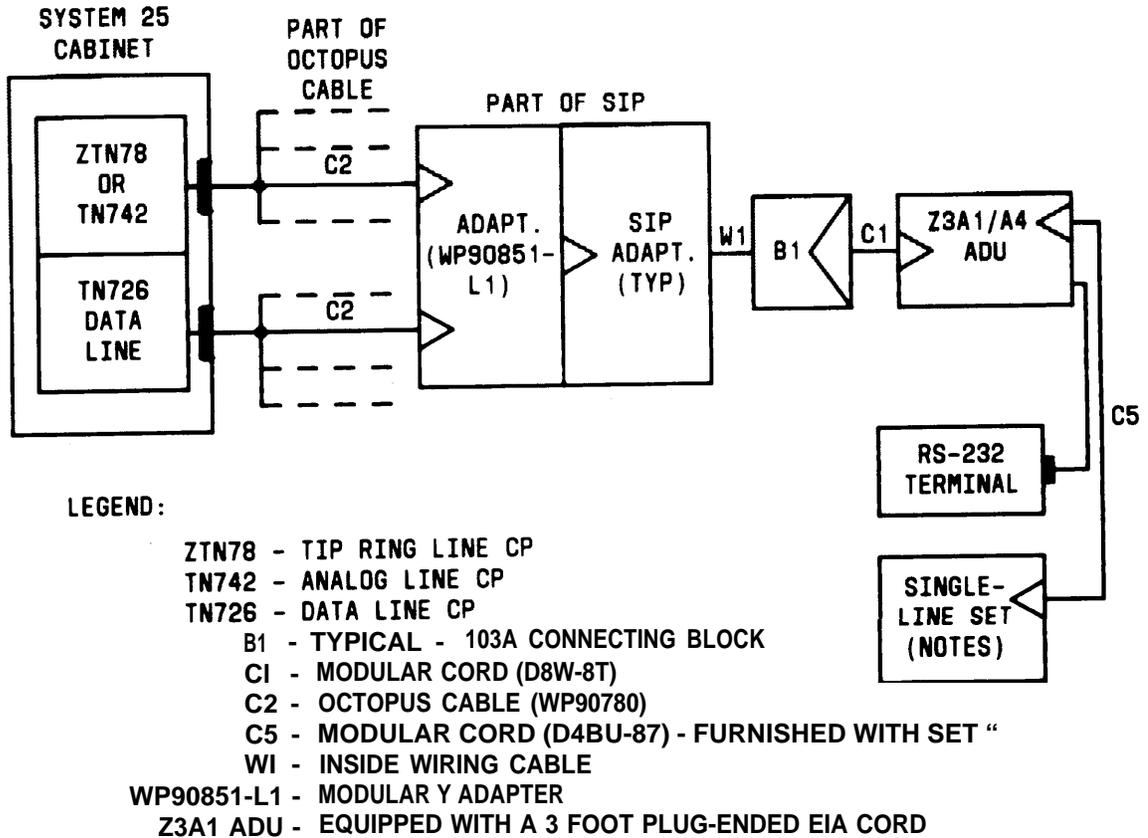
## Single-Line and 7300H Series Voice Terminals With Associated ADUs

See Figures 2-39 and 2-40.

1. Unpack each voice terminal and ADU and examine them for damage.
2. Arrange 7300H Series terminals and single-line terminals with appropriate ADUs (see Note).

**Note:** The Z3A1 ADU is equipped with a male RS-232C connector, and the Z3A4 ADU is equipped with a female RS-232C connector. The choice depends on the data terminal since both ADUs are used with single-line voice terminals.

3. At the workstation, connect the ADU'S cable to the RS-232C receptacle on the data terminal. Always tighten the screws or other fasteners on this connection. If these connections are not properly fastened, the Data Line CP port may be falsely busied out.
4. Connect the voice terminal to the modular jack labeled Telephone on the ADU.
5. Connect a D8W-87 modular cord between the jack labeled *Wall Jack* on the ADU and the wall jack.
6. For 7300H Series terminals, use a D6AP Cord to connect a KS-22911 Power Unit to the power jack on the Z3A5 ADU.



**NOTES :**

1. IF RANGE IS GREATER THAN 2000 FT FROM SYSTEM CABINET, TERMINAL DATA RATE (SPEED) MAY BE LIMITED
2. IF RANGE IS LESS THAN 2000 FEET FROM SYSTEM CABINET, USE ZTN78. IF RANGE IS MORE THAN 2000 FEET BUT LESS THAN 1300 OHM (INCLUDES TELEPHONE/TERMINAL) (LOOP RESISTANCE) FROM CABINET, USE TN742

**Figure 2-39. Single-Line Terminal/ADU Connections**

## INSTALLATION

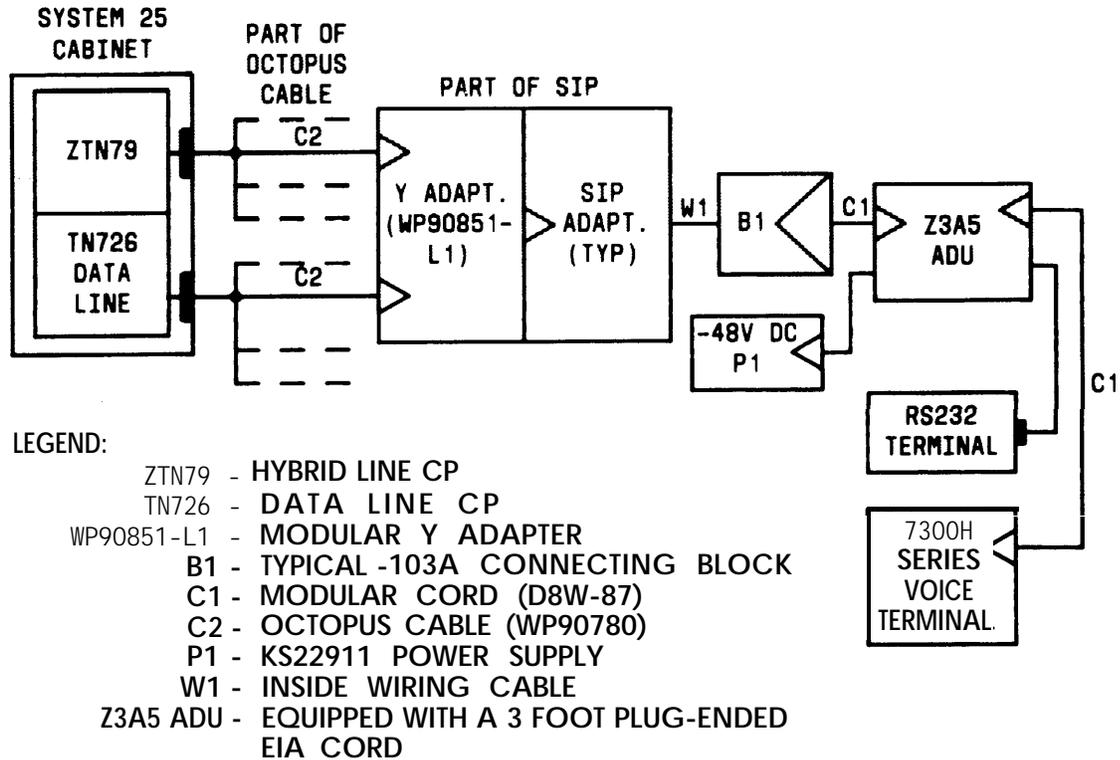


Figure 2-40. 7300H Series Terminal/ADU Connections

## ATL Cordless Telephone

Before placing the base at the designated location, the following things must be reconsidered.

- The base unit should be located at least three feet from any metal source.
- The base should be located so that no metal objects are in the line of sight to the operating area of the handset.
- The base should be located at least six feet from computing equipment and electromagnetic sources.

Install the ATL Cordless Telephone using the documentation provided with the telephone.

## **Off-Premises Stations (TN742, TN746B in R3V2)**

An FCC-registered single-line terminal may be installed as an Off-Premises Station (OPS).

**Note:** Only the local telephone company can install the interconnections for the OPS.

The connections between the network interface and the 700A Jacks are described under “Connect Network Interfaces to TAE Jacks.” (Only the TN742 CP supports this feature.)

1. Trace the OPS pairs through the network interface to their termination on the TAE.
2. Install secondary wiring protectors. (See Table 2-B.)
3. Cut down one end of a cable pair on the 700A and the other to a 858A Adapter on the SIP.
4. Connect an octopus cable to a TN742 circuit pack.
5. Connect the octopus cable legs to the adapter wired in Step 3 above.
6. Document all connections.

## **Out-of-Building Voice Terminals (TN742, TN746B in R3V2)**

A single-line voice terminal may be located in another building in a campus environment within a loop resistance of less than 1300 ohms (including the voice terminal). These terminals require primary and secondary protection devices. Only a TN742 CP can be used.

1. At the remote location, connect the single-line terminal to a 103A connecting block, using a modular telephone cord.
2. Using 4-pair inside wiring cable, connect the 103A connecting block to primary and secondary protection devices. (See Table 2-B.)
3. Run the cable from the remote protection device to the System 25 equipment location.

4. Connect the cable to a protection device at the System 25 location.
5. Connect the second protection device to an 858A Adapter on the 617A Panel, using 4-pair inside wiring cable.
6. Connect the 858A Adapter to a port on a TN742 circuit pack using an octopus cable.

### Out-of-Building Voice Terminals (ZTN79)

Transmission facilities (voice pairs) that extend out-of-building and are not included in the interface may be installed by the telephone company or through other means (e.g., the building and/or property owner). These facilities, aerial or buried, must be protected with voltage limiting devices and sneak current fuses. The only exception to this rule is buried cable that is enclosed in a continuous metallic conduit from one building entrance to the other. In this case, the conduit must be connected to an approved building ground at each end.

If single-line terminals are extended out-of-building, standard protection devices for voice pairs should be used. If 7300 H-type voice terminals are extended out-of-building, the facilities must be protected with an In-Range Out-Of-Building (I ROB) Unit TII Model-343, PEC 32918, Comcode 406-106-583 at each end. Terminals J1-3 and J1-6 of the IROB Unit should not be connected. Maximum distance between a 7300H voice terminal and the system 25 cabinets is 2000 feet. There is no limit on how much of the 2000 feet may be locally powered using the DS181 522 Kit-of-Parts, Comcode 105-105-514. (Only ZTN79 CP supports 7300 H-type voice terminals. Secondary wiring protectors are listed in Table 2-B.)

### Off-Premises-DS1 Interface

The TN767 DS1 Interface can support up to 24 analog off-premises stations through the use of a D4 channel bank.

Make the connections shown in Figure 2-41 at the S25. The CSU can be powered by the line or from a locally provided -48 V dc power supply. The -48 V and GRD leads are optional according to how the CSU is powered. For the connections at the D4, refer to the D4 installation document (555-170-102). Secondary wiring protectors are listed in Table 2-B.

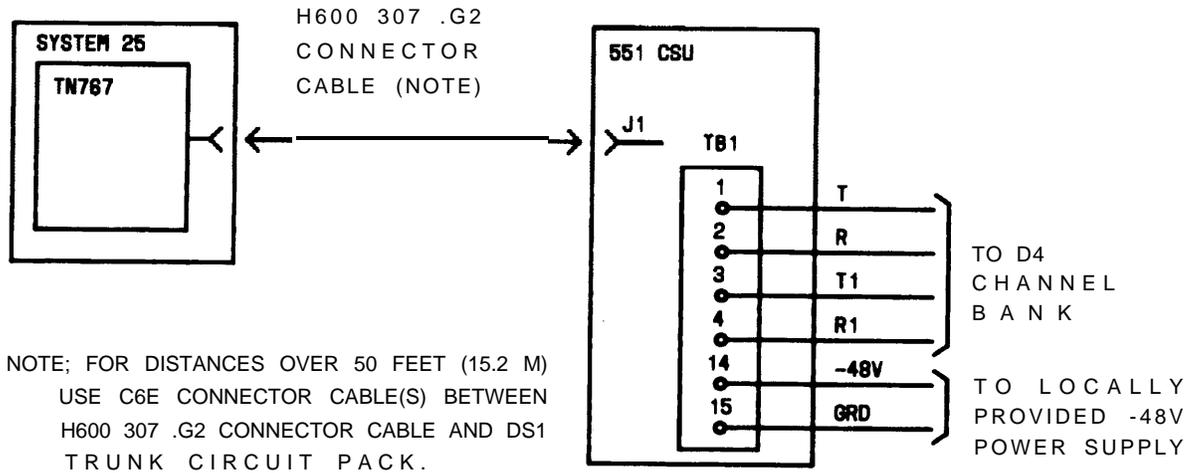


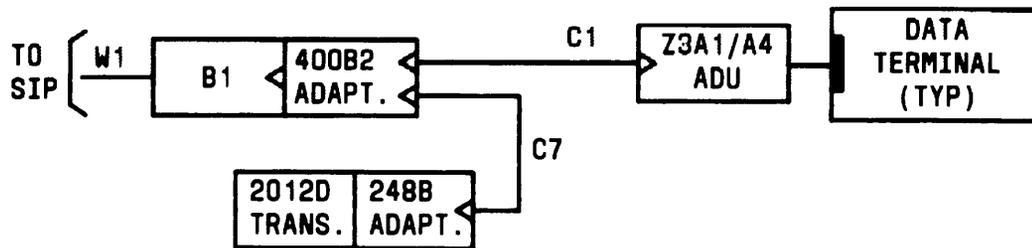
Figure 2-41. DS1 to D4 Connections for Off-Premises Stations

### **Stand-Alone Data Terminals**

Data terminals and computers may be connected to the system through ADUs or a Multiple Asynchronous Data Unit (MADU) without being linked to a voice terminal. Depending on the data terminal that they connect to, some ADUs may need supplementary power for proper operation. See Figures 2-42 and 2-43.

#### ***ADU Connections***

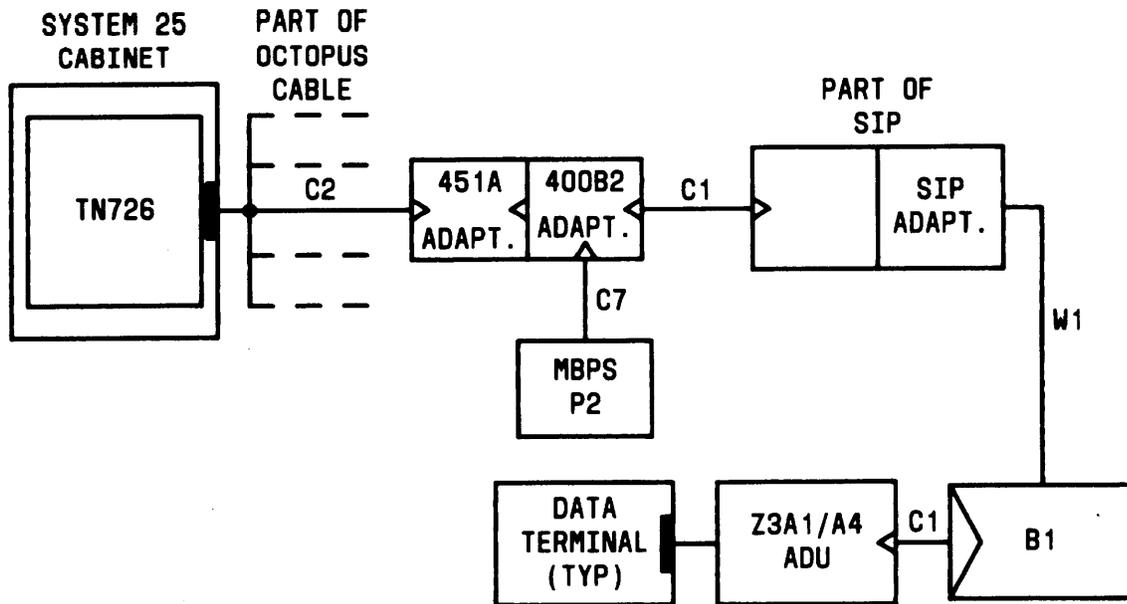
1. **Unpack the ADU and examine for damage.**
2. **At the workstation, connect the ADU connector to the RS-232C receptacle of the terminal or computer. Always tighten the screws or other fasteners on this connection. If these connections are not properly fastened, the Data Line CP port may be falsely busied out.**
3. **Connect a modular cord between the ADU Wall jack and the modular wall jack.**



LEGEND :

- B1 - TYPICAL - 103A CONNECTING BLOCK
- C1 -MODULAR CORD (D8W-87)
- C7-MODULAR POWER CORD (D6AP-87)
- W1 -4-PAIR INSIDE BUILDING WIRING CABLE
- 248B ADAPTER-ALLOWS MODULAR JACK CONNECTION FROM  
2012D TRANSFORMER
- 400B2 ADAPTER-POWER ADAPTER
- 2012D TRANSFORMER - 15-18V AC TRANSFORMER
- Z3A1 ADU -EQUIPPED WITH A 3 FOOT PLUG-ENDED EIA CORD
- Z3A4 ADU -EQUIPPED WITH A 3 FOOT RECEPTACLE-ENDED EIA CORD

Figure 2-42. Local Powering of an ADU



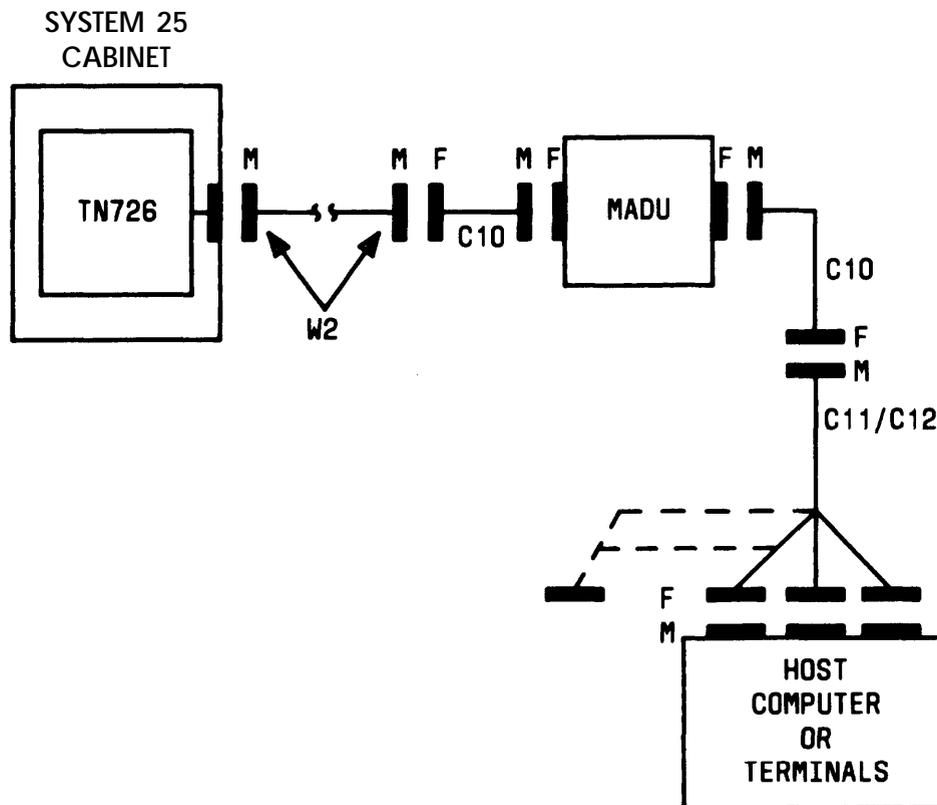
LEGEND :

- TN726 -DATA LINE CP
- B1 - TYPICAL - 103A CONNECTING BLOCK
- C1 -MODULAR CORD (D8W-87)
- C7-MODULAR CORD (D6AP-87)
- P2-MODULAR BULK POWER SUPPLY POWER UNIT (346A) POWER PANEL (346A-1)
- W1 -4-PAIR INSIDE WIRING CABLE
- Z3A1 ADU -EQUIPPED WITH A 3 FOOT PLUG-ENDED EIA CORD
- Z3A4 ADU -EQUIPPED WITH A 3 FOOT RECEPTACLE-ENDED EIA CORD

Figure 2-43. Remote Powering of an ADU (Optional)

**MADU Connections**

The MADU provides a direct connection to a host computer or a large group of data terminals (64 maximum). See Figure 2-44. The MADU has eight port connectors; each port is equivalent to a single ADU. Complete installation instructions for the MADU are contained in the *MADU Product Guide (999-700-525)*.



**LEGEND :**

- TN726 - DATA LINE CP
- MADU - MULTIPLE ASYNCHRONOUS DATA UNIT SINGLE UNIT ASSEMBLY (8 ADU PORTS)
- W2 - BUILDING WIRING ( 25-PAIR CABLE)
- C10 - 25-PAIR CENTERFEED-TO-ENDFEED CABLE (ALWAYS REQUIRED)
- C11 -M48C OCTOPUS CABLE (7-FOOT CORD WITH EIGHT 6-INCH ARMS FOR "DTE" HOST INTERFACE)
- C12-R48G OCTOPUS CABLE (7-FOOT CORD WITH EIGHT 6-INCH ARMS FOR "DCE" HOST INTERFACE)

Figure 2-44. MADU to Host Computer or Terminals Connections

## INSTALL CUSTOMER'S SAT

The SAT can be connected through the SIP to the CPU/Memory CP by any one of the following methods:

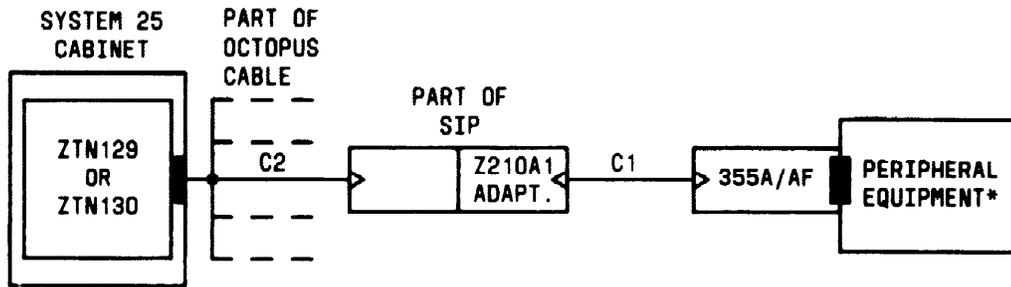
- | On-premises nonswitched connection (no ADU required if the SAT is plugged into the system AC outlet)
- | On-premises switched connection
- | Off-premises nonswitched connection
- | Off-premises switched connection.

SMDR equipment can also be connected by any of the four methods listed above. The DTU can be connected only by the on-premises nonswitched connection.

### Nonswitched Connection of Equipment Plugged Into System AC Outlet

See Figure 2-45.

1. Connect the RS-232C plug on the peripheral equipment to the RS-232C receptacle on a 355AF Adapter (an extension cable may be used).
2. Using a D8W-87 modular cord, connect the 355AF Adapter to the appropriate SIP adapter jack.



LEGEND :

- ZTN129-CPU/MEMORY CP
- C1 -MODULAR CORD (D8W-87)
- C2 -OCTOPUS CABLE (WP90780)
- 355A ADAPTER -RS-232 PLUG TO MODULAR JACK
- 355AF ADAPTER -RS-232 RECEPTACLE TO MODULAR JACK

\* PERIPHERAL EQUIPMENT

- SYSTEM ADMINISTRATION TERMINAL (LEG 1 OF OCTOPUS CABLE)
- DIGITAL TAPE UNIT (LEG 3 OF OCTOPUS CABLE)
- SMDR OUTPUT DEVICE (LEG 2 OF OCTOPUS CABLE)

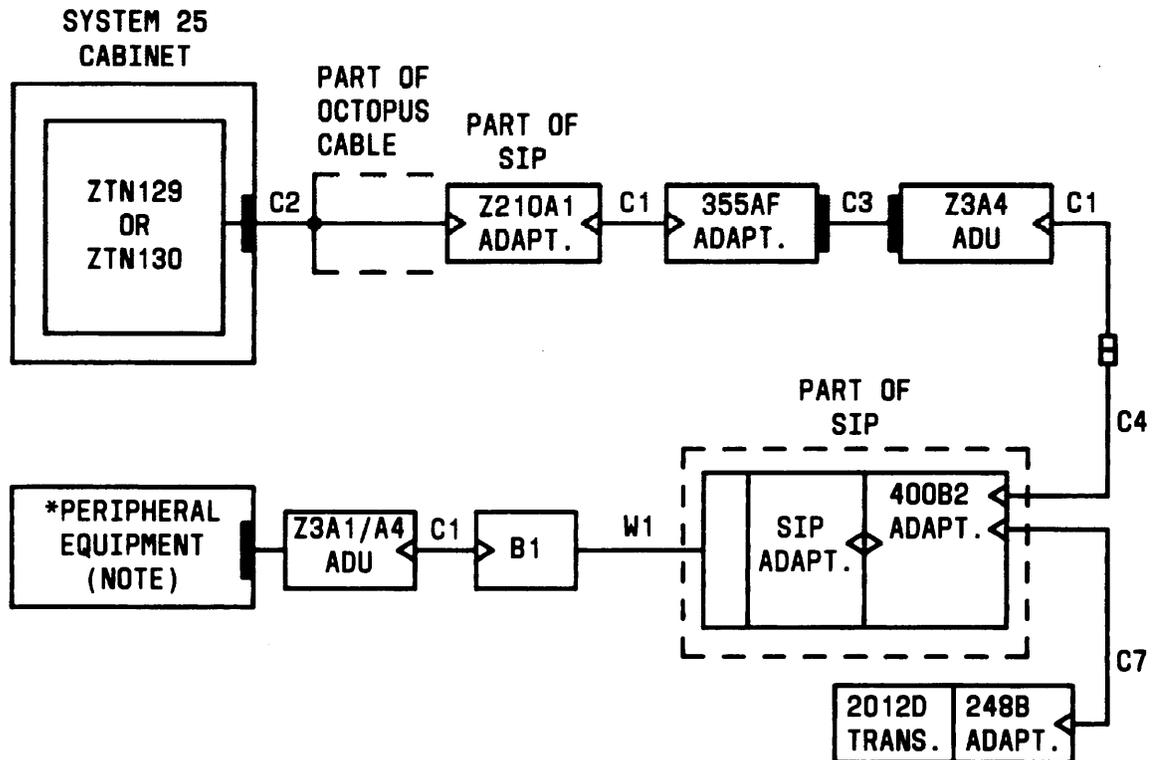
Figure 2-45. Nonswitched Connection of Peripheral Equipment Plugged into System AC Outlet

### Nonswitched Connection of Equipment

See Figure 2-46.

**Note:** Figure 2-46 shows an Z210A1 SIP Adapter to provide the building wiring termination. An 858A Adapter can also be used.

1. Connect the RS-232C plug on the peripheral equipment to the RS-232C port on a Z3A1 or Z3A4 ADU. **Always** tighten the screws or other fasteners on this connection.
2. Connect the ADU to the building wiring with a D8W-87 modular telephone cord.
3. At the SIP, connect the building wiring termination to an Z210A1 Adapter.
4. Locate the Z210A1 Adapter connected to the desired call processor port. Connect a D8W-87 modular telephone cord to a Z210A1 Adapter jack.
5. Connect the other end of the modular cord to a 355AF Adapter.
6. Connect an M7U-87 Cord to the 355AF Adapter.
7. Connect the other end of the M7U cord to the RS-232C jack on a Z3A4 ADU. Always tighten the screws or other fasteners on this connection.
8. Connect the ADU to a 400B2 Adapter with two series connected modular cords, D8W-87 and D8AM-87, as shown in Figure 2-46.
9. Connect the 400B2 Adapter to a 2012D supplementary power unit with a D6AP Cord, as shown.
10. Plug the 400B2 Adapter into the SIP appearance (858A Adapter jack) of the peripheral equipment.



LEGEND :

- B1 -TYPICAL - 103A CONNECTING BLOCK
- C1 -MODULAR CORD (D8W-87)
- C2 -OCTOPUS CABLE (WP90780)
- C3-EIA CROSSOVER CABLE (P17U-87)
- C4 -MODULAR RECEPTACLE TO MODULAR PLUG ADU CROSSOVER (D8AM-87)
- C7-MODULAR POWER CORD (D6AP-87)
- W1 -INSIDE BUILDING WIRING CABLE
- 248B ADAPTER-ALLOWS MODULAR JACK CONNECTION FROM 2012D TRANSFORMER
- 355AF ADAPTER RS-232 RECEPTACLE TO MODULAR JACK
- 2012D TRANSFORMER - 15-18V AC TRANSFORMER
- Z3A1 ADU -EQUIPPED WITH A 3-FOOT PLUG-ENDED EIA CORD
- Z3A4 ADU -EQUIPPED WITH A 3-FOOT RECEPTACLE-ENDED EIA CORD

\* PERIPHERAL EQUIPMENT

- SYSTEM ADMINISTRATION TERMINAL (LEG 1 OF OCTOPUS CABLE)
- DIGITAL TAPE UNIT (LEG 3 OF OCTOPUS CABLE)
- SMDR OUTPUT DEVICE (LEG 2 OF OCTOPUS CABLE)

NOTE :

DEPENDING ON EQUIPMENT, ADU MAY REQUIRE AUXILIARY POWER.

Figure 2-46. Nonswitched Connection of Peripheral Equipment Greater Than 50 Feet and/or Not Sharing Same AC Outlet

### On-Premises Digital Switched Connection

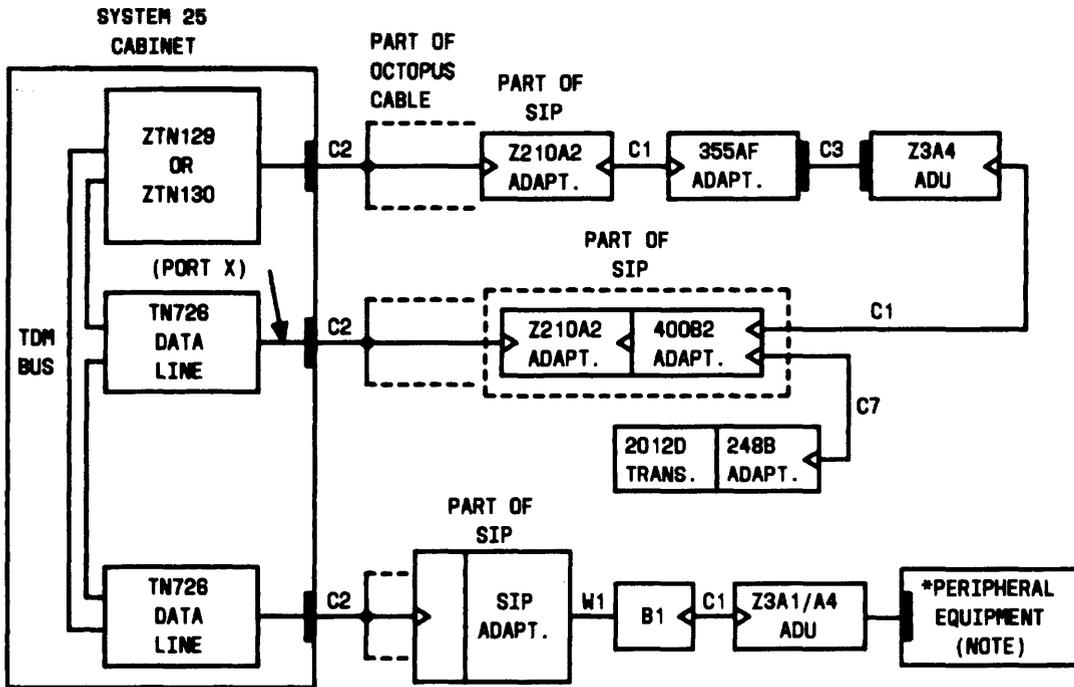
To access a CPU/Memory port through a switched connection, the port is connected to a port on a TN726 CP and assigned a Data Dial Code (DDC). See Figure 2-47.

The peripheral equipment can be either stand-alone or associated with a voice terminal. The peripheral equipment is connected to another port on a TN726 CP. To access the CPU/Memory port, the peripheral equipment must dial the DDC of the CPU/Memory port.

**Note:** Figure 2-47 shows a 858A SIP Adapter to provide the building wiring termination. A Z210A2 Adapter can also be used.

1. Connect RS-232C plug on the peripheral equipment to the RS-232C connector on a Z3A1 or Z3A4 ADU. Always tighten the screws or other fasteners on this connection. If these connections are not properly fastened, the Data Line CP port may be falsely busied out.
2. If the peripheral equipment requires supplementary power, continue with Step 3; otherwise, go to Step 8.
3. Connect the ADU to the building wiring with a D8W-87 modular cord plugged into a 400B2 Adapter.
4. Plug the 400B2 Adapter into the wall jack.
5. Plug one end of a D6AP Cord into the 400B2 Adapter and the other end into a 248B Adapter.
6. Connect the 248B Adapter to a 2012D supplementary power supply.
7. Plug the 2012D Power Supply into an ac outlet.
8. At the SIP, connect the building wiring termination to an 858A Adapter.
9. Using an octopus cable, connect the modular side of the adapter to a port on a TN726 CP.
10. Locate the Z210A2 Adapter connected to the desired CPU/Memory port. Connect a D8W-87 modular telephone cord to the jack on that Z210A2 Adapter.

- 11. Connect the other end of the modular cord to a 355AF Adapter.**
- 12. Connect an M7U-87 Cord to the 355AF Adapter.**
- 13. Connect the other end of the M7U-87 Cord to the RS-232C jack on a Z3A4 ADU.**
- 14. Connect the ADU to a 400B2 Adapter with a D8W-87 cord.**
- 15. Connect the 400B2 Adapter to a 2012D Supplementary Power Unit as shown in Figure 2-47.**
- 16. Plug the 400B2 Adapter into a 2210A2 Adapter on the SIP.**
- 17. Using an octopus cable, connect the other side of the Z210A2 Adapter to the supporting TN726 CP.**



**LEGEND:**

- B1 - TYPICAL 103A CONNECTING BLOCK
- c1 - MODULAR CORD (D8U-87)
- C2 - OCTOPUS CABLE (UP80780)
- C3 - EIA CROSSOVER CABLE (M7U-87)
- C7 - MODULAR POUER CORD (D8AP-87)
- W1- INSIDE BUILDING WIRING CABLE
- 2488 ADAPTER - ALLOW MODULAR JACK CONNECTION FROM 20120 TRANSFORMER
- 355AF - ADAPTER (RS-232 RECEPTACLE TO MODULAR JACK)
- 40082 ADAPTER - POWER ADAPTER
- 2012D TRANSFORMER -15-18V AC TRANSFER
- Z3A1 ADU EQUIPPED WITH A 3-FOOT PLUG-ENDED EIA CORD
- Z3A4 ADU - EQUIPPED WITH A 3-FOOT RECEPTACLE-ENDED EIA CORD

**\* PERIPHERAL EQUIPMENT**

- SYSTEM ADMINISTRATION TERMINAL (LEG 1 OF OCTOPUS CABLE)
- SMDR OUTPUT DEVICE (LEG 2 OF OCTOPUS CABLE)

**NOTE: PERIPHERAL EQUIPMENT OR MULTILINE VOICE TERMINAL WITH DATA BUTTON DIALS PORT X DDC TO ESTABLISH DATA CONNECTION TO ZTN129. DEPENDING ON EQUIPMENT, ADU MAY REQUIRE AUXILIARY POWER.**

Figure 2-47. On-Premises Peripheral Equipment With Switched Connection to CPU/Memory

### **Off-Premises Nonswitched Connection**

Off-premises peripheral equipment must be equipped with an originating modem (see Figure 2-48). The connection is made from the CO through the TAE to a dedicated modem (optioned for autoanswer) connected to the appropriate Call Processor port.

1. Following the instructions for connecting off-premises stations, connect the OPS line from the RJ21X network interface through the TAE connecting block to the SIP.
2. Using a modular telephone mounting cord, connect a modem to the other side of the appropriate adapter.
3. Using an M7U-87 Cord, connect the RS-232C port on the modem to the RS-232C receptacle on a 355AF Adapter.
4. Locate the Z210A2 Adapter jack connected to the desired Call Processor port. Using a D8W-87 modular cord, connect the jack to the 355AF Adapter.

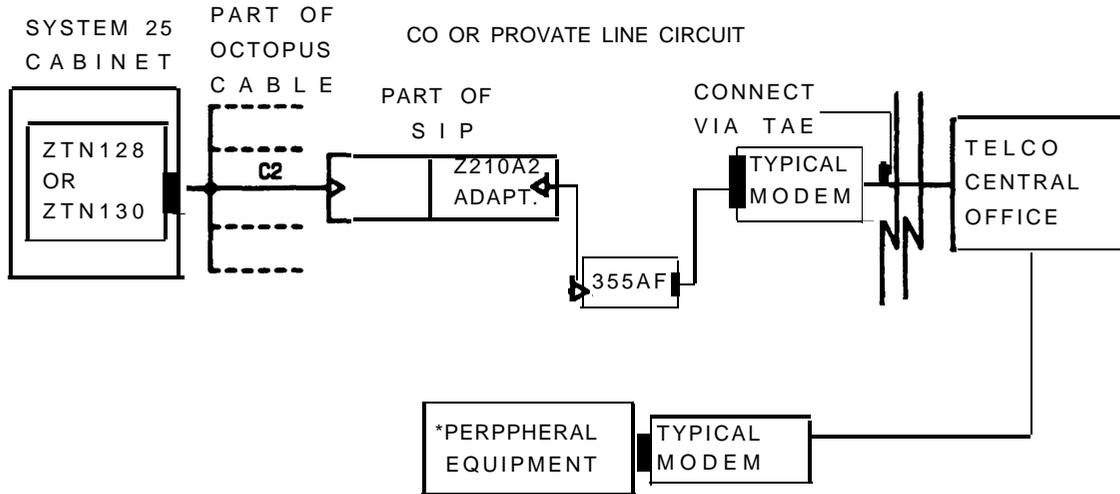
### **Off-Premises Switched Connection**

To provide off-premises switched access, the peripheral equipment accesses the system either as an off-premises (analog) station or simply as a dial-up connection through the CO. In either case, the peripheral equipment must be equipped with an originating modem.

The CPU/Memory port may be connected to a modem, as shown in Figure 2-48, and the telephone (2-wire) side of the modem connected like a station to a ZTN78 Tip Ring Line CP port. In this case, the peripheral equipment user sets up a call (station-to-station in the OPS case, trunk-to-station in a dial-up configuration) to the Call Processor port.

The CPU/Memory port may alternatively be connected and switched via a TN726 Data Line CP port, as shown in Figure 2-47. In this case, the system must be equipped with a TN758 Pooled Modem CP to support the analog to digital connection.

# INSTALLATION



LEGEND:

- ZTN129/130- CPU/MEMORY CP
- C1 - MODULAR CORD (D8W-87)
- C2 - OCTOPUS CABLE (WP90780)
- C3 - EIA CROSSOVER CORD (M7U-87)
- 355AF ADAPTER (RS-232 RECEPTACLE TO MODULAR JACK)
- \* PERIPHERAL EQUIPMENT
  - SYSTER ACCESS TERMINAL (LEG 1 OF OCTOPUS CABLE)
  - SMDR OUTPUT DEVICE (LEG 3 OF OCTOPUS CABLE)

**Figure 2-48. Off-Premises Peripheral Equipment With Direct Connection to CPU/Memory**

## **INSTALL CUSTOMER'S DTU**

The DTU must be directly connected to Port #3 on the CPU/Memory CP (Figures 2-45 and 2-46). Remote and switched connections are not supported. Follow the procedures provided for installing the SAT.

## **INSTALL STATION MESSAGE DIGITAL RECORDING (SMDR) EQUIPMENT**

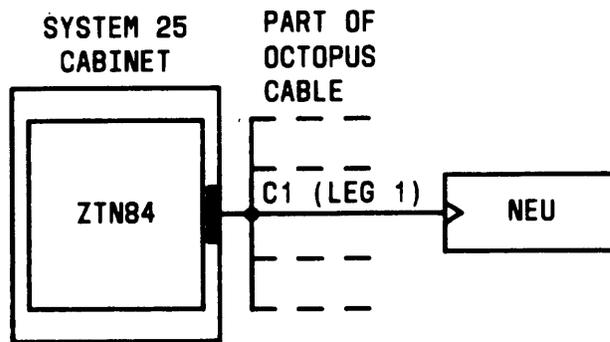
The SMDR equipment connects to Port #2 on the CPU/Memory CP. The connections are the same as those for the SAT (Figures 2-45 through 2-48). Follow the procedures provided for installing the SAT.

## INSTALL STARLAN NETWORK INTERFACE

**Note:** Support for the STARLAN Interface has been discontinued.

The ZTN84 STARLAN Interface CP provides an interface between the System 25 TDM bus and a STARLAN NETWORK local area network (LAN). An octopus cable connects the ZTN84 CP to a Network Extension Unit (NEU) on the STARLAN NETWORK (Figure 2-49).

1. Select the cable label sheet (Figure 2-7) that identifies the cabinet (blue for #1, orange for #2, and green for #3).
2. On an octopus cable, attach an appropriate label (CAB1 SLOT8, for example) on the last flag-type cable tie and on the back of the hood of the 25-pair connector.
3. Connect the 25-pair connector end of the octopus cable to the ZTN84 receptacle on
4. Connect the modular plug on leg 1 of the octopus cable to an NEU IN jack.



**LEGEND:**

- ZTN84 - STARLAN INTERFACE CP
- C1 - OCTOPUS CABLE ( WP90780 )
- NEU - NETWORK EXPANSION UNIT

**Figure 2-49. ZTN84 STARLAN Interface CP Connection**

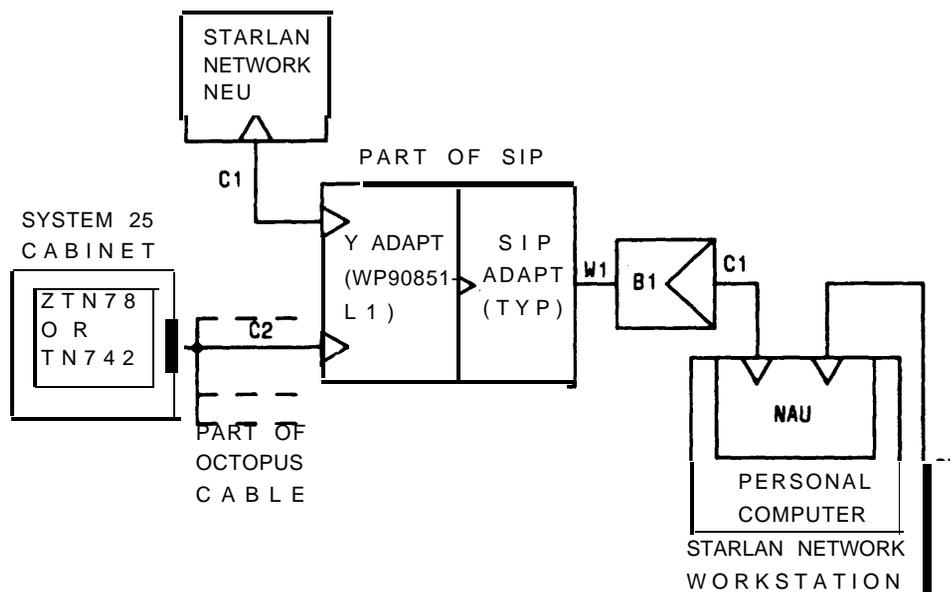
## **Shared System 25 Voice/STARLAN NETWORK Data Connections**

STARLAN NETWORK workstations can share the 4-pair System 25 wiring to the SIP with an analog or 7300H Series voice terminal. The STARLAN NETWORK data is transmitted over pairs two and three. At the SIP, the data pairs and voice pair(s) are separated by the standard Y-adapter (WP90851 ,L1 ). The data pairs are connected to the STAR LAN NETWORK NEU. For analog single-line voice terminals, the voice pair is connected by an octopus cable to a ZTN78 CP. For 7300H Series voice terminals, the voice pairs are connected to a ZTN79 CP. A KS-23475, L1 Adapter and a KS-2291 1 Power Unit are also required at the workstation to provide power to the 7300H Series voice terminal.

### ***Single-Line Voice Terminals***

See Figure 2-50.

1. **Unpack each terminal and examine it for damage.**
2. **At the workstation, connect one end of the terminal line cord to the terminal and the other end to the PHONE jack on the NAU.**
3. **Using a D8W-87 modular cord, connect the OUT jack on the NAU to the modular wall jack.**
4. **Locate the workstation appearance at the SIP, and disconnect the octopus cable. Install a WP90581, L1 Y Adapter, and connect the octopus cable plug to the VOICE jack.**
5. **Using a D8W-87 modular cord, connect the DATA jack on the Y Adapter to the STARLAN NETWORK NEU IN jack.**



**LEGEND :**

- ZTN78 - TIP RING LINE CP
- TN742 - ANALOG LINE CP
- 699Y - ATL ADAPTER
- B1 - TYPICAL 103A CONNECTING BLOCK
- C1 - MODULAR CORD (D8W-87)
- C2 - OCTOPUS CABLE (WP90780)
- C5 - MODULAR CORD (D4BU-87) - FURNISHED WITH SET
- W1 - INSIDE WIRING CABLE
- MP90851-L1 - MODULAR Y ADAPTER

**NOTES :**

1. IF RANGE IS GREATER THAN 2000 FEET FROM SYSTEM CABINET, TERMINAL DATA RATE (SPEED) MAY BE LIMITED
2. IF RANGE IS LESS THAN 2000 FEET FROM SYSTEM CABINET, USE ZTN78. IF RANGE IS MORE THAN 2000 FEET BUT LESS THAN 1300 OHM (INCLUDES TELEPHONE/TERMINAL) (LOOP RESISTANCE) FROM CABINET, USE TN742

**Figure 2-50. Single-Line Analog Terminal/STARLAN NETWORK Workstation Connections**

**73001H Series Voice Terminals**

See Figure 2-51.

1. **Unpack each terminal and examine it for damage.**
2. **At the workstation, use a D8W-87 modular cord to connect the NAU jack on the KS-23475, L1 Adapter to the OUT jack on the NAU.**
3. **Using a D8W-87 modular cord, connect the PHONE jack on the KS- , 23475, L1 Adapter to the voice terminal.**
4. **Connect the POWER plug on the KS-23475, L1 Adapter to the KS-22911 Power Unit.**
5. **Connect the plug on the KS-23475, L1 Adapter's modular cord to the modular wall jack.**
6. **Locate the workstation appearance at the SIP and disconnect the octopus cable. Install a WP90581, L1 Y Adapter and connect the octopus cable plug to the VOICE jack.**
7. **Using a D8W-87 modular cord, connect the DATA jack on the Y adapter to the STARLAN NETWORK NEU IN jack.**

# INSTALLATION

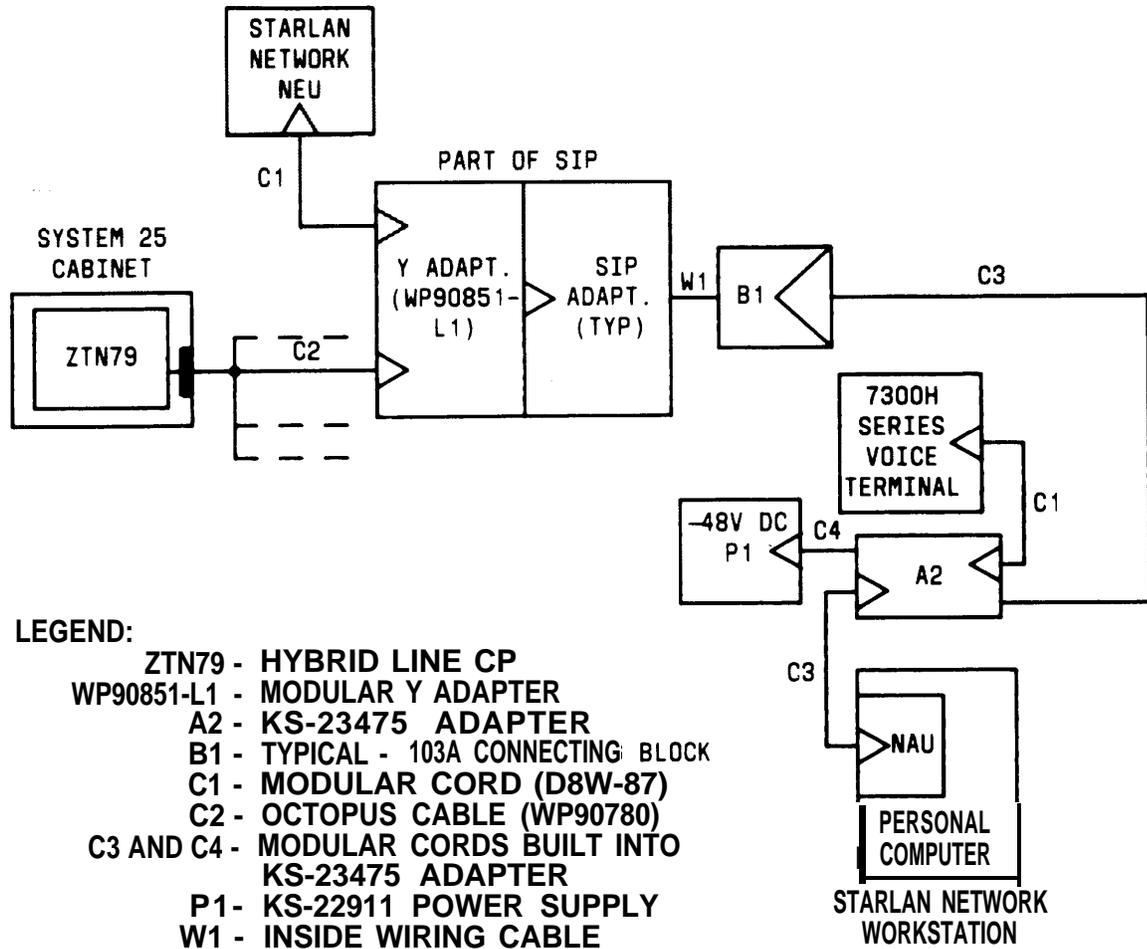


Figure 2-51. 7300H Series Terminal/STARLAN NETWORK Workstation Connections

## INSTALL MUSIC-ON-HOLD INTERFACE

**Note:** Use of equipment that rebroadcasts copyrighted music or other material may be required to obtain a license from a third party such as ASCAP or BMI.

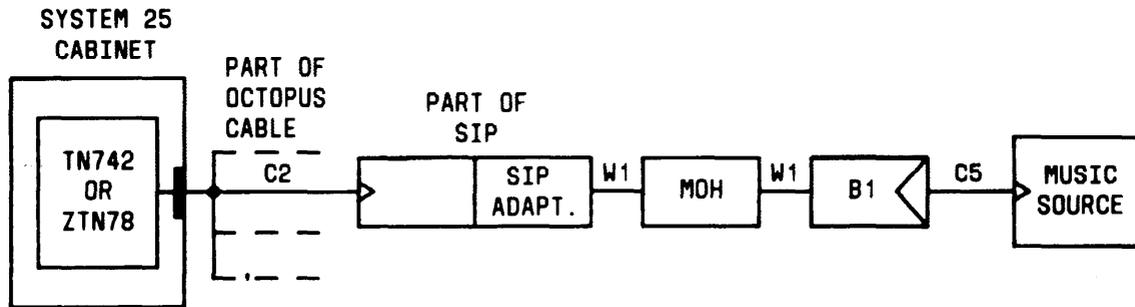
### FCC-Registered Music Source Interface

The music source is connected to a ZTN78 CP through the SIP (see Figure 2-52).

1. Using an octopus cable, connect the CP to an 858A Adapter at the SIP.
2. Using inside wire, connect T and R leads on the other side of the 858A Adapter to the PT and PR terminals on the Music-on-Hold (MOH) interface (KS-23395).
3. Connect the T and R terminals on the MOH interface to terminals 1 and 2 on a 103A Connecting Block.
4. Connect the music source to the 103A block using a D4BU-87 modular cord.

# INSTALLATION

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## LEGEND :

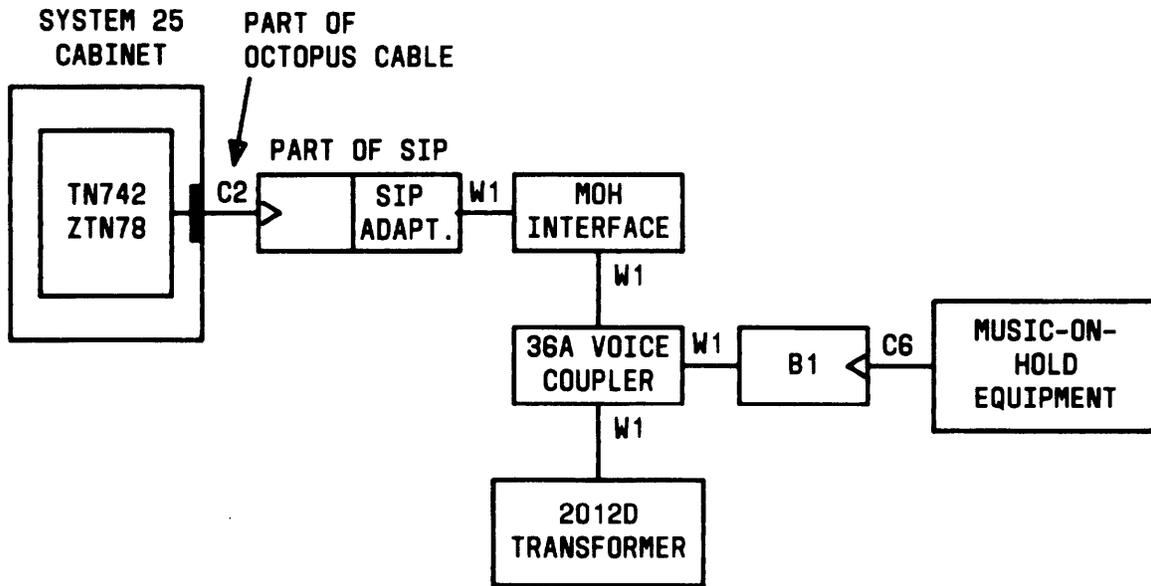
- TN742 - ANALOG LINE CP
- ZTN78 - TIP RING CP
- B1 - TYPICAL - 103A CONNECTING BLOCK
- C2 - OCTOPUS CABLE (WP90780) PEC 2720-05P
- C5 - MODULAR CORD (D4BU-87)
- W1 - INSIDE WIRING CABLE
- MOH - KS-23395 INTERFACE

Figure 2-52. Music Source, FCC Registered

## Non-FCC Registered Music Source Interface

The music source is connected to a ZTN78 CP (see Figure 2-53). Connect the CP to a 858A Adapter at the SIP.

Follow the instructions for installing FCC-registered equipment. You must also install a kit-of-parts (D-181575; includes 36A Voice Coupler, 2012D transformer, and KS-23395 MOH interface). Follow the wiring instructions included with the kit.



**LEGEND:**

- TN742 - ANALOG LINE CP
- ZTN78 - TIP RING CP
- B1- TYPICAL - 103A CONNECTING BLOCK
- C2 - OCTOPUS CABLE ( WP90780 )
- C6 - SINGLE-ENDED MODULAR CORD, D4BY
- W1 - 4-PAIR INSIDE WIRING CABLE

Figure 2-53. Music Source, Non-FCC Registered

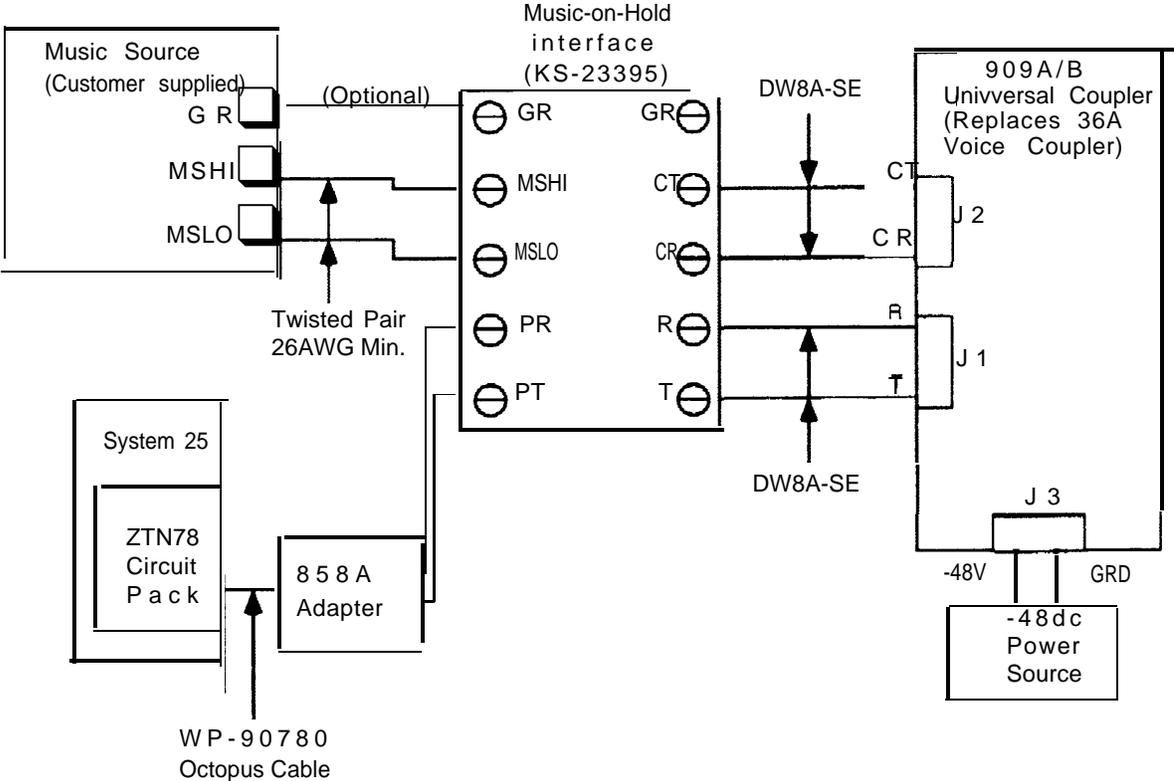


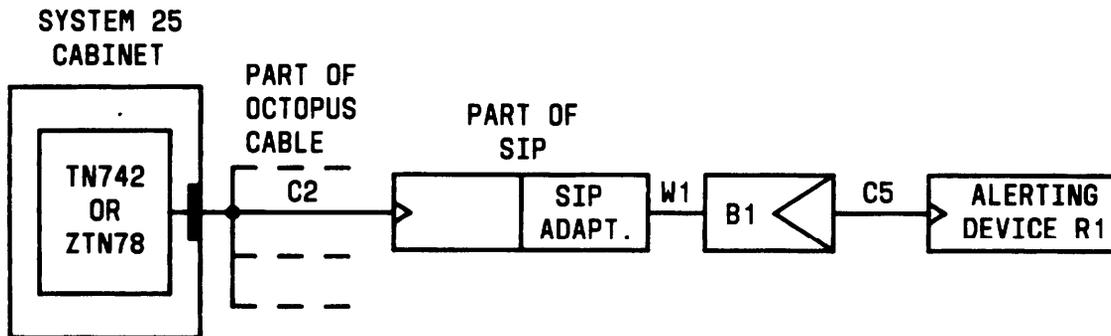
Figure 2-53a. Music-on-Hold

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## INSTALL EXTERNAL ALERTS

External alerts are connected to the system through a ZTN78 CP (Figure 2-54).

