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AUDIX®

Networking

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The ordering number for this document is 585-300-903. To order this document, call the AT&T Customer Information Center at 1-800-432-6600 (In Canada, use 1-800-255-1242). For more information about AT&T documents, refer to the *Business Communications Systems Publications Catalog* (555-000-010).

Comments

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Acknowledgment

This document was prepared by the BCSystems Product Documentation Development Department in Denver, CO.

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About This Document

This document describes most major aspects of networking AUDIX® Voice Messaging Systems. Its purpose is to assist any group or person involved with the implementation of an AUDIX network. If it does not contain the information you desire, please fill out the feedback form with your comments and send it to the originating organization.

INTENDED AUDIENCE

This document is intended for account teams, the Business Communications Systems Design Center (BCSDC), the Technical Service Center (TSC), the Sales and Technical Response Center (STRC), field technicians, and hotline personnel.

PREREQUISITE SKILLS OR KNOWLEDGE

No prerequisite skills or knowledge are presumed. However, it is recommended that someone with networking experience be available to assist anyone that is new to this type of implementation.

HOW THIS DOCUMENT IS ORGANIZED

Information in this document is organized as follows.

- Chapter 1, *Introduction*, describes the network interfaces, an overview of how a network is implemented, and the AUDIX system requirements that pertain to any type of AUDIX network.
- Chapter 2, *Dedicated EIA RS-232 Networks*, provides examples and requirements when using direct cabling to transmit data between adjuncts and PCs using the Electronic Industries Association (EIA) RS-232 protocol.
- Chapter 3, *Switched EIA RS-232 Networks*, provides examples and requirements when using a switched connection through a modem (to a tip and ring circuit) or through a data module [to a Digital Communications Protocol (DCP) circuit] to the switch.
- Chapter 4, *DCP Mode 1 Networks — 56 Kbps*, provides examples and requirements when using AT&T's DCP Mode 1 for interlocation data transmission.
- Chapter 5, *DCP Mode 2 Networks — Modem Pooling*, provides examples and requirements when using AT&T's DCP Mode 2 for interlocation data transmission.
- Chapter 6, *DCP Mode 3 Networks — 64 Kbps*, provides examples and requirements when using AT&T's DCP Mode 3 for colocated or interlocation data transmission.

- Chapter 7, *Mixtures of RS-232 and DCP Networks*, presents examples of combination networks where a single adjunct might use RS-232 and DCP or where one location uses RS-232 and another location uses DCP. Requirements are provided in earlier chapters.
- Chapter 8, *EIA RS-232 Cabling*, explains how to install the RS-232 interface at the AUDIX system for an RS-232 interface at the switch or for a dedicated RS-232 interface.
- Chapter 9, *DCP Cabling and Administration*, explains how to install and administer the DCP interface on the switch for the AUDIX system.
- Chapter 10, *DCP Mode 1 Installation and Administration*, briefly describes the requirements of a switch that uses DCP Mode 1 (56 Kbps) communication between adjuncts.
- Chapter 11, *DCP Mode 2 Installation and Administration*, explains how to install and administer modem pooling for a switch that uses DCP Mode 2 communication between adjuncts. Both stand-alone modem pooling and modem pooling that uses the modem to control the data set (D-Lead control) are described.
- Chapter 12, *DCP Mode 3 Installation and Administration*, briefly explains how to install and administer a DCP Mode 3 (64 Kbps) interface at the switch.
- Chapter 13, *AUDIX System Administration*, contains procedures for administering the AUDIX systems for networking. It also contains an administrator's worksheet to help keep track of network parameters.
- Chapter 14, *AUDIX Network Testing*, contains procedures for testing the network links, for testing transmission between AUDIX systems, and for testing the Remote Updates feature of the AUDIX system.
- Appendix A, *Network Considerations*, is written for the BCSDC. Every AUDIX network order must pass through the engineering center for design and approval. Information pertains to AUDIX system requirements, trunking between the switches if the network is a remote network, and administrative requirements that must be passed on to the SIM.
- Appendix B, *Sales Engineering Notes*, is designed to help the branch office implement an AUDIX network.
- Appendix C, *AMIS Analog Networking*, contains a brief description of the AMIS Analog Networking feature which is an alternative to digital networking.

This document also includes an abbreviations section, glossary, and index.

CHANGES FROM THE PREVIOUS ISSUE

The entire document has been updated to reflect AUDIX R1V7 enhancements. Specific changes include:

- Network loop-around testing capability for 56 and 64 Kbps setups have been added (this is administered on the `maintenance : network` form).
- The automatic network connection turnaround capability and the option to send messages to non-administered recipients has been added (this is administered on the `system : translation : machine : audix/amis/call delivery` form).

This document has also been updated to reflect AUDIX setups with DEFINITY Communications System Generic 3 where appropriate.

NOTE

In this document, the terms *Generic 3i* and *Generic 3s* refer to versions of software based on DEFINITY Generic 1 features. The term *Generic 3r* refers to the version of software based on DEFINITY Generic 2 features. The term *Generic 3* refers to *all* versions of Generic 3 software (Generic 3i, Generic 3r, and Generic 3s).

CONVENTIONS USED IN THIS DOCUMENT

The following typographic conventions are used in this document:

- Information that appears on your terminal screen — including displays, field names, prompts, and error messages — is shown in constant-width type. Information that you are to type just as it appears in the document is shown in constant-width bold type. For example:

  In the `machine name` field, type **`audix`**.

- Terminal keys that you press are shown in curved-edge boxes. For example, an instruction to press the return, carriage return, or equivalent key appears in this document as:

  Press ENTER.

- Two or three keys that you are to press at the same time (that is, you are to hold down the first key while pressing the second key and, if appropriate, the third key as well) are enclosed together, separated by hyphens, in a curved-edge box. For example, an instruction to press and hold CTRL while typing the letter *d* appears in this document as:

  Press CTRL-d.

- Variables for which you or the system substitute a word specific to your own application are shown in italic type. For example, an error message that appears on the screen with the name of your own specific filename might appear generically in this document as:

  Your file <*filename*> is formatted incorrectly.

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- Manager™ II, Manager™ III, and Manager™ IV are trademarks of AT&T
- MERLIN® II Communications System is a registered trademark of AT&T
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- Telebit® is a registered trademark of Telebit Corporation
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RELATED RESOURCES

The following documents may be helpful when planning, ordering, installing, maintaining, and using the AUDIX network.

- *AUDIX System Description* (585-305-201)
- *Switch Administration Guide for AUDIX Voice Messaging* (585-305-505)
- *AUDIX Administration* (585-305-501)
- *AUDIX Release 1 Version 7 Forms Reference* (585-305-208)
- *AUDIX Data Acquisition Package* (585-302-502)
- *AUDIX Maintenance for Tier I* (585-305-106)

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1. Introduction

AUDIX Networking enables an organization to transmit messages between two or more AUDIX systems, making the group of systems appear as one large system. One-Cabinet AUDIX systems, Two-Cabinet AUDIX systems, and AUDIX Large systems can be used. These systems can be located on the same site or spread out over several locations in the same or different cities. A single network can have up to 101 systems (a local system can be connected to up to 100 remote systems).

When considering adding more than one system to a single switch, keep in mind that although several systems can be networked at a single location, the systems may or may not be able to be installed as fully integrated AUDIX systems (that is, with a data link installed between the AUDIX system and the switch). The number of directly connected AUDIX adjuncts depends on the switch:

- System 75 and DEFINITY Communications System Generic 1, Generic 3i, and Generic 3s support one directly connected AUDIX system.
- System 85 R2V2 and R2V3 support up to four AUDIX adjuncts.
- System 85 R2V4 and DEFINITY Generic 2 and Generic 3r support up to eight AUDIX adjuncts.

Any additional AUDIX systems must be installed as stand-alone systems.

THE NETWORK INTERFACE

An AUDIX system provides three types of network connections, using either the Electronic Industries Association (EIA) RS-232 protocol or AT&T's DCP. They are:

- *Dedicated RS-232:* AUDIX systems communicate through direct cabling. No connection to the switch is required. Communication between AUDIX systems is straight RS-232. Any channel connected in this manner cannot be shared with other adjuncts or with other AUDIX system applications. This connection requires AUDIX R1V5 or later software and a TN539 or TN539B ACCE circuit pack.
- *Switched RS-232:* AUDIX systems communicate through dial-up modems. Communication between systems is via analog facilities. Channels connected in this manner can be shared with other systems or with the AUDIX Call Detail Recording Package (CDR). This connection requires AUDIX R1V5 or later software and a TN539 or TN539B ACCE circuit pack.

  Special Application: The RS-232 channels can be converted to DCP before entering the switch. This is done with a data module instead of the modem. This, too, is a dial-up connection; all six AUDIX network channels appear at the switch as DCP channels.

NOTE

Although a total of six network channels are available on an AUDIX system, the AUDIX R1V3, R1V4, and R1V5 software limit the number of simultaneously active channels to four. To use all six channels simultaneously, an AUDIX system must have R1V6 or later software and a vintage 7 TN539 or a TN539B ACCE.

- *Switched DCP:* AUDIX systems communicate through dial-up DCP connections at the switch. Communication between systems can be via digital or analog facilities. DCP modes 1, 2, and 3 are supported. Channels connected in this manner can be shared with other systems for networking and for other AUDIX system applications. This connection requires AUDIX R1V3 or later software and an ACC (TN366 or TN366B) or ACCE (TN539 or TN539B) circuit pack.

NOTE

If the customer's switch does not support the DCP interface, an AT&T DCP switch can be used to provide this interface. For local networking, this is usually done with a MERLIN® II Communications System. (Remote networking with MERLIN II is not supported.)

The TN539 or TN539B ACCE circuit pack provides two RS-232 channels and four DCP channels. Both types are two-way communications links. The type or types of connections used depend on the location and number of AUDIX systems involved, the type of switch(es) involved, networking facilities, and whether or not the customer wants to use the Text Services Interface and/or Call Detail Recording applications.

LOCAL NETWORKING

In a local network setup, one or more AUDIX systems work with a single switch. The local system can be networked with up to 100 other remote AUDIX adjuncts. In this setup, the local system is the one to which the administration terminal the system administrator is using is connected; all other systems are considered remote. All AUDIX subscribers can be assigned the same (or no) prefixes and separate extension numbers, or different prefixes to distinguish among local systems.

A one-cabinet 16-port AUDIX system can provide services to up to 2000 local subscribers; a two-cabinet 32-port system can handle twice as many. When AUDIX systems are integrated into a local network, they take on the appearance of one large AUDIX system. The AUDIX systems can reside together in the same equipment room with the switch, or in different locations according to the type of connections made.

REMOTE NETWORKING

In a remote network, AUDIX systems are integrated with more than one switch. The local system can be networked with up to 100 other remote AUDIX adjuncts. The local system is the one to which the administration terminal the system administrator is using is connected; all other systems are considered remote. These remote systems may be geographically distant, have different dial plans, and use different connections such as:

- Digital Service (DS1) facilities between switches
- Voice-grade (analog) facilities between switches

Any remote network can be mixed with a local network. Switches can use any public or private switched networking facility, or be a part of a Digital Communications System (DCS) network.

NETWORK PLANNING

Planning is an essential first step in setting up an AUDIX network. Network administration should not be started until the local AUDIX system is running smoothly. Network planning should begin as soon as the customer decides to network their AUDIX systems.

One person (perhaps someone also serving as the administrator of one of the AUDIX machines in the network) must serve as coordinator of the network. The network coordinator must establish and maintain a good line of communication with each of the remote system administrators in order to facilitate necessary cooperation and flow of information. Because every AUDIX machine within the network must be administered with information about any other AUDIX machine with which it will be exchanging messages, the network coordinator must be prepared to supply each local AUDIX system administrator with the information.

AUDIX NETWORK IMPLEMENTATION

Each AUDIX system in the network requires the following. Each item is explained in some detail on the following pages:

- Specific releases of software.
- AUDIX Communications Controller (ACC) or AUDIX Communications Controller Enhanced (ACCE) circuit pack.
- Specific issues of supporting circuit packs.
- Rear connector panel and backplane modifications.
- New network cabling used with most types of networks. When unique cabling and equipment are required, they will be pointed out in chapters 2 through 7.
- AUDIX system translations must be added.

AUDIX Software

An AUDIX network can consist of a mixture of R1V3, R1V4, R1V5, R1V6, and R1V7 systems. If desired, you may upgrade your AUDIX-L to R1V5 or upgrade your AUDIX one- or two-cabinet system to the latest software version. See the *System Description* manual (585-305-201) for ordering codes.

NOTE

If the network contains R1V3 or R1V4 systems, the Sending Restrictions feature cannot be used.

ACC/ACCE

The AUDIX Communications Controller (ACC) or AUDIX Communications Controller Enhanced (ACCE) is the circuit pack that provides the interconnections for AUDIX networking. It must be installed in slot 03 of a one- or two-cabinet AUDIX system and in slot 16 of an AUDIX Large Data Base Processor (DBP) carrier (J58888K).

This section describes the ACC or ACCE circuit packs currently in existence. All new AUDIX systems ordered with networking are shipped with the latest circuit pack available, currently the TN539B AUDIX Communications Controller Enhanced (ACCE). However, a new AUDIX system can be added to an existing network where the earlier TN366, TN366B, or TN539 circuit packs are used.

TN366 ACC

This circuit pack provides four DCP channels. It must be a TN366 vintage 5 or later. This circuit pack is no longer orderable, but if the customer has an older vintage and wishes to upgrade, this circuit pack is available through QPPCN 330DR (comcode 103279840). It will work with R1V3 and later software.

TN366B ACC

This circuit pack provides four DCP channels. It will work with R1V3 or later software. This circuit pack is no longer orderable (comcode 106186588).

The TN366B is a TN366 that has been enhanced for the following reasons:

- The TN366B will work with modem pools that use 7400A DSUs; the original TN366 will not.
- The TN366B will work with the MERLIN II Communications System which is used as a DCP interface for non-DCP switches; the TN366 will not.
- When a Generic 2 universal module serves as the host switch, the TN366B allows access to all four DCP channels; the TN366 does not.

TN539 ACCE

This circuit pack provides four DCP channels and two RS-232 channels. It will work with R1V5 and later software. The Vintage 7 TN539 permits six simultaneously active ports. Vintage 4 and earlier of the TN539 permits four simultaneously active ports. This circuit pack is no longer orderable (comcode 103281473). It provides all the functionality of the TN366 or TN366B with the following additions:

- Multi-stage dialing
- DCP Mode 1 (56 Kbps) interface
- RS-232 interface

NOTE

Customers who implemented 56 Kbps networking using TN539 ACCE boards may wish to upgrade to the TN539B ACCE in order to take advantage of the performance improvements and loop-around testing capabilities offered on this board by R1V7 software.

TN539B ACCE

This pack replaces the TN366, TN366B, or TN539 circuit pack (comcode 106757768). It provides all the functionality of the previous networking boards as well as 56 and 64 Kbps loopback testing capabilities.

All new systems ship with a TN539B ACCE. In addition, you may wish to upgrade an earlier board to a TN539B ACCE for the following reasons:

- You have a TN366 or TN366B ACC and you wish to use the two RS-232 ports available on the TN539B.
- You have a TN366 or TN366B ACC and you wish to obtain the additional `activity` status information available on the `maintenance : network` form in R1V7 (for example, if you are using the R1V7 network turnaround feature).
- You have a TN366 or TN366B ACC or a TN539 ACCE and you wish to upgrade to a TN539B ACCE for performance reasons. A TN539B is required at both the sending and receiving machine in order to achieve increased performance.
- You have a TN539 ACCE running DCP Mode 1 (56 Kbps) connections and you wish to replace it with the TN539B in order to take advantage of the AUDIX R1V7 loop-around testing capabilities and possible performance improvements (see the previous item).

All TN539B ACCE orders (new or upgrade) include two H600-330, Group 1 null-modem adapters and one H600-331, Group 2 cable. See the *System Description* manual (585-305-201) for ordering codes.

Other AUDIX Circuit Pack Requirements

Certain circuit packs must be present and certain other packs must be of a specific vintage or issue.

One-Cabinet and Two-Cabinet AUDIX System

In slot 01 of the base cabinet the AUDIX system must have the following:

- TN506B circuit pack (comcode 105222301).

In slot 04 of the base cabinet the AUDIX system must have the following:

- TN472C vintage 2 (white wire 10-17) or later circuit pack (comcode 105474126). This is the Data Base Processor Central Processing Unit (DBP-CPU).

In slot 06 of the base cabinet the AUDIX system must have the following:

- UN160B vintage 2 or later circuit pack (comcode 105319818). This is the Data Base Processor Interface (DBPI).

AUDIX Large System

In slot 01 of the DBP carrier (J58888K) the AUDIX system must have the following:

- TN506B circuit pack (comcode 105222301).

In slots 04-07 and 12-14 of the DBP carrier the AUDIX system must have the following:

- TN508 (vintage 4 or higher); up to seven packs.

In slot 08 of the DBP carrier the AUDIX system must have the following:

- TN509C circuit pack (comcode 105319286). This circuit pack is available through QPPCN 444DR.

In slot 10 of the control carrier (J58888H) the AUDIX system must have the following:

- UN160B circuit pack (comcode 105319818).

In slot 08 of the power carrier (J58888L) the AUDIX system must have the following:

- 495JB power converter (comcode 104016746).

Rear Connector Panel and Backplane

The network cabling requires a connector on the back of the AUDIX system cabinet. This connector must be attached to the backplane. Certain versions of the backplane require wire modification.

One-Cabinet and Two-Cabinet AUDIX System

For new orders, an ACC/ACCE port will be installed at the back of the AUDIX system base cabinet and wired to the backplane.

For upgrades to existing systems, check the base cabinet for an ACC D05 connector. This is a 50-pin Amphenol connector. Order the AUDIX Networking upgrade kit D181965 if this port is missing (comcode 845953108).

Rear Connector Panel and Backplane (Large)

Check the control cabinet for an ACC D06 connector. This is a 50-pin Amphenol connector.

- If the connector is missing, order the AUDIX Large Networking Upgrade kits D181757 (comcode 105308696) and D182422 (comcode 845798131).
- If the port is installed, check the label on the cable that goes from the connector to the backplane. It will probably be an ED-1E434-11, Group 373 cable. **If the system is to use EIA RS-232 ports for its network,** this cable must be replaced with a Group 374 cable — order the AUDIX Large Networking Upgrade kit D182422.

Network Cabling Common to Most Configurations

New AUDIX systems ordered with networking will be shipped two H600-330, Group 1 null-modem adapter cables for the RS-232 ports (see Figure 1-1, *H600-330, Group 1 Special AUDIX Null-Modem Cable*) and one H600-331, Group 2 breakout cable (see Figure 1-2, *H600-331, Group 2 AUDIX Networking Breakout Cable*).

Systems that already have networking installed may have the H600-331, Group 1 networking breakout cable rather than the H600-331, Group 2 cable (see Figure 1-3, *H600-331, Group 1 AUDIX Networking Breakout Cable*). However, the Group 1 cables are no longer shipped.

H600-330, Group 1 Cable

The special null-modem adapter cables are used only for dedicated RS-232 connections. Two are supplied (one for each RS-232 port).

NOTE

The null-modems are unique; do not substitute standard null-modems in this application.

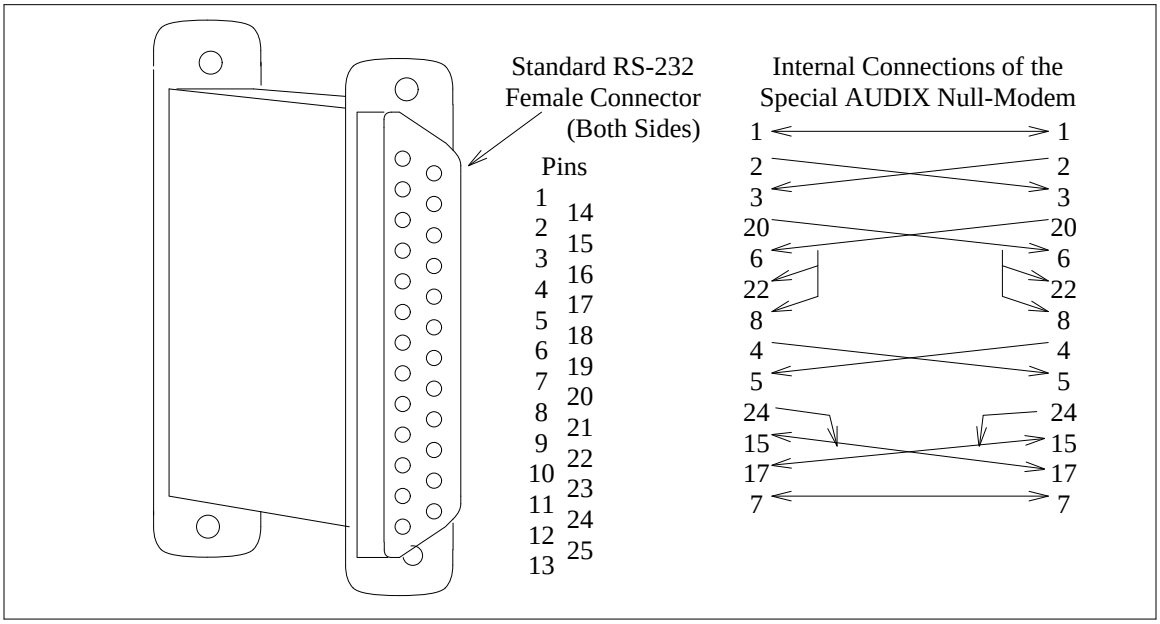


Figure 1-1. H600-330, Group 1 AUDIX Special Null-Modem Cable

H600-331, Group 2 Cable

All new AUDIX networking systems are shipped with one H600-331, Group 2 breakout cable. One end of the Group 2 cable is a 50-pin male Amphenol connector that connects to the ACCE on the AUDIX system. The other end of the cable has a 50-pin female Amphenol connector and two 25-pin RS-232 male connectors. See Table 1-1 for the pin assignments.

The female Amphenol connector provides access to the four DCP channels (AUDIX networking channels 1, 2, 3, and 4). The RS-232 connector A provides access to one RS-232 channel (AUDIX networking channel 5), and RS-232 connector B provides access to the other RS-232 channel (AUDIX networking channel 6).

Table 1-1. Pin Assignments for the H600-331, Group 2 Cable

Connector	**Pin Number**														
50-Pin Amphenol RS-232 A	shield 1	7 2	34 3	9 4	14 5	33 6	35 7	13 8	38 12	39 13	36 15	12 17	8 20	32 22	11 24
50-Pin Amphenol RS-232 B	shield 1	21 2	46 3	23 4	48 5	24 6	16 7	47 8	17 12	42 13	19 15	44 17	18 20	49 22	43 24

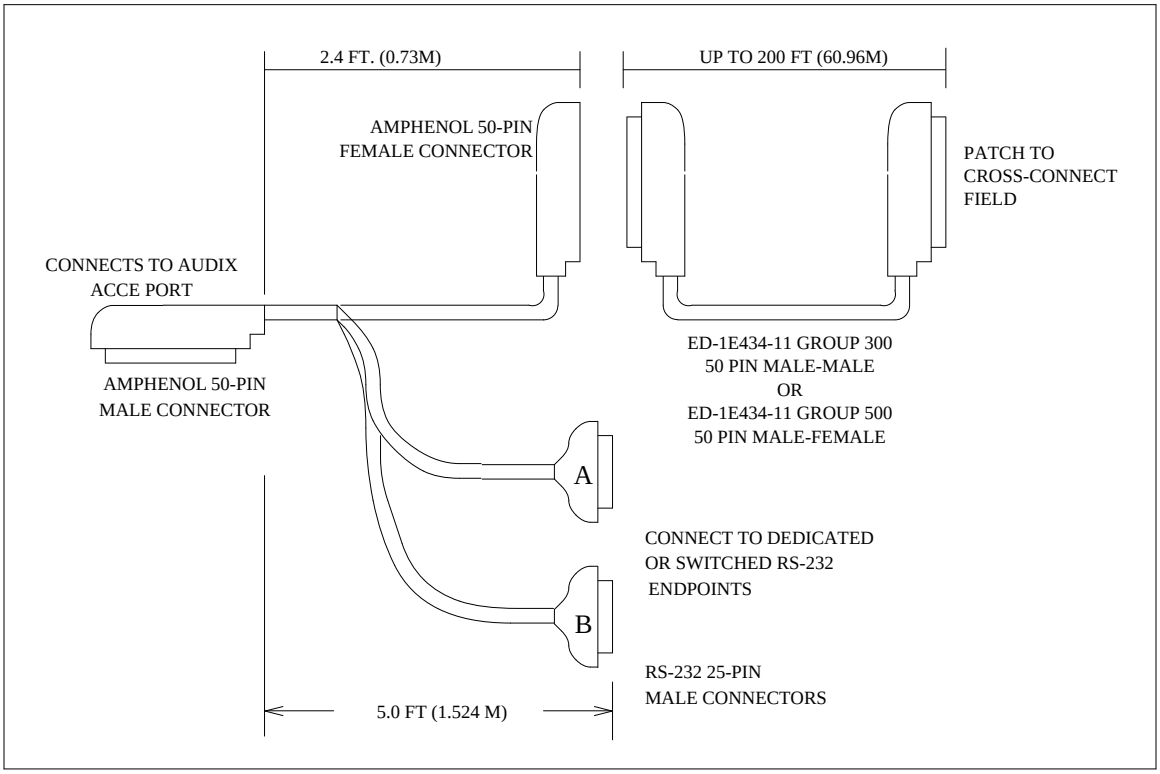


Figure 1-2. H600-331, Group 2 AUDIX Networking Breakout Cable

H600-331, Group 1 Cable

The H600-331, Group 1 breakout cable is no longer shipped; only an AUDIX system that is already installed will have the Group 1 networking cable. One end of this cable is a 50-pin male Amphenol connector that connects to the ACC or ACCE on the AUDIX system. The other end of the cable has two 8-pin DCP connectors and two 25-pin RS-232 male connectors. See Table 1-2 for pin assignments.

The H600-331, Group 1 DCP connector 0 provides access to two DCP channels (AUDIX networking channels 1 and 2). DCP connector 1 also provides access to two DCP channels (AUDIX networking channels 3 and 4). The two 451A adapters are shipped on the ends of connectors 0 and 1. The D8W-87 extension cords and 103A adapters must be ordered separately.

The H600-331, Group 1 RS-232 connector A also provides access to one RS-232 channel (AUDIX networking channel 5), and RS-232 connector B provides access to another RS-232 channel (AUDIX networking channel 6).

Table 1-2. Pin Assignments for the H600-331, Group 1 Cable

Connector	Pin Number														
50 Pin Amphenol RS-232 A	shield 1	7 2	34 3	9 4	14 5	33 6	35 7	13 8	38 12	39 13	36 15	12 17	8 20	32 22	11 24
50 Pin Amphenol RS-232 B	shield 1	21 2	46 3	23 4	48 5	24 6	16 7	47 8	17 12	42 13	19 15	44 17	18 20	49 22	43 24
50 Pin Amphenol DCP 0	27 1	2 2	28 3	3 6											
50 Pin Amphenol DCP 1	30 1	5 2	31 3	6 6											

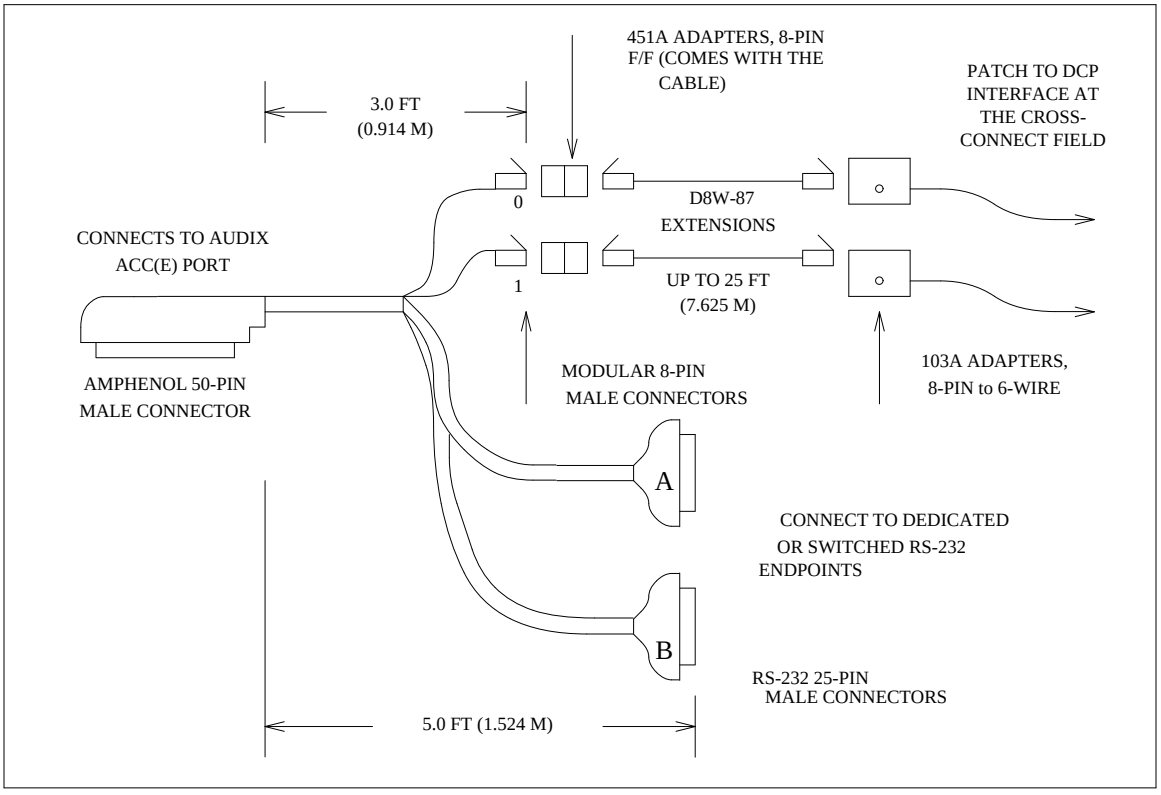


Figure 1-3. H600-331, Group 1 AUDIX Networking Breakout Cable

AUDIX System Administration

In order for the AUDIX system to recognize messages addressed to subscribers at other AUDIX systems, it must be administered with remote machine and remote subscriber profiles. Dial strings, transmission intervals, connection types, and so forth must also be assigned. Each AUDIX system in the network requires this administration of each of the other systems. See Chapter 13, *AUDIX System Administration*.

NETWORKING ENHANCEMENTS

The AUDIX Networking feature was enhanced for R1V5, R1V6, and R1V7.

R1V5 Release

Major changes brought about by AUDIX R1V5 software and the TN539 ACCE circuit pack:

- RS-232 connectivity between AUDIX systems. Previously, only DCP was supported. To use RS-232, the AUDIX system must be running R1V5 or later software and the TN539 ACCE circuit pack is required.
- DCP Mode 1 access to a switched 56 network (that is, 56 Kbps digital transmission) is supported. The AUDIX system must be running R1V5 or later software (56 Kbps loop-around testing is not offered until R1V7). Each AUDIX system requiring access to the switched 56 network must be equipped with the TN539 or TN539B ACCE circuit pack.
- Multi-Stage Dialing is supported. This allows the use of modem pooling to provide a remote AUDIX network for a non-DCP switch. The AUDIX system must be equipped with a TN539 or TN366B circuit pack, the system must be running R1V5 or later software, and a switch supporting DCP must be on site.
- The TN539 ACCE circuit pack can be used with R1V3 and R1V4 AUDIX software, but the RS-232 ports are not available unless R1V5 or later software is used.
- The TN366 or TN366B circuit pack can be used with R1V5 or later software, but the RS-232 ports and access to 56 or 64 Kbps facilities require the TN539 or TN539B ACCE.
- A network can consist of a mixture of R1V3, R1V4, R1V5, R1V6, and R1V7 AUDIX systems. However, the Sending Restrictions feature cannot be used anywhere in a network with R1V3 or R1V4 AUDIX systems.
- Network address ranges — up to 16 AUDIX systems can have the same range specified. The old limit (R1V3 and R1V4) is eight.

R1V6 Release

Major changes brought about by AUDIX R1V6 software and the vintage 7 TN539:

- With the R1V3, R1V4, and R1V5 software releases, only four channels could be simultaneously active. AUDIX systems with R1V6 software and a vintage 7 TN539 or TN539B ACCE can use all six networking ports simultaneously (however, System 75, Generic 1, Generic 3, and MERLIN II can still only access two of the four DCP channels).

NOTE

If a customer is upgrading to R1V5 or R1V6 from an existing network, and the RS-232 channels and/or six simultaneous channels are not required, the existing TN366 or TN366B can be retained. The new TN539 can replace the old circuit pack while the cabling to the switch is left intact.