1. Connect the CP to a 858A Adapter at the SIP.
2. Connect the other side of the adapter to a 103A Connecting Block using building wiring.
3. Connect the block and alerting device with a D4BU cord.



**LEGEND :**

- TN742 - ANALOG LINE CP
- ZTN78 - TIP RING CP
- B1- TYPICAL - 103A CONNECTING BLOCK
- C2 - OCTOPUS CABLE ( WP90780 )
- C5 - MODULAR CORD ( D4BU-87 )
- R1 - EICM-50 RINGER OR EQUIVALENT
- W1 - INSIDE WIRING CABLE

Figure 2-54. External Alerts

## **INSTALL RECORDED DELAY ANNOUNCEMENT**

Delay announcements are installed the same way as external alerts.

## **INSTALL DICTATION SYSTEM INTERFACE**

If the equipment does not require a contact closure, follow the instructions for installing external alerts.

If the equipment requires a contact closure, follow the instructions below for connecting a paging system to the TN763 CP.

## **INSTALL PAGING SYSTEM INTERFACE**

PagePac\* Paging System, or compatible paging equipment, may be connected to System 25.

System 25 provides three types of paging system interfaces. The paging equipment can be connected to a TN763 Auxiliary Trunk, ZTN76 Ground Start, or ZTN77 Loop Start Trunk CP. The type of connection provided depends on the customer's equipment and/or requirements. Read the paragraphs preceding the instructions provided to determine the correct procedure.

**Note:** The PagePac 20 system is not normally connected to an Auxiliary Trunk CP because only 1-zone paging is provided by this connection. However, three PagePac systems can be used for three zones provided by TN763.

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\* Trademark of Harris Corporation Dracon Division

## Direct Connection to TN763 Auxiliary Trunk CP

Paging equipment can be connected directly to a TN763 Auxiliary Trunk CP (Figure 2-55) when the following conditions exist:

- Paging equipment is FCC registered.
- Paging equipment requires a contact closure for proper operation.

Connect as shown in Figure 2-55, following the steps below:

1. Connect the CP to a 66-type block, using an A25D 25-pair cable. Use kit-of-parts D-1 81524 (PEC 62511).

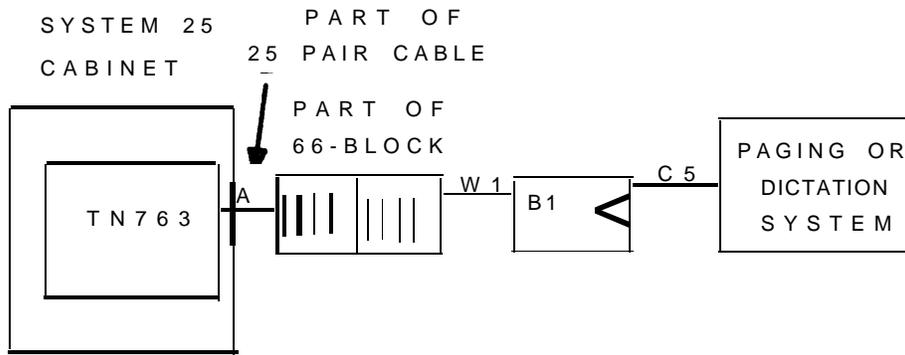
**Note:** The 66-block provides a 3-pair interface to TN763 (see Appendix A of this manual for details).

2. Using 4-pair inside wiring cable, connect the 66-block to a 103A connecting block. Make the following connections:

66-Block Term.*	103A Term.
T	1
R	2
SZ	3
SZI	4
S	5
S1	6

\* T,R is the voice pair; SZ,SZ1 is the seizure request pair; and S,S1 is the seizure acknowledge pair to the TN763.

3. Using a D4BU cord, connect the paging equipment to the 103A block.
4. If you are installing a PagePac 20 system, connect the speakers to the receptacle on the back of the PagePac system.



**LEGEND :**

TN763- AUXILIARY TRUNK CP

A - SINGLE-ENDED 25 PAIR CONNECTOR CABLE (A25D)

B1 - TYPICAL .103A CONNECTING BLOCK

C5 -MODULAR CORD (D4BU-87)

W1 - INSIDE WIRING CABLE (4-PAIR)

NOTE : APPARATUS CODE D-181523 INCLUDES  
66E3-25 BLOCK CONNECTOR AND CABLE  
B25A 15/DE.

Figure 2-55. Paging System Connection to TN763 Circuit Pack

## Connection to TN763 Auxiliary Trunk CP (278A Adapter Required)

A 278A Adapter is required to connect paging equipment to a TN763 Auxiliary Trunk CP (Figure 2-56) when the following conditions exist:

- I Paging equipment is not FCC registered.
- I Paging equipment requires a contact closure for proper operation.

Connect as shown in Figure 2-56, following the steps below:

1. Connect the CP to a 66-type block, using an A25D 25-pair cable. Use kit-of-parts D-1 81524 (PEC 6251 1).

**Note:** The 66-block provides a 3-pair interface to TN763 (see Appendix A of this manual for details).

2. Using 4-pair inside wiring cable, connect the following leads on the 66-type block to a 278A adapter.

CP Leads*	278A Term.
T	T
R	R
SZ	BZ1
SZI	GRD
S	BY1
S 1	BY2

I T,R is the voice pair; SZ,SZ1 is the seizure request pair; and S,S1 is the seizure acknowledge pair.

3. Open the 278A adapter, and install a strap between terminals BZ2 and -V.
4. Move the yellow shorting plugs so that the following connections are made (Figure 2-57).

A to B  
E to F  
G to H

D to C and J to K should be open.

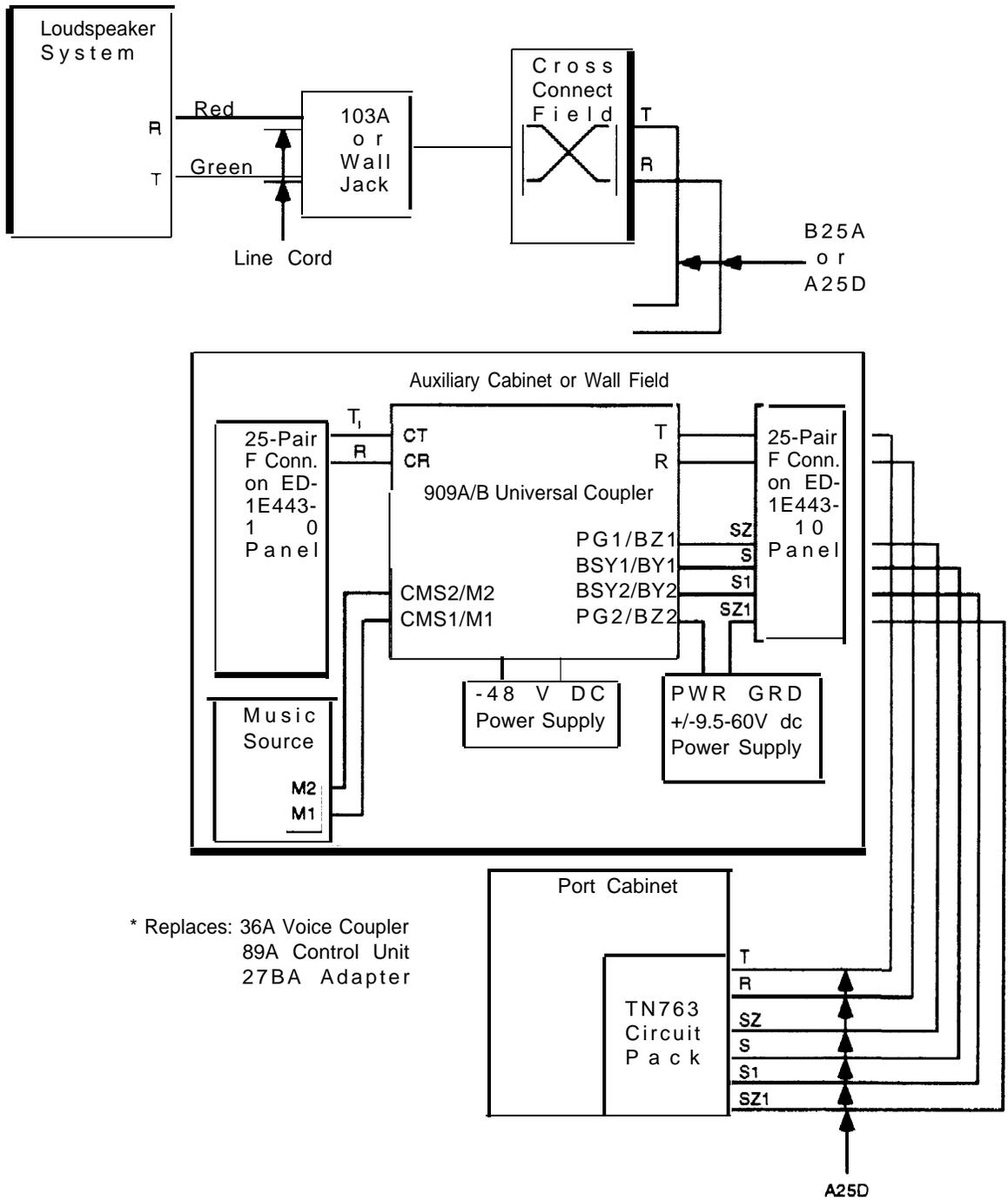


Figure 2-55a. Loudspeaker Paging with Background Music

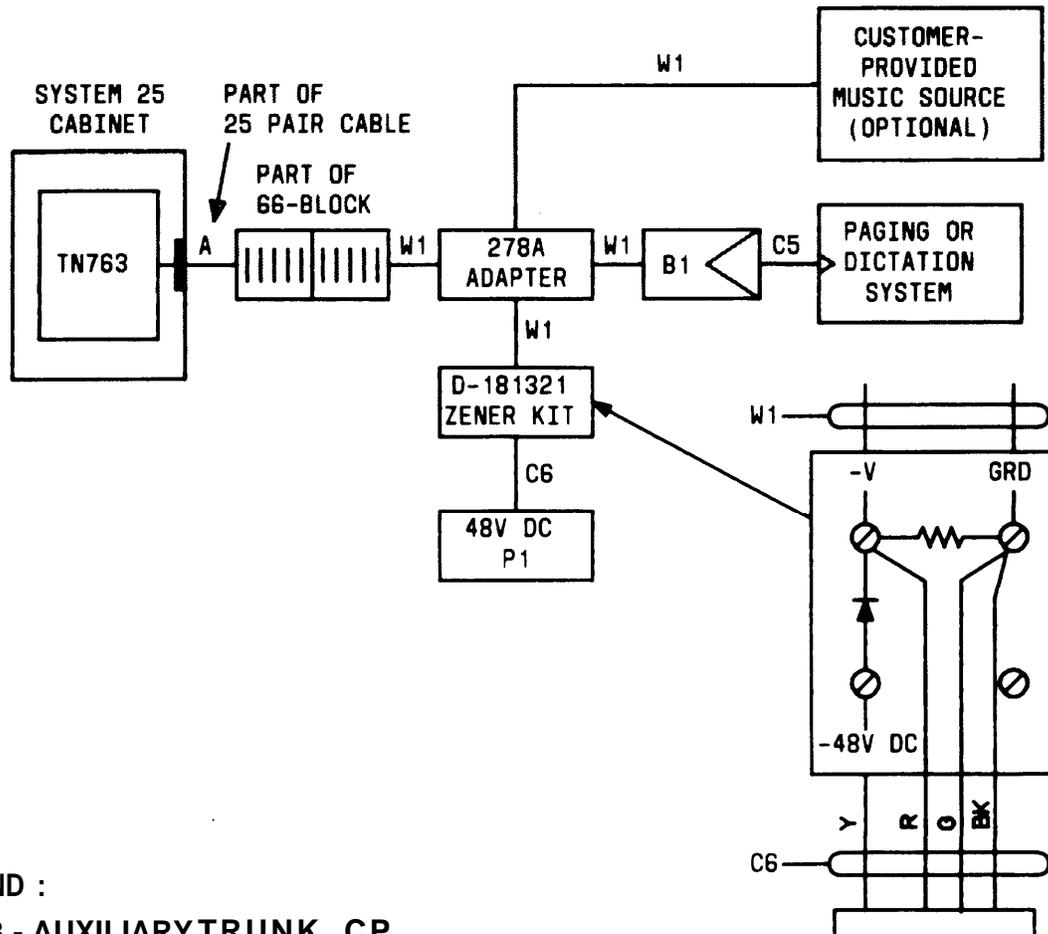
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5. Set switch to **NORMAL** position.
6. Using a **D4BY** (single-ended) modular cord, connect **D-181321** kit of parts (Figure 2-56) to a **KS-22911, L2** power supply (-48V dc).
7. Connect terminals **-V** and **GRD** on **278A** adapter to **D-kit**.
8. If background music is desired, connect terminals **MI** and **M2** on the **278A Adapter** to the customer-provided music source.
9. Connect the **278A** adapter to a **103A** connecting block, using 4-pair inside wiring cable. Make the following connections:

278A Term.	103A Term.
CT	1
CR	2
C1	5
C2	6

10. Using a **D4BU** cord, connect the paging system to the connecting block.
11. If you are installing a **PagePac** system, connect the speakers to the receptacle on the back of the **PagePac** system.

# INSTALLATION



**LEGEND :**

**TN763 - AUXILIARY TRUNK CP**

**A - SINGLE-ENDED 25 PAIR CONNECTOR CABLE (A25D)**

**B1 - TYPICAL - 103A CONNECTING BLOCK**

**C5 - MODULAR CORD (D4BU-87)**

**C6 - SINGLE-ENDED MODULAR CORD**

**P1 - KS-22911, L2, POWER SUPPLY, -48 VOLT DC**

**W1 - INSIDE WIRING CABLE (4-PAIR)**

**278A ADAPTER -REQUIRES -24 VOLT ZENER DIODE KIT OF PARTS**

**NOTES :**

1. APPARATUS CODE D-181523 INCLUDES 66E3-25 BLOCK CONNECTOR AND CABLE B25A 15/DE.
2. APPARATUS CODE D-181524 INCLUDES C6, P1, 278A ADAPTER AND ZENER KIT.

**Figure 2-56. Paging System Connection to TN763 Circuit Pack (278A Adapter Required)**

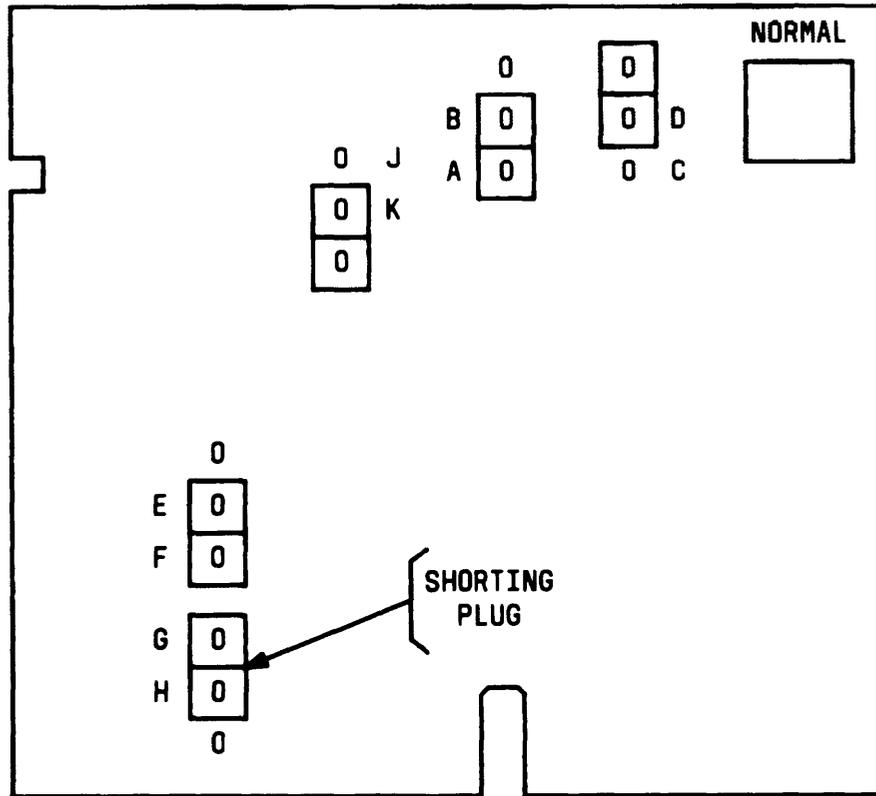


Figure 2-57. 278A Adaptor Plug Positions for Connecting TN763 Circuit Pack to Paging System

## Connection to ZTN76 or ZTN77 CP

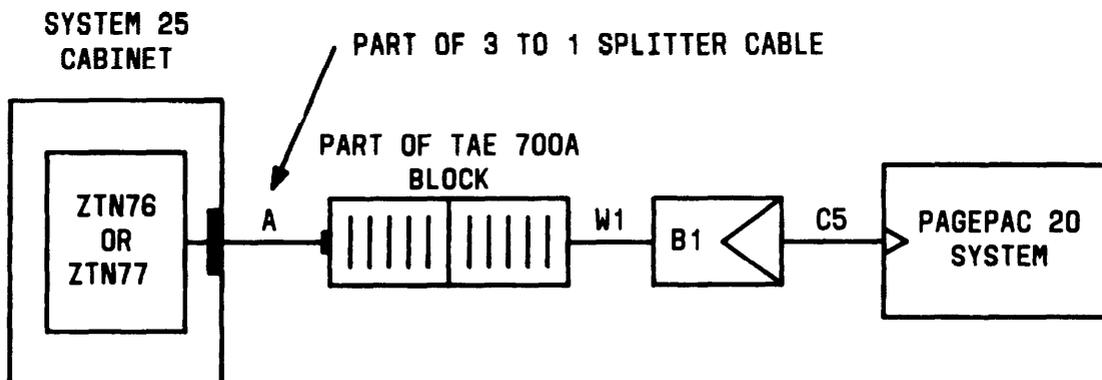
PagePac 20 system with ZoneMate 9/39 and Common Control Unit (CCU) provides up to nine/thirty-nine paging zones and multizone groups.

To connect a PagePac 20 system, make connections using the following steps (Figure 2-58):

1. Place the PagePac amplifier on the ZoneMate and the CCU.
2. Connect the three units as follows:
  - a. Plug the cord attached to the CCU into the modular jack on the PagePac system.
  - b. Connect the 25-pin cable between the ZoneMate and the CCU.
  - c. Plug GR Molex connector from CCU into PagePac 20.
3. Using a D4BU modular cord connect the jack on the back of the CCU to the 103A connecting block.
4. Using 4-pair inside wiring cable, connect the 103A connecting block to the TAE 700A block. Make the following connections:

700A Block Term.	103A Term.
T	1
R	2

5. Attach the speakers to the ZoneMate.
6. Set the switch on the CCU to LS for loop-start trunks or GS for ground-start trunks.
7. For ground start trunks, connect the black lead from the 2-pair cord supplied with PagePac 20 to the System 25 cabinet ground block.



LEGEND :

- ZTN76 - GROUND START C'
- ZTN77 - LOOP START C'
- A - 3 TO 1 SPLITTER CABLE (WP-90929,L1)
- B1 - TYPICAL- 103A CONNECTING BLOCK
- C5 - MODULAR CORD (D4BU-87)
- W1 - INSIDE WIRING CABLE (4-PAIR)

Figure 2-58. PagePac 20 System Connection to ZTN76 or ZTN77 Circuit Pack

Customer-provided paging equipment can also be connected to ZTN76 or ZTIN77 CO trunk CPs. Connection to the system is made through the TAE appearance of the Tip/Ring pair of the CO trunk CP (See Appendix A for connection details). A paging equipment interface kit D-181900 consisting of a Universal Telephone Access Module (UPAM) and a -48 VDC power supply, PRS-48, is required unless all of the following conditions exist:

- Paging equipment is FCC registered.
- Paging equipment does not require a contact closure for proper operation.
- A trunk interface is provided.

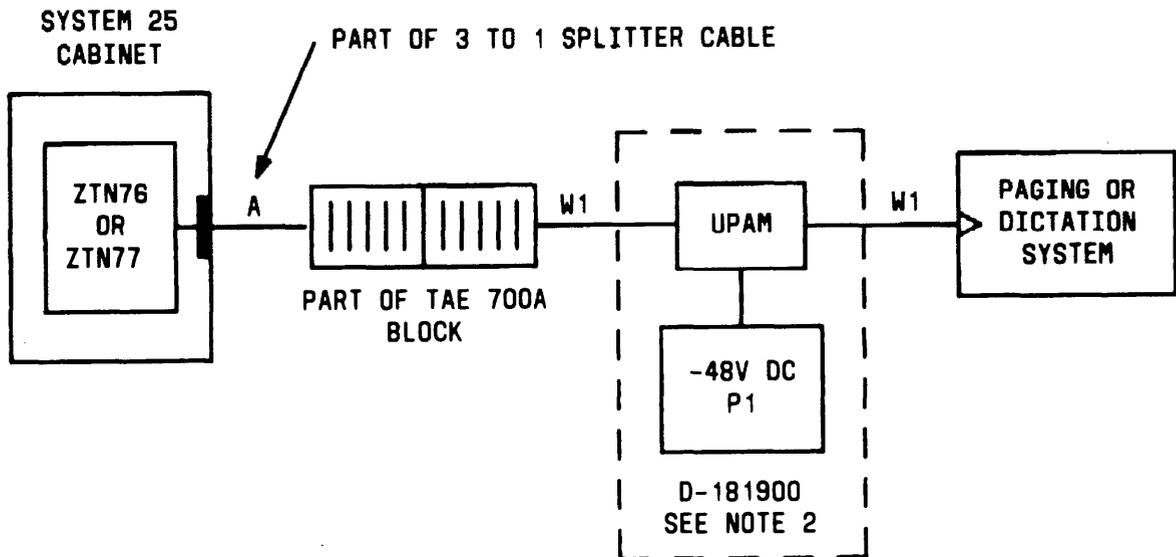
If kit D-181900 is required, make connections using 4-pair inside wiring as listed below (Figure 2-59):

1. Connect UPAM chassis ground to building ground.
2. Connect UPAM terminals PT and PR to paging equipment.
3. Connect UPAM terminals +24/48 and -24/48 to respective PRS-48 power supply terminals +48VDC and -48VDC. For ZTN76 ground start CP only, connect +48VDC to System 25 system ground which appears on the TAE block (Appendix A).
4. Connect UPAM terminal R to trunk CP ring lead appearing on TAE block.

For ZTN76 ground start CP connect UPAM terminal T to UPAM terminal N.O. and connect UPAM terminal COM to trunk CP tip lead appearing on TAE block.

For ZTN77 loop start CP connect UPAM terminal T directly to trunk CP tip lead appearing on TAE block.

If kit D-181900 is not required, use 4-pair inside wiring and connect paging equipment directly to trunk CP tip and ring leads appearing on TAE block.



**LEGEND :**

ZTN76- GROUND START CP

ZTN77- LOOP START CP

A - 3 TO 1 SPLITTER CABLE (WP-90929,L1)

UPAM - UNIVERSAL TELEPHONE (PAGING) ACCESS MODULE

P1 - PRS-48 POWER SUPPLY

W1 - INSIDE WIRING CABLE (4-PAIR)

**NOTES :**

1. APPARATUS CODE D-181523 INCLUDES 66E3-25 BLOCK CONNECTOR AND CABLE B25A 15/DE.
2. APPARATUS CODE 0-181900 INCLUDES UPAM AND PRS-48 POWER SUPPLY. D-181900 IS REQUIRED UNLESS ALL OF THE FOLLOWING CONDITIONS EXIST:
  - PAGING EQUIPMENT IS FCC REGISTERED
  - PAGING EQUIPMENT DOES NOT REQUIRE A CONTACT CLOSURE FOR PROPER OPERATION
  - A TRUNK INTERFACE IS PROVIDED.

Figure 2-59. Paging System Connection to ZTN76 or ZTN77

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## SYSTEM TESTS

Once installation is completed, the system must be initialized, following the procedures in the *AT&T System 25 Administration Manual (555-540-500)*. When this has been done, the system is ready for acceptance testing. You should test all trunks, voice terminals, data terminals, and features.

If any equipment does not perform properly, refer to the maintenance section of this manual for more details.

### TEST OUTGOING TRUNKS

You can test all outgoing trunks by using the \*2 access code.

1. At a voice terminal that is not toll restricted, dial \*2 and the assigned 4-digit trunk number.

You should hear dial tone for a working trunk or reorder tone for a DID trunk or invalid trunk number.

2. Dial an incoming trunk on the system.
3. Answer the call and verify transmission.
4. Go on-hook at both voice terminals.

### TEST DS1 INTERFACE

The DS1 Interface feature is tested by making the appropriate type calls that use the DS1 facilities. Refer to the appropriate section of this manual for those test procedures. As an example, if the DS1 Interface is used as a Tie Trunk, refer to the "TEST TIE TRUNK" section of this manual.

## TEST INCOMING DID TRUNKS

You can test DID trunks by establishing a connection on each DID trunk and then busying it out so that all DID trunks can be tested.

1. At a working voice terminal, go off-hook, dial the CO trunk access code, and then dial a DID number.

You should hear ringback at the calling terminal and ringing at the called terminal.

2. At the called terminal, go off-hook and verify transmission.
3. At both terminals, lay the handsets down so that the call remains active. If using a multiline terminal, put the call on hold and place another call (step 1).
4. Place a second call from another terminal to another DID number in the system and verify transmission.
5. Now, place as many calls as there are DID numbers in the system (alternating terminals and numbers). Verify transmission in each case.
6. At all voice terminals used for this test, go on-hook.
7. If there are not enough dial-up CO trunks, work with the CO to check all trunks or have someone call from the outside to check each DID trunk.

## TEST INCOMING TIE TRUNKS

1. At the other tie trunk site, go off-hook and access a tie trunk. To test a dial repeating tie trunk, dial a System 25 voice terminal. (No dialing is required to test an automatic incoming tie trunk.)

You should hear ringback at the distant terminal and ringing at the called terminal (with incoming tie trunk appearance).

2. At the test terminal, go off-hook and verify transmission.
3. At the test and distant terminals, go on-hook.

4. Repeat Steps 1 through 3 for all incoming tie trunks, and make sure each tie trunk is tested.

## TEST 7300H SERIES VOICE TERMINALS

Test each 7300H Series terminal using the terminal's test switch, by placing both station-to-station and external calls, and by using the feature buttons.

1. Push the T/P switch on the left side of the voice terminal to T, and hold it there a few seconds.

- If it is working properly, you should hear a steady tone.

- The terminal's red and green LEDs should flash.

2. Return the T/P switch to the center position.

3. Go off-hook at the test terminal.

You should hear the system dial tone.

4. Dial the Personal Dial Code (PDC) of another working voice terminal.

You should hear ringback at the calling terminal and ringing at the called terminal.

5. Go off-hook at the called voice terminal, and verify transmission by talking.

6. Go on-hook at both terminals.

7. At the test terminal, go off-hook.

You should hear the system dial tone.

## SYSTEM TESTS

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8. Dial the central office (CO) trunk access code.

You should hear the CO dial tone.

9. Dial the listed directory number for the system you are installing.

You should hear ringback at the calling terminal and ringing at the attendant console.

10. Go off-hook at the attendant position, and verify transmission.

11. At the calling terminal and attendant position, go on-hook.

12. If the station is toll restricted, place a toll call.

You should hear Reorder Tone.

13. Verify that all feature buttons on the voice terminal are working properly.

14. If any terminal feature is not working properly, verify the translations at the System Administration Terminal (SAT).

## TEST SINGLE-LINE VOICE TERMINALS

Test each single-line voice terminal by placing station-to-station and external calls.

1. At the test terminal, go off-hook.  
— You should hear system dial tone.
2. Dial the PDC of another working terminal.  
You should hear ringback at the calling terminal and ringing at the called terminal.
3. At the called voice terminal, go off-hook and verify transmission.
4. At both voice terminals, go on-hook.
5. At the test terminal, go off-hook.  
You should hear system dial tone.
6. Dial the CO trunk access code.  
You should hear CO dial tone.
7. Dial the listed directory number for the system you are installing.  
You should hear ringback at the calling terminal and ringing at the attendant position.
8. Go off-hook at the attendant position, and verify transmission.
9. At the calling terminal and attendant position, go on-hook.
10. If the station is toll restricted, place a toll call.  
— You should hear reorder tone.
11. If any terminal feature is not working properly, verify the translations at the SAT.

## TEST ATL CORDLESS TELEPHONE

The ATL Cordless Telephone must be tested to see if it functions properly. The transmission quality must be verified when the base and handset are separated by the maximum operating distance.

Use the documentation provided with the ATL Cordless Telephone to perform the required tests.

## TEST DIAL ACCESS CODES

1. Using a single-line or multiline voice terminal, verify the proper operation of each feature requiring a dial access code (Night Service access code).
2. If any feature is not working properly, verify the translations at the SAT.

## TEST SYSTEM FEATURES

You can test a number of system features from a multiline voice terminal: Automatic Route Selection (ARS), Station Message Detail Recording (SMDR), Direct Group Calling (DGC), System Speed Dialing, PDC login, and Call Coverage. (Note! You can also use a single-line voice terminal to test all of these features except for Call Coverage.)

### ARS and SMDR Tests

If ARS patterns have been translated, you can test the routing by placing long-distance calls and checking the trunk indicated on the SMDR output. To use the SAT to print SMDR records, unplug it from port 1 and attach it to port 2.

To verify ARS patterns:

1. Determine which long-distance numbers to call by examining the System Administrator's ARS patterns.

2. At any multiline voice terminal, go off-hook, dial the ARS access code, and dial one of the long-distance numbers. Make sure that the call is completed before going on-hook.
3. Repeat Step 2 if additional long-distance numbers must be called.
4. At the SMDR printer (or SAT), verify that the call was placed over the correct trunk group.
5. If not, verify the translations through the SAT.
6. If the SAT was substituting for the SMDR printer, return the SAT to port 1.

## **Remote Access Test**

Make an incoming call through the RA trunk. Use the correct and incorrect Barrier Codes. Check the SMDR,

## **DGC Test**

1. At any voice terminal, go off-hook, dial the CO trunk access code, and dial a DGC listed directory number.
2. At the ringing terminal in the DGC group, go off-hook and verify transmission.
3. Repeat Steps 1 and 2 for each DGC group.
4. Make additional calls to exercise each member of the complete DGC group.
5. Test the DGC dialing announcement (if provided) by making whole group busy or by logging all members of the group out.
6. At any voice terminal, dial the DGC access code and go to Step 2.

## **System Speed Dialing Test**

1. From the SAT, determine which numbers have been translated for System Speed Dialing. (Obtain the list of translated numbers from the System Administrator.)
2. At any voice terminal, go off-hook, dial a system speed calling code. Verify transmission and that correct party was reached.

### PDC Login Test

1. At a voice terminal, go off-hook and dial \* \* PDC PDC, where PDC is a PDC other than that of the test terminal.
  - You should hear a confirmation tone.
2. At another voice terminal, go off-hook and dial the PDC that was logged into the first terminal.
  - You should hear ringing at the first terminal.
3. At the home voice terminal of the PDC that was logged in, go off-hook and dial I I PDC PDC.
  - You should hear a confirmation tone.
4. Repeat Step 2, but this time the home terminal should ring.

### Call Coverage Test

1. From the SAT, determine how many rings have been set before coverage treatment. Also, identify a voice terminal with coverage and its covering voice terminal.
2. At a third voice terminal, go off-hook and dial the covered voice terminal.
3. Verify the number of rings at the covered terminal.
4. Verify ringing at the covering terminal.
5. At the calling voice terminal, go on-hook.
6. Check both individual and group coverage.

## TEST ATTENDANT CONSOLE

Testing the attendant console is the same as testing a multiline voice terminal, except for testing the console's unique feature buttons.

1. Perform all the steps in "Test 7300H Series Voice Terminal" in this section.
2. Verify that all attendant features are working properly.
3. If any features are not working or not working properly, verify the translations through SAT.

## TEST SELECTOR CONSOLE

At each selector console, check that all selector console LEDs are operational. Place a call to a voice terminal in the system.

1. Press the Test button on the console (the rightmost of the eight group buttons on the bottom row). This initiates test mode A.
  - Each LED lights in sequence.
2. Press the Test button (or any other button) again. This initiates test mode B.

Each LED lights as its associated button is pressed.

3. Press the Test button again to exit the test mode.
4. Go off-hook at the attendant console.
5. With the correct group select button activated, press a Direct Extension Selector (DXS) button.

You should hear a ringback tone.

6. Go on-hook.

## TEST DATA TERMINAL DIALING FEATURE

Perform this test on all data terminals and personal computers connected to the system through ADUs.

1. Make sure the test terminal is on.
2. Press <BREAK> <RETURN>.

The command mode menu is displayed.

(The command mode menu may be displayed before you press <RETURN>.)

3. Type D to select <place Data call>.

The prompt DIAL: is displayed.

4. Enter the number of a data terminal or host you want to call and press <RETURN>. (This is referred to as the Data Dial Code [DDC] of the data terminal.)

— RINGING is displayed.

5. If the call cannot be completed, one of these messages is displayed: INCOMPATIBLE FAR END, DISCONNECTED, BUSY, DENIED, or TRY AGAIN. Try the call again, or dial another terminal to perform the test.
6. If the call is still not completed, check data port translations.
7. If the call is completed, ANSWERED is displayed. Press <BREAK> twice within 1 second to end the test call.

DISCONNECTED is displayed.

The test terminal returns to the idle state.

---

## MAKE POOLED MODEM TEST CALL

Skip this test if the system does not include a TN758 Pooled Modem CP.

This test involves placing a data call from a data terminal connected through an ADU from a data terminal or personal computer connected via a modem (the modem may be part of a terminal connected to System 25 or off premises). Place the call following the dialing procedure required by the modem. When you hear answer tone, transfer the call to data. You should now be able to communicate with the called endpoint.

## TEST TRANSFER TO DATA

Perform this test at each voice terminal with a DATA button,

1. Determine which data terminal or personal computer (PC) is associated with the DATA button being tested. Be sure the terminal or PC is turned on.
2. Go off-hook at the voice terminal.
3. Dial the DDC of another data terminal or host computer (be sure the terminal or PC is turned on and idle).
4. When you hear answer tone, press the DATA button and hang up.
5. A call is now established between the associated data terminal and the called terminal. Verify connection by sending a message or logging in at the called end-point.
6. Hit <BREAK> twice within 1 second at one of the data terminals to disconnect the call.

## TEST EXTERNAL ALERT (NIGHT SERVICE)

Place a test call to the attendant console to verify that the alerting device sounds when the attendant console is in the Night Service mode. If an alerting device has not yet been installed, connect a spare voice terminal or alerting device to the modular jack reserved for the alerting device.

1. At the attendant console, press the Night Service button.
  - The Night Service LED lights steadily.
2. At any voice terminal, go off-hook. Dial the CO trunk access code, and dial the number of a CO trunk that receives night service coverage.
3. Verify that the alerting device sounds.
4. At another voice terminal, go off-hook and dial the night service access code.
  - The alerting device ringing should stop.

The call should be picked up.
5. Verify transmission.
6. At both voice terminals, go on-hook.
7. Repeat Steps 2 through 6 for each night service trunk.
8. At the attendant console, press the Night Service button again and verify that the Night Service LED goes dark.

## TEST DICTATION SYSTEM ACCESS

Place a call to verify that dictation equipment can be accessed. If dictation equipment has not been installed, this feature cannot be tested.

1. Use a working voice terminal as the test terminal, and go off-hook.
2. Dial the access code or PDC, and the number associated with the dictation equipment.
3. Verify that ready or talkdown tone is transmitted.
4. Transmission in both direction should be tested. Make a recording and play it back
5. Go on-hook.

## TEST PAGING INTERFACE

Place a test call to each paging zone to verify that paging equipment can be accessed.

**Note:** If testing ZoneMate 9 (used with PagePac 20), get an acknowledge tone. Then dial the zone code, and make an announcement.

1. At any working voice terminal, go off-hook and dial the access code or PDC for a particular zone.

You may hear a confirmation tone.

2. Make an announcement into the handset.  
— You should hear the announcement from the loudspeaker(s).
3. At the calling voice terminal, go on-hook.
4. Repeat Steps 1 through 3 for all paging zones provided.

## TEST MUSIC-ON-HOLD

Verify that music is provided to outside callers placed on hold. (Inside callers do not receive Music-on-Hold [MOH].)

1. At any working voice terminal, go off-hook. Dial the CO trunk access code and the system's listed directory number, or if DID, dial any station.
2. At the called station, answer the incoming call.
3. At the called station, press HOLD.

The line button's green LED should flash.

4. Verify that music is heard at the calling voice terminal.
5. At the calling voice terminal, go on-hook.

---

## TEST EMERGENCY TRANSFER

Place the system in emergency transfer mode by turning power off (or remove the modular connector from the ETU). Place an outside call from each emergency transfer station.

1. At Cabinet 1, turn the power off using the rocker switch on the back or remove the modular connector from the ETU.
2. For ground start trunks, at an emergency transfer voice terminal, go off-hook. Press the ground start key, if so equipped.
3. For loop start trunks, go off hook at an emergency transfer terminal.
  - You should hear dial tone.

4. Dial a incoming trunk wired for emergency service.

You should hear a ringback tone at the calling terminal and ringing at the called station. If a busy tone is heard, the call may be to the calling station

5. At the called station, go off-hook and verify transmission.
6. At both emergency transfer stations, go on-hook.
7. Repeat Steps 2 through 5 for each emergency transfer station, including the ones you have just rung, to ensure that you can place as well as receive a call from each.
8. At Cabinet 1, turn power on using the rocker switch on the back, or replace the modular connection into the ETU.

## TEST TOUCH-TONE RECEIVERS

1. At a single-line voice terminal, go off-hook. Dial \*3 and the 2-digit number (01 through 12) of the touch-tone receiver to be tested. Receivers 01 through 04 are on the ZTN85 or ZTN131 (R3) CP. Receivers 05 through 12 are only present if your system has two TN748 CPs (05 through 08 receivers on one, and 09 through 12 receivers on the other).

You will hear busy tone if the receiver is in use, reorder tone if you misdialed or addressed a receiver not in your system (for example, you dialed \*05 and your system does not have a TN748 CP). Try again.

If you hear dial tone after 1 to 3 seconds of silence, proceed with this test.

2. Dial the digits 1234567890 \*#.

You should hear a dual-tone, multifrequency (DTMF) signal as each key is pressed.

You will hear dial tone after entering the “#” if the test passes.

3. Repeat the test for each touch-tone receiver.

---

# MAINTENANCE

The primary maintenance objective is to detect, report, and clear troubles as quickly as possible with minimum disruption to normal service. Periodic system self-tests, automatic software diagnostic programs, and fault detection hardware are several of the maintenance tools used to achieve this objective. Most troubles in System 25 can be isolated to a replaceable unit.

The System 25 hardware is maintained as a group of independent units (that is, maintenance objects). Each object is normally a separately replaceable unit. Examples include circuit packs (CPs), power supplies, fan assemblies, the Digital Tape Unit, AC Power Distribution Unit, voice terminals, lines, and trunks.

- System-Detected Errors
- User-Reported Troubles.

For system-detected errors, a light-emitting diode (LED) on the attendant console automatically lights if the error qualifies as an “alarm.” This is a serious error. Most alarms are also indicated by LEDs on system CPs.

User-reported troubles usually result from service problems at individual voice and data terminals and are often related to alarmed conditions.

Error records and alarms are retired either automatically or manually. After a trouble or error has been cleared, the system retests the previously faulty area within a variable time interval. When the error is no longer detected, the error message and the alarm, if applicable, are retired. By entering commands at the SAT, maintenance personnel can retire error records and alarms manually after a problem has been fixed. Also, error records can be accessed and listed, and some alarms can be removed through the SAT. However, certain alarms must be cleared manually. After the error messages have been removed from the error tables, the Attendant Alarm LED (and red CP LEDs) will go dark unless the trouble recurs.

**Note:** Information contained in this part applies to the AT&T System 25 RI VI, R1V2, R2V1 and R3V1. However, in all cases except in the description of CP LEDs, the CPU/Memory CP (ZTN129 [R2V1] or ZTN130 [R3]) is referenced rather than the Call Processor CP and Memory CP used in RIV1 and R1V2.

## EQUIPMENT NEEDED

The maintenance technician should take the following tools and equipment on any System 25 service call:

- EIA breakout box
- Digital voltmeter (KS-20599 or equivalent)
- 11 O/66-type punchdown tool (AT 8762D or equivalent)
- Dracon TS21 or equivalent touch-tone test set
- Assorted flat-head screwdrivers
- Assorted Phillips-head screwdrivers
- Long-nosed pliers
- Regular pliers
- Wrist grounding strap
- Model DC4 Digital Tape Unit, with 355A adapter and a D8W cord (Comcode 404079429)
- Administration terminal (TI 703KSR or equivalent), with 355A adapter (Comcode 404079436).

## Precautions

Electromagnetic fields radiating from the system cabinets may generate noise in other communications equipment. The technician must be sure that all cabinet panels and covers are securely in place after performing maintenance.

**Caution:** Electrostatic discharge can destroy or severely damage integrated circuits on CPs.

The maintenance technician **MUST ALWAYS WEAR A WRIST GROUNDING STRAP** when handling CPs. The cord must be attached to the grounding block at the back of the cabinet. Damage to integrated circuits caused by electrostatic discharge may not be immediately apparent.

**Caution:** The wrist grounding strap must not be clipped to any cabinet location other than the grounding block or a front-cover retainer screw. The wrist grounding strap must not be attached to a CP.

## GENERAL MAINTENANCE INFORMATION

### System Errors and Alarms

During periodic testing, a maintenance audit could detect a system error that automatically generates an error record. Depending on severity, the error record is stored in one of following three tables in the Error Log:

- Permanent System Alarms
- Transient System Errors
- Most Recent System Errors.

The three error tables can be displayed at the System Administration Terminal (SAT). The error tables are used to diagnose and analyze problems, particularly when the problem has not caused an alarm or when alarms cannot be retired by replacing faulty units.

The errors are listed in the error tables by time of occurrence. Resolved and unresolved errors are listed, thus providing a profile of the past and current state of the system. Error message explanations are provided under “Error Messages” in this section.

### Emergency Transfer

System 25 has emergency transfer capability in case of total system outage. The Emergency Transfer Unit (ETU) connects preassigned single-line voice terminals directly to the CO, bypassing the System 25. Emergency transfer is invoked by loss of ac power or by any failure of the system that prevents it from processing calls.

### Circuit Pack LEDs

During the various states of operation (start-up testing, normal operation, and failure), CP LEDs appear as follows:

**Note:** The first two listings, Memory and Call Processor, apply only to Release 1. The CPU/Memory circuit pack applies to Release 2 and Release 3.

**Memory (ZTN81 [R1V7] or ZTN127 [R1 V2]J):** The red LED on this CP lights when power is applied and goes dark upon successful completion of the ROM checksum test initiated by the Call Processor CP. Failure is indicated by a steadily lighted red LED.

**Call Processor [ZTN82 (R1V1) or ZTN128 (R1V2)]:** The green LED on this CP lights when power is applied and flashes during normal operation. When the system resets itself, the green LED lights and then goes dark for a few seconds while the Call Processor performs its self-tests. Once testing is complete, the green LED flashes and the Call Processor resets all port CPs. Failure is indicated when the green LED remains steadily lighted or dark.

**CPU/Memory [ZTN129 (R2V1) or ZTN130 [R3];** The green LED on this CP lights when power is applied and flashes during normal operation. When the system resets itself, the green LED lights and then goes dark for a few seconds while the CP's call processor performs its self-tests. Once testing is complete, the green LED flashes and the call processor resets all port CPs. Failure is indicated when the green LED remains steadily lighted or dark.

**Port Circuit Packs;** The red LED on port CP lights during power-up testing and goes dark upon successful test completion. The green LED lights when translations have been loaded and remains lighted during normal operation. The red LED remains lighted for any port CP that fails the start-up test or fails while in use. The amber LED lights when any port on the CP is in use.

**Note:** A red LED indicator immediately lights an alarm at the console for all port CPs except the TN767. Because of the sensitivity of this CP to noise and transients, a 15 minute delay exists in lighting the console LED to allow the problem to correct itself. This will help eliminate service calls for transient problems caused by weather or noise.

**Clock/Service Circuit (ZTN85 or ZTN131 [R3]):** The red LED on this CP lights during self-testing and goes dark upon successful test completion. The amber LED flashes during normal operation (indicating that the clock generator is active) and remains lighted when any tone receiver on the CP is in use. When the amber LED is dark, the CP is not translated or a problem exists. The green LED lights when translations have been loaded and remains lighted during normal operation.

## Attendant Console LED

A lighted green Alarm LED on the console indicates the presence of a Permanent System Alarm. The LED flashes with each new alarm. The attendant can press the associated button to cause the LED to light steadily. A lighted red Alarm LED indicates a barrier code violation.

## Power Supply LED

A lighted green LED on the power supply indicates normal power operation.

## Switches and Test Points

The power switch on the back of the cabinet controls cabinet ac power and should be left in the "On" position (1 = "On"), except when otherwise indicated. The system has no other field accessible switches, fuses, or circuit breakers. The power supply contains its own fuses, but these are not field replaceable.

The test points (-5 V, +5 V, 48 V, and GNU) for the power supply are located on the upper right corner at the front of the cabinet.

## System Administration Terminal

The SAT used to administer the system may also be used to read and clear the error log tables. The error log is read by logging on the SAT, selecting the main menu item "SEARCH," and then selecting the table to be read (that is, Permanent System Alarms, Transient System Errors, or Most Recent System Errors). To log on the SAT and access an error table, refer to the procedures provided in "Error Log."

## Remote Initialization and Maintenance (RIM) Service

### Description

The Remote Initialization and Maintenance Service (RIMS) (R2V1 or R3) provides an AT&T technician remote access to System 25. Using the RIMS feature, the technician can do System 25 initialization, ongoing administration, and maintenance. The RIMS port is a logical port on the ZTN129 or ZTN130/ZTNI 42 (R3) CPU/Memory circuit pack:

Using RIMS, the remote administrator can initialize translations after the switch itself is installed. As long as there is no hardware change, the remote administrator can do ongoing administration without having to visit the customer's site. Similarly, to trouble-shoot a problem, a technician can call the RIMS port and check the Error Log to determine the cause of the trouble. The technician can clear alarms remotely and decide whether or not a service dispatch is necessary.

The remote administrator can establish a call to the RIMS port by one of the following methods:

- The remote administrator dials the listed directory number (LDN) for the RIMS trunk. When the call rings at the station (typically, the attendant console), the called party transfers the call to the RIMS port. When the RIMS port is connected, the transferring station is disconnected from the call.
- The remote administrator directly dials the RIMS port using the Remote Access feature. The Remote Access feature is described in this manual.

By first dialing a trunk access code, the on-site technician can also establish a call to the RIMS port using either of the two methods described above.

### **Considerations**

Only one terminal can be connected to the RIMS port at one time. Any station with a touch-tone dial pad can transfer a call to the RIMS port. Intercom (station-to-station) calls cannot be connected to the RIMS port.

The trunk connecting to the RIMS port receives busy tone if the port is already in use. For transfers, the transferring station receives confirmation tone if the far end is successfully transferred to the RIMS port. The station receives reorder tone if there is an error in the transferring sequence.

### **Interactions**

A call to the RIMS port is logged by Station Message Detail Recording (SMDR).

### **Administration Requirements**

For a RIMS call to be made during initialization, at least one voice station and one trunk must be translated. A cold start with defaults provides these translations.

The RIMS transfer code (\*1 00) can be assigned to a Repertory Dialing feature button on a multiline voice terminal. If the Remote Access feature is used, the trunk used for RIMS access must be administered as a remote access trunk.

### **Hardware Requirements**

#### **Customer's Site:**

**None.**

#### **Remote Location:**

A dumb terminal equipped with a modem that supports voice transfer to data and an RS-232C connecting cable is required. An AT&T PC 6300 replaces the terminal if the Advanced Installation Tool (AIT) software is used.

## **MAINTENANCE STRATEGY**

**Fault isolation is the cornerstone of the System 25 maintenance strategy. Maintenance activity isolates faults to one (or more) repairable or replaceable maintenance units. Equipment should be tested in the following order:**

- 1. Terminal equipment**
- 2. Station wiring**
- 3. Port circuit packs (CPs)**
- 4. Common control circuitry**
- 5. Power supply and cabinet**
- 6. Backplane.**

**The first fault isolation step attempts to reproduce the fault, whether it is system-detected or user-reported. A fault that can be reproduced is more easily diagnosed and corrected.**

**Figure 4-1 presents a practical approach in responding to system troubles. If the maintenance technician is sent to a System 25 site in response to a trouble report, the maintenance activity will probably consist of isolating and replacing one or more faulty units of equipment. However, multiple faults recorded in the Error Log and user-reported troubles may require more investigation and analysis'.**

**When the limits of trouble-clearing analysis are reached and the trouble is still not cleared, the maintenance technician must escalate the problem to a higher level of technical support. Problems should be escalated to the National Service Assistance Center (NSAC) in Denver, Colorado. The telephone number is 1-800-628-2888.**

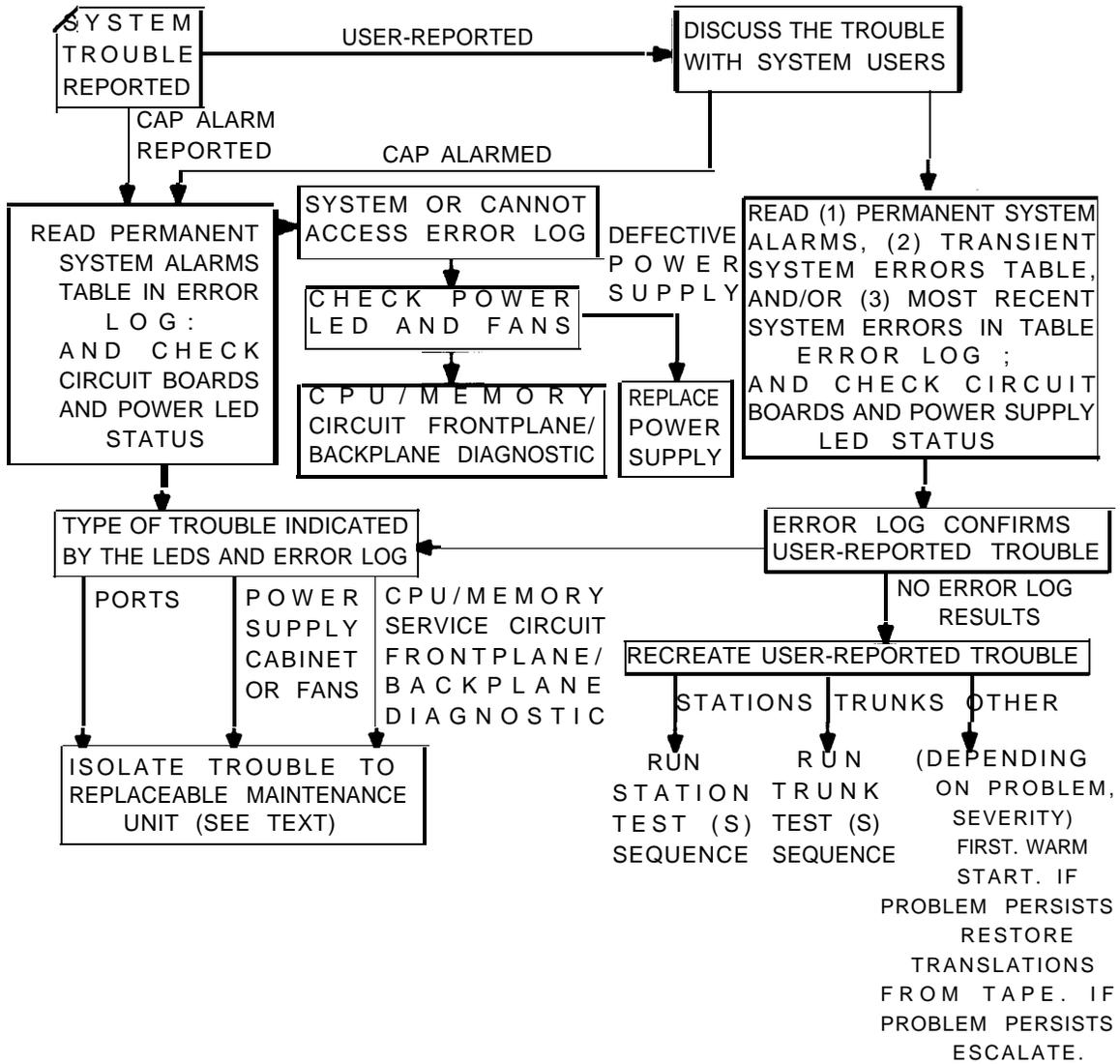


Figure 4-1. Response to System 25 Trouble Report

Sometimes, faults recorded in the error log and user-reported troubles will exist at the same time. The logged faults should always be cleared first, if possible. This procedure often clears the user-reported troubles without any additional maintenance.

Clearing the most serious logged fault may clear some or all of the other faults. Descriptions of the errors in the error log section indicate their relative urgency.

Error log records should be manually recorded before clearing a recorded error or alarm. If a faulty CP is located in the process of clearing a problem, it must be replaced with a known good CP. The associated error record should be included with the CP when it is returned for repair. If the SAT has an associated printer, the error records can be printed instead of being manually recorded.

Traditional troubleshooting methods still have a valid place in maintaining a system as advanced as System 25. And sometimes these methods are sufficient to locate and clear faults. These methods include voice terminal substitution, visual inspections, continuity checks, and clarification of operating procedures with users.

## **Total System Failures**

As the flowchart in Figure 4-1 shows, a failure of the common control circuitry (that is, CPU/Memory and Service Circuit) must be repaired immediately. This procedure may clear other problems in the system as well.

## **Port Problems**

Port CP failures can usually be cleared by replacing the CP that has a lighted red LED (if reseating was unsuccessful). When replacing suspected defective CPs, wait until the amber LED (indicating CP is in use) goes dark before removing the pack.

## Common Control Problems

**Common Control circuitry is difficult to troubleshoot. The system must be powered down before any of these CPs are replaced. Before powering the system down, save translations to tape (see “Using the Digital Tape Unit”). Other repair procedures may also require the system to be powered down. After removing a suspected faulty CP, do the following:**

- **Visually inspect the CP. If a problem is identified, attach a note to the CP identifying the problem.**
- **Attach any error reports that may apply.**
- **Visually inspect the cabinet backplane.**

**After the suspected faulty CP has been replaced, the system can be powered up. When the CPU/Memory CP is replaced, all historical data is lost. The system will then have to be restored from the tape backup unit with the latest copy of the system’s translations. If no tape exists, the system has to be reinitialized.**

**Multiple errors and off-board errors are more likely to occur in common control problems than in port problems. Use of the Error Log is imperative in clearing common control problems.**

---

## Station, Wiring, and Trunk Problems

If the system indicates that a fault is with a station, or if a user complaint indicates a station problem, the trouble must be isolated to the station itself or to the wiring between the cabinet or station interconnect panel and the station.

The station wiring, particularly the mounting cord, should be visually inspected in cases of station trouble reports. A dead station could be caused by a loose mounting cord. Station trouble can also occur when wiring is crushed or severed by furniture or traffic. Stations can be swapped with known good stations of the same type to help isolate the trouble.

Trunk problems reported by alarms or by users can be evaluated with tests from stations or by interpreting the error log. If trunk troubles appear to be outside the System 25, the responsible common carrier should be asked to make repairs.

## Automatic Maintenance Tests

Because System 25 maintenance tests are performed automatically, no provision is made for users or technicians to initiate maintenance tests. The error log is read by entering commands from the SAT. Additional information that may help in clearing complex or subtle troubles is also available through the SAT (for example, the record of port locations).

Refer to the *Administration Manual (555-540-500)* for information on using "Search" procedures from the SAT as an aid in troubleshooting.

## Maintenance Failure

If a System 25 equipment problem cannot be corrected using the procedures in this manual, follow established maintenance escalation procedures.

## USING THE DIGITAL TAPE UNIT

The Model DC4 Digital Tape Unit (DTU) or equivalent is extremely important in system maintenance. System Translations are stored in the DTU and can be accessed in the unlikely event that translations are lost during a system failure.

This section covers the following:

- Setting Up the DTU
- Saving Translations
- Verifying Translations
- Restoring Translations.

### Setting Up the DTU

The DTU must be properly connected to the system before it can be used. Refer to Section 2, "Installation" in this manual for connection information. The DTU automatically turns on when ac power is applied.

The DTU must also be connected to the CPU/Memory CP. Normally, this connection is made through port 3 in the octopus cable originating from the CPU/Memory CP. This connection should be verified, however, because the port can be reassigned from the SAT.

A high quality audio cassette tape should be used. Examples of acceptable tapes are the Maxell UD XL-II C60 or C90, and the TDK SA C60 or C90.

Before operating the DTU, always follow these steps:

1. Press the STOP/EJECT button on the unit. (The plastic cover pops up.)
2. Insert the cassette so the exposed portion of the tape faces the unit's buttons. Press the cassette downward until it snaps into place.
3. Close the cover.

4. Press the REWIND button, and wait for the unit to fully rewind the tape. This step ensures that the tape is played from the beginning.

Note: The system automatically compensates for the clear “leader” material at the beginning and end of the tape.

## Saving Translations

Follow these steps to save translations on tape:

1. Complete the steps listed above under “Setting Up the DTU.”
2. Press both the RECORD and PLAY buttons simultaneously. (The unit should not yet begin to run.)
3. Log on to the SAT (if not already logged on).

4. The system displays the main menu prompt:  
Make one selection from menu ->.
5. Enter 9 for the SAVE/RESTORE selection.

The system responds with:

>Action=.

6. Enter 1.

The system responds with:

Save/Restore: Action= 1 Data=.

7. Enter D.

The system completes the word Data followed by the = sign.

8. Enter 1.

The system responds with:

Save/Restore: Action=1 Data=1

W24: YOU ARE ABOUT TO START A TAPE SAVE

Keyboard input is blocked while doing tape operation

c to continue, any other key for abort

Press **c** to continue, and the tape unit is automatically started by the system. Saving translations on tape takes about 5 minutes and does not affect switch performance.

When the save is complete, the unit stops automatically.

If the save is successful, the SAT displays:

**SAVE COMPLETED SUCCESSFULLY.**

9. Press the **REWIND** button and rewind the tape fully.
10. Verify the translations saved on the tape, following the steps in the next procedure.

## Verifying Translations

Always verify the translations saved to tape because of the possibility of faults with cassettes or equipment. Successful completion of the Verify function assures that saved translations match exactly the translations in the system.

**Note:** Performing the Verify function takes about 5 minutes.

To verify translations saved to tape, follow these steps:

1. Complete the steps under “Setting Up the DTU” unless Verify is being performed immediately after the Save function.
2. Press the **PLAY** button on the tape unit. (The unit should not yet begin to run.)
3. Log on to the SAT, if not already logged on.

The system displays the main menu prompt:

Make one selection from menu ->.

4. Enter **9** for the **SAVE/RESTORE** selection.

The system responds with:

>Action=.

5. Enter 2.

The system responds with:

**Save/Restore: Action=2 Data=.**

6. Enter D.

The system completes the word Data followed by the = sign.

7. Enter 1.

The system responds with the complete line:

**Save/Restore: Action=2 Data=1**

**W25: YOU ARE ABOUT TO START A TAPE VERIFY**

**c for continue, any other key for abort**

Press c to continue, and the tape unit is automatically started by the system. Verifying translations takes about 5 minutes.

When verification is complete, the unit stops automatically.

If verification is successful, the SAT displays:

**“(feature code issue, date, time, size)”**

followed by:

**VERIFY COMPLETED SUCCESSFULLY.**

8. Press the REWIND button to rewind the tape fully.
9. Label the tape with the date, time, task and feature release, and customer’s name. Be sure the tape is stored in a safe place for future access.

**Note: Task and Feature release can be acquired by pressing m on the SAT.**

10. Repeat both the Save and Verify procedures for a backup tape. Label and date both tapes accurately, and be sure they are stored in a secure place for future access.

## Restoring Translations

**Note:** Restoring translations from tape removes the system from operation for about 5 minutes.

When it is necessary to restore system translations from tape, follow these steps:

1. Complete the steps under "Setting up the DTU," using the cassette on which translations were saved.
2. Press the PLAY button on the tape unit. (The unit will not run at this time.)
3. Log on to the SAT, if not already logged on.

The system displays the main menu prompt:

Make one selection from menu ->.

4. Enter 9 for the SAVE/RESTORE selection.

The system responds with:

Action=.

5. Enter 3.

The system responds with:

Save/Restore: Action=3 Data=.

6. Enter D.

The system completes the word Data followed by the = sign.

7. Enter 1.

The system responds with:

Save/Restore: Action=3 Data=1

W26: YOU ARE ABOUT TO START A TAPE RESTORE

c for continue, any other key for abort

Press **c** for continue, and the tape unit is automatically started by the system. Restoring translations takes about 5 minutes.

When restoration is complete, the unit stops automatically.

If restoration is successful, the SAT displays:

(feature code issue, date, time, size)

followed by:

**RESTORE COMPLETED SUCCESSFULLY**

**Initiated warm start**

8. If above message is not displayed on the SAT, restoration was probably not successful. Force a warm start of the system and check the restart message (see “Restarting the System”). If the system has done a cold restart (which you can tell by reading the restart message), the restoration was not successful.
9. If the restoration was not successful, repeat the restoration process or escalate the problem to a higher support level.
10. Press the **REWIND** button to rewind the tape fully.
11. Be sure that the tape and the backup tape are labeled and dated accurately and stored in a secure place for future access.

## ROUTINE MAINTENANCE

The following are general trouble-clearing techniques usually required to resolve system-detected and/or user-detected troubles.

- Reseating and Replacing Circuit Packs
  - Removing and Restoring Power
  - Restarting the System.

### Reseating and Replacing Circuit Packs

Except for the CPU/Memory and Service CPs, power can be left on while a CP is reseated or replaced. When possible, CPs should not be removed when the amber LED is lighted.

**Note:** When a CP is removed from an unused slot (slot was being used for storage), a “Port Board Out of Service” error message is generated and the attendant Alarm LED flashes. The error message must be removed from the Error Log.

To remove a CP:

1. Remove cabinet front cover.
2. Make sure that your hands are clean and dry. Put on a wrist grounding strap and attach it to the metal grounding block on the back of the cabinet to discharge static electricity.

**Caution:** Static electricity can damage a CP.

3. With your thumb, pull up on the latch of the removal lever.
4. When the latch is up, pull the removal lever down until it stops, at an angle of about 30 degrees to the floor.
5. Pull the CP out a few inches, tugging hard; then slide the CP the rest of the way out of the carrier. Use both hands when removing a CP.

**Danger:** *The backplane contains hazardous voltages. Do not touch the backplane during any maintenance procedure.*

6. **Inspect the cabinet backplane and the connectors at the back of the CP. It may be possible to clean dirty connectors per prescribed procedures and return the CP to service. However, if any connectors are damaged or corroded the CP should be replaced.**
7. **Rest the CP on a firm nonconducting surface, and press in all socketed devices on the CP to be sure that they are firmly connected. Ensure that all straps (if there are any) are firmly seated.**

**To Replace or Reseat a CP:**

1. **To reseat a CP, slide it back firmly in its slot. When it is almost back in place, you'll feel resistance and the removal lever will start to return to its vertical position, flush with the edge of the CP.**
2. **Push the lever all the way to vertical, until it catches on the latch.**
3. **The red LED on the CP lights for up to 4 seconds during self-testing and then goes dark when the self-test is okay. If the CP has already been translated, the green LED lights.**
4. **Recheck the CP LEDs. Red LEDs should be dark. The CPU/Memory CP green LED should flash. Green LEDs on all translated port and trunk CPs should be lighted; amber LEDs may be lighted or dark. The Service Circuit amber LED should be lighted or flashing.**

## Removing and Restoring Power

When the following procedures are performed, the system must be unplugged from the ac power source:

- Reseating or replacing the Service Circuit or CPU/Memory CPs
- Replacing the frontplane ribbon connector between the Call Processor and Memory CPs (Release 1 only)
- Replacing the power supply
- Replacing the fan assembly.

**Danger:** The System 25 cabinet(s) contain hazardous voltages. This equipment must be serviced only by qualified technicians.

Before removing power from one or more cabinets, save translations on the tape backup. To save translations, follow the procedures under "Using the Digital Tape Unit" in this section.

To remove power from a cabinet, set the power switch on the rear panel of the cabinet to the OFF (0) position. Unplug the cabinet power cord. When the repair or replacement has been completed, restore power by plugging in the cabinet power cord and setting the power switch to the ON (1) position. Note that when power is removed from the first cabinet (contains the common control circuits), the Emergency Transfer Unit automatically activates.

**CAUTION:** *Removing a CP that is in use will cause users to be disconnected.*

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## Restarting the System

The system automatically warm starts after power is restored. (The system's maintenance software may restart the system under certain self-detected error conditions. ) There are two types of restart: cold and warm.

A Cold Start and limited cold start (which takes about 4 to 5 minutes) causes the system to check all slots for valid CP types and assign default translations to all ports except auxiliary trunk ports. Current translations are not retained. This means that all calls in progress are dropped.

A Warm Start (which takes about 3 minutes) causes the system to check all slots for valid CP types but does not assign default translations. Current translations are retained, but all call status information is cleared. This means that all calls in progress are dropped.

During a Cold or Warm Start, the SAT lists the version of the firmware loaded in the CPU/Memory CP, lists all CPs in the system, by cabinet, and indicates any invalid types/versions detected. When the Cold or Warm Start is complete, the green LED on all CPs (except the CPU/Memory and Auxiliary Trunk) should be lighted and the amber LED on the Service Circuit should be flashing or steady. All red LEDs should be dark.

The system can also be restarted by entering commands at the SAT. Follow these steps to manually restart the system from the SAT:

1. Confirm that the SAT is properly connected to the CPU/Memory CP administration port.
2. If the SAT has a selectable baud rate, set it to 1200 baud.
3. Be sure that transmission parity is set to none and the parity bit is set to space (0).
4. Turn the terminal on, and press the carriage return key once or twice. On most terminals, this key is <RETURN> or <ENTER>.

prompt is displayed:

Enter Password ->

5. Obtain the password from the System Administrator. Enter the password, and press <RETURN>. The main menu and the following prompt is displayed:

Make one selection from menu ->

6. Enter 9 (for the SAVE/RESTORE selection) and press <RETURN>.

7. The system responds with:

**A c t i o n =**

8. Enter 10 for a warm restart.

The system responds with:

**S a v e / R e s t o r e : A c t i o n = 1 0 D a t a = .**

9. Enter D.

The system responds with:

**D a t a =**

10. Enter 1.

The system responds with:

**S a v e / R e s t o r e : A c t i o n = 1 0 D a t a = 1**

**Y O U A R E A B O U T T O F O R C E A W A R M S T A R T**

**c t o c o n t i n u e , a n y o t h e r k e y f o r a b o r t .**

11. Enter c to initiate the warm restart.

To perform a cold restart, follow the preceding steps for Restarting the System, except enter 20 after Action=. Enter 1 or 2 after Data=. (Data=1 , initiates a “full default” cold start; Data=2 initiates a limited cold start. See the Administration *Manual*, 555-540-500, for a listing of default translations provided by the system.

The system responds with:

**S a v e / R e s t o r e : A c t i o n = 2 0 D a t a = 1 ( o r D a t a = 2 )**

**Y O U A R E A B O U T T O I N I T I A T E A C O L D S T A R T**

**c t o c o n t i n u e , a n y o t h e r k e y t o a b o r t .**

Enter c to initiate the cold restart.

If you make any typing errors while entering information, press the backspace key. Each time you press <BACKSPACE>, one character is erased.

Messages displayed on the SAT indicate which restart is being performed. The same type of information is displayed for a cold and a warm restart. This information consists of a listing of the version of the firmware loaded in the CPU/Memory CP and a configuration listing of all CPs recognized by the system. The CPU/Memory CP is not listed in the configuration listing; however, it should be located in slot 1 of Cabinet 1.

Table 4 A provides a listing of SAT messages that may be displayed during a cold or warm restart. The displayed message is a result of CP occupancy, type, and port translations.

Displayed SAT Messages During Cold or Warm Start

CP IN SLOT	PORT TRANSLATED	DISPLAYED MESSAGE
No	Yes	Missing †
Yes	No	CP Type Listed #
Yes	Yes	CP Type Listed
Yes	Yes (doesn't match physical CP)	CP Type Listed *
Yes (Unsupported CP Type)	Yes or No	Illegal

† Warm Start Only.

# Mark indicating that the CP is unused.

Mark indicating that the CP is mismatched.

## MAINTENANCE

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The SAT message for a cold restart appears after the system has performed all self-tests and reading of its configuration. The time required for a cold start depends on the number of CPs in the system but is generally several minutes.

*A typical Release 2 cold restart SAT message is as follows:*

### RESTART

TS ROM pair 1: version 3.5 \*  
FC ROM pair 1: version 3.13 \*  
FC ROM pair 2: version 3.13 \*  
FC ROM pair 3: version 3.13 \*

### COLD START

SLOT	CABINET 1	CABINET 2	CABINET 3
1			
2	ZTN85 06	TN753 04	
3	ZTN79 03	TN760B 05	
4	ZTN79 03	TN760B 05	
5	ZTN79 03	TN760B 05	
6	ZTN79 03	TN760B 05	
7	ZTN78 02		
8	ZTN78 02		
9	ZTN78 02		
10	TN747 03		
11	TN747 03		
12	TN748 06		

• This is important information that should be noted in trouble reports.

After the restart message has been displayed, enter <RETURN>. The system will respond with the following administration prompt:

```
SYSTEM 25 ADMINISTRATION
(CPU/Memory release information)
Enter password -->
```

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## ERROR LOG

When a system maintenance object fails periodic testing, the system automatically generates an error record. Depending on severity, the record is stored in one of three tables in the Error Log. The Error Log contains the following three error tables:

- ***Permanent System Alarms:*** These are failures that cause degradation of service and require immediate attention. These alarms will light the Alarm LED on the Attendant Console and are stored in the Error Log Permanent System Alarm table. This type of alarm also lights a red LED on an associated CP. A red lighted LED is a visual signal that service is required.
- ***Transient System Errors:*** These are potential failures that may cause degradation of service, although they do not light the Alarm LED on the Attendant Console. Transient System Errors have not yet been verified by system self-tests, and/or have not reached the level of a Permanent System Alarm.

If a transient system error is verified or reaches a certain level of severity, it is reclassified as a Permanent System Alarm, and the Alarm LED on the Attendant Console lights. Transient system errors are stored in the Transient System Error table. The system stores up to 40 Permanent System Alarms and Transient System Errors in their respective tables in the Error Log.

- ***Most Recent System Errors:*** These are the ten most recent errors recorded by the system, regardless of their severity. They do not light the Alarm LED on the Attendant Console unless they escalate to a Permanent System Alarm.

The Error Log is accessible through the SAT. Each error record is reported as one line on the SAT (80 characters or fewer). Permanent System Alarms and Transient System Errors tables use the same format. These error records provide the location of the error (by port and CP type), the date and time of the first occurrence and last occurrence of the error, the number of times the error has occurred, and a description of the error.

A typical error record from the Permanent System Alarms and Transient System Errors table is as follows:

**PERMANENT SYSTEM ALARMS**

PORT NUMBER	BOARD CODE	FIRST OCCURRED	LAST OCCURRED	COUNT	NAME
10400	ZTN130	23/12:30	30/01:56	1	Port Board missing But Administered

Interpret this record as follows:

- “Port Number” 10400 is the 5-digit port identification number specifying the location of the error. The first digit indicates the cabinet (1-3), the next two digits indicate the slot within the cabinet (01-12), and the last two digits indicate the port number on the CP in the slot (01-08).
- “Board Code” ZTN130 is the CP on which the error occurred (or that is associated with the error if this is an off-board error).
- “First Occurred” 23/12:30 is the date and time of the first occurrence of this error. The date is assumed to be the current year and month. A 24-hour clock is used.
- “Last Occurred” 30/01:56, is the date and time of the last occurrence of this error. The date is assumed to be the current year and month. A 24-hour clock is used.
- “Count” 1 is the number of times this particular error has occurred.
- “Name” Port Board Missing But Administered is a description of the nature of the error. Descriptions are self-explanatory.

Error records in the Most Recent System Errors table have a slightly different format. A typical error record from the Most Recent System Errors table is

**MOST RECENT SYSTEM ERRORS**

<b>PORT NUMBER</b>	<b>BOARD CODE</b>	<b>DATE OCCURRED</b>	<b>TIME OCCURRED</b>	<b>NAME</b>
30300	ZTN131	03/12/85	2:01:56	Port Board Missing But Administered

Interpret this record as follows:

- “Port Number” 30300 is the 5-digit port identification number.
- “Board Code” ZTN131 is the circuit pack on which the error occurred (or that is associated with the error if this is an off-board error).
- “Date Occurred” 03/1 2/85 is the date this error occurred. A conventional calendar designation is used.
- “Time Occurred” 12:01:56 is the time this error occurred. A 24-hour clock is used.
- “Name” Port Board Missing But Administered is a description of the nature of the error.

A combined total of 40” (R1V1 ) or 50” (RIV2, R2V1, R3) error records for Permanent System Alarms and Transient System Errors is stored by the system. Ten error records are stored in the Most Recent System Errors table. Errors are displayed in the order that they occurred.

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• Two or more instances of the same error result in only two entries in the log (that is, the first and last occurrence).

The Error Log is under the control of internal background maintenance software that automatically escalates an error to a more serious category or retires it. The system tests itself after a repair has been made. If the error condition is corrected, the error may be removed from the Error Log.

Although some errors are automatically retired from the Error Log, they can also be manually retired by entering commands at the SAT. Alarms, conditions that light the alarm LED on the attendant console, can also be manually retired in the same way.

### *Accessing the Error Log From the SAT*

Follow these steps to read any of the tables in the Error Log from the SAT:

1. Confirm that the SAT is properly connected to the CPU/Memory CP administration port.
2. If the SAT has a selectable baud rate, set it to 1200 baud.
3. Be sure that transmission parity is set to none, with the parity bit set to space (0).

**Note:** For the AT&T Model 703 SAT, four pencil switches under the paper compartment cover are set as follows: switches 1 and 3 to "Off;" switches 2 and 4 to "On."

4. Turn on the terminal, and press the carriage return key once or twice. On most terminals, this key is <RETURN> or <ENTER>.
5. After communication with the system' is established, a prompt is displayed:

Enter Password ->

6. Obtain the password from the system administrator. Enter the password, and press <RETURN>. The main menu is displayed with the prompt: Make one selection from menu ->.
7. Enter 8 (for the SEARCH selection), and press <RETURN>.
8. The SAT displays:

When search is defined type c to search >Action=

9. Enter 1 and press <RETURN>.

10. The SAT displays:

SEARCHES: ACTION=1 DATA=

11. Enter D.

The system completes the word Data followed by the = sign.

12. After Data= enter one of the following numbers, depending on which error table you wish to see:

- 30 to see Permanent System Alarms
- 31 to see Transient System Errors
- 32 to see Most Recent System Errors.

If you select 30, for example, the system responds with: SEARCHES: Action=1 Data= 30.

Now, enter the letter c to begin the search of this table. The c must be entered repeatedly to access each line.

To remove a record from the Permanent System Alarms or Transient System Errors table, enter the letter r.

If you enter a letter incorrectly, press the backspace key or CTRL H for the Model 703 terminal. Each time you press this key, one character is erased.

If the message "P16; END OF LIST" is displayed. All errors in this list have been displayed.

When you finish viewing one of the tables and want to view another error log table, enter D. The system completes the word Data followed by the = sign. Now enter the appropriate number for the table you want to view. (See preceding Steps 11 and 12.)

If you want to return to the main menu at any point, type M and <RETURN>. To log off, simply turn off the terminal.

## ERROR MESSAGES

Error messages, along with the alarm indicators, are the most likely indicators that an error has occurred in the system. When a maintenance object fails periodic testing, the system automatically generates an error record. The error record (log) is accessible through the SAT. The following table lists and describes error messages that can be displayed on the SAT. The table also includes possible solutions for some of the errors that are encountered.

If the recommended solution includes CP replacement and, if repeated replacement of hardware does not fix problems or similar problems seem to be happening at many locations, suspect software problems. Contact the Local FAST if this problem persists.

When the procedure indicates CP replacement, inspect each CP for the following:

- Bent pins
- Damaged components (ICs, resistors, etc.)
- Correct firmware vintage (call local FAST for assistance).

After the inspection is complete, reseal the circuit pack and if the problem persists, replace the circuit pack. When returning a defective board to MLO, include the associated Error Log entries on the trouble ticket.

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<p><b><i>AC Power Failure:</i></b> An indication that ac power has been lost (for example, plug removed from a wall receptacle, building power down for more than a quarter of a second, etc.). If power is lost from the first cabinet, the ETU will be triggered.</p>	<p>Check plug at wall receptacle. If this error occurs more often than the building power outages, check connection to wall.</p>
<p><b><i>Alarm Log Overflow:</i></b> The error logs are full and no more errors can be written to them. This error is kept, however, to alert you of the fact.</p>	<p>Correct indicated errors, and then remove entries from the Transient Error Log to free-up space.</p>
<p><b><i>Arch Angel Insane Restart:</i></b> Clocks may be missing from the TDM bus.</p>	<p>Make sure ZTN85 or ZTN131 (R3) circuit pack (CP) is installed. Check the inter-cabinet cables, bus terminator and back plane for bent pins. Reseat a port CP that is in the same cabinet as ZTN85 or ZTN131 (R3). If it does not power up, replace ZTN85 or ZTN131 (R3). If it does but problem persists, replace CPU/Memory CP.</p>
<p><b><i>Arch Angel Interrupt Restart:</i></b> System restarted due to CPU/Memory problem.</p>	<p>Possible software problem. If this error occurs frequently, check the CPU/Memory CP.</p>
<p><b><i>Bad Oat Device:</i></b> (STARLAN Interface CP) This error is an isolated transient condition.</p>	<p>Recoverable; no action required.</p>

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<i>Bad Port:</i> (STARLAN Interface CP) This error is an isolated transient condition.	Recoverable; no action required.
<i>Bad Ringing Supply:</i> Problems detected with ringing portion of power supply.	Check ring voltage on associated power supply (see Figure 4-2).
<i>Belated External Release:</i> See "No External Release on PBX Disconnect. "	Normally, no action required; however if problem persists, check for faulty trunk (see Figure 4-3).
<i>Buffer Deallocation Failure:</i> (STARLAN Interface CP) This error resets the CP.	If reset is not successful, reseal board. If the reseal fails, replace the CP.
<i>Bus Error Test Failed:</i> Bus error circuitry failure.	If this problem persists, replace CPU/Memory CP.
<i>Cold Start:</i> System was restarted and initialized to the default translations. This error is logged after a user forced cold start.	Check the CPU/Memory CP to see if the cold start strap was removed. Strap is located at the bottom left quarter between pins EI and E2. An error message will be displayed on the SAT during system initialization if a cold strap is installed. If the strap is installed, remove it. If the CPU/Memory CP was removed while in use, the system may perform a cold start due to corruption in translations. Restore system as described in the <i>Administration Manual</i> .
<i>CPU ROM Checksum Error:</i> CPU has failed the ROM test.	If this problem persists, replace the CPU/Memory CP.

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<i>DC Fail Transient Record:</i> Indicates a dc power failure.	No action required; this error display is a record of the start time of the failure.
DC Power <i>Failed:</i> Indicates the absence of +5 V dc on a cabinet. Each cabinet has its own power supply; therefore, this may not cause a warm start.	Check the +5 V dc voltage level on the power supply (see Figure 4 - 2 ).
<i>DC Power Restored:</i> Indicates that +5 V dc has been restored. The "DC Fail Check" log is removed. This message keeps a record of dc "hits."	It is possible to produce this error when a CP is inserted into a slot with power "On" (not a real Problem).
<i>Down Link Buffer Overflow:</i> The down-link buffer is receiving messages too fast.	Recoverable; no action required.
<i>DSP Insane:</i> Service Circuit or Tone Detector CP problem.	If a " DSP Sane " occurred, the system will remove this error from the permanent alarm table. If the problem persists, check or replace the faulty CP.
<i>DSP Sane:</i> DSP recovered from an insane condition.	Recoverable; no action required.
<i>Dual Port RAM Read-Back Failure:</i> Service Circuit dual port RAM problem.	Check CP, and replace if required.
<i>WART Test Failed:</i> Peripheral port on CPU/Memory CP has failed.	This problem affects the tape, administration, maintenance and SMDR ports. If the problem persists, replace the CPU/Memory CP.

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<p><b>DXS Reset;</b> The DXS console has been reset.</p>	<p>Recoverable; no action required.</p>
<p><i>Electronic Power Feed Off, Overcurrent:</i> A Hybrid Line (ZTN79) port EPF chip shut down. Two ports are effected, for example, 1-2,3-4,5-6,7-8.</p>	<p><i>Check the wiring for shorts from the backplane/SIP up to the phone jack. Check the ATL set at the SIP. Try swapping ATL sets. Error removed if Audit passed and short removed. Audit runs every 4 minutes.</i></p>
<p><i>Electronic Power Feed Overload:</i> A Tie Trunk (TN760B) port EPL chip went into overload.</p>	<p>Check the tie trunk pairs from the back of the cabinet through to the network for an external short (see Figure 4-4). If the short is not detected on the pairs, replace the board.</p>
<p><i>Electronic Power Feed Test Overload:</i> The “M” lead on a tie trunk has an external short circuit.</p>	<p><i>Check the E and M leads for external shorts (see Figure 4-4). If the short is not on the pairs, replace the board.</i></p>
<p><i>Empty CSMA Queue:</i> (STAR LAN Interface CP) This error resets the CP.</p>	<p>If the reset is not successful reseal board. If the reseal fails, replace the CP.</p>
<p><i>Error Log Table Full:</i> Transient Error Log is full.</p>	<p>Correct indicated errors, and then remove entries from the Transient Error Log to free-up space.</p>
<p><i>External RAM Failure:</i> Port or CPU/Memory CP error while running background non-destructive external RAM tests.</p>	<p>Reseat board. If problem persists, check or replace appropriate CP.</p>

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<i>External Stack Full:</i> (STARLAN Interface CP) This error resets the CP.	If the reset is not successful reseal board. If the reseal fails, replace the board.
<i>Fault on Outgoing Seizure:</i> ZTN76/TN747 CO ground was not detected within a predetermined time-frame. ZTN77/747 loop current was not detected within a predetermined time frame.	Check trunk for slow dial tone; more than 10 seconds. Perform trunk test call per “Trunk Troubles” procedure in this section. If the problem persists, see Figure 4-3.
<i>Frame Length Error:</i> (STAR LAN Interface CP) Packet length too long for ZTN84.	Recoverable; no action required.
<i>Generator DSP Insane:</i> Service Circuit problem.	If a “Generator DSP Sane” occurred, the system will remove this error from the permanent alarm table. If the problem persists, check or replace the faulty CP.
<i>Generator DSP Sane:</i> Service Circuit recovered from insane condition.	Recoverable; no action required.
<i>Ground But No Ringing:</i> The switch does not detect ringing from the CO within 5 seconds of Tip ground on an incoming ground start call.	Incoming calls are okay. The problem could exist at the CO, bad ringing generator or a bad ring detector on the board. The Tip lead could be getting ground hits. Perform a trunk test call per “Trunk Troubles” procedure in this section.

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<i>Illegal Instruction:</i> This error is logged when an illegal instruction is encountered by the CPU.	The Problem could be with the ROM on the CPU/Memory CP. If the problem persists, check or replace CP.
<i>Illegal Interrupt:</i> CPU/Memory CP problem.	The CP may still pass the power-up test for the ROM. Check or replace the CPU/Memory CF.
<i>Illegal Port Command:</i> (STARLAN Interface CP) This error is an isolated transient condition.	Recoverable; no action required.
<i>Illegal Port Interrupt:</i> (STAR LAN Interface CP) This error is an isolated transient condition.	Normally, this is a isolated transient condition that is recoverable; however, if problem occurs too frequently, a permanent alarm will be generated. If problem persists, check or replace CP.
<i>Internal RAM Failure:</i> Port CP error while running background non-destructive internal RAM tests.	Check port CF.
<i>Internal Sanity Timeout:</i> (STARLAN Interface CP) This error resets the CP.	If the reset is not successful, reseal board. If the reseal fails, replace the CP.
<i>Invalid Board Message:</i> The port CP sent an up-link message that is not in the expected message set.	If the problem persists, check or replace the port CP.

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<i>Invalid Message Length:</i> The port CP sent an up-link message that is not in the expected message set.	If the problem persists, check or replace the port CP.
<i>Invalid Port Board:</i> (Other than CPU or Memory) Port CP not supported by system.	Remove or replace CP with a board that is supported by System 25.
<i>Invalid Port Message:</i> The port CP sent an up-link message that is not in the expected message set.	If problem persists, check or replace the port CP.
<i>LAN Protocol Error:</i> (STARLAN Interface CP) This error may be caused by a defective endpoint on the STARLAN NETWORK.	System will normally recover; however, if the problem persists, a defective endpoint may exist on the STARLAN NETWORK (see Figure 4-5).
<i>Limited Default Cold Start:</i> This is a cold start after which only a limited amount of default translations have been made. The CPU/Memory, Service Circuit, and Tone Detector are the only CPs initialized.	Connect SAT and translate system. Perform "Restore System" procedure listed in the <i>Administration Manual</i> .
<i>Memory Management Corruption:</i> Software audit determined and corrected memory management.	If problem persists, check or replace CPU/Memory CP.

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<p><i>Memory Management Error:</i> Bus error that occurs while accessing the “other than protected” RAM. A warm start is logged after this error.</p>	<p>Possible software error. If problem persists, check or replace CPU/Memory CP. A warm start or retranslation of the system could be a possible fix for this problem.</p>
<p><i>Memory ROM Checksum Error:</i> Memory has failed the ROM test.</p>	<p>If this problem persists, replace CPU/Memory CP.</p>
<p><i>Message Corruption:</i> (Other than CPU/Memory) Down-link message checksum error.</p>	<p>If consistent error for particular port CP, check TDM bus drivers on the CP. If error is associated with many CPs, drivers on CPU may be bad. Also check I/O cables and TDM bus terminator.</p>
<p><i>Message From Non-Translated Port:</i> Untranslated port CP sent an up-link message.</p>	<p>Translate the CP and its port, or remove the CP from system.</p>
<p><i>No External Release On PBX Disconnect:</i> CO did not release within 4-5 minutes on DID or ground start trunk after System 25 disconnected. Message sent every 4-5 minutes until release.</p>	<p>Check associated trunk (see Figure 4-4). Error is cleared from log when trunk release occurs belatedly.</p>
<p><i>No Free Buffer:</i> (STARLAN Interface CP) This error resets the CP.</p>	<p>If the reset is not successful, reseal board. If the reseal fails, replace CP.</p>
<p><i>No Loop Current On Incoming Call:</i> CP does not detect dc current on answered incoming call. Call will drop.</p>	<p>Swap CP with similar CP. If problem follows the boards, replace CP. If problem persists, test the trunk per Figure 4-3.</p>

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<p><b><i>On-HookBeforeReady To Receive Digits:</i></b> For a tie trunk with delay dial or wink start—after the handshake is complete, a 50-ms guard time must pass before digits are received. If the far-end goes on-hook before guard time elapses, this message is logged.</p>	<p>Recoverable; no action required.</p>
<p><b><i>On-Hook Before Wink:</i></b> For a tie trunk with delay dial or wink start—if the far end goes on-hook (possibly indicating the beginning of a rotary dial digit) before the wink handshake is completed, the error is logged. A disconnect sequence is started, and the call may be dropped.</p>	<p>If this problem persists, check the tie trunk configuration (see Figure 4-6).</p>
<p><b><i>On-Hook During Wink:</i></b> This error indicates that digits are being sent by the far end before the switch is ready to receive them.</p>	<p>The two switches are probably not compatible. Check the configuration of each switch.</p>
<p><b><i>Physical and Logical Type Mismatch:</i></b> (Other than CPU or Memory) Port CP plugged into wrong slot.</p>	<p>Change translations to reflect the new CP, or install the proper CP.</p>
<p><b><i>Port CP in Unadministered Slot:</i></b> (Other than CPU/Memory) Port CP inserted into a slot that is not translated or CP inserted into wrong slot.</p>	<p>Translate slot, or remove CP. If CP is in the wrong slot remove and install CP into proper location.</p>

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<p><b>Port CP Missing But "Administered:</b> (Other than CPU/Memory) Translated port CP that CPU cannot access.</p>	<p><b>Check CP slot; reseal CP; change CP; or remove CP from translations. If CP does not pass power-up, replace CP.</b></p>
<p><b>Port CP Out Of Service:</b> (Other than CPU/Memory) Message occurs when a CP is removed from a cabinet. Error removed when the CP passes power-up.</p>	<p>If the CP has not been removed and the problem persists, check or replace the port CP.</p>
<p><b>Port CP ROM Checksum Failure:</b> The port CP has found that the checksum on its firmware is bad.</p>	<p>Try reseating the CP. If this error happens again, then replace the CP .</p>
<p><b>Port Buffer Full:</b> (STARLAN Interface CP) This error resets the CP.</p>	<p>If the reset is not successful, reseal CP. If the reseal fails, replace the CP.</p>
<p><b>Port Fault:</b> For an auxiliary trunk, this message is logged when a ground is expected from external equipment and is not detected.</p>	<p>Check wiring of external equipment (see Figure 4-7).</p>
<p><b>Port Queue Full:</b> (STARLAN Interface CP) This error resets the CP.</p>	<p>If the reset is not successful, reseal CP. If the reseal fails, replace the CP.</p>
<p><b>Program Logic Inconsistent:</b> (Other than CPU/Memory) Possible hardware problem on port CP.</p>	<p>Reseal CP. If problem persists, replace it.</p>
<p><b>RAM Test Failed:</b> CPU/Memory CP has failed the RAM test.</p>	<p>Check CPU/Memory CP.</p>

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<p><i>Received Incorrect Number of DID Digits:</i> This error indicates that the CO is set up to send a number of DID digits different from what the switch has been administered to receive.</p>	<p>Ensure that trunks are properly translated. Notify local CO to verify the correct number of digits to be sent. Test trunk per Figure 4-3.</p>
<p><i>RIMS Insane:</i> Service Circuit or Tone Detector CP problem.</p>	<p>If an “RIMS Sane” occurred, the system will remove this error from the permanent alarm table. If the problem persists, check or replace the faulty CP.</p>
<p><i>RIMS Sane:</i> RIMS recovered from an insane condition.</p>	<p>Recoverable; no action required.</p>
<p><i>ROM Checksum Failure:</i> CPU/Memory CP ROM checksum test has failed.</p>	<p>If the problem persists, check or replace the CPU/Memory CP.</p>
<p><i>Ringling Without Ground:</i> Ground was not detected from CO within 5 seconds from the time ringing starts.</p>	<p>Check Tip/Ring for possible reversal.</p>
<p><i>Service Circuit In Mismatched slot:</i> Service Circuit in slot translated for other type CP; two Service Circuits mounted in cabinet. Only one Service Circuit (ZTN85 or ZTN131 [R3]) allowed per system. Additional tone detection available using Tone Detector CP (TN748).</p>	<p>Ensure that only one ZTN85 or ZTN131 (R3) is in the system. If there are others, remove them. Also make sure that the ZTN85 or ZTN131 (R3) is in its translated slot.</p>

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<p><b><i>Service Circuit Test Failed:</i></b> Service Circuit demand test failed on the DTMF receivers.</p>	<p>Check TDM bus terminator and cabinet interconnect cables. If the problem persists, replace ZTN85 or ZTN131 (R3).</p>
<p><b><i>Signaling Lead Fault:</i></b> Auxiliary Trunk CP is expecting a ground from external equipment but none is detected.</p>	<p>Check wiring of external equipment per Figure 4-7.</p>
<p><b><i>Slot Configuration Error:</i></b> (STARLAN Interface CP) This error means that another ZTN84 port CP is on the STARLAN NETWORK and has the same physical address.</p>	<p>This condition can be resolved by moving the ZTN84 port CP to another slot in the carrier.</p>
<p><b>System Lock-Up:</b> This error is logged by the task supervisor if, during scheduling of tasks, no messages have been read for at least 60 seconds. This causes a restart of the system.</p>	<p>Usually, no action required; however if problem persists, replace CPU/Memory CP.</p>
<p><b><i>System Restart:</i></b> System locked up in a software task. The "Port Number" entry in the log is the task at fault.</p>	<p>Check the power supply voltages per Figure 4-2. If problem persist, the CPU/Memory CP could be defective.</p>
<p><b><i>Translation Memory Test Failed:</i></b> Memory translation checksum test failed.</p>	<p>Check if Cold Start error has occurred. Reload translations from tape per the procedure in Administration Manual. If the problem persists, check or replace CPU/Memory CP.</p>

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<p><b><i>Trunk Call Dropped:</i></b> A call that had been up on a trunk for more than 9 hours has been detected by an audit and dropped. The port associated with the error identifies the trunk in question.</p>	<p>Normally, no action required; however, if problem persists, perform trunk test call per Trunk Troubles procedure in this Part. Also, check the CO disconnect and trunk timing.</p>
<p><b><i>Trunk Call Too Long:</i></b> An audit found a call that had been up on a trunk for more than 5 hours and logged this error to alert the user of it.</p>	<p>This error is removed when a “Trunk Call Dropped” error is logged. Normally, no action is required, and system will recover in 4 hours. However, if a problem does exist, check the associated trunks per Figure 4-3. Also check for a trunk to trunk call.</p>
<p><b><i>Unable To Send Down-link Message:</i></b> Down-link message queue is full. This condition means that messages to CPs may be lost.</p>	<p>If problem persists, check or replace CPU/Memory CP.</p>
<p><b><i>Unexpected Command:</i></b> (STARLAN Interface CP) This error is an isolated transient condition.</p>	<p>Recoverable; no action required.</p>
<p><b><i>Unexpected interrupt:</i></b> (STARLAN Interface CP) This error is an isolated transient condition.</p>	<p>Normally, no action required; however, if this error occurs too frequently, a permanent alarm will be generated and the CP should be checked.</p>

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<p><b>Unrecognized Command:</b> (STARLAN Interface CP) This error is an isolated transient condition.</p>	<p>Recoverable; no action required.</p>
<p><b>User Forced Warm Start:</b> System was warm started through the SAT.</p>	<p>Recoverable; no action required.</p>
<p><b>Warm Start:</b> System was restarted for some reason; translations are okay.</p>	<p>Power supply may be out of regulation (see Figure 4-2). Check remaining errors in the alarm tables for associated problems.</p>
<p><b>Wink Too Short For Valid Signal:</b> For a delay dial or wink start outgoing trunk, if the wink from the far end is less than the minimum 100 ms, this error is generated. The tie trunk remains waiting for a valid signal.</p>	<p>Check equipment at far end to ensure that it is working and translated properly per Figure 4-3.</p>
<p><b>Work Cycle Interrupt Test Failed:</b> Work cycle interrupt problem. System most likely is stopped.</p>	<p>Try to warm start the system through the SAT. If the problem persists, check or replace the CPU/Memory CP.</p>

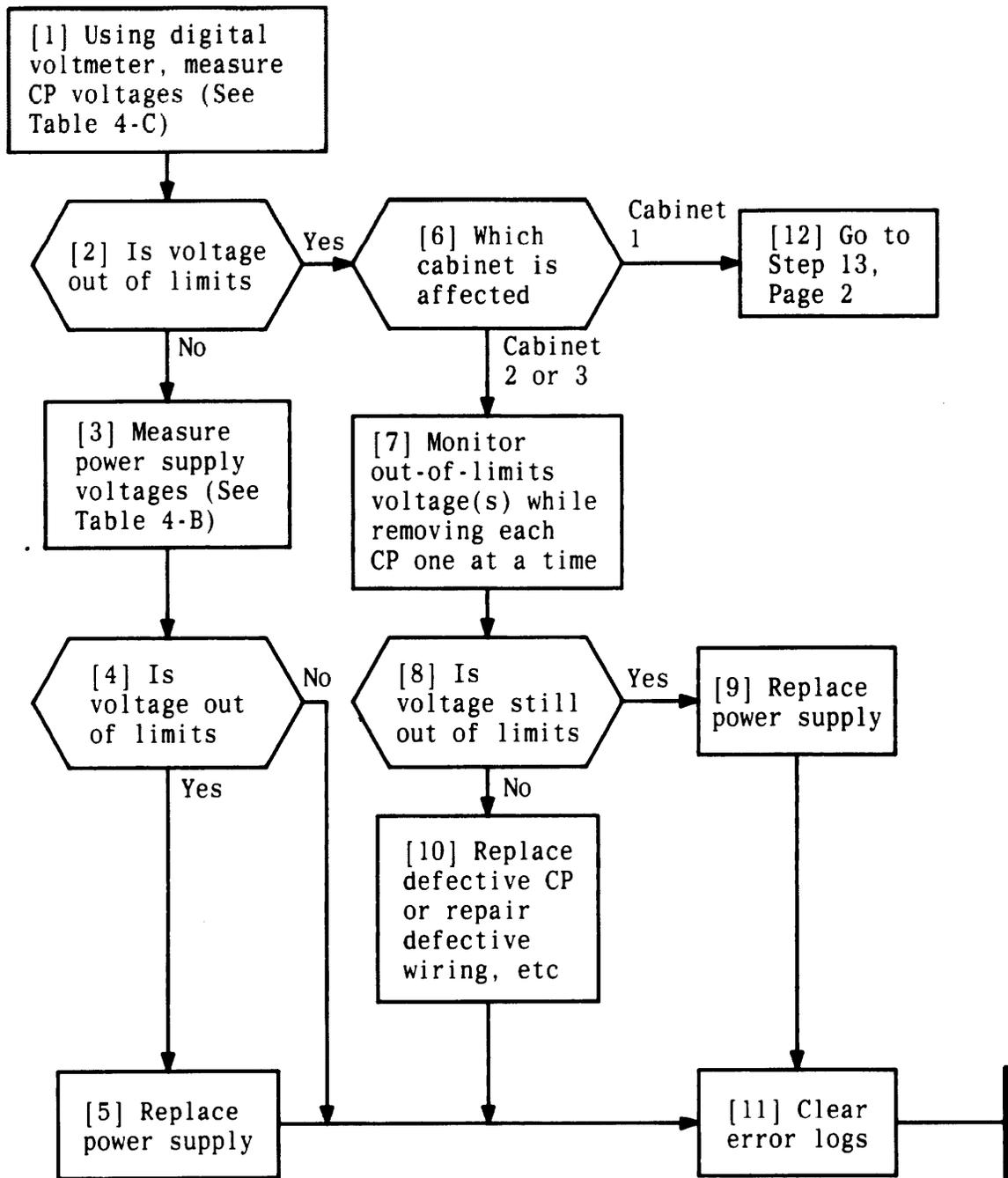


Figure 4-2. Clearing Power Supply Troubles (Sheet 1 of 2)

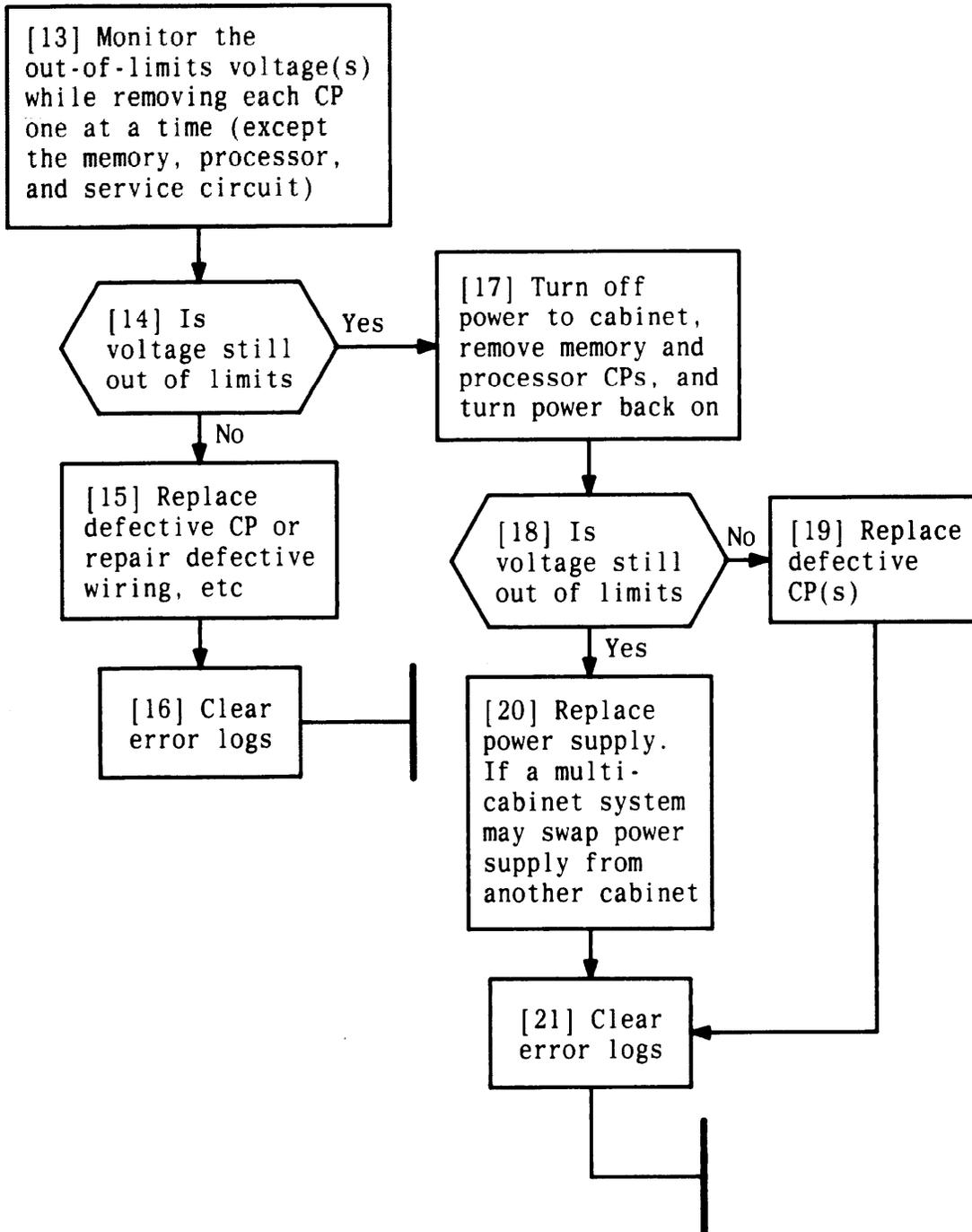


Figure 4-2. Clearing Power Supply Troubles (Sheet 2 of 2)

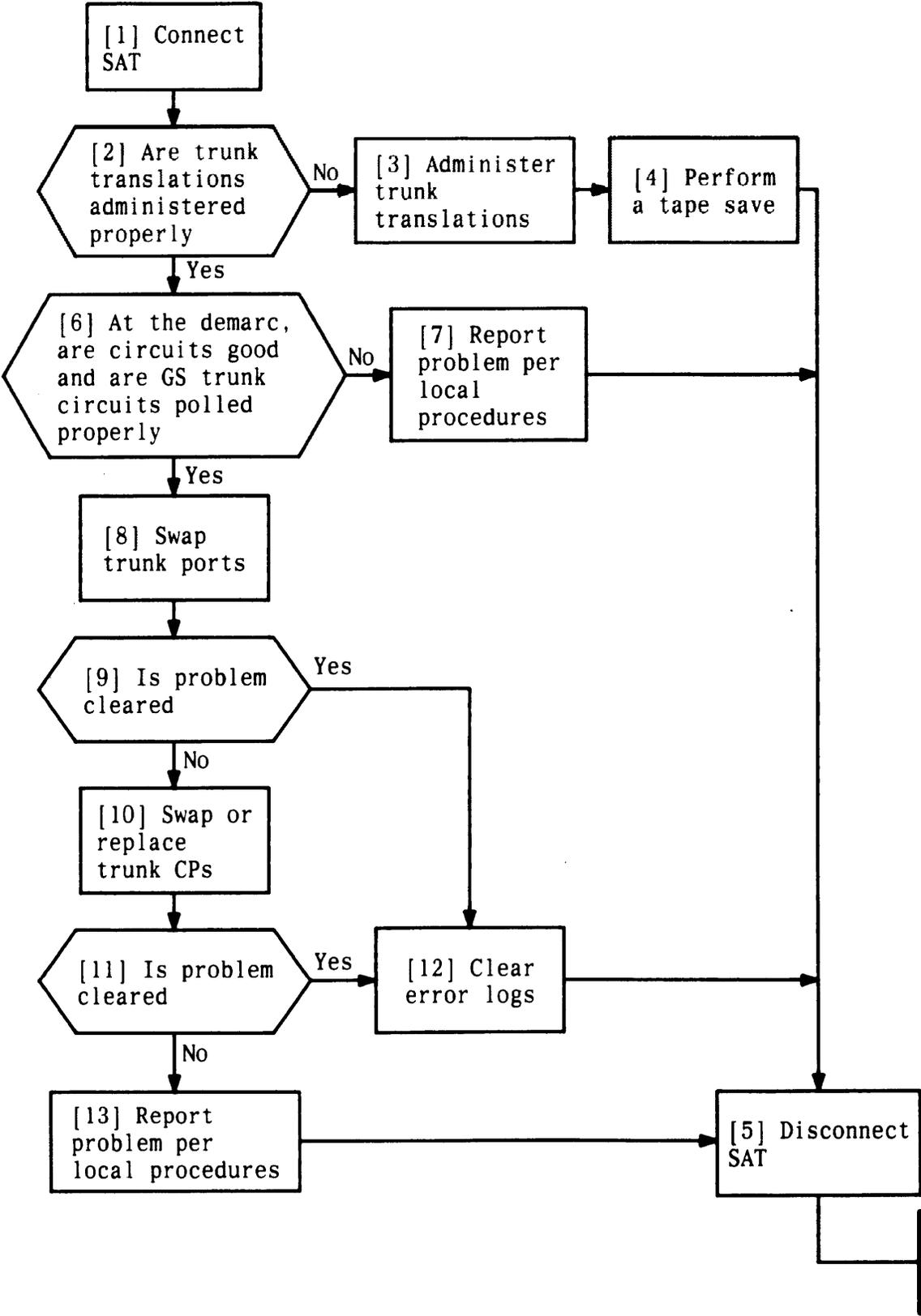


Figure 4-3. Clearing CO Trunk Troubles

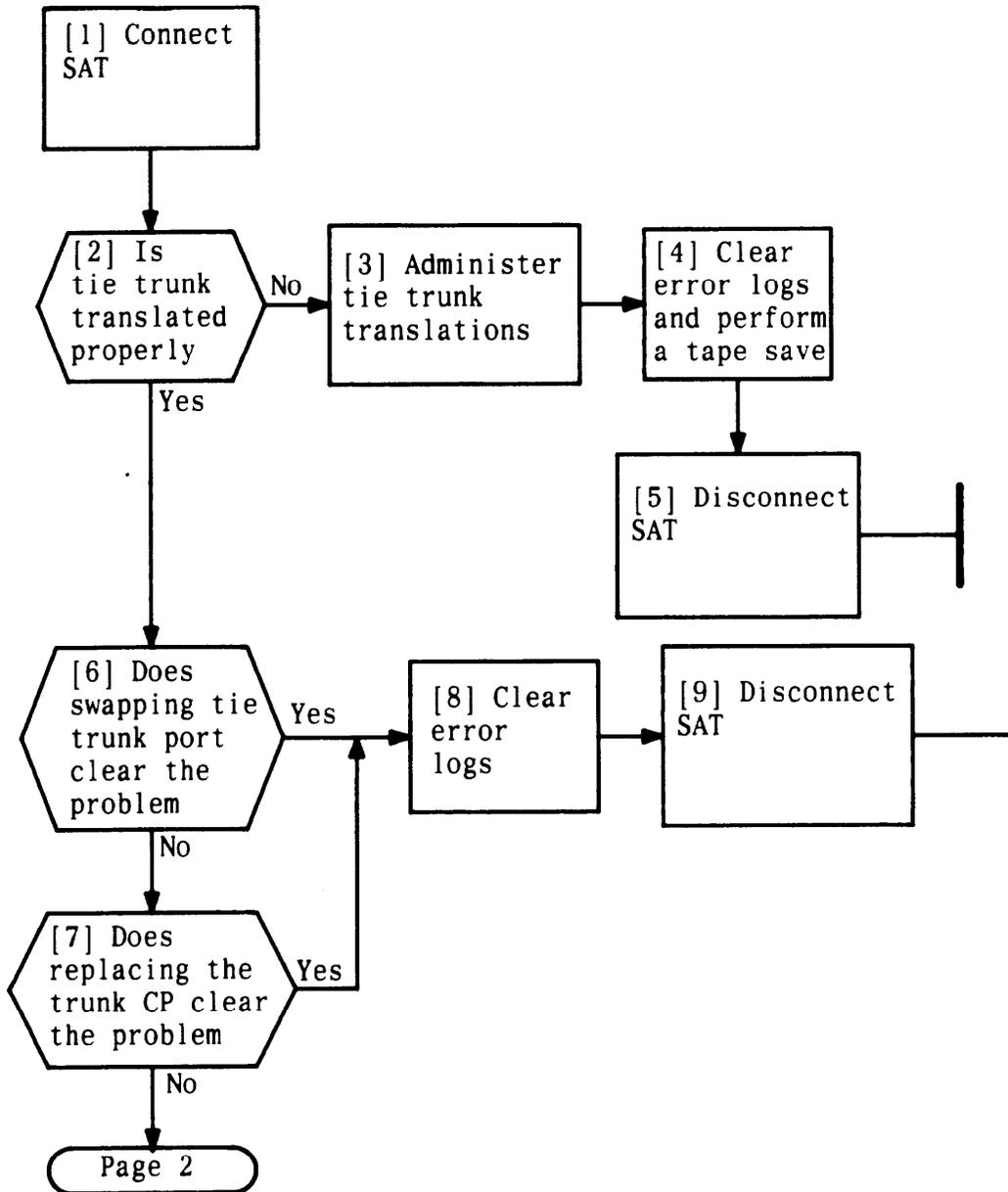


Figure 4-4. Clearing 4-Wire Tie Trunk Troubles (Sheet 1 of 4)

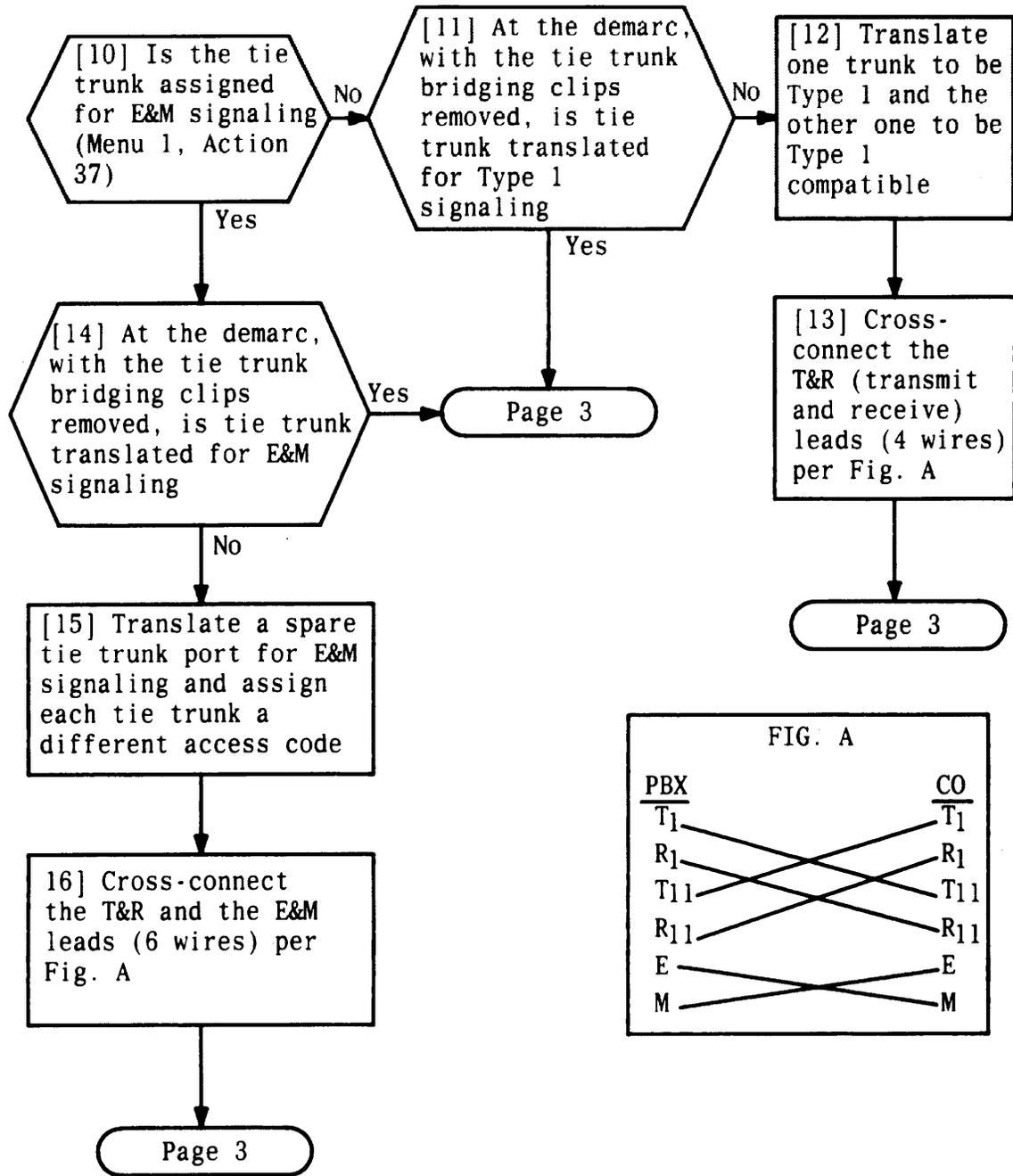


Figure 4-4. Clearing 4-Wire Tie Trunk Troubles (Sheet 2 of 4)

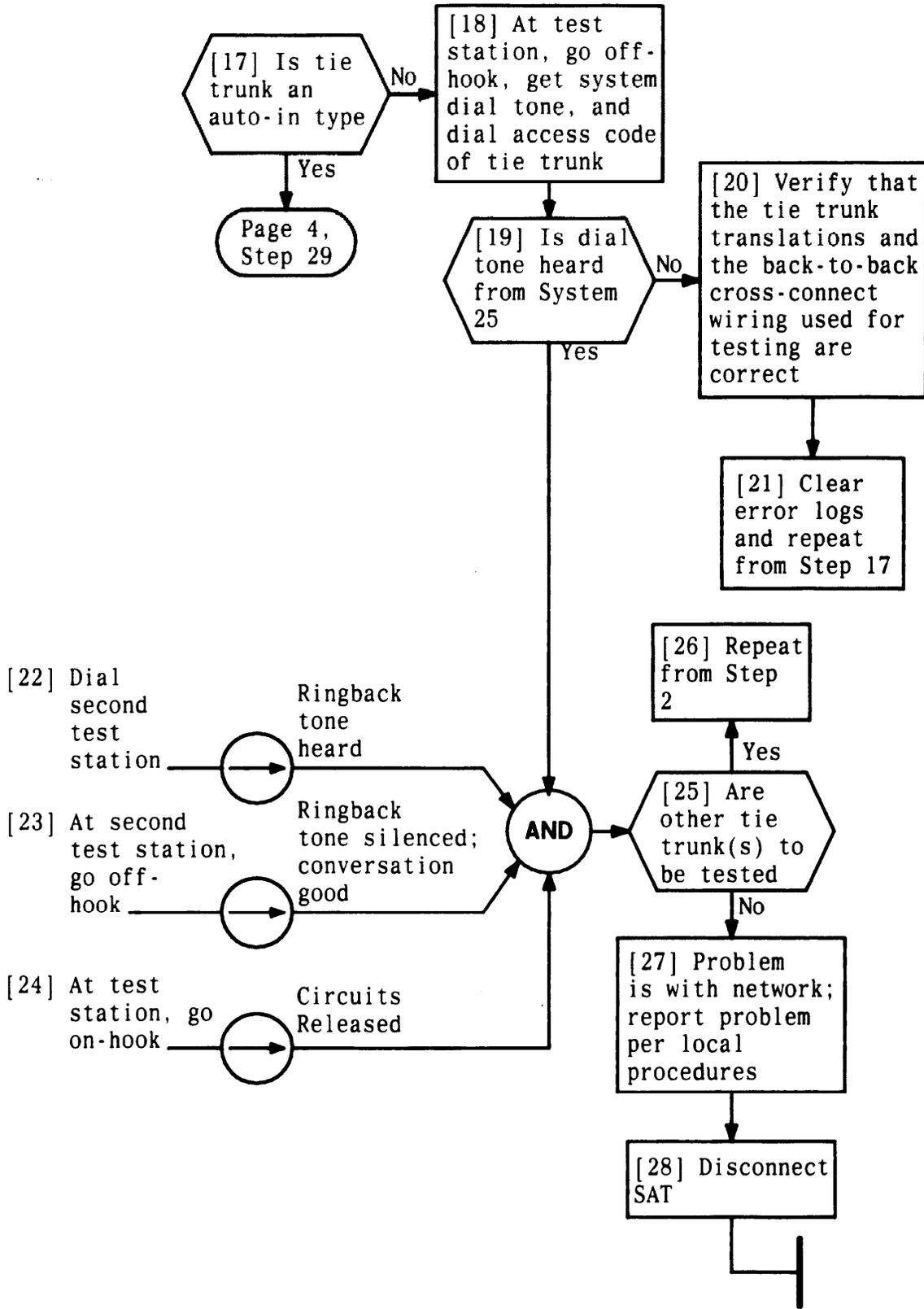


Figure 4-4. Clearing 4-Wire Tie Trunk Troubles (Sheet 3 of 4)