R1V7 Release

Major changes brought about by AUDIX R1V7 software and the TN539B board:

- The new TN539B ACCE board can provide faster throughput than previous networking boards for networks with heavy traffic.
- The R1V7 software and the TN539B ACCE board permit 56 or 64 Kbps loopback testing; the serving office can send data to an AUDIX port and, if the connection is up, the AUDIX system will echo the data back to the serving office. See Chapter 14, *AUDIX Network Testing* for details.
- On R1V7 systems, the network turnaround feature can be administered. This option is activated using the `system : translation : machine : audix/amis/call delivery` form; it can be administered on a system-wide or per-machine basis.
  - — If network connection turnaround is implemented, the local machine will call a remote machine and do the following: notify the remote system of its updated subscriber information, request updated subscriber information from the remote system, and send voice mail and updated message status information to the remote system. Then network connection will then be *turned around* and the remaining events will occur: the remote system will request updated subscriber information from the local system, notify the local system of its updated subscriber information, and send voice mail and updated message status information to the local system.
  - — If the network turnaround feature is not implemented, the local machine will call a remote machine and do the following: notify the remote system of its updated subscriber information, request updated subscriber information from the remote system, and send voice mail and updated message status information to the remote system. The call will then be disconnected.

  The network turnaround feature reduces system overhead time and long-distance charges by allowing all of these events to occur with a single call rather than two calls. If cost control from a central point is not critical, greater efficiency can be gained by implementing the network connection turnaround feature. The connection can only be turned around once during a single call.

2. Dedicated EIA RS-232 Networks

AUDIX networking can be implemented using a dedicated Electronic Industries Association (EIA) RS-232 interface. This chapter presents dedicated RS-232 configurations supported by AT&T. These examples show AUDIX using RS-232 at both ends. For networks with RS-232 and DCP mixed, see Chapter 7, *Mixtures of RS-232 and DCP Networks*.

If your customer develops their own method, contact the Business Communications Systems Design Center (BCSDC) to make sure the method is feasible. Each of the configurations presented here is accompanied by the equipment required for the AUDIX systems.

NOTE

System 75, DEFINITY Generic 1, Generic 3, and MERLIN II can access only two of the four DCP channels. This is a limitation regardless of the AUDIX software used and the networking circuit pack provided. When mixing the two DCP channels with the two RS-232 channels, a maximum of four channels can be provided for these switches. An AUDIX system installed with a System 85 or a DEFINITY Generic 2 can provide access to six channels in this manner.

AUDIX R1V3, R1V4, and R1V5 software limit the number of simultaneously active channels to four. To use all six channels simultaneously, an AUDIX system must have R1V6 or later software and a TN539 vintage 7 or TN539B ACCE.

CONSIDERATIONS

If a customer is considering using *dedicated* RS-232 connections in their AUDIX network, keep the following in mind:

- Only *local* networking configurations are supported.
- A maximum of three AUDIX systems can be networked via this method.
- AUDIX software must be R1V5 or later.
- The customer needs a TN539 or TN539B networking board.
- This type of network can operate at speeds up to 64 Kbps (depending on distance).

GENERAL INFORMATION

Figure 2-1, *Dedicated RS-232 Network of Two AUDIX Systems*, shows two AUDIX systems networked using dedicated RS-232 connections. The transmission schedules (that is, the times set up for one system to connect to another for the purpose of transmitting messages) can be set so the systems will not attempt to use the channel at the same time. If they do attempt simultaneous transmissions, the system denied access

to the channel will retry automatically.

Normally both RS-232 channels are required for networking. If only one channel is used, the other channel can be used for the AUDIX Call Detail Recording (CDR) feature. However, this configuration is only appropriate for networks with low traffic volume. If a customer chooses to use a channel for CDR, AT&T recommends running CDR only during non-peak hours, thereby leaving two ports available for networking during peak hours. See Figure 2-2, *Dedicated RS-232 Network of Two AUDIX Systems and a PC (Low Traffic Only)*. A switched RS-232 configuration is always preferable for networks that do not have very low traffic.

If another system must be added to Figure 2-1, this can be done as shown in Figure 2-3, *Dedicated RS-232 Network of Three AUDIX Systems (Low Traffic Only)*. If a PC is required in this case, at least one channel from each system must be converted to a switched connection. See Figure 2-4, *Dedicated RS-232 Network of Three AUDIX Systems and a PC*. Instead of switching cables as with configurations such as Figure 2-2, the PC has dial-up access to any AUDIX system in the network. There is more information on switched connections in the next section.

NOTE

Text Services and/or Call Detail Recording can be added using the DCP channels. See Chapter 4, *DCP Mode 1 Networks — 56 Kbps*, and Chapter 7, *Mixtures of RS-232 and DCP Networks*.

When there are more systems and/or PCs than channels, contention for the channels may occur. This situation can usually be avoided, however, by scheduling the transfer of data at different times of the day. See Chapter 13, *AUDIX System Administration* for details on how to set up transmission schedules. Even when contention does occur, an AUDIX system will try to establish a connection two more times. If still unable to make the connection, the AUDIX system will try again at the next scheduled interval or when the transmission queue becomes full.

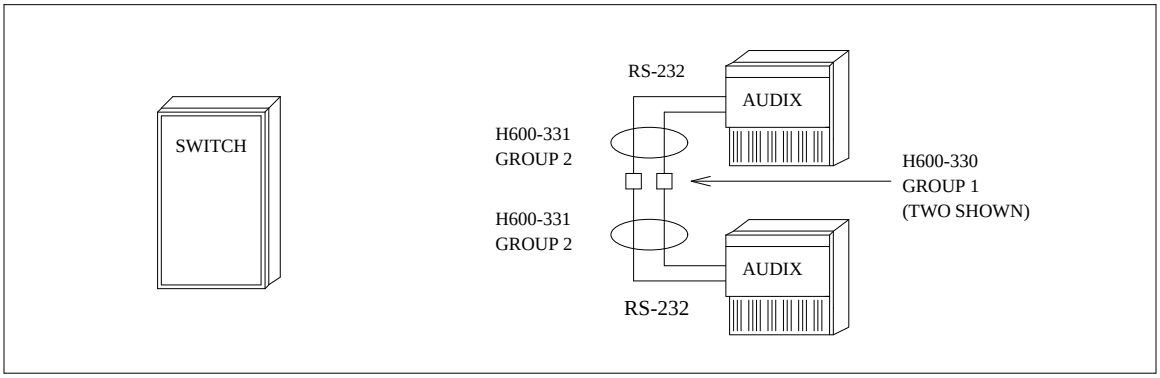


Figure 2-1. Dedicated RS-232 Network of Two AUDIX Systems

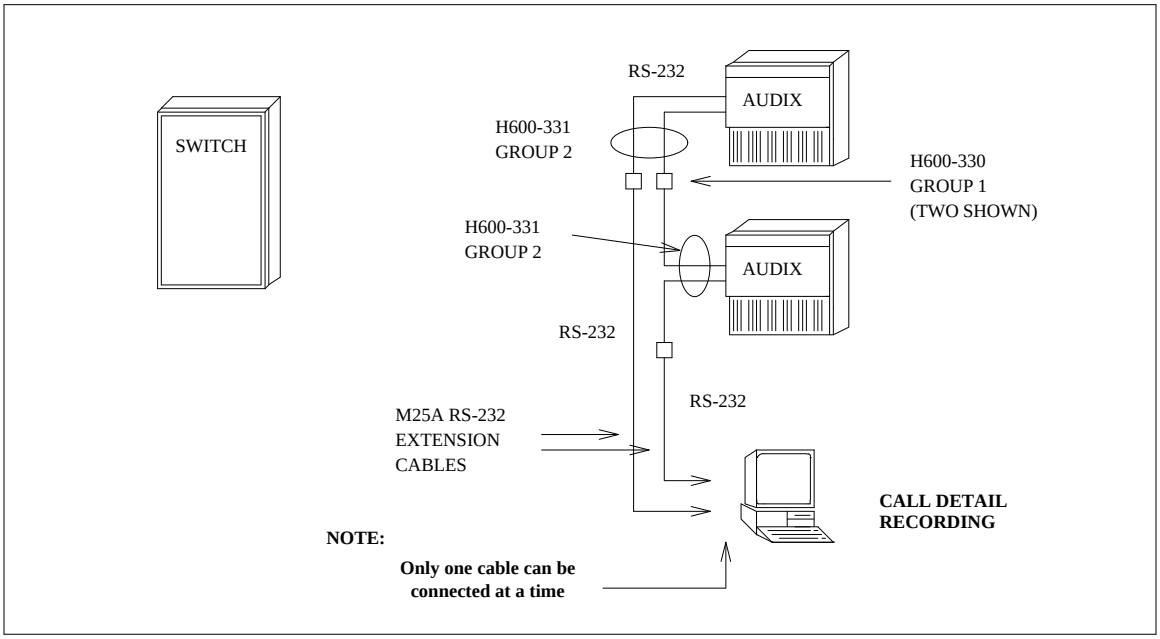


Figure 2-2. Dedicated RS-232 Network of Two AUDIX Systems and a PC (Low Traffic Only)

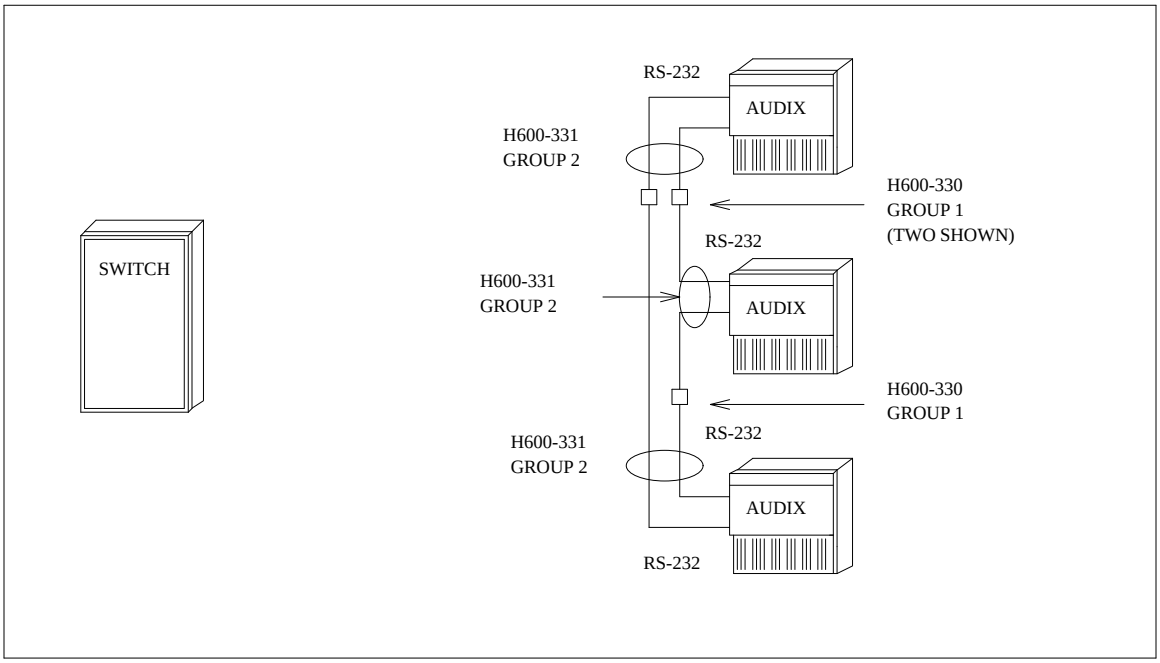


Figure 2-3. Dedicated RS-232 Network of Three AUDIX Systems (Low Traffic Only)

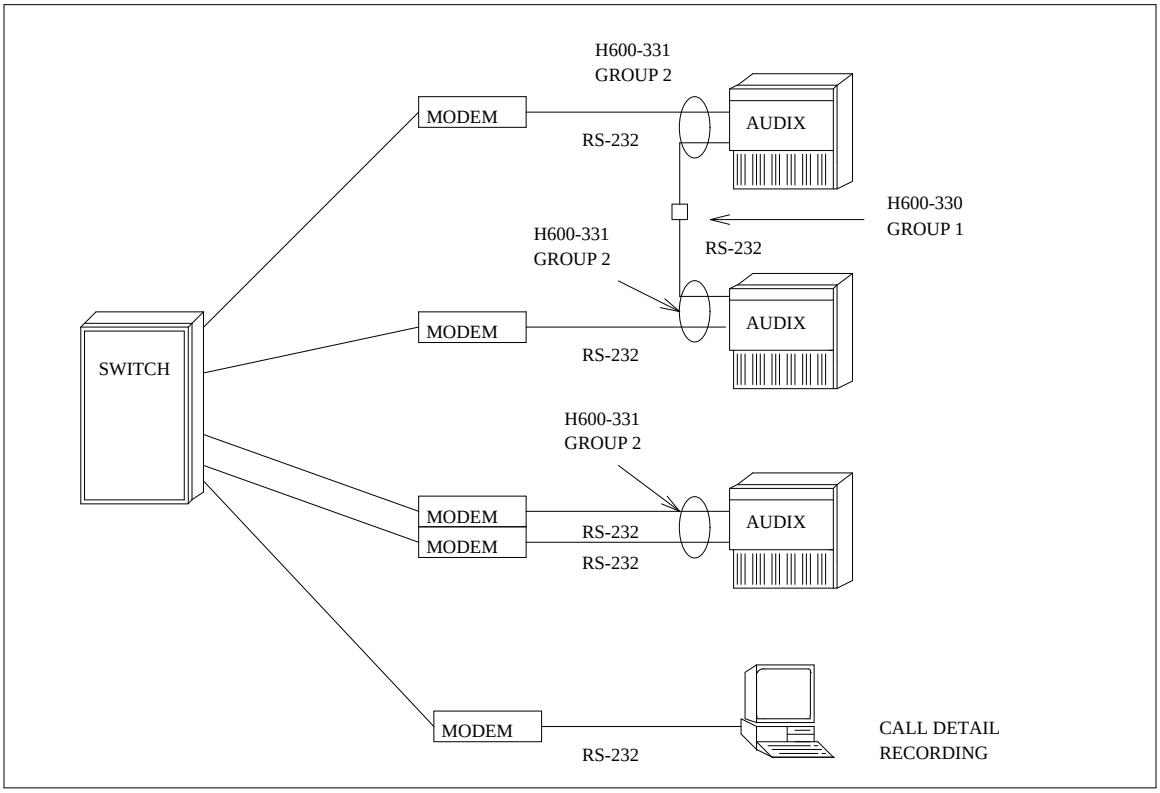


Figure 2-4. Dedicated RS-232 Network of Three AUDIX Systems and a PC

AUDIX REQUIREMENTS FOR DEDICATED RS-232

Each AUDIX system must be running R1V5 or later software. Each AUDIX must be equipped with a TN539 or TN539B ACCE circuit pack. The AUDIX Networking Breakout cable (H600-331, Group 2) and the special AUDIX null-modems (H600-330, Group 1) are provided with each TN539 or TN539B ordered.

NOTE

Standard null-modems cannot be substituted for the AUDIX null-modems.

SWITCH (OR CUSTOMER) REQUIREMENTS FOR DEDICATED RS-232

If the distance between systems is greater than 10 feet (3.05 meters), an M25A RS-232 extender cable (male-female) is required in addition to the H600-331, Group 2 cable and H600-330, Group 1 null-modems at each AUDIX system. Only one null-modem is required in each link. The extender cable is inserted on one side of the null-modem. See Figure 2-5, *Dedicated RS-232 Extended Connections*. This cable comes in lengths up to 50 feet (15.24 meters).

If the distance between AUDIX systems is greater than 50 feet, you can do one of two things:

- In addition to the H600-331, Group 2 cable at each AUDIX system, a pair of data sets must be inserted in place of the null-modem (see Figure 2-5). The data sets must be Z3A Asynchronous Data Units (ADU). The following equipment is required (see Figure 8-3). Two Z3A Asynchronous Data Units (ADU), two D8W-87 modular cords, two 103A adapters, one D8AM-87 crossover cord, external power on one end (400B adapter, D6AP-87 modular cord, 248B adapter, and a Model 2012D transformer), and building wire (4-wire).

  Check the document(s) shipped with the data sets for the maximum distances allowed.

- The dedicated connection can be recabled as a switched connection. See Chapter 3, *Switched EIA RS-232 Networks*.

DATA RATES FOR DEDICATED RS-232

Data rate limitations are imposed on the RS-232 interface when certain distances are exceeded:

- At 20 feet (6.1 meters) or less, the data rate can be as high as 64 Kbps.
- At 20 to 50 feet (6.1 to 15.25 meters), the maximum data rate is 19.2 Kbps unless limited-distance modems are used. Check with the documentation shipped with the limited-distance modems.
- At more than 50 feet (15.25 meters), limited-distance modems must be used. Check with the documentation shipped with the limited-distance modems.

NOTE

Configurations with limited-distance modems are supported only as custom work.

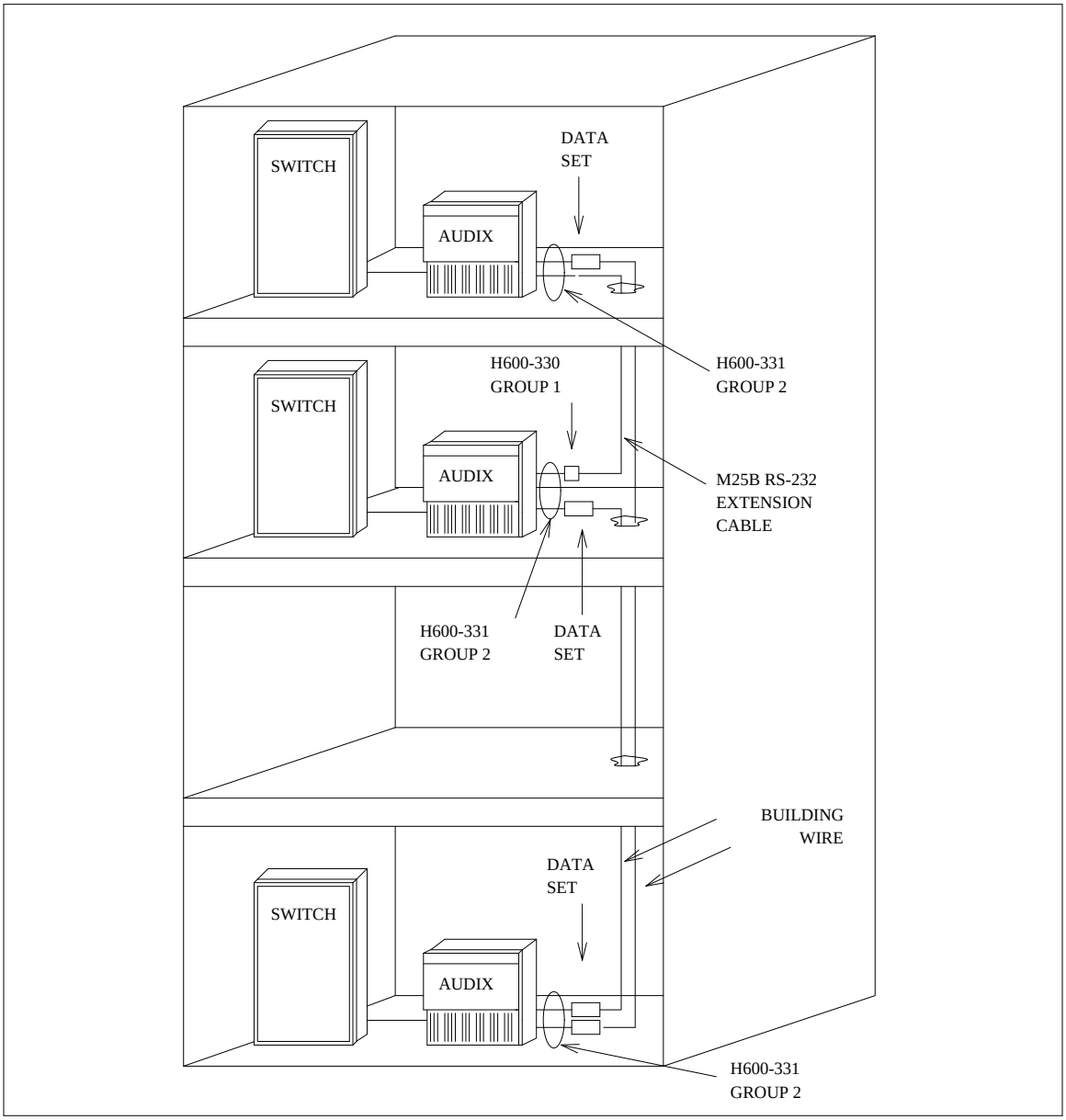


Figure 2-5. Dedicated RS-232 Extended Connections

3. Switched EIA RS-232 Networks

AUDIX networks can be implemented using a switched Electronic Industries Association (EIA) RS-232 connection. Networks can also be implemented by converting the RS-232 channels into switched Digital Communications Protocol (DCP) connections. This chapter presents supported configurations for both methods. The examples show an AUDIX system using RS-232 at both ends. See Chapter 7, *Mixtures of RS-232 and DCP Networks*, for RS-232/DCP combinations.

If your customer develops their own method, contact the Business Communications Systems Design Center (BCSDC) to make sure the method is feasible. Each of the examples presented here is accompanied by the equipment required for the AUDIX systems and for the switches the AUDIX systems serve.

CONSIDERATIONS

If a customer is considering using switched RS-232 connections in their AUDIX network, keep the following in mind:

- Local or remote networking configurations are supported.
- Two or more AUDIX systems can be networked via this method.
- AUDIX software must be R1V5 or later.
- The customer needs a TN539 or TN539B networking board.
- In this type of network speeds can be up to 19.2 Kbps; speeds are limited by the modems or data modules the customer chooses to use.
- The customer will need data modules or Hayes-compatible modems for each AUDIX channel to be switched.

NOTE

System 75, DEFINITY Generic 1 and Generic 3, and MERLIN II can only access two of the four AUDIX DCP channels. This is a limitation regardless of the AUDIX software used and the networking circuit pack provided. Thus, conversion of the RS-232 channels to DCP becomes of particular importance in these cases. When mixing the two DCP channels with the two RS-232 channels, a maximum of four channels can be provided for these switches. AUDIX installed with a System 85 or a DEFINITY Generic 2 can provide access to six channels in this manner.

For a System 85 or Generic 2, AUDIX R1V3, R1V4, and R1V5 software limit the number of simultaneously active channels to four. To use all six channels simultaneously with a System 85 or Generic 2, an AUDIX system must have R1V6 or later software and a TN539 vintage 7 or TN539B ACCE.

SWITCHED RS-232 USING MODEMS

When a dedicated RS-232 network requires more than three AUDIX systems, or any time two systems are separated by a distance greater than two data sets can support, a switched RS-232 network must be formed. Modems convert the RS-232 signal into an analog signal for transmission through the switch to a colocated AUDIX system, or out of the switch across the public/private facilities to another switch.

Figure 3-1, *Dedicated and Switched RS-232 Network for a Single Switch*, shows four AUDIX systems serving the same switch. Notice that in this example there is a mixture of dedicated and switched connections. Incorporating two dedicated connections into this setup saves the customer the price of four modems. Whether this is a viable setup depends on the network usage between all systems.

If the network requires switched access to all RS-232 channels, the network would look like Figure 3-2, *Switched RS-232 Network for a Single Switch*.

Figure 3-3, *Switched RS-232 Network for Separate Locations*, shows three AUDIX systems serving switches at different locations. This setup also presents a mixture of dedicated and switched connections. The assumption is that the two systems serving the same switch will have much more use for a network connection, so a dedicated connection is provided. For the occasional connection to/from the other site, a switched connection is used.

If Call Detail Recording is required, a PC can be included in a switched RS-232 network using a spare dedicated RS-232 connection or through a switched RS-232 connection. Figure 3-4, *Switched RS-232 Network for Separate Locations and a PC*, shows a switched connection. The PC has dial-up access to any AUDIX system in the network.

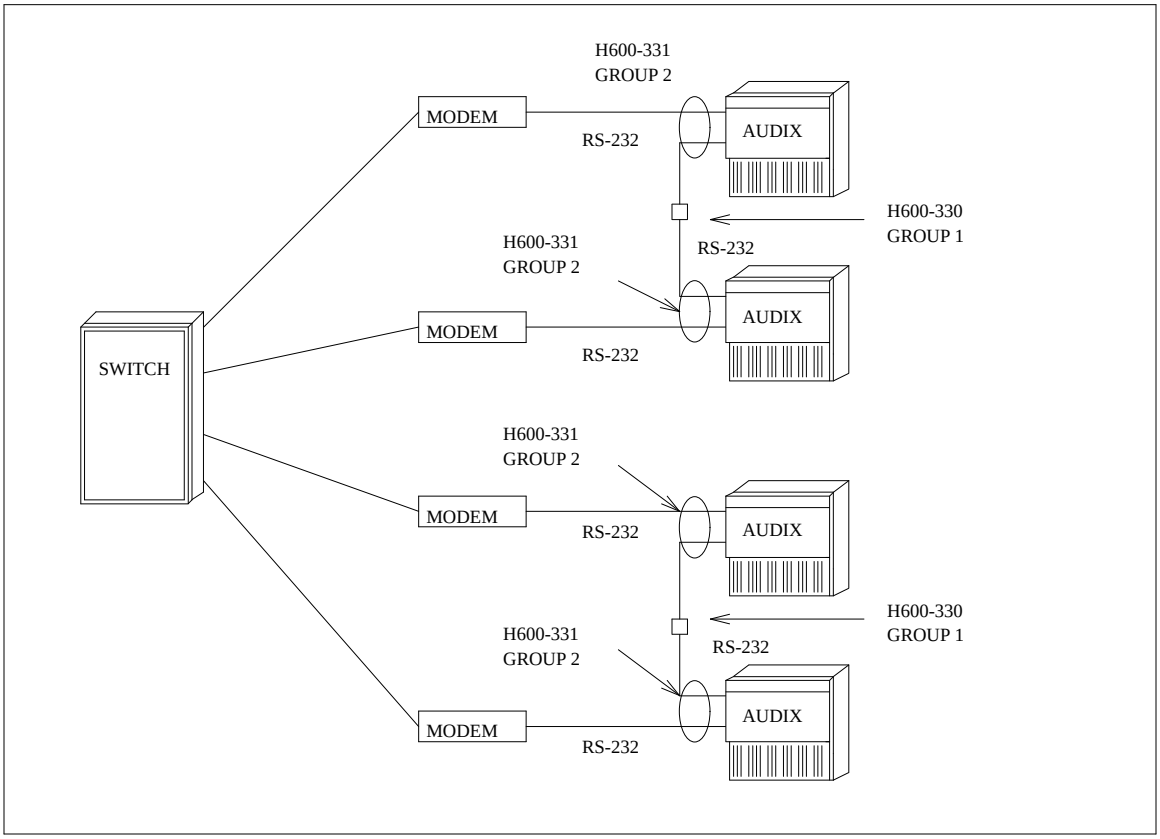


Figure 3-1. Dedicated and Switched RS-232 Network for a Single Switch

AUDIX System Requirements For Switched RS-232 Using Modems

Each AUDIX system must be running R1V5 or later software. Each AUDIX system must be equipped with a TN539 or TN539B ACCE circuit pack. The AUDIX Networking Breakout cable (H600-331, Group 2) is required at each AUDIX system.

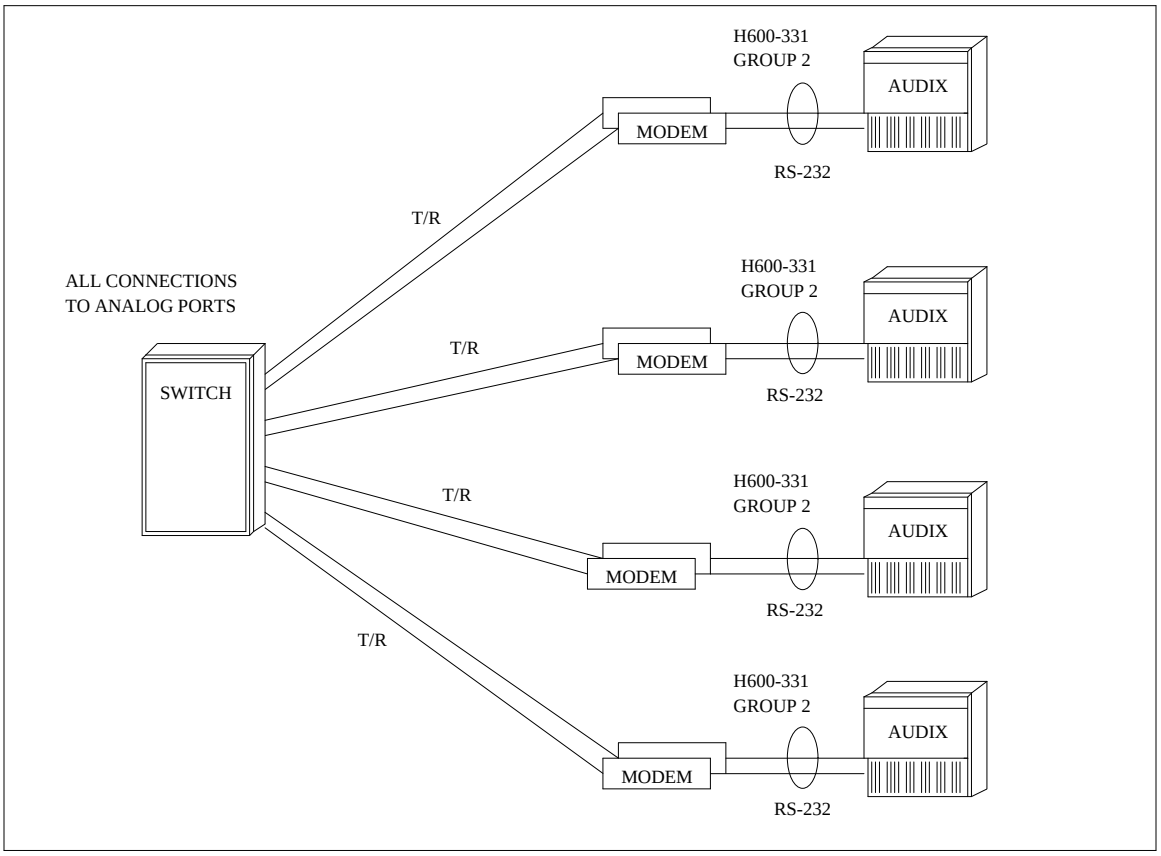


Figure 3-2. Switched RS-232 Network for a Single Switch

Switch (or Customer) Requirements For Switched RS-232 Using Modems

Each switched RS-232 channel requires one of the following Hayes®-compatible modems:

- AT&T 2296A
- AT&T Paradyne 3820
- AT&T Paradyne DM424
- MICROCOM QX 3296/C (not orderable through AT&T)

NOTE

Equivalent modems such as the AT&T Paradyne DL424 instead of the DM424 modem could be used.