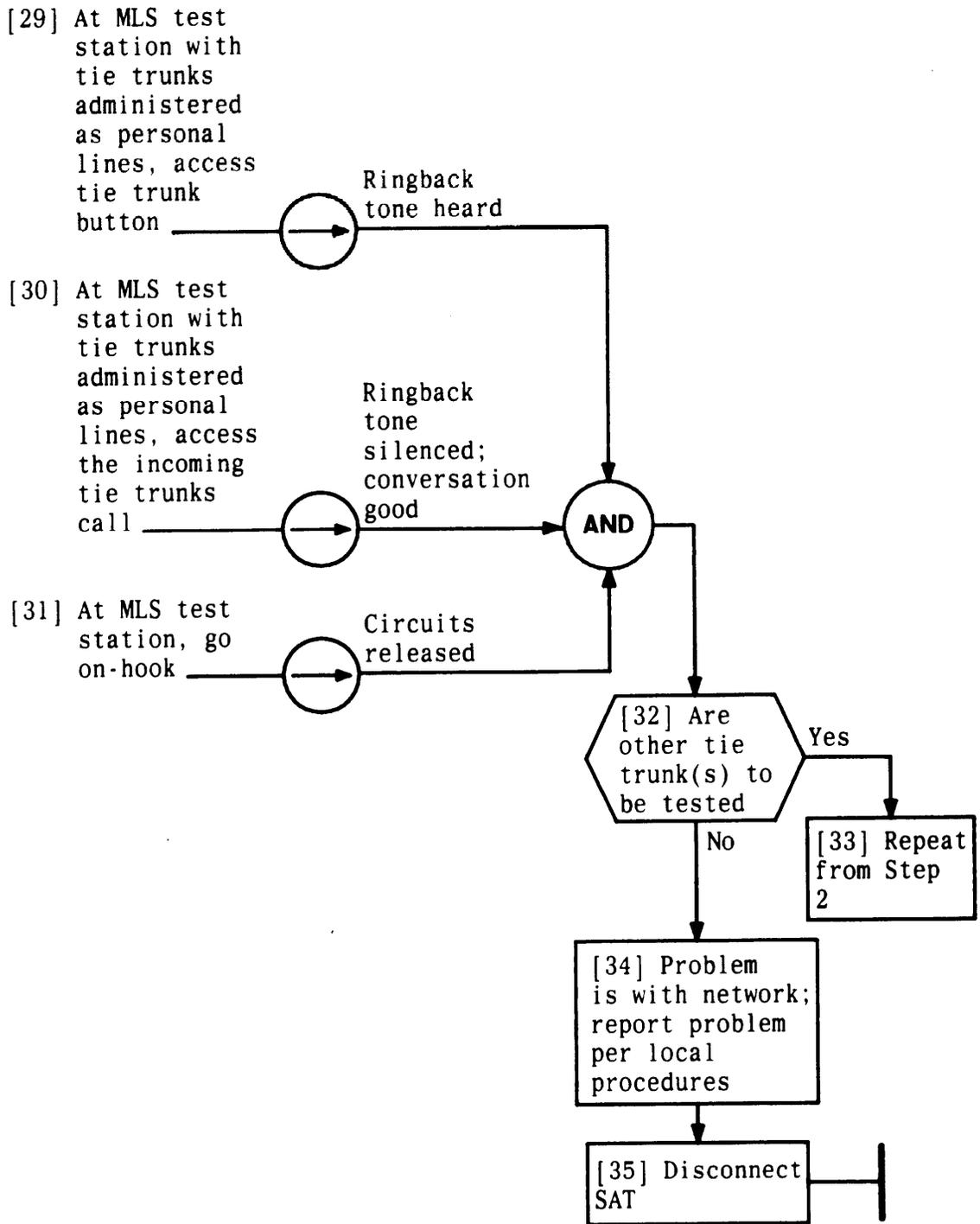
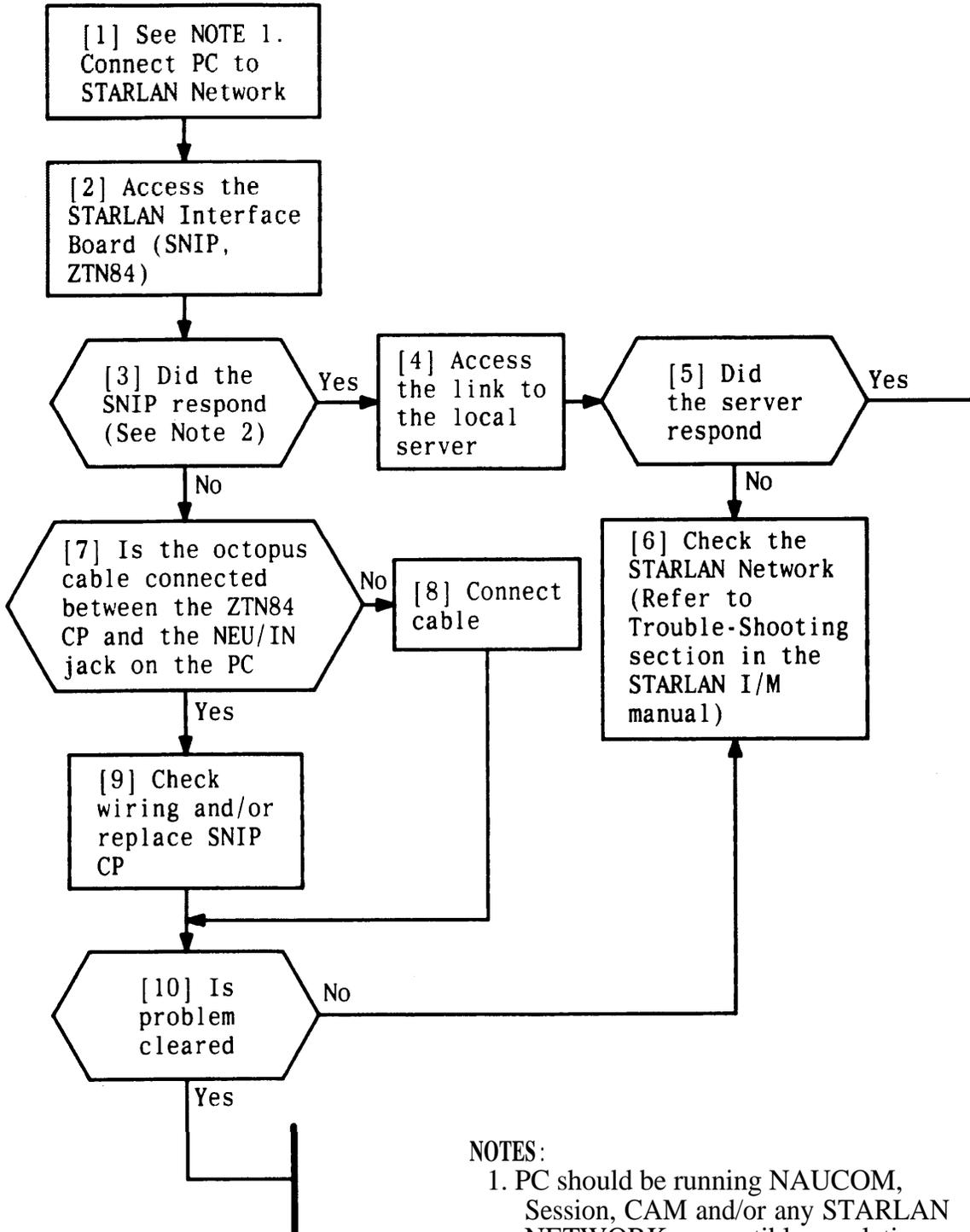


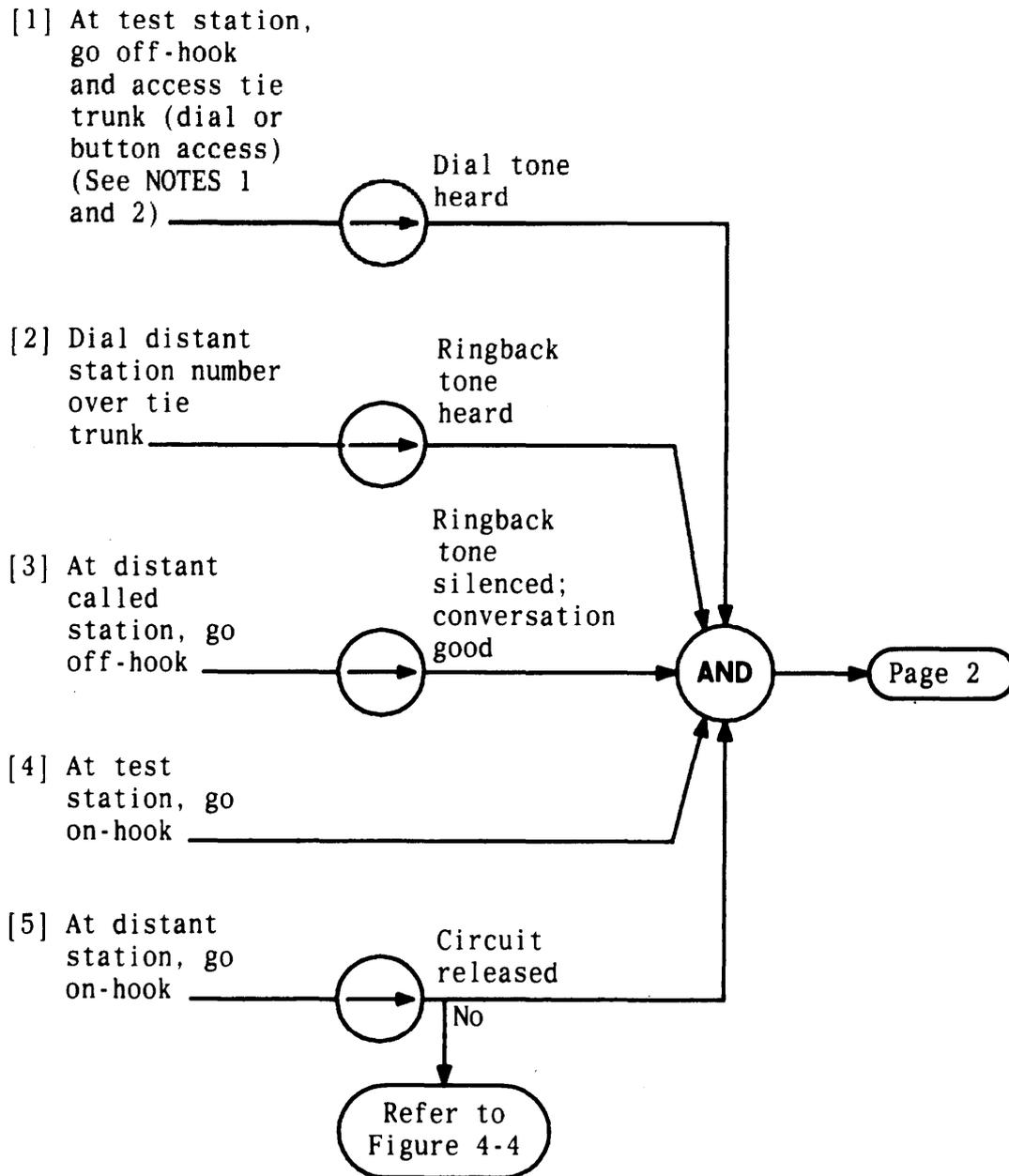
Figure 4-4. Clearing 4-Wire Tie Trunk Troubles (Sheet 4 of 4)



NOTES:

1. PC should be running NAUCOM, Session, CAM and/or any STARLAN NETWORK compatible emulating program.
2. The green LED lights when the STARLAN CP passes power up.

Figure 4-5. Clearing STARLAN Interface Troubles



NOTES:

1. Test station can be any working MLS or SLS station.
2. Tones are provided from distant location and may or may not be provided depending on terminating equipment. Check configuration of the far end to determine the translation for the switch side.

Figure 4-6. Clearing Tie Trunk Troubles (Sheet 1 of 5)

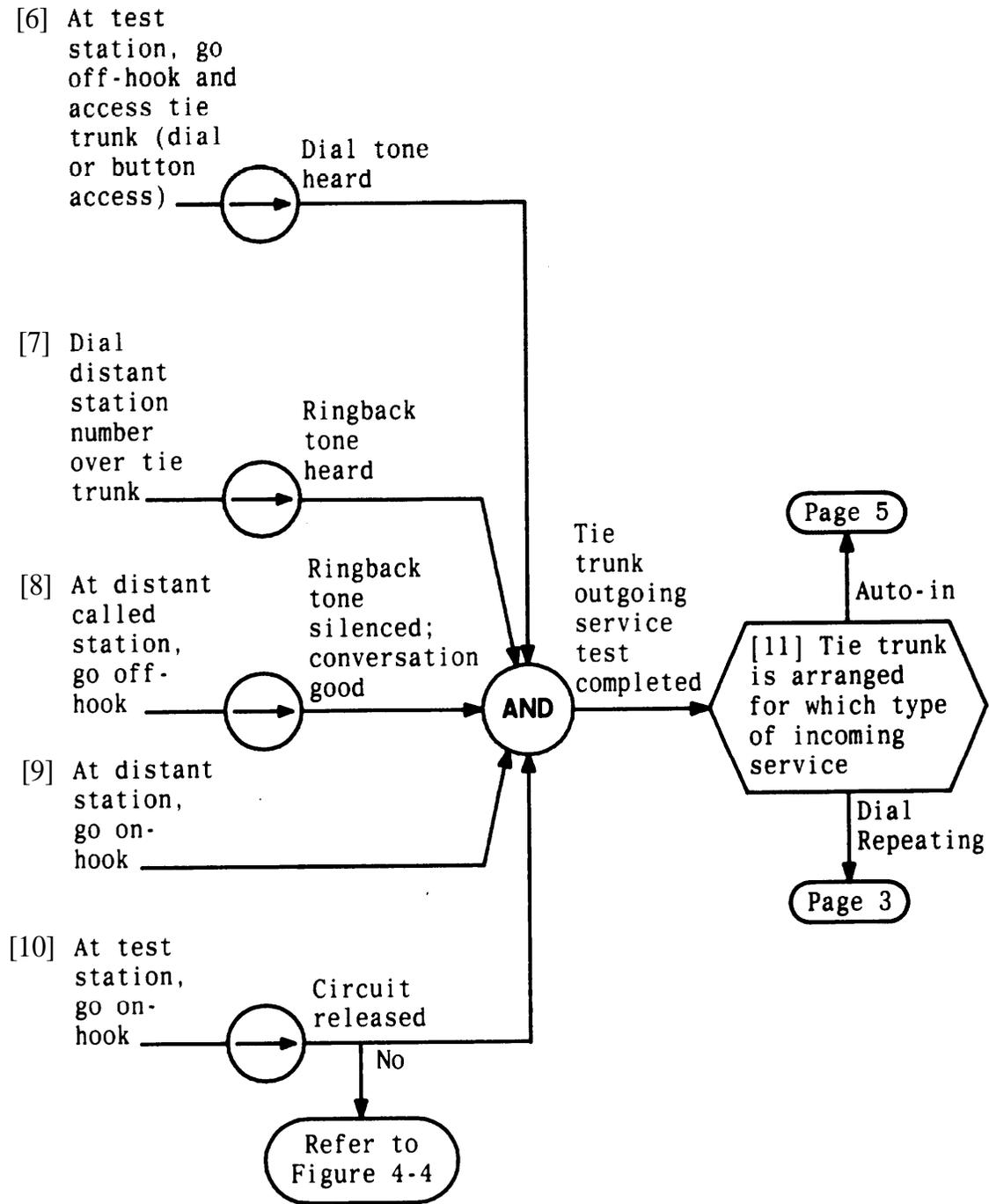


Figure 4-6. Clearing Tie Trunk Troubles (Sheet 2 of 5)

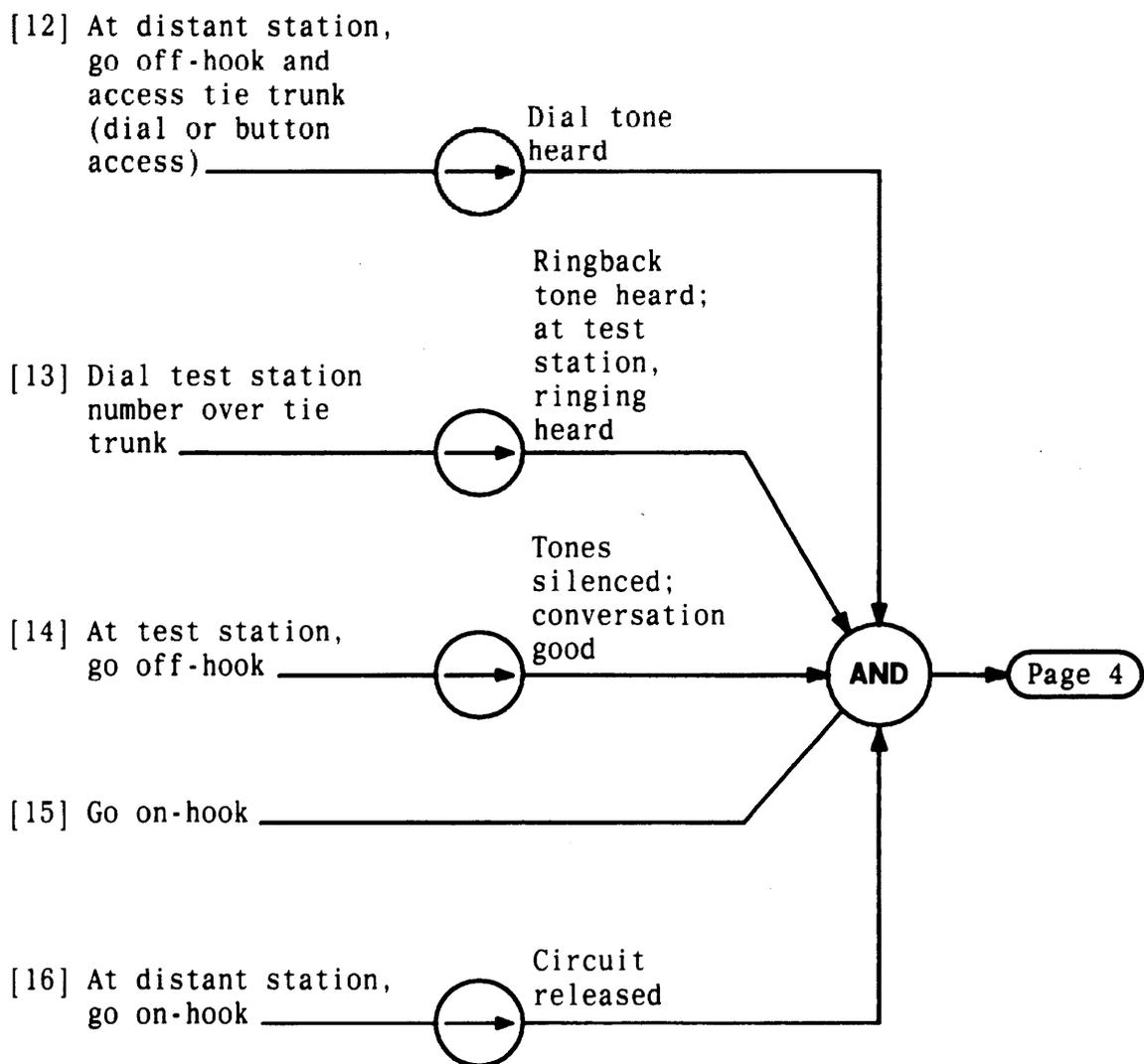


Figure 4-6. Clearing Tie Trunk Troubles (Sheet 3 of 5)

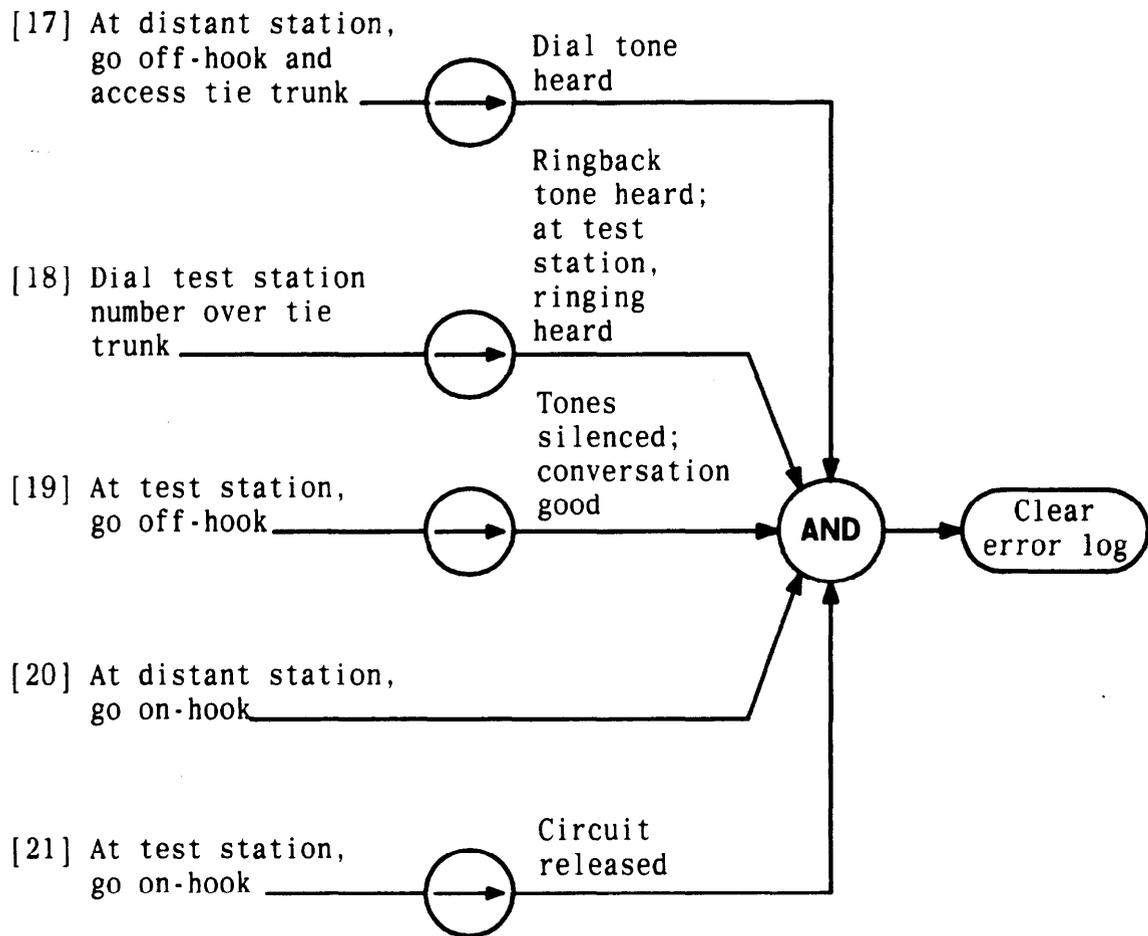


Figure 4-6. Clearing Tie Trunk Troubles (Sheet 4 of 5)

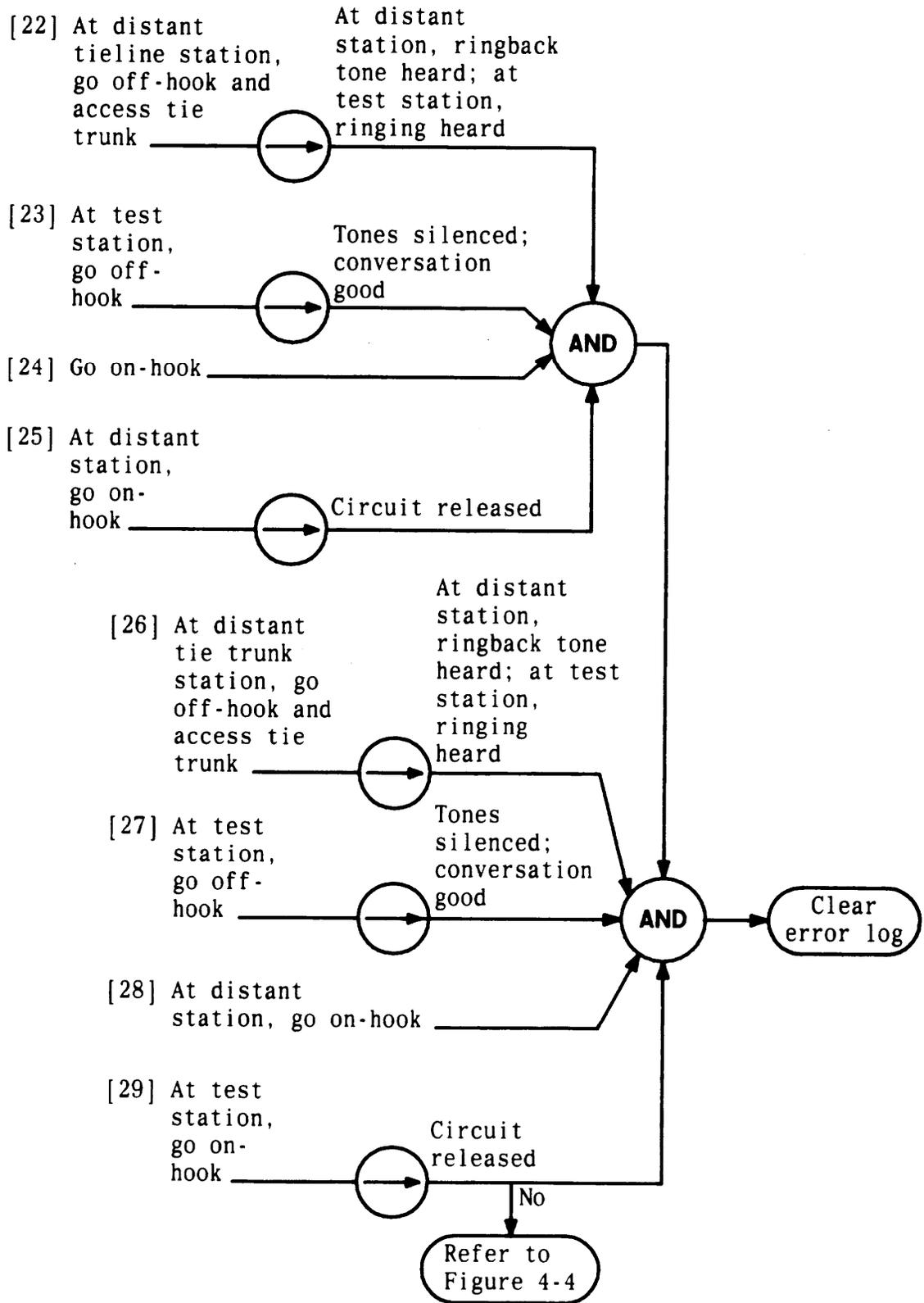


Figure 4-6. Clearing Tie Trunk Troubles (Sheet 5 of 5)

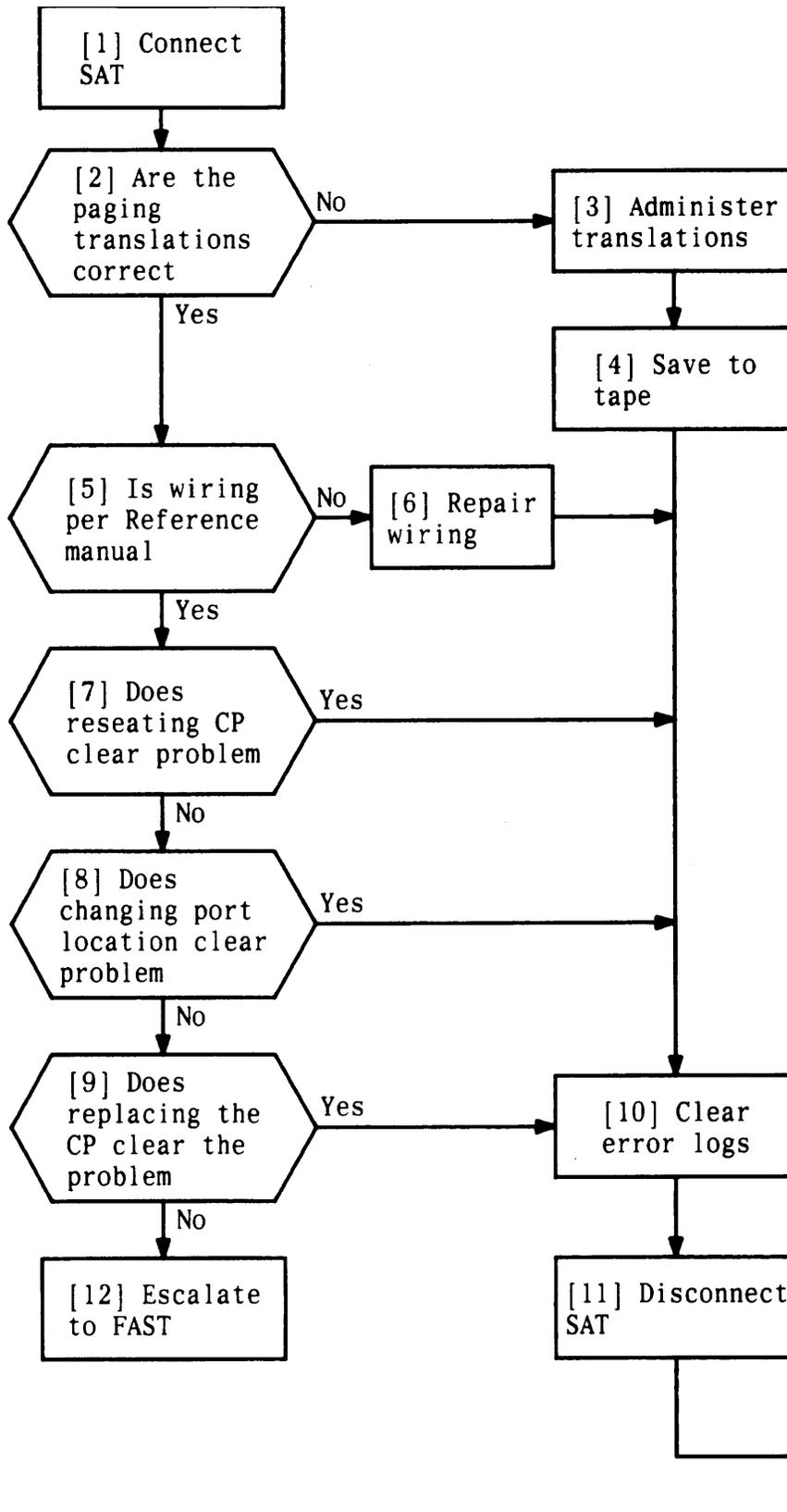


Figure 4-7. Clearing Paging Equipment Troubles

## Clearing System-Detected Troubles

Most troubles are detected through the Alarm LED located on the Attendant Console, the Error Log, and, in some cases, the LEDs on the circuit packs (CPs). The following is a list of system troubles. Each item in the list is described in this section.

- Complete System Failure
- Common Control Trouble
- Circuit Pack Trouble
- Frontplane Ribbon Connector Trouble (Release 1 Only)
- Power Supply Trouble
- Fan Assembly Trouble
- Overheating Trouble
- Backplane and Cabinet Trouble
- Emergency Transfer Unit Trouble.

### Complete System Failure

A complete system failure is caused by a catastrophic failure in the Common Control circuitry, the power supply, the backplane, or the cabinet. Refer to the relevant procedures below in the event of such a failure. Complete system failures are rare; most failures are of a noncritical component, such as a port on a CP.

### Common Control Trouble

Failure of a the Common Control CP (that is, CPU/Memory or Service Circuit) is critical and requires replacement of the faulty pack(s). Failure of these CPs can affect the entire system and may cause the Emergency Transfer Unit (ETU) to activate.

Failure of the CPU/Memory CP at power-up generates the following type of error message:

FAIL: <CARD>: <TEST>: <DETAIL>:

The bracketed fields contain the following information:

- <CARD> is CPU/Memory
- <TEST> is one of the following:

RAM TEST

ROM TEST

AA INTERFACE

DUART TEST

REAL-TIME-CLOCK TEST

BUS ERROR

WORK CYCLE

D P R T E S T

MMU TEST

AA RESET STUCK : SC?

- <DETAIL> specifies the specific location of the failure, such as the address of a failed integrated circuit.

A representative Common Control failure message would be as follows:

FAIL: CPU: RAM TEST: IC26:

This message identifies the failure as a Random Access Memory (RAM) test failure in integrated circuit 26 occurring on the CPU/Memory CP.

After partial failure, the system continues to operate and the green LED on the CPU/Memory CP flashes normally.

After total failure, the system ceases to operate and the green LED on the CPU/Memory CP may not flash.

Failure can also be verified by checking the LEDS on each CP.

If either a partial or total Common Control failure is detected, remove and then restore system power. This procedure forces the system to perform a warm restart.

If the failure exists after system restart, remove power again and reseal CP suspected of being faulty. (Be sure to press in all socketed devices to ensure a firm connection.) Restore system power. If a Common Control failure continues to exist, one of the CPs must be replaced. To determine which CP to replace, check the messages on the SAT and in the Error Log and check the LEDs on the CPs.

Common Control error messages sometimes appear on the SAT automatically during power-up testing. If the Common Control is experiencing serious failure, error messages may appear only on the SAT and not be sent to the error log.

For Release 1 systems, a Memory CP problem could be caused by (1) a fault in the frontplane connector to the Call Processor CP or (2) a problem on the Call Processor CP itself. A Memory CP problem does not necessarily indicate a fault in the Memory CP.

To replace a Common Control CP, follow the preceding instructions. Be sure to save translations on tape before removing power. For Release 1 systems, replacing either the Call Processor or Memory CP also requires that the frontplane connector be disconnected and then reconnected.

After replacing the CPU/Memory CP, it is mandatory to force a Cold Start or Limited Cold Start. The Cold Start initializes the new CPU/Memory CP with the system's CP configuration as well as clears all status and error logs. Old information may have been stored on the replacement CP; therefore, you should then do a tape restore to restore to the original translations (Note! You must have a DTU to do this).

## **Circuit Pack Trouble**

Most CP troubles result in user complaints. User complaints are discussed under "Clearing User-Reported Troubles" in this section. Diagnosis of user complaints is aided by messages in the Error Log and LEDs on the CPs.

Once a faulty CP is identified, it can be replaced using the procedures in “Reseating and Replacing Circuit Packs” under “Routine Maintenance.” Refer to the information in “Circuit Pack LEDs” under the “General Maintenance Information” to understand the meaning of the CP LEDs.

If the Error Log notes an error related to the touch-tone receivers, the receivers are performing below system requirements.

Touch-tone receiver problems are due to a faulty Service Circuit (ZTN85 or ZTN131 [R3]) or Tone Detector (TN748). Replace the faulty CP.

### **Frontplane Ribbon Connector Trouble (Release 1 Only)**

The frontplane ribbon connector is a flat cable connecting the Call Processor and Memory CPs at their front edges.

To reattach or replace this cable, follow these steps:

1. Remove power from the system.
2. Pull the exposed tab on the cable from one of the CPs. This exposes a second tab at the other end of the cable.
3. Pull the second tab to remove the cable entirely.
4. Replace the cable in the reverse manner. (The cable is keyed for correct placement.)

### **Power Supply Trouble**

If a major malfunction occurs, the system may activate the 109 Emergency Transfer Unit. With this condition, the system may be nonfunctional, even though the green LEDs on CPs in the other cabinets remain lighted. Failure of the power supply in a cabinet containing only port CPs (Cabinet 2 or 3) will shut down all devices connected to that cabinet but will not shut down the entire system.

Check the green LED on PS (visible through the fan slots on the front door). If extinguished, PS is shut down. Remove ac power from the cabinet for about 3 minutes. Turn on ac power. Green LED lighted, PS overheated (fan defective), or current overload. Check all boards in cabinet for problems.

Table 4-B lists the test points (-5 V, +5 V, -48 V, and GND) for the power supply. The test points are located on the upper-right corner at the front of the cabinet.

Table 4-C lists the voltages used by the CPs and symptoms that occur when voltages are missing. This information is useful in diagnosing power supply or power distribution problems.

**Table 4-B. Power Supply Test Points**

Test Points	Voltage Limits		Remarks
	Min	Max	
-5	-4.80	-5.15	
+5	+4.80	+5.15	The green LED on the power supply monitors this particular voltage
-48	-43.0	-51.0	
GND	-	-	Ground

Table 4-C. Circuit Pack Voltage–Symptoms

Voltage/ Circuit Pack (Notes)	+5 volts		-5 volts		-48 Volts	
		No+5 V		No-5 V		No-48 V
Call Proc. (ZTN82, ZTN1 28) for RI	X	System Failure	X	EIA Failure	X	ETU Activated
Memory (ZTN81, ZTN1 27) for RI	x	System Failure	-	-	-	-
CPU/Memory (ZTN129, for R2, ZTN130 for R3)	x	System Failure	X	EIA Failure	X	ETU Activated
STARLAN (ZTN84)	x	CP Failure	X	CP Failure	-	-
Service Ckt (ZTN85 or ZTN131 (R3))	x	System Failure	-	-	-	-
Hybrid Line (ZTN79)	x	CP Failure	x	No Voice	x	Station OS
Tip/Ring (ZTN78)	X	CP Failure	X	No Voice	x	Station OS
Analog Line (TN742)	x	CP Failure	x	No Voice	x	Station OS
MET Line (TN735)	X	CP Failure	x	No Voice	x	Station OS
Loop Start (ZTN77)	x	CP Failure	x	No Voice	x	Trunks OS
Grd Start (ZTN76)	x	CP Failure	x	No Voice	x	Trunks OS
DID Trk (TN753)	x	CP Failure	x	No Voice	x	Trunks OS
Tie Trk (TN760B)	x	CP Failure	x	No Voice	x	Trunks OS
Aux Trk (TN763)	x	CP Failure	x	No Voice	x	AUX. Eq. OS
Data Line (TN726)	x	CP Failure	-	-	-	-
Tone Det (TN748)	x	Tone Failure	-	-	-	-

Legend: CP—Circuit Pack  
 ETU—Emergency Transfer Unit  
 OS-Out-of-Service  
 X—indicates that the voltage is used by the associated CP.

- Notes: 1. Ringing voltage (not shown on table) is used by the ZTN78 and TN742 CPs. Associated stations will not ring if a ringing voltage problem occurs.  
 2. TN746B same as TN742  
 3. TN747 same as ZTN76 and ZTN77  
 4. TN762 same as ZTN79.

Each power supply has one green LED on its front that can be seen through the fan assembly. The LED is visible through the ventilation slots on the front cover, but the cover must be removed for diagnostic and service purposes. This LED is always lighted when the system is receiving 5.1 volts power. The LED is dark when there is a failure in the +5 volt power supply or power connections, or when there is a short on the backplane.

If the green LED on the power supply is dark, first make sure that the cabinet is receiving ac power. Be sure that the fans are running, that the connection to building ac power has been made correctly, and that the power rocker switch is in the ON (1) position. See DANGER below. Then check the internal power connections (see Figure 4-8).

Danger: The power cord must be unplugged before the rear cover is removed. Simply setting the power switch to OFF is not sufficient.

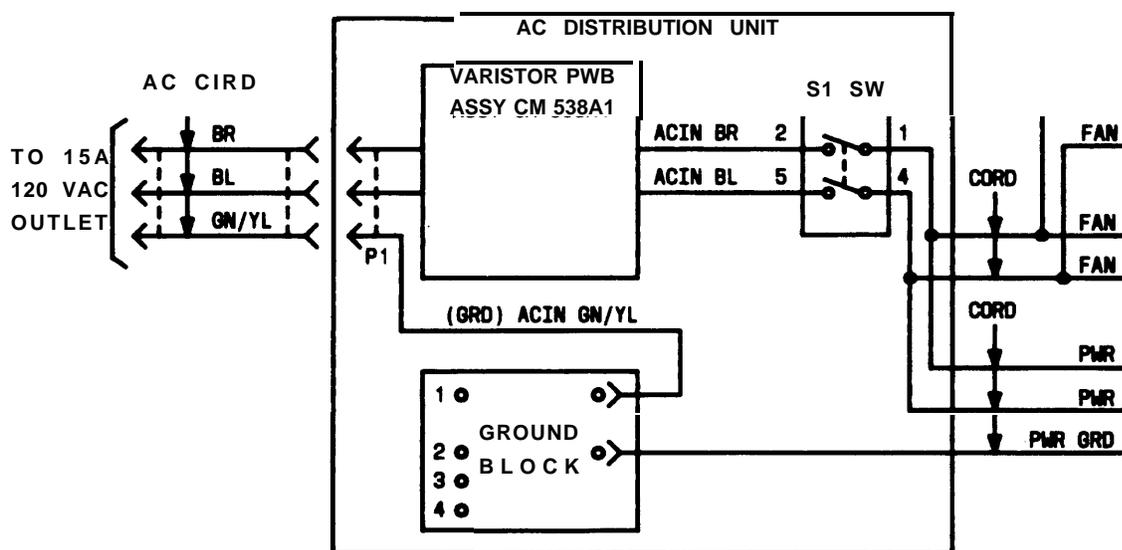


Figure 4-8. AC Power Schematic

### ***Power Supply Protection***

Power supply outputs are protected from damage when they are subjected to either momentary or sustained short circuits. “Shutdown” current protection is provided at 125 percent (plus or minus 5 percent) of full load for each dc output. Current foldback is provided for the 90 V ac output.

Output power is removed when the output voltage exceeds an internally set trip point. The trip point is set at the factory at +6.25, +0.75 V for the +5.1 V output for all rated line and load conditions.

Output power is removed when the power supply overheats for any reason (for example, fan failure or operation outside ambient temperature limits). Once the cause of the shutdown is corrected, remove ac power for about 5 minutes. The green LED (visible through the fan slots on the front of the cabinet) will light when the power supply recovers. If the green LED is not lighted, remove ac power a second time. If green LED is still not lighted, remove all ac power. Repeat procedure a third time; if the LED is now lighted, there is a short. Find the short, and either repair it or have it repaired.

Although the power circuits are designed to withstand lightning surges on the ac line with proper grounding, it is advisable to provide supplemental protection with external protectors in high lightning activity areas.

### ***Power Supply Replacement***

To replace the power supply, follow these steps:

**Danger:** Hazardous voltages are present on some backplane pins. Unplug power cord from the outlet, and wait at least 5 minutes before removing rear cover or power supply.

1. Remove the front cover of the cabinet.
2. Remove the four No. 6-32 screws at the corners of the fan assembly.
3. Unplug the fan assembly from system power by removing the two modular plugs on the left side of the assembly.
4. Set the fan assembly aside in a safe place.
5. Unplug the 3-prong ac power connector that supplies building power to the power supply. This connector is located at the bottom front of the power supply.
6. Reach into the cabinet, between the power supply and the port carrier. At the rear of this narrow space is the multipin dc power connector that connects the power supply to the backplane. Remove this connector by squeezing the tabs on the top and bottom of the plug and pulling the plug up and away from its receptacle.
7. Remove the four No. 10-24 screws on the left side of the cabinet (viewed from the front). These screws secure the power supply in position.
8. Pull up on the top lip of the power supply and carefully slide it out of the cabinet. The power supply rests on the cabinet floor. There are no additional anchors or guides. The power supply weighs about 4 pounds.

To reinstall a new power supply, follow the preceding steps in reverse order.

## **Fan Assembly Trouble**

**The fans should always be operating when the system is receiving ac power and the cabinet switch is turned on. If the fans are not operating, be sure that the system is receiving ac power.**

**if the system is receiving power and the fans are still not operating, the ac power connection to the fan assembly is faulty or the fans themselves are faulty (for example, burned out motors).**

**To check the ac power connection to the fan assembly, first unplug the power cord, and then remove the four No. 6-32 screws at the corners of the assembly. Carefully lift the fan assembly away from the cabinet. Check the two modular plugs attached on the left side of the assembly. If the plugs are securely attached, the fan assembly itself is faulty and must be replaced.**

**To replace the fan assembly, remove the modular plugs at the left side of the assembly. Reconnect these plugs to a known good fan assembly, and reinstall the new fan assembly by setting it in place in front of the power supply and replacing the four No. 6-32 screws at the corners of the assembly. (Without fans, the power supply will overheat and the system will automatically shut down.)**

**Danger:** Whenever the power supply shuts itself down (due to overheating, shorting, etc.), unplug the power cord and wait at least 5 minutes before restoring power.

## Overheating Trouble

A clogged or dirty air filter can cause the cabinet to overheat. The cabinet air filter rests on the floor of the cabinet under the CP carrier. The air filter should be inspected on any service call and replaced as needed (with air filter comcode 845948348).

**Caution:** Check underneath cabinet for paper and other debris that could clog the air filter and cause the cabinet to overheat.

To replace the air filter, pinch it in the center and pull straight out.

**Warning:** To reduce risk of fire, air filter must be in place during operation.

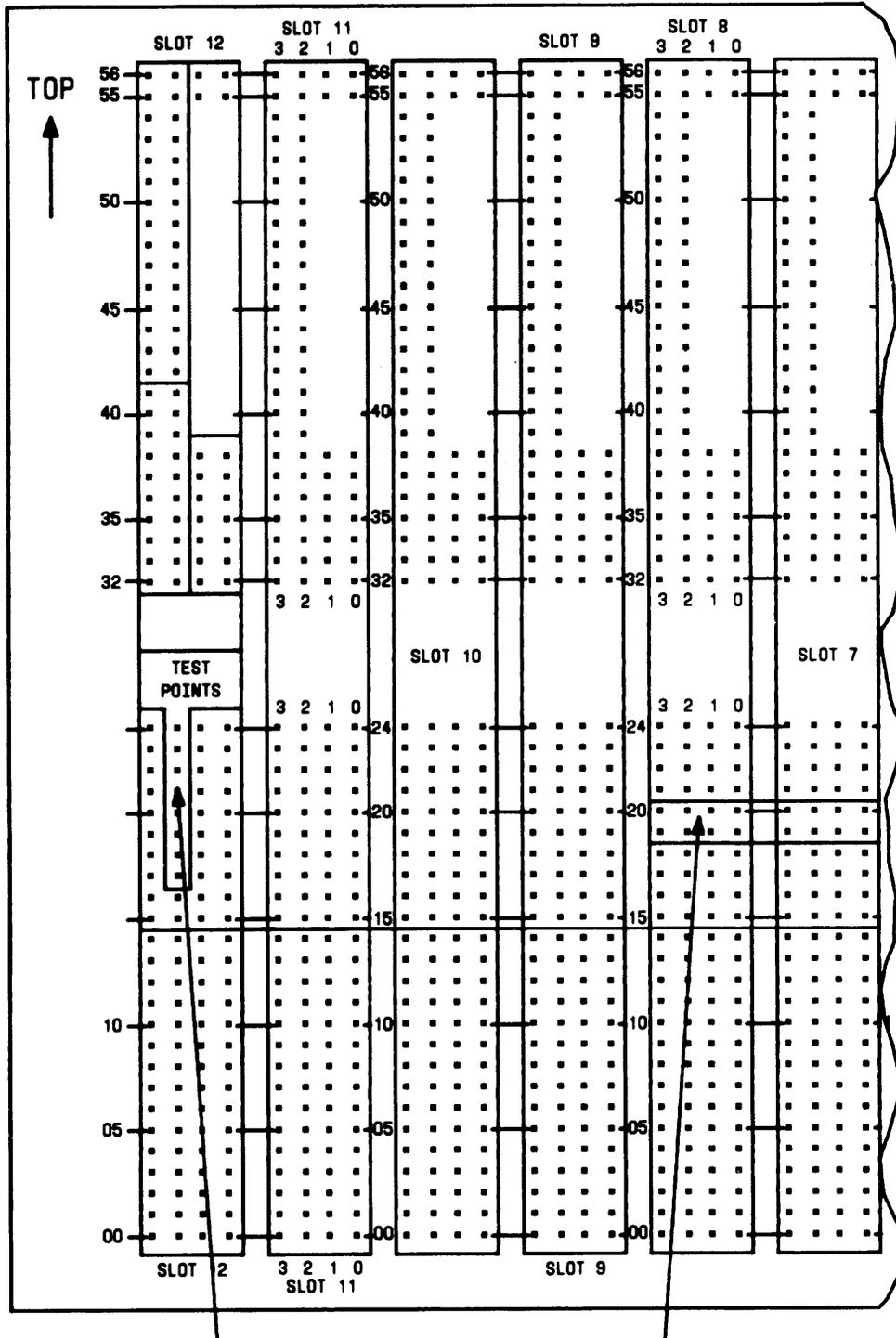
## Backplane and Cabinet Trouble

The backplane provides power, TDM bus connections, and station and trunk interconnections. Each carrier has 12 universal slot positions. Any port CP can be installed in any slot. Connection to the corresponding stations or trunks is made through the backplane to the appropriate cross-connect field.

**Danger:** Hazardous voltages are present on some backplane pins. Unplug the power cord and wait at least 5 minutes before removing the rear cover.

Figure 4-9 provides a rear view of the cabinet backplane (rear cover must be removed). Typical backplane pin designations are noted on Figure 4-9 for pins 355, 254, and 056 located on slots 4, 3, and 1, respectively. Address plug locations for Cabinets 1, 2, and 3 are also noted. The address plug position assigned slot 8 is reserved for future use. Seven leads (BA0 through BA6, see Figure 4-10) are tied to corresponding logic levels to uniquely identify each CP slot in the system, including multiple cabinet systems. The logic values on leads BA4 and BA5 are used to identify the cabinet (Cabinet 1, 2, or 3) and are tied through the cabinet address plugs to either +5 V dc or ground, as appropriate. Lead BA6 is tied to ground.

An address plug inserted on a cabinet's backplane (pins 19 and 20) at slot 5 designates the cabinet as Cabinet 1, slot 6 = Cabinet 2, and slot 7 = Cabinet 3.



TEST POINT CABLE CONNECTS  
HERE. ACCESS VOLTAGE TEST  
POINTS FROM FRONT OF  
CABINET.

ADDRESS PLUG POSITION  
(SLOT 08 NOT USED)

Figure 4-9. System Cabinet Backplane Wiring Side (Sheet 1 of 2)

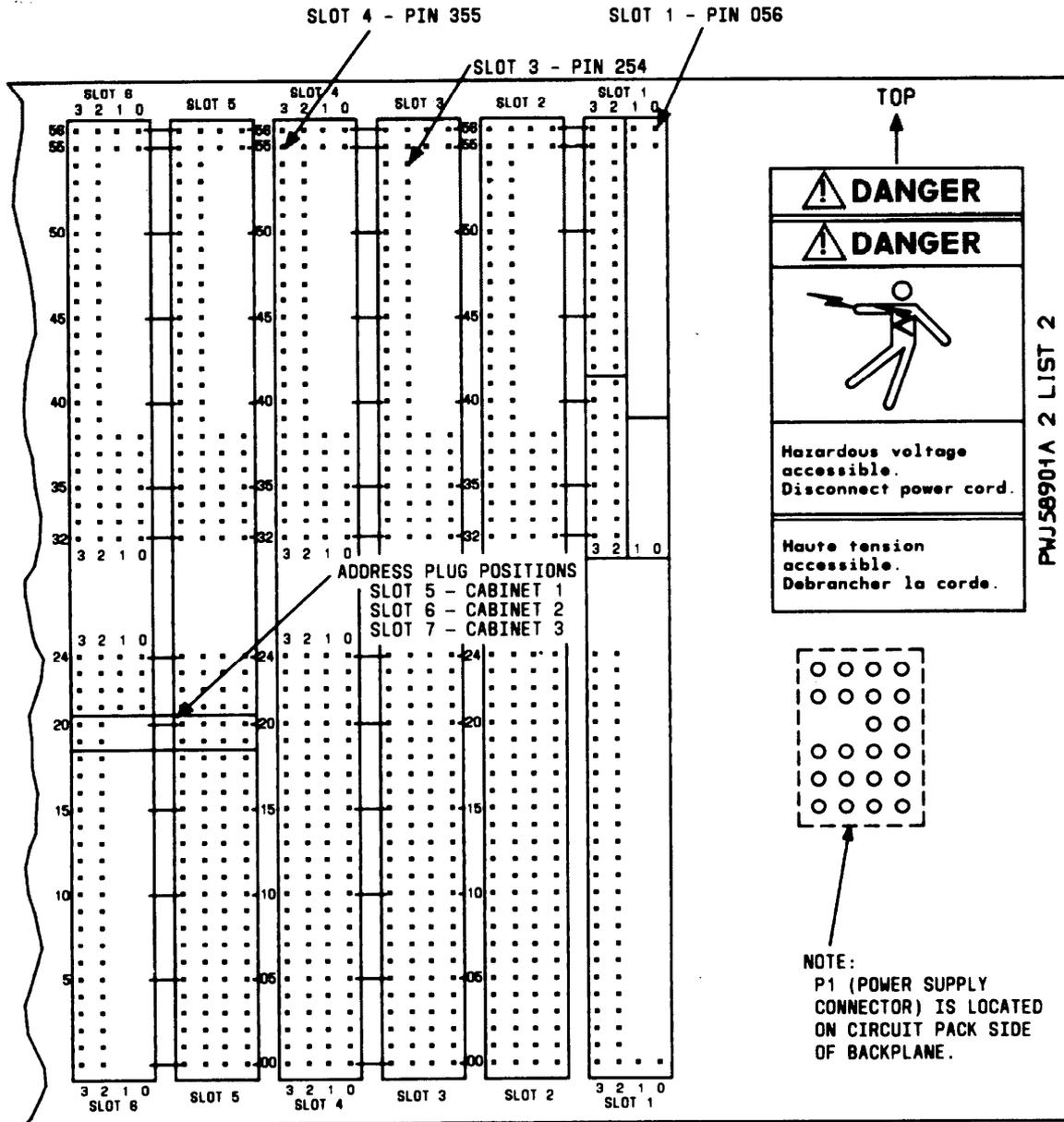


Figure 4-9. System Cabinet Backplane Wiring Side (Sheet 2 of 2)

TO SLOTS 1-12	SYSBUSAO	354	BACKPLANE J58901A	102	TA.0	TO SLOTS 1-12
	SYSBUSA1	353		103	TB.0	
	SYSBUSA2	352		104	TC.0	
	SYSBUSA3	351		105	TA.1	
	SYSBUSA4	350		106	TB.1	
	SYSBUSA5	349		107	TC.1	
	SYSBUSA6	348		108	TA.2	
	SYSBUSA7	347		109	TB.2	
	SYSBUSB0	346		110	TC.2	
	SYSBUSB1	345		111	TA.3	
	SYSBUSB2	344		112	TB.3	
	SYSBUSB3	343		113	TC.3	
	SYSBUSB4	342		302	TA.4	
	SYSBUSB5	341		303	TB.4	
	SYSBUSB6	340		304	TC.4	
	SYSBUSB7	339		305	TA.5	
	SYSCLK	337		306	TB.5	
	SYSOCLK	335		307	TC.5	
	CLKSEL	334		308	TA.6	
	SYSSYNC	038		309	TB.6	
	SYSFR	036		310	TC.6	
	SPARE-BUS	034		311	TA.7	
	BA6 (GRD)	220		312	TB.7	
	BA5	120		313	TC.7	
	BA4	020		002	RA.0	
	BA3	019		003	RB.0	
	BA2	119		004	RC.0	
	BA1	219		005	RA.1	
	BA0	319		006	RB.1	
				007	RC.1	
		008	RA.2			
		009	RB.2			
		010	RC.2			
		011	RA.3			
		012	RB.3			
		013	RC.3			
		202	RA.4			
		203	RB.4			
		204	RC.4			
		205	RA.5			
		206	RB.5			
		207	RC.5			
		208	RA.6			
		209	RB.6			
		210	RC.6			
		211	RA.7			
		212	RB.7			
		213	RC.7			

LEGEND:  
 = BUSSED

Figure 4-10. TDM Signal Designations on Cabinet Backplane

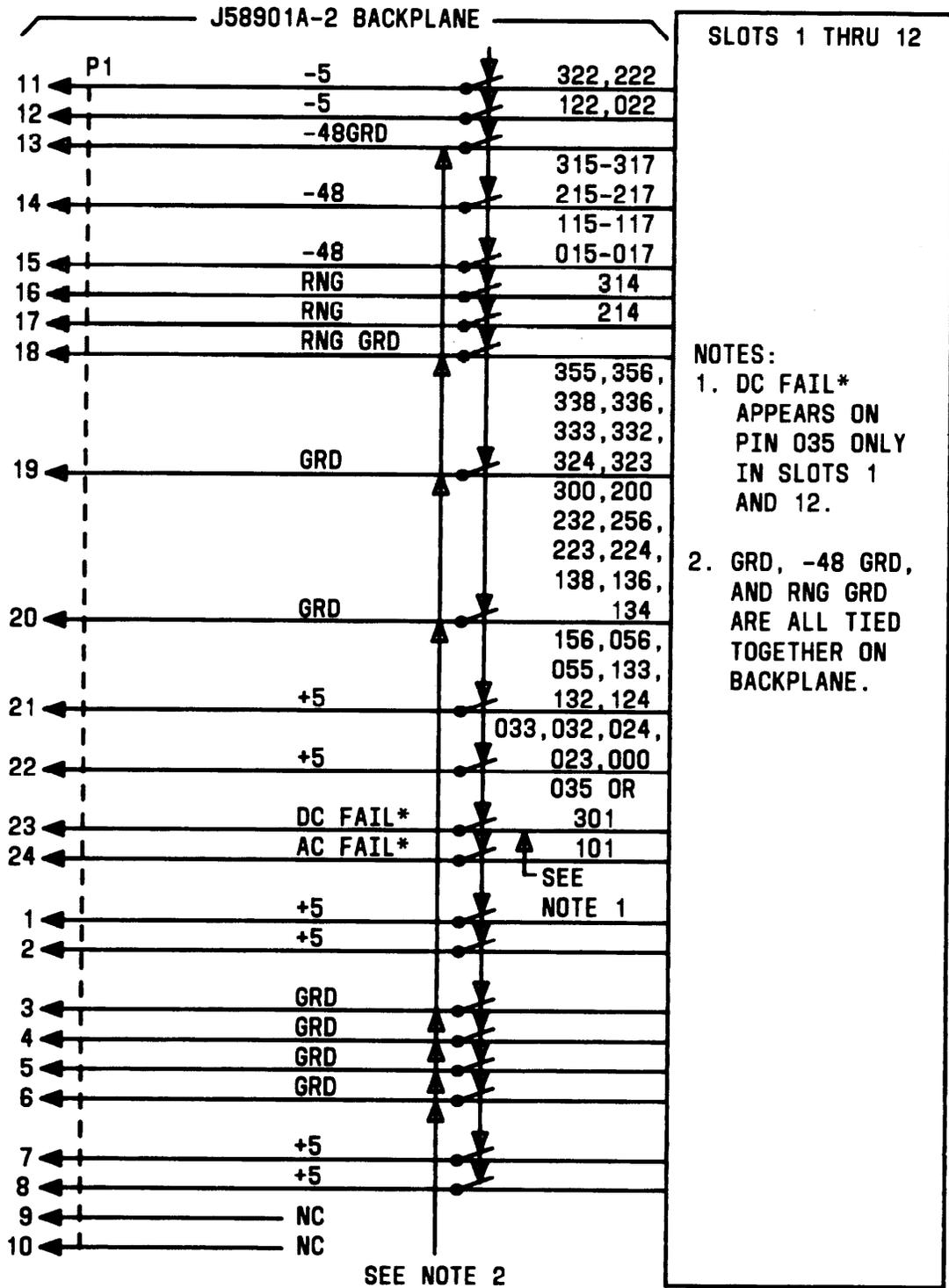


Figure 4-11. Power Designations on Cabinet Backplane

Each of the 12 universal carrier slots has 48 pins on the backplane for connection to station and trunk ports. The 48 pins are divided into eight groups of 6 pins each, one group for each port circuit. Lead designations consist of the lead name suffixed by the group number (for example, TA.2, RA.2). Specific functions depend on the type of port CP. Table 4-D provides the 25-pin connector to backplane pin designations.

Typical backplane problems include power supply failure, sudden failure of one or more CPs or system troubles that cannot be isolated to a specific maintenance unit.

Backplane troubles are usually caused by bent or broken pins. A visual inspection of the backplane may be adequate to determine if pins are bent or broken. This inspection may require removing one or more CPs

Backplanes cannot be repaired in the field. When a backplane is faulty, the entire cabinet (but not the CPs in the cabinet) must be replaced.

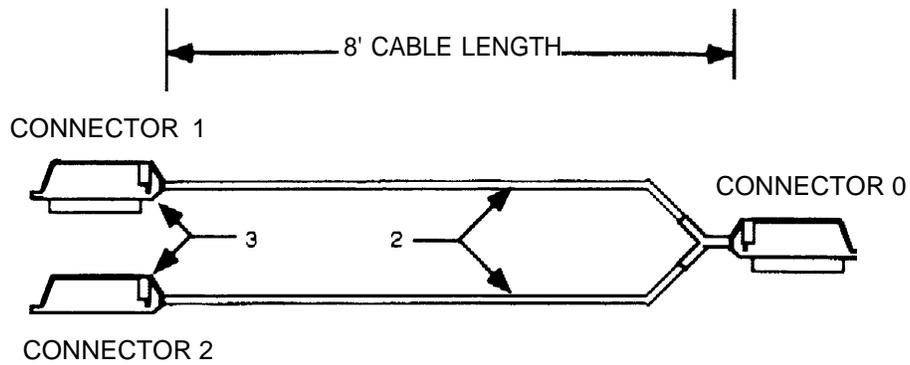
**Table 4-D. 25-Pair Connector to Backplane Designations**

25-Pin-Conn.		Call Proc	GS Trunk ZTN76	LS Trunk ZTN77	Tip Ring Line ZTN78	A T L Line ZTN79	M E T Line TN735	Backplane Pin No. (Slots 1-12)
Pin No.	Wire Color							
26	W-BL	R D A S G A	T 1 R 1	T 1 R 1	T 1 R 1	T 1 R 1	T 1 R 1	1 0 2 0 0 2
1	BL-W							
27	W-O	DCDA				CT1 CR1	BT1 BR1	1 0 3 0 0 3
2	O-W							
28	W-G	DTRA T D A				P - 1 P + 1	LT1 LTR1	1 0 4 0 0 4
3	G-W							
29	W-BR	R D B S G B	T 2 R 2	T 2 R 2	T 2 R 2	T 2 R 2	T 2 R 2	1 0 5 0 0 5
4	BR-W							
30	W-S	DCDB				CT2 CR2	BT2 BR2	1 0 6 0 0 6
5	S-W							
31	R-BL	DTRB T D B				P - 2 P + 2	LT2 LTR2	1 0 7 0 0 7
6	BL-R							
32	R-O	R D C S G C	T 3 R 3	T 3 R 3	T 3 R 3	T 3 R 3	T 3 R 3	1 0 8 0 0 8
7	O-R							
33	R-G	DCDC				CT3 CR3	BT3 BR3	1 0 9 0 0 9
8	G-R							
34	R-BR	DTRC T D C				P - 3 P + 3	LT3 LTR3	1 1 0 0 1 0
9	BR-R							
35	R-S	R D D S G D	T 4 R 4	T 4 R 4	T 4 R 4	T 4 R 4	T 4 R 4	1 1 1 0 1 1
10	S-R							
36	BK-BL	DCDD				CT4 CR4	BT4 BR4	1 1 2 0 1 2
11	BL-BK							
37	BK-O	DTRD T D D				P - 4 P + 4	LT4 LTR4	1 1 3 0 1 3
12	O-BK							
38	BK-G		T 5 R 5	T 5 R 5	T 5 R 5	T 5 R 5		3 0 2 2 0 2
13	G-BK							
39	BK-BR					CT5 CR5		3 0 3 2 0 3
14	BR-BK							
40	BK-S					P - 5 P + 5		3 0 4 2 0 4
15	S-BK							
41	Y-BL		T 6 R 6	T 6 R 6	T 6 R 6	T 6 R 6		3 0 5 2 0 5
16	BL-Y							
42	Y-O					CT6 CR6		3 0 6 2 0 6
17	O-Y							
43	Y-G					P - 6 P + 6		3 0 7 2 0 0 7
18	G-Y							
44	Y-BR		T 7 R 7	T 7 R 7	T 7 R 7	T 7 R 7		3 0 8 2 0 8
19	BR-Y							
45	Y-S	ETU48 ETUGD				CT7 CR7		3 0 9 2 0 9
20	S-Y							
46	V-BL	ETU48 ETUGD				P - 7 P + 7		3 1 0 2 1 0
21	BL-V							
47	V-O		T 8 R 8	T 8 R 8	T 8 R 8	T 8 R 8		3 1 1 2 1 1
22	O-V							
48	V-G	ETU48 ETUGD				CT8 CR8		3 1 2 2 1 2
23	G-V							
49	V-BR	ETU48 ETUGD				P - 8 P + 8		3 1 3 2 1 3
24	BR-V							
50	V-S		GND GND	GND GND	GND GND	GND GND	GND GND	3 0 0 2 0 0
25	S-V							

**Note:** TN747 is same as ZTN76 and ZTN77. TN762 is same as ZTN79.

**Table 4-D. 25-Pair Connector to Backplane Designations Contd)**

25-Pin-Conn.. Pin No.	Wire Color	D I D Trunk TN753	T i e Trunk TN760B	Aux. Trunk TN763	Data Line TN726	Analog Line TN742	Analog Line TN746B	D S 1 Interface TN 7 6 7	Backplane Pin No. (Slots 1-12)
2 6 1	W-BL BL-W	T1 R1	T 1 R 1	T 1 R 1		T 1 R 1	T 1 R 1		1 0 2 0 0 2
2 7 2	W - O O - W		T 1 1 R 1 1	S Z 1 S Z 1 1	TXT1 TXR1		T 2 R 2		1 0 3 0 0 3
2 8 3	W - G G - W		E 1 M 1	S 1 S 1 1	PXT1 PXR1		T 3 R 3		1 0 4 0 0 4
2 9 4	W-BR BR-W	T2 R2	T 2 R 2	T 2 R 2		T 2 R 2	T 4 R 4		1 0 5 0 0 5
3 0 5	W - S S - W		T 1 2 R 1 2	S Z 2 S Z 1 2	TXT2 TXR2				1 0 6 0 0 6
3 1 6	R-BL BL-R		E 2 M 2	S 2 S 1 2	PXT2 PRT2				1 0 7 0 0 7
3 2 7	R - O O - R	T3 R3	T 3 R 3	T 3 R 3		T 3 R 3			1 0 8 0 0 8
3 3 8	R - G G - R		T 1 3 R 1 3	S Z 3 S Z 1 3	TXT3 TXR3				1 0 9 0 0 9
3 4 9	R-BR BR-R		E 3 M E	S 3 S 1 3	PXT3 PXR3		T 5 R 5		1 1 0 0 1 0
3 5 10	R - S S - R	T4 R4	T 4 R 4	T 4 R 4		T 4 R 4	T 6 R 6		1 1 1 0 1 1
3 6 11	BK-BL BL-BK		T 1 4 R 1 4	S Z 4 S Z 1 4	TXT4 TXR4		T 7 R 7		1 1 2 0 1 2
3 7 12	BK-O O-BK		E 4 M 4	S 4 S 1 4	PXT4 PXR4		T 8 R 8		1 1 3 0 1 3
3 8 13	BK-G G-BK	T5 R5				T 5 R 5	T 9 R 9		3 0 2 2 0 2
3 9 14	BK-BR BR-BK				TXT5 TXR5		T10 R10		3 0 3 2 0 3
4 0 15	BK-S S-BK-				PXT5 PXR5		T11 R11		3 0 4 2 0 4
4 1 16	Y-BL BL-Y	T6 R6				T 6 R 6	T12 R12		3 0 5 2 0 5
4 2 17	Y - O O - Y				TXT6 TXR6				3 0 6 2 0 6
4 3 18	Y - G G - Y				PXT6 PXR6				3 0 7 2 0 7
4 4 19	Y-BR BR-Y	T7 R7				T 7 R 7			3 0 8 2 0 8
4 5 20	Y - S S - Y				TXT7 TXR7				3 0 9 2 0 9
4 6 21	V-BL BL-V				PXT7 PXR7		T13 R13		3 1 0 2 1 0
4 7 22	V - O O - V	T8 R8				T 8 R 8	T14 R14	L1* L1	3 1 1 2 1 1
4 8 23	V - G G - V				TXT8 TXR8		T15 R15	L0 L0	3 1 2 2 1 2
4 9 24	V-BR BR-V				PXT8 PXR8		T16 R16	LBACK 2 LBACK 1	3 1 3 2 1 3
5 0 25	V - S S - V	GND GND			GND GND	GND GND	GND GND		3 0 0 2 0 0



ITEM NO.	QTY	STOCKLIST DESCRIPTION
1	1	25 - P R P L U G
2	2	8-FT, 8-PR, 24-GC, CABLE
3	2	25-PR RECEPTACLE
4	3	SPACER (NOTE 1)

**NOTES:**

1. INSTALL SPACER AT CONNECTOR CABLE CLAMP TO ENSURE PROPER CABLE RETENTION.
2. ITEMS 1 AND 3 SHALL BE EQUIPPED WITH SCREWS TO FACILITATE ASSEMBLY TO B25A CABLES.
3. LABEL CONNECTORS AS SHOWN: 0,1,2.

**WIRING LIST**

<u>CONN 0</u>	<u>CONN 2</u>	<u>CONN 0</u>	<u>CONN 1</u>
26	26	38	26
1	1	13	1
27	29	39	29
2	4	14	4
28	32	40	32
3	7	15	7
29	35	41	35
4	10	16	10
34	38	46	38
9	13	21	13
35	41	47	41
10	16	22	16
36	44	48	44
11	19	23	19
37	47	49	47
12	22	24	22

**Figure 4-11a. 853 Adapter**

## **Emergency Transfer Unit Trouble**

**If the Emergency Transfer Unit (ETU) will not enter the power failure mode, do the following steps:**

- 1. Unplug the cable bringing the control signal from port 7 or 8 on the CPU/Memory CP to the ETU. This cable terminates in a modular jack that is inserted in a modular plug labeled CPU on the left-hand side of the ETU.**
- 2. If the ETU goes into the power failure mode, the CPU/Memory CP is probably faulty or a wiring problem exists. Plug the cable back in, then reset the CPU/Memory CP by removing and restoring power to the system. If the ETU still does not go into the power failure mode, the CPU/Memory CP must be replaced.**
- 3. If the ETU does not go into the power failure mode after the control cable was unplugged in Step 1, the ETU is faulty and must be replaced.**

**If the ETU remains in the power failure mode continuously (preventing normal operation of the system), follow these steps:**

- 1. At the ETU, unplug the cable bringing the control signal from the CPU/Memory CP.**
- 2. Using a modular jack breakout box and voltmeter, check to see that 48 volts are present between pins 1 and 2 and pins 3 and 6 of the control cable from the CPU/Memory CP.**
- 3. If the above voltages are present, the ETU is faulty and should be replaced.**
- 4. If the above voltages are not present, either the CPU/Memory CP or the cable is faulty and should be replaced.**

---

## CLEARING USER-DETECTED TROUBLES

User-reported troubles are usually associated with voice or data terminal equipment or trunks. They can result from system-detected errors and are often solved by clearing system error conditions or alarms.

This section presents trouble-clearing techniques and procedures for user-reported troubles.

Maintenance routines for data terminals and Asynchronous Data Units (ADUs) are not contained in this section (although some basic routines for clearing administration equipment troubles are included). Manuals covering data terminals and data modules are listed in Section 5, "References." Maintenance for auxiliary devices that are customer provided is the responsibility of the user.

### Administration Equipment Troubles

Administration equipment that is connected to the system on a dedicated basis includes the System Administration Terminal (SAT), Station Message Detail Recording (SMDR), and Digital Tape Unit.

#### Symptoms:

Terminal dead or functioning intermittently. Messages contain "garbage" characters.

#### Procedures:

1. Check ac power connection.
2. Check cabling to cabinet.
3. Check administered settings for SAT (see the *Administration Manual*). Settings should be for 8-bit word length, no parity, space (0) for bit 8; baud rate 1200.
4. Check pin 20 of EIA connector for DTR signal. Signal should be steady at greater than or equal to +3.0 volts with respect to pin 7 (ground).

**Note:** For problems with administration equipment that is not connected on a dedicated basis, refer to the *Terminal Operations Manual, 555-540-710*.

## **Time-Keeping Troubles**

### **Symptoms:**

Clock doesn't reflect current time or date.

### **Procedures:**

1. Reset clock from SAT (see the *Administration Manual*). Clock has tolerance of plus or minus 3 minutes per month. Variances outside this range indicate a faulty clock and require replacement of the CPU/Memory CP. Time must be reset for Daylight Savings Time.

## **Voice Terminal and Wiring Troubles**

### **Symptoms:**

Intermittent voice terminal troubles.

### **Procedures:**

1. Swap a known good terminal with the questionable terminal to determine if problem is localized to a single terminal. If local power is provided, check power supply.
2. If troubles do not persist, problem is localized to single terminal. Replace faulty terminal.
3. If good terminal does not work properly, fault is in wiring or circuit pack (CP).
4. Check other terminals connected to same CP. If other terminals are working properly, fault is probably in wiring. Swap wiring between Station Interconnect Panel and terminal to verify wiring problem. Check and clear any wiring problems.
5. If other terminals connected to same CP are not working properly, fault is probably in CP.

6. Check CP translations from the SAT to be sure that this CP has
7. Check LEDs on CP. The red LED will be lighted if a fault on the CP affects all ports. Also, the red LED may be lighted if one or a few ports are faulty.
8. Check Error Log for relevant messages.
9. Reseat the CP even if the red LED is dark. (See “Reseating and Replacing Circuit Packs” under “Routine Maintenance” in this section.) Replace the faulty CP.

## **Voice Transmission Troubles**

### **Symptoms:**

Voice terminals not receiving tones.

### **Procedures:**

1. Check that green LED on power supply is lighted.
2. Check power supply for voltages.

### **Symptoms:**

Many single-line sets or multibutton electronic telephone (MET) sets are not able to dial correctly even though they are able to receive calls.

**Procedures:** Using a single-line voice terminal, test the touch-tone registers as follows:

1. Go off-hook, and dial \*3 and the 2-digit number (01 through 12) of the touch-tone receiver to be tested. Receivers 01 through 04 are on the ZTN85 or ZTN131 (R3) CP. Receivers 05 through 12 are present only if the system has TN748B CP(s).

You will hear busy tone if the receiver is in use. You will hear reorder tone if you misdialed or addressed a receiver not in the system (for example, you dialed \*305 and the system does not have a TN748B CP). Try again.

If you hear dial tone, continue with this test.

2. Dial the digits 1234567890 \*#.

You should hear a DTMF signal as each key is pressed.

If the test passes, you will hear dial tone within 1 to 3 seconds after you enter #.

3. Repeat the test for each touch-tone receiver.
4. Replace the Service Circuit CP if this test fails.

## **7300H Series Terminal Troubles**

### **Symptoms:**

7300H Series terminal LEDs and/or tones not functioning properly.

### **Procedures:**

1. Move the T/P lever on the left-hand side to the "T" (Test) position, and hold it there.

— Tone ringing should be heard.

All the red and green LEDs on the terminal should flash alternately while the lever is held in this position.

2. Release the lever, letting it return to its normal position.

Ringing tone should be silenced, and the LEDs should be dark.

3. If any part of the test fails, replace the terminal.

### **Symptoms:**

Voice terminal keys don't click.

**Procedures:**

1. Make sure that the appropriate ZTN79 CP is translated.
2. Check for the presence of -48 volts at test point on front of cabinet.

**Symptoms:**

Inoperative display-equipped voice terminal when LOCAL button is used.

**Procedures:**

1. If LOCAL button/lamp is off, and voice terminal is inoperative, activate LOCAL button.
2. If terminal is still inoperative, check for other problems.

**Virtual Facilities Troubles**

Refer to Figure 4-12 for assistance in clearing virtual facilities troubles.

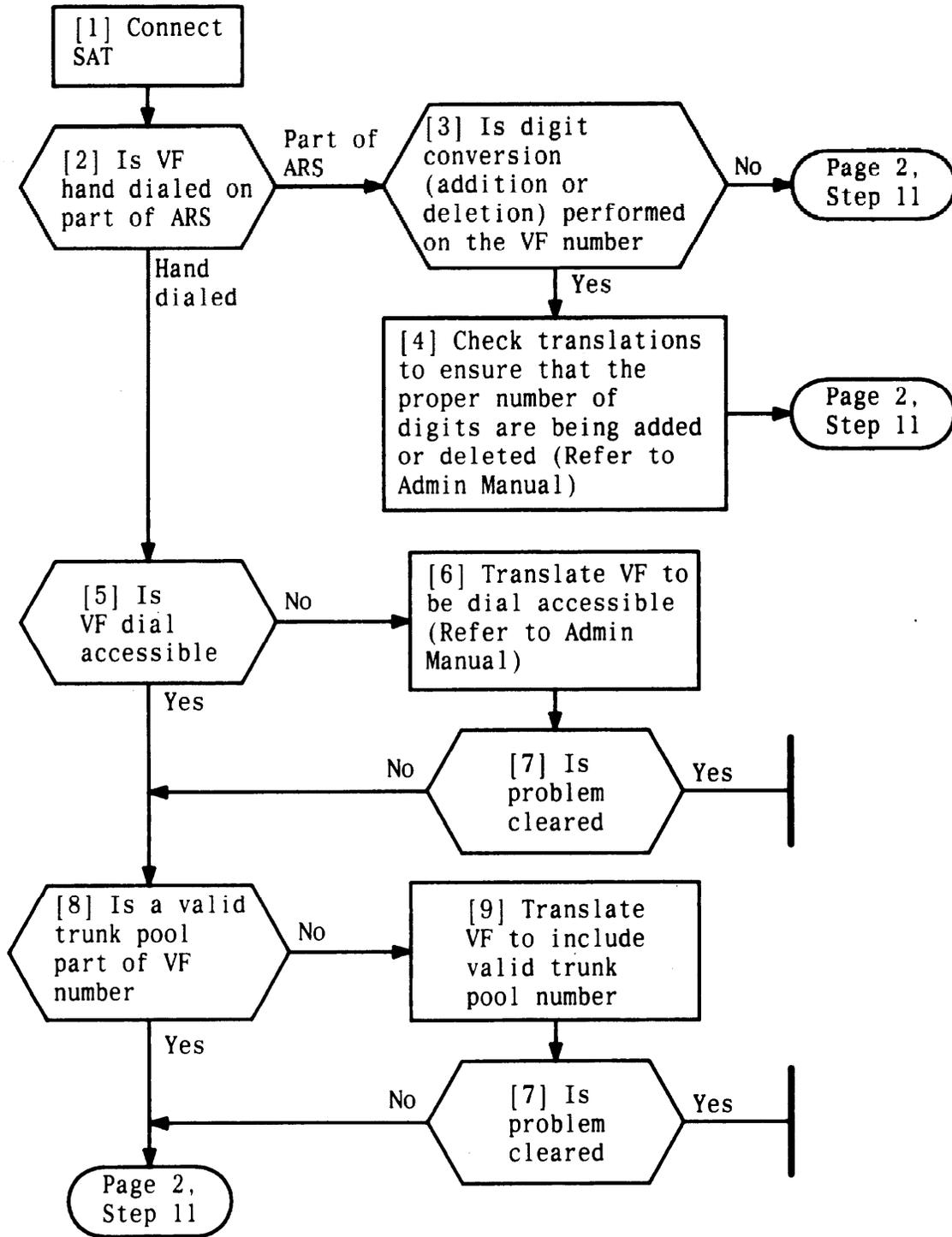


Figure 4-12. Clearing Virtual Facilities Troubles (Sheet 1 of 3)

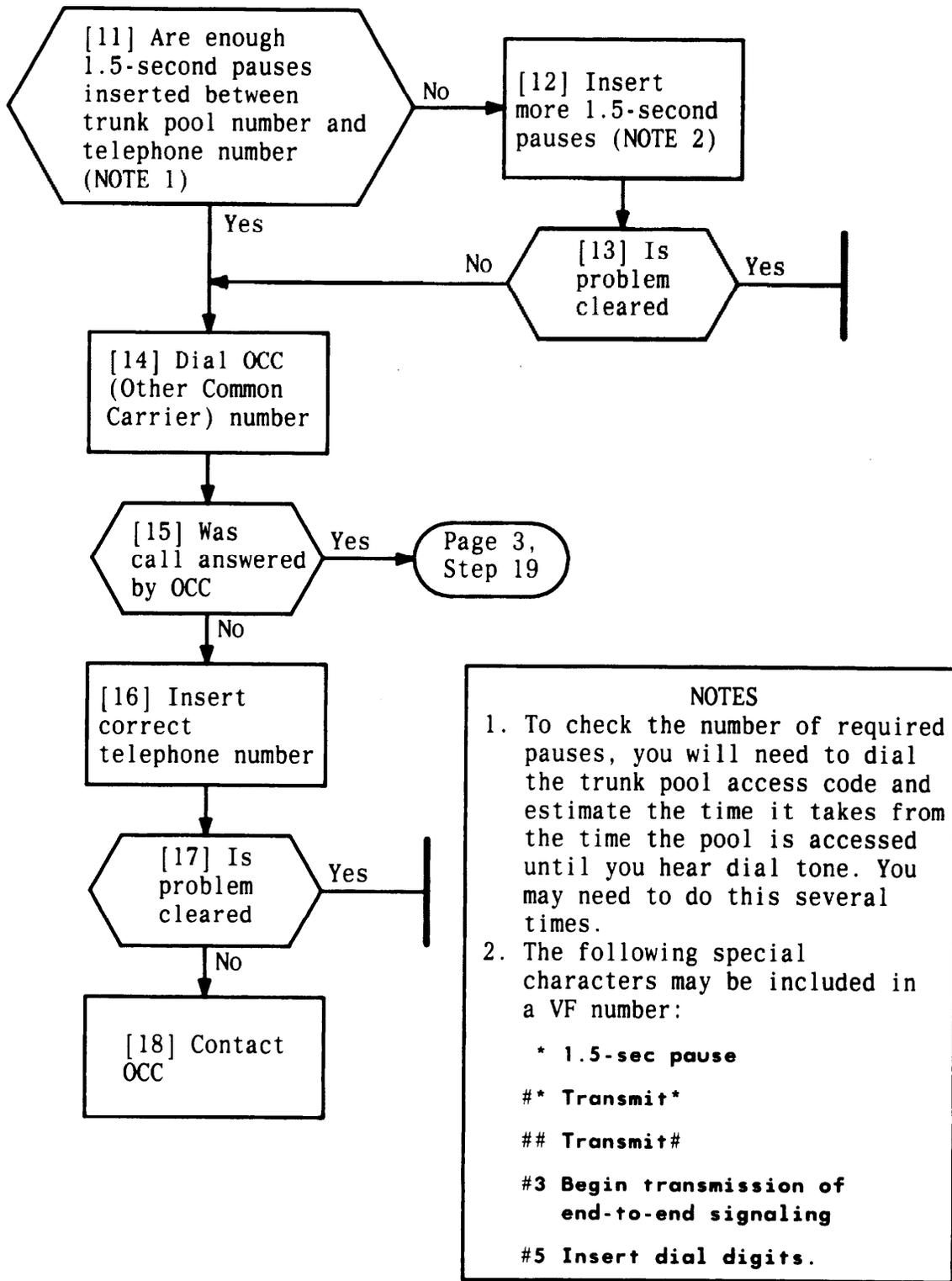


Figure 4-12. Clearing Virtual Facilities Troubles (Sheet 2 of 3)

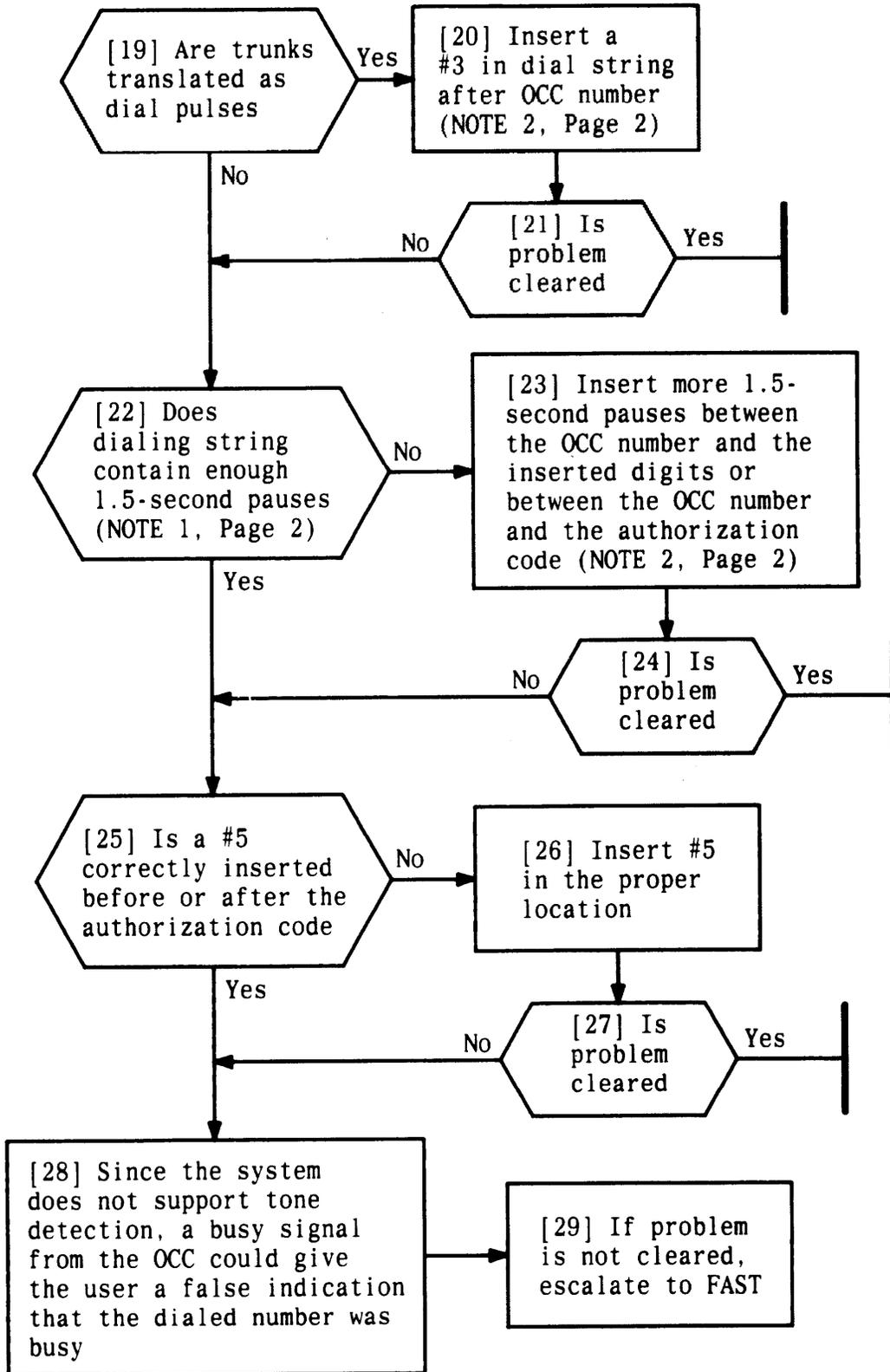


Figure 4-12. Clearing Virtual Facilities Troubles (Sheet 3 of 3)

## Trunk Troubles

Many trunk troubles originate in the central office (**CO**) facilities. The first step in identifying trunk troubles should be to check for presence of dial tone at the Trunk Access Equipment (TAE). If required, check the Error Log records, and make a trunk test call.

Note that it is sometimes difficult for the user to detect or identify trunk troubles. If an outgoing trunk is down, an error is recorded in the error log and the trunk is taken out of service (see Note ). If an incoming-only trunk is down, however, the only indication of trouble is customer complaints that incoming calls are not being received.

**Note:** For Release 1, Version 2 or Release 3 systems, the system will not busy out more than half of the trunks in any pool. Thus, a permanent alarm may be logged against a particular trunk, but the trunk may not be taken out of service because of this constraint.

Other troubles could occur because of incorrect loop current. The loop current of trunks from the CO to System 25 should be 20 mA.

### *Outgoing Trunk Problems*

#### Symptoms:

Difficulty in seizing outgoing trunks.

#### Procedures:

1. Verify that dial tone is received from the CO at the TAE (see Note). If dial tone is not present, notify the CO through the proper channels.

**Note:** For ground-start trunks, apply ground to the Ring lead to get dial tone.

2. Go off-hook at a test station to get system dial tone.
3. Dial \*2 (the test code for all non-DID facility trunks).
4. Dial the 4-digit trunk number of the trunk to be tested. (This is the same number used by the System Administrator to identify this trunk.)

5. Listen for dial tone from the accessed trunk. If dial tone is not present, isolate the fault to a trunk port CP or location in the trunk access equipment, etc., using a test set.
6. If dial tone is present, dial a working outside number. Verify that the call is complete.
7. If trunk is busy, fast busy tone is heard. If a nonport trunk was dialed, fast busy tone is heard.

### ***Incoming Trunk Problems***

#### **Symptoms:**

Incoming trunks (of any type) not working properly.

#### **Procedures:**

1. Place an incoming call through the troubled trunk.
2. At the SAT, check the trunk translations to be sure this trunk has been properly translated. (See the *Administration Manual*.)

### ***Error Log Interpretation: Loop-Start Trunks***

#### **Procedures:**

1. Check Error Log for messages pertaining to loop-start trunks.
2. If “no loop current on incoming call” is displayed, no loop current was detected on an incoming call. The CP detected ringing, but not loop current when it closed the loop. In this case, the CO facility is probably good, but either the current sensor on the CP is faulty or the CO battery circuit is faulty.
3. Switch trunk ports, and see if the problem moves to the new loop-start trunk.
4. If the problem does not move, the loop-start CP is faulty and must be replaced.
5. If the problem moves, the fault is with the CO. Notify CO personnel through the proper channels.

6. If “no loop current on outgoing call” is displayed, either of the above conditions could be true. It is more likely, however, that the facility is down.
7. Place an outside call on the line using the trunk test call procedures listed in outgoing Trunk Problems. If you get fast busy tone, switch trunk ports and try again.
8. If the problem does not move, replace the Loop Start CP.
9. If the problem moves, the fault is with the CO. Notify CO personnel through the proper channels.

### ***Error Log Interpretation: Ground-Start Trunks***

#### **Procedures:**

1. Check the Error Log for messages pertaining to ground-start trunks.
2. If “no loop current on incoming call” is displayed, no loop current was detected on an incoming call. The CP detected ringing, but not loop current when it closed the loop. In this case, the CO facility is probably good, but either the current sensor on the CP is faulty or the CO battery circuit is faulty.
3. Switch trunk ports and see if the problem moves to the new ground-start trunk.
4. If the problem does not move, replace the Ground Start CP.
5. If the problem moves, the fault is with the CO. Notify CO personnel through the proper channels.
6. If “fault on outgoing seizure” is displayed, either of the two conditions is true. The first condition is that the trunk CP did not detect loop current as in the case of the “no loop current on incoming call” message. The second condition is that the trunk CP did not detect tip ground. This could be either a problem with the CO or the ground detector on the CP.
7. Place an outside call on the line using the trunk test call procedures listed under Outgoing Trunk Problems. If you get fast busy tone, switch trunk circuits and try again.

8. If the problem does not move, replace the Ground Start CP.
9. If the problem moves, the fault is with the CO. Notify CO personnel through the proper channels.
10. If “Ringing no ground” is displayed, the T and R leads may be reversed in the trunk access wiring. The T lead should have ground, and the R lead should have –48 volts. These can be verified by reversing the ground and ring leads and checking with either a voltmeter or a test set (with a polarity switch). A voltmeter should indicate the presence of 48 volts. A test set should provide dial tone when the Ring lead is temporarily grounded.
11. “Ringing no ground” may also mean that the ground detect circuit on the Ground Start CP is faulty. Check and replace this CP if necessary.
12. “Ringing no ground” may also mean that the CO is unable to send ground. If this is the problem, notify the CO through the proper channels.

### ***DID Trunks Troubles***

#### **Symptoms:**

User complaints that DID trunks are not operating properly (for example, callers hear ringing, but users do not hear ringing at voice terminals).

#### **Procedures:**

1. Check the trunk translations via the SAT to be sure that trunks have been properly translated. (See the *Administration Manual*.)
2. Check the Error Log for messages such as:
  - Rotary dial before wink
  - Rotary dial pulse too early
  - Rotary dial pulse during wink

- CO failure to release after PBX disconnect
- CO belated release.

These messages indicate CO problems. The first three errors are very common when DID trunks are installed. The CO should be notified through the proper channels about any of these problems.

3. The CO failure to release after PBX disconnect can frequently be corrected by disconnecting and then reconnecting the DID trunk. If this procedure does not resolve the problem, notify the CO through the proper channels.
4. Check each DID trunk port suspected of being faulty by dialing in with the touch-tone test set beginning at the network interface. (Be sure to use the appropriate dialing mode, dial pulse or rotary.)
5. If the test call is successful at the network interface, the fault is probably with the CO facility, and the CO should be notified through the proper channels.
6. If the test call is not successful at the network interface, repeat this test at the cabinet.
7. If the test fails at the cabinet, replace the DID circuit pack.
8. If the test call is successful at the cabinet but not at the network interface, repair the trunk access equipment wiring.
9. Check the Error Log for any messages indicating unused (inaccessible) DID trunks.

### **Switched Loop Attendant Console Troubles**

Refer to Figure 4-13 for assistance in clearing Switched Loop Attendant Console troubles.

**Note:** If problems occur after the LOCAL mode has been used, activate the LOCAL mode again and recheck console operation.

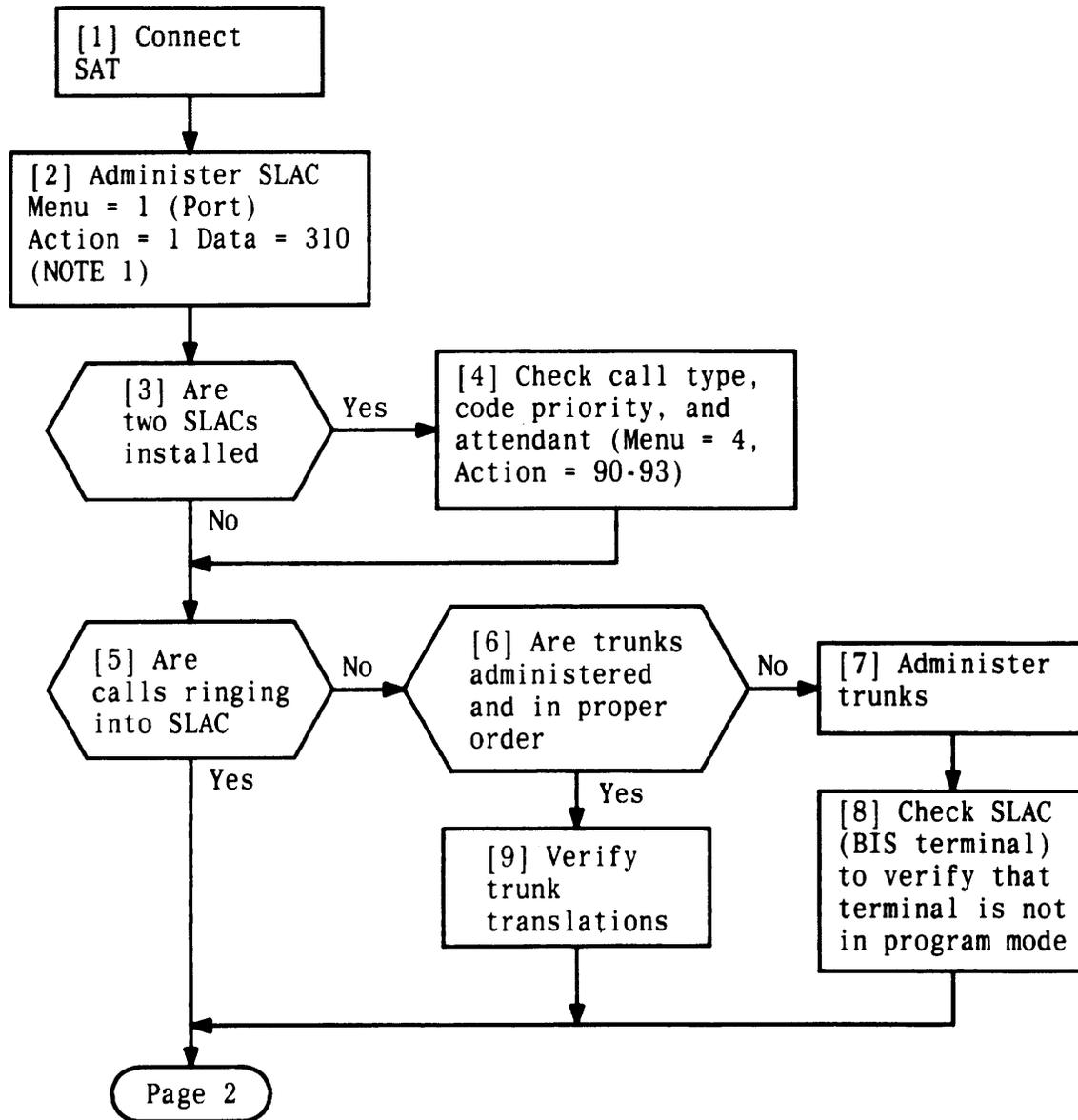


Figure 4-13. Clearing Switched Loop Attendant Console Troubles (Sheet 1 of 5)

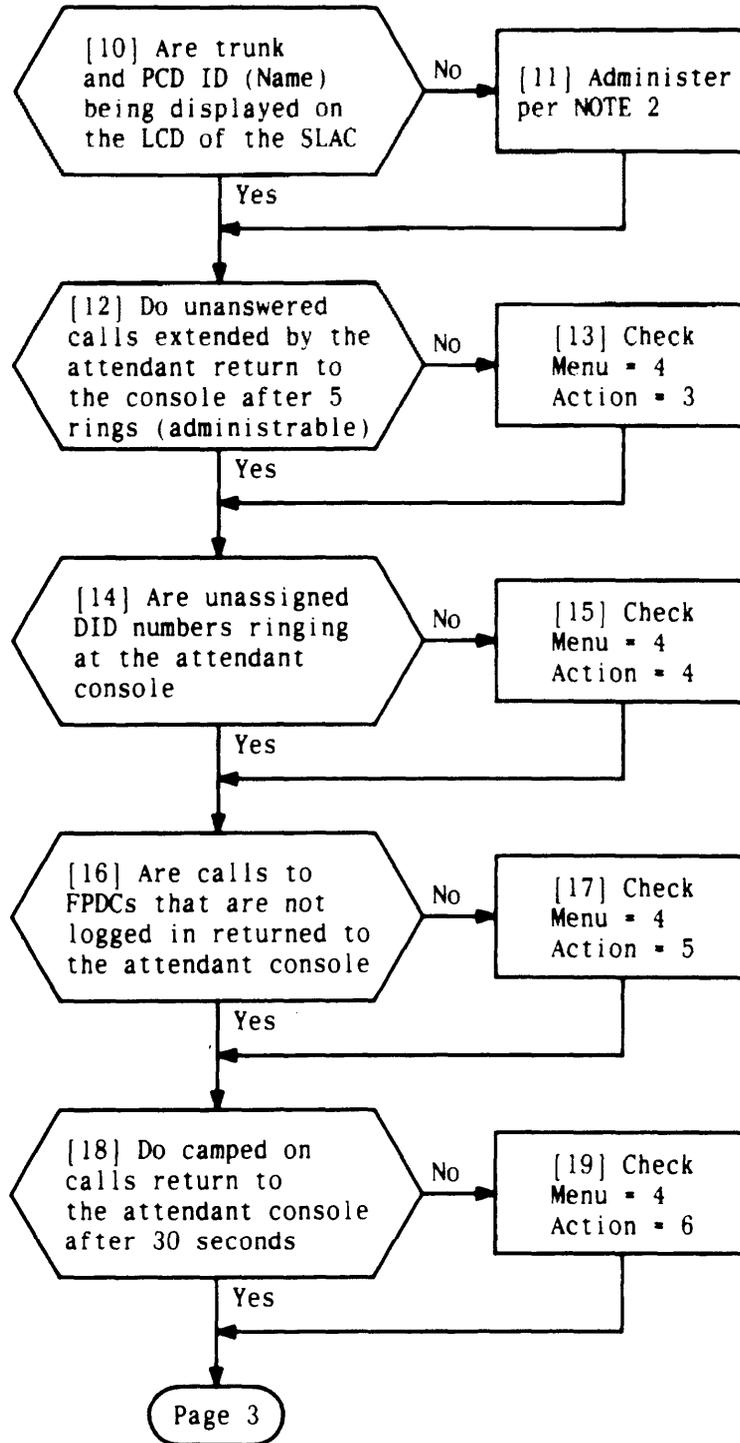


Figure 4-13. Clearing Switched Loop Attendant Console Troubles (Sheet 2 of 5)

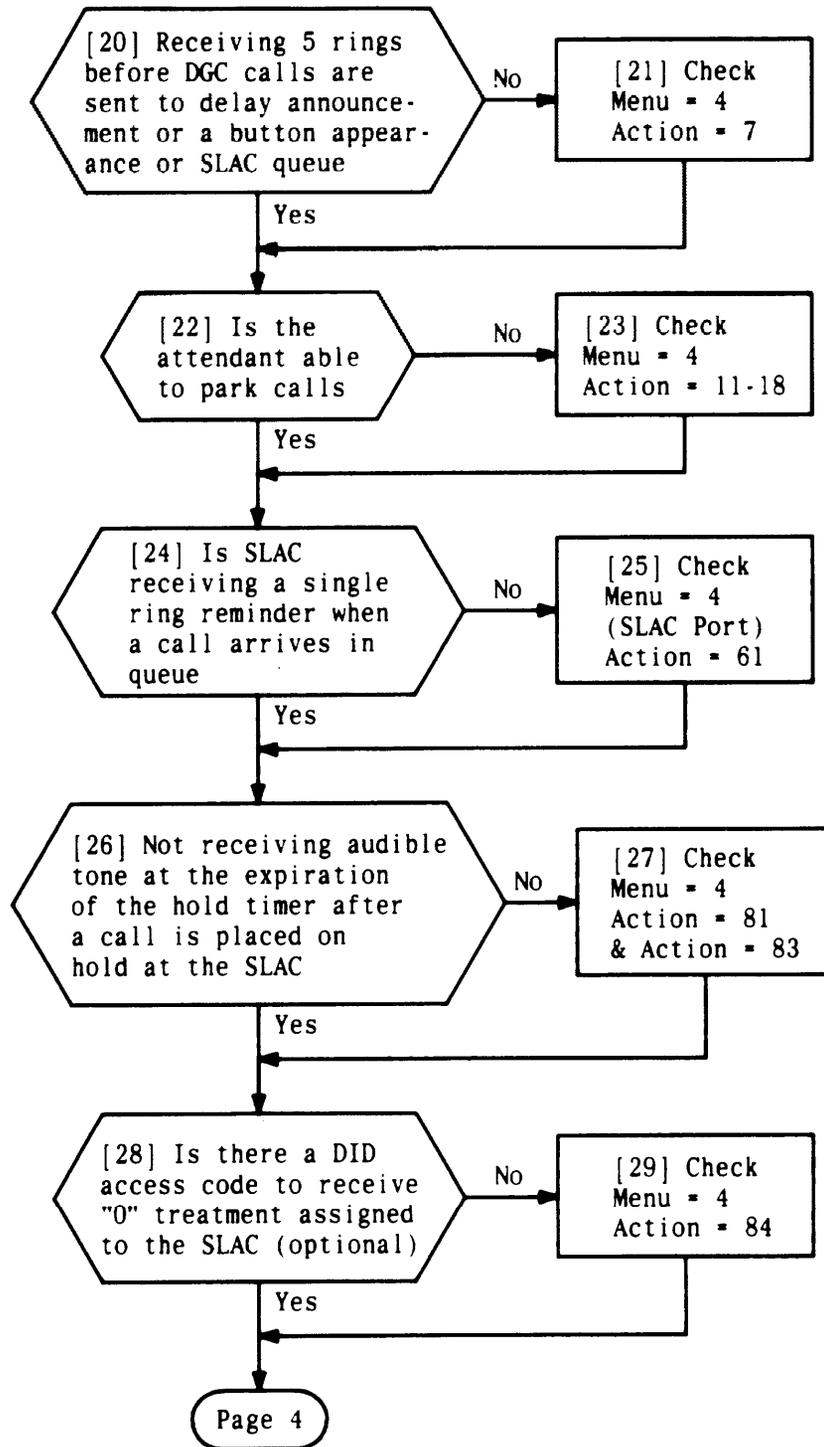
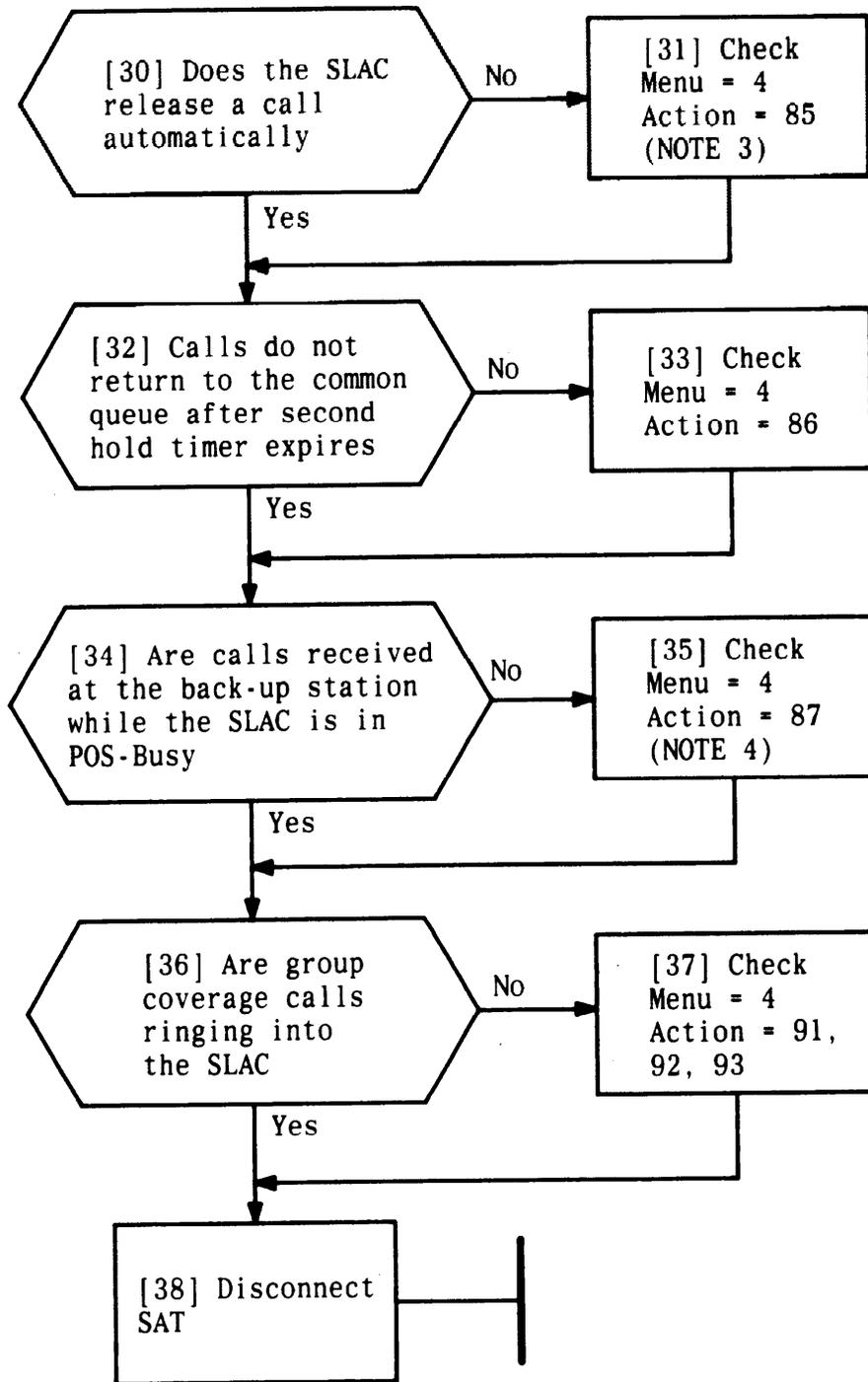


Figure 4-13. Clearing Switched Loop Attendant Console Troubles (Sheet 3 of 5)



4-13. Clearing Switched Loop Attendant Console Troubles (Sheet 4 of 5)

## NOTES :

1. (a) System defaults to a DTAC when first powered up.  
(b) You have to remove the DTAC before you can administer the SLAC .  
(c) System 25 can support 1 or 2 DTAC or 1 or 2 SLAC but not a combination of both.
2. ID names can be assigned for PDCs, Trunks, FPDCs, and DGC groups.
  - (a) Under Menu = 1 or 2 (Port/PDC)  
Action = 90 Assign/Remove IDs 11 characters
  - (b) Under Menu = 1 (Port-Trunk Administration)  
Action = 90 Assign/Remove Trunk IDs 11 characters
  - (c) Under Menu = 5 (FPDC)  
Action = 5 Assign/Remove FPDC IDs 11 characters
  - (d) Under Menu = 6 (DGC)  
Action = 14 Assign/Remove DGC  
Access Code IDs 11 characters  
(Only 9 characters are displayed).
3. You either have automatic hold or automatic release. If automatic hold is set, you do not have automatic release.
4. (a) Back-up recommended to be an ATL set.
  - (b) Cannot remove back-up station until POS-Busy button is removed from SLAC.
  - (c) Back-up station will be removed automatically when second SLAC is administered.

**Figure 4-13. Clearing Switched Loop Attendant Console Troubles (Sheet 5 of 5)**

## Special Port Circuit Options for Stations and Trunks

Tables 4-E and 4-F provide the special port circuit options that are administered in the system. System defaults and associated action codes applicable to the various port CPS are also shown. Procedures are available in the *Administration Manual* for logging onto the system and accessing the information shown in Table 4-E. The administrable items shown in Table 4-E should not be changed unless CO and maintenance personnel agree that an item needs changing.

Table 4-E. Station/Trunk/Special Port Circuit Pack Options

CIRCUIT PACK-OPTIONS (See Applicable Actions-Table 4-F)			
ACTION	DESCRIPTION	DATA	DEFAULT
32	CO Disconnect Time (in 20-msec increments)	(0-2540) Msecs	[500]
33	End-to-End Signaling Tone Timing (in 20-msec increments) FOR TN742 AND ZTN78 ONLY: FOR ALL OTHER BOARDS:	(20-2540) Msecs (0-2540) Msecs	[340] [60]
34	End-to-End Signaling Pause Timing (in 20-msec increments) FOR TN742 AND ZTN78 ONLY: FOR ALL OTHER BOARDS:	(20-2540) Msecs (0-2540) Msecs	[100] [60]
35	Hybrid Balance	1- Resistor 0 - Resistor/Capacitor	[1]
36	Gain	1- Gain = 3db 0- Gain = 0db	[0]
37	E&M Signaling Type	0 - Type I Compatible 1- Type V 2- Type I	[2]
38	Answer Supervision Delay Timing	(0-51 00) Msecs	[300]

\* Default depends on CP type. Trunk ports are defaulted to 0 (RC termination) while station ports are defaulted to 1 (R termination).

Table 4-F. Applicable Actions for Circuit Pack Options

ACTIONS FOR CIRCUIT PACK OPTIONS (See Circuit Pack Options—Table 4-E)								
CIRCUIT PACK	CP TYPE	ACTIONS						
		32	33	34	35	36	37	38
ZTN76	GS Board	•	•	•	•			
ZTN77	LS Trunk	•	•	•	•			
ZTN78	Tip/Ring Line		•	•				
TN742	Analog Line		•	•	•	•		
TN753	DID Trunk	•	•	•	•			
TN760B	Tie Trunk	•	•	•			•	•
TN763	Aux Trunk		•	•				
TN767	DS1 Interface	•	•	•				•

Note: TN747 same as ZTN76 and ZTN77. TN746B same as TN742.

### Data Line Troubles

#### Symptoms:

Data terminals connected through the Data Line CP (TN726) are dead or are not functioning properly.

#### Procedures:

1. Check that the RS-232C connector on the Asynchronous Data Unit (ADU) is properly connected to the RS-232C connector on the data terminal. Always tighten connector screws and fasteners.
2. Check the terminal ac power connection.
3. Make sure that the connection to the ADU is a 4-pair modular plug.
4. Check the ADU ac power connection (see Steps 5, 6, and 7). An ADU connected to a port on the CPU/Memory CP must have a local ac power source. Briefly disconnect the ADU's power cord.
5. If the ADU is not externally powered, check pin 20 (DTR signal on the RS-232C connector) for presence of at least +7 volts relative to pin 7 (ground).

6. If +7 volts are not present, the ADU is not receiving enough power from the data terminal and must be locally powered.
7. If the ADU is powered from a local transformer, make sure that a 3-pair or 2-pair modular cord is connected between the transformer and the ADU.
8. Using a 4-pair modular jack breakout box, check to be sure that the ac voltage between pins 7 and 8 is about 14 volts under load or about 28 volts for an open circuit.
9. Even with alternate power, the data terminal needs to deliver at least 3 volts on pin 20 (DTR signal).
10. Check the data terminal settings that have been administered at the SAT to be sure that the administered settings match those of the data terminal. Settings should be for 8 bits, no parity with 0 in the parity bit. Check the baud rate settings. Even if the terminal accommodates autobaud rate, the administered settings must include the baud rate.
11. If the data port is administered for “long break” disconnects, check to be sure that breaks from the terminal are at least 2 seconds. If they are not, or if the break length cannot be determined, insert a device with a disconnect button in the line and enter 2-second breaks.
12. Check wiring.
13. If none of the preceding procedures correct the terminal troubles, change the ADU.
14. If the problems persist, replace the Data Line CP.

## **Multiple Troubles or Trouble That Cannot Be Diagnosed**

### **Symptoms:**

Red LED is lighted on all port CPs. SAT displays this message:  
“FAIL: CPU: ARCH ANGEL INSANE: CHECK ZTN85:  
TERMINATOR?”.

### **Procedures:**

1. Check that the TDM bus terminator card(s) is installed in the rear pin field(s).

**Note:** The CPU/Memory CP provides built-in bus termination circuitry for one end of the bus, and the TDM bus termination card is used to terminate the other end.

2. Reseat the CPU/Memory and Service CPs (see “Reseating and Replacing Circuit Packs” under “Routine Maintenance” in this section).
3. If troubles persist, replace units in this order: TDM bus terminator card; Service Circuit CP; CPU/Memory CP. Recheck the system after each unit has been replaced to see if the trouble is clear.
4. If troubles still persist, check the intercabinet cabling.
5. If troubles cannot be cleared, escalate to higher level maintenance.

**Symptoms:**

Red LED is lighted on several port CPs.

**Procedures:**

1. Check the power supply to be sure that it is providing correct voltages (see "Power Supply Trouble").
2. Check the frontplane connector and the CPU/Memory CP, and replace any faulty unit(s).
3. Reseat any CPs where the red LED is still lighted. After reseating a CP, if the red LED remains lighted, replace the CP.
4. If troubles persist, check the backplane for signs of shorts or other troubles. A port CP with trouble may be providing a logic "1" or "0" onto the backplane causing other port CPs to experience trouble also. In multiple-cabinet systems, move CPs that are suspected of being faulty to another cabinet to help identify CP or backplane trouble (see "Backplane and Cabinet Trouble").

**Symptoms:**

Troubles cannot be fixed or diagnosed.

**Procedures:**

1. Force a cold restart of the system from the SAT (see "Restarting the System" under "Routine Maintenance" in this section).
2. Read in the latest tape containing system translations (see "Using the Digital Tape Unit" in this section).
3. Check the LEDs on the CPU/Memory CP. Check the Error Log for relevant messages.
4. If troubles persist, follow established escalation procedures.

## REFERENCES

The following System 25 documents are available for reference. A brief description of each manual is provided.