The modem requires a connection through one of the switch's analog ports or can connect directly to a CO line. Switch analog port circuit packs are:

- System 75, Generic 1, and Generic 3: TN742 or TN746B analog line circuit
- System 85 and Generic 2 traditional module: SN222, SN228, or SN228B analog line circuit
- System 85 and Generic 2 universal module: TN742 or TN746B analog line circuit

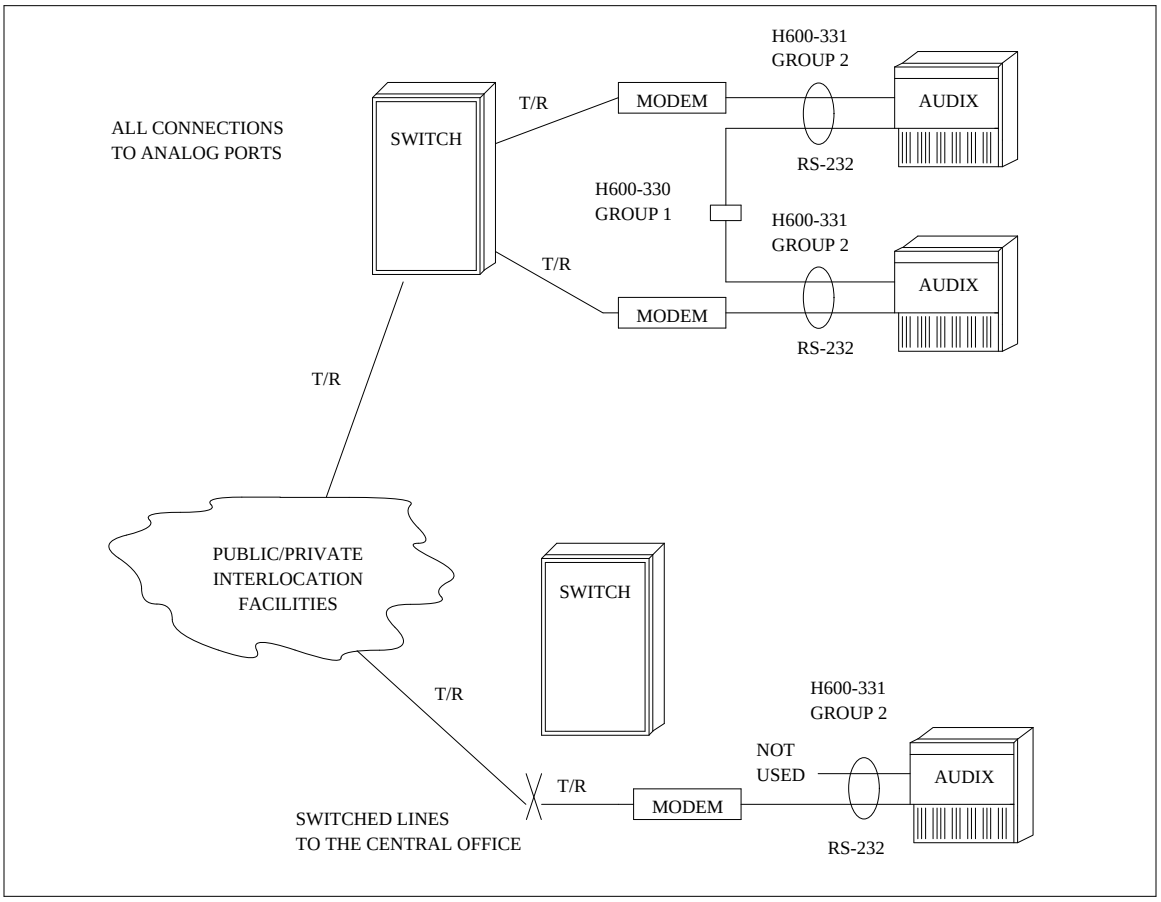


Figure 3-3. Switched RS-232 Network for Separate Locations

If the modems must be located greater than 5.0 feet (1.524 meters) from the AUDIX system, an M25A RS-232 extender cable is required for each. The modem must be within 50 feet (15.24 meters) of the AUDIX system. The tip/ring circuit should be engineered by a switch representative.

Data Rates for Switched RS-232 Using Modems

When connected through the switch, data rates are limited to speeds up to and including 19.2 Kbps. The speeds may be reduced by the limit of the modems and the public/private facilities involved.

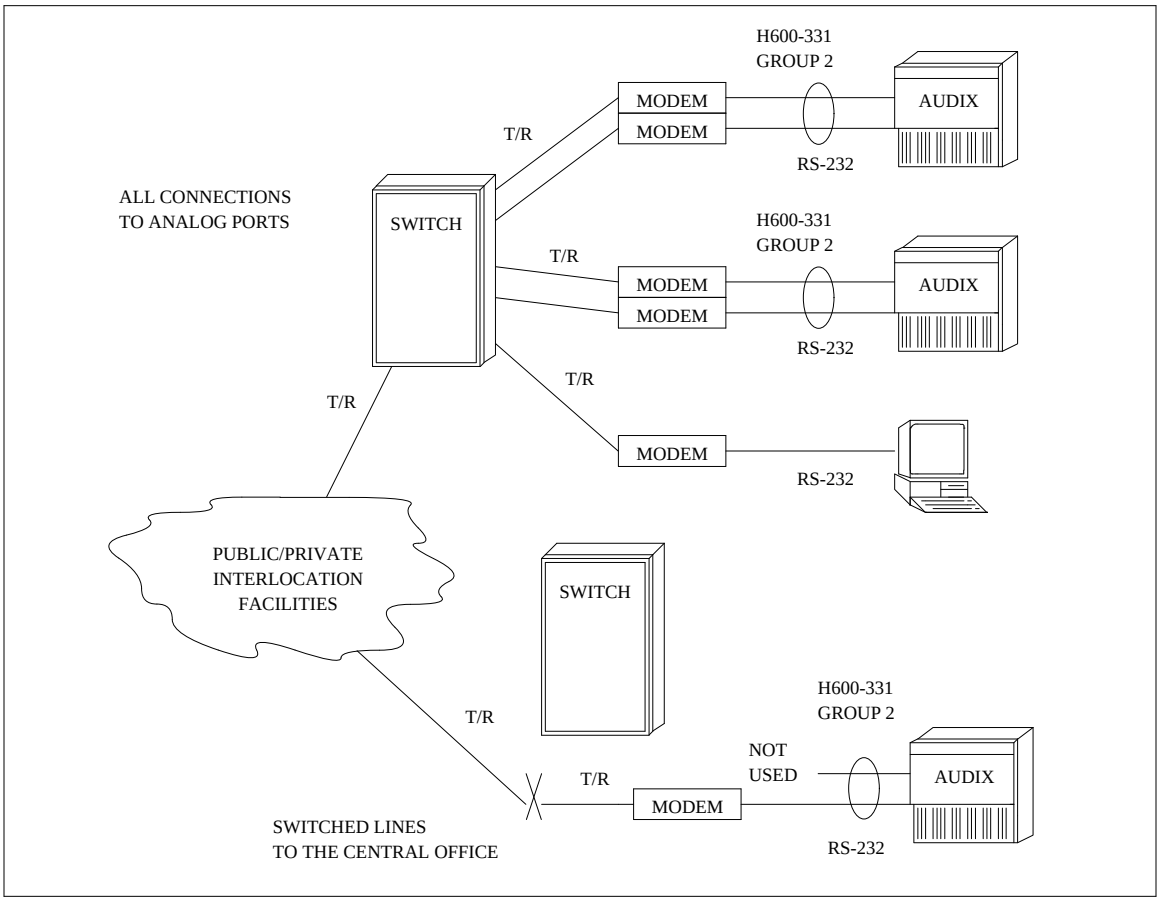


Figure 3-4. Switched RS-232 Network for Separate Locations and a PC

SWITCHED RS-232 USING DATA MODULES FOR DCP

By using a data module instead of a modem, the RS-232 channel becomes a DCP channel, at least as far as the switch and the switch network is concerned. RS-232 channels can be converted to DCP mode 1, DCP mode 2, or DCP mode 3. See Figure 3-5, *Converting RS-232 Channels to DCP*.

- To convert to DCP mode 1 (56 Kbps) or DCP mode 3 (64 Kbps), use a Modular Processor Data Module, Model M1* (MPDM/M1*). In either of these cases, the channels can only be used for incoming calls; they cannot be used for outgoing calls. All outgoing calls must use the DCP ports.
- To convert to DCP mode 2, use a 7400A or 7400B Data Service Unit (DSU). In this case, the channels can be used for incoming or outgoing calls.

Converting RS-232 channels to DCP is particularly useful for System 75, Generic 1, Generic 3, and MERLIN II where a DCP network is desired. Adding the two converted channels to the regular two DCP channels creates a total of four DCP channels. (If the customer desires, these channels can be left as RS-232 channels giving two RS-232 and two DCP channels, again for a total of four channels. See Chapter 7, *Mixtures of RS-232 and DCP Networks*, for examples.)

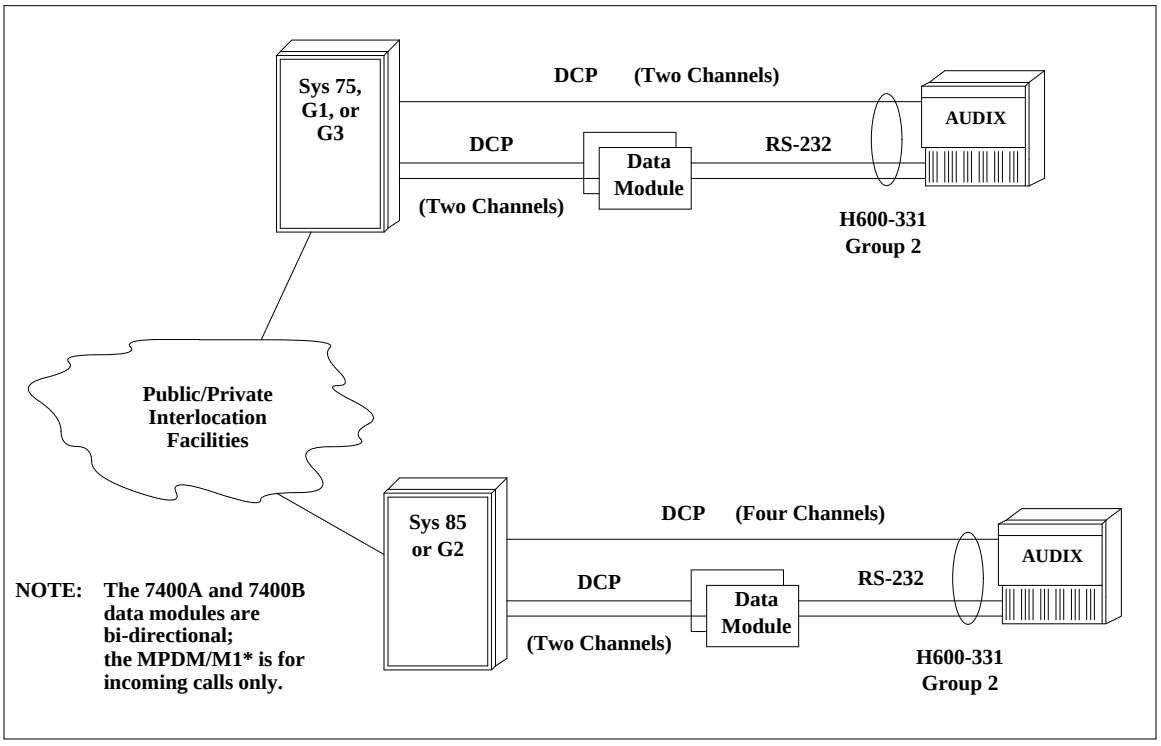


Figure 3-5. Converting RS-232 Channels to DCP

AUDIX System Requirements for Switched RS-232 Using Data Modules For DCP

Each AUDIX system must be running R1V5 or later software and must be equipped with a TN539 or TN539B ACCE circuit pack and the AUDIX Networking Breakout cable (H600-331 Group 1 or 2).

Switch (or Customer) Requirements for Switched RS-232 Using Data Modules for DCP

Each AUDIX RS-232 channel to be converted to DCP requires a data module. The data module must be connected to a DCP port at the switch and should be located within 5 feet (1.524 meters) of the AUDIX system, so an M25A RS-232 extender cable is not needed. The distance from the data module to the switch should be no more than 5000 feet (1524 meters). The following is required:

- One of the following data modules:
  - — For DCP mode 1 (56 Kbps, synchronous) or DCP mode 3 (64 Kbps, synchronous) use an MPDM/M1*. The MPDM/M1* operates in synchronous mode. An older MPDM can be upgraded to support 56 Kbps with D-kit D-181509. Install the D-kit by following the instructions included with the kit. These channels can *only* be used for incoming calls.
  - — For DCP mode 2, use a 7400A or 7400B DSU. The 7400A and 7400B operate in only asynchronous mode. These channels can be used for incoming or outgoing calls.
- One D8W-87 modular cord (provided with the data module) is required for each module.
- Switch DCP interface:
  - — System 75, Generic 1, and Generic 3: TN754 Digital Line Circuit
  - — System 85 and Generic 2 traditional module: SN270B General Purpose Port
  - — System 85 and Generic 2 universal module: TN754

If the converted channels are to be used for DCP Mode 2 operation, two modem pool pairs are also required. See Chapter 5, *DCP Mode 2 Networks — Modem Pooling*. Access to two additional channels on the interlocation facilities might also be required.

Data Rates for Switched RS-232 Using Data Modules For DCP

Data rates are limited to the capabilities of the data modules. MPDM/M1* data modules operate at 56 or 64 Kbps (synchronous), but they do not support dialing out at these speeds, so the converted channels would be limited to receiving calls only. In some cases this limitation would not create a problem. In cases where it would, the 7400A data module, which supports incoming and outgoing calls, can be used. However, with the 7400A, communication is performed at low speeds (up to and including 19.2 Kbps, asynchronous).

4. DCP Mode 1 Networks — 56 Kbps

AUDIX networks can be implemented using AT&T's Digital Communications Protocol (DCP) Mode 1. This type of network is only used when the AUDIX systems to be networked are not colocated and, therefore, they require some type of interlocation facility to pass data. (For local networking, see Chapter 6, *DCP Mode 3 Networks — 64 Kbps*.) This chapter presents supported 56 Kbps configurations; all other 56 Kbps configurations must be designed by Custom Development.

The examples show an AUDIX system using DCP at both ends. See Chapter 7, *Mixtures of RS-232 and DCP Networks*, for RS-232/DCP combinations. Each of the examples presented in this chapter is accompanied by the equipment required for the AUDIX systems and for the switches that the AUDIX systems serve.

NOTE

Customers who implemented 56 Kbps networking using TN539 ACCE boards may wish to upgrade to AUDIX R1V7 software and a TN539B ACCE in order to take advantage of the performance improvements and built-in loop-around testing capabilities.

CONSIDERATIONS

If a customer is considering using DCP Mode 1 connections in their AUDIX network, keep the following in mind:

- Only *remote* networking configurations are supported.
- Two or more AUDIX systems can be networked via this method.
- AUDIX software must be R1V5 or later. However, R1V7 software is recommended because of the networking feature enhancements and 56 Kbps loopback testing capabilities included in that load when a TN539B ACCE board is used.
- AUDIX systems running R1V5 or R1V6 software require an MPDM/M1* for loopback testing. AUDIX R1V7 systems only require an MPDM/M1* if the two RS-232 ports are to be converted for 56 Kbps use.
- The customer needs a TN539 or TN539B ACCE networking board; the TN539B is recommended because of the 56 Kbps loopback testing capabilities included in that load when AUDIX R1V7 software is used.
- Transmission in this type of network is full-duplex, synchronous, at 56 Kbps.
- The customer will need access to 56 Kbps robbed-bit facilities to a static or dynamic serving office (SO).
- The customer will also need a DCP interface on the switch to connect with the AUDIX and a DS1 interface on the switch to connect with the 56 Kbps network.

NOTE

MERLIN II, System 75, and DEFINITY Generic 1 and Generic 3 can only access two of the four DCP channels. This is a limitation regardless of the AUDIX software and networking circuit pack used. See Chapter 3, *Switched EIA RS-232 Networks*, for information on expanding this limitation to four channels by adding the AUDIX RS-232 channels.

GENERAL INFORMATION

To use DCP Mode 1 as the transmission protocol, the switch must be set up to access a switched network at 56 Kbps via robbed-bit facilities. These special access lines can be either Dataphone Digital Service (DDS) or ACCUNET T1.5, SDN service providing access to either a static or dynamic Serving Office (SO), or compatible services provided by other vendors. Currently the System 75, System 85, DEFINITY Generic 1, Generic 2, or Generic 3 can provide this type of access. However, System 85 (R2V3 or R2V4) does not support dynamic access. Up to six channels on the 56 Kbps service facility may be required at any one time for System 85 and Generic 2 and up to four channels for System 75, Generic 1, and Generic 3.

Figure 4-1, *DCP Mode 1 Network Using Switched 56 Service*, shows an arrangement where AUDIX networking is accomplished via 56 Kbps services. Figure 4-2, *PC Added to A DCP Network*, shows a network of R1V5 or later AUDIX systems with RS-232 access. When RS-232 is available, the customer has a choice of connecting a PC for the CDR feature via dedicated or switched RS-232 (dedicated RS-232 is shown in Figure 4-2).

NOTE

If the customer does not subscribe to switched 56 service, check with the DCP Mode 2, DCP Mode 3, and RS-232 network alternatives before setting up a switched 56 Kbps facility.

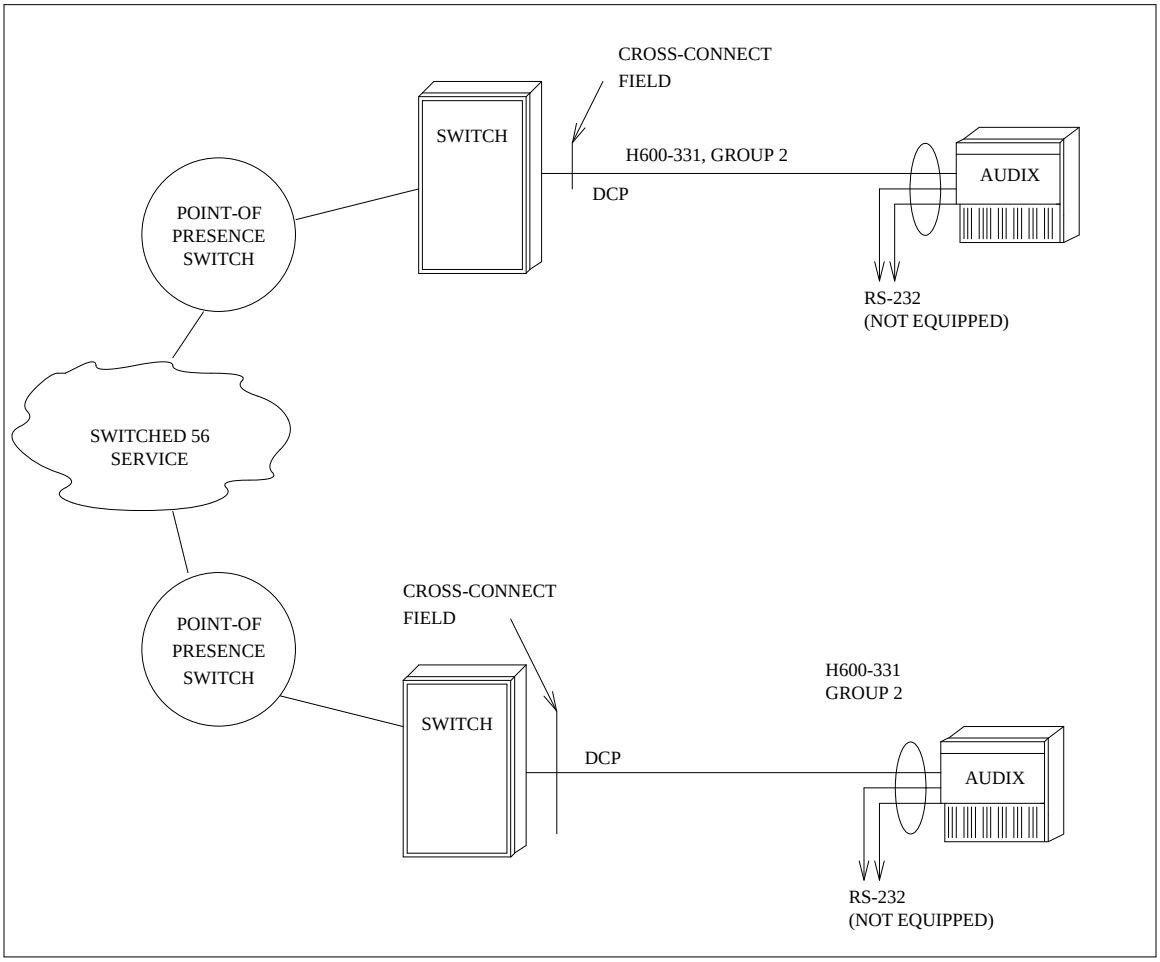


Figure 4-1. DCP Mode 1 Network Using Switched 56 Service

Static Access

Static SDDN (non-ISDN) allows customers currently subscribing to SDN voice applications to transmit data on the same access arrangement by designating a subgroup defined for data terminations. Customers using this configuration must have a trunk subgroup (TSG) dedicated to SDDN 56 Kbps between the customer premises and a central office. They must also have a System 75 R1V3 Issue 2.1 or later, a System 85 R2V3 or R2V4, or a DEFINITY Generic 1, Generic 2, or Generic 3 switch.

The central office must provide one of the following:

- SDN, T1.5, or DDS and Switched Digital Service (SDS), or compatible service offered by another vendor
- A 4ESS supporting 56 Kbps service

A customer with T1.5 access to a central office tariffed for SDN and T1.5 that does not home to a 4ESS with SDS *cannot* use this option.

Dynamic Access

Dynamic SDDN (non-ISDN) allows customers that currently subscribe to SDN voice applications to transmit data on the same access arrangement by prefixing a 115 feature code in front of a telephone number. This allows customers to alternately transmit voice and data on one access line; a separate trunk group for 56 Kbps data is not required.

The T1.5 is dedicated to SDN and is therefore not exclusively 56 Kbps. The central office must route to a 4ESS that supports 56 Kbps via digital connectivity. This access may only be offered on circuits without echo cancellation.

The dynamic arrangement is not possible from locations using DDS access. DDS lines must terminate in a central office that has been tariffed for SDN, DDS, and SDS.

System 85 R2V3 and R2V4 *do not* support dynamic access. System 75 R1V3 and and DEFINITY Generic 1, Generic 2, and Generic 3 *do* support dynamic access. However, if a customer wants to use a Generic 2 for Switched 56 Kbps networking, contact the BCSDC for help.

NOTE

Dynamic trunk group arrangements cannot be used by modem pooling. If a customer has both 56 Kbps and modem pooling, two trunk groups are required.

AUDIX SYSTEM REQUIREMENTS FOR DCP MODE 1

Each AUDIX system requiring access to a switched 56 network must be running R1V5 or later software. Each AUDIX system must also be equipped with a TN539 or TN539B ACCE circuit pack, the AUDIX Networking Breakout cable (H600-331, Group 1 or Group 2). Also, if the RS-232 ports are to be used for DCP Mode 1 transmission, an MPDM/M1* with an RS-232 interface card is required. If loopback testing is to be conducted for an R1V5 or R1V6 AUDIX system, an MPDM/M1* with a V.35 interface card is required. In addition, each AUDIX system must be within 5000 cable feet (1525 meters) of the switch's DCP interface.

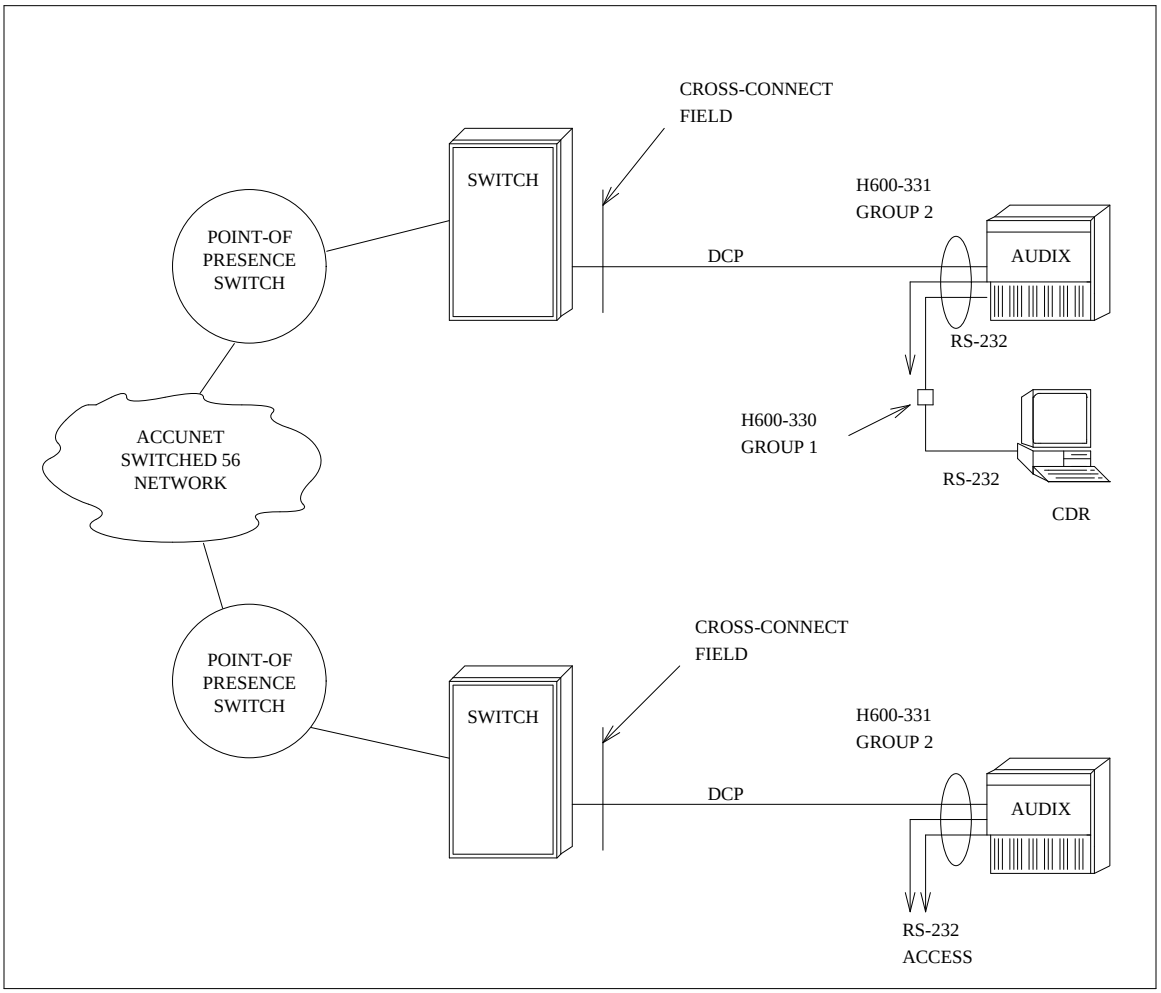


Figure 4-2. PC Added to a DCP Network

SWITCH (OR CUSTOMER) REQUIREMENTS FOR DCP MODE 1

To implement AUDIX networking over static or dynamic switched 56 Kbps facilities, the customer's switch must have a DCP interface to connect with the AUDIX system and a DS1 interface to connect with the 56 Kbps switched network.

Whether a customer is using static or dynamic 56 Kbps, the point-of-presence switch needs to be translated to match the switch, (including wink in/wink out). The RNXs are set up by the customer and added to the network by Network Systems.

NOTE

Contact the Business Communications Systems Design Center (BCSDC) to design ISDN.

The following equipment is typical for 56 Kbps facility access:

- Digital Line Circuits for the AUDIX network
- DS1 Interface
- For R1V5 or R1V6, a Modular Processor Data Module, Model M1* (MPDM/M1*) ACCUNET data module with V.35 interface card (for loopback testing)

NOTE

See the *DEFINITY® Communications System & System 75/85 DS1/DMI/ISDN-PRI Reference* (555-025-101) for a complete specification of requirements.

Static Access Switch Requirements

The requirements for networking AUDIX systems via static 56 Kbps facilities depend on the customer's premise switch:

- System 75
  - — The switch must be R1V3 2.1 or later.
  - — All tone detectors must be TN748C (V4 or later).
- DEFINITY Generic 1 and Generic 3
  - — Any release will support static 56 Kbps access.
  - — All tone detectors must be TN748C (V4 or later).

- System 85
  - — The switch must be R2V3 or R2V4
  - — All tone detectors must be at least an SN255.
- DEFINITY Generic 2
  - — Any release will support static 56 Kbps access.
  - — For universal modules, the detector must be a TN748C (V4 or later). For traditional modules, the detector is a SN255.

Dynamic Access Switch Requirements

The requirements for networking AUDIX systems via dynamic 56 Kbps facilities depend on the customer premise switch:

- System 75
  - — The switch must be R1V3 2.1 or later.
  - — All tone detectors must be TN748C (V4 or later).
- DEFINITY Generic 1 and Generic 3
  - — Any release will support dynamic 56 Kbps access.
  - — All tone detectors must be TN748C (V4 or later).
- System 85
  - — Does not support dynamic access.
- DEFINITY Generic 2
  - — Any release will support dynamic 56 Kbps access.
  - — For universal modules, the detector must be a TN748C (V4 or later). For traditional modules, the detector is a SN255.

  For help in designing dynamic switched 56 Kbps networking with a Generic 2, contact the BCSDC.

NOTE

The MERLIN II does not support this arrangement. If your customer has a non-DCP switch and wishes to use DCP Mode 1, a DEFINITY Generic 1, Generic 2, or Generic 3 can be used instead of the MERLIN II.

DATA RATES FOR DCP MODE 1

All of the configurations shown in this chapter operate at 56 Kbps.

5. DCP Mode 2 Networks — Modem Pooling

AUDIX networks can be implemented using AT&T's Digital Communications Protocol (DCP) Mode 2. This type of network is only used when the AUDIX systems to be networked are not colocated and, therefore, require some type of interlocation facility to pass data. This arrangement makes use of the switch's modem pool or can be implemented using stand-alone modem pools. This chapter presents supported configurations. The examples show the AUDIX system using DCP at both ends. See Chapter 7, *Mixtures of RS-232 and DCP Networks*, for RS-232/DCP combinations.

If a customer develops their own method, contact the Business Communications Systems Design Center (BCSDC) to make sure it is feasible. Each of the examples presented here is accompanied by the equipment required for the AUDIX systems and for the switches that the AUDIX systems serve.

CONSIDERATIONS

If a customer is considering using DCP Mode 2 connections in their AUDIX network, keep the following in mind:

- Only *remote* networking configurations are supported.
- Two or more AUDIX systems can be networked via this method.
- AUDIX software must be R1V3 or later.
- The customer needs a TN366, TN366B, TN539, or TN539B networking board.
- Transmission in this type of network is full-duplex or half-duplex, synchronous or asynchronous, at speeds up to 9600 bps.
- The customer will need rack-mounted or standalone modem pool.

NOTE

System 75 and DEFINITY Generic 1 and Generic 3 can be set up to access only two of the four DCP channels. This is a limitation regardless of the AUDIX software used and the networking circuit pack provided. See Chapter 3, *Switched EIA RS-232 Networks*, for information on expanding this limitation to four channels.

GENERAL INFORMATION

DCP Mode 2 networking uses the DCP interface between the AUDIX system and the switch. Analog or voice-grade data facilities are used between customer locations. When the switch is a System 85 or DEFINITY Generic 2, the AUDIX system can use up to six ports at any given time. When the switch is a System 75, Generic 1, or Generic 3, up to four ports may be used at any given time.

Figure 5-1, *Typical Rack-Mounted Modem Pool Using D-Lead Control*, shows a modem pool where a D-Lead is used between the modems and data modules. This arrangement is usually shared by two or more switch applications. The customer can use this arrangement for AUDIX systems so long as the equipment and their option settings are compatible. (Compatible equipment is provided later in this chapter. Compatible option settings are provided in Chapter 11, *DCP Mode 2 Installation and Administration*.) The customer could also use what is called stand-alone modem pooling. See Figure 5-2, *Typical Stand-Alone Modem Pool (No D-Lead Control)*.