•Administration Manual	5 5 5 - 5 4 0 - 5 0 0
•Advanced Admin User Guide (MS-DOS)	5 5 5 - 5 4 0 - 5 1 0
•Advanced Admin User Guide (UNIX)	5 5 5 - 5 4 0 - 5 1 2
•An Introduction to AT&T System 25	5 5 5 - 5 4 0 - 0 2 1
•Implementation Manual	5 5 5 - 5 4 0 - 6 5 0
•Installation and Maintenance Manual	5 5 5 - 5 4 0 - 1 0 3
•Reference Manual	5 5 5 - 5 4 0 - 2 0 0
•Integrated Solution User Guide	5 5 5 - 5 4 0 - 7 1 5
•Terminal Operations Manual	5 5 5 - 5 4 0 - 7 1 0
•User Guides	
—Data Features User Guide	5 5 5 - 5 4 0 - 7 0 4
—Direct Trunk Attendant Console User Guide	5 5 5 - 5 4 0 - 7 0 1
—Multiline Voice Terminal User Guide	5 5 5 - 5 4 0 - 7 0 3
—Single-Line Voice Terminal User Guide	5 5 5 - 5 4 0 - 7 0 2
—Switched Loop Attendant Console User Guide	5 5 5 - 5 4 0 - 7 0 6
—STARLAN Network Access	5 5 5 - 5 4 0 - 7 0 8
—Communications Access Messages	5 5 5 - 5 4 0 - 7 0 9
•Call Management System—System Manual	5 5 5 - 5 3 2 - 1 1 0
•Call Management System—Installation Guide	5 5 5 - 5 3 2 - 1 0 0
•Call Management System—Planning Guide	5 5 5 - 5 3 2 - 6 5 0
•Call Management System—Startup Guide	5 5 5 - 5 3 2 - 5 0 4

### Administration Manual

Provides the information necessary to initialize a system and to perform ongoing system administration. Explains the operation of the System Administration Terminal, the Digital Tape Unit, and the commands that allow the System Administrator to make changes and additions.

## **An Introduction to AT&T System 25**

Provides an introduction to System 25 features and services. The emphasis is on how System 25 helps solve information management, productivity, and cost control problems.

## **Implementation Manual**

Describes how to plan the system's operating configuration. Explains how to determine customer needs and how to convert these needs into a system configuration plan. This plan is recorded on accompanying forms that are used in conjunction with the *Administration Manual* to initialize the system. The *Implementation Manual* and associated forms are packaged together in the Administration Records Binder.

## **Installation and Maintenance Manual**

Provides step-by-step procedures for installing System 25 and associated equipment. Includes procedures for testing equipment and trunks and for making additions and changes to the system. Also provides a detailed description of system operation and procedures for isolating and clearing customer-affecting faults.

## **Reference Manual**

This document is the system's principal technical reference. It provides reference material for sales support, system configuration and operation, and for the system technician. It contains a comprehensive description of the system, emphasizing features, components and overall capabilities and capacities.

## **Integrated Solution II Administration Guide**

Lists and describes features and applications available under the Integrated Solution 11; provides documentation checklist for all major applications; provides cross-reference to System 25 Reference Manual.

## **Terminal Operations Manual**

This manual is designed to help the System Administrator better understand System 25 voice terminal and data terminal operation. This manual contains all operating procedures provided in the various User Guides and provides additional explanatory material as well.

## **User Guides (700 Series)**

These guides specify operating procedures for System 25 voice and data terminals users.

## **Call Management System—System Manual**

Provides information necessary to install CMS software, administer, use, and troubleshoot CMS.

## **Call Management System—Installation Guide**

Provides instructions for inserting the CMS interface card into the PC.

## **Call Management System—Planning Guide**

Provides detailed information necessary to make decisions necessary to install and administer CMS per customer requirements.

## **Call Management System—Startup Guide**

Contains step-by-step instructions for use when CMS is being installed and configured for the first time. The guide includes checklists, “maps” to tasks, and related documentation necessary to get CMS up and running.

## ABBREVIATIONS AND ACRONYMS

<b>ADU</b>	<b>Asynchronous Data Unit</b>
<b>AE</b>	<b>Account Executive</b>
<b>ARS</b>	<b>Automatic Route Selection</b>
<b>ASCII</b>	<b>American Standard Code for Information Interchange</b>
<b>BPS</b>	<b>Bits Per Second</b>
<b>CCS</b>	<b>Hundred Call Seconds</b>
<b>CCSA</b>	<b>Common Control Switching Arrangement</b>
<b>COS</b>	<b>Class of Service</b>
<b>CSU</b>	<b>Customer Service Unit</b>
<b>DCE</b>	<b>Data Communications Equipment</b>
<b>DDC</b>	<b>Data Dial Code</b>
<b>DDD</b>	<b>Direct Distance Dialing</b>
<b>DID</b>	<b>Direct Inward Dialing</b>
<b>DGC</b>	<b>Direct Group Call</b>
<b>DS1</b>	<b>Digital Signal Level 1</b>
<b>DTAC</b>	<b>Direct Trunk Attendant Console</b>
<b>DTE</b>	<b>Data Terminal Equipment</b>
<b>DTMF</b>	<b>Dual-Tone Multifrequency</b>
<b>DXS</b>	<b>Direct Extension Selector</b>
<b>EIA</b>	<b>Electronics Industries Association</b>
<b>ETU</b>	<b>Emergency Transfer Unit</b>
<b>FNPA</b>	<b>Foreign Numbering Plan Area</b>
<b>FRL</b>	<b>Facility Restriction Level</b>
<b>FX</b>	<b>Foreign Exchange</b>
<b>HNPA</b>	<b>Home Numbering Plan Area</b>
<b>IROB</b>	<b>In Range Out of Building</b>

## ABBREVIATIONS AND ACRONYMS

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<b>LDN</b>	<b>Listed Directory Number</b>
<b>LED</b>	<b>Light-Emitting Diode</b>
<b>MET</b>	<b>Multibutton Electronic Telephone</b>
<b>MOH</b>	<b>Music-on-Hold</b>
<b>NAU</b>	<b>Network Access Unit</b>
<b>NEU</b>	<b>Network Extension Unit</b>
<b>NPA</b>	<b>Number Plan Area</b>
<b>OPS</b>	<b>Off-Premises Station</b>
<b>PDC</b>	<b>Personal Dial Code</b>
<b>PDS</b>	<b>Premises Distribution System</b>
<b>R A M</b>	<b>Random Access Memory</b>
<b>R N X</b>	<b>Private Network Office Code</b>
<b>R O M</b>	<b>Read Only Memory</b>
<b>S A T</b>	<b>System Administration Terminal</b>
<b>S I P</b>	<b>Station Interconnect Panel</b>
<b>SLAC</b>	<b>Switched Loop Attendant Console</b>
<b>SMDR</b>	<b>Station Message Detail Recording</b>
<b>T A E</b>	<b>Trunk Access Equipment</b>
<b>T C</b>	<b>Technical Consultant</b>
<b>V T</b>	<b>Voice Terminal</b>
<b>W A T S</b>	<b>Wide Area Telecommunications Service</b>

# APPENDIX A: System Wiring Tables

## Connector Pin Assignments

Table A-A lists the lead designations and pin assignments at the 25-pair connectors on the system cabinets.

## System 25 Building Wiring

Table A-B lists the 25-pair and 4-pair cable color codes, voice and data terminal lead designations, and connecting block terminal punch-down information.

Table A-A. 25-Pair Connector Pin Assignments

25-Pin Pin No.	Corm. Wire Color	Call Proc. ZTN82	GS Trunk ZTN76	LS Trunk ZTN77	Tlp Ring Line ZTN78	ATL Line ZTN79	MET Line TN735	Backplane Pin No. (Slots 1-12)
26 1	W-BL BL-W	RDA SGA	T1 RI	T1 RI	T1 RI	T1 R1	T1 R1	102 002
27 2	w-o o-w	DCDA				CT1 CR1	BT1 BR1	103 003
28 3	W-G G-W	DTRA TDA				P-1 P+1	LT 1 LTR 1	104 004
29 4	W-BR BR-W	RDB SGB	T2 R2	T2 R2	T2 R2	T2 R2	T2 R2	105 005
30 5	w-s s-w	DCDB				CT2 CR2	BT2 BR2	106 006
31 6	R-BL BL-R	DTRB TDB				P-2 P+2	LT2 LTR2	107 007
32 7	R-O O-R	RDC SGC	T3 R3	T3 R3	T3 R3	T3 R3	T3 R3	108 008
33 8	R-G G-R	DCDC				CT3 CR3	BT3 BR3	109 009
34 9	R-BR BR-R	DTRC TDC				P-3 P+3	LT3 LTR3	110 010
35 10	R-S S-R	RDD SGD	T4 R4	T4 R4	T4 R4	T4 R4	T4 R4	111 011
36 11	BK-BL BL-BK	DCDD				CT4 CR4	BT4 BR4	112 012
37 12	BK-O O-BK	DTRD TDD				P-4 P+4	LT4 LTR4	113 013
38 13	BK-G G-BK		T5 R5	T5 R5	T5 R5	T5 R5		302 202
39 14	BK-BR BR-BK					CT5 CR5		303 203
40 15	BK-S S-BK					P-5 P+5		3(M) 204
41 16	Y-BL BL-Y		T6 R6	T6 R6	T6 R6	T6 R6		305 205
42 17	Y-o o-Y					CT6 CR6		306 206
43 18	Y-G G-Y					P-6 P+6		307 207
44 19	Y-BR BR-Y		T7 R7	T7 R7	T7 R7	T7 R?		308 208
45 20	Y-s s-Y	ETU48 ETUGD				CT7 CR7		309 209
46 21	V-BL BL-V	ETU48 ETUGD				P-7 P+7		310 210
47 22	v-o o-v		T8 R8	T8 R8	T8 R8	T8 R8		311 211
48 23	V-G G-V	ETU48 ETUGD				CT8 CR8		312 212
49 24	V-BR BR-V	ETU48 ETUGD				P-8 P+8		313 213
50 25	v-s s-v		GND GND	GND GND	GND GND	GND GND	GND GND	300 200

Note: TN747 is same as ZTN76 and ZTN77. TN762 is same as ZTN79.

Table A-A. 25-Pair Connector Pin Assignments (Contd)

25-Pin Conn.		DID	Tie	Aux.	Data	Analog	Analog	TN767	Backplane
Pin No.	Wire Color	Trunk TN763	Trunk TN760B	Trunk TN763	Line TN726	Line TM742	Line TN746B	DS1 Interface	Pin No. (Slots 1-12)
26 1	W-BL BL-W	T1 R1	T1 R1	T-O R-O		T1	T1 R1		102 002
27 2	w-o o-w		T11 R11	SZ-O SZ1-0	TXT1 TXR 1		T2 R2		103 003
28 3	W-G G-W		E1 M1	s-o S1-0	PXT1 PXR1		T3 R3		104 004
29 4	W-BR BR-W	T2 R2	T2 R2	T-1 R-1		T2 R2	T4 R4		105 005
30 5	w-s s-w		T12 R12	SZ-2 SZ1-2	TXT2 TXR2				106 006
31 6	R-BL BL-R		E2 M2	s-1 S1-1	PXT2 PXR2				107 007
32 7	R-O O-R	T3 R3	T3 R3	T-2 R-2		T3 R3			108 008
33 8	R-G G-R		T13 R13	SZ-2 Sz 1-2	TXT3 TXR3				109 009
34 9	R-BR BR-R		E3 M3	s-2 S1-2	PXT3 PXR3		T5 R5		110 010
35 10	R-S S-R	T4 R4	T4 R4	T-3 R-3		T4 R4	T6 R6		111 011
36 11	BK-BL BL-BK		T14 R14	SZ-3 SZ1-3	TXT4 TXR4		-17 R7		112 012
37 12	BK-O O-BK		E4 M4	s-3 S1-3	PXT4 PXR4		T8 R8		113 013
38 13	BK-G G-BK	T5 R5				T5 R5	T9 R9		302 202
39 14	BK-BR BR-BK				TXT5 TXR5		T10 R10		303 203
40 15	BK-S S-BK				PXT5 PXR5		T11 R11		304 204
41 16	Y-BL BL-Y	T6 R6				T6 R6	T12 R12		305 205
42 17	Y-o o-Y				TXT6 TXR6				306 206
43 18	Y-G G-Y				PXT6 PXR6				307 207
44 19	Y-BR BR-Y	T7 R7				T7 R7			308 208
45 20	Y-s s-Y				TXT7 TXR 7				309 209
46 21	V-BL BL-V				PXT7 PXR7		T13 R13		310 210
47 22	v-o o-v	T8 R8				T8 R8	T14 R14	L1*	311 211
48 23	V-G G-V				TXT8 TXR8		T15 R15	L0 L0"	312 212
49 24	V-BR BR-V				PXT8 PXR8		T16 R16	LBACK 2 LBACK 1	313 213
50 25	v-s s-v	GND GND	GND GND	GND GND	GND GND	GND GND	GND GND		300 200

\*Denotes high side or ringside of pair

Table A-B. Building Wiring

Ckt. No.	25-Pair Cable				4-Pair Cable		
	Term. Lead Functions			D-Inside Cable Color code	Conn. Pin Num.	D-Inside Cable Color code	Conn. Block Term.
	500 7101A 2500 Series	ATL Cordless 7300H Series	RS-232C Term,				
1	T R	T R CT CR P- P+	TXT TXR PXT PXR	W-BL	26	W-BL	1
				BL-W	1	BL-W	2
				w-o	27	w-o	3
				o-w	2	o-w	4
				W-G	28	W-G	5
				G w	3	G-W	6
				W-BR	29	W-BR	7
				BR-W	4	BR-W	8
2	T R	T R CT CR P- P+	TXT TXR PXT PXR	w-s	30	W-BL	1
				s-w	5	BL-W	2
				R-BL	31	w-o	3
				BL-R	6	o-w	4
				R-O	32	W-G	5
				O-R	7	G-W	6
				R-G	33	W-BR	7
				G-R	8	BR-W	8
3	T R	T R CT CR P- P+	TXT TXR PXT PXR	R-BR	34	W-BL	1
				BR-R	9	BL-W	2
				R-S	35	w-o	3
				S-R	10	o-w	4
				BK-BL	36	W-G	5
				BL-BK	11	G-W	6
				BK-O	37	W-BR	7
				O-BK	12	BR-W	8
4	T R	T R CT CR P- P+	TXT TXR PXT PXR	BK-G	38	W-BL	1
				GBK	13	BL-W	2
				BK-BR	39	w-O	3
				BR-BK	14	o-w	4
				BK-S	40	W-G	5
				S-BK	15	G-W	6
				Y-BL	41	W-BR	7
				BL-Y	16	BR-W	8
5	T R	T R CT CR P- P+	TXT TXR PXT PXR	Y-o	42	W-BL	1
				O-Y	17	BL-W	2
				Y-G	43	w-o	3
				G-Y	18	o-w	4
				Y-BR	44	W-G	5
				BR-Y	19	G-W	6
				Y-s	45	W-BR	7
				S-Y	20	BR-W	8

Table A-B. Building Wiring (Contd)

Ckt. No.	25-Pair Cable				4-Pair Cable		
	Term. Lead Functions			D-inside Cable Color Code	Conn. Pin Num.	D-Inside Cable Color code	Conn. Block Term.
	500 7101A Series	ATL Cordless 7300H Series	RS-232C Term.				
6	T R	T R CT CR P- P+	TXT TXR PXT PXR	V-BL BL-V v-o o-v V-G G-V V-BR BR-V v-s s-v	46 21 47 22 48 23 49 24 50 25	W-BL BL-W w-o o-w W-G G-W W-BR BR-W	1 2 3 4 5 6 7 8
Spare							

## APPENDIX B: Parts Listing

The following information may assist you in cross-referencing Apparatus Codes, Comcodes and Price Element Codes (PECs).

<u>DESCRIPTION</u>	<u>PEC</u>	<u>APPARATUS CODE</u>	<u>COMCODE</u>
<b>Cabinets</b>			
<b>System 25 Control Unit (R3V2)</b>	<b>6250-031</b>	<b>includes</b>	
<b>Carrier</b>		<b>J58901 A2 L-1 5 (e/w)</b>	
<b>Power Supply</b>		<b>WP90510, L2</b>	<b>405528472</b>
<b>Fans Ass'y</b>		<b>WP90677, L2</b>	<b>405661091</b>
<b>Air Filter</b>			<b>845948348</b>
<b>Address Plug</b>		*	<b>845416635</b>
<b>TDM Bus Term.</b>		<b>WP91602, L1</b>	<b>405522780</b>
<b>CPU/MEM CP</b>		<b>ZTN130C</b>	<b>106428907</b>
<b>Service Circuit CP</b>		<b>ZTN131</b>	<b>105275671</b>
<b>SLAC Graphics Overlays (2)</b>		*	<b>845875155</b>
<b>System 25 Control Unit (RI VI )</b>	<b>6250-011</b>	<b>includes</b>	
<b>Carrier</b>		<b>J58901A1, L1 (e/w)</b>	
<b>Power Supply</b>		<b>WP90510,L1</b>	<b>403954761</b>
<b>Fan Assembly</b>		<b>WP90677, L2</b>	<b>845416379</b>
<b>Air Filter</b>		*	<b>845418755</b>
<b>Address Plug</b>		*	<b>845416635</b>
<b>TDM Bus Term.</b>		<b>AHF-1</b>	<b>103810586</b>
<b>Memory CP</b>		<b>ZTN81C</b>	<b>105291488</b>
<b>Processor CP</b>		<b>ZTN82</b>	<b>103965299</b>
<b>Service Circuit CP</b>		<b>ZTN85</b>	<b>103965323</b>

APPENDIX B: Parts Listing

<u>DESCRIPTION</u>	<u>PEC</u>	<u>APPARATUS CODE</u>	<u>COMCODE</u>
<b>System 25 Control Unit (R1V2)</b>	<b>6250-012</b>	<b>includes</b>	
Carrier		J58901A1, L1 (e/w)	
Power Supply		WP90510, L1	403954761
Fan Assembly		WP90677, L2	845416379
Air Filter		-----	845418755
Address Plug		-----	845416635
TDM Bus Term,		AH F-1	103810586
Memory CP		ZTN127	105212179
Processor CP		ZTN128	105211023
Service Circuit CP		ZTN85	103965323
SLAC Grap. Layer (2)			845875155
<b>System 25 Expansion Unit</b>	<b>62501</b>	<b>includes</b>	
Carrier		J58901A1, L1 5 (e/w)	
Power Supply		WP90510, L2	405528472
Fan Assembly		WP90677, L2	405661091
Air Filter		*	845548348
Address Plug		*	845416635
TDM Bus Cable		H600166, G5	403961519
<b>AC Power Surge Suppressor</b>			
TII Model 428	8310-001		402988950
<b>Upgrade Kit(R1 or R2 to R3V2)</b>			
R2V1/R3V2 Upgrade Kit	62525A	*	*
CPU/Memory CP		ZTN130	105243810
SLAC Face Plates (2)		*	845875155
Service Circuit Pack		ZTN131	105275671
R2/R3 Documentation			
<b>Upgrade Kit (R1 or R2 to R3V3)</b>			
R2V1/R3V3 Upgrade Kit	62526N	*	*
CPU/MEM CP		ZTN142	107057754
SLAC Face Plates (2)		*	845875155
Service Circuit Pack		ZTN131	105275671

APPENDIX B: Parts Listing

<u>DESCRIPTION</u>	<u>PEC</u>	<u>APPARATUS CODE</u>	<u>COMCODE</u>
<b>Upgrade Kit (R3V1/V2 to R3V3)</b>			
R3V1/V2 Upgrade Kit CPU/MEM CP	6 2 5 2 7 N *	ZTN142	* 107057754
<b>Circuit Packs</b>			
GS Trunk CP	62502	ZTN76	103965232
LS Trunk CP	62503	ZTN77	103965240
TR Line CP	62504	ZTN78	103965257
ATL Line CP	62505	ZTN79	103965265
STARLAN Interface CP	62518	ZTN84	103965315
Analog Line CP	63111	TN742	103556957
MET Line CP	63112	TN735	103556882
DID Trunk CP	63116	TN753	103557062
Tie Trunk CP	63140	TN760D	106360142
Aux Trunk CP	63118	TN763D	106405616
Pooled Modern CP	63119	TN758	103557112
Tone Detector	63123	TN748D	106502552
Data Line CP	63130	TN726	103556791
DS1 Interface CP (R3)	63166	TN767D	106367170
Clock/Service Circuit CP (R3)		ZTN131	105275671
Analog Line		TN746B	106361421
CPU/MEM		ZTN142	107057754
CO Trunk		TN747B	105167266
Hybrid Line		TN762B	103976171

## APPENDIX B: Parts Listing

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<u>DESCRIPTION</u>	<u>PEC</u>	<u>APPARATUS CODE</u>	<u>COMCODE</u>
<b>Peripheral Equipment</b>			
Digital Tape Unit	62507	TS-555A	404079436
System Admin. Terminal (SAT)	62508	TI-703	404079428
<b>Voice Terminals and Accessories</b>			
Direct Extension Selector Console	62509	23A1-003 e/w D6AP Cord D8W-87 Cord (14ft) KS-22911, L1 Power 400B2 Adapter	103969424 102937620 103786802 403242639 103848859
Rotary Desk Telephone	3100-ORD	5 0 0 M M	103870267
Rotary Wall Telephone	3100-ORW	5 5 4 B M P A	103823555
Rotary Desk (4A Spkphone Combat)	3100-2RD	5 0 0 S M	103870416
TT Desk (4A Spkphone Combat)	3100-2TD	2 5 0 0 S M	•
TT Desk Telephone	3100-1TD	2 5 0 0 M M G B	•
TT Wall Telephone	3100-TWR	2554BMPA	103234472
TT Desk w/Message & Recall	3178-SYS	2500DMGC	103966255
TT Desk w/Recall	3100-TRC	2500MMGT	103956447
TTOut Door	•	2526BMG	*
Multifeature Desk w/ Spkphone, Mere. & Redial	•	CS6402UOIA	*
10-button MET Set	3140-010	2991C05	103871018
ATL Cordless telephone	3168-MLC		

APPENDIX B: Parts Listing

<u>DESCRIPTION</u>	<u>PEC</u>	<u>APPARATUS CODE</u>	<u>COMCODE</u>
<b>MET Set-BIS Transformer Kit-of-Parts</b>	<b>3141-BIS</b>	<b>2993C04 2012D 13181245</b>	<b>103942146 *102600517</b>
<b>12-button MET Set</b>	<b>3143-12M</b>	<b>Z7203M01 A-003</b>	<b>103963310</b>
<b>MET Adapter Cord</b>	<b>2750-A17</b>	<b>ZD8AJ</b>	<b>103881421</b>
<b>5-Button 7300H Ser VT</b>	<b>3160-111 (MAC30 Att)</b>	<b>Z7302HO1D-003</b>	<b>•</b>
<b>10-Button 7300H Ser VT</b>	<b>3161-172 (MAC30 Att)</b>	<b>Z7303H01D-003</b>	<b>•</b>
<b>7300H Ser. HFAI VT</b>	<b>3161-161</b>	<b>Z7309H01B-003</b>	<b>103982005</b>
<b>7300H Ser BIS VT With Display</b>	<b>3162-131S</b>	<b>Z7305H04C-003</b>	<b>103981981</b>
<b>34 But Dlx 7300H Ser VT</b>	<b>3162-417 (MAC30 Att)</b>	<b>Z7305H0213-003</b>	
<b>7300H Ser BIS VT</b>	<b>3162-BIS</b>	<b>Z7305H03B-003</b>	<b>103981965</b>
<b>7300H Ser Speaker Mod</b>	<b>3163-HFU</b>	<b>S102A</b>	<b>103814356</b>
<b>7300H Ser Headset Adapter</b>	<b>3164-HFA</b>	<b>502-type</b>	<b>103943213</b>
<b>7300H Ser VT local power</b>	<b>62510</b>	<b>D181522 includes Z400F Adapter D6AP-87 Cord KS-22911, L1 Power</b>	<b>105105514 103942857 102937620 403242639</b>
<b>10-Button BIS VT</b>	<b>3165-10B</b>	<b>7313H01 A</b>	<b>105336978</b>
<b>22-Button BIS VT</b>	<b>3166-22B</b>	<b>7314HO1A</b>	<b>105336960</b>
<b>34-Button BIS VT</b>	<b>3167-34B</b>	<b>7316H01 A</b>	<b>105336952</b>
<b>34-Button BIS VT With Display</b>	<b>3167-DSB</b>	<b>7317HO1A</b>	<b>105400030</b>

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<u>DESCRIPTION</u>	<u>PEC</u>	<u>APPARATUS CODE</u>	<u>COMCODE</u>
Acoustic Coupler	31710	349A Adapter	104010061
Single-Line VT w/Message Light & Recall button	3170-OOM	7101A01A-003	103871109
Ground Start Key	31017	55A1	100287143
Mounting Bracket		77A	100013978
Ground Start Key		KS23566,L1	405792339
External Alert	31019	E1CM-50	102917952
Message Adjunct	31032	Z3A1	103966396
IROB Unit	32918	ITW343	406721738
Mod. Bulk Pwr. Supply			
Power Unit	31760	346A	104174768
Power Panel	31761	346A-1	104174750
<b>STARLAN NETWORK Equipment</b>			
NEU	2610-001		527840003
NAU	2614-100		527840102
STARLAN/ATL Interface	62520	D181807 includes	105355374
Voice/Data (Y) Adapter	2750-T05	WP90851 , L1	405010620
Adapter		KS-23475, L1	405462904
Power Unit		KS-2291 1, L1	403242639
Software			
AA Software	1203-020		105339584
ACCESS Software	1020-S90		555500708
CAM Software	1020-S91		555500709
Advanced Admin. Rel 3 V3	1203-033n Software (MS-DOS)	•	107058372
Advanced Admin. Rel 3 V3	1203-034n Software (UNIX)	•	107058398

**APPENDIX B: Parts Listing**

<u>DESCRIPTION</u>	<u>PEC</u>	<u>APPARATUS CODE</u>	<u>COMCODE</u>
<b>Asynchronous Data Units</b>			
ATL ADU	62506	D181521 includes D8W-87 Cord (14ft) Z3A5 ATL ADU	105105506 103786802 103975349
Mod/RS-232C(M) ADU	2169-001	Z3A1	103963963
Mod/RS-232C (F) ADU	2169-004	Z3A4	103964185
ADU Aux Power	21691	2012D 248B 400B2 D6AP-87	102600517 102802103 103848859 102937620
MADU	2169-005	1 06A	103981809
25-Pr. CF to EF	2724-78B	M50MF-87	105225007
Octopus Cable (12 ft) (For DTE Host)	2724-29G	M48C	104109285
Octopus Cable (12ft) (For DCE Host)	2724-98G	M48G	104319025
<b>Auxiliary Equipment</b>			
Auxiliary Trunk Interface	62511	D181523 includes Block Conn 66E3-25 Cable B25A15/DE	105105522 100009968 100017334
Paging/Dictation (Aux Trunk Interface)	62512	D181524 includes 278A Adapter KS-22911, L1 Pwr Unit D4BYCord (14ft) D181321 kit (zener)	105105530 103871844 403242639 102999059 105031181
MOH Interface	62513	D181575 includes KS-23395 Interface 2012D Transformer 36A Voice Coupler	* 405193186 102600517 103558916

**APPENDIX B: Parts Listing**

<u>DESCRIPTION</u>	<u>PEC</u>	<u>APPARATUS CODE</u>	<u>COMCODE</u>
MOH Interface (Reg)	62517	KS-23395	405193186
10B ETU	62514	Emergency Trans Unit	103984118
		(2) B25A Cables DE	100017334
		D8W-87 Cord (7ft)	103786786
Peripherals	62515	248B Adapter	102802113
Interface for		355AF Adapter	105012645
Remote Access		400B2 Adapter	104152558
		D6AP-87 Cord	102937620
		D8AM-87 Cord	104154430
		D8W-87 Cord	103786786
		M7U-87 Cord	104246616
		Z3A4 ADU	103964185
		201 2D Transformer	102600517
<b>System Wiring</b>			
New Installation:			
Flat Rate (preferred)		2782-004	
Hourly Rate		2781-004	
Firm Price Quote		2783-004	
Aftermarket:			
Installations:Flat Rate		2788-004	
Installations:Hourly Rate		2789-004	
Moves + rearrangements:		2785-004	
Rearrangement only		2785-OOR	
<b>Secondary Wiring Protectors</b>			
Protector		SCP-1	403617632
Protector		SCP-2	406304840
Protector		SCP-3	406304857
Protector		LP5-230-220	405936071
Replacement Fuse for LP5-230-220		LP5-SCP-3	406304816
Protector		79A	103551610
Protector (mounting)		192A1-P/J-25	104293311

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<u>DESCRIPTION</u>	<u>PEC</u>	<u>APPARATUS CODE</u>	<u>COMCODE</u>
<b>Cross-Connect Hardware</b>			
Station interface Panel	2750-D28	617A	103982658
Mod/Mod Adapter	2750-D27	Z210A2	106308869
Mod/I 10 Adapter	2750-D29	858A	405177791
Voice/Data (Y) Adapter	2750-T05	WP90851 , L1	405010620
Fanning Strip	2750-D30	50A	105196604
<b>Connector Blocks</b>			
Block, Connector	No PEC	110 Female	103756334
Block, Connector	No PEC	1576 Female	403613003
Block, Connector	No PEC	103A	103104220
Block, Connector	No PEC	104A	103116943
<b>RS-232C Adapters</b>			
Mod/RS-232C, Male	2750-A24	355A	105012637
Mod/RS-232C, Female	2750-A25	355AF	105012645
Null Modem Adapter	2750-A50		405369042
Gender Adapter F-F	2750-A53		405369075

**APPENDIX B: Parts Listing**

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<u>DESCRIPTION</u>	<u>PEC</u>	<u>APPARATUS CODE</u>	<u>COMCODE</u>
<b>Cables</b>			
Octopus Cable (15 ft)	2720-OSP	WP90780, L1	405010612
Splitter Cable, Tie-Trk	2720-05X	WP90929, L3	403864150
Splitter Cable, CO Trk	2720-06X	WP90929, L1	403836620
Adapter (TN746)		8536	104305834
RS-232C X-Over Cable	2724-30C	M7U-87	104246616
Cable Corm (15' DE)	No PEC	A25D	100963990
CPU/MEM interconnect cable	No PEC		845412956
Cable, Adapter	No PEC	853B	104305834
Cable, Connector	No PEC	H600 307, G2	
Cable, Connector	No PEC	C6E	104307434
<b>Cords</b>			
Mod(ADU) X-Over Cord	2724-38X	138AM-87	104154430
Mod Cord (7 ft)	2725-07G	D8W-87	103786786
Mod Cord (14 ft)	2725-07N	D8W-87	103786802
Mod Cord (25 ft)	2725-075	D8W-87	103786828
MET AdapterCord	2750-AI 7	ZD8AJ	103881421

\* Not Available.

## **APPENDIX C: System Additions or Changes**

Additions and changes can be made to the system to support growth or changing needs of the customer. These system changes include: adding voice or data terminals, changing a voice-only connection to a voice/data connection, adding trunks, adding modems, and adding auxiliary equipment.

To handle such changes as these, you may need to add or replace circuit packs (CPs), add a cabinet, add cabling, and add or change a user's terminal. These procedures are described first; then specific procedures for making the changes listed above are described.

**Note:** After any changes have been made, save translations to DTU.

### **Evaluate Cabinet Unit Power Load**

Each cabinet can handle a maximum of 80 unit loads of 48-volt power. The unit load for each type of terminal equipment is shown in Table C-A. Before adding a CP or a terminal to an existing system, count the unit loads in the cabinet to ensure that the maximum has not been reached.

Any station/adjunct combination requiring more than two unit loads must be locally powered. When 7300H Series terminals are locally powered, they represent zero load to the switch. (Any CPs not listed do not affect the unit load.)

Table C-A. Unit Loads

Port Type	Unit Load	Port Type	Unit Load
ZTN178 port	0.5	10- and 34-Button Terminals	1.25
TN742, TN746 port	1.0	HFAI Terminals	1.5
ETU	2.0	MET Terminals	1.0
TN760B Port	2.0	BIS Terminals	1.5
TN753B Port	0.5	34-Button Deluxe Terminals	2.0
502-type Headset Adapter	.75	S102A Speakerphone	1.0
5-Button Terminals	1.0	34-Button BIS With Display	2.0

## Add Circuit Pack

All CPs are installed in the cabinets in the same way. Evaluate the cabinet unit power bad, using the procedure above.

1. Determine in which cabinet to add the CP. Install all DID CPs in Cabinet 1. A maximum of two Pooled Modem CPs can be installed in each cabinet. A maximum of two TN767 DS1 Interface CPs can be Installed per system. Select the cabinet with the lowest unit load to minimize the power bad and heat dissipation requirements.
2. If the CP being added is a TN760B, you must first set the option switches for the type signaling. See Set TN760B Option Switches in this appendix.
3. Remove the front cover of the cabinet.
4. See Danger and Warning. Make sure that your hands are clean and dry. Put on a wrist grounding strap, and clip it to the grounding block at the back of the cabinet.

**Danger:** Do not clip the wrist grounding strap to the front of the cabinet where high voltage is present.

**Caution:** To release static electricity, always wear a wrist grounding strap when handling CPs. Electrostatic discharge can destroy or severely damage integrated circuits and CPs.

5. Insert the CP into the slot with the latch lever opened. Push it in firmly until you feel resistance and the latch lever moves toward its vertical position, flush with the edge of the CP. Push the lever all the way to vertical until the latch pin engages. (See figure C-1.)

## Add Cabling

If the CP added is a voice or data station CP (ZTN78, ZTN79, TN762, TN726, TN735, TN742, or TN746), you must connect the associated 25-pair receptacle in the back of the cabinet to the SIP with an octopus cable. Follow the instructions under "Connect Cabinets to SIP in Section 2. If the new CP is a trunk CP (ZTN76, ZTN77, TN747, TN760, TN763, or TN753), connect the associated 25-pair receptacle on the back of the cabinet to the TAE with a splitter cable, following the instructions under "Install Equipment Room Trunk Cabling" in Section 2.

For DS1 Interface CP (TN767) connections, see "Install DS1" in "INSTALL EQUIPMENT ROOM TRUNK CABLING" in Section 2.

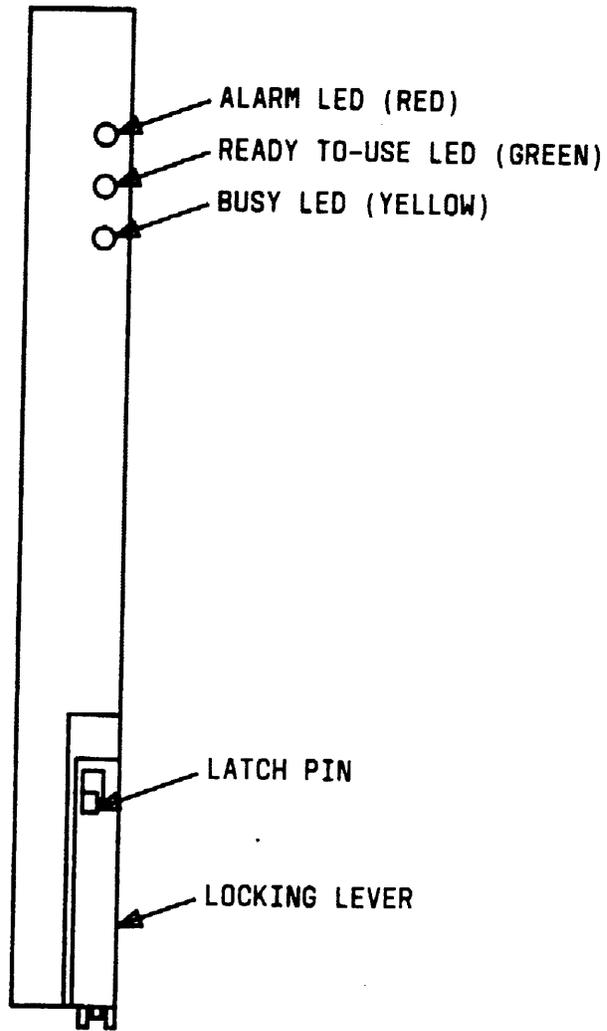


Figure C-1. Typical System 25 Port Circuit Pack

### Set Option Switches on TN760B CP

If the CP being added is a TN760B, use Figure C-2 and Table C-B to choose

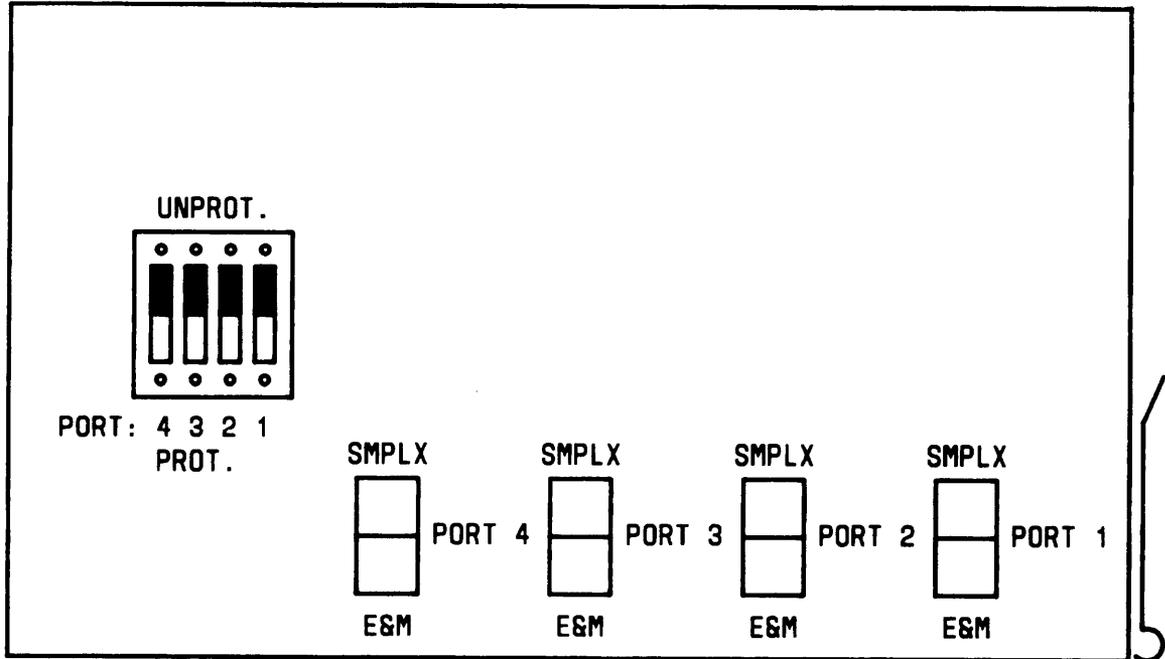


Figure C-2. Tie Trunk (TN760B) Circuit Pack Option Switches

Table C-B. TN760B Option Switch Settings and Administration

System 25 Installation Situation		Preferred Signaling Format		Set E&M/ SMPLX Option Switch	Set Prot/ Unprot Option Switch	Administer the Port
Circumstance	To	System 25	Far-End			
Co-Located	Sys25 DEFINITY Sys75/75XE Sys85	Simplex Type 5	Simplex Type 5	SMPLX	Either	Type 5
Inter-Bldg.	Sys25 DEFINITY sys75/75xE Sys85	Simplex Type 5	Simplex Type 5	SMPLX	Either	Type 5
Co-Located	DIMENSION PBX	E&M Type 1 Compatible	E&M Type 1 Standard	E&M	Unprot	Type 1 Compatible
Inter-Bldg.	DIMENSION PBX	Prot. Type 1 Compatible	Prot. Type 1 Standard	E&M	Prot	Type 1 Compatible
Co-Located	Other	E&M Type 1 Compatible	E&M Type 1 Standard	E&M	Unprot	Type 1 Compatible
Inter-Bldg.	Other	Prot. Type 1 Compatible	Prot. Type 1 Std. Plus Protection Unit	E&M	Prot	Type 1 Compatible
Co-Located	Net Int.	E&M Type 1 Standard	Don't Care	E&M	Unprot	Type 1

## Replace Circuit Pack

Replace a CP if it fails or becomes damaged.

1. **Make sure that your hands are clean and dry. Put on a wrist grounding strap, and clip it to the grounding block at the back of the cabinet.**
2. **With your thumb, pull up on the latch pin.**
3. **When the latch is up, pull down on the latch lever until the lever stops at an angle of about 30 degrees to the floor.**
4. **Pull the CP out of the slot, and set it aside.**
5. **Insert the replacement of the same type CP in the same slot, following the instructions above for adding a CP.**
6. **Package the defective CP in protective material, and return it per local instructions.**

## Add Cabinet

Add a cabinet if all the slots in the existing cabinets are full and you need to add a CP. Also, if the addition of a CP to a cabinet will cause the unit load to exceed 80, a cabinet must be added. The system can support a maximum of three cabinets.

Perform this task outside normal business hours, if possible, to avoid interfering with normal business operations.

**Caution:** Service is interrupted when the TDM Bus cable is connected to working cabinets.

1. Make sure that the new cabinet power switch is in the OFF position.
2. Stack the new cabinet on top of the existing cabinet(s).
3. Remove the front and upper back covers.
4. Label the connectors on the bottom back cover following the instructions under “Install System Cabinets” in Section 2.
5. On the backplane near the center, note an “address plug” installed in one of the positions marked 1 -3 on a black address connector. This indicates the cabinet number. If it is not in the correct position, pull it out and insert it in the correct position. (The new cabinet will be either Cabinet 2 or 3.) Take care to avoid bending the pins on the backplane.

6. **Power down the system—all cabinets (Cabinet 1 last).**
7. **Connect the cabinets, following the instructions under “Install System Cabinets” in Section 2.**
8. **Connect a #6 AWG copper wire between the ground block of the new cabinet and the ground block of Cabinet 1.**
9. **See Note. Make connections between the TDM bus of the new cabinet and the cabinet directly beneath. Move the bus terminator, following the instructions under “Install System Cabinets” in Section 2 .**

**Note:** When properly installed, the light blue stripe on the extender cable is at the bottom of the cable and the lettering on the cable (SER=1, for example) is right side up.

10. **Connect the receptacle end of the power cord to the plug at the rear of the new cabinet.**
11. **Connect the plug end of the power cord to the system’s quad ac outlet.**
12. **See DANGER. Recheck the electrical and ground connections that you just made.**

**Danger:** Once power has been applied, do not insert hands or tools into the cabinet.

13. **Power up the system—Cabinet 1 last.**
14. **Check the performance of the CPs in the new cabinet following the instructions under “Power Up and Initialize System” in Section 2.**

## Add Terminal

1. Evaluate the cabinet unit power load using the procedures under “Evaluate cabinet unit Power Load” in this appendix.
2. Check for available ports on a compatible CP using the SAT or by checking the octopus cables attached to the 25-pair receptacles on the back of the cabinet.
3. If a port is available, connect the building wiring from the terminal to an unused termination on the SIP, following the instructions under “connect Cabinets to SIP” in Section 2. Then, insert plug on the octopus cable into the modular jack.
4. If a port is not available, add the correct CP and octopus cable, following the procedures under “Add Circuit Pack” in this appendix. Then connect the building wiring from the terminal to a termination on the SIP, following the procedures under “Install Cross-Connect Equipment” in Section 2. Next, connect the new CP to the SIP with an octopus cable, following the procedures under “Connect Cabinets to SIP” in Section 2. Finally, install the terminal, following the procedures under “Install Terminals” in Section 2.
5. Follow standard procedures for translating the terminal port using the SAT.
6. Document the new terminal on the Voice and Data Station Records Form.

## Add Trunk

1. If you are adding a DID or tie trunk, evaluate the cabinet unit power load using the procedures under Evaluate Cabinet Unit Power Load in this appendix.
2. Check to see that the trunk has been connected to an RJ21X (for a DID trunk) or RJ2GX (for a tie trunk) network interface by the telephone company.
3. If the trunk is connected to an existing network interface, determine the correct wires on the connecting cable. Cut them down to the correct position on the TAE connecting block, following the procedures under “Install Cross-Connect Equipment” in Section 2.
4. If the trunk is connected to a new network interface, connect it to the TAE following the procedures under “Install Cross-Connect Equipment” in Section 2. Install the correct CP as described under “Add Circuit Pack” in this appendix. Connect a plug from the splitter cable to the connector of the above CP at the back side of the cabinet.
5. Install secondary wiring protectors. (See Table 2-B.)
6. Follow standard procedures for translating the trunk port using the SAT.

## Add Trunk—DS1 Interface

1. Determine if a trunk is available at the TN767 Interface circuit pack, with the SAT. If there isn't, a new T1 facility and CSU are required. Use “Install DS1” in Section 2.
2. Check to see that the T1 facility has been connected to the RJ48X network interface by the telephone company.
3. If the facility is connected to an existing network interface, use MOD cable to connect to the CSU, see Figure C-3.
4. If the facility is connected to a new network interface, connect as in Step 3.
5. Make the required connections using “INSTALL DS1” in Section 2.

6. Follow standard procedures for translating the DS1 Interface port using the SAT.

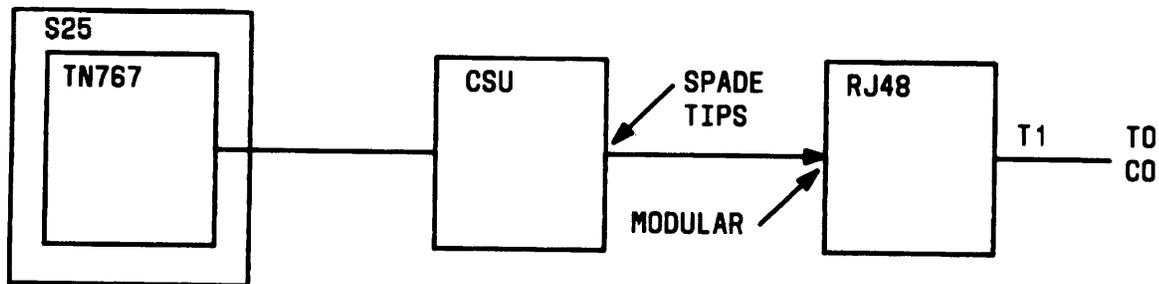


Figure C-3. DS1 Network Interface Connections

## Replace Voice-Only Terminal With Voice/Data Terminal

1. Using the Voice and Data Station Records Form (see “INSTALL EQUIPMENT ROOM STATION CABLING” in section 2), find the jack in the SIP adapter associated with the voice terminal that is to share a cable with a data terminal or personal computer.
2. Remove the plug (leg of the octopus cable) from the modular jack of the SIP adapter.
3. Insert a Y plug adapter in the same modular jack of the SIP (see “Make SIP Connections for Data Terminals and Computers” in section 2).
4. Insert the modular plug on the octopus cable into the voice side of the Y adapter.
5. Select an unused modular plug that is attached to a TN726 Data Line CP (or, add a TN726 CP and its octopus cable if there are none).
6. Insert the plug into the data side of the Y adapter.
7. Document the change.
8. Install the appropriate ADU, following the procedures under “Install Terminals” in Section 2.

9. When the terminal is initialized, test it following the appropriate procedures in Section 3, "System Tests. "

## **Add Pooled Modem Circuit Pack**

1. Select a cabinet in which to add the TN758 Pooled Modem CP. Only two Pooled Modem CPs per cabinet are allowed.
2. Add the Pooled Modem CP following the procedures under "Add Circuit Pack" in this appendix.
3. Follow the procedures in the *Administration Manual* to translate the Pooled Modem CP.
4. When the Pooled Modem CP is initialized, test it following the procedures under "Make Pooled Modem Test Call" in Section 3.

## **Add Auxiliary Equipment**

1. Install the auxiliary equipment, following the appropriate procedures in Section 2, "installation. "
2. When the auxiliary equipment is initialized, test it following the appropriate procedures in Section 3, "System Tests. "

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## APPENDIX D: System Upgrades

A D-kit-of-parts (PEC 62526N) is required to upgrade a Release 1 or a Release 2 system to a Release 3 V3 system. The kit contains the following:

- ZTN142 CPU/Memory Circuit Pack(1)
- ZTN131 Service Circuit Pack (1)
- Switched Loop Attendant Console (SLAC) Face Plates (2)
- Cassette Tapes (2)
- Release 3 V3 Documentation.

To upgrade to a Release 3 V3 system, proceed as follows:

1. Connect SAT and DTU. Follow the instructions in this manual.
2. Save the translations, and verify the accuracy of the backup tape. Refer to “Using the DTU” in Section 4.
3. Power down the system—all cabinets (Cabinet 1 last).
4. From R1 to R3 only: At the rear of the control cabinet (Cabinet 1), move the 50-pin Amphenol connector from slot 2 to slot 1.
5. Remove the front cover on the control cabinet (Cabinet 1).
6. From R1 to R3 only: Disconnect and remove the ribbon cable that connects the Memory (ZTN81 or ZTN127) and Call Processor (ZTN82 or ZTN128) CPs.
7. Replace the ZTN81, ZTN127 Memory CP, or ZTN129 CPU/Memory CP in slot 1 with the ZTN130/ZTN142 CPU/Memory CP.

8. Remove the ZTN82 or ZTN128 Call Processor CP from slot 2 and discard (R1 only). Remove ZTN85 Service CP from slot 3 (R1 only) or slot 2 (R2 only) and replace with ZTN131 Service CP. (Put in slot 2.) If ZTN85 is not replaced, move ZTN85 to slot 2.
9. Power up the system-Cabinet 1 last.
10. Cold start the system. Refer to "Cold Start the System" in Section 2.
11. Restore the translations from the backup tape. Refer to "Using the DTU" in Section 4.
12. Install any new port circuit packs.

**Caution:** Do not Install new port circuit packs until after backup tape has been restored.

**Note:** The system must be idle to perform the following step.

13. From R1 to R3 one: The new slot location (slot 2) of the ZTN131 CP must be translated as follows:
  - Select Menu 1.
  - Remove port 10301 by entering Port=10301, Action=1, and Data=0.
  - Assign port 10201 by entering Port=10201, Action=1, Data=1102.
14. *Enter new or changed translations as needed so that the customer can use the new R3 capabilities (Note).* Refer to the Administration Manual for R3V1 (555-540-500) for these procedures.

**Note:** If you are replacing a direct trunk console with a switched loop console, you must remove the direct trunk console translations and enter translations for the switched loop console. Also, the switched loop console does not have a NIGHT SERVICE button by default; therefore, you must administer one, if the Night Service feature is required (note the Night Service Access code before switching the consoles). Set trunk priority to ring-in on SLAC Menu 1, Action=11, Data=1 through 7.

16. Save the translations, and verify the accuracy of the backup tape. Refer to the *Administration Manual for R3V1 (555-540-500)* for these procedures.
17. Install the front cover on Cabinet 1.
18. Overlay the existing face plates on each switched loop console with the plates provided in the D-kit.
19. Familiarize the customer with the new R3 capabilities. Verify that the customer has the following manuals.

<i>Reference Manual</i>	<i>555-530-200</i>
<i>Administration Manual</i>	<i>555-540-500</i>
<i>New Capabilities Manual R3V1</i>	<i>555-540-205</i>
<i>Switched Loop Attendant Console</i>	
<i>Users Guide (optional)</i>	<i>555-530-706</i>

## APPENDIX E: Administration Codes and Data

The tables in this appendix are intended to help those familiar with system administration locate specific information without having to refer to the full text in the Administration Manual.

Default values, if applicable, are indicated in bold print in these tables.

### Default Dial Code Assignments

Each time the system is cold started (full-default), default translations are assigned to ports as shown in the Table below.

Table E-A. Default Dial Codes

PORT	DEFAULT CODE
Trunk Numbers (not part of dial plan)	<b>0001-0104</b>
Multiline voice terminals	<b>200-238</b> <b>300-355</b>
Single-line voice terminals	<b>400-599</b>
Data terminals	<b>600-704</b>
Loop start TAC	<b>100</b>
Ground start TAC	<b>101</b>
Tie trunk TAC	<b>102</b>
Attendant Call Park	<b>800-807</b>
Night Service	<b>810</b>
Modem Request Code (Pooled Modem)	<b>820</b>
ARS	<b>9</b>

Table E-B. PORT/PD. Administration, Voice Terminals (Menu=1/2)

ACTION	DESCRIPTION	DATA
0	Physical port number	CSSPP**
1	Enter terminal type code	[See Table E-C]
2	Enter PD.	[1 -9999]
3	Restrict dial access to CC) trunk pool	[1=Y/0=N]
4	Restrict dial access to all other trunk pools	[1=Y/0=N]
5	Assign ringing line preference*	[1=Y/0=N]
6	Assign prime line preference*	[Button Number, 7]
7	Assign call coverage receiver group†	[1 -32,0 for none, or 101-132 DGC receiver group, SLAC default is 0 for none]
8	Assign call coverage ring on no answer†	[1=Y/0=N, SLAC default is 0 for none]
9	Assign call coverage ring on busy†	[1=Y/0=N, SLAC default is 0 for none]
10	Make this an extended station‡	[1=Y/0=N]
11	Assign a group pickup number	[1-1 6; 0 for none]
12	PD. of station to hunt to next	[PD.; 0 for none]
14	Assign toll restriction class	[1-5; 0 for none]
15	Assign ARS Facility Restriction Level	[0-3; 3]
16	Enable personal speed dialing	[1=Y/0=N]

\* Read-only feature for SLAC.

\*\* Note: The TN746 (Analog Line) has to be installed per Menu 3 first.

† Not administrable for SLAC. For Action 9 for AUDIX Voice Power, set Data = 0 (no) for Merlin telephones, set Data =1 (yes) for single-line telephones.

‡ Action 10 cannot be used for the TN746B. Refer to the following information when administering extended stations on the TN746B.

**Table E-B. PORT/PDC Administration, Voice Terminals (Menu=1/2)  
(Contd)**

### **Administering the TN746B with Basic Administration**

**Plug the TN746B into an unadministered carrier/slot location and warm start the System 25.**

**Note: The TN746B circuit pack is not interchangeable with either the ZTN78 or TN742 circuit packs from an administration point of view. Therefore, if a TN746B circuit pack is to be plugged into a slot formerly populated by a TN742 or ZTN78, all of the latter translations must be removed before the System 25 is warm started. (The TN746B must be plugged into a slot before warm starting the system and/or administering the circuit pack.)**

**At this point, the rules for administering this circuit pack follows the normal ZTN78 and TN742 circuit pack procedures, with one exception. If it is necessary to administer the TN746B circuit pack to an extended station, the ACTION 10 (Make this an extended station) item under PORT administration in the Main Menu will not work. Also, do not utilize the ACTION 36 (Set gain) DATA 1 (Gain = 3db) option to make the station extended. This is accomplished by utilizing the ACTION 35 (Set Hybrid Balance), DATA O (Resistor/Capacitor Term.) option.**

### **Administering the TN762B with Basic Administration**

**All TN762B administrative procedures should follow the same administrative procedures as a ZTN79 circuit pack.**

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Table E-B. PORT/PD. Administration, Voice Terminals (Menu=1/2) (Contd)

ACTION	DESCRIPTION	DATA
17	Send ringing to bridged appearances when principal doesn't answer?	[1=Y/0=N]
18	Send ringing to bridged appearances when principal is busy?	[1=Y/0=N]
19	Is this a display station?‡	[1=Y/0=N]
20	Enable automatic incoming call ID‡	[1=Y/0=N]
21	Type of account code entry	[0=optional, 1=forced (for all outside calls), 2=forced (for calls beginning with "0" or "1")]
22	Allow this station to use remote call forwarding?	[1=Y/0=N]
23	Allow tool-restricted stations to make IXC codes+1NPA calls.	[1=Y/0=N]
24	Allow tool-restricted stations to make IXC codes+O11 calls.	[1=Y/0=N]
25	Allow tool-restricted stations to make IXC codes+NXX calls.	[1=Y/0=N]
40	Assign the number of callback retries for internal facilities	[0-15; 2]
41	Number of rings per callback try for internal facilities	[2-15; 3]
42	Assign the number of rings per callback try for outgoing facilities	[0-15; 2]
43	Assign the number of rings per callback try for outgoing facilities	[2.15; 3]
44	Assign automatic queuing for internal facilities	[1=Y/0=N]
45	Assign automatic queuing for outgoing facilities	[1=Y/0=N]

\* Not administrable for SLAC or DTAC.

‡ Not administrable for SLAC.

Table E-B. PORT/PD. Administration, Voice Terminals (Menu=1/2) (Contd)

ACTION	DESCRIPTION	DATA
46	Enable call waiting*	[1=Y/0=N]
51	Display the number of any trunks assigned to this station for night service	
52	Assign a trunk to this station for night service	[4-digit trunk number]
53	Delete a trunk from this station's night service list	[4-digit trunk number]
60	For DTAC or SLAC: Display attendant position number (Read-only)	[1=1st Att./2=2nd Att.]
90	Assign/remove PDE Display ID	["1 1 characters or less," or ** to remove]
1 0 0	Button to be assigned	[button #]
1 0 1	SYSTEM ACCESS - ORIGINATE ONLY If type 310 or 311: NOT ADMINISTRABLE	[1]
100	Button to be assigned	[button #]
101	POOLED FACILITY	[2]
102	Facility Access Code of this pooled facility	[FAC]

\*Not administrable for SLAC or DTAC.

Table E-B. PORT/PDC Administration, Voice Terminals (Menu=1/2)  
(Contd)

ACTION	DESCRIPTION	DATA
100	Button to be assigned	[button #]
101	PERSONAL LINE If type 310 or 311: NOT ADMINISTRABLE	[3]
1 0 2	4-digit "Listed Directory Number" for this trunk	[trunk #]
103	Is this the " Principal" station?	[1=Y/0=N]
104	Enable ring for calls on this button?	[1= Y/0=N]
100	Button to be assigned	[button #]
101	EXCLUSION	[4]
100	Button to be assigned	[button #]
101	STATION-TO-STATION MESSAGE WAITING	[5]
102	PDC of the station that's paired with this station's MSG WAIT button	[PDC]
103	Button number of the MSG WAIT button on the paired station	[button #]
100	Button to be assigned	[button #]
101	COVERAGE MESSAGE WAITING If type 310 or 311: NOT ADMINISTRABLE	[6]
1 0 0	Button to be assigned	[button #]
101	MANUAL SIGNALING	[7]
1 0 2	PDC of signaled station	[PDC]

Table E-B. PORT/PDC Administration, Voice Terminals (Menu=1/2)  
(Contd)

ACTION	DESCRIPTION	DATA
100	Button to be assigned	[button #]
101	AUTOMATIC INTERCOM	[8]
102	PDC of paired station	[PDC]
103	Button number of the AUTO ICOM button on the paired station	[button #]
100	Button to be assigned	[button #]
101	TRANSFER TO DATA	[9]
102	Associated DDC	[DDC]
100	Button to be assigned	[button #]
101	CALL COVERAGE - GROUP If type 310 or 311: NOT ADMINISTRABLE	[10]
102	Coverage Group number	[1-32]
103	Enable ring for calls on this button?	[1=Y/0=N]

Table E-B. PORT/PDC Administration, Voice Terminals (Menu=1/2)  
(Contd)

ACTION	DESCRIPTION	DATA
1 0 0	Button to be assigned	[button #]
101	SEND ALL CALLS If type 310 or 311: NOT ADMINISTRABLE	[11]
1 0 2	Enable single-ring reminder?	[1=Y/0=N]
103	Send ring to bridged stations or to coverage stations? 0 = to bridged stations 1 = to coverage stations 2 = to both	[0-2; 2]
1 0 0	Button to be assigned	[button #]
101	CALL COVERAGE - INDIVIDUAL If type 310 or 311: NOT ADMINISTRABLE	[12]
102	PDC of the covered station	[PDC]
103	Enable ring for calls on this button?	[1=Y/0=N]
100	Button to be assigned	[button #]
101	FLEXIBLE DIRECT STATION SELECTION (FLEX DSS)	[13]
1 0 0	Button to be assigned	[button #]
101	DIRECT STATION SELECTION (DSS)	[14]
102	PDC or access code to be stored on this button (max. 4 digits)	[PDC]
1 0 0	Button to be assigned	[button #]
101	ACCOUNT CODE ENTRY	[15]

Table E-B. PORT/PDC Administration, Voice Terminals (Menu=1/2)  
(Contd)

ACTION	DESCRIPTION	DATA
100	Button to be assigned	[button #]
101	ALARM For types 309, 310, 311 ONLY (read-only)	[16]
100	Button to be assigned	[button #]
101	NIGHT SERVICE For types 309, 310, 311 ONLY	[17]
102	Night Service access code	[access code]
100	Button to be assigned	[button #]
101	POSITION BUSY For types 309, 310, 311 ONLY	[18]
100	Button to be assigned	[button #]
101	ATTENDANT MESSAGE WAITING For types 309, 310, 311 ONLY. If type 310 or 311: read-only	[19]
100	Button to be assigned	[button #]
101	REPERTORY DIALING	[20]
100	Button to be assigned	[button #]
101	AUTOMATIC ANSWER	[21]
100	Button to be assigned	[button #]
101	RETURN - DON'T ANSWER For type 309 ONLY (read-only).	[22]
100	Button to be assigned	[button #]
101	RETURN - BUSY For type 309 ONLY (read-only).	[23]

Table E-B. PORT/POC Administration, Voice Terminals (Menu=1/2)  
(Contd)

ACTION	DESCRIPTION	DATA
100	Button to be assigned	[button #]
101	START For types 309, 310, 311 ONLY (read-only)	[24]
100	Button to be assigned	[button #]
101	CANCEL For types 309, 310, 311 ONLY (read-only)	[25]
100	Button to be assigned	[button #]
101	RELEASE For types 309, 310, 311 ONLY (read-only)	[26]
100	Button to be assigned	[button #]
101	LOOP For type 310 or 311 ONLY (read-only)	[27]
100	Button to be assigned	[button #]
101	INSPECT Note: this feature requires the use of a DISPLAY voice terminal. If type 310 or 311: READ-ONLY	[28]
100	Button to be assigned	[button #]
101	SOURCE For type 310 or 311 ONLY (read-only)	[29]
100	Button to be assigned	[button #]
101	FORCED RELEASE For type 310 or 311 ONLY (read-only)	[30]

Table E-B. PORT/PDC Administration, Voice Terminals (Menu=1/2)  
(Contd)

ACTION	DESCRIPTION	DATA
100	Button to be assigned	[button #]
101	JOIN For type 310 or 311 ONLY (read-only)	[31]
100	Button to be assigned	[button #]
101	DESTINATION For type 310 or 311 ONLY (read-only)	[32]
100	Button to be assigned	[button #]
101	LOCAL Note: this feature requires the use of a DISPLAY voice terminal. If type 310 or 311: READ-ONLY	[33]
100	Button to be assigned	[button #]
101	SCROLL Note: this feature requires the use of a DISPLAY voice terminal. If type 310 or 311: READ-ONLY	[34]
100	Button to be assigned	[button #]
101	LAST NUMBER DIALED	[35]
100	Button to be assigned	[button #]
101	SYSTEM ACCESS If type 310 or 311: NOT ADMINISTRABLE	[36]
102	Assign ring option: 0 = no ring 1 = immediate ring 2 = delayed ring	[0-2; 1]

Table E-B. PORT/PDC Administration, Voice Terminals (Menu=1/2)  
(Contd)

ACTION	DESCRIPTION	DATA
100	Button to be assigned	[button #]
101	BRIDGED ACCESS If type 309, 310, or 311: NOT ADMINISTRABLE	[37]
102	PDC of Principal station NOTES: Cannot have a BA for a DTAC's SA. Also, cannot have a BA for your own SA.	[PDC]
103	Button number of paired SA button on Principal's station	[button #]
104	Assign ring option: 0 = no ring 1 = immediate ring 2 = delayed ring	[0-2; 1]
100	Button to be assigned	[button #]
101	LEAVE WORD CALLING Note: this feature requires the use of a Voice Messaging System	[38]
100	Button to be assigned	[button #]
101	DIRECTORY Note: this feature requires the use of a DISPLAY voice terminal.	[39]
100	Button to be assigned	[button #]
101	CALL Note: this feature requires the use of a DISPLAY voice terminal.	[40]

Table E-B. PORT/PDC Administration, Voice Terminals (Menu=1/2)  
(Contd)

ACTION	DESCRIPTION	DATA
100	Button to be assigned	[button #]
101	NEXT Note: this feature requires the use of a DISPLAY voice terminal.	[41]
100	Button to be assigned	[button #]
101	AGENT STATUS FOR CMS	[42]
102	Assign button subtype: 0 = Monitor 1 = Available (Agent) 2 = After Call Work (Agent) 3 = Logged Out (Agent)	[0-3]
103	PDC of station that has the associated Monitor button, or 0 if this is the Monitor station	[1-9999 or 0 if Monitor]
104	Button # for the associated Monitor button on the station listed in Action 103, or 0 if this is the Monitor station	[button # or 0 if Monitor]

Table E-C. Voice Terminal Type Codes

If the Terminal Type is:	Code:
<b>SINGLE-LINE VOICE TERMINALS:</b> Without message waiting indicator With message waiting indicator	201 202
<b>MERLIN CS (ATL) VOICE TERMINALS:</b> 5-Button, Z7302H01 10-Button Hands-Free Answer on Intercom, Z7309H01 10-Button Built-in-Speakerphone, Z7313H01 A ATL Cordless Telephone 10-Button, Z7303H01 22-Button Built-in-Speakerphone with Display, Z7314H01 A 34-Button, Z7305H01  34-Button Deluxe, Z7305H02, (NOT attendant) 34-Button Built-in-Speakerphone, Z7305H03 (NOT attendant) 34-Button Deluxe Built-in-Speakerphone, Z7316H01 A (NOT attendant) 34-Button Built-in-Speakerphone with 16-Character Display, Z7305H04C (NOT attendant) 34-Button Deluxe Built-in-Speakerphone with 16-Character Display, Z7317H01A (NOT attendant) <b>AITENDANT VOICE TERMINALS:</b> Direct Trunk Attendant Console (34-Button Deluxe or 34-Button Deluxe Built-in-Speakerphone) Switched Loop Attendant Console (34-Button Built-in-Speakerphone with 16-Character Display) Switched Loop Attendant Console, Deluxe (34-Button Deluxe Built-in-Speakerphone with 16-Character Display)	302 303 303 303 304 312 307 or 306 307 305 305 308 308  309 310 311
<b>MET VOICE TERMINALS:</b> 10-Button MET 10-Button MET with Built-in-Speakerphone 12-Button MET	401 401 401

Table E-D. Feature Button Translation (Menu=1/2)

“Action=100” is required before action(s) 101-104 listed in this table are administered.

ACTION 101	NOTES	BUTTON TYPE	ACTION 102	ACTION 103
1	(1)	SYS ACCESS-ORG		
2		FACILITY	Facility Access Code	
3	(1, 11, & 15)	PERS LINE	Trunk Number	Owner?
4		EXCLUSION		
5		MSG WAIT	Signaled PDC	Signaled Button No.
6	(1)	COVER MSG		
7		MANUAL SIGNAL	Signaled PDC	
8	(15)	AUTO ICOM	Called PDC	Called Button No.
9		DATA	Assoc. DDC	
10	(1)	COVER-GRP	Group Number	Ringer Enable? (Yes)
11	(1 & 15)	SEND ALL CALLS	Single Ring Reminder?	Send where?
12	(1 & 2)	COVER-IND	Covered PDC	Ringer Enable? (Yes)
13		FLEX DSS		
14	(15)	DSS	Called PDC	
15		ACCT ENTRY		
16	(3 & 4)	ALARM		
17	(4)	NIGHT	Night Access Code	
18	(4 & 5)	POS BUSY		
19	(4 & 6)	ATT MSG		
20		REP DIAL		

Table E-D. Feature Button Translation (Menu=1/2) (Contd)

"Action=100" is required before action(s) 101-104 listed in this table are administered

ACTION 101	NOTES	BUTTON TYPE	ACTION 102	ACTION 103
21	(14)	AUTO ANS		
22	(3 & 7)	RTN-DA		
23	(3 & 7)	RTN-BUSY		
24	(3 & 4)	START		
25	(3 & 4)	CANCEL		
26	(3 & 4)	RELEASE		
27	(3 & 8)	LOOP		
28	(6,10 & 14)	INSPECT		
29	(3 & 8)	SOURCE		
30	(3 & 8)	FORCED RELEASE		
31	(3 & 8)	JOIN		
32	(3 & 8)	DESTINATION		
33	(6, 10 & 14)	LOCAL		
34	(6, 10 & 14)	SCROLL		
35	(15)	LAST # DIALED		
36		SYSTEM ACCESS	Ring Option	
37	(12)	BRIDGED ACCESS	Principal's PD.	Prin's SA button #
38	(9)	LEAVE WORD CALLING		
39	(10)	DIRECTORY		
40	(10 & 14)	CALL		
41	(10 & 14)	NEXT		
42	(13)	AGENT STATUS FOR CMS	Subtype*	Monitor's PD.

\* Refer to page 10-6 of the *Administration Manual*.

**NOTES:**

A ? mark indicates that a yes/no (1/0) response is required.  
If a (No) or (Yes) is present, this indicates a strongly suggested response.

- 1) If Switched Loop Attendant Console: NOT ADMINISTRABLE
- 2) Switched Loop Attendant Console cannot be specified as the covered PDC (Action 102) for individual call coverage
- 3) This code is READ ONLY (can't be changed)
- 4) Direct Trunk or Switched Loop Attendant Console ONLY
- 5) If single-position Switched Loop Attendant Console: see Action 87 of SYSTEM menu for designating PDC of covering station
- 6) If Switched Loop Attendant Console: READ-ONLY
- 7) Direct Trunk Attendant Console ONLY
- 8) Switched Loop Attendant Console ONLY
- 9) Requires the use of a Voice Messaging System
- 10) For DISPLAY voice terminals only
- 11) This feature also requires an ACTION 104 entry of "Ringer Enable".
- 12) This feature also requires an ACTION 104 entry of "Ring Option".  
Data = 0 (No Ring); 1 (Ring); or 2 (Delayed Ring).
- 13) This feature also requires an ACTION 104 entry of "Monitor Button #",
- 14) This feature can not be used with ATL Cordless Telephone.
- 15) This feature should be used with ATL Cordless Telephone with CAUTION.

Table E-E. Multiline Voice Terminal Button Defaults

7- SYS ACCESS	12- FLEX DSS	17- FLEX DSS	29- FLEX DSS
8- SYS ACCESS	13- ACCT ENTRY	18- FLEX DSS	30- FLEX DSS
9- REP DIAL	14- SEND ALL CALLS	19- FLEX DSS	31- FLEX DSS
10- REP DIAL	15- FLEX DSS	20- FLEX DSS	32- FLEX DSS
11- LAST # DIALED	16- FLEX DSS	21- FLEX DSS	33- FLEX DSS
		22- FLEX DSS	34- FLEX DSS
		23- FLEX DSS	35- FLEX DSS
		24- FLEX DSS	36- FLEX DSS
		25- FLEX DSS	37- FLEX DSS
		26- FLEX DSS	38- FLEX DSS
		27- FLEX DSS	39- FLEX DSS
		28- FLEX DSS	40- FLEX DSS

Table E-F. Switched Loop Attendant Console Button Defaults (Type 310)

7- LOOP†	12- ALARM†	17- LOCAL†	29- SCROLL†
8- LOOP†	13- POS BUSY	18- FLEX DSS	30- FORCED RELEASE†
9- LOOP†	14- FLEX DSS	19- FLEX DSS	31- LAST # DIALED
10- LOOP†	15- SOURCE†	20- FLEX DSS	32- FLEX DSS
11- LOOP†	16- DESTINATION†	21- FLEX DSS	33- FLEX DSS
		22- FLEX DSS	34- FLEX DSS
		23- FLEX DSS	35- FLEX DSS
		24- FLEX DSS	36- FLEX DSS
		25- FLEX DSS	37- FLEX DSS
		26- CANCEL†	38- JOIN†
		27- START†	39- RELEASE†
		28- ATT MSG†	40- INSPECT†

---

† Cannot be changed.

Table E-G. Switched Loop Attendant Console Button Defaults (Type 311 )

7- LOOP†	12- ALARM†	17- INSPECT†	29- SCROLL†
8- LOOP†	13- POS BUSY	18 - LOCAL†	30- FORCED RELEASE†
9- LOOP†	14- FLEX DSS	19- FLEX DSS	31- LAST # DIALED
10- LOOP†	15- SOURCE†	20- FLEX DSS	32- FLEX DSS
11- LOOP†	16- DESTINATION†	21- FLEX OSS	33- FLEX DSS
		22- FLEX DSS	34- FLEX DSS
		23- FLEX DSS	35- FLEX DSS
		24- FLEX DSS	36- FLEX DSS
		25- FLEX DSS	37- FLEX DSS
		26- FLEX DSS	38- ATT MW†
		27- CANCEL†	39- JOIN†
		28- START†	40- RELEASE†

† Cannot be changed.

**Table E-H. Direct Trunk Attendant Console Button Defaults (Cold-Start Defaults)**

7- SYS ACCESS	12- FLEX DSS	17- Trunk 0001	29- Trunk 0009
8- SYS ACCESS	13- ACCT ENTRY	18- Trunk 0002	30- Trunk 0010
9- REP DIAL	14- ATT MSG	19- Trunk 0003	31- Trunk 0011
10- REP DIAL	15- NIGHT	20- Trunk 0004	32- Trunk 0012
11- LAST # DIALED	16- ALARM†	21- Trunk 0005	33- Trunk 0013
		22- Trunk 0006	34- Trunk 0014
		23- Trunk 0007	35- Trunk 0015
		24- Trunk 0008	36- Pool 100
		25- COVER-GRP	37- Pool 101
		26- RTN-DA†	38- Pool 102
		27- RTN-BUSY†	39- CANCEL†
		28- START†	40- RELEASE†

<b>SELECTOR CONSOLE BUTTON DEFAULTS</b>														
2..		3..		4..		5..		6..		7..		8..		TEST

---

† Cannot be changed.

Table E-1. Direct Trunk Attendant Console Defaults (Administration-Installed Defaults)

7- SYS ACCESS	12- FLEX DSS	17 - 0	29 - 0
8- SYS ACCESS	13- ACCT ENTRY	18 - 0	30 - 0
9- REP DIAL	14- ATT MSG	19 - 0	31 - 0
10- REP DIAL	15 - 0	20 - 0	32 - 0
11- LAST # DIALED	16- ALARM†	21 - 0	33 - 0
		22 - 0	34 - 0
		23 - 0	35 - 0
		24 - 0	36 - 0
		25- COVER GRP	37-0
		26 - RTN-DA†	38 - 0
		27 - RTN-BUSY†	39 - CANCEL†
		28 - START†	40 - RELEASE†

†Cannot be changed.

Table E-J. MET Set Button Defaults

<b>7 - SYS ACCESS</b>
<b>8 - SYS ACCESS</b>
<b>9 - REP DIAL</b>
<b>10 - REP DIAL</b>
<b>11 - LAST # DIALED</b>
<b>Message†</b>
<b>Drop†</b>
<b>Conference†</b>
<b>Transfer†</b>
<b>Hold†</b>

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†Cannot be changed.

Table E-K. PORT/PDC Administration, Data Terminals (Menu=12)

ACTION	DESCRIPTION	DATA
0	Physical port number	CSSPP
1	Enter data type code	[See Table E-K]
2	Enter DDC	[1 -9999; 600-704]
3	Restrict dial access to CO trunk pool†	[1=Y/0=N]
4	Restrict dial access to all other trunk pools†	[1=Y/0=N]
12	DDC of station to hunt to next	[PDC; 0 for none]
13	Restrict this station from making outward calls†	[1=Y/0=N]
14	Assign toll restriction class†	[1-4; 0 for none]
15	Assign ARS Facility Restriction Level†	[0-3; 3]
21	Enter associated voice/data endpoint station*	[PDC/DDC or 0 for none]
22	Restrict Third-Party Call Set-Up so user can only establish calls for the associated station (see Action 21)†	[1=Y/0=N]
61	Auto-adjust baud rate on call origination.* (The default is 0 for STARLAN CP.)	[1=Y/0=N]
62	Allow terminal to operate at low bits per second (bps)*	[1=Y/0=N]
63	Allow terminal to operate at a baud rate of 300 bps*	[1=Y/0=N]
64	Allow terminal to operate at a baud rate of 1200 bps*	[1=Y/0=N]
65	Allow terminal to operate at a baud rate of 2400 bps*	[1=Y/0=N]
66	Allow terminal to operate at a baud rate of 4800 bps*	[1=Y/0=N]

† If data port type code 1802 (STARLAN CP), default values are relevant for the first installed port on the board. Values assigned to this action item on *any* of the four ports will be copied to *all* four ports on this board.

‡ Not administrable for STARLAN CP.

\* Read-only for STARLAN CP.

Table E-K. PORT/PDC Administration, Data Terminals (Menu=1/2)  
(Contd)

ACTION	DESCRIPTION	DATA
67	Allow terminal to operate at a baud rate of 9600 bps†	[1=Y/0=N]
68	Allow terminal to operate at a baud rate of 19200 bps†	[1=Y/0=N]
69	Assign this parity setting to correspond with terminal's parity setting†	[0-3; 2]  0= Bit in parity position (no parity); 1 =Bit in parity position (no parity) 2=Even parity; 3= Odd parity
70	Allow keyboard dialing/Command Mode†	[1=Y/0=N]
71	Allow user configuration of data port parameters.† (The default is 0 for STARLAN CP.)	[1=Y/0=N]
72	Allow mismatch of user's data module and data port baud rate†	[1=Y/0=N]
73	Allow characters dialed from keyboard to be echoed by the data port†	[1=Y/0=N]
74	Enter your disconnect code†	[1=2 short BREAKS/ 0=1 long BREAK]
75	Allow call progress text messages to be displayed on screen.†	[1=Y/0=N]
77	Display connection indication message†	[1=Y/0=N]
90	Assign/remove DDC Display ID	["11 characters or less", or "" to remove]

† Read-only for STARLAN CP.

Table E-L. Data Port Type Codes

IF THE DATA PORT TYPE IS	CODE:
Data Line Card (DLC) functionality for ZTN126 or TN726	1801
STAR LAN Interface Circuit Pack (STARLAN CP) in DLC-compatibility mode	1802
Disable this individual port (for any of the above data port types)	0

Table E-M. Port Administration, Trunks (Menu=1)

ACTION	DESCRIPTION	DATA
0	Physical port number	CSSPP
1	Enter trunk port type code	[See Table E-N]
2	Enter trunk number	[0001 -9999; 0001-0104]
3	Assign class-of-service code	[(DID-1-4; 3) (All other— See Table E-O; 8)]
4	Assign pooled facility access code.	[Facility access code; (100,101,102) 0 if trunk not in any group]
5	Allow dial access	[I=Y/0=N]
6	Assign the trunk to a DGC group	[1-32; 0 or none]
7	Make this a directed night service trunk	[1 Y/0=N]
8	Assign night service delay announcement	[1 for first announcement, 2 for second announcement, 0 for none]
9	Type of signaling on incoming calls (Tie-Trunks only)	[1=Tone/0=Pulse]
10	Determine pooled trunk hunting order of a specified trunk {Read Only}	
11	For Switched Loop Attendant systems ONLY: Priority of trunk to ring in queue†	[0-7; 0=won't ring in queue/or 1=highest priority, thru 7=lowest priority]

Note: The TN747B CO Trunk port can be administered as either loop-start or ground-start, but not both at the same time. If a TN747B is administered before it is installed in a slot, the System 25 must be warm started before it will recognize the TN747B.

† Not administrable for trunk port type codes 901-902 or 1003-1008.

\* Not administrable for trunk port type codes 901-902 or 1001-1008.

Table E-M. PORT Administration, Trunks (Menu=1) (Contd)

ACTION	DESCRIPTION	DATA
12	For Switched Loop Attendant Systems ONLY; Which attendant should receive calls from this trunk?†	[0-2; 0=either Att./ 1=1st At. ONLY/ 2=2nd Att. ONLY]
13	Specify Remote Access usage type‡	[0-2; 0=name, 1=shared, 2-dedicated]
14	Allow dial-access users to queue for this trunk?	[1=Y/0=N]
15	Adjust Digital Tie Trunk gain for satellite > 15 msec round trip delay	[1 = satellite, 0= tandem]
16	For types 702 and 802 ONLY: Is this a paging port?	[1=yes/0=no]
17	Identify trunk pool with Originating Line Screening	[0=[IXC+] O, O+, or 01N+ calls are not allowed from toll-restricted stations; [1=[IXC+] O, O+, or 01 N+ calls are allowed from toll-restricted stations.
30	Special Signaling DS1 (LS, GS, OPS ONLY)	[0=foreign Exchange (default), 1=Special Access Unit]
40	Special Signaling	[0=FX (default); 1=SAU]
90	Assign/remove trunk Display ID*  For trunk port type codes: 701, 702, 801, 802, 805: default is "Outside" 901, 902: NOT ADMINISTRABLE 1001-1008: default is "BRANCH"	"11 characters or less," or ** to remove]  [FAC]

\* Not administrable for trunk port type codes 901-902.

Table E-N. Trunk Type Codes

If the Trunk Type is:	Code:
Ground Start, CO	701†
Ground Start, WATS, FX	702
Ground Start, WPBX/Centrex	705
Loop Start, CO	801†
Loop Start, WATS, FX	802
PBX/Centrex	805*
DID Immediate Dial	901
DID Wink Start	902†
Auto-in/Auto out	1001
Auto-in/Immediate Dial-out	1002
Immediate Dial-in/Auto-out	1003
Immediate Dial-in/Immediate Dial-out	1004
Wink Dial-in/Auto-out	1005
Wink Dial-in/Wink Dial-out	1006†
Delay Dial-in/Auto-out	1007
Delay Dial-in/Delay Dial-out	1008

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† Default Types.

\* Required for Centrex.

Table E-O. Trunk Class-of-Service (for all trunks except DID)

TRUNK CLASS-OF-SERVICE (FOR ALL TRUNKS EXCEPT DID)				
COS CODE	NIGHT SERVICE	OUTWARD SIGNALING	IN ONLY	SHORT DISCONNECT
0		TT		
1		TT	.	
2		TT		.
3		TT	.	.
4		DP		
5		D P	.	
6		DP		.
7		DP	.	.
8	.	TT		
9	.	TT	.	
10	.	TT		.
11	.	TT	.	.
12	.	DP		
13	.	DP	.	
14	.	DP		.
15	.	DP	.	.

TT=Touch-Tone  
DP=Dial-Pulse

Table E-P. Port Administration, Auxiliary Equipment (Menu=1)

ACTION	DESCRIPTION	DATA
0	Display physical port number, in the form CSSPP	
1	Enter special feature port type code	(see Table E-Q).
1	Assign external alerts	[253]
2	Assign associated station number	[PDC of associated station; 0 if night service alert]
1	Assign paging Interface (associated with auxiliary trunk circuit)	[1301-1303]
2	Assign PDC for this zone	[PDC (zone 1) PDC (zone 2) PDC (zone 3) 0 for none]
3	Assign all-zone PDC	[PDC for all-zone, 0 for none]
4	Dial restrict this zone (1=YES/0=NO)	[1/0]
1	Assign DGC delay announcement	[255]
2	Assign PDC	[unique PDC]
3	Restrict Dial Access	[1=yes, 0=no]
90	Assign ID	[1=yes, 0=no]
1	Assign directed night service delay announcement	[251 (delay announcement #1); 252 (delay announcement #2)]
2	Assign number of rings before delay announcement	[0-15]
1	Assign music-on-hold source	254
2	Assign music-on-hold for Special Hold?	[1=Yes/0=No]

Table E-P. Port Administration, Auxiliary Equipment (Menu-1 ) (Contd)

<b>ACTION</b>	<b>DESCRIPTION</b>	<b>DATA</b>
1	Assign voice Messaging Service port type:  260 = standard voice mail services 261 = call coverage/auto-attendant 262 = message drop 263 = bulletin board	[260 - 263]
2	Assign PD for this VMS port	[PD.]
3	Restrict dial access to the CO trunk pool	[1=Y/0=N]
4	Restrict dial access to all other trunk pools	[1=Y/0=N]
5	Make this VMS port dial-accessible	[1=Y/0=N]
10	Make this VMS port an extended station†	[1=Y/0=N]
13	Restrict this station from making any outside calls	[1=Y/0=N]
14	Assign a toll restriction class	[0-4]
15	Assign an ARS Facility Restriction Level	[0-3]
90	Assign/Remove VMS port Display ID	["11 characters or less," or** to remove]
1	Assign pooled modem	[1901]
1	Assign additional tone detector	[2101]
1	Assign dial dictation	[2201 (if auxiliary trunk interface); 201 (if station port interface)]
2	Assign dial dictation PD.	[PD.]
1	Assign selector console	[1 601 or 1602]
21-27 Assign the hundreds group to this button		

† For TN742/TN746 ports only. Use the default value for extended stations in order to meet FCC compliance for level of dial tone.

Table E-Q. Special Feature Port Type Codes

This table shows data values associated with Action=1 on Table E-P.

Feature	TN742, ZTN78	TN763	ZTN76	ZTN77	TN748	TN758	ZTN79
Tone Detector					2 1 0 1		
External Alert	2 5 3						
1st Page Zone		1 3 0 1	702†	802†			
2nd Page Zone		1 3 0 2	702†	802†			
3rd Page Zone		1 3 0 3	702†	802†			
nth Page Zone			702†	802†			
DGC Delay Ann.	2 5 5						
Dial Dictation	2 0 1	2 2 0 1					
Music-On-Hold	2 5 4						
1st N.S. Delay Ann.	2 5 1						
2nd N.S. Delay Ann.	2 5 2						
1st Selector Console							1 3 0 1
2nd Selector console							1 6 0 2
Pooled Modem						1 9 0 1	
VMS: Voice Mail	2 6 0						
V M S : Cover/Auto- Attend	2 6 1						
VMS: Message D r o p	2 6 2						
VMS: Bulletin Board	2 6 3						

† Only one 703 or 802 type page port may be needed to provide multiple paging zones, dependent on the type of paging hardware connected to the paging port. Mixing of 702, 802 with 1301-1303 types to provide additional zones is allowed. However, Actions like ALL ZONE paging and "dial restrict" page zone are only available with 1301-1303 types.

Table E-R. Port Options

<b>PORTS, Station/Trunk/Special Port Circuit Board Options                      FOR QUALIFIED SYSTEMS TECHNICIANS ONLY                      (See Table E-S, " Applicable Options " )</b>		
<b>ACTION</b>	<b>DESCRIPTION</b>	<b>DATA</b>
32	Set CO disconnect time (in 20 msec increments)	[0-2540 msec; 500]
33	Set end-to-end signaling tone timing (in 20 msec increments) FOR TN742 AND ZTN78 ONLY: FOR ALL OTHER BOARDS:	[20-2540 msec; 340] [0-2540 msec; 60]
34	Set end-to-end signaling pause timing (in 20 msec increments) FOR TN742 AND ZTN78 ONLY: FOR ALL OTHER BOARDS:	[20-2540 msec; 100] [0-2540 msec; 60]
35	Set hybrid balance. Data is balance type: 1=Resistor; 0=Resistor/Capacitor. Trunk ports default to 0; station ports default to 1.	[1/0] .
36	Set gain; 1 (Gain=3dB) or 0 (Gain=0dB)	[1/0]
37	Set E&M signaling type. Data is signaling type 0 (Type 1 compatible), 1 (Type V), or 2 (Type I).	[0-2]
38	Set answer supervision delay timing	[0-51 00 msec; 300]

**Warning:** The default values in Tables E-R and E-S must not be changed without the support and guidance of Tier III staff.

Table E-S. Applicable Options

See WARNING for Table E-R. Also note that a bullet in a box on this table indicates that the default value for that action (shown in Table E-R) is applicable for this circuit board. No bullet indicates that the option is

CIRCUIT BOARD	BOARD TYPE	ACTION						
		32	33	34	35†	36	37	38
ZTN76	GS Trunk	•	•	•	•			
ZTN77	LS Trunk	•	•	•	•			
TN753	DID Trunk	•	•	•	•			
TN760	TIE Trunk	•	•	•			•	•
TN763	AUX Trunk		•	•				
TN742	T.T. Station		•*	•*	•	•		
ZTN78	T.T. Station		•*	•*				
ZTN79	ATL Station							
TN735	MET Station							
ZTN85 or ZTN131 (R3)	Svc. Ckt.							
TN748	Tone Det.							
TN767	DS1 Interface	•	•	•				•

•Timing adjustable for internal calls only.

† ACTION 35 (Hybrid Balance) defaults depend on board type. Trunk Ports are defaulted to 0 (Resistor/Capacitor termination), while Station Ports are defaulted to 1 (Resistor termination).

Table E-T. PDC Administration (Menu=2)

ACTION	DESCRIPTION	DATA
0	Move this station to a new port (moved-to port must be vacant)	[CSSPP (new port assignment)]
1	Display terminal type code	[See Table E-C]
2-53	All other	See note below.
90	Assign/remove PD. Display ID	["11 characters or less," or ** to remove]

Note: Action/data items administrable under PD. (Menu=2) are the same as those administrable under Port (Menu=1). (See Table E-B.)

Table E-U. High Density Circuit (Menu=3)

ACTION	DESCRIPTION	DATA
1	Board type	[746=TN764/767=TN767]
2	Error reporting enable	[1=enable/0=disable]
3	Line compensation	[Select 1-5]
4	Zero code suppression	[0=ZCS/1=B8ZS]
5	Framing mode	[0=D4/1=ESF]
6	Signaling mode	[0=Robbed bit/1=Common Channel]
8	Red alarm activation time	[0=3 sec./1 =10 sec.]

Table E-V. System Administration (Menu=4)

ACTION	DESCRIPTION	DATA
3	Assign the number of rings before unanswered calls extended by Attendant return to the console (1 -31)	[Number of rings; 5]
4	Force DID calls to unassigned DID numbers to ring at Attendant Console	[1=Y/0=N]
5	Force calls to FPDCs that are not logged in anywhere to ring at the Attendant Console	[1=Y/0=N]
6	Assign the number of seconds before a camped-on call returns to the Attendant console (1-1 20)	[Number of seconds; 3 0 ]
8	Number of seconds before park return	[0-240; 120]
11-18	Assign the eight PDCs that are used to access calls parked by the Attendant. Data will be a pseudo-PD. or O for none.	[Pseudo-PDCs; 800-807]
25	Assign a speed dialing access code	[1 00-1 89]
26	Assign speed dialing number	[0-9, *, #]
25	Assign a virtual facility access code	[1 90-1 99]
26	Assign a virtual facility number	[0-9, *, #]
27	Allow dial access to this virtual facility	[1=Y/0=N]
30	Enter your area code	[Your area code]
31	Allow toll-restricted station to make toll calls within your area code	[1=Y/0=N]
32	Is the 1 prefix required to dial outside your area code?	[1=Y/0=N]
33	Is the 1 prefix required to dial toll calls within your area code?	[1=Y/0=N]
34	Toll restrict calls made over inter-PBX trunks (type 805) that start with one specific digit	[1-9; 0 for none]
35	Specify the number of digits in the IXC code	[0= 5 digits, 1 = 5 or 7 digits, 2 = 7 digits]
36	identify the INPA status for toll restriction checking	[0= non-INPA, 1 = INPA]

Table E-V. System Administration (Menu=4) (Contd)

ACTION	DESCRIPTION	DATA
37	Specify type of dialing plan for Home Area Code calls	[0=7-digit dialing; 1 = 10-digit dialing]
38	Specify the number of digits used for international dialing	[0=13digits,1=15 digits]
40	Provide call coverage ringing on internal calls	[1=Y/0=N]
41	Specify the number of rings before calls are sent to call coverage or call following calls return to their home station	[0-31 ; 2]
50	Set time of day	[HHMM]
51	Set the date	[MMDDYY]
52	Allow SMDR records to be sent to the SMDR port	[1=Y/0=N]
53	Minimum length of calls that will be recorded by SMDR (seconds)	10-255; 40]
60	Specify the modem request code	[1 -9999; 820]
61	Does the receiver respond to remote loop	[1=Y/0=N]
62	Disconnect on loss of carrier	[1=Y/0=N]
63	Are pins CF and CB common	[1=Y/0=N]
64	Disconnect on received space	[1=Y/0=N]
65	Should the system send a space character on disconnect	[1=Y/0=N]
68	Enable dial tone for incoming tie trunks?	[1=Y/0=N]
69	Allow trunk-to-trunk transfer for incoming Loop Start trunks?	[1=Y/0=N]
70	Should maintenance busy of GS trunks be blocked?	[1=Y/0=N]
71	Assign the CO trunk pool access code	[1 -9999]
72	Set the number of DID digits used to match against station PDCs	[2-4; 0 for none; 3]
73	Assign the number of account code digits	[0-15; 15]
74	Display/change expert mode prompt (up to 9 printable characters	[“Command:”]

Table E-V. System Administration (Menu=4) (Contd)

ACTION	DESCRIPTION	DATA
75	Change administration password (up to 8 ["8 characters or less"] printable characters, no spaces allowed, display always shows "????????")	
76	Change display ID for "PDC 0" (up to 11 printable ASCII characters	["ATTENDANT"]
77	Change/remove display ID for unassigned DID numbers (up to 11 printable ASCII characters	["11 characters or less," or ** to remove; "OUTSIDE"]
78	Change/remove display ID for unassigned DID numbers (up to 11 or ** to remove; printable ASCII characters)	["NO DID,IN"]
81	Switched Loop Attendant system; Audible tone at expiration of hold timer?	[1=Y/0=N]
83	Switched Loop Attendant system: Length of hold timer (seconds)	[1 0-255; 20]
84	switched Loop Attendant system: DID access code to receive "0" treatment (PD. format, no leading zeros, can't exist in system number plan prior to this)	[PD.]
85	Switched Loop Attendant system; Enable automatic hold feature?	[1=Y/0=N]
86	Switched Loop attendant system: Should calls return to the common queue after second hold timer expires?	[1=Y/0=N]
87	Single-position Switched Loop Attendant system: PD. of multiline station serving as coverage when the attendant is in POS BUSY mode (PD./station must already exist)	[PD.]
88	For Switched Loop Attendant System ONLY: Specify SLAC attendant (1st or 2nd) for Action 89, below.	[1=1st Att., 2=2nd Att.]

Table E-V. System Administration (Menu=4) (Contd)

ACTION	DESCRIPTION	DATA
89	Should this SLAC attendant (specified in Action 88) receive a single-ring reminder whenever a new call enters the queue?	[1=Y/0=N]
90	Dual-position Switched Loop Attendant system: Which attendant should take on default message center-like characteristics? (See Table E-X)	[0=neither, 1=1st Att., 2=2nd Att.]
91	Switched Loop Attendant system: Enter call type code:	[1-6, 8, 70-732; see Table E-W]
92	Switched Loop Attendant system, Must have selected call type via Action 91: Enter call type priority.	[1-7; 0=call will not ring in queue (type 701-732 only)]
93	Switched Loop Attendant system, Must have selected call type via Action 91 (if call type codes 2 and 6: NOT ADMINISTRABLE); which attendant should receive this call?	[0-3; see Tables E-W & E-X; 0=either Att., 1=1st Att., 2=2nd Att., 3=originating attendant (for call type 8 only)]
96	VMS disconnect: forward disconnect for VP4 (900 msec); or # #99 disconnect message for VP1	[0=VP1/1=VP4]
100	For Callback Queuing: Enter the maximum queue size for outgoing facilities:	[0-64; 64]
101	For Callback Queuing: Enter the maximum queue size for internal facilities:	[0-64; 64]
102	For Callback Queuing: Enter the minimum time (in seconds) between callback retries for internal facilities	[0-120; 30]

Table E-V. System Administration (Menu=4) (Contd)

ACTION	DESCRIPTION	DATA
103	For Callback Queuing: Enter the minimum time (in seconds) between callback retries for outgoing facilities	[0-1 20; 30]
110	For Remote Access: Enable barrier codes?	[1=Y/1=N]
111	Assign DID remote access digits	[PD.; 0]
113	Assign the remote Facility Restriction Level (FRL)	[0-3;3]
114	Assign the remote toll restriction class	[1-4; 0 for none]
115	Assign remote total outward restriction	[1=Y/0=N]
116	Assign remote CO pool dial restriction	[1=Y/0=N]
117	Assign remote other pools dial restriction	[1=Y/0=N]
119	Assign the number of barrier code digits to be used: 5 through 15 digits*	[5 through 15; 5]
120	Assign a barrier code number for remote access	[1-16]
121	Assign barrier code digits (5 through 15 [5 through 15 digits or 0 digits; 0-9, *, #)	to remove]
122	Assign barrier code's FRL	[0-3; 3]
123	Assign barrier code's toll class	[1-4 or 0 for none]
124	Assign barrier code's total outward restriction	[1=Y/0=N]
125	Assign barrier code's CO pool dial restriction	[1=Y/0=N]
126	Assign barrier code's "other pools" dial restriction	[1=Y/0=N]
128	To identify SMDR terminal	{0=non-CAT;1=CAT}
129	Assign remote access Night Service backup station	[PD.; 0]

\*NOTE: Whenever the barrier code size is changed, the previously entered barrier codes are cleared.

Table E-V. System Administration (Menu=4) (Contd)

ACTION	DESCRIPTION	DATA
130	Assign RIMS barrier code digits (5 [5 through 15 digits or 0 through 15 digits; 0-9, *, #	to remove; 98765]
140	Sync. source"	[0= Internal] [CSS of TN767=External
142	Enable automatic sync. Source switching	[1=enable/0=disable]

\* In order to change the thing source, the DATA for Action 142 must be a"1 ."

**Table E-W. Standard Call Type Defaults  
FOR SWITCHED LOOP SYSTEMS ONLY**

<b>CALL TYPE</b>	<b>CODE (Action 91)</b>	<b>DEFAULT PRIORITY (Action 92)</b>	<b>DEFAULT ATTENDANT (Action 93)</b>
Dial Attendant (0)	1	4	0
Call Following - Logged to SLAC	2	4	NA
Non logged in FPDC	3	4	0
Unassigned DID	4	4	0
Attendant DID access code	5	4	0
PD. of Attendant	6	4	NA
Coverage	701-732	4	0
Returning	8	4	0

**Table E-X. Message-Center-Like Call-Type Defaults (effect of Action 90)  
FOR SWITCHED LOOP SYSTEMS ONLY**

CALL TYPE	CODE (Action 91)	DEFAULT PRIORITY (Action 92)	DEFAULT ATTENDANT (Action 93)
non-logged in FPDC	3	4	(selected with Action 90)
Unassigned DID	4	4	*
Coverage	701-732	4	*
Returning	8	4*	*
Dial Attendant (0)	1	4	(opposite of
Attendant DID Access Code	5	4	Action 90 selection)
Call following – Logged into S L A C	2	4	NA
PD. of Attendant	6	4	NA

**Table E-Y. Floating PD. Administration (Menu=5)**

ACTION	DESCRIPTION	DATA
1	List active FPDCs	2
3	Delete an FPDC	[FPDC to be deleted]
4	Enter existing FPDC to be named	[FPDC]
5	Assign/remove Display ID from FPDC selected with Action 4	["11 characters or less," or **to remove]

**APPENDIX E: Administration Codes and Data**

**Table E-Z. Direct Group Calling (DGC) Administration (Menu=6)**

<b>ACTION</b>	<b>DESCRIPTION</b>	<b>DATA</b>
1	Assign a DGC access code (0 to delete an existing DGC access code)	[New DGC access code]
2	For data DGC groups only; Disable DGC queuing?	[1=Y/0=N]
3	Designate the VMS Message Waiting indication receiver	[PD. or 0 for none]
11	List members of a DGC group	
12	Add a member to a DGC group	[PD. to be added]
13	Delete a member from a DGC group	[PD. to be deleted]
14	Assign/remove Display ID for the DGC access code specified with Action 1.	["11 characters or less," ** to remove]
20	Assign Delay Announcement machine	[PD of DA machine]
21	Enter time interval, in seconds, before DGC calls sent to DA machine or button appearance.	[1 -255 seconds]
51	Display night service trunks for DGCs	
52	Assign night service trunk to DGC	4-digit trunk #]
53	Delete night service trunk from DGC	4-digit trunk #]

**Table E-AA. Toll Calls Allowed (TCA) List Administration (Menu=7)**

<b>ACTION</b>	<b>DESCRIPTION</b>	<b>DATA</b>
1	List numbers in a TCA list	
2	Add a number to the list	[AAA, NAA-AAA or 0NAAAA]
3	Delete a number from the list	[AAA, NAA-AAA or 0NAAAA]

Table E-AB. DGC Announcement Administration

ACTION	DESCRIPTION	DATA
1	DGC Announcement	2 5 5
2	P D C	[Unique PDC]
3	Dial Restricted	[1=yes, 0=no (default)]
90	Assign Announcement Port Display ID	11 characters or less

Table E-AC. Searches: Action Items (Menu=8)

ACTION	DESCRIPTION	DATA
1	Search for PDCs of call coverage senders	[1]
2	Call coverage receiver group	[1-32 or 101-132 if DGC coverage group]
1	Search for stations covering a specified group	[ 2 ]
2	Call coverage group	[1 -32]
1	Search for PDC of call coverage (individual) receivers	[3]
2	PDC of covered station	[PDC]
1	Search for PDC having an auto-intercom, message waiting,	[4]
2	PDC of pointed-to station	[PDC]
1	Search for PDCs that hunt to a specified station	[5]
2	PDC of hunted-to station	[PDC]
1	Search for DGC group number for a specified station	[6]
2	PDC of station whose DGC group is desired	[PDC]
1	Search for lists of stations that are currently eligible to receive calls in a given DGC group	[7]
2	DGC group number	[1-32]
3	1=NOT-Made-Busy members; 0= Made-Busy members	[1/0]
1	Search for PDC having a personal trunk	[8]
2	Trunk number of personal trunk	[trunk number]

Table E-AC. Searches: Action Items (Menu=8) (Contd)

ACTION	DESCRIPTION	DATA
1	Search for PDC of pickup group members	[9]
2	Pickup group number	[1-16]
1	Search for assigned PDCs	[11]
1	Search for stations associated with directed night service	[12]
2	Trunk number for directed night service	[trunk number]
1	Search for directed night service trunks	[13]
2	PDC of station whose night service assignments are being searched for	[PDC]
1	Search for physical board locations	[15]
2	Port or board type (see Tables E-AD and E-AE)	[port or board type]
1	Search for physical port locations	[16]
2	Port or board type (see Tables E-AD and E-AE; O not applicable)	[port or board type]
3	Limit the search to (1=)untranslated or (0=)translated ports	[1/0]
1	Search for translated board locations	[17]
2	Port or board type (see Tables E-AD and E-AE)	[port or board type]
1	Search for translated port locations	[18]
2	Port or board type (see Table E-AD and E-AE; O not applicable)	[port or board type]
3	Limit the search to (1=)untranslated or (0=)translated ports	[1/0]
1	Search for port location of external alert	[19]
2	PDC of station with external alert	[PDC]

Table E-AC. Searches: Action Items (Menu=8) (Contd)

ACTION	DESCRIPTION	DATA
1	Search for button location on a station	[20]
2	PDC of station with buttons	[PDC]
3	Button function code (see "Action 10111 column of Table E-D)	[1-42]
1	Search for Area Codes assigned to specified ARS pattern	[21]
2	Pattern number or wildcard character	[1-8 or .]
1	Search for the DDC that can dial for a station or data port.	[22]
2	Enter PDC/DDC being "dialed for:"	[PDC/DDC]
1	Search for bridged appearances	[23]
2	PDC of the principal	[PDC]
3	Principal's SA button number	[button #]
1	Search for PDCs of all Agent stations pointing to a Monitor station (AGENT STATUS FOR CMS buttons)	[24]
2	PDC of Monitor station (containing one or more Monitor buttons)	[PDC]
3	Search for the specific agent pointing to a specific button on the monitor station.	[monitor station button #]
1	Search for DS1 Physical CP location	[25]
2	Search for DS1 specifying CP	767,722
1	Search for translated DS1 CP	[26]
2	Search for translated DS1 type	767,722
1	Search for permanent system alarms	[30]
1	Search for transient system alarms	[31]
1	Search for most recent errors	[32]

Table E-AC. Searches: Action Items (Menu=8) (Contd)

ACTION	DESCRIPTION	DATA
1	“Given number, get Display ID” search (PDC, DDC, FPDC, or DGC access ,code ONLY)	[40]
2	Enter existing PDC, DDC, FPDC, or DGC access code:	[PDC / DDC / FPDC / DGC]
1	“Given number, get Display ID” search (trunk LDN ONLY)	[41]
2	Enter existing trunk LDN:	[trunk LDN]
1	" Given Display ID, get number" search (PDC, DDC, FPDC, or DGC names ONLY)	[42]
2	Enter existing PDC, DDC, FPDC, or DGC Display ID:	["11 characters or less ",]
1	“Given Display ID, get number” search (trunk names ONLY)	[43]
2	Enter existing trunk name:	>["11 characters or less ",]
1	Display list of port board types, vintages, and locations	[50]

Table E-AD. Board Type—Wildcard Representation

CATEGORY:	BOARD DESCRIPTION:	DATA:
Empty		
	Empty Slot (Searches 15 & 17 only)	0
Station		
	Single-line Voice Terminal or Special Port MERLIN CS Voice Terminal or Attendant MET Voice Terminal	2.. 3.. 4..
Trunk		
	Ground Start or Paging Loop Start or Paging DID T I E	7.. 8.. 9.. 10..
Special		
	Touch Tone Receiver Paging Selector Consoles Pooled Modem Tone Detector Dial Dictation	11.. 13.. 16.. 19.. 21.. 22..
Data		
	Data Ports	18..

Table E-AE. Port/Board Type—Specific Representation

CATEGORY:	DESCRIPTION:	DATA:
Voice Station		
	<b>SINGLE-LINE VOICE TERMINALS:</b>	
	Without message waiting indicator	201
	With message waiting indicator	202
	<b>MERLIN CS (ATL) VOICE TERMINALS:</b>	
	5-Button, Z7302H01	302
	10-Button, Z7303H01	304
	10-Button Hands-Free Answer on Intercom, Z7309H01	303
	10-Button Built-in-Speakerphone, Z7313H01 A	303
	22-Button Built-in-Speakerphone, Z7314H01A	312
	34-Button, Z7305H01	307*
	34-Button Deluxe, Z7305H02,) (NOT attendant)	307
	34-Button Built-in-Speakerphone, Z7305H03, (NOT attendant)	305
	34-Button Deluxe Built-in-Speakerphone, Z7316H01 A, (NOT attendant)	305
	34-Button Built-in-Speakerphone with 16-Character Display, Z7305H04C, (NOT attendant)	308
	34-Button Deluxe Built-in-Speakerphone with 16-Character Display, Z7317H01A, (NOT attendant)	308

\* An acceptable alternative is 306

Table E-AE. Pod/Board Type—Specific Representation (Contd)

CATEGORY:	DESCRIPTION:	DATA:
<b>Voice Station (Contd)</b>		
	<b>ATTENDANT VOICE TERMINALS:</b> Direct Trunk Attendant Console (34-Button Deluxe or 34-Button Deluxe Built-in-Speakerphone)	309
	Switched Loop Attendant Console (34-Button Built-in-Speakerphone with 16-Character Display)	310
	Switched Loop Attendant Console, Deluxe (34-Button Deluxe Built-in-Speakerphone with 16-Character Display)	311
	<b>MET VOICE TERMINALS:</b> 10-Button MET 10-Button MET with Built-in- Speakerphone 12-Button MET	401 401 401
<b>Trunk</b>		
	Ground Start, CO Ground Start, WATS Loop Start, CO Loop Start, WATS PBX/Centrex DID Immediate Dial DID Wink Start	701 702 801 802 805 901 902 1001 1002 1003 1004 1005 1006

Table E-AE. Port/Board Type—Specific Representation (Contd)

CATEGORY:	DESCRIPTION:	DATA:
Trunk (Contd)		
	Delay Dial-in/Auto-out	1007
	Delay Dial-in/Delay Dial-out	1008
Special		
	Service Circuit ZTN85 (R1V1, R2V2)	1101
	Service Circuit Pack ZTN131 (R3)	1102
	External Alerts	253
	First Paging Zone	1301
	Second Paging Zone	1302
	Third Paging Zone	1303
	DGC Delay Announcement	255
	Music-on-Hold	254
	First Selector Console	1601
	Second Selector Console	1602
	First Directed Night Service Delay Announcement	251
	Second Directed Night Service Delay Announcement	252
	Pooled Modem	1901
	Tone Detector	2101
	Dial Dictation	201 and/ or 2201
	VMS: Standard Voice Mail Services	260
	VMS: Call Coverage/Auto-Attendant	261
	VMS: Message Drop	262
	VMS: Announcement Service	263
Data		
	Standard Data Port	1801
	STARLAN Interface Port (STARLAN CP), DLC compatible	1802

Table E-K Save/Restore and System Restarts (Menu=9)

For Action=1, you need to press the PLAY and RECORD buttons.  
 For Action=2 and Action=3, you need to press the PLAY button.

ACTION	DESCRIPTION	DATA
1	Save (Backup) translations	[1 to run]
2	Verify translations	[1 to run]
3	Restore translations	[1 to run]
10	Force a system warm start. FOR QUALIFIED SYSTEMS TECHNICIAN ONLY	[1 to run]
20	Force a system cold start. FOR QUALIFIED SYSTEMS TECHNICIAN ONLY. "Full Default" cold start will reinstate all default values (true cold start). "Limited Default" cold start will reinstate default values everywhere except for port boards.	[1 for Full Default, 2 for Limited Default]

**Caution:** Action=3 will interrupt phone service for about ten minutes.

You should save and restore translations during system off-hours, since these operations can affect phone service and call traffic can affect these operations.

Table E-AG. RS232 Port Administration (Menu=10)

In response to "RS232=", enter the RS232 connector (1-5\*) to be administered.

ACTION	DESCRIPTION	DATA
1	Reassign RS232 connector capability	[0 to disconnect port or see footnote † for options and defaults]
2	For Ports 1-4 ONLY*: Change the RETURN delay	[0-2;0]
3	For Ports 1-4 ONLY*: Change the baud rate	[300, 1200, 4800, 9600 See footnote † for defaults]

\* Ports 1-4 are the RS232 connectors off the Call Processor. Port 5 is a special modem port accessed through the switch fabric for RIMS.

† The default for each Target connector is as follows:

TARGET	DEFAULT DATA (= Capability)	DEFAULT BAUD RATE
1	1 (= Administration)	1200, 300 (auto-baud)
2	2 (=SMDR)	1200
3	3 (= Save/Restore Tape)	1200
4	Reserved	9600, 1200 (auto-baud)
5	RIMS	1200

Table E-AH. Automatic Route Selection Administration (Menu=1)

ACTION	DESCRIPTION	DATA
100	Assign a pattern number	[1-8]
101	Assign a start time for subpattern 1 A in the form HOUR, MINUTES (HHMM)	[HHMM]
102	Assign a stop time for subpattern 1A	[HHMM]
110	Assign Route 1 for subpattern 1A (a facility access code [FAC] or virtual facility code [VFC])	[FAC or VFC]
111	Assign facility restriction level (FRL 0-3) for subpattern 1A, route 1	[FRL]
120	Assign Route 2 for subpattern 1A (a facility access code [FAC] or virtual facility code [VFC])	[FAC or VFC]
121	Assign facility restriction level (FRL 0-3) for subpattern 1A, route 2	[FRL]
130	Assign Route 3 for subpattern 1 A (a facility access code [FAC] or virtual facility code [VFC])	[FAC or VFC]
131	Assign facility restriction level (FRL 0-3) for subpattern 1A, route 3	[FRL]
140	Allow subpattern 1A to overflow to DDD (1=YES,0=NO)	[1/0]
141	Assign facility restriction level (0-3) for DOD overflow	[FRL]
200	Assign a pattern number	[1 -8]
210	Assign Route 1 for subpattern 1 B (a facility access code [FAC] or virtual facility code [VFC])	[FAC or VFC]
211	Assign facility restriction level (FRL 0-3) for subpattern 1 B, route 1	[FRL]
220	Assign Route 2 for subpattern 1 B (a facility access code [FAC] or virtual facility code [VFC])	[FAC or VFC]
221	Assign facility restriction level (FRL 0-3) for subpattern 1 B, route 2	[FRL]

Table E-AH. Automatic Route Selection Administration (Menu=11)  
(Contd)

ACTION	DESCRIPTION	DATA
230	Assign Route 3 for subpattern 1 B (a facility access code [FAC] or virtual facility code [VFC])	[FAC or VFC]
231	Assign facility restriction level (FRL 0-3) for subpattern 1 B, route 3	[FRL]
240	Allow subpattern 1 B to overflow to DDD (1=YES,0=NO)	[1/0]
241	Assign facility restriction level (0-3) for DDD overflow	[FRL]
300	Area Code for which an ARS pattern is being assigned	[Area Code]
301	ARS pattern number associated with this Area Code	[1-8; 0 for none; 1]
401	Assign the ARS access code	[dial code: 9]
402	Assign ARS pattern number for international calls	[1-8; 0 for none; 0]
500	Home Area Code (HAC) exception list number (1-4)	[1-4]
501	ARS routing pattern associated with this HAC exception list	[1-8]
511	Display CO codes on this HAC exception list (READ ONLY)	
512	Add CO code to HAC exception list	[Code Number]
513	Remove CO code from HAC exception list	[Code Number]
521	Display HAC exception list telephone numbers (7 digits)	[7-digit number]
522	Add a (7-digit) telephone number to the HAC exception list	[7-digit number]
523	Remove a (7-digit) telephone number from the HAC exception list	[7-digit number]

Table E-AH. Automatic Route Selection Administration (Menu=11)  
(Contd)

ACTION	DESCRIPTION	DATA
601	Assign a 7-digit emergency telephone number	[7-digit number]
602	Assign a 7-digit emergency telephone number	[7-digit number]
603	Assign a 7-digit emergency telephone number	[7-digit number]
700	Enter facility (route) code number	[FAC or VFC]
701	Assign associated area code	[Associated area code]
702	Specify how many digits to strip from the front when the dialed number is to the associated area code	[Number of digits]
703	Specify digits to be prefixed, after deleting digits as specified by Action 702 above, for calls to the associated area code	[Digits to be prefixed]
704	Specify how many digits to strip from the front when the dialed number is NOT to the associated area code	[Number of digits]
705	Specify digits to be prefixed, after deleting digits as specified by Action 704 above, for calls NOT to the associated area code	[Digits to be prefixed]
800	Pattern number for other area codes exception telephone numbers	[1-8]
821	Display entries in other area codes exception list	
822	Add a number to the other area codes exception list (first 8 or fewer digits of a 10-digit telephone number)	[Number]
823	Remove a number from the other area code exception list	[Telephone number]

Table E-AH. Automatic Route Selection Administration (Menu=11)  
(Contd)

ACTION	DESCRIPTION	DATA
900	N11 CO exchange for which a pattern is being assigned (where N=2-8)	[N11 code]
901	ARS pattern number to route these N11 calls	[1-8 or O if this N11 Code must be followed by 4 other digits (N11 -XXXX)]

## APPENDIX F: Administration Error Messages

APPENDIX F shows Basic Administration error codes and descriptions. The Advanced Administration system uses different terminology. For additional details about an error message in Basic Administration, press the “?” key.

The following table lists and describes error messages that can be displayed at the SAT while administering the system. The table also includes possible solutions for some of the error messages.