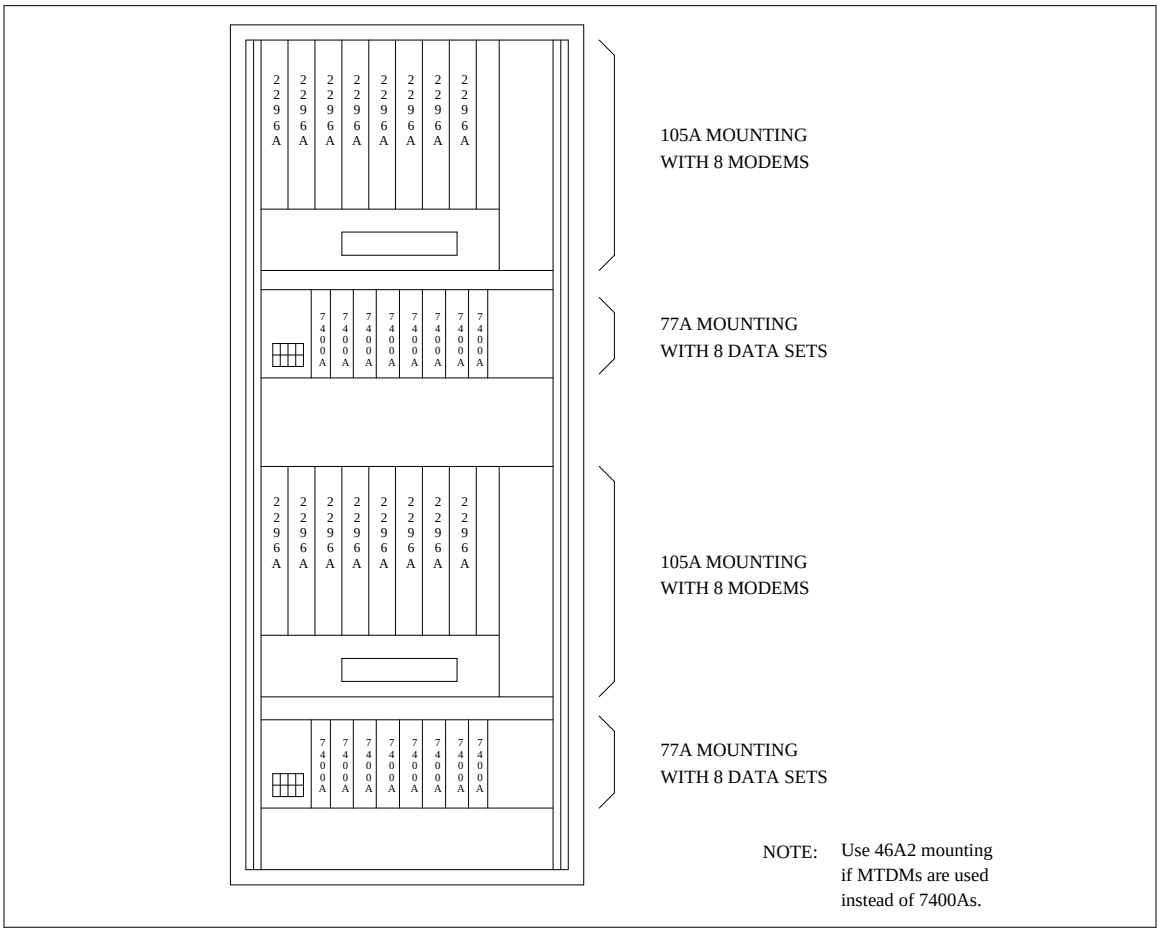


Figure 5-1. Typical Rack-Mounted Modem Pool Using D-Lead Control

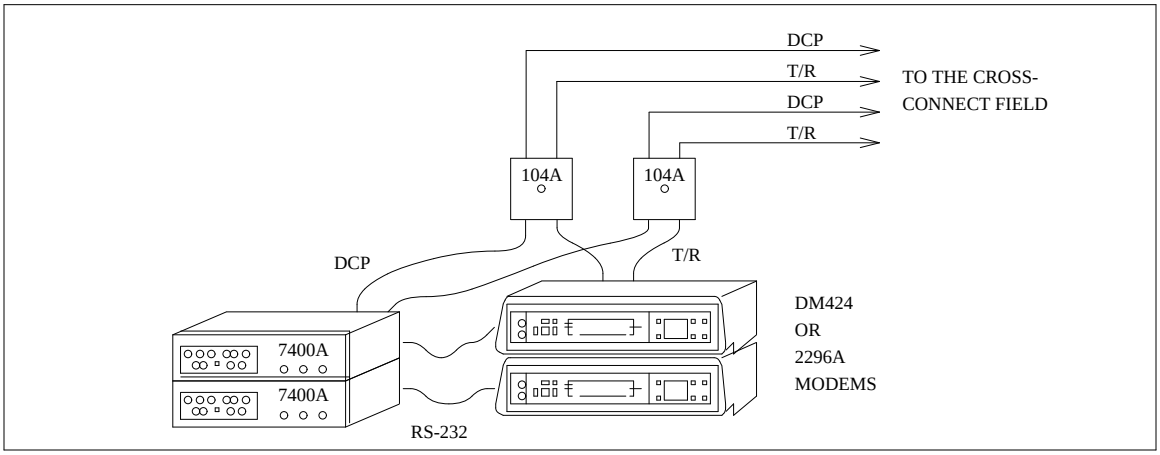


Figure 5-2. Typical Stand-Alone Modem Pool (No D-Lead Control)

In Figure 5-2, the modems and data modules are typically the models that are contained in their own housings and placed on shelves or on top of other cabinets. However, they could be the rack-mounted versions where they are cabled as stand-alone modem pools (no D-Lead). Stand-alone modem pools are usually dedicated for a particular application.

Figure 5-3, *DCP Mode 2 Network (Modem Pooling)*, shows a DCP Mode 2 network where the switches are either System 75, System 85, Generic 1, Generic 2, or Generic 3.

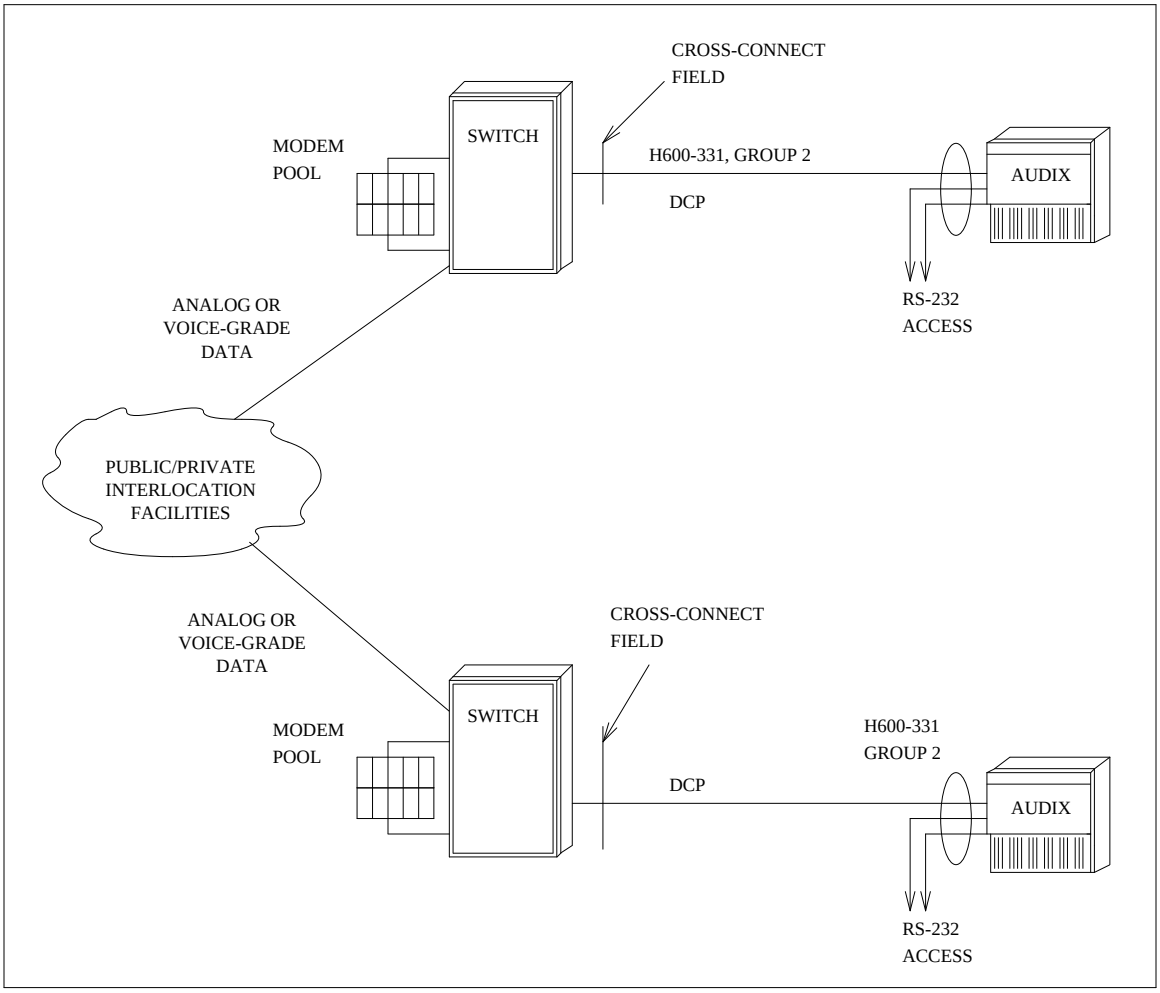


Figure 5-3. DCP Mode 2 Network (Modem Pooling)

AUDIX SYSTEM REQUIREMENTS FOR DCP MODE 2

Each AUDIX system must be running R1V3 or later software and must be equipped with one of the following:

- TN366 AUDIX Communications Controller (ACC) circuit pack
- TN366B ACC circuit pack
- TN539 ACC Enhanced (ACCE) circuit pack
- TN539B ACCE circuit pack

The AUDIX Networking Breakout cable (H600-331, Group 1 or Group 2) provides access to the DCP channels at the AUDIX system. Also, each AUDIX system must be within 5000 cable feet (1525 meters) of the switch's DCP interface.

SWITCH (OR CUSTOMER) REQUIREMENTS FOR DCP MODE 2

The switch must have a DCP interface and some type of modem pool to provide access to the analog or voice-grade-data interlocation facilities. For System 75, System 85, DEFINITY Generic 1, Generic 2, or Generic 3, the modem pool may be:

- Rack-mounted with a D-Lead
- Rack-mounted or shelf-mounted as a stand-alone modem pool (no D-Lead)

NOTE

It is strongly recommended that all modems in a modem pool be of the same make and model.

Basic Switch Needs

The switch must have the following circuit packs to support modem pooling:

- *System 75, Generic 1, Generic 2 (universal module), or Generic 3*:
  - — TN748C Tone Detector (System 75 requires a vintage 1 or vintage 3 board; Generic 1 and Generic 3 require vintage 3) — **required in all carriers of a System 75, but not all carriers of a Generic 1 or Generic 3.** (Do not use the TN748B, TN748D vintage 1, or the TN756.) For System 75, Generic 1, and Generic 3, this board does not require assignment, but for Generic 2, it does (use channels 4 and 8).

    NOTE

    The TN748D vintage 1 board does not currently work for this application. Also, any existing TN748B tone detectors must be upgraded to TN748Cs.

  - — TN727 Network Controller (System 75) or TN777 Network Controller (Generic 1 and Generic 3) is required.
  - — MT 771B Maintenance Test Circuit (Generic 2 universal module; equivalent to the SN261).
- *System 85 or Generic 2 (traditional module)*:
  - — SN253 Auxiliary Tone Plant (one in each module used)
  - — SN255B or SN255C Tone Detector
  - — SN261B or SN261C Analog/Digital Facility Test Circuit

DCP Interface for the AUDIX Network Channels

The following digital lines are required to terminate the AUDIX network channels at the switch:

- *System 75, Generic 1, or Generic 3:*

  Two TN754 Digital Line ports are required for the AUDIX DCP channels. Two more ports are required if the AUDIX RS-232 channels are to be converted to DCP.

- *Generic 2 (universal module):*

  Two TN754 Digital Line ports are required for the AUDIX DCP channels. Two more ports are required if the AUDIX RS-232 channels are to be converted to DCP.

- *System 85 or Generic 2 (traditional module)*:

  Two SN270B General Purpose Port (GPP) ports are required for the AUDIX DCP channels. Two more ports are required if the RS-232 channels are to be converted to DCP.

DCP Interface for the Digital Side of the Modem Pool

The following digital lines are required to terminate the digital side of a modem pool:

- *System 75, Generic 1, or Generic 3:*

  One TN754 or TN754B Digital Line port is required for each modem pool pair. The ports used for the modem pool must appear on a circuit pack(s) separate from the pack(s) used for the AUDIX channels.

- *Generic 2 (universal module):*

  One TN754 or TN754B Digital Line port is required for each modem pool pair.

- *System 85 and Generic 2 (traditional module):*

  One SN270B General Purpose Port is required for each modem pool pair.

Analog (Tip and Ring) Interface to the Interlocation Facilities

One of the following analog trunk circuits is required for terminating interlocation analog facilities at the switch:

- *System 75, Generic 1, Generic 2 (universal module), or Generic 3*:
  - TN747B Central Office (CO) Trunk (1200 to 9600 bps)
  - TN753 Direct Inward Dialing (DID) Trunk (1200 to 9600 bps)
  - TN760B Tie Trunk (1200 to 9600 bps)
- *System 85 or Generic 2 (traditional module)*:
  - SN230B CO Trunk (1200 to 9600 bps)
  - SN232B DID Trunk (1200 to 9600 bps)
  - SN233C Tie Trunk (1200 to 9600 bps)

Analog Interface for the Analog Side of the Modem Pool

The following analog lines are required to terminate the analog side of the modem pool:

- *System 75, Generic 1, Generic 2 (universal module), or Generic 3*:

  One TN742 or TN746B Analog Line port is required for each modem pool pair.

- *System 85 and Generic 2 (traditional module):*

  One SN243B Analog Data Port is required for each modem pool pair.

Modems and Data Modules

The following modems can be used in a modem pool for AUDIX networking. One modem is required for each modem pool pair.

- AT&T 2296A (rack-mounted or stand-alone modem pool). If used in a stand-alone modem pool, an auto-dialer module is required.

NOTE

The 2296A must have a 140C1, (V1.1 or V1.2; supported but no longer purchasable) or a 140F1 Memory Module (V1.1) installed in the right-hand slot at the bottom of the 2296A (modem standing on end). The version can be seen on the front label of the module. It should be labeled ABTLG or ABTTA. If not, order a new chip by calling 1-800-222-PART (comcode 105304935).

- MICROCOM QX 3296/C (stand-alone modem pool).
- AT&T Paradyne 3820 (stand-alone modem pool).
- AT&T Paradyne DM424 (stand-alone modem pool).

NOTE

Equivalent modems such as the AT&T Paradyne DL424 instead of the DM424 modem could be used.

The following data modules can be used in a modem pool used by AUDIX systems. One data module is required for each modem pool pair.

- 7400A Data Service Unit (rack-mounted or stand-alone modem pool)

NOTE

The 7400A DSU is configured for Data Terminal Equipment (DTE) modem pool operation with D-lead controlled 2296-type modems. The mounting package includes an adapter harness (WP90780L0), an OR-6316 bridging adaptor, and a 2296A modem control cable (D-Lead).

- MTDM (rack-mounted modem pool)

NOTE

Make certain the MTDM is set up in one of two ways: 1) processor PID ABCED and EPROM PID ABGHB are used, or 2) processor PID ABGHC, no EPROM installed, and IC3 is numbered 8052. In either case, make sure that TRIC 4 chips are used (coded 229EJ). If the MTDM requires an upgrade, order the MTDM D-kit (comcode 103033211). This should be D-kit D181470. Old versions of the MTDM (TDM/2 Z700C models) should also get D181469. See Chapter 11, *DCP Mode 2 Installation and Administration*, for the location and identification of these chips.

In selecting modems or data modules for modem pooling, it is important to note that once a specific model is chosen for use on one end of the remote network, only certain models will work on the other end of the remote connection. Combinations that have been tested are listed in the following tables. Combinations that work are marked as ‘‘OK,’’ and those that do not work are marked ‘‘FAIL.’’

Table 5-1. Tested RS-232 to Rack-Mounted Modem Pool Combinations

	RS-232 MODEMS		
MODEM POOL MEMBERS	**424(9600)**	**2296(9600)**	**3296(9600)**
2296(9600) + MTDM	OK	OK	OK
2296(9600) + 7400A	OK	OK	OK
424 + 7400A	NOTE 4	NOTE 4	NOTE 4
424 + MTDM	NOTE 5	NOTE 5	NOTE 5

NOTE 1 — flow control problem. Both the MTDM and the 7400A expect XON/XOFF flow control when running 19.2 Kbps.

NOTE 2 — works but not cost effective (RS232 modems should be running 19200 also).

NOTE 3 — not tested and not cost effective (modems should be running 19.2). Voice messages can emulate XON/XOFF. This results in lost data and dropped connections.

NOTE 4 — not tested because not cost effective (424 not off the shelf compatible with 7400A in a rack mount).

NOTE 5 — not recommended since MTDM is being manufacture discontinued.

Table 5-2. Tested RS-232 to Standalone Modem Pool Combinations

	RS-232 MODEMS		
MODEM POOL MEMBERS	**424(9600)**	**2296(9600)**	**3296(9600)**
2296(9600) + MTDM	OK, NOTE 1	OK, NOTE 1	OK, NOTE 1
2296(9600) + 7400A	OK	OK	OK
424(9600) +MTDM	OK	OK	OK
424(9600) + 7400A	OK	OK	OK
3296(9600) + MTDM	NOTE 1, NOTE 3	NOTE 1, NOTE 3	NOTE 1, NOTE 3
3296 +7400A	NOTE 6	NOTE 6	NOTE 6

NOTE 1 — MTDM is being manufacture discontinued.

NOTE 2 — flow control problem. Both the MTDM and the 7400A expect XON/XOFF flow control when running 19.2 Kbps. Voice messages can emulate XON/XOFF. This results in lost data and dropped connections.

NOTE 3 — not tested.

NOTE 4 — not tested; expected to fail.

NOTE 5 — not tested; expected to work.

NOTE 6 — 7400A expects a result code that is not given by the modem. 3296 sends a 32 and the 7400A expects a 12. 3296 sends a 37; 424 sends a 17 for 19200 and the 7400A expects a 14.

Rack-Mount Equipment

The following equipment is required when rack-mounted modem pools are used (i.e., a D-Lead modem pool):

- 72-inch Data or Auxiliary Cabinet and power supply
- The 2296A requires a 105A mounting
- One of the following multi-mounts for the data sets:
  - — The MTDM requires a 46A2 mounting
  - — The 7400A requires a 77A mounting

Cabling

Cabling for multi-mount arrangements is provided with the cabinet and the mountings. One D-Lead cable (RS-232C to 25-pair cable), one 25-pair cable for each mounting, and one M25 RS-232C cable for each modem pool pair is required.

Cabling for stand-alone modem pools consists of a 104A adapter, an M25 RS-232C cable (male-male), a D8W-87 modular cord, and building wire for each pair.

DATA RATES FOR DCP MODE 2

This arrangement operates at speeds up to and including 9.6 Kbps (the limit for modem pooling).

DCP MODE 2 FOR A 5ESS SWITCH

The System 75, System 85, DEFINITY Generic 1, Generic 2, Generic 3, and DIMENSION PBX systems support the DCP interface. If the customer has an AUDIX system serving another switch and would like to network the AUDIX system with another location, they could use an AT&T digital PBX for its DCP and modem pooling capabilities. A picture of the DCP Mode 2 arrangement is shown along with a DCP Mode 3 arrangement in Chapter 6, *DCP Mode 3 Networks — 64 Kbps*.

6. DCP Mode 3 Networks — 64 Kbps

AUDIX networks can be implemented using AT&T's Digital Communications Protocol (DCP) Mode 3. This arrangement can be used when the AUDIX systems are colocated (serving the same switch) or when they are at separate customer sites. This chapter presents supported local and remote networking configurations. The examples show the AUDIX system using DCP at both ends. See Chapter 7, *Mixtures of RS-232 and DCP Networks*, for RS-232/DCP combinations.

If your customer develops their own method, contact the Business Communications Systems Design Center (BCSDC) to make certain it is feasible. Each of the examples presented here is accompanied by the equipment required for the AUDIX systems and for the switches that the AUDIX systems serve.

CONSIDERATIONS

If a customer is considering using DCP Mode 3 connections in their AUDIX network, keep the following in mind:

- Local or remote networking configurations are supported.
- Two or more AUDIX systems can be networked via this method.
- AUDIX software must be R1V3 or later. For remote configurations, R1V7 software is recommended because of the 64 Kbps loopback testing capabilities included in that load.
- The customer needs a TN366, TN366B, TN539, or TN539B networking board. For remote configurations, the TN539B is recommended because of the 64 Kbps loopback testing capabilities included in that board.
- Transmission in this type of network is full-duplex, synchronous, at 64 Kbps.
- For remote configurations, the customer will need access to 64 Kbps public or private telephone network facilities; these should normally be a T1 carrier with DS1 services.

NOTE

System 75, DEFINITY Generic 1 and Generic 3, and MERLIN II can be set up to access only two of the four DCP channels. This is a limitation regardless of the AUDIX software used and the networking circuit pack provided. See Chapter 3, *Switched EIA RS-232 Networks*, on information for expanding this limitation to four channels.

GENERAL INFORMATION

DCP Mode 3 networks use the DCP interface on the AUDIX system and on the switch. Since the AUDIX connections are switched, the AUDIX channels can be shared with the CDR application. For colocated AUDIX systems, communication between AUDIX systems is directly from one switch DCP port to another. Figure 6-1, *DCP Mode 3 Network for A Single Switch*, shows how this is done with a System 75, System 85, Generic 1, Generic 2, or Generic 3. Figure 6-2, *DCP Mode 3 Network for A Non-DCP Switch*, shows how the MERLIN II performs this function for a non-DCP switch.

When the AUDIX systems are at different customer locations serving separate switches, interlocation facilities are usually T1 Carrier with a Digital Service 1 (DS1) interface at the switches providing the termination.

AUDIX SYSTEM REQUIREMENTS FOR DCP MODE 3

Each AUDIX system must be running R1V3 or later software and must be equipped with one of the following:

- TN366 AUDIX Communications Controller (ACC) circuit pack
- TN366B ACC circuit pack
- TN539 ACC Enhanced (ACCE) circuit pack
- TN539B ACCE circuit pack

If the AUDIX system is linked to a Generic 2 universal module, the TN366B or TN539 or TN539B must be used if the customer requires all four DCP channels. If a TN366 is used, only channels 1 and 3 can be used. If the AUDIX system is linked to a MERLIN II, the TN366B, TN539, or TN539B must be used.

In addition, for MERLIN II, the following is required:

- MERLIN II control unit (power/processor/base)
- Feature Module II
- Feature Module III
- 008D digital station module
- 356A adapter (one per AUDIX system), comcode 104158829
- DW8-87 modular cord (two per AUDIX system), comcode 102796950

The AUDIX Networking Breakout cable (H600-331, Group 1 or Group 2) provides access to the DCP channels at the AUDIX system. Also, each AUDIX system must be within 5000 cable feet (1525 meters) of the switch's DCP interface.

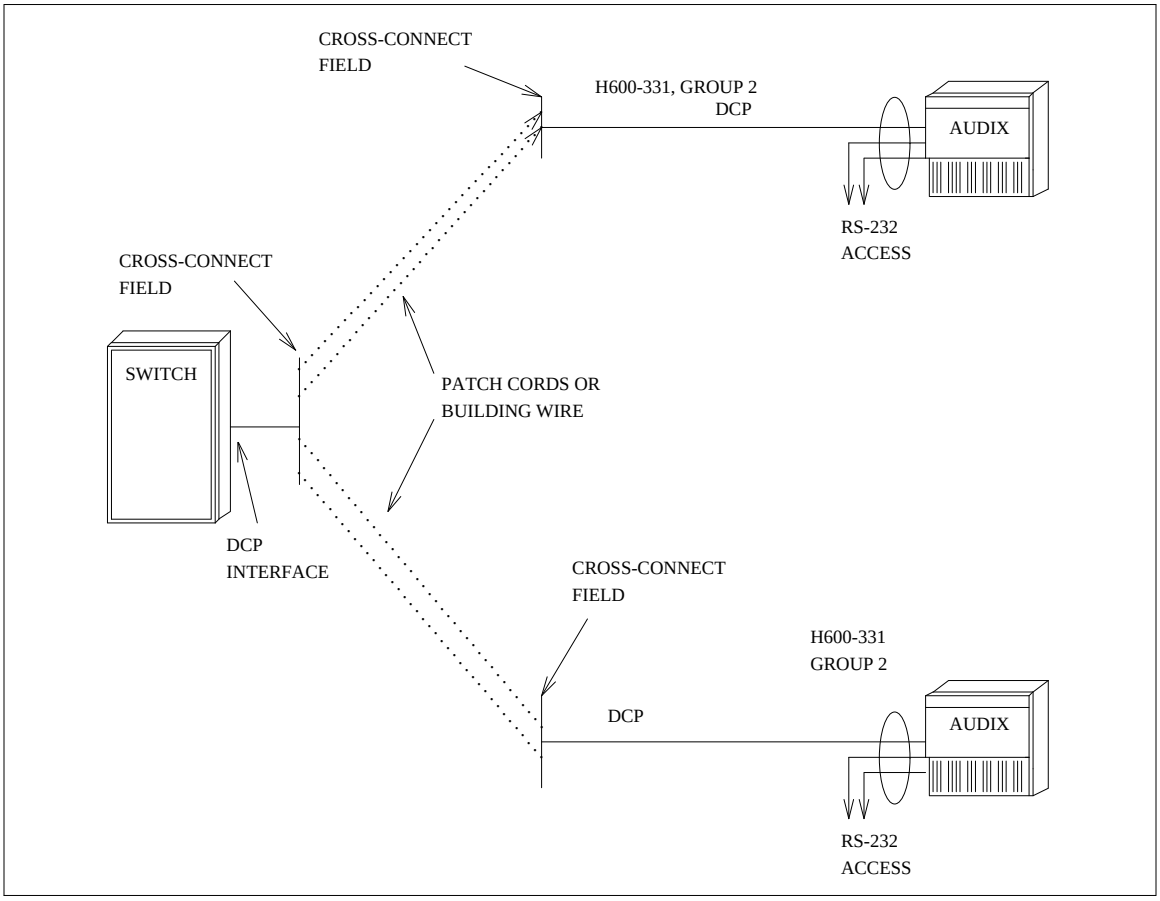


Figure 6-1. DCP Mode 3 Network for a Single Switch

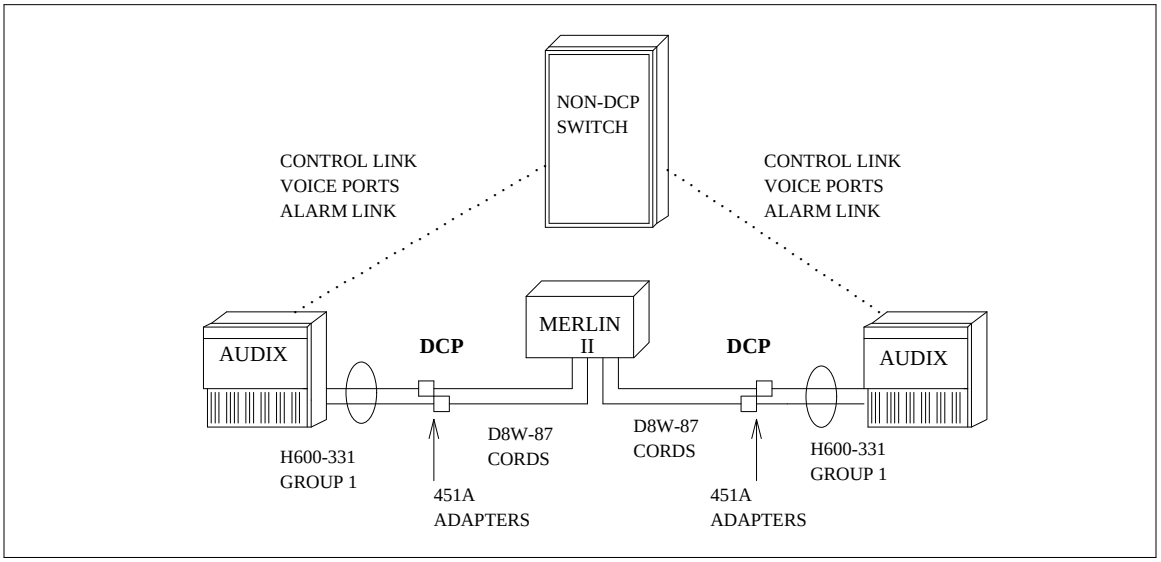


Figure 6-2. DCP Mode 3 Network for a Non-DCP Switch

SWITCH (OR CUSTOMER) REQUIREMENTS FOR DCP MODE 3

Switch requirements depend on whether the systems are serving the same switch or are serving different switches.

Colocated Requirements

One of the following switches must be used and equipped with a DCP interface for termination of the AUDIX DCP channels:

- *System 75, Generic 1, Generic 2 (universal module), or Generic 3*:

  Two TN754 Digital Line ports are required per AUDIX system. Although not required, it is recommended that the circuits be on separate packs so all four network channels will not be lost in the event a single pack goes bad.

NOTE

All ports on a TN754 should be assigned as either lines (pdm) or trunks (tdm). Trunk ports will have problems when assigned on circuit packs that have other ringing stations (that is, line circuits). Make sure no ports on the pack is assigned as a trunk (TDM) or assigned to a modem pool.

- *System 85 or Generic 2 (traditional module):*

  Two SN270B General Purpose Ports are required per AUDIX system. Although not required, it is recommended that the ports be on separate packs. Then not all four network channels will be lost in the event a single pack goes bad.

- *MERLIN II (for colocated systems only)*

  Two ports on an 008D Digital Line card; the MERLIN II must be equipped as specified earlier in this chapter in *AUDIX System Requirements for DCP Mode 3*.

When the AUDIX RS-232 channels are converted to DCP, two more ports are required.

Interlocation Requirements

In addition to the requirements listed in the previous paragraphs, a T1 Carrier (DS1 Interface set for Alternate Voice/Data) or the B-channels of an Integrated Systems Digital Network (ISDN) span must be provided for networking between locations.

NOTE

The BCSDC will design networks using ISDN.

The switch must have the following circuit packs:

- *System 75, Generic 1, Generic 2 (universal module), or Generic 3*:
  - — TN748C Tone Detector (System 75 requires a vintage 1 or vintage 3 board; Generic 1 and Generic 3 require vintage 3) — **required in all carriers of a System 75, but not all carriers of a Generic 1 or Generic 3.** (Do not use the TN748B, TN748D vintage 1, or the TN756.) For System 75, Generic 1, and Generic 3, this board does not require assignment, but for Generic 2, it does (use channels 4 and 8).

    NOTE

    The TN748D vintage 1 board does not currently work for this application. Also, any existing TN748B tone detectors must be upgraded to TN748Cs.

  - — TN727 Network Controller (System 75) or TN777 Network Controller (Generic 1 and Generic 3) is required.
  - — MT 771B Maintenance Test Circuit (Generic 2 universal module; equivalent to the SN261).
- *System 85 or Generic 2 (traditional module):*
  - — SN253 Auxiliary Tone Plant (one in each module used)
  - — SN255B or SN255C Tone Detector
  - — SN261B or SN261C Analog/Digital Facility Test Circuit

AUDIX systems could use up to six channels at any one time. Figure 6-3, *DCP Mode 3 Network for Multiple Locations*, shows the DS1 arrangement. For requirements on the switch for DS1, refer to the latest issue of *DEFINITY Communications System & System 75/85 DS1/DMI/ISDN-PRI Reference* (585-025-101). If the customer has a non-DCP switch and wishes to use DCP Mode 3 for interlocation communication, see *DCP Mode 3 Network For a 5ESS Switch* later in this chapter.

DATA RATES FOR DCP MODE 3

This arrangement operates at speeds of 64 Kbps.

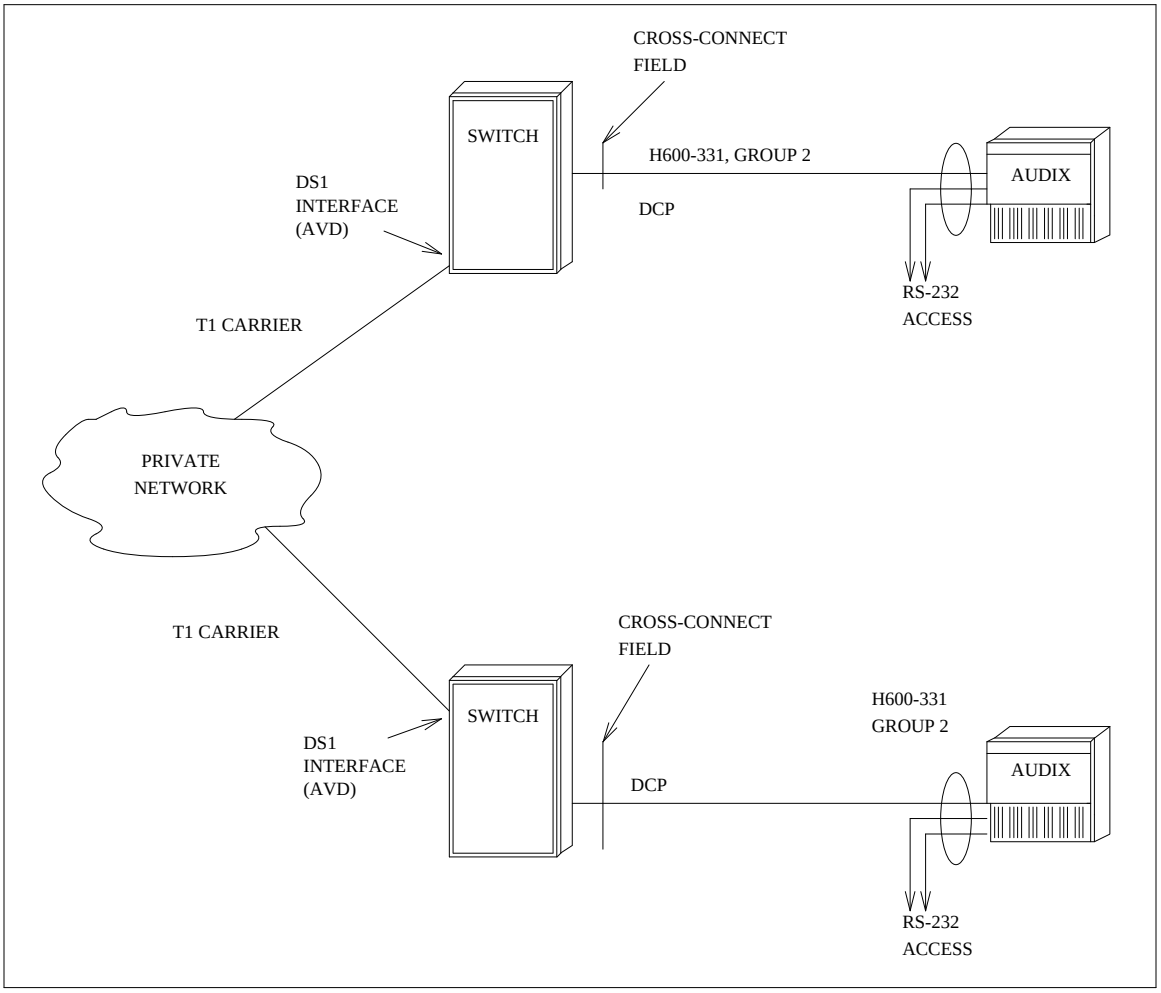


Figure 6-3. DCP Mode 3 Network for Multiple Locations

DCP MODE 3 FOR A 5ESS SWITCH

Figure 6-4, *DCP Mode 3 Network for a 5ESS Switch*, shows how a Generic 2 provides the DCP and DS1 interfaces for a 5ESS Centrex switch (an example of a non-DCP switch). The customer has installed the AUDIX system to serve their employees which reside on the Centrex. A ‘‘bare-bones’’ Generic 2 is installed for its DCP, DS1, modem pooling, and alternate routing capabilities only. No stations reside on the Generic 2. The Generic 2 does the following:

- Provides a 64 Kbps digital network path between the two AUDIX systems shown.
- Provides a 64 Kbps digital network path to an AUDIX system located outside the 5ESS environment.
- Generic 2 software (R2V5) provides the ability to designate the digital path as the first-choice facility with the analog path providing backup (see the Automatic Alternate Routing feature).

NOTE

Any network of this nature is considered experimental and should be developed on an individual basis by the BCSDC.

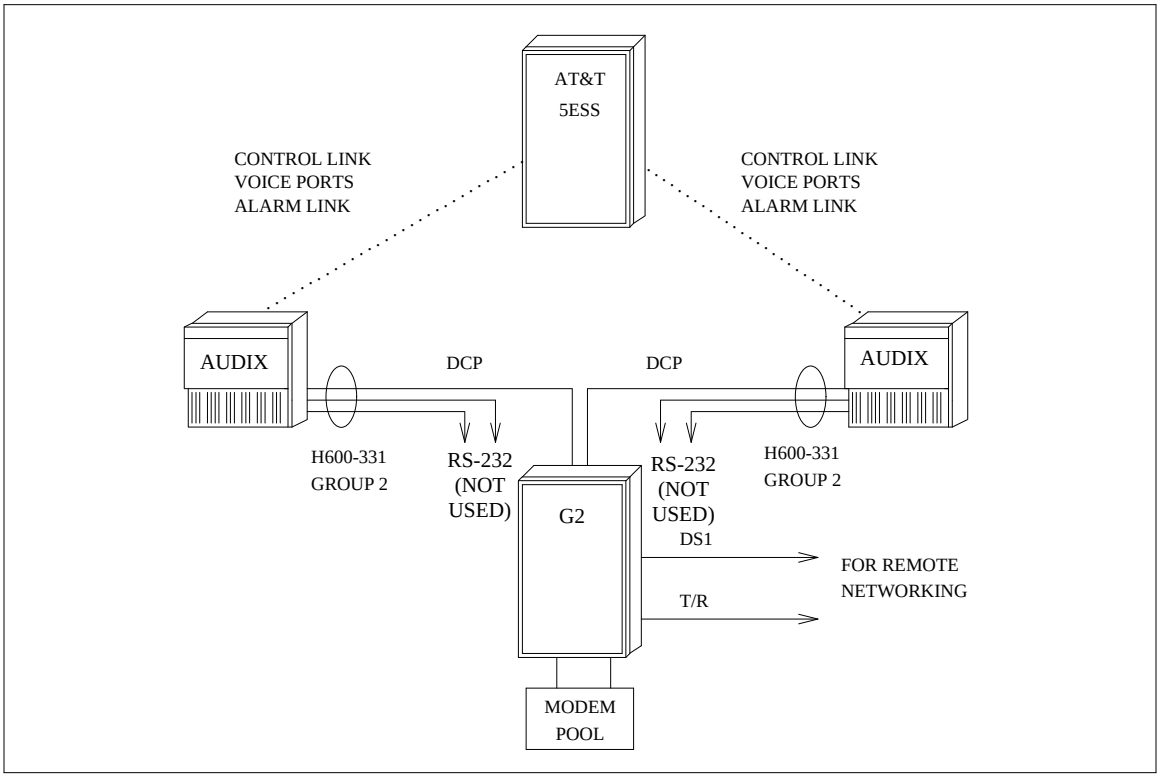


Figure 6-4. DCP Mode 3 Network for a 5ESS Switch

7. Mixtures of RS-232 and DCP Networks

This chapter presents supported configurations using RS-232 and DCP connections on the same AUDIX system. If your customer develops their own method, contact the Business Communications Systems Design Center (BCSDC) to make certain it is feasible. Look to the previous chapters for the requirements of the following networks.

CONSIDERATIONS

An AUDIX network can be implemented using both RS-232 connections and Digital Communications Protocol (DCP) connections. A single AUDIX system can use both types, or an RS-232 connection can be used at one AUDIX system to talk to another AUDIX system that uses DCP connections.

NOTE

System 75, DEFINITY Generic 1 and Generic 3, and MERLIN II can be set up to access only two of the four DCP channels. This is a limitation regardless of the AUDIX software used and the networking circuit pack provided. See Chapter 3, *Switched EIA RS-232 Networks* for information on expanding this limitation to four channels.

RS-232 AND DCP AT THE SAME AUDIX SYSTEM

Figure 7-1, *RS-232 and DCP at the Same AUDIX*, shows how the two AUDIX RS-232 channels and the four AUDIX DCP channels are used on the same AUDIX system. This is particularly useful for a System 75, System 75 XE, Generic 1, Generic 3, or MERLIN II, where only two of the four AUDIX DCP channels can be accessed. In this example, the RS-232 channels are used for communication between the two colocated systems at the top of the figure. The DCP channels are used for these systems to communicate with the off-site system at the bottom of the figure. In a larger network, where several AUDIX systems to be networked are off-site, it might be advantageous to make the RS-232 channels switched connections as in Figure 7-2, *High-Speed Switched RS-232 and DCP AUDIX Connections*. This provides a greater degree of access to these systems.

Figure 7-3 shows the DCP channels of the colocated AUDIX systems being used for communication with an off-site AUDIX system. One of the RS-232 channels is used for communication between the colocated systems and the other is used to connect to a PC. The PC could be used to run the Call Detail Recording software package.

RS-232 AND DCP AT SEPARATE LOCATIONS

Figure 7-4 shows a case where one of the customer's AUDIX systems is tied to a DCP switch and the other tied to a non-DCP switch. The system located with the non-DCP switch is brand new, running R1V5 or later software and equipped with a TN539 or TN539B for RS-232 access. The other system is running R1V4 software and equipped with a TN366B (no RS-232 access). Since the DCP switch is equipped with modem pooling, the modem pools are used to convert DCP into analog (t/r) for transmission to the other AUDIX system. If the DCP switch did not have modem pooling, the customer should upgrade to R1V5 or later software.

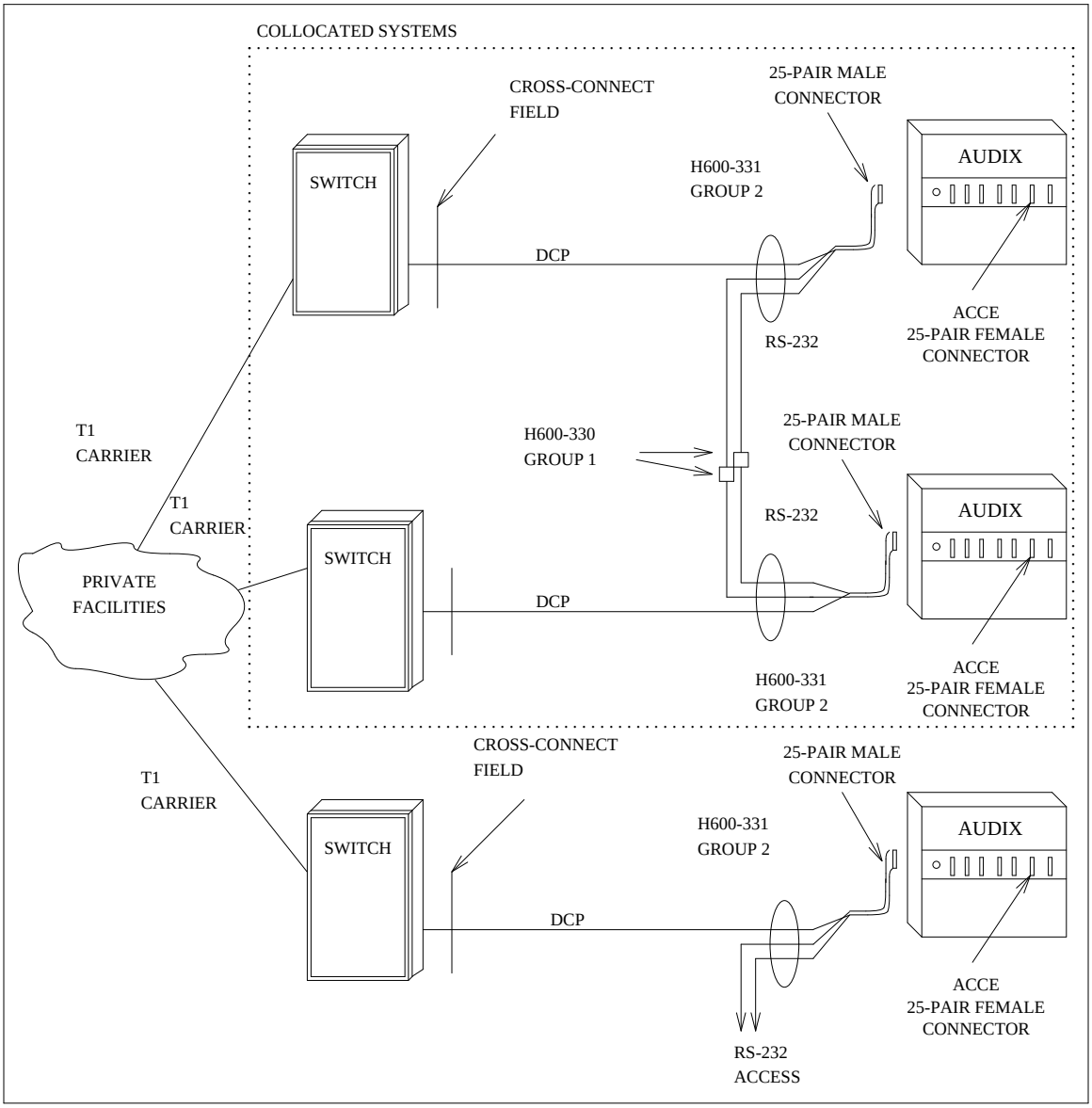


Figure 7-1. RS-232 and DCP at the Same AUDIX

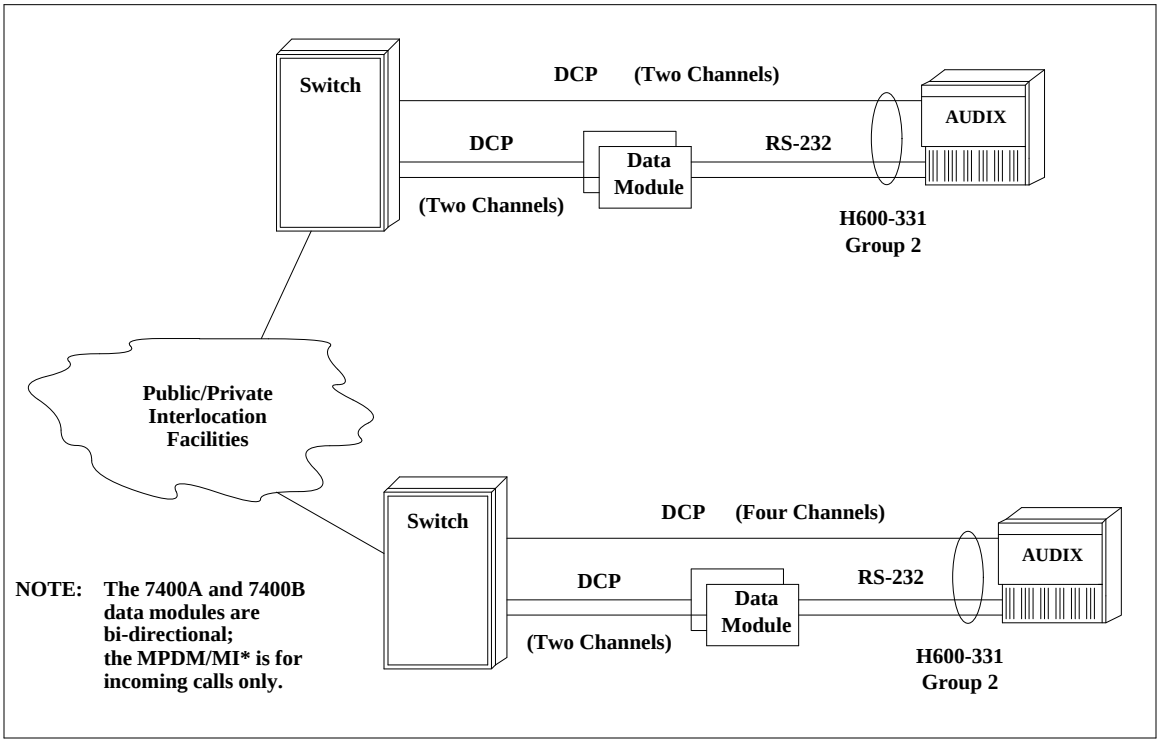


Figure 7-2. High-Speed Switched RS-232 and DCP AUDIX Connections

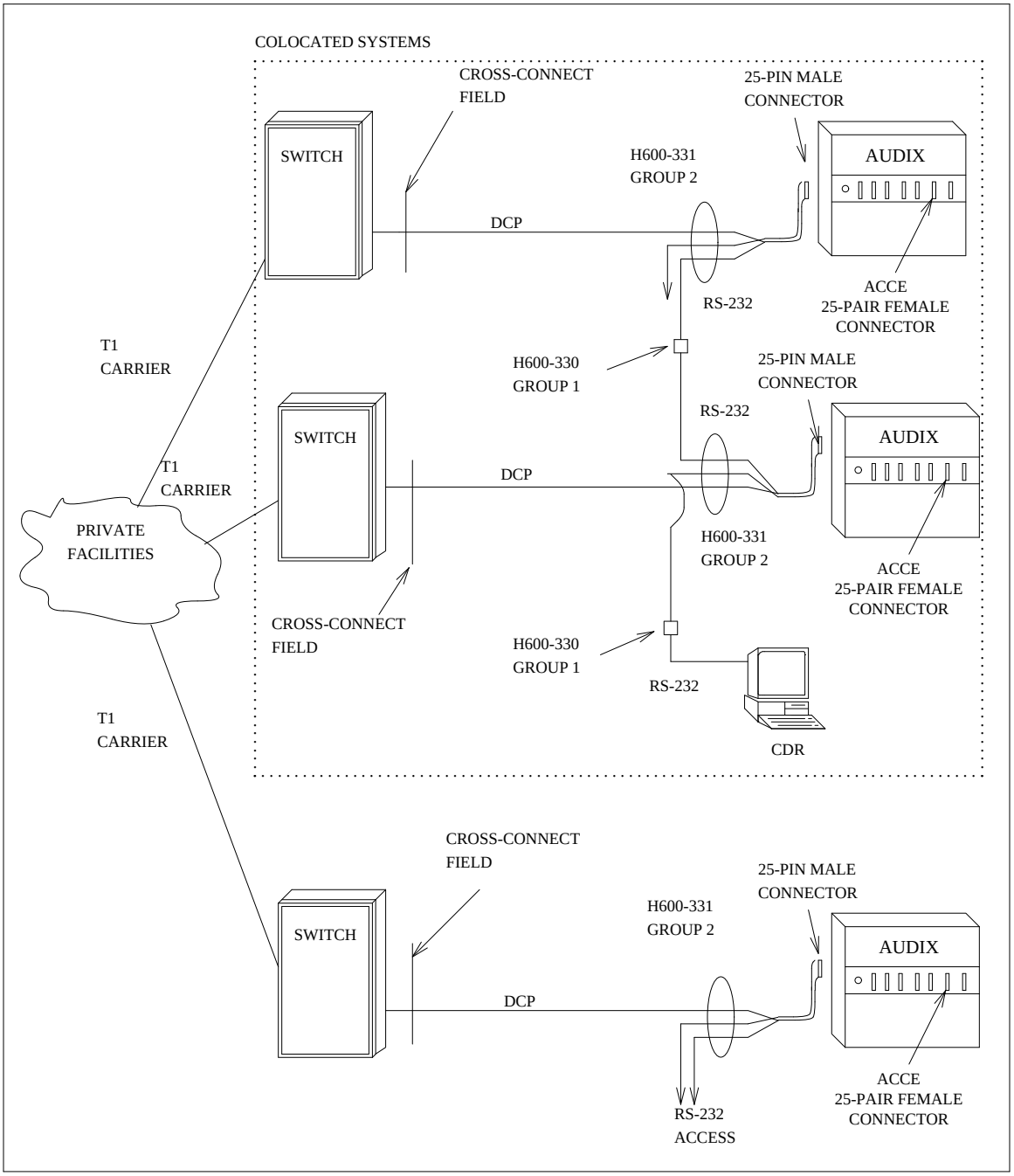


Figure 7-3. Using DCP for AUDIX Systems and RS-232 for a PC

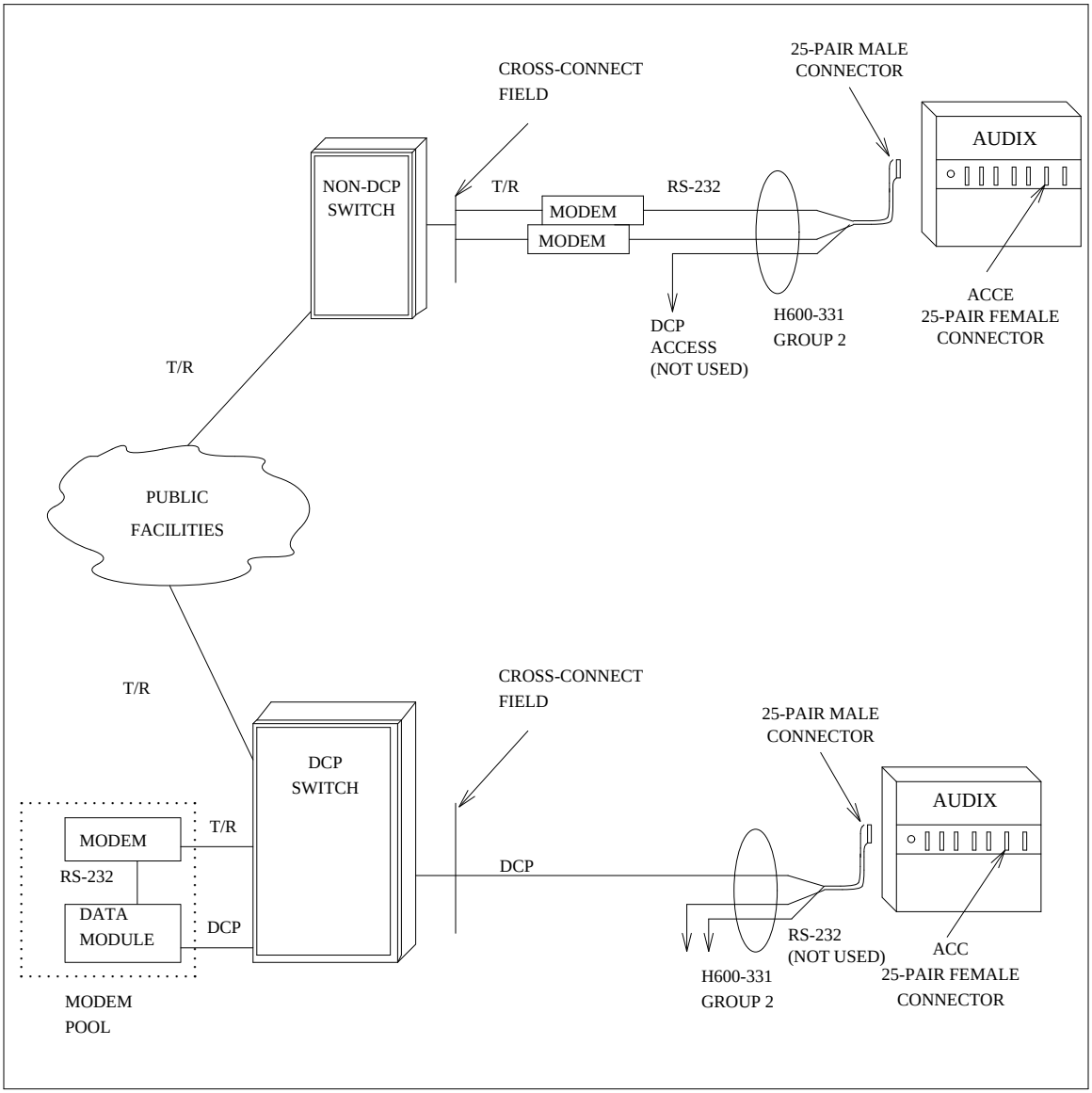


Figure 7-4. RS-232 and DCP at Separate Locations

8. EIA RS-232 Cabling

This chapter shows how to cable the AUDIX RS-232 ports to another AUDIX system using direct cabling or by cabling through the switch. These ports can be converted to Digital Communications Protocol (DCP) ports before entering the switch, if desired. This is attractive to System 75, DEFINITY Generic 1, Generic 3, and MERLIN II installations using DCP for interlocation communications since these switches can only access two of the four DCP ports.

DEDICATED RS-232 CABLING

Figure 8-1, *Dedicated RS-232 Connection (Within 10 Feet)*, shows how to cable a dedicated RS-232 AUDIX connection when the AUDIX systems are within 10 cable feet. Figure 8-2, *Dedicated RS-232 Connection (Within 50 Feet)*, shows that an RS-232 extender cable is used when the distance between systems is greater than 10 cable feet apart, but less than 50 feet. Figure 8-3, *Dedicated RS-232 Connection (Using Z3A ADUs)* shows how to install and wire a dedicated connection that requires data sets to extend the distance capability beyond 50 feet.

Within 50 feet (15.25 meters), the data rate may be up to and including 19.2 Kbps. Within 20 feet (6.1 meters), the data rate may be up to and including 64 Kbps. When data sets are used, check the documentation provided with the data sets for supported data rates.

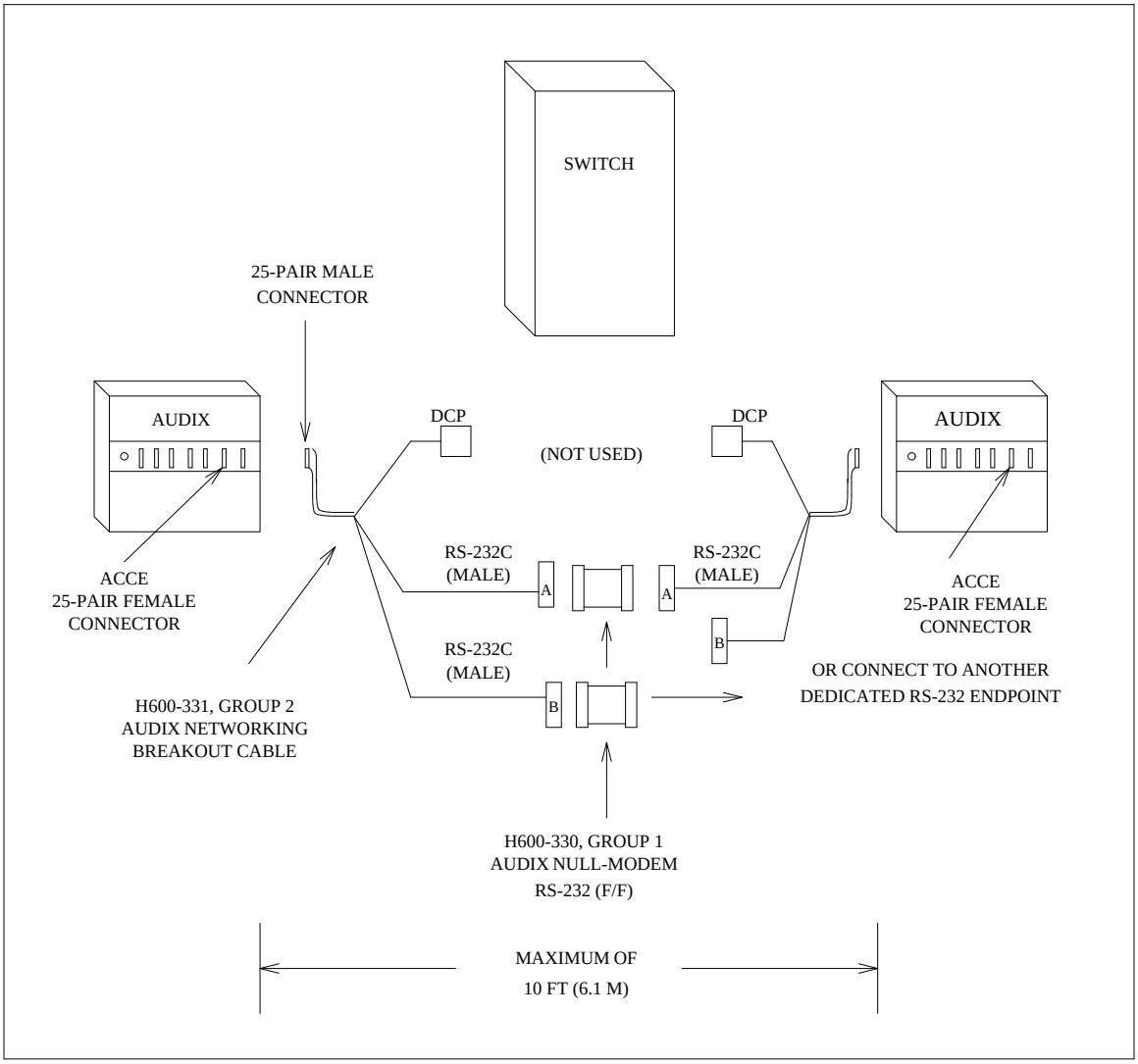


Figure 8-1. Dedicated RS-232 Connection (within 10 feet)

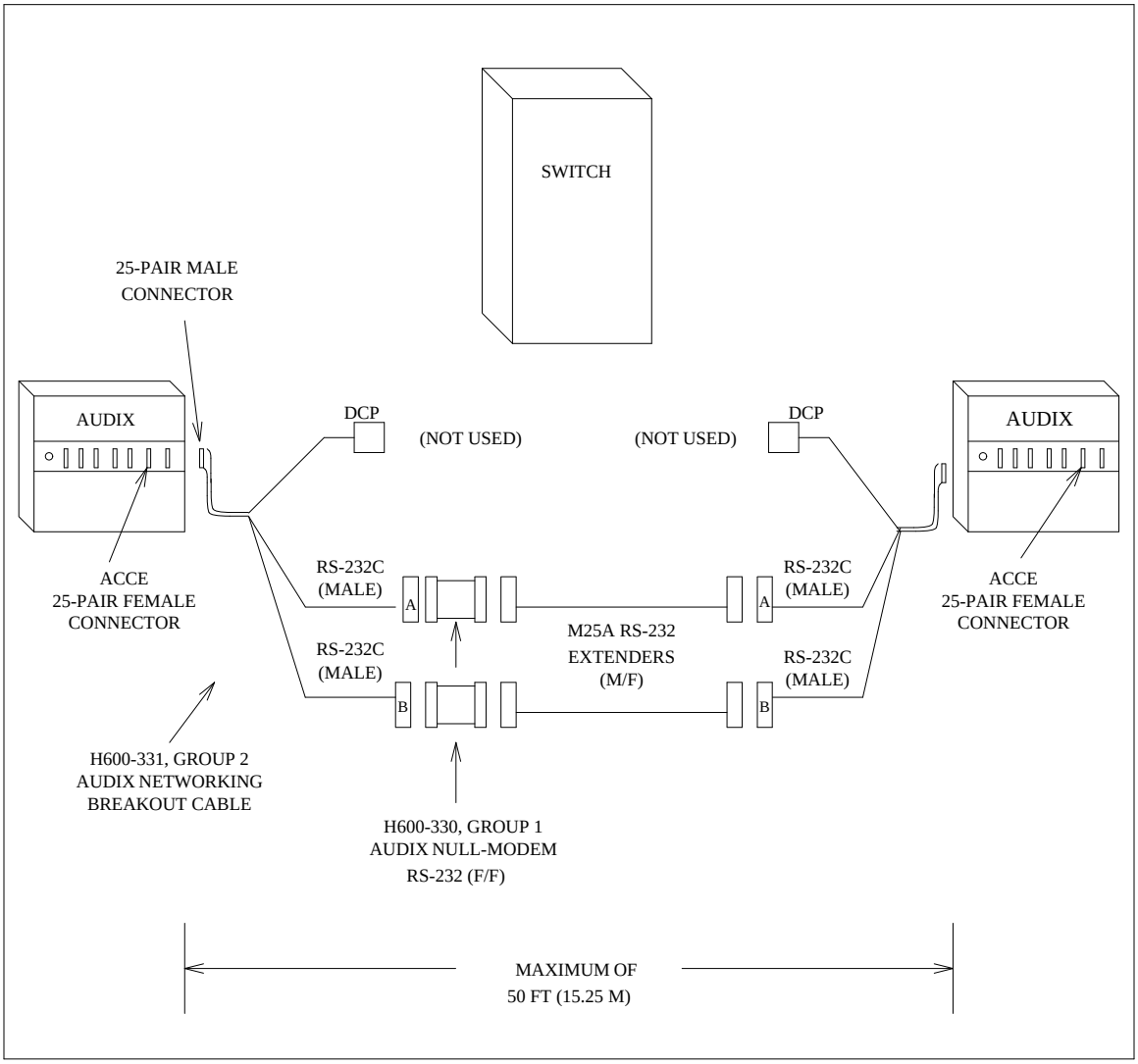


Figure 8-2. Dedicated RS-232 Connection (within 50 feet)

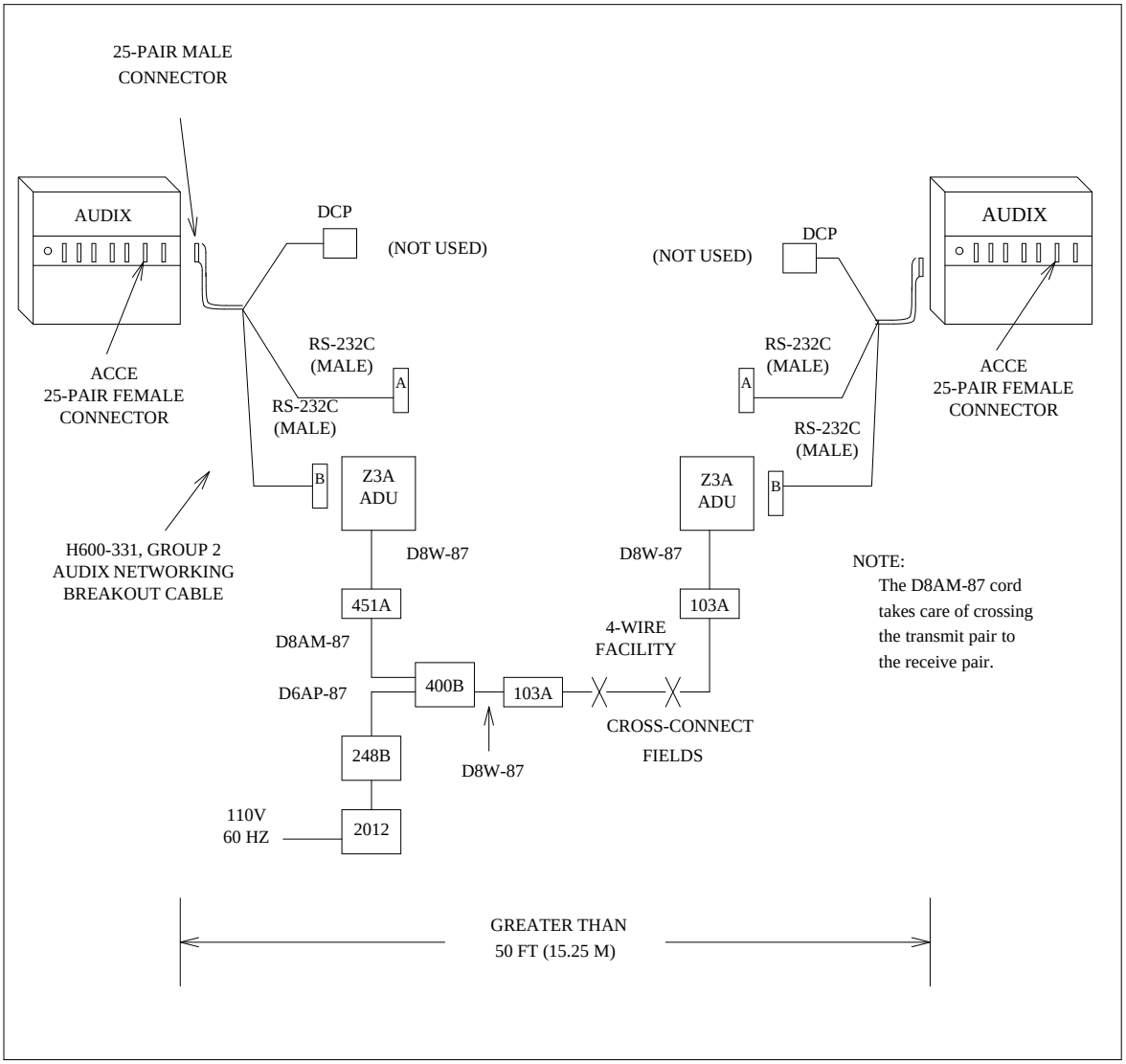


Figure 8-3. Dedicated RS-232 Connection (using Z3A ADUs)

SWITCHED RS-232 CABLING

Figure 8-4, *Switched RS-232 to an Analog Switch Port*, shows how a modem is used to interface the AUDIX system to a DCP or non-DCP switch. Figure 8-5, *Switched RS-232 to a DCP Switch Port*, shows how a data set is used to interface the AUDIX system to a DCP switch. Option settings for the modems and data modules are given after the figures.

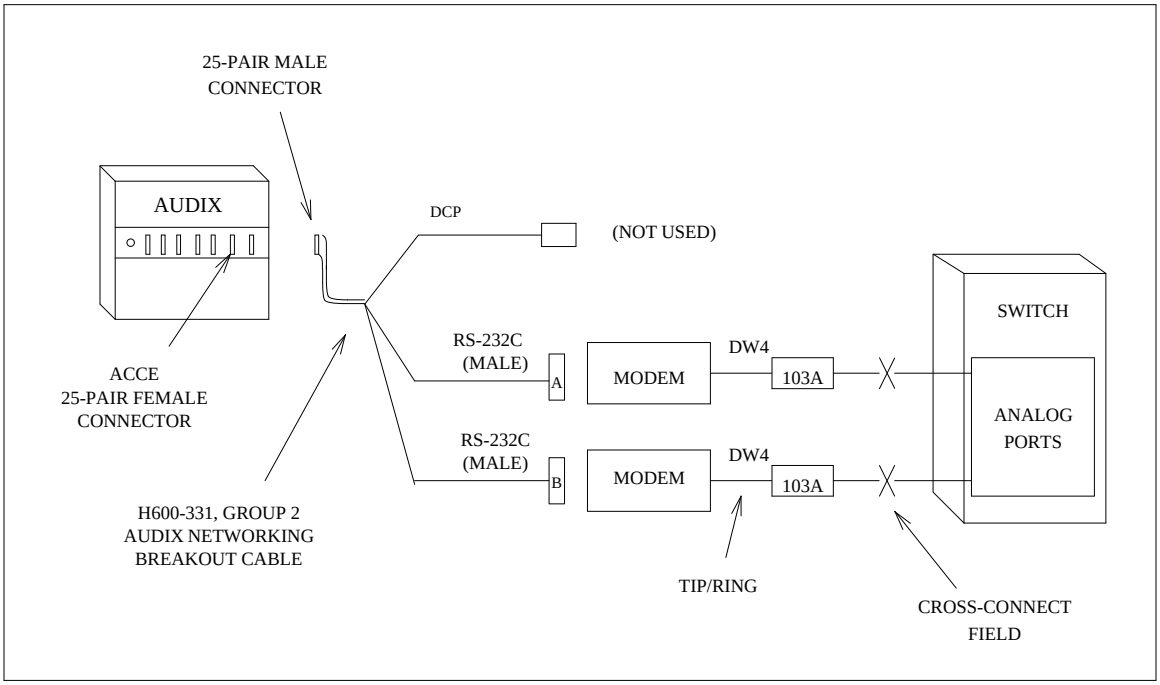


Figure 8-4. Switched RS-232 to an Analog Switch Port

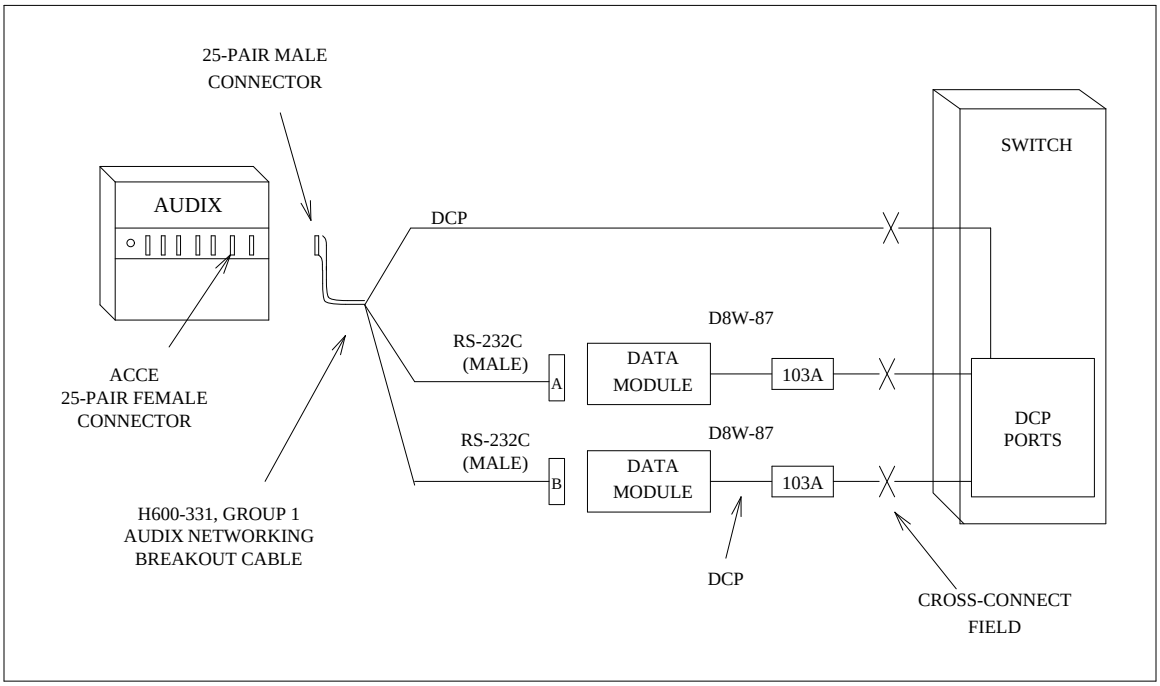


Figure 8-5. Switched RS-232 to a DCP Switch Port

The modems used for switched RS-232 networking may be one of the following modems that can run Microcom Networking Protocol (19.2 MNP) or non-MNP modes. The non-MNP modes will have a fixed rate of 9600 bps. To confirm a modem version, connect a 9600 bps terminal to the modem and enter one of the Hayes commands listed below (the result is listed below the command in each case).

- For an AT&T 2296A, enter the following:
  - **ATI0** RETURN
    ```
    ID:961
    ```
  - **ATI1** RETURN
    ```
    version:243
    ```
  - **ATI2** RETURN
    ```
    checksum:OK
    ```

  All 2296A modems must have at least a 140C memory module.

- For an AT&T Paradyne 3820, enter the following:
  - **ATI0** RETURN
    ```
    ID:144
    ```
  - **ATI1** RETURN
    ```
    version:212
    ```
  - **ATI2** RETURN
    ```
    checksum:OK
    ```
- For an AT&T Paradyne DM424, enter the following:
  - **ATI0** RETURN
    ```
    ID:960
    ```
  - **ATI1** RETURN
    ```
    version:0626/0403
    ```
  - **ATI2** RETURN
    ```
    checksum:0454
    ```
- For a MICROCOM QX 3296/C, enter the following:
  - **ATI0** RETURN
    ```
    ID:960
    ```
  - **ATI1** RETURN
    ```
    version:010f1
    ```
  - **ATI2** RETURN
    ```
    checksum:OK
    ```

DIP Switch Settings

There are no required DIP switch settings for the 7400A or 7400B data sets. The AT&T Paradyne 3820 has no dip switches.

For other modems supported by AT&T, the dip switches should be set as follows:

- For the AT&T Paradyne DM424 (or DL424), the dip switches in the rear of the modem should all be UP.
- For the AT&T 2296A, the dip switches under the front panel should be set so 6 is UP; 1, 5, 7, and 8 are DOWN.
- For the MICROCOM QX 3296/C, set the switches in one of the following ways:
  - — For MNP 19.2 Kbps mode, set the switches in the front of the modem so 1, 4, 5, 6, 7, and 9 are UP; 2, 3, and 8 are DOWN. Set the switches in the rear of the modem so 4, 5, and 6 are UP; 1, 2, 3, 7, and 8 are DOWN.
  - — For non-MNP 9600 bps mode, set the switches in the front of the modem so 1, 4, 5, 6, 7, and 9 are UP; 2, 3, and 8 are DOWN. Set the switches in the rear of the modem so 2, 4, and 5 are UP; 1, 3, 6, 7, 8 are DOWN.

Mixing Modem Types and Modes

The AT&T 2296A modem is not in the following table because the other modems are better alternatives. If you do wish to a 2296A, set it up for non-MNP at 9600 bps or for MNP at 19.2 Kbps and try not to mix it with other modem types.

Tested Modem Combinations For RS-232 to RS-232 AUDIX Networking

	424 (FS)	**424 (MNP)**	**3296 (FS)**	**3296 (MNP)**
424 (FS)	yes	yes	yes1	yes
424 (MNP)	-	yes	yes2	yes
3296 (FS)	-	-	yes	yes
3296 (MNP)	-	-	-	yes

FS — modem is in fixed speed mode. Tested speeds are 19.2K, 9600, and 4800 bps.

MNP — tested MNP speeds are 19.2K, 9600, and 4800 bps.

Yes1 — all tested cases passed except 3296 (FS @ 4800) to a 424 (FS @ 9600) fails. Calls from the 424 to the 3296 passed.

Yes2 — all tested cases passed except 3296 (FS @ 4800) to a 424 (MNP @ 19.2K) fails. Calls from the 424 to the 3296 passed.

RS-232 to DCP Conversion

This type of connection is shown for a DCP switch in Figure 8-5, *Switched RS-232 to a DCP Switch Port*.

- To convert an RS-232 channel to DCP mode 2, use a 7400A or 7400B Data Service Unit (DSU). In this case, the channels can be used to originate and receive calls at speeds up to and including 19.2 Kbps.

  An initialization string for the 7400A or 7400B will have to be entered on the AUDIX `system : translation : network port` form.

  — If a 7400A is used, make sure it is optioned for Data Communications Equipment (DCE). Lift off the cover and check the vertical card at the front. If it reads DCE, the 7400A is okay. If not, remove the card, turn it around, and reinstall it. If a 7400B is used, it does not require this step. It is always optioned for DCE.

  To set up the 7400A, go to the front panel and press the next/no button until the set interface options comes up. Then press the yes button and choose `INT=AT COMM`.

  — For a 7400B, set switch 1 to ON if there is no telephone connected to the data module. To get to switch 1, lift the cover off the modem.

- To convert an RS-232 channel to DCP mode 1 (56 Kbps) or DCP mode 3 (64 Kbps), use a Modular Processor Data Module, Model M1* (MPDM/M1*). In either of these cases, the channels can only be used for incoming calls; they cannot be used for outgoing calls. All outgoing calls must use the DCP ports. Make sure the MPDM/M1* has the option settings shown in the following table.

NOTE

If you are using an older version of the MPDM, it must be upgraded to an MPDM/M1*. Use D-kit D-181509 and follow the instructions included with the kit.

Table 8-1. MPDM/M1* Option Settings

MPDM/M1* Option Settings	
speed	56 Kbps or 64 Kbps
OFF-TRBK	OFF
HDX-FDX	OFF (FDX)
ASYN-SYNC	SYNC
EXT-INT	EXT
OFF-DISC	OFF
OFF-KYBD	OFF
OFF-PRTY	OFF
O/EV-I/OD	O/EV
OFF-DMLL	OFF
OFF-MKBY	MKBY
OFF-ANET	ANET
OFF-SIGLS	SIGLS
OFF-AANS	AANS

SWITCH ADMINISTRATION

The only administration required at the switch is the translation of the new analog or DCP ports for communication with the appropriate endpoints. For analog port translations, see the appropriate switch documentation. For DCP port translations, see Chapter 9, *DCP Cabling and Administration*.

NOTE

Remember, if you are using MPDM/M1* data modules to convert RS-232 ports to DCP mode 1 or DCP mode 3, these ports can only be used for incoming calls. Consequently, these data modules must be administered as the first members of an incoming hunt group on the switch and the DCP ports should be administered as the remaining members of the hunt group.

9. DCP Cabling and Administration

This chapter provides explanations and illustrations for the cabling, translation, and use of the AUDIX networking channels for supported host switches. If you are setting up a connection requiring interlocation facilities, use this chapter to set up the Digital Communications Protocol (DCP) channels from the AUDIX system to the switch, then go to Chapter 10, *DCP Mode 1 Installation and Administration*, Chapter 11, *DCP Mode 2 Installation and Administration*, or Chapter 12, *DCP Mode 3 Installation and Administration* to set up the interlocation facilities.

ACC(E) WIRING TO THE SWITCH

For a System 75, System 85, DEFINITY Generic 1, Generic 2, or Generic 3, the DCP circuits at the switch are normally wired to the cross-connect field using 25-pair cable. If you are connecting the AUDIX system to a MERLIN II, D8W-87 modular cord is always used (that is, the cross-connect field is not required).

NOTE

MERLIN II is supported for local networking only. Remote networking/modem pooling with MERLIN II is not supported.

System 75, System 85, and DEFINITY Communications Systems

For the System 75, System 85, and DEFINITY Generic 1, Generic 2, or Generic 3, the AUDIX DCP ports must be wired to the switch through the cross-connect field. Figure 9-1, *DCP Cabling to the Switch Using the H600-331, Group 2 Cable*, shows how this is done.

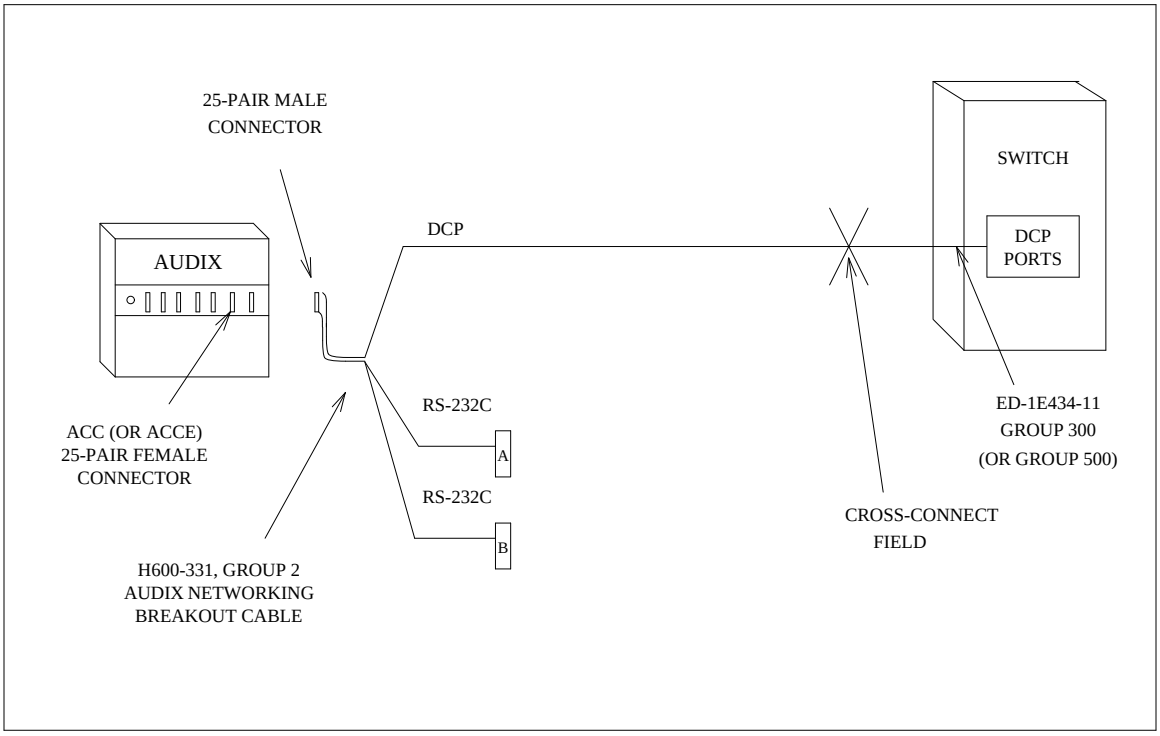


Figure 9-1. DCP Cabling to the Switch Using the H600-331, Group 2 Cable

Non-DCP Switch Applications

The AUDIX DCP channels are connected directly to the MERLIN II using D8W-87 modular cords. The installation of the MERLIN II Communications System is the responsibility of the customer or AT&T General Business Systems. Thus, the following procedure requires a coordinated effort between them and the AUDIX system installer. Make sure that the TN366B, TN539, or TN539B board is installed in the AUDIX system and that the AUDIX system and MERLIN II are operational.

1. Assemble the system modules as shown in Figure 9-2, *MERLIN II Default Configuration and Slot Assignments*, and power-on the MERLIN II system. The numbering of the jack positions will be the default numbering shown on the 008D modules in Figure 9-2. If additional 008D modules need to be added for additional ports, the numbering scheme continues to increase upward from bottom to top, left to right as shown.

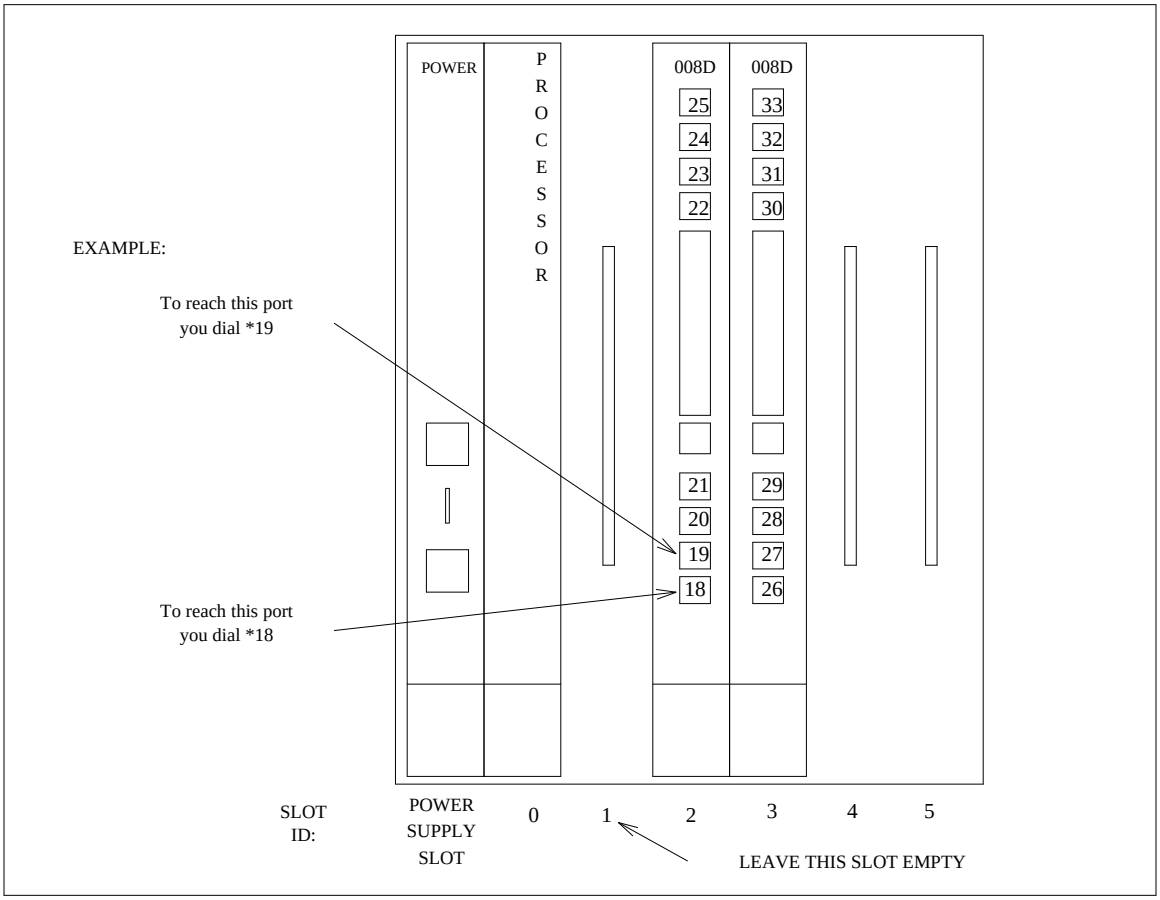


Figure 9-2. MERLIN II Default Configuration and Slot Assignments

2. At the rear of the AUDIX cabinet is a 25-pair female connector labeled ACC or ACCE. Connect the 25-pair male connector of the H600-331, Group 1 cable to this ACC connector. Or connect the 25-pair male connector of a 356A adapter to this connector. Either setup will provide you with the two D8W-87 female modular connectors required. The H600-331, Group 1 modular connectors should have 451A adapters on the ends. Figure 9-3, *AUDIX to MERLIN II Connectivity*, shows a 356A adapter being used.

3. Plug one end of a DW8-87 cord (male-male) into Jack No. 1 of the 356A adapter or Connector 1 of the H600-331, Group 1 cable. If the AUDIX system is within 5 feet of the MERLIN II, the 451A adapter can be removed from Connector 1, and Connector 1 (an D8W-87 male connector) can be used in the next step.

   Repeat this step with the second D8W-87 cord. Use Jack No. 2 of the 356A adapter or Connector 2 of the H600-331, Group 1 cable.

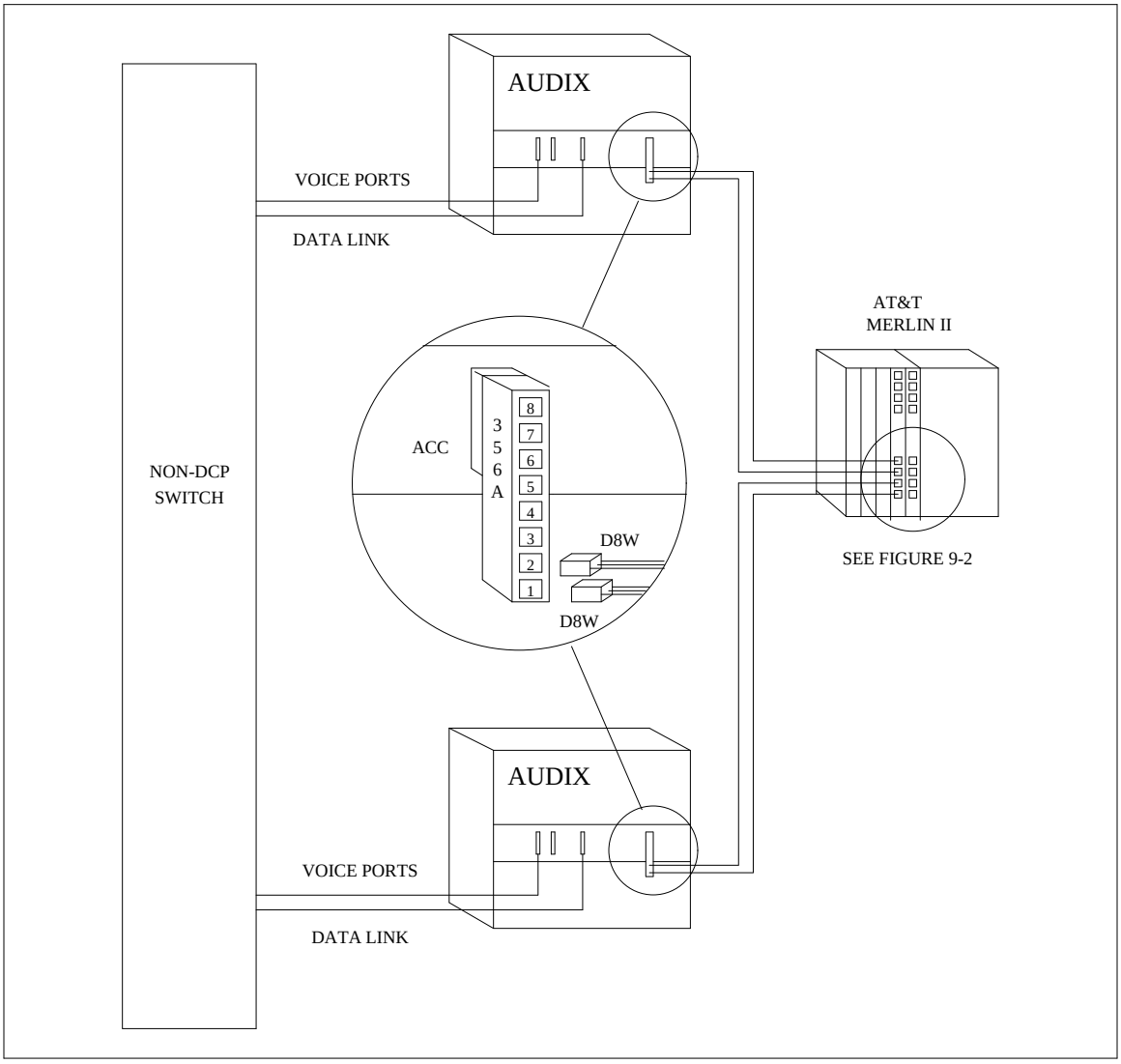


Figure 9-3. AUDIX to MERLIN II Connectivity

4. Run the other ends of the D8W-87 cords to the MERLIN II (008D module). Plug them in to the desired positions.

   Any digital module (008D) jack position will work. The jack position determines the number assigned to the AUDIX DCP data port.

5. Repeat steps 1 through 4 for each AUDIX-to-MERLIN II connection.

SWITCH ADMINISTRATION

The BCSDC will design hunt groups for AUDIX networking so the customer does not need to do so. Always use the extension numbers and hunt sequences provided by the BCSDC for AUDIX networking administration.

The AUDIX networking port administration covered in this section is used in *all* AUDIX networking setups. The following switch administration is required:

- At the System 75, Generic 1, and Generic 3, you will be assigning two channels. These switches use only I-channel 1 of each DCP circuit. At the AUDIX system, they appear as Channels 1 and 3. Channels 2 and 4 are not currently used.
- System 85 and Generic 2 use both I-channels of each circuit, so you will be assigning four channels. At the AUDIX system, they appear as Channels 1 through 4.
- The MERLIN II does not require administration for AUDIX DCP channels. The jacks used on the 008D module have fixed dialing codes. At the AUDIX system, the MERLIN II connections appear only as Channels 2 and 4 (only I-channel 2 is used with each DCP circuit). Channels 1 and 3 are not used.

NOTE

If the RS-232 AUDIX channels are converted to DCP (see Chapter 3, *Switched EIA RS-232 Networks*), you will need to assign two more channels. These appear at the AUDIX system as channels 5 and 6.

If you are using MPDM/M1* data modules to convert RS-232 ports to DCP mode 1 or DCP mode 3, these ports can only be used for incoming calls. Consequently, these data modules must be administered as the first members of a hunt group on the switch and the DCP ports should be administered as the remaining members of the hunt group.

System 75, Generic 1, and Generic 3 Administration

Use the following procedure to assign the AUDIX DCP channels (terminated at two DCP circuits).

1. Use ‘‘add data-module xxxxx’’ to assign a DCP port where xxxxx is a 1- to 5-digit unused extension.
2. Set *Type* to **pdm**.
3. Set *Port* to the location of the TN754 circuit that is wired to the AUDIX DCP port (cable H600-331, Group 1; connector 1, 2, A, or B).
4. Press ENTER.
5. Repeat steps 1 through 4 for each DCP port used.
6. Use ‘‘add hunt-group next’’ to assign a hunt group.

NOTE

Use the hunt groups the BCSDC has designed for AUDIX networking.

7. Set *Group Extension* to another unused extension. Use a DID extension if the AUDIX system is to be accessed from a remote AUDIX system.
8. Set *Group Type* to **ucd**.
9. Set *Message Center* to **none**.
10. Set *ACD* to **n**.
11. Press ENTER.
12. Go to Page 2 and assign the DCP extensions to this hunt group. If you are converting the AUDIX RS-232 ports to DCP, you will have four networking extensions.

NOTE

Assign extensions in the order determined by the BCSDC. For example, the hunt sequence may start with port 5.

System 85 Administration

System 85 can use both I-channels of the DCP port. This provides access to all four AUDIX DCP networking ports. The DCP circuits are assigned as follows using the Maintenance and Administration Panel (MAAP).

1. Assign a class of service (cos) for the AUDIX networking ports that has touch-tone dialing and data protection – permanent enabled (use Proc 010, Word 1 and Proc 010, Word 3).

Wd	1	2	3	4-10	11	12	13	14	15	PROC
1	cos	-	0	0	-	-	0	0	1	010

Wd	1	2-10	11	12	13	14	15	-	23	PROC
3	cos	0*	0	0	1	0	0		$	010

* Fields 2 through 10 may be assigned for toll fraud protection.

$ For remote networking configurations, if the AUDIX networking extension is dialing AAR or ARS to reach a remote AUDIX system, make sure an appropriate FRL is assigned to the AUDIX networking extensions' cos (Proc 010, Word 3, Field 23).

2. The bearer capability of the AUDIX networking ports should be assigned to their class of service using Proc 010, Word 4.

Wd	1	2	3	4	PROC
4			*		010

* Value of this field differs depending on networking configuration.

3. Assign an extension number for each networking port, four extension numbers for the DCP-only ports or six if you are converting the RS-232 ports to DCP (use Proc 000, Word 1). Either port 1 (if you are using only the DCP ports) or port 5 (if you are converting the RS-232 ports) should have a DID extension if the AUDIX system is to be accessed from a remote AUDIX system through the public network.

The extension numbers shown are only examples; use the extensions from the BCSDC.

Wd	1	2-5	7	8	9	PROC
1	xxxx0	-	cos	-		000
1	xxxx1	-	cos	-		000
1	xxxx2	-	cos	-		000
1	xxxx3	-	cos	-		000
1	xxxx4	-	cos	-		000
1	xxxx5	-	cos	-		000

4. Assign the extensions to hunt to each other (use Proc 000, Word 2). You will administer hunting for four extensions if only the DCP ports are used, or six extensions if the RS-232 ports have been converted to DCP. Normally the extensions hunt in a circular pattern unless directed otherwise by the BCSDC. **Hunt sequences are determined by the BCSDC.**

This sequence is only an example; use the hunt sequence from the BCSDC.

Wd	1	2	3	4	5	6	7	8	9	10	PROC
2	xxxx0	xxxx1	0	0	0	0	0	0	0	0	000
2	xxxx1	xxxx2	0	0	0	0	0	0	0	0	000
2	xxxx2	xxxx3	0	0	0	0	0	0	0	0	000
2	xxxx3	xxxx0	0	0	0	0	0	0	0	0	000

5. For each GPP equipment location, assign the following characteristics (use Proc 051, Word 1). Unless specified, leave the field dashed or blank.

   a. Terminal Type — select one of the following:

      — For DCP ports, administer terminal type as AP32 (Field 6 = 10)

      — If converting RS-232 ports to DCP, administer terminal type as PDM (Field 6 = 4)

   b. Originating Preference = Prime Appearance (Field 10 = 2)

   c. Terminating Preference = None (Field 11 = 0)

   d. Keyboard Dialing = active (Field 13 = 1)

Wd	Fields 1-5	6	7	8	9	10	11	12	13	14	PROC
1	circuit0	*	-	-	-	2	0	-	1	-	051
1	circuit1	*	-	-	-	2	0	-	1	-	051

* This field may be 10 for DCP ports or 4 for converted RS-232 ports.

6. For each GPP equipment location, assign two appearances with the following characteristics (Proc 052, Word 1):
   a. Device Type = Basic Set (Field 6 = 0)
   b. Member = 0 (first appearance), then 1 (second appearance) (Field 7 = 0 or 1)
   c. Extension Number = extensions assigned above (Field 8)
   d. Call Appearance Number on this Set = 1 (Field 9 = 1)
   e. Line Type = Prime Line (Field 10 = 1)
   f. Alert Type = alert (Field 11 = 1)
   g. Home Terminal = home terminal (Field 12 = 1)
   h. Originating Call Appearance Only = not originating only (Field 13 = 0)
   i. SAC Group = not a SAC member (Field 14 = 0 on R2V4 or later systems)

Wd	Fields 1-5	6	7	8	9	10	11	12	13	14	PROC
l	circuit0	0	0	xxxx0	1	1	1	1	0	0	052
l	circuit0	0	1	xxxx1	1	1	1	1	0	0	052
l	circuit1	0	0	xxxx2	1	1	1	1	0	0	052
l	circuit1	0	1	xxxx3	1	1	1	1	0	0	052

7. *Auxiliary tone pack:* A System 85 must have at least one SN253C auxiliary tone pack in every module; this pack is administered using Proc 252, Word 2.
8. *Tone detector pack (remote networking configurations):* A System 85 requires an SN255 tone detector pack or an SN255B pack in applications requiring modems that use 2100 Hz answer tone (such as the AT&T 2296, 2248, or 2224). Four tone detectors should be assigned on each SN255 board; the tone-detector trunk group is assigned in Proc 100, Word 1 as trunk type 100, and circuits are assigned to this trunk group in Proc 150.

Generic 2 Administration

Generic 2 can use both I-channels of the DCP port. This provides access to all four AUDIX DCP networking ports. The DCP circuits are assigned as Dual Port Data. This section describes how to administer AUDIX networking on a Generic 2 switch using the enhanced mode of Manager II.

Some general notes on Generic 2 requirements include:

- *Auxiliary tone pack:* A Generic 2 with traditional modules must have at least one SN253C auxiliary tone pack in every traditional module; this pack is administered using Proc 252, Word 2. No administration is required for the TN748C tone pack in a Generic 2 universal module.
- *Tone detector pack (remote networking configurations):* A Generic 2 with traditional modules requires an SN255 tone detector pack, or an SN255B pack in applications requiring modems that use 2100 Hz answer tone (such as the AT&T 2296, 2248, or 2224). Four tone detectors should be assigned on each SN255 board; the tone-detector trunk group is assigned in Proc 100, Word 1 as trunk type 100, and circuits are assigned to this trunk group in Proc 150.

  The TN748C board in a Generic 2 universal module can use channels 4 and 8 for tone detection; up to two tone-detector circuits can be assigned on each board and placed in a tone-detector trunk group. The number of tone detector circuits needed depends on the data traffic characteristics of the switch.
- *Universal modules:* If the switch is a Generic 2 with universal modules, make sure the AUDIX system has a TN366B, TN539, or TN539B ACC(E) board. Otherwise, you can only assign two of the four available DCP channels.

Manager III and Manager IV Administration

DEFINITY Manager III and Manager IV are covered in their own documentation sets. Refer to the appropriate manual for more information on administering systems using Manager III or Manager IV:

- *DEFINITY® Manager III Operations* (585-222-701)
- *DEFINITY® Manager IV Facilities Management Operations* (585-223-702)
- *DEFINITY® Manager IV Terminal Change Management Operations* (585-223-701)
- *DEFINITY® Manager IV System Administration* (585-223-700)

Manager II Administration

Manager II assignments for Generic 2 are as follows:

1. Assign all four extension numbers (or six if you are converting RS-232 ports to DCP) to the system (Proc 000, Word 1) as shown in Figure 9-4, *Manager II Administration of a DCP Port (Proc 000, Word 1)*. The extension number shown is only an example; use the extension numbers provided by the BCSDC.

   Use a class-of-service (Proc 010, Word 1 and Word 3) that has touch-tone dialing capability and data protection – permanent. Class of service 10 is only an example.

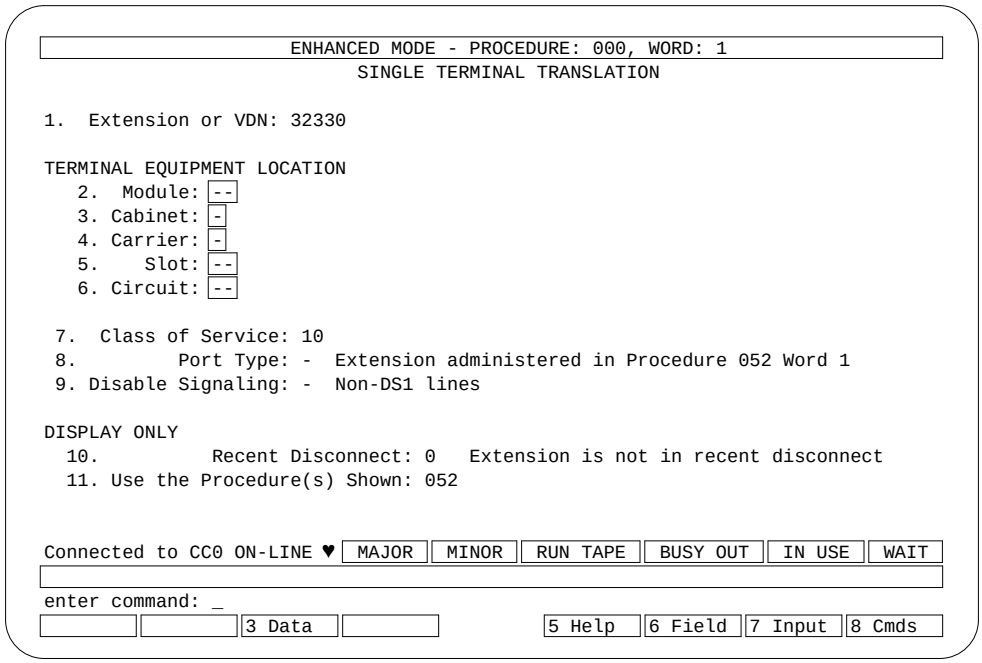


Figure 9-4. Manager II Administration of DCP Port (Proc 000, Word 1)

2. Assign all four extensions (or six if you are converting RS-232 ports to DCP) to Bearer Capability Class-Of-Service (BCCOS) 6 as shown in Figure 9-5, *Manager II Administration of a DCP Port (Proc 000, Word 3).* The extension number shown is only an example.

NOTE

The default BCCOS 0 through 8 should *not* be modified to support AUDIX networking. If a custom BCCOS is required, create a *new* BCCOS using the default values shown in PROC 014, Words 1 and 2. Refer to the *DEFINITY Generic 2 Administration Procedures* manual (555-104-506) if needed.

The BCCOS 6 default parameters are also shown in Figure 9-6, *Manager II Administration of a DCP Port (Proc 014, Word 1)*, and Figure 9-7, *Manager II Administration of a DCP Port (Proc 014, Word 2).*

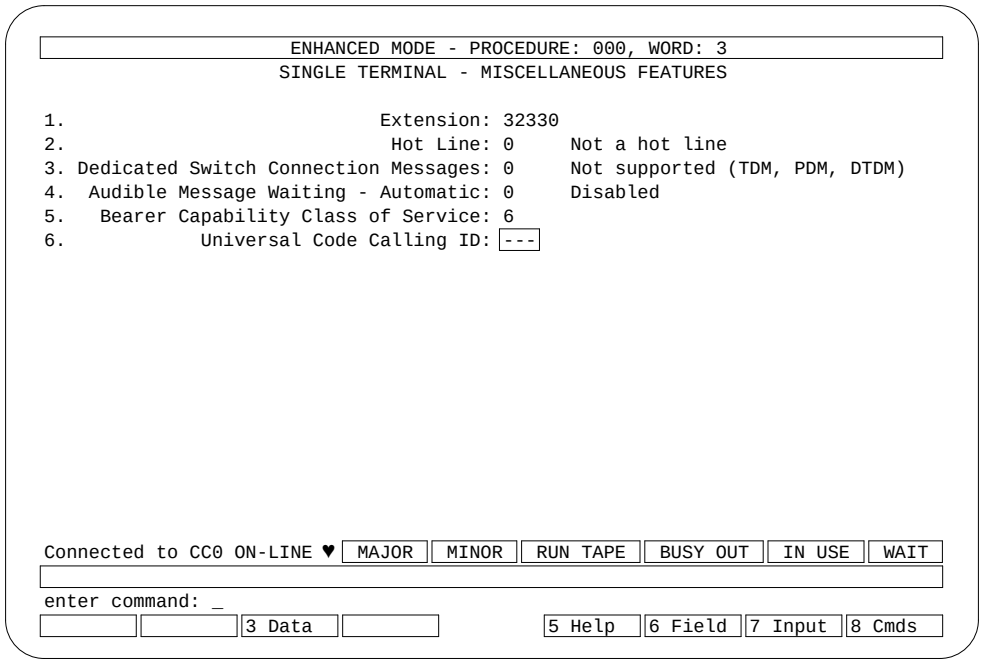


Figure 9-5. Manager II Administration of DCP Port (Proc 000, Word 3)

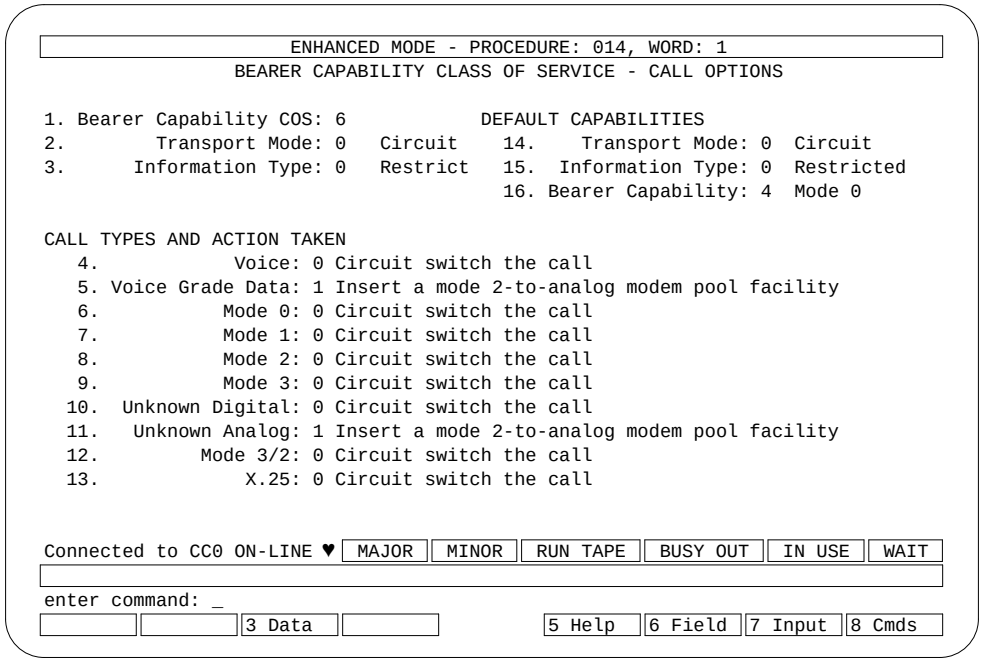


Figure 9-6. Manager II Administration of DCP Port (Proc 014, Word 1)

3. The DCP extensions default to BCCOS 1. Change this to BCCOS 6 as shown in these examples. This allows the DCP port to communicate with either a digital or analog outside facility.

   A call to/from this port will be circuit switched unless it is voice-grade data or unknown analog. In these cases, a modem pool will be inserted.

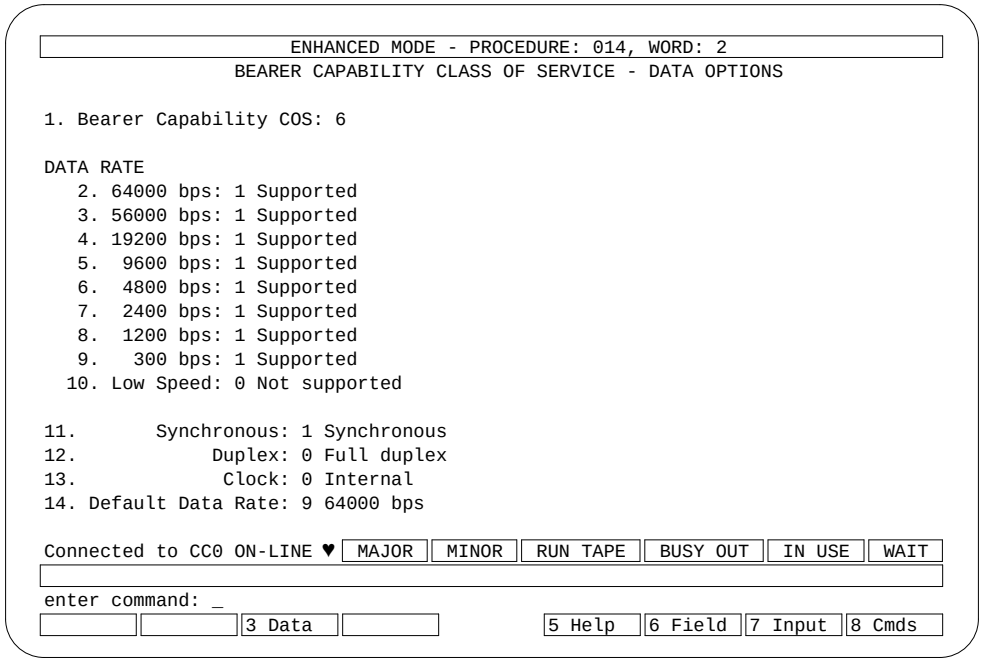


Figure 9-7. Manager II Administration of DCP Port (Proc 014, Word 2)

4. Assign the DCP equipment location as Dual Port Data (Proc 051, Word 1). Make the entries as shown in Figure 9-8, *Manager II Administration for DCP Ports (Proc 051, Word 1).* The equipment location shown is only an example.

5. Repeat step 4 for the second DCP equipment location.

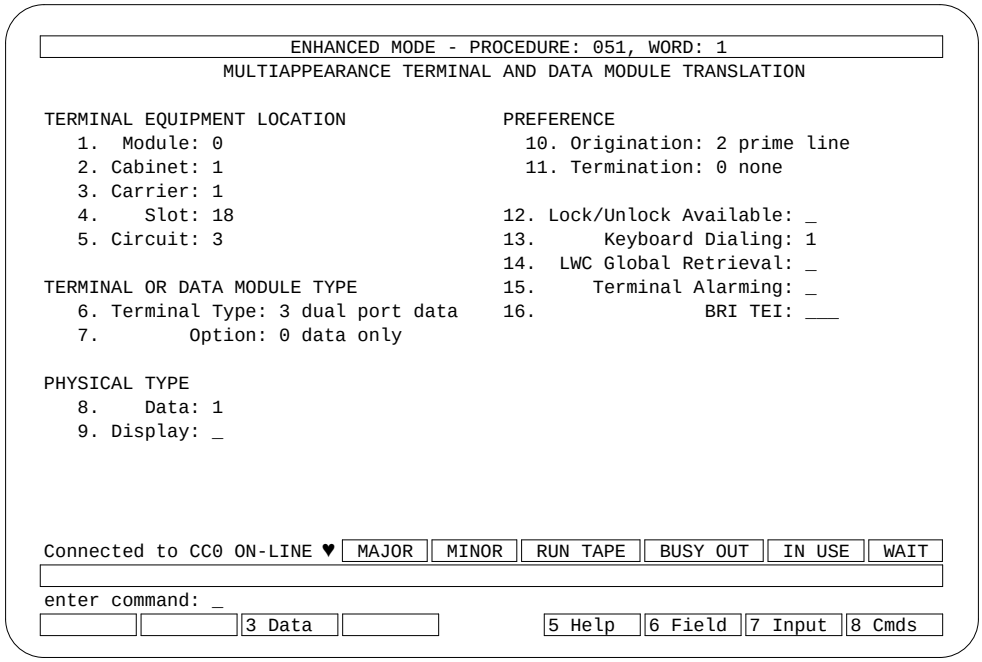


Figure 9-8. Manager II Administration for DCP Ports (Proc 051, Word 1)

6. Assign line appearances to the DCP equipment location. Make the entries as shown in Figure 9-9, *Manager II Administration for DCP Ports (Proc 052, Word 1)*. The extension shown in Field 8 is only an example.

7. The first extension is assigned to Device Type 0 (Field 6) Member 0 (Field 7). Repeat step 6, only use Device Type 0 Member 1 and assign a different extension to it.

8. Repeat steps 6 and 7 for the second DCP equipment location. Assign two other extension numbers to Device Type 0 (Field 6) Members 0 and 1 (Field 7) for this equipment location.

   If desired, you may display the extensions using Proc 052, Word 2.

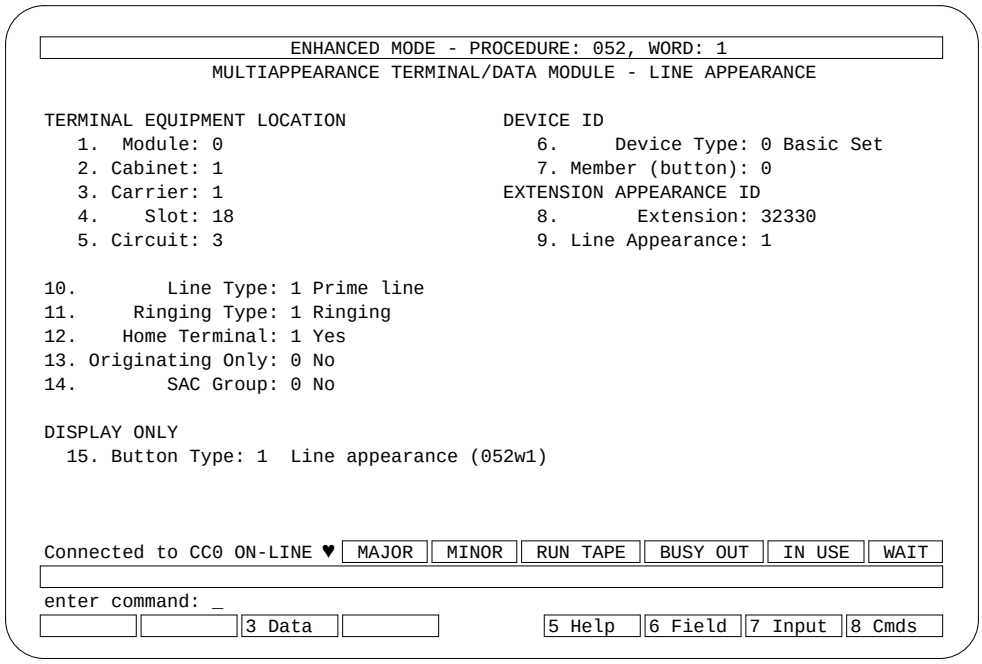


Figure 9-9. Manager II Administration for DCP Ports (Proc 052, Word 1)

9. After the extensions are assigned here, their BCCOS may be reset to 1. Go back to Procedure 000, Word 3 and check if the BCCOS is still 6. If not, reset it to 6 if necessary. Check each of the AUDIX networking extensions.

10. DCP Mode 1 Installation and Administration

In most cases where the customer wishes to use this type of network, it will be because the network connections are already in place. T1 facilities connect the Private Branch Exchange (PBX) to a network *point-of-presence* switch which in turn is connected to the 56 Kbps facilities. Additional trunk circuits may have to be added to handle the additional traffic. The Business Communications Systems Design Center (BCSDC) must make this determination.

SWITCH COMPONENT INSTALLATION

See the appropriate switch and/or feature documentation for installing circuit packs and wiring trunks on the switch.

SWITCH ADMINISTRATION

Check to make certain the customer's switch and the central office switch are compatible. For DCP Mode 1 networking, the trunk group used to transport the AUDIX calls must be DS1 and the DS1 pipe must employ robbed-bit signaling.

4ESS Administration

If not already done, the 4ESS must be translated for 56 Kbps operation as follows:

- The 4ESS facilities must be translated for robbed-bit transmission.
- If the 4ESS is using AMI, the System 75, System 85, or DEFINITY Communications System must be translated for ZCS (*not* B8ZS).
- The trunk types on the 4ESS and switch must match (for example, both may be translated as wink/wink type trunks).

System 75, Generic 1, and Generic 3 Administration

Administration depends on whether the customer is using static (high-speed data only) or dynamic (voice and high-speed data) switched 56 access.

NOTE

Any Generic 1 switches in a 56 Kbps network that includes a Generic 2 must be running at least Issue 7.2 software.

- *Static Access:* For static (high-speed data only) 56 Kbps switched access, the switch must be administered as follows:
  - — Using the `add trunk-group` form, set the comm type to **DATA** and administer the switch for wink in/wink out.
  - — Using the `change system-parameters features` form, set the `off-premise tone detect` to **25**.
  - — Using the `change ds1 circuit pack` form, set the `signaling mode` field to **robbed-bit** and set either **ZCS** or **B8ZS** to match the CO.
- *Dynamic Access:* For dynamic (voice and high-speed data) 56 Kbps switched access, the switch must be administered as follows:
  - — Using the `add trunk-group` form, set the comm type to **RBAVD**, the baud rate (or bit rate) to **19.2**, and administer the switch so it matches the central office trunk type.
  - — Using the `change system-parameters features` form, set the `off-premise tone detect` to **25**.
  - — Using the `change ds1 circuit pack` form, set the `signaling mode` field to **robbed-bit** and set either **ZCS** or **B8ZS** to match the CO.

System 85 Administration

The following translations need to be completed for a System 85 for static switched 56 Kbps (dynamic access is not supported for System 85 R2V3 or R2V4; System 85 R2V2 does not support 56 Kbps networking). System 85 is administered as follows using the MAAP.

1. Using Procedure 010, Word 4, assign mode 1 data to the class of service associated with the AUDIX networking ports (Field 3 = 1).

Wd	1	2	3	4	PROC
4			1		010

2. Using Procedure 100, Word 1, translate the trunk group (tgroup) as follows:
   a. Assign a dial access code (DAC) in Fields 2 through 5. The dial string used by the AUDIX networking ports must be routed via a dedicated (static) trunk group using this DAC.
   b. Assign a DMI trunk type (Field 6 = 109). The DS1 facility used to transport the 56 Kbps call must employ robbed-bit signaling.

Wd	1	2-5	6	7	8	PROC
1	tgroup	dac	109	0	0	100

3. Using Procedure 101, set the following values:
   a. Set Touch Tone In and Touch Tone Out to 1 (Fields 6 and 7 = 1).
   b. Set the AVD bit for the trunk group to 0 (Field 17 = 0).

Wd	1	2	3	4	5	6	7	8	-	16	17	PROC
1	tgroup					1	1				0	101

Generic 2 Administration

The following Manager II translations need to be completed for a Generic 2 for *static* switched 56 Kbps networking. For Generic 2 translations using dynamic 56 Kbps networking, contact the BCSDC.

NOTE

DEFINITY Manager III and Manager IV are covered in their own documentation sets. Refer to the list of documents in Chapter 9 to find the appropriate manual for administering systems using Manager III or Manager IV.

1. Using Procedure 100, Word 1, make the assignments shown in Fields 1 through 9. *The trunk group (76) and the dial access code/trunk ID code shown are only examples;* enter the appropriate values supplied by the BCSDC.

NOTE

To administer *members* of the trunk group, use Procedure 116.

If you need to change the signaling type, use Procedure 100, Word 3.

```
                    ENHANCED MODE - PROCEDURE: 100, WORD: 1
                              TRUNK GROUP TRANSLATION

1. Trunk Group: 76

DIAL ACCESS CODE/TRUNK ID CODE
   2. Digit 1: 7
   3. Digit 2: 5
   4. Digit 3: 1
   5. Digit 4: -

 6. Trunk Type: 41
 7.      Dial Access Restriction: 0 Access is allowed using DAC
 8.  Personal CO Line Appearance: 0 Not used for CO line appearance
 9. Public Network Access/Egress: 1 Enabled

DISPLAY ONLY
10. Signaling Type: 26 E&M wink/delay dial out with fail on timeout



Connected to CC0 ON-LINE ♥ | MAJOR | MINOR | RUN TAPE | BUSY OUT | IN USE | WAIT |

enter command: _
          | 2 Repeat | 3 Form |          | 5 Help | 6 Field | 7 Input | 8 Cmds |
```

Figure 10-1. Manager II Mode 1 Administration (Proc 100, Word 1)

2. Using Procedure 100, Word 2, assign BCCOS 7 to the trunk group (trunk group 76 is only an example).

NOTE

BCCOS 7 is the default and should *not* be modified. However, if BCCOS 7 has been modified at your site, use a custom BCCOS that has the default values of BCCOS 7 (one that uses robbed-bit signaling). Refer to the *DEFINITY Generic 2 Administration Procedures* manual (555-104-506) for default BCCOS values if needed.

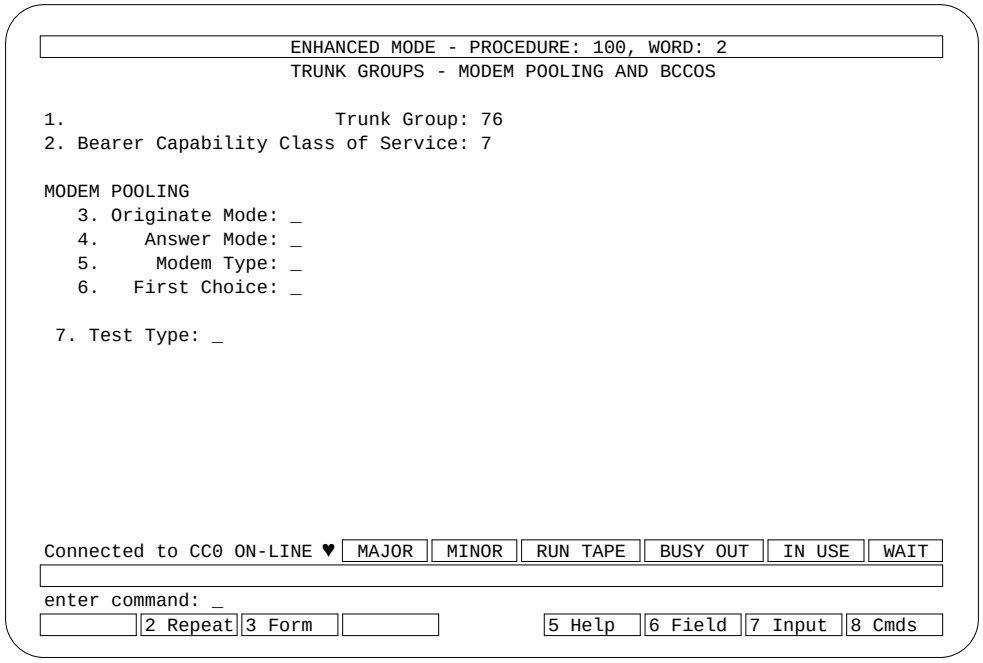


Figure 10-2. Manager II Mode 1 Administration (Proc 100, Word 2)

3. Using Procedure 101, Word 1, make the assignments shown below:

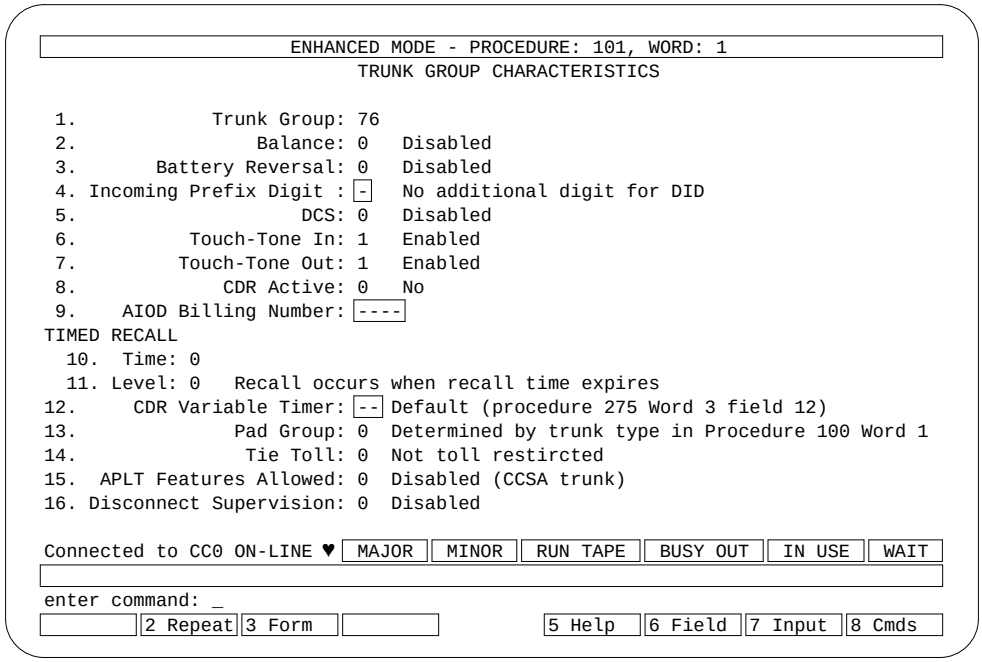


Figure 10-3. Manager II Mode 1 Administration (Proc 101, Word 1)

LOOPBACK TESTING

AT&T Network Systems requires loopback capabilities in order to test and support AUDIX networking over switched digital services (SDS). With R1V7 software and a TN539B ACCE, this test can be enabled via the `maintenance : network` form. On R1V5 and R1V6 systems, an MPDM/M1* is required for loopback testing.

Loopback Testing for R1V7

On AUDIX R1V7 systems, you can test the connection between the local AUDIX system and the 56 Kbps serving office (SO), as shown in Figure 10-4, *56 Kbps Network Loop-Around Test*. Normally only the four DCP ports are tested, but if you have an MPDM/M1* connected to ports 5 and 6, they may also be tested using the AUDIX `maintenance : network` form.

While a channel is in loopback mode, it will be unavailable to send information to remote systems or receive information from remote systems. Incoming calls will be answered, but the calling system will be unable to establish a connection; eventually it will drop the call and attempt to call back at its next scheduled transmission time.

Also, if you put a channel in loopback mode, any active calls will be dropped. It is therefore recommended that before you perform this test you check the status of the channel. It is also not a good idea to perform this test during peak traffic times.

1. Go to the `maintenance : network` form. Set *select test* to **7** to test a 56 Kbps network connection. Press TAB to get to the *channel* field and specify the channel (1-6) you want to use for the test. Press CHANGE or RUN and wait for the result.

   NOTE

   If you have an MPDM/M1* between the AUDIX system and the PBX, you may also test channels 5 or 6 (the RS-232 channels) for 56 Kbps operation.

2. Have the serving office place a call to the telephone number assigned to the channel you specified on the `maintenance : network` form. If the test is successful, any data the serving office sends over the AUDIX channel will be echoed back.
3. Go to the `maintenance : network` form. Set *select test* to **9** to take the channel out of loopback mode. Press TAB to get to the *channel* field and the specify the channel (1-6) you want to take out of loopback mode. Press CHANGE or RUN and wait for the result.

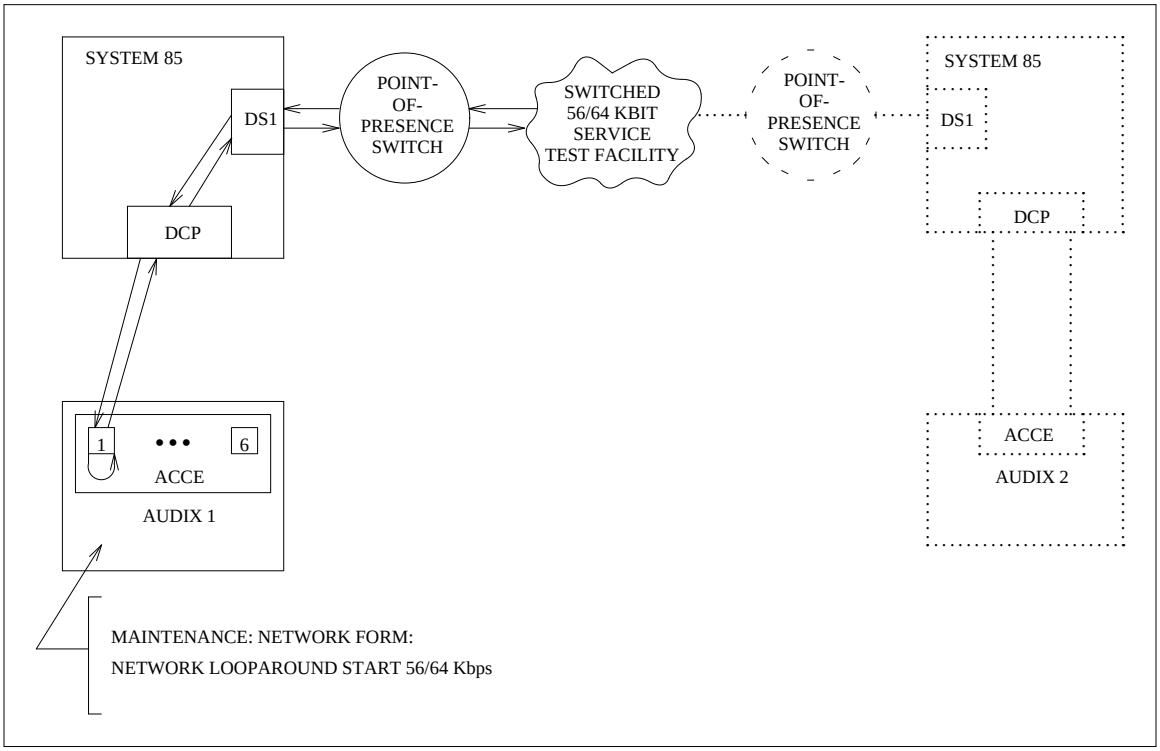


Figure 10-4. 56 Kbps Network Loop-Around Test

Loopback Testing for R1V5 and R1V6

For R1V5 and R1V6, loopback capabilities are provided by an MPDM/M1*.

*Setting Up the MPDM/M1**

NOTE

The MPDM/M1* used for loopback testing is not the same one used for the RS-232 ports on the AUDIX system.

To install the MPDM/M1*, complete the following steps:

1. If the customer did not order an MPDM/M1*, modify the MPDM to support 56 Kbps by completing the following steps.

NOTE

If the faceplate of the MPDM reads *ACCUNET*, then the D-kit has already been installed and you should not need to modify the MPDM in any way. In this case, skip to step 2.

a. Install the 56 Kbps D-181509 kit by following the instructions included with the kit. The D-kit is used to modify the MPDM so it will work with 56 Kbps facilities.

b. Install the V.35 DTR card in the MPDM. The V.35 card allows a call to be answered without an attached DTE device.

   To see if the V.35 card has already been installed, power up the MTDM *without* having a DTE attached. The Terminal Ready LED on the MPDM will be on if the V.35 DTR interface has previously been installed.

c. Solder two loops or build and connect a male loopback plug to make the connections shown in Figure 10-5, *V.35 Male Connector*.

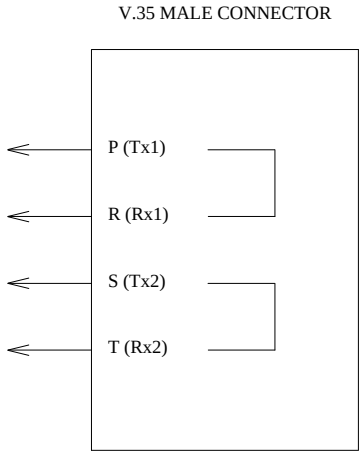


Figure 10-5. V.35 Male Connector

2. Install the MPDM/M1* by following the instructions that come with the data module.
3. Set all MPDM option switches to OFF (left) except the following:
   - Set OFF/56K to 56K
   - Set ASYNCH/SYNC to SYNC
   - Set EXT/INT to INT
   - Set OFF/ANET to ANET
   - Set OFF/AANS to AANS

Performing Loopback Test

AT&T Network Systems requires loopback capabilities in order to test and support AUDIX networking over switched digital services (SDS).

NOTE

The AUDIX networking ports will be *unavailable* for the duration of the loopback test. Therefore, the test should not be conducted during prime-time hours.

In order to conduct a loopback test, you must have installed the loopback MPDM/M1*. One MPDM/M1* is required per customer location, not per AUDIX system. (The MPDM/M1* must have the V.35 interface described earlier in this chapter.) You will also need to disconnect the AUDIX Networking Breakout Cable (H600-331, Group 2) from the AUDIX system for the duration of the test, so the system will have no networking capabilities during the test. See Figure 10-6, *Loopback Test with the H600-331, Group 2 Cable*. (If you are using the H600-331, Group 1 cable, you will only need to use one of the DCP lines. See Figure 10-7, *Loopback Test with the H600-331, Group 1 Cable*.)

When a loopback test is to be conducted, complete the following steps:

1. Busy out the AUDIX networking ports as follows:
   a. If the RS-232 ports are converted to DCP using an MPDM/M1*, set the SELFTEST/NORMAL switch on the MPDM to SELFTEST.
   b. Use the `maintenance : network` form to busy out all of the AUDIX networking ports.
2. Connect the loopback MPDM/M1* (with the V.35 interface card) as follows:
   - If you are using the H600-331, Group 2 Cable, do one of the following:
     — If a 356A adapter is available (see Figure 10-6, *Loopback Test with the H600-331, Group 2 Cable*), disconnect the Amphenol 50-pin male connector from the ACC D05 port on the AUDIX system. Connect the Amphenol connector to the 25-pair male connector 356A adapter using a 50-pin female-to-female Amphenol adapter. Plug one end of the D8W-87 cord into slot 1 of the 356A adapter, and the other end into the MPDM/M1* data module. This makes DCP channels 1 and 2 available for the loopback test.
     — If a 356A adapter is not available, patch a 103A adapter to the DCP interface for the first physical port (ELL) at the cross-connect field. Plug one end of the D8W-87 cord into the 103A adapter, and the other end into the MPDM/M1* data module. This makes DCP channels 1 and 2 available for the loopback test.
   - If you are using the H600-331, Group 1 Cable, borrow one of the AUDIX DCP ports as shown in Figure 10-7, *Loopback Test with the H600-331, Group 1 Cable*.
3. Put the loopback MPDM/M1* (with the V.35 interface) into normal mode.
4. Have Network Systems conduct the loopback test on the port connected to the loopback MPDM/M1*. Once the MPDM/M1* answers the call, put it into remote loopback mode.
5. When the test is completed, have Network Systems disconnect the call or press the ORIGINATE/DISCONNECT switch on the loopback MPDM.
6. Connect the network breakout cable (H600-331, Group 1 or Group 2) back to the AUDIX system as before the test.

7. If the RS-232 ports are converted to DCP using an MPDM/M1*, set the SELFTEST/NORMAL switch on the MPDM back to NORMAL.
8. Use the `maintenance : network` form to unbusy the AUDIX ports.

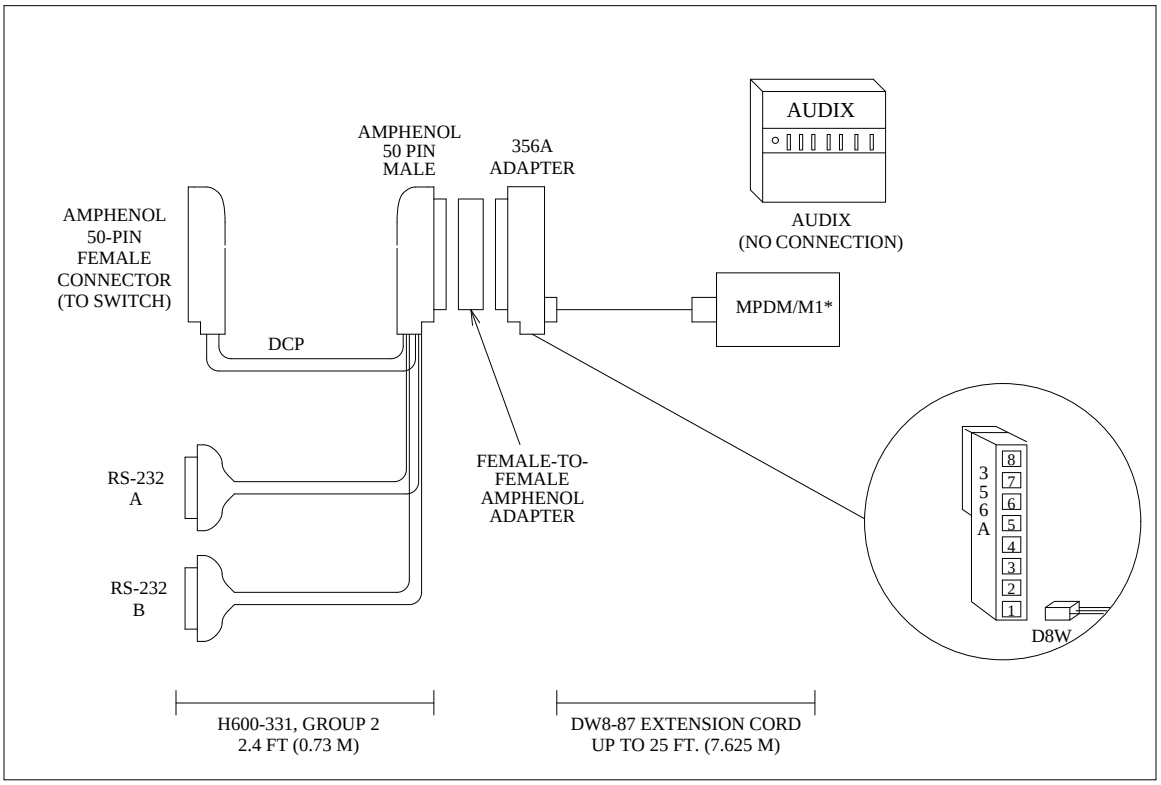


Figure 10-6. Loopback Test with the H600-331, Group 2 Cable

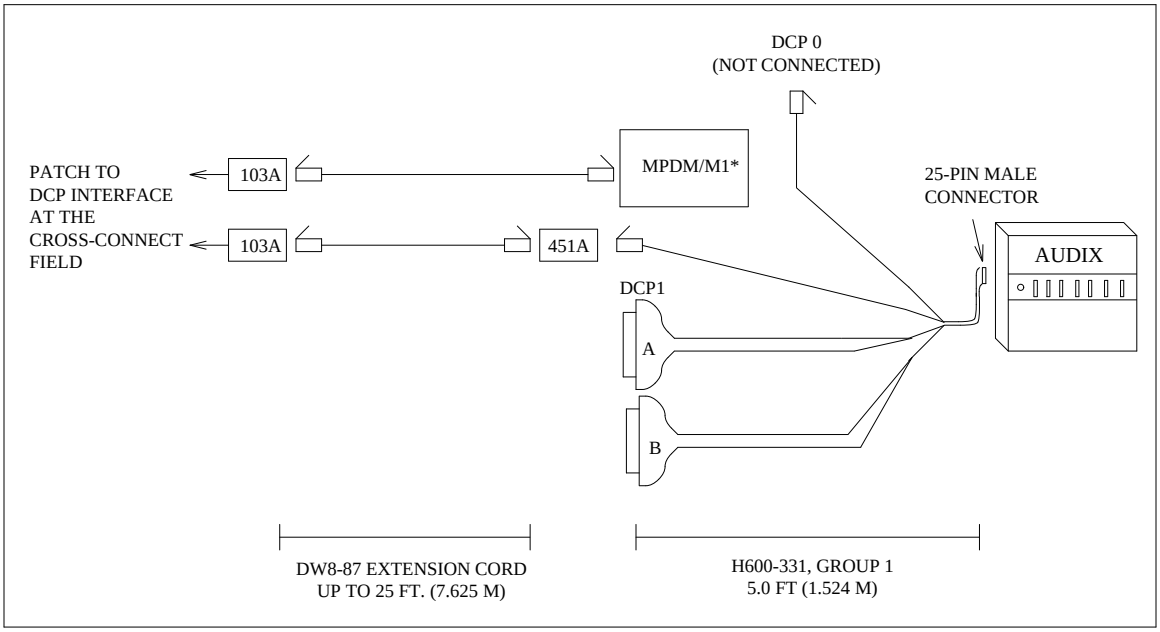


Figure 10-7. Loopback Test with the H600-331, Group 1 Cable

11. DCP Mode 2 Installation and Administration

This chapter explains how to install and translate stand-alone modem pools and rack-mounted (D-Lead) modem pools. Once the modem pools are installed and translated, any problems should be directed to the Technical Service Center (TSC).

INSTALLING A 2296A AND MTDM IN A MODEM POOL

The following shows how to install and administer 2296A modems and MTDM data modules in their multi-mount configuration. This arrangement uses a standard 72-inch cabinet with multiple mounts.

Do not apply power to the cabinet or any related equipment until all components are installed and ready for service.

Install the Modem Pool Cabinet

The modem pool cabinet requires a 57 to 63 Hz, 105 to 129 VAC circuit. Expect to draw a maximum of 1200 watts. (This circuit should come from the same AC Distribution panel that powers the AUDIX, and power should not be controlled by the switch. The circuit should not share power with room lighting or other electrical devices that could cause electrical interference.)

A power strip should be installed at the back of the cabinet along the bottom left-hand side. The vertical side rails on the left and right sides of the cabinet go in the fifth hole from the front. The equipment mounting flanges on the rails face the front.

Install the Multiple Mountings

Each mounting plugs into the cabinet power strip and will draw 52 watts of power. The mountings operate in an ambient temperature range of 40 to 120 degrees F (4.44 to 48.8 degrees C) and a relative humidity range of 5 to 95 percent, noncondensing. The altitude limit is 10,000 feet above sea level.

Figure 11-1, *72-Inch Data Cabinet and Multiple Mountings*, shows how the mountings are to be installed. The 105A mounting can be modified to fit in a 19- or 23-inch space by changing bracket positions.

Test-fit an empty mounting between the rails and determine which holes in the rails will be used. Leave 1/2 inch between mountings. Start a screw in each of these holes, leaving 1/4-inch gap between the screw-head and rail. Install the mounting using the screws as hooks to hold it in place. Start a screw at the top of each side of the mounting and tighten. Tighten the bottom screws.

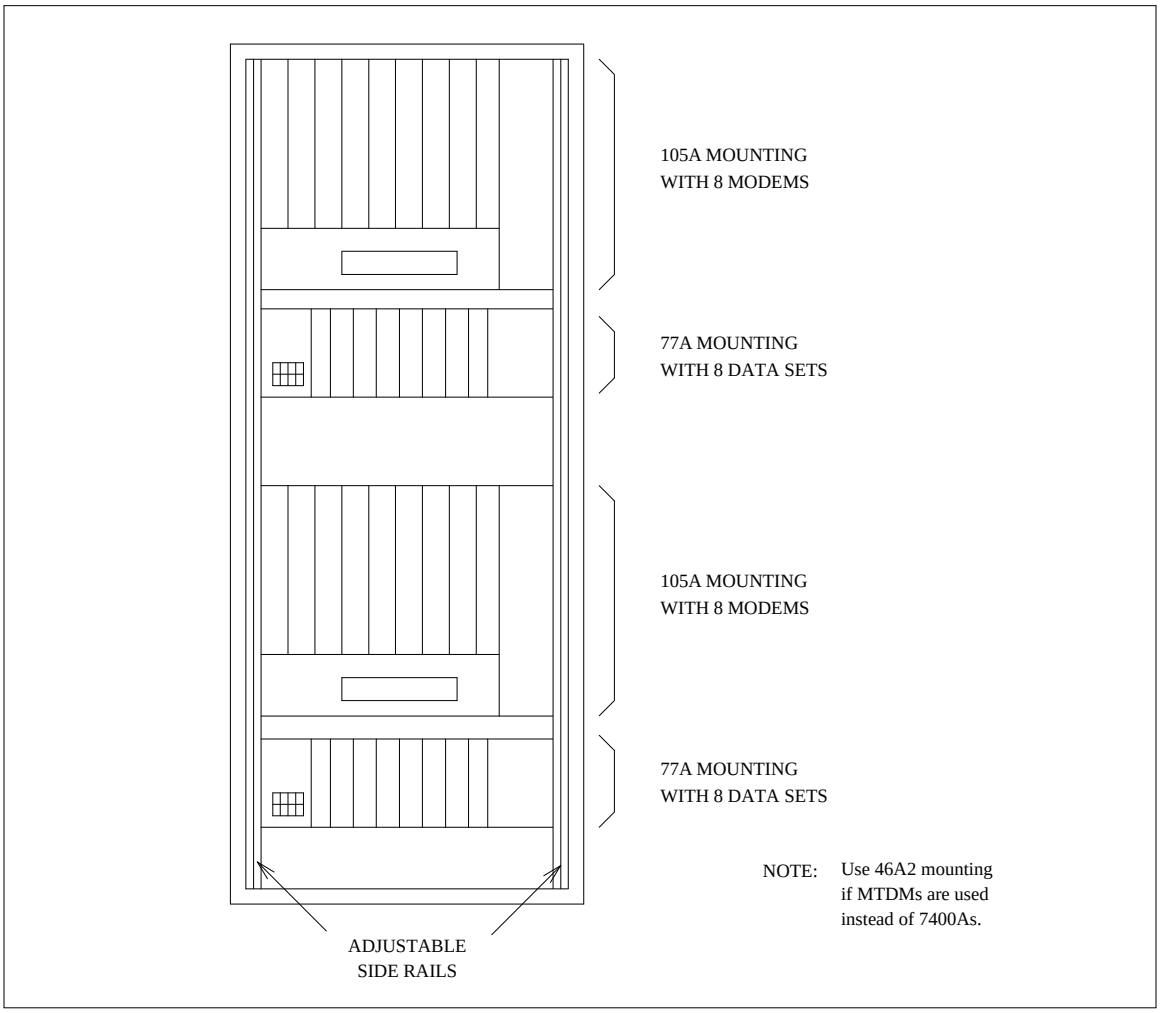


Figure 11-1. 72-Inch Data Cabinet and Multiple Mountings

Install the Modems and Data Sets

Each modem and data set plugs into the mounting and will draw 30 watts of power. The modems and data sets also operate in an ambient temperature range of 40 to 120 degrees F (4.44 to 48.8 degrees C) and a relative humidity range of 5 to 95 percent, noncondensing. The altitude limit is 10,000 feet above sea level.

Figure 11-2, *Modem Pooling Cabinet with MTDMs (Front View)*, shows the front of a 105A and a 46A2 mounting. The shared Liquid Crystal Display (LCD) front panel of the 105A is for setting options inside each modem. The MTDMs require a 46A2 mounting (shown in Figure 11-2). The 7400A data sets require a 77A mounting (shown in Figure 11-5 Installation procedures for the 7400A are given in the *7400A DSU Installation and Settings (D-Lead Control)* section later in this chapter.

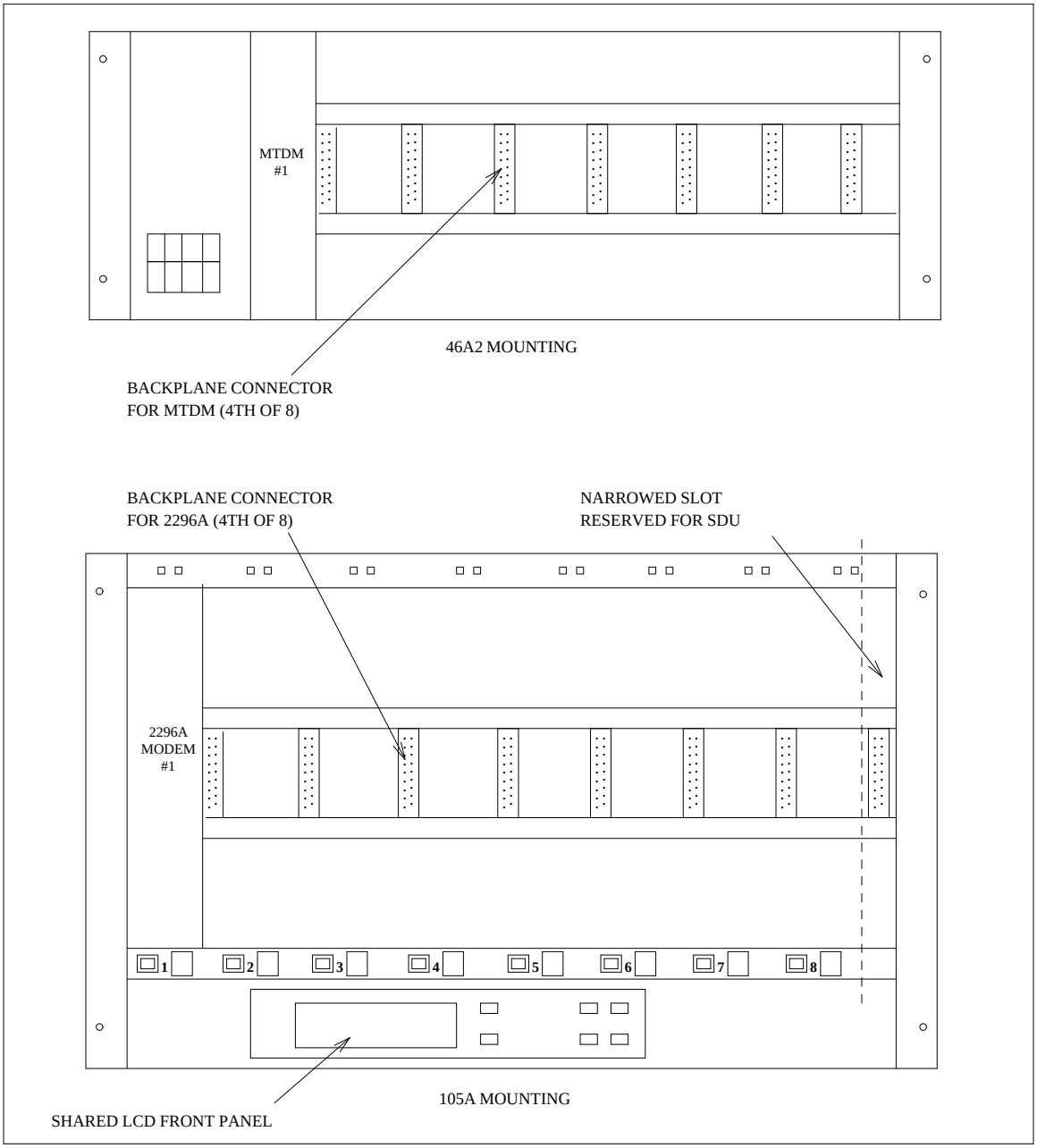


Figure 11-2. Modem Pooling Cabinet with MTDMs (Front View)

Use the following steps to install the modems and data sets.

1. Before installing a 2296A modem, check the feature package module located in the right-hand slot (modem standing on end). This should be a 140C1 (V1.1 or V1.2 no longer purchasable), 140F (V1.1), or 140F2 (V1.0) Memory Module.

   CAUTION

   Do not pull the feature package or other module from the 2296A when power is applied. Turn the power switch at the back of the 2296A OFF and unplug the 2296A power cord from the mounting.

   The Automatic Calling Unit (ACU) and AUTOCALL modules are not required and should be removed if present. The Microcom Networking Protocol (MNP) module is only required if the data rate is 19.2 Kbps. In most AUDIX modem-pooling setups, the data rate is 9600 bps.

2. Install the 2296A modems in 105A slots. Start at the left. The modems must contact their backplane connector. Set the following options located at the top of the 2296A faceplate under the sliding panel:

Switch	Option	Position
S1	1	O(pen)
S2	1	C(losed)
	2	C(losed)
	3	O(pen)
	4	C(losed)
	5	C(losed)
	6	O(pen)
	7	O(pen)
	8	C(losed)

   The LCD display will be used to set internal options once power is applied.

3. Before installing the MTDMs, verify that they contain the new processor and TRIC 4 chips (see Figure 11-3, *MTDM Location of TRIC 4 Chips*). If not, they must be upgraded before they can be used. See Chapter 5, *DCP Mode 2 Networks — Modem Pooling*, for upgrades.

4. Set the following options on the MTDM circuit card:

Switch	1	2	3	4	5	6	7	8
Position	on	off	on	off	on	on	on	off

5. Install the MTDM data sets in 46A2 slots. Start at the left. Each MTDM is paired with a modem. The MTDMs must make contact with the backplane connector.

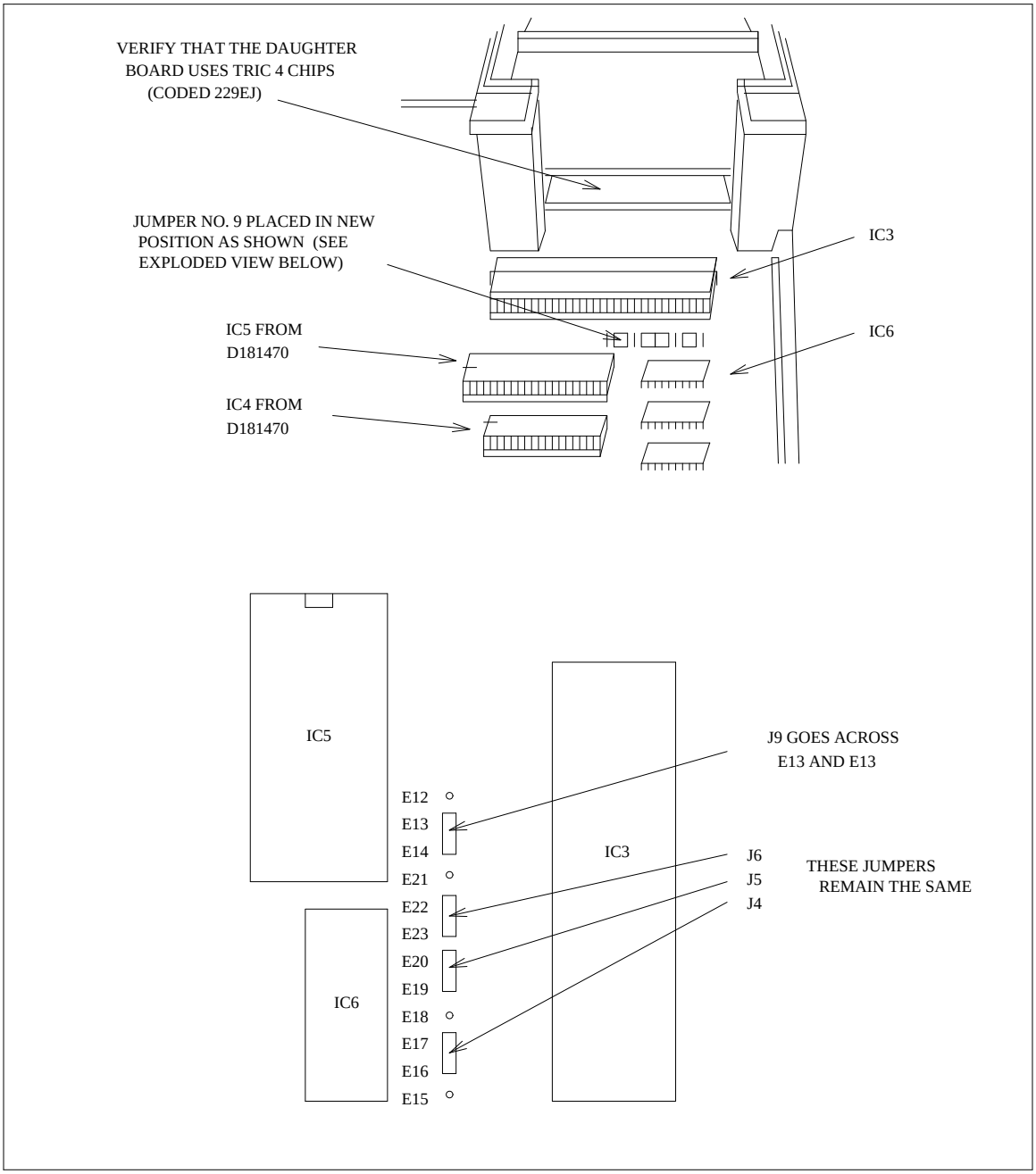


Figure 11-3. MTDM Location of TRIC 4 Chips

6. Set the following options on the face of the MTDM. The arrows (< for left, > for right) indicate which direction the rockers should be set. The speed shown is 9600 bps.

10 Position Switch			12 Position Switch		
OFF	<	LOW	FDX	<	HDX
OFF	<	300	ASYNC	<	SYNC
OFF	<	1200	INT	<	SLV
OFF	<	2400	OFF	>	DISC
OFF	<	4800	OFF	>	KYBD
OFF	>	9600	OFF	<	PRTY
OFF	<	19.2K	0/EV	<	1/OD
OFF	<	56K	SPARE	<	
OFF	<	64K	SPARE	<	
OFF	<	TRBK	PL	>	SW
			OFF	>	SIGLS
			SPARE	<	

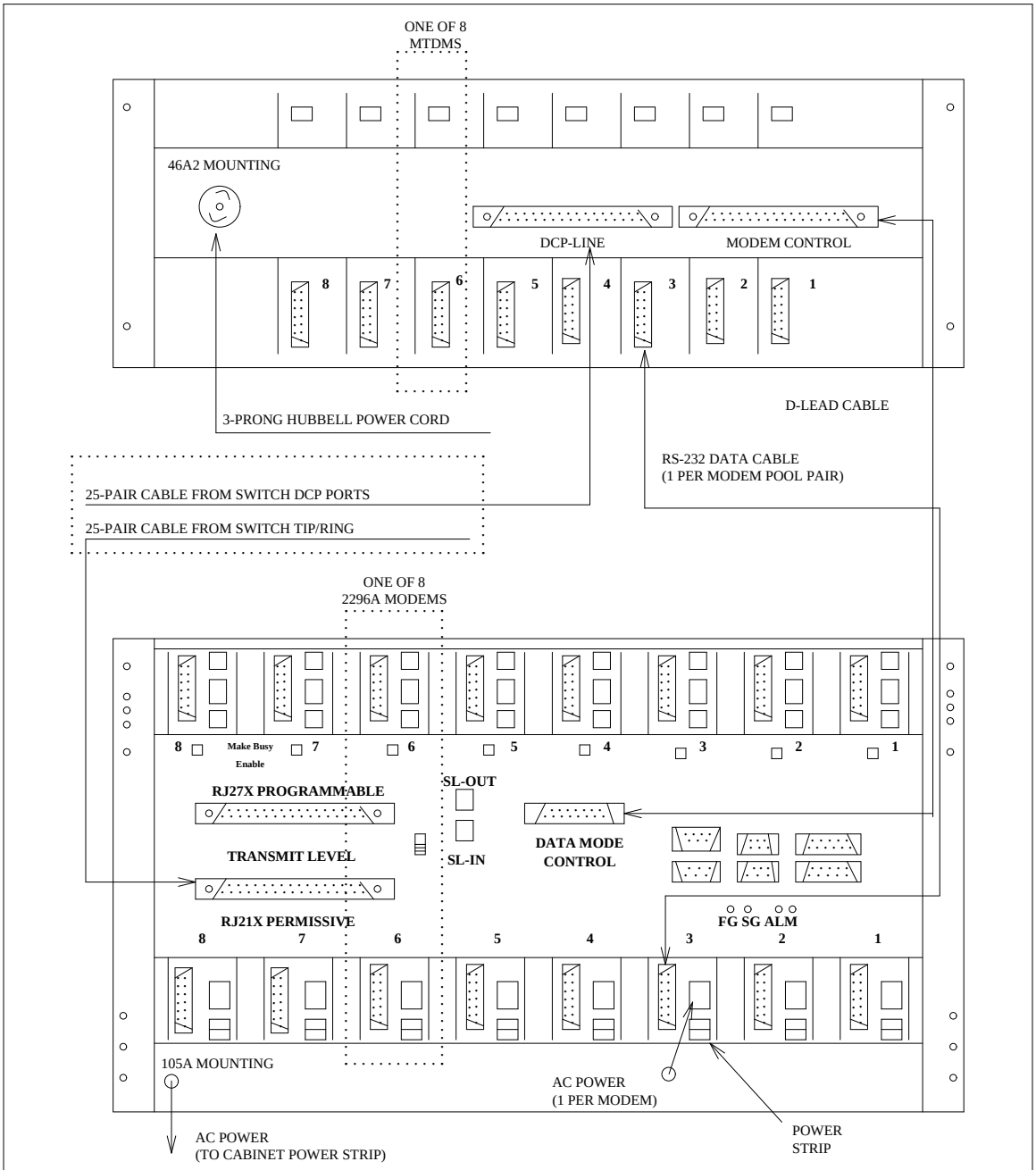
Install the Multi-Mount Cables

Figure 11-4, *Modem Pooling Cabinet Cabling*, shows the rear view of the modem-pool cabinet. Cables should be installed as shown. For details, see the following procedures:

1. Connect the D Lead Control cable (RS-232C to 25-pair) from the DATA MODE CONTROL connector on the 105A to the MODEM CONTROL connector on the 46A2.
2. Connect one end of a 25-pair cable to the RJ21X PERMISSIVE connector on the 105A.
3. Connect the other end of this cable to the switch cross-connect field. Use the following table to patch a tip and ring pair to a switch analog