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
1000: entry out of range must be 3-4 digits	Entered data must be a 3- or 4-digit number or 0.
1001: incorrect entry must be 0 with equipped facility	This error occurs you try to change the terminal code type. <b>EXAMPLE:</b> Go to MENU 2 (PDC). Go to any PDC target value and type ACTION = 1, you see DATA = terminal code type 304 etc. (Try to change the DATA value to another terminal code type) DATA = 305 you get error 1001: (You have to 0 the terminal type code if you want to change its value)
1002: incorrect PDC does not exist or used improperly	Could be existing PDC number Go to MENU 8 (search) ACTION = 1 DATA= 11 Hit c to continue to search for assigned PDCs
1003: inappropriate request incorrect mode	The entered mode does not exist.
1004: incorrect entry or cabinet number out of range	Cabinet-Slot-Port (CSSPP) SS must be a number from 1 to 3
1005: incorrect entry slot number out of range	Cabinet-Slot-Port (CSSPP) SS must be a number from 1 to 12

APPENDIX F: Administration Error Messages

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
1006: incorrect entry port-on-board number out of range	Cabinet-Slot-Port (CSSPP) PP must be a number from 1 to 8 (varies on different circuit packs)
1007: incorrect action number can't exceed 1 with unequipped facility	Must administer ACTION = 1 before proceeding.
1008: incorrect entry port-on-board number out of range	The entered port is greater than maximum port number on the associated board.
1009: incorrect entry number must be 5 digits	Number must be 5 digits. Nonspecial port does not have 5 digits.
1010: incorrect facility type does not exist or used improperly	The facility type is not valid for this system.
1011: inappropriate request FPDC already exists	Go to MENU 5 (FPDC) ACTION = 1 Hit c to continue to list FPDCs. FPDC could be not assigned.
1012: incorrect PDC does not exist or used improperly	The entered number is valid but is not a station or data port.
1013: inappropriate request slot not equipped	Port type has to be administered before proceeding.
1014: inappropriate request must be station	Must be a station supported by System 25. See Voice Terminal Type Codes in <i>Administration Manual</i> . Can only move port associated with station.
1015: inappropriate request can't move CAP port	Can not move the port associated with the CAP.
1016: incorrect action number must be 0-2	Item numbers must be 0-2 at this point.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
1017: inappropriate request system already has Direct C A P	Cap already installed ACTION = 1 (Cap) Go to MENU 8 (Searches) ACTION = 1 DATA = 18 ACTION = 2 DATA = 309 or 310 ACTION = 3 DATA = 0
1018: inappropriate request must remove secondary CAP first	Must remove secondary CAP before attempting to remove the first CAP.
1019: incorrect action number does not exist or used improperly	Check if the ACTION value taken is legal.
1020: inappropriate request primary or secondary CAP does not exist	Trying to administer features to a secondary CAP that does not exist.
1021: at installed max -200 stations	At the maximum number of stations allowed by the system.
1022: at installed max -104 trunk	At the maximum number of trunks allowed by the system.
1023: button function code out of range does not exist or used improperly	Button station out of range for terminal type code. Check station for button range. (invalid button function code)
1024: at installed max -300 FPDCs	At system maximum of 300 FPDCs.
1025: at installed max -199 EMT sets	At system maximum of 199 EMT sets.
1026: at installation max -96 ATL set	Maximum of 111 ATL sets, 2 of which have to be CAPS
1027: at installed max -104 trunk	At system maximum of 104 ground-start trunks.
1028: at installed max -104 trunk	At system maximum of 104 loop-start trunks.
1029: at installed max -104 trunk	At system maximum of 104 DID trunks.
1030: at installed max -32 Tie trunk	At system maximum of 32 TIE trunks.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
1031: at installed max -12 Touch-Tone Receivers	At system maximum of 12 touch-tone receivers.
1032: at installed max -8 external alert	At system maximum of 8 external alerts
1033: at installed max -3 paging zones	At system maximum of 3 paging zones.
1034: at installed max 2 announcement machine	At system maximum of 2 Direct Night Service Delay Announcements or limit of 1 delay announcement for DGC groups.
1035: at installed max 1 music on hold	At system maximum of 1 music on hold port.
1036: at installed max -2 selector console	At system maximum of 2 selector consoles
1037: at installed max -2 night service announcement machine	At system maximum of 2 Night Service Delay Announcements.
1038: at installed max -256 port	At system maximum of 256 ports.
1039: at Installed max -Pooled Modems	At system maximum of 6 Pooled Modem Circuit Packs/System 2 PM CP/Cabinet. (12 conversion resources)
1040: at installed max no more 34-button sets available	At system maximum for 34-button sets . 53 ATLS max (55 34B or 22B sets)
1041: at installed max no more 10-button sets available	At system maximum for 10-button sets . 109 5-button or 10-button sets
1042: incorrect entry not CAP/Msg Waiting already installed	CAP MW button already installed or station not a CAP port.
1043: incorrect button function code button 8 (CAP alarm) not allowed	Cannot administer CAP Alarm button.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
1044: inappropriate request primary or secondary CAP unavailable	Neither primary nor secondary CAP universal port number agrees with the one stored by admin. on the stack.
1045: at installed max -104 data port	At system maximum of 104 data ports.
1046: incorrect button function code button facility already exists	Duplicate button function code found.
1047: incorrect button number out of range or reserved for system use	Button number out of range for voice terminal type or certain button types are not assignable.
1048: inappropriate request CAP buttons fixed - can't assign	Certain feature buttons are not administrable on the CAP.
1049: inappropriate request DID trunk can't be pool member	A DID trunk cannot be part of an outgoing trunk pool facility
1050: incorrect facility type must be ATL set or MET set	Must be an ATL or MET set before you can administer a button feature or facility type. Facility type cannot be used in conjunction with this button function code.
1051: inappropriate request group station max reached	At system maximum for sets allowed in a particular group.
1052: at installed max -Service Circuit	Can only install 1 Service Circuit per system.
1054: incorrect button function code does not exist or used improperly	External button code entered by customer is invalid.
1055: entry out of range must be 0-1 with station/ring enable	Allow a 0-1 only, any other input is invalid.

APPENDIX F: Administration Error Messages

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
1056: inappropriate request must be virtual facility	Trying to administer something other than a Virtual digit. [0-9, *, #] Must be a Virtual Facility.
1057: at installed max System btn or station group max reached	Group or button maximum reached. Station is sender in group.
1058: incorrect entry illegal character within data	Can only enter numerical values for trunk number. Unexpected ASCII character received.
1059: Inappropriate request, system already has QIC-CAP.	System has SLAC, cannot add DTAC.
1060: inappropriate request station already exists	Trying to administer a station that exists. Go to MENU 8-Search ACTION = 1 DATA = 11 Hit c to continue to search for assigned PDCs to verify that the station exists.
1061: incorrect action number can't exceed 2 digits	Cannot exceed 2 digits.
1062: inappropriate request selector console not installed	Trying to administer selector console features without the selector console installed.
1063: incorrect facility type must be selector console	Trying to administer selector console features on something other than the selector console.
1064: incorrect action number out of range for selector console	Item number is out of range.
1065: A system error has occurred, sorry please consult user documentation	A PLI error has been generated.
1066: incorrect entry can't exceed 7 digits	Inserted dialed digits cannot exceed 7 digits.
1067: incorrect action number must be virtual facility	Enter VF Access Code before you enter VF number.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
1069: incorrect facility type incompatible with board type	Board and features do not mix. Check slot location for correct board or not compatible with the already entered types on the board.
1070: facility type out of range must be 3-4 digits	Must be 3 or 4 digits.
1071: inappropriate request name does not exist	Name does not exist. Go to MENU 8 (Search) ACTION = 1 DATA = 40 ACTION = 2 DATA = PDC Hit c to continue to search for name associated with PDC, DDC, FPDC, or DGC.
1072: PDC out of range can't exceed 4 digits	System 25 dial codes may have 1,2,3 or 4 digits only.
1073: incorrect entry must begin with quote	You are administering a character string and must begin with quotes.
1074: incorrect action number can't update with 0	Cannot update under action zero.
1075: entry out of range data must be 28 digits or less	System Speed Dialing numbers must be 28 digits or less.
1077: incorrect entry 5 zeroes always incorrect	5 zeros are never a legal entry.
1078: incorrect entry leading zeroes not allowed	Leading zeros are not allowed for Toll Call Allowed Lists.
1079: incorrect action number can't exceed 2 with unequipped facility	Item not installed, cannot enter items greater than 2.
1080: incorrect entry must be 0 for removal	Item must be 0 for removal.
1081: at installation max 109 MET sets	System maximum of 109 MET sets.
1082: inappropriate request TT generator already installed	TT generator already exists at this location

APPENDIX F: Administration Error Messages

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
1083: inappropriate request TT generator not installed	Recheck translations to see if TT generator was installed.
1084: inappropriate request system already has two CAPS	Trying to administer a third CAP when you are only allowed two.
1085: incorrect entry must be 0-3 if parity, else 0-1	Data parity setting must be between 0-3. Delay break for STARLAN is 0-1.
1086: inappropriate request DID trunk can't have Trunk ID	Cannot assign a DID trunk port an (ID) name. Go to MENU 1 (Port) ACTION = 90 DATA = "name-not-allowed " for DID trunk.
1088: entry out of range data must be 10-255	SMDR billing must be between 10-255 seconds MENU = 4 (System) ACTION = 53 DATA = 10-255
1089: entry out of range port can't exceed 5 digits	Port number cannot exceed 5 digits.
1090: at installed max -1 data button	Can only associate 1 data button with a PDC.
1091: incorrect entry data must be 0-7	Switched Loop Console call type priority must be between 0-7. See: MENU = 4 (System) ACTION = 92 for more information.
1092: incorrect entry Trunk ID must be 9 characters or less	You are exceeding the amount of characters that a trunk name (ID) can be.

APPENDIX F: Administration Error Messages

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
1094: inappropriate request only DISPLAY of SLC-CAP status allowed	Display attendant position DTAC/SLAC. See: MENU = 1 (Port) ACTION = 60 for more information.
1095: action number out of sequence must enter 90 &/or 91 first	Check MENU 4 (System Administration) for administering correct sequence.
1096: entry out of range data must be 1-7	Call type priority must be between 1-7. Check MENU 4 Action item 92.
1097: entry out of range data must be 1-8	Call type code must be between 1-8. Check MENU 4 Action item 91
1098: entry out of range data must be 0-2	Denotes att. that should receive calls from this trunk. NOTE: Data range must be between 0-2 not 1-3. See: MENU = 1 (Port) UNDER TRUNKS ACTION = 12 for more information.
1099: incorrect entry too many characters	Must be <= 11 printable ASCII characters.
2000: incorrect action number can't exceed 3 digits	4-digit number not supported.
2001: inappropriate request must be data port	Must be data port for Action 22 to be legal. See: MENU = 1 (Port) UNDER DATA PORT ACTION = 22 for more information.
2002: inappropriate request must be station or data port	Trying to administer a feature that is not related to a station or data port. Button number invalid (button numbers <9 are already programmed or system access.)

**APPENDIX F: Administration Error Messages**

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<b>ERROR MESSAGE AND DESCRIPTION</b>	<b>POSSIBLE SOLUTION</b>
<b>2003: incorrect button number out of range for ATL set</b>	<b>Check button range for station type.</b>
<b>2004: inappropriate request EMT can't have button</b>	<b>Cannot administer button features on an EMT station or not allowed for particular type of service.</b>
<b>2007: incorrect facility type must be EMT</b>	<b>EMT station is required.</b>
<b>2009: inappropriate request must enter PDC first</b>	<b>Must enter PDC before you continue.</b>
<b>2011: incorrect entry must be 0-1</b>	<b>Data value must be 0-1.</b>
<b>2012: incorrect entry number out of range</b>	<b>Call coverage group number out of range.</b>
<b>2014: incorrect facility type must be Touch-tone EMT</b>	<b>Not touch-tone EMT for Off Prem. extension.</b>
<b>2015: incorrect entry group number out of range</b>	<b>Pickup group number out of range.</b>
<b>2016: incorrect PDC not allowed in hunt group</b>	<b>Only Single Line stations and data stations hunt.</b>
<b>2017: inappropriate request FPDC not allowed in hunt group</b>	<b>Floating PDCs cannot be in a hunt group.</b>
<b>2018: inappropriate request SLAC has Position Busy Button</b>	<b>Cannot remove backup station until POS-BUSY button is removed SLAC. Removing POS-BUSY button from SLAC removes backup station.</b>
<b>2019: inappropriate request facility not allowed in hunt group</b>	<b>Only single line stations and data stations hunt.</b>
<b>2020: incorrect entry number out of range</b>	<b>Toll restriction class number out of range.</b>
<b>2024: inappropriate request can't update button</b>	<b>Cannot make changes to the Alarm button.</b>

APPENDIX F: Administration Error Messages

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
2026: incorrect entry trunk does not exist	Check to see if trunk is administered. No such trunk ID.
2027: inappropriate request not optioned for night service	Cannot assign night service to a DID trunk. Trunk not optioned for night service.
2029: inappropriate request trunk already assigned station	Station already assigned to this trunk.
2030: out of space trunk station max reached	The maximum allowable night service trunks per station was reached (A trunk can be directed to 4 voice terminals.)
2031: inappropriate request incorrect night service trunk	DID trunks are not assignable to Night Service. Dial-in TIE trunks will not receive Night Service treatment. The data specified is not a 4-digit trunk number associated with night service for the station port given.
2032: inappropriate request nondata number can't receive data	Cannot add one button transfer to data for a nondata number.
2034: inappropriate request can't update - hunted	Cannot update. The station is being hunted to.
2035: inappropriate request can't update -DGC	No change or remove allowed, the station or data port belongs to a D G C .
2036: inappropriate request can't update -auto intercom	No station change or remove allowed due to auto intercom.
2037: inappropriate request can't update -manual signal	No station change or remove allowed due to manual signal.
2038: inappropriate request can't update -msg waiting	No station change or remove allowed due to message waiting.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
2039: inappropriate request buttons fixed- can't assign	Cannot assign buttons that are already fixed on the CAP.
2040: incorrect PDC must be station for prime line pref	Has to be an ATL station to assign prime line preference.
2041: inappropriate request must be ATL set for prime line pref	Has to be an ATL station to assign prime line preference.
2043: out of space no more button sets available	System maximum reached for ATL stations. No button structure left for adding a new station or a new data port.
2044: incorrect entry incorrect board type for Off Premises (OPX)	Has to be TN742 CP for OPX.
2045: incorrect facility type incompatible with button	Error occurs when administering button features. Usually relates to PDC you are trying to specify. Check validity of PDC/DDC you are trying to administer.
2046: incorrect button function code incompatible with facility	Incompatible button feature for station type.
2049: incorrect entry data must be 0-1	Data value must be 0-1.
2050: inappropriate request busy station can't be move destination	Station can't be busy if you are going to move it.
2051: incorrect entry data can't be 0	Entered data for night service contains leading zero.
2052: inappropriate request improper procedure	Cannot change Toll Calls Allowed port number here.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
2053: incorrect entry incorrect area code office code	Area Code = NPA where N=2-9, P=0-1 ,and A=1 -9. Office Code = NXX where N=2-9, X = 0 - 9 Invalid area code or office code for Toll Calls Allowed.
2054: incorrect entry data must be 0-2	Data entry must be 0-2.
2055: inappropriate request office code found in wrong list	Found office code but not in proper list.
2056: incorrect entry area code does not exist	Area Code does not exist in the NPA (no such area code found in table).
2057: incorrect entry incorrect area code office code	Specified office code pattern and list not found in table) There are no office codes for the given list under the area code.
2060: action number out of sequence improper procedure	Check the <i>Administration Manual</i> for correct ACTION sequence.
2062: entry out of range number out of range	Call Coverage Group out of range - too high.
2063: incorrect entry number can't be 0	Call Coverage Group zero not allowed.
2066: incorrect facility type must be station type	Port not a station
2067 Invalid data, SLC reprioritization 0-30 sec.	Number entered not in allowable range of time.
2068: incorrect PDC station can't have 0	Zero not allowed for station PDC.
2071: out of space no more groups available	No more Universal Port Numbers (UPNs) available.
2072: action number out of range does not exist or used improperly	Check Admin. manual for correct ACTION number/sequence.
2073: incorrect entry list reference out of range	LIST 'target' is out of range.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
2074: inappropriate request office code exists-list 1	Check Home Area Code/Toll Call Allowed list to see if office code exists in list 1. Added office code to pattern already.
2075: inappropriate request office code exists-list 2	Check Home Area Code/Toll Call Allowed list to see if office code exists in list 2. Added office code to pattern already.
2076: inappropriate request office code exists-list 3	Check Home Area Code/Toll Call Allowed list to see if office code exists in list 3. Added office code to pattern already.
2077: inappropriate request office code exists-list4	Check Home Area Code/Toll Call Allowed list to see if office code exists in list 4. Added office code to pattern already.
2078: inappropriate request subset exists-list 1	See: MENU = 7 (TCA) ACTION = 2 Trying to add a number to a TCA list that already exists in another list.
2079: inappropriate request subset exists-list 2	See: MENU =7 (TCA) ACTION =2 Trying to add a number to a TCA list that already exists in another list.
2080: inappropriate request subset exists-list 3	See: Menu = 7 (TCA) ACTION = 2 Trying to add a number to a TCA list that already exists in another list.
2081: inappropriate request subset exists-list 4	See: MENU = 7 (TCA) ACTION = 2 Trying to add a number to a TCA list that already exists in another list.

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
2082: inappropriate request superset exists-list 1	See: MENU = 7 (TCA) ACTION = 2 Trying to add a number to a TCA list that already exists in another list. In this case, the superset is used in conjunction with wild card characters.
2083: inappropriate request superset exists-list 2	See: Menu = 7 (TCA) ACTION = 2 Trying to add a number to a TCA list that already exists in another list. In this case, the superset is used in conjunction with wild card characters.
2084: inappropriate request superset exists-list3	See: MENU = 7 (TCA) ACTION = 2 Trying to add a number to's TCA list that already exists in another list. In this case, the superset is used in conjunction with wild card characters.
2085: inappropriate request superset exists-list4	See: MENU = 7 (TCA) ACTION = 2 Trying to add a number to a TCA list that already exists in another list. In this case, the superset is used in conjunction with wild card characters.
2086: inappropriate request button already assigned	Individual Call Coverage Msg Waiting button has already been added.
2087: inappropriate request not allowed for port-on-board	Option not allowed for given port. Recheck port options.
2088: incorrect entry data out of range	Value out of range for selected option.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
2089 entry out of range facility restriction level exceeded	ARS Facility Level = 0-3.
2090: inappropriate request station not allowed speed number	Single line stations are defaulted personal speed dialing. ATL stations must be administered personal speed dialing.
3000: inappropriate request trunk must be pool member	Trunk is not a pool member; therefore, this item cannot be entered.
3001: incorrect entry number must be 4 digits	Trunk directory number is not 4 digits.
3003: inappropriate request non-DID not allowed	Only DIDs can have the same trunk number.
3005: inappropriate request trunk not installed	Check trunk number to see if it exists. Trunk not installed; item cannot be requested.
3007: incorrect entry can't exceed 1 digit	Entry for DID expected digits is only 1.
3008: entry out of range DID digit must be value from 1-4	Class of service for DID must be 1-4. Check ACTION = 3 under trunks.
3010: inappropriate request number can't exceed 4,	The maximum class of service type is expected.
3011: inappropriate request dial-in ties can't have night service	Dial-in Tie trunks cannot receive service treatment.
3012: incorrect PDC leading space not allowed	Must be numerical value. The entered number was determined by the system to have a leading blank.
3013: inappropriate request already assigned to nonpool facility	The number was previously assigned to a nonpool facility.
3014: inappropriate request last pool trunk: and dependent stations	The trunk is the last one in the pool and cannot be removed until the stations with the pool buttons pointing to this pool are eliminated.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
3015: at installed max -pool groups	Can install 16 trunk group maximum.
3016: entry out of range access code must be 1 digit	Only 1 digit can be entered for the trunk pool dial access information.
3017: entry out of range access code can't exceed 1	The maximum value that can be entered for trunk pool dial access of 1.
3018: inappropriate request only display of hunt position allowed	The hunting position of a trunk in pool cannot be updated manually.
3019: incorrect entry DGC group number out of range	Can have 32 DGC groups with 20 members per group. The entered number is not in the range of allowed DGC groups.
3021: inappropriate request DID trunk can't have night service	DID trunks are not assignable to N S .
3024: inappropriate request tie trunks not allowed announcement	Cannot administer announcement for TIE trunks.
3025: inappropriate request announcement must be 0 - 2	The entered value is not a delay announcement group number.
3026: inappropriate request announcement machine not installed	The entered flexible night service delay announcement machine group does not have an announcement machine installed.
3027: inappropriate request trunk has dependent buttons	Trunk cannot be removed until the personal trunk buttons pointing to it are untranslated.
4000: incorrect action number must be 0-5.	Recheck Action value taken.

**APPENDIX F: Administration Error Messages**

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<b>ERROR MESSAGE AND DESCRIPTION</b>	<b>POSSIBLE SOLUTION</b>
4001: entry out of range FPDC max reached	Maximum FPDCs = 300
4002: incorrect entry does not exist or used improperly	Specified FPDC not found.
4003: action number out of sequence do action 1 display before FPDC removal	Must do action 1 before removing FPDC.
4005: inappropriate request unlogged FPDC's/non- existent CAP	CAP not installed even through flag is set to send FPDCs not logged in there.
4007: incorrect action number can't exceed 2 if FPDC update/display	Action invalid for FPDC update or display.
4008: inappropriate request facility not equipped	Facility unequipped for FPDC display.
4014: at installed max -300 FPDCs	Maximum FPDCs = 300
5003: incorrect entry data out of range	Number of seconds after last digit dialed to commence billing is invalid.
5005: entry out of range area code can't exceed 3 digits	NPA cannot exceed 3 digits.
5006: incorrect entry area code digit out of range	Area Code= NPA where N=2-9, P=0-1, and A=1-9.
5007: incorrect entry date must be 6 digits	Date must be in the form (MMDDYY).
5010: incorrect entry incorrect month data	Date = MMDDYY where MM=01 - 12, DD=01 -31, and YY=00-99.
5011: incorrect entry incorrect day data	Day = HHMM where HH=00-23, MM=00-59
5012: entry out of range hours/minutes must be 4 digits	Hours/minutes = HHMM (4 digits exactly)

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
5013: incorrect entry incorrect hours data	Day= HHMM where HH=00-23
5014: incorrect entry incorrect minutes data	Day = HHMM where MM= 00-59
6000: incorrect entry search type does not exist	Check search type in admin. manual to see if it exists.
6001: incorrect action number can't exceed 1 digit	Go back and check action value taken.
6003: entry out of range search max reached	Search maximum reached.
6004: inappropriate request must enter search type	Must enter search type. Check Admin. manual to verify.
6005: inappropriate request must enter search data	Cannot perform a search until all ACTION & DATA values have been entered.
6007: incorrect action number must be 1 or 2	Accepts only 1 or 2.
6008: incorrect entry data not allowed	No item #2 data expected for the search type given in item #1
6009: incorrect entry number out of range	Traffic register number given in item #2 is out of range.
6010: incorrect entry incorrect trunk	Trunk number given in item #2 is not valid.
6011: incorrect PDC not optioned or used improperly	The number under item #2 is not acceptable. It should relate to either stations, DGCs, page-all or paging zones.
6015: incorrect entry board type does not exist	The entered board type is unknown.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
6016: incorrect facility type subfacility type out of range	The subtype number is the entered type is too large for the facility specified.
6017: incorrect entry number out of range	Traffic register number given is out of range.
6018: incorrect action number incompatible with search	Item No. 3 is not applicable for the entered search type under item No. 1.
6020: incorrect action number can't exceed 4 digits	Data entered for an item number is greater than 4 digits and is not acceptable.
6021: incorrect entry DGC group number out of range	32 DGC groups/20 members per group. Can only be a member of 1 group at a time.
6022: inappropriate request must enter search data	Cannot perform a search until the data has been entered in item 3.
6023: incorrect entry type does not exist	The entered alarm type is unknown.
6024: incorrect action number incompatible with search	Item No. 2 is not applicable for the entered search type under item No. 1.
6025: incorrect entry illegal character within data	Incorrect pattern number or unexpected wild card character. See: MENU = 8 (Search) ACTION = 1 DATA = 21 or ACTION = 2 DATA = 1-8 for more information.
7003: incorrect entry data must be 1-31	Data must be 1-31. See: MENU = 4 (System) ACTION = 3 and ACTION = 7 for more information.
7004: incorrect entry data must be 0-31	Data must be 0-31. See: MENU = 4 (System) ACTION = 41 for more information.

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<b>ERROR MESSAGE AND DESCRIPTION</b>	<b>POSSIBLE SOLUTION</b>
<b>7005: incorrect entry incorrect data to restrict PBX calls</b>	Entered data not valid for restricting PBX calls.
<b>7006: incorrect entry data can't exceed 120</b>	Number of seconds before a camped on call returns to the attendant console [1-1 20].
<b>7007: inappropriate request must install CAP first</b>	To install CAP: Go to MENU 1 (Port) ACTION = 1, DATA = terminal type (309, or 310) ACTION = 2, DATA = PDC
<b>7008: inappropriate request must install CAP first</b>	Cannot set bit for FPDCs to go to the CAP because neither the primary nor secondary CAP is installed.
<b>7010: out of space no more room to change</b>	Number plan is full.
<b>7011: out of space no more room to add</b>	ID (Name) directory is full.
<b>7012: inappropriate request PDC already exists</b>	Check to see if PDC already exists. Go to MENU 8-Search ACTION = 1 DATA = 11 Hit c to continue to search for assigned PDCs
<b>7016: incorrect entry data can't exceed 1</b>	Data must be 0-1. See: MENU = 4 (System) ACTION = 5 for more information.
<b>7017: incorrect entry must be 0 - 4</b>	Data not valid for number of DID digits used by PDCs.
<b>7019: PDC out of range must be 1-9999</b>	System 25 dial codes may have 1,2,3 or 4 digits (1-9999).
<b>7020: entry out of range data can't exceed 2 digits</b>	Data is greater than 2 digits.
<b>7021: incorrect entry account code can't exceed 15 digits</b>	System Maximum Account Code digits (0-1 5). Default = 15

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
7023: incorrect entry data can't exceed 1	Data value cannot exceed 1.
7026: incorrect PDC must be station or data port	Must be station or data port.
7027: incorrect entry can't be 0 or exceed 5 digits	Entry cannot be 0 or exceed 5 digits.
7030: incorrect entry leading zeros not allowed	Leading 0 was found while processing item 2 for paging zone add.
7031: out of space no more room to add	Not enough room for adding new paging zones.
7032: incorrect PDC this zone & all zone PDC's do not agree	Entered numbers for this zone and all zone is ambiguous.
7034: action number out of sequence must enter 2 first	Must assign a paging zone before trying to administer all zone paging.
7035: inappropriate request paging zone not equipped	The paging zone is equipped; therefore the restriction flag is unknown.
7036: incorrect button number station button already exists	Button on station is previously assigned.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
7037: inappropriate request announcement group already exists	<p>Direct Group Calling Delay Announcement (1 per system). (Need a ZTN78 or TN742 CP port) Go to MENU = 8 Search ACTION = 1 DATA = 16 ACTION = 2 DATA = 255 ACTION = 3 DATA = 0 (hit c to continue)</p> <p>Directed Night Service Delay Announcement (2 per system) (Need a ZTN78 or TN742 CP port) Go to MENU = 8 Search ACTION = 1 DATA = 16 ACTION = 2 DATA = 251 or 252 ACTION = 3 DATA = 0 (hit c to continue)</p>
7039: incorrect PDC first digit ambiguous	The 1st digit of 4 is ambiguous.
7040: incorrect PDC second digit ambiguous	The 2nd digit of 4 is ambiguous.
7041: incorrect PDC third digit ambiguous	The 3rd digit of 4 is ambiguous.
7042: incorrect PDC fourth digit ambiguous	The 4th digit of 4 is ambiguous.
7045: inappropriate request PDC already member of the DGC group	<p>Do a Search to find the DGC group that the PDC is a member of. Go to MENU = 8 Search ACTION = 1 DATA = 6 ACTION = 2 DATA = PDC (hit c to continue)</p>
7046: incorrect entry data must be 0	The entered data must be 0 to show that the customer is continuing the moving of a station

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
7047: incorrect PDC not in any DGC group	Can verify that the PDC is not in a DGC group by: Go to MENU = 8 Search ACTION = 1 DATA = 6 ACTION = 2 DATA = PDC (hit c to continue)
7048: incorrect PDC not in this DGC group	Do a Search to find the DGC group the PDC is a member of. Go to MENU = 8 Search ACTION = 1 DATA = 6 ACTION = 2 DATA = PDC (hit c to continue)
7049: incorrect PDC must enter pool member	Incorrect virtual facility access code.
7050: action number out of sequence must enter access code	<p>Must administer the access code before administering the speed dialing number. Go to MENU = 4 System Administration ACTION = 25 DATA = 100-189 ACTION = 26 DATA = Speed Number [0-9, *, #]</p> <p>Must administer the access code before administering the virtual facility number. ACTION = 25 DATA = 190-199 ACTION = 26 DATA = VF number [0-9*, #]</p>
7051: entry out of range speed number must be 100-189	Access code must be 100-189 for system speed dialing.
7052: incorrect entry illegal character within speed number	Speed number must be [0-9, *, #].
7053: entry out of range must be 0-1 for pooled modem options	Under Administering System-Wide Options in the Admin. manual for pooled modem options must be a 0 - 1

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
7054: out of space no more room in digit pool	System speed digit pool is full.
7200: entry out of range RS232 value out of range	Invalid TARGET value specification. Target value should be 1-4. See: MENU = 10 (RS232)
7202: inappropriate request improper procedure	ACTION = 0 under MENU = 10 (RS232) is invalid.
7203: incorrect entry logical channel out of range	MENU = 10 (RS232) ACTION = 1 DATA = must be 1-4 (anything else is invalid.)
7204: incorrect entry return delay out of range	MENU = 10 (RS232) ACTION = 2 DATA = must be 0-2
7206: incorrect entry incorrect baud rate	MENU = 10 (RS232) ACTION = 3 DATA = baud rates must be 300, 1200, 4800, 9600. Legal baud rates for Administration and Maintenance are 1200, 4800, 9600. Legal baud rate for SMDR is 1200. Legal baud rate for Tape is 1200.
7300: incorrect action number data must be 1,2,3,10 or 20	Under Save/Restore, MENU = 9 Action values must be 1,2,3,10, or 20.
7302: inappropriate request can't update translation - tape lockout	Cannot administer system during tape backup.
7400: incorrect entry data must be 1 or 4 only  NOTE: Above is statement is wrong. data must be 2 or 3 only	MENU = 10 (RS-232) TARGET = 3 ACTION = 1 DATA = 2 or 3 SMDR output can come out of the tape port.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
<p><b>7401:</b> incorrect entry data must be 2 or 3</p> <p>NOTE: Above statement is wrong. data must be 1 or 4 only</p>	<p>MENU = 10 (RS-232) TARGET = 1 ACTION = 1 DATA = 1 or 4 (Reassign RS232 connector)</p>
<p><b>8000:</b> incorrect action number can't contain space</p>	<p>A blank space is not acceptable.</p>
<p><b>8001:</b> incorrect action number must be 3 digits</p>	<p>3 digits must be entered for this item number.</p>
<p><b>8002:</b> incorrect entry does not exist</p>	<p>The item ars activity area specified is not valid.</p>
<p><b>8100:</b> action number out of sequence must enter pattern number first</p>	<p>Must enter an ARS pattern before proceeding.</p>
<p><b>8101:</b> entry out of range time data must be 4 digits</p>	<p>Time for ARS subpattern must be in the form HOUR, MINUTES [HHMM], military time.</p>
<p><b>8102:</b> entry out of range hours data can't exceed 23</p>	<p>ARS subpattern hours [HHMM] cannot exceed 23.</p>
<p><b>8103:</b> entry out of range minutes data can't exceed 59</p>	<p>ARS subpattern minutes [HHMM] cannot exceed 59.</p>
<p><b>8106:</b> entry out of range number must be 0-3</p>	<p>ARS FRL (Facility Restriction level) must be between 0-3.</p>
<p><b>8108:</b> incorrect entry incorrect pool number</p>	<p>Facility access code (FAC) in ARS has to be a valid pool number.</p>
<p><b>8109:</b> incorrect facility type facility does not exist</p>	<p>The entered facility must be 4 digits.</p>
<p><b>8110:</b> facility type out of range must be 190-199</p>	<p>A virtual facility access code must be between 190-199.</p>

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
8111: incorrect entry trunk pool does not exist	Check the original trunk pool entered against the ARS trunk pool you are trying administer.
8112: action number out of range number must be 0-1	Only 1 and 0 are valid entries for DDD overflow in ARS.
8113: inappropriate request must install pool for this route member	Must administer an ARS FAC before trying to administer the FRL.
8201: inapproriate request incorrect pattern	The pattern cannot be changed without a valid pattern display
8202: inappropriate request must enter pattern number	An NPA was not entered before the pattern read.
8203: incorrect entry pattern digits incorrect or conflicting	The entered NPA is not valid
8204; entry out of range pattern number must be 1 digit	Patterns are 1 digit only.
8205: entry out of range pattern number must be 1-8	The pattern range is 1-8
8300: incorrect action number must be 401 or 402	The only action items acceptable are 401 or 402
8301: entry out of range access code can't exceed 4 digits	The ARS access code cannot exceed 4 digits
8302: entry out of range pattern must be 0-8	The ARS international range is 0-8 only.
8400; incorrect action number must be 0 unti pattern entered.	Must be 0 until you entered pattern. Can only enter Action 500 unti list is entered.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
8402: entry out of range list reference can't exceed 4	The list number range is between 1 - 4 .
8403: entry out of range must be 0-8 for removal	The pattern range is 1-8 or 0 for removal.
8404: incorrect entry list reference can't exceed 4	The list cannot exceed 4.
8406: inappropriate request all members of list were displayed	All information for the list was displayed. There is no more information in the list.
8407: incorrect entry must be 3 digits - first can't be 0 or 1	The entry must be 3 digits in which the first digit cannot be a 0 or 1.
8408: at installed max 800 office codes	Home NPA exception lists, 3-digit office codes are divided among 4 lists. Eight entries may be 7 digits. Max is 800 office codes
8409: inappropriate request office code exists-list 1	The office code is already entered in list 1.
8410: inappropriate request office code exists - list 2	The office code is already entered in list 2.
8411: inappropriate request office code exists-list 3	The office code is already entered in list 3.
8412: inappropriate request office code exists-list 4	The office code is already entered in list 4.
8413: inappropriate request office code not installed	The office code was never installed, so it cannot be removed.
8414: inappropriate request office code exists-list 1	The office code cannot be removed its in list 1.
8415: inappropriate request office code exists-list 2	The office code cannot be removed, its in list 2.
8416: inappropriate request office code exists-list 3	The office code cannot be removed; it's in list 3.
8417: inappropriate request office code exists-list 4	The office code cannot be removed it's in list 4.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
8418: entry out of range list member must be 1 digit; value 1-8	MENU = 11 (ARS) ACTION = 501 DATA = 1 digit value, 1-8 range.
8419: inappropriate request all members of list were displayed	All members of the list have already been displayed.
8420: incorrect entry first digit can't be 0-1 (7 digit max)	Entered number is not valid; recheck number.
8421: at installed max -8 phone number	Installed maximum reached for ARS-HAC exception list. See: MENU = 11 (ARS) ACTION = 512 and ACTION = 522 ACTION = 822 for more information.
8422: inappropriate request phone number exists-list 1	The telephone number cannot be installed; it already exists in list 1.
8423: inappropriate request phone number exists-list 2	The telephone number cannot be installed; it already exists in list 2.
8424: inappropriate request phone number exists-list 3	The telephone number cannot be installed; it already exists in list 3.
8425: inappropriate request phone number exists-list 4	The telephone number cannot be installed; it already exists in list 4.
8426: inappropriate request phone number not installed	The telephone number cannot be removed because it was not installed in any lists.
8427: inappropriate request phone number exists-list 1	The telephone number cannot be removed because it's installed in list 1.
8428: inappropriate request phone number exists-list 2	The telephone number cannot be removed because it's installed in list 2.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
8429: inappropriate request phone number exists-list 3	The telephone number cannot be removed because it's installed in list 3 .
8430: inappropriate request phone number exists-list 4	The telephone number cannot be removed because it's installed in list 4 .
8501: incorrect entry number can't exceed 7 digits	The entered telephone number is not valid.
8502: inappropriate request phone number already exists	The telephone number is already in the list at another location.
8503: incorrect entry illegal character within phone number	Check character entry within phone number .
8600: incorrect action number must be 0-5	Action number must be in the range 0 - 5 .
8601: inappropriate request must enter pool first	The trunk pool must be specified before actions 1-5 can be entered.
8602: incorrect entry pool number does not exist	The entered number was not translated.
8603: incorrect entry must be pool number ,	Entered number is not a trunk pool.
8604: incorrect entry must be 3 digits-first can't be 0 or 1	Entered NPA is not valid.
8605: incorrect entry out of range for removal	The number of digits that are specified to be removed at the beginning of the dialed number is not in range.
8606: entry out of range prefixed digits can't exceed 5	A maximum of 5 digits can be entered for the prefixed digits.
8607: entry out of range first digit can't be 0	The first prefixed digit cannot be 0.

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
8700: action number out of sequence must enter pattern number first	Must enter pattern number first.
8701: incorrect action number does not exist or used improperly	Go back and verify the action item taken.
8702: incorrect entry pattern number does not exist	Pattern number for other area codes exception numbers must be between 1-8. See: MENU = 11 (ARS) ACTION = 800 for more information.
8703: entry out of range must be 8 digits -first can't be 0 or 1	Must be 8 digits, first cannot be a 0 or 1. See: MENU = 11 (ARS) ACTION = 822
8704: entry out of range must be 2 digits	Must be 2 digits. The 2 digits must be <= 32. See: MENU = 11 (ARS) ACTION = 821
8706: inappropriate request phone number already exists	Adding a number that already exists. This relates to MENU = 11 (ARS) ACTION = 822
8707: inappropriate request phone number does not exist	Removing a number is not on the exception list. This relates to MENU = 11 (ARS) ACTION = 823
9001: inappropriate request announcement port already installed	DGC delay announcement already installed. Do a search to verify.
9002: inappropriate request external alert already installed	External alert already installed. Do a search to verify. Night Service external alert already installed.

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ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
9003: inappropriate request station to be linked not installed	MENU = 1 (Port) under Special Feature port. ACTION = 1 DATA = 253 ACTION = 2 DATA = PDC or 0 In this case, the PDC is invalid or does not exist.
9004: inappropriate request station already assigned external alert	Trying to administer an external alert to a station that already has one.
9005: entry out of range pre-night service rings max reached	MENU = 1 (PORT) (under special Feature Ports/Auxiliary Equipment) ACTION = 1 DATA = 251 or 252 ACTION = 2 DATA = 0-15
9007: inappropriate request selector console port already installed	Check to see if selector console is already installed. Go to MENU = 8 Search ACTION = 1 DATA = 16 ACTION = 2 DATA = 1602 or 1602 ACTION = 3 DATA = 0 (hit c for continue)
9011: inappropriate request selector console button already exists	Selector console button already exists. Recheck selector console buttons that are already installed.
9020: inappropriate request station is being queued for	Removal of a station is disallowed if it is being queued for.
9021: inappropriate request data port is being queued for	Removal of a data port is disallowed if it is being queued for.
9022: inappropriate request trunk is being queued for	Removal of a trunk port is disallowed if it is being queued for.
9023: inappropriate request DGC group is being queued for	Removal of a DGC group is disallowed if it is being queued for.
9024: inappropriate request trunk pool is being queued for	Removal of a trunk pool is disallowed if it is being queued for.

ERROR MESSAGE AND DESCRIPTION	POSSIBLE SOLUTION
9025: inappropriate request sole member of queued for DGC group	Removal of a station is disallowed if the station happens to be the only member of a DGC group that is being queued for.
9026: inappropriate request sole member of queued for trunk pool	Removal of a trunk port is disallowed if the trunk happens to be the last trunk in a trunk pool that is being queued for.
9030: inappropriate request station does not have a SYSTEM ACCESS button	<p>Cannot assign a station as a</p> <ol style="list-style-type: none"> <li>1. Directed Night Service receiver or</li> <li>2. a member of a DGC group or</li> <li>3. a SLAC Position Busy backup station</li> </ol> <p>if it does not have a System Access button.</p>
9031: removal not allowed station is a Directed Night Service receiver	Cannot remove the last System Access button from a station that is a Directed Night Service receiver.
9032: removal not allowed station is a member of a DGC group	Cannot remove the last System Access Button from a station that is a member of a DGC group.
9033: removal not allowed station is a SLAC POSITION BUSY receiver	Cannot remove the last System Access button from a station that is a SLAC Position Busy backup station.
9034: inappropriate request Monitor button and Agent buttons can't be on same station	The agent buttons cannot be on the same station as their associated Monitor Button.

**APPENDIX F: Administration Error Messages**

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<b>ERROR MESSAGE AND DESCRIPTION</b>	<b>POSSIBLE SOLUTION</b>
9035: inappropriate request Agent buttons must be on same station	All Agent buttons that are in the same linked-list must be on the same station.
9036: inappropriate request can't have identical list member	Not allowed to administer more than one Agent button of the same type in a single linked-list.
9037: inappropriate request must be Monitor button	When administering an Agent button, action 104 must be a Monitor button number on the station entered in Action 103 (supervisor station).
9038: Removal not allowed station has parked a call	Cannot remove the last System Access button from a station that has parked a call.
9039 Removal not allowed, station has FPDC logged in.	Remove FPDC from station.
9040 PDC removal not allowed, station is a SLAC position busy receiver	Clear System action 87 first.
9041 Synchronization error.	Board must have slip detection enabled.
9042 Synchronization source error.	Primary and secondary source cannot be the same.
9043 Synchronization source error.	Board not a T1 type.
9044 Incorrect entry,	Data must be between 10 and 40.
9045 Cannot remove this board via the HI D CKT menu.	Existing ports have to be removed first.
9046 Cannot remove this board via the HI D CKT menu.	The board is a primary or secondary synch source. Remove first.

**APPENDIX F: Administration Error Messages**

<b>ERROR MESSAGE AND DESCRIPTION</b>	<b>POSSIBLE SOLUTION</b>
<b>9047 Incorrect entry.</b>	<b>Must be CSS or 0.</b>
<b>9048 Cannot change board type via the HI D CKT menu.</b>	<b>Untranslated or (and) remove board first.</b>
<b>9049 Invalid TN or ZTN code for the HI D CKT menu.</b>	<b>Use correct code to set board options for board type.</b>
<b>9050 At installed maximum</b>	<b>System has the maximum number of board/port type.</b>
<b>9051 Incorrect entry, board must be disabled.</b>	<b>Board enabled, cannot administer signaling mode.</b>
<b>9052 Cannot change signaling mode channel 24 translated</b>	<b>Channel 24 is administered as the signaling channel.</b>
<b>9053 Entry not allowed</b>	<b>CSS not administered as a T1 board.</b>
<b>9054 Incorrect entry</b>	<b>Must be 1 to 5.</b>
<b>9055 Incorrect entry.</b>	<b>Must be CSS.</b>
<b>9056 Entry not allowed</b>	<b>Slot not administered as a T1 board or empty.</b>
<b>9060 Port removal blocked.</b>	<b>Final port on T1 board administered as a synch reference.</b>
<b>9061 Translation for port 24 blocked.</b>	<b>Board administered for 24th channel signaling.</b>
<b>12000 Incorrect action number.</b>	<b>Must be 0 -3 or next action-button.</b>
<b>12003 Action number out of sequence.</b>	<b>Must enter action 1 first.</b>
<b>12006 Entry out of range</b>	<b>Data must be 1-255.</b>
<b>12007 Entry out of range</b>	<b>Action 3 data cannot exceed 255.</b>
<b>12008 Action number out of sequence.</b>	<b>Enter action 1 and/or 2 first.</b>
<b>12009 Entry out of range</b>	<b>Data must be 0 or 1.</b>
<b>12010 Entry out of range</b>	<b>Data cannot exceed 104.</b>

# GLOSSARY

The following is a list of definitions of terms used in System 25 documentation.

## **Administer**

To access and change the parameters associated with the services or features of the system.

## **Analog Data Endpoint**

Data endpoints connected to the system by (built-in or stand-alone) modems. They do not require the use of data modules (Asynchronous Data Units) and are addressed like a voice terminal, by Personal Dial Code (PDC). These endpoints connect to Tip/Ring circuit pack ports.

## **Analog Voice Terminals**

See Single-Line Voice Terminals.

## **Appearance**

See Call Appearance.

## **Asynchronous Data Transmission**

A scheme for transmitting data where each character is preceded by a start bit and followed by a stop bit, thus permitting data elements to occur at irregular intervals. This type of transmission is advantageous when transmission is irregular (such as when characters are typed from a keyboard).

## **Asynchronous Data Unit (ADU)**

A Data Communications Equipment (DCE) device that allows direct connection between RS-232C equipment and the digital switch through ports on the TN726 Data Line circuit pack.

### Attendant

The operator of the attendant console.

### Attendant Console

- *Direct Trunk Console*: An electronic call-handling position with pushbutton control. Used by attendants to answer and place calls and to manage and monitor some system operations.
- *Direct Extension Selector (DXS) Console*: Provides the attendant with a visual indication of the status of stations. Also allows the attendant to extend incoming calls to stations through button access rather than by dialing.

### Auxiliary Equipment

- Dictation Equipment
- Delay Announcement Devices
- External Alerting Devices (external alerts)
- Music-on-Hold Equipment
- Paging Equipment.

### Auxiliary Trunk

A trunk circuit used to connect auxiliary equipment to the switch. Only dictation and paging equipment may be connected through an auxiliary trunk.

### Bit (Binary Digit)

One unit of information in binary notation (having two possible states or values, 0 or 1).

### Bridge (Bridging)

The sharing of the same extension by two or more voice terminals.

**Buffer**

A circuit or component that isolates one electrical circuit from another. Typically, a buffer holds data from one circuit or process until another circuit or process is ready to accept the data.

**Bus**

A multiconductor electrical path used to transfer information over a common connection from any of several sources to any of several destinations.

**Bus, Time-Division Multiplex**

See Time-Division Multiplex Bus.

**Call Appearance**

A button on a multiline voice terminal at which a call seems to appear. Calls may be received, originated, and held at an appearance. System Access, Personal Lines, Direct Extension Selection, and Pooled Facilities are examples of call appearances. Software makes it seem to the terminal user that a line actually is terminated at the button.

**Call Appearance, Voice Terminal**

A button labeled with an extension number or line number used to place outgoing calls, receive incoming calls, or hold calls. Two light-emitting diodes (LEDs) next to the button show the status of the call appearance or status of the call.

**CCS (Hundred Call Seconds)**

A traffic-measuring unit that expresses the load of one or more traffic-handling devices. A device used for 1 hour without interruption represents a load of 36 CCS, which equals 1 erlang (see Erlang).

**Central Office**

The location housing telephone switching equipment that provides local telephone service and access to toll facilities for long-distance calling.

**Central Office Codes**

The first three digits of a 7-digit public network telephone number. These codes are numbered from 200 through 999 and are sometimes referred to as NNXS.

**Central Office Trunk**

A telecommunications channel that provides access from the system to the public network through the local central office (CO).

**Channel**

A communications path for transmitting voice and data.

**Class of Service (COS)**

Parameters used to define voice terminal, data, and trunk port capabilities and restrictions.

**Common Control Switching Arrangement (CCSA)**

A private telecommunications network using dedicated trunks and a shared switching center for interconnecting company locations.

**Confirmation Tone**

Three short bursts of tone followed by silence; indicates that the feature has been activated, deactivated, or canceled.

**Console**

See Attendant Console.

**Coverage Call**

A call that is redirected from the called station to an alternate answering position.

**Coverage Path**

The order in which calls are redirected to alternate answering positions.

**Covering User**

The person at an alternate answering position who answers a redirected call.

**Data Channel**

A communications path between two points used to transmit digital signals.

**Data Communications Equipment (DCE)**

Refers to a specific RS-232C interface connector configuration. The DCE devices are designed to interface directly (pin-for-pin) to Data Terminal Equipment (DTE). The transmit and receive pins are reversed from that of a DTE interface. A modem is an example of a DCE device.

**Data Dial Code (DDC)**

The extension number of a digital data endpoint.

**Data Endpoint**

Two general groups: those having a DTE-type interface, which encompasses almost all of the data terminal devices, and those having a DCE interface, which are primarily modems. It should be noted that within each category, control interfaces may vary. Refer to Analog Data Endpoint and Digital Data Endpoints for additional information.

**Data Module**

A DCE device providing a standard interface between data equipment and a TN726 Data Line CP port on the switch. Only ADU Models Z3A1, Z3A2, Z3A4, and Z3A5 are supported.

**Data Terminal Equipment (DTE)**

DTE refers to a specific RS-232C connector termination designed to connect directly to a DCE-type connection. Typically associated with video display terminals, printers, and computers that either originate or terminate a data transmission path.

### **Delay-Dial Tie Trunk**

After a request for service (called a seizure) is detected on an incoming trunk, the system sends a momentary signal followed by a steady tone over the trunk. This informs the calling party that dialing can start. This type of trunk allows dialing directly into the system; that is, the digits are received as they are dialed.

### **Digital Data Endpoints**

In System 25, digital data endpoints include any DTE or DCE with an RS-232C interface to the switch connected through Asynchronous Data Units.

### **Digital Tape Unit (DTU)**

The RS-232C peripheral DTE used to store and reload system translations.

### **Direct Extension Selector (DXS) Console**

An option at the attendant console that allows an attendant direct access to voice terminals by pressing a Group Select button and a DXS button.

### **Direct Group Call (DGC)**

An incoming call that arrives on a loop-start, ground-start, or tie trunk and is routed to a predetermined group of stations (for example, sales department and service department).

### **Direct Inward Dialing (DID)**

A service whereby the called extension (station) number is transmitted to a PBX by the central office (CO) and incoming calls are routed directly to the called station, bypassing the attendant.

### **DSn**

Generally, Digital Signal (DS) level n refers to the logical organization or division of the bandwidth available on T carriers. DS0 is a single 64 Kbps channel. Twenty-four DS0 channels combine to form a DS1 channel. Four DS1 channels combine to form a DS2 channel. Twenty-eight DS1 channels combine to form a DS3 channel.

**Dual-Tone Multifrequency (DTMF)**

Industry terminology for touch-tone calling.

**Emergency Transfer Unit (ETU)**

Provides direct connection of designated Power Failure Transfer (PFT) registered voice terminals to the CO during a power failure or other service interruption.

**Erlang**

A traffic measuring unit that expresses the load of one or more traffic-generating devices (36 CCS equals 1 erlang—see CCS [Hundred Call Seconds]).

**Extension Number**

A 1- through 4-digit number assigned to each voice terminal and data endpoint in the system. Also see “Personal Dial Code.”

**External Call**

A connection between a system user and a party on the public telephone network or on a tie trunk. Also referred to as an outside call.

**Facility (Physical)**

A transmission channel to another switching system (a Central Office, for example). By application, examples are:

- CO Trunks
- FX Trunks
- WATS Trunks
- OCC Trunks
- Tie Trunks
- DS1 Tie Trunks.

By technical type these include loop-start, ground-start, DID, data, and automatic ringdown trunks. These facilities may be accessed by their facility access codes (FACS).

**Facility Restriction Level (FRL)**

A restriction parameter associated with the Automatic Route Selection (ARS) feature. Determines whether a particular station can access a particular trunk.

**Fast Busy Tone**

See Reorder Tone.

**Feature**

A specifically defined function or service provided by the system.

**Feature Button**

A labeled button on a voice terminal or attendant console designating a specific feature.

**Foreign Exchange (FX)**

A central office other than the one providing local access to the public telephone network.

**Foreign Exchange Trunk**

A telecommunications channel that directly connects the system to a central office other than its local central office.

**Foreign Numbering Plan Area (FNPA) Code**

An area code other than the local area code. The FNPA code must be dialed to call outside the local numbering plan area.

### **Ground-Start Trunk**

On outgoing calls, System 25 transmits a request for service to the distant switching system by grounding the trunk ring lead. When the distant system is ready to receive the digits of the called number, that system grounds the trunk tip lead. When System 25 detects this ground, it removes the ground from the ring lead and the trunk is ready for service.

### **Home Numbering Plan Area (HNPA) Code**

The local area code. Does not have to be dialed to place calls to numbers within the local numbering plan area.

### **Immediate-Start Tie Trunk**

After establishing a connection with the distant switching system for an outgoing call, the system waits a nominal 65 milliseconds before sending the digits of the called number. This allows time for the distant system to prepare to receive the digits. Similarly, on an incoming call, the system has 65 milliseconds to prepare to receive the digits.

### **Intercept Tone**

On System 25, this tone is the same as Reorder Tone. Indicates a dialing error or denial of the service requested.

### **Interface**

A common boundary between two systems or pieces of equipment.

### **Internal Call**

A connection between two stations within the system. Sometimes called an inside or intercom call.

### **I-Use Lamp**

A red lamp on a multiline voice terminal that lights to show which call appearance will be selected when the handset is lifted or which call appearance is active when a user is off-hook.

### Loop-Start Trunk

Simplest type of central office (CO) trunk. Calls are originated by providing a dc path between the tip and ring leads. The CO detects the loop *current* thus drawn and returns dial tone. Incoming calls are signaled by the CO placing an ac ringing voltage between the tip and ring leads. (The port circuit pack detects this signal.)

### Modem

A device that modulates and demodulates signals transmitted over a communications path. Used to connect Data Terminal Equipment to the system's analog ports. The system (optionally) provides a 212A compatible conversion resource.

### Modem Pooling

Provides shared-use conversion resources that eliminate the need for dedicated modems.

### Multiline Voice Terminal

A terminal equipped with several call appearance buttons for the same extension number. Allows the user to handle more than one call at the same time.

### Multiplexed

The simultaneous transmission of two or more signals over a common transmission medium.

### Network

An arrangement of inter- and/or intra-location circuits designed to perform specific functions.

### Network Interface

Provided by the telephone company in three forms:

- (1) RJ21X for trunk facilities other than tie trunks.
- (2) RJ2GX for tie trunk facilities.
- (3) RJ48X or RJ48G for DS1 Tie Trunk facilities.

**Number Plan Area (NPA)**

The area code.

**Off-Premises Station (OPS)**

An arrangement provided by the local telephone company permitting remote terminal equipment to operate as though it were directly connected to the system. This tariffed service can be provided only for FCC-registered single-line voice terminals.

**Out-of-Building Station**

Terminal equipment directly connected to the system, but not located in the same building as the common equipment. Special arrangements are made to protect the system and its users from lightning, power line crosses, etc. Only single-line and 7300H series voice terminals may be so connected. (MET sets cannot be connected as Out-of-Building Stations.)

**Paging Trunk**

A telecommunications channel used to access a paging system.

**Peripheral Equipment**

Equipment connected to one of the RS-232C channels on the CPU/Memory circuit pack. Examples are the System Administration Terminal (SAT), SMDR Output device such as a Printer or a Call Accounting System, Digital Tape Unit (DTU), and Customer Service Unit (CSU).

**Personal Dial Code (PDC)**

Voice terminal extension number.

Each system user is assigned a PDC and is allowed to “log in” the PDC at any voice terminal in the system. The PDC may be a 1-, 2-, 3-, or 4-digit number. There are two types of PDCs:

- The PDCs assigned to voice terminals—One is associated with each voice terminal in the system.

- **Floating**— Assigned to visitors who will be moving about the premises. Floating PDCs may be associated with the attendant position or may be “logged in” by the user at any voice terminal. Calls to the floating PDC will ring at the terminal where “logged in. ”

### **Pickup Group**

A group of individuals who can answer any incoming call within the group by dialing a code.

### **Port**

An interface circuit between System 25 and associated trunks and terminals. Specifically:

- Terminal port (station port)
- Facility port (trunk port)
- Auxiliary equipment port.

### **Private Branch Exchange**

A switching system that provides switched communications access among its terminals and facilities (for example, System 25).

### **Private Network**

A network used exclusively for handling the telecommunications needs of a particular customer.

### **Private Network Office Code (RNX)**

The first three digits of a 7-digit private network number. These codes are numbered 220 through 999, excluding any codes that have a 0 or 1 as the second digit.

**Protocol**

A set of conventions or rules governing the format and timing of message exchanges to control data movement and correction of errors.

**Public Network**

The network that can be openly accessed by all customers for local or long-distance calling.

**Queue**

An ordered sequence of tasks to be processed.

**Queuing**

The process of holding calls in order of their arrival to await connection to an attendant, to a DGC group, or to an outgoing trunk. Calls are automatically connected in first-in, first-out sequence.

**Random Access Memory (RAM)**

A storage arrangement whereby information can be retrieved at a speed independent of the location of the stored information.

**Read Only Memory (ROM)**

A storage arrangement primarily for information retrieval applications.

**Recall Dial Tone**

Three short bursts of tone (confirmation tone) followed by steady dial tone; indicates that the system has completed some action (such as holding a call) and is ready to accept dialing.

**Redirection Criteria**

The information administered for each voice terminal that determines when an incoming call is redirected to coverage.

**Reorder Tone**

Atone repeated 120 times a minute; indicates that at least one of the facilities, such as a trunk or a digit transmitter, required for the call is not available. Also called Fast Busy Tone.

**Single-Line Voice Terminals**

Single-line voice terminals served by a Tip Ring Line or Analog Line circuit pack (2500 series and 7101 A voice terminals or industry standard Dual-Tone Multifrequency equivalent).

**Software**

A set of computer programs that accomplishes one or more tasks.

**Station**

A place where terminal equipment is located or sometimes the terminal equipment itself. Each voice terminal (station) is assigned a station (extension) number. Users of the terminal are sometimes referred to as station users. Reference to the extension number is sometimes in the form PDC (Personal Dial Code) rather than station number. PDCs may be "logged in" at other stations. In most circumstances, PDCs and station numbers may be used interchangeably. Analogously, data stations are assigned DDCs (Data Dial Codes).

**Station Interconnect Panel (SIP)**

The station cross-connect field.

**Station Message Detail Recording (SMDR)**

Data output by System 25 that provides a record of each incoming and outgoing call.

**Status LED (Lamp)**

A green LED or lamp that shows the status of a call appearance or a feature button by the state of the lamp (lighted, flashing, fluttering, broken flutter, or dark).

**Switch**

The software-controlled communications processor complex that interprets dialing pulses/tones/keyboard characters and makes the proper interconnections both within the system and outside the system. The switch itself consists of a digital computer, software, storage device (memory), and associated circuit packs and special hardware necessary to perform the actual connections.

**Switchhook**

The button(s) on a voice terminal located under the receiver. A user typically goes "off-hook" to place or answer a call by picking up the receiver and goes "on-hook" (hangs up) to end a call.

The RS-232C DTE peripheral equipment used to enter and change system translations.

**Synchronization**

Coordinated timing whereby all switches, channel banks, and multiplexer operate from the same stable clock reference. The process assures that the transmit and the distant receive node achieve proper bit alignment.

**System Administrator**

A person responsible for specifying and administering features and services for the system.

**System Restore**

A process that allows stored data to be written from a tape into the system memory (normally after a cold start).

**T 1**

The T1 carrier system is a high speed, time division multiplexed, digital transmission facility capable of transmitting voice and data at 1.544 Mbps. In System 25, T1 can replace up to 24 analog trunks, offering improved quality, cost savings, and enhanced features.

**Terminal Equipment**

**Equipment used to change information (sound, keystrokes) into an electrical signal compatible with System 25's port circuits. (Voice and data terminals are the two primary types.)**

**Tie Trunk**

**A telecommunications channel that directly connects two private switching systems.**

**Time-Division Multiplex Bus**

**A special bus that is time-shared by preallocating short time slots to each transmitter on a regular basis. In a PBX, all port circuits are connected to the time-division multiplex bus, permitting any port to send a signal to any other port.**

**Tone Ringer**

**A device with a speaker, used in electronic voice terminals to alert the user.**

**Translations**

**Specific information assigned to a terminal or to the system and customized for the user. Translations are entered and changed through the SAT.**

**Trunk**

**A telecommunications channel between two switching systems.**

**Trunk Access Equipment (TAE)**

**The cross-connect field for central office (CO)/network facilities.**

**Trunk Group**

Telecommunications channels assigned as a group for certain

**Trunk Port**

The hardware (circuit pack) providing an interface between the system and central office (CO)/network trunks.

**Unit Load**

A measurement used to evaluate a System 25 cabinet's power load capacity. Each System 25 cabinet can handle 80 unit loads of 48-volt power. One unit load equals 44 mA.

**Voice Terminal**

A single-line or multiline voice instrument (that is, telephone). See Terminal Equipment.

**Wide Area Telecommunications Service (WATS)**

A service that allows calls to a certain area or areas for a flat-rate charge based on expected usage.

**Wink-Start Tie Trunk**

After establishing a connection with a distant switching system for an outgoing call, the system waits for a momentary signal (wink) before sending the digits of the called number. Similarly, on an incoming call, the system sends the wink signal when ready to receive digits.

**Write Operation**

The process of putting information onto a storage medium such as magnetic tape.

**800 Service**

A service that allows incoming calls from a certain area or areas to an assigned number for a flat-rate charge based on usage.

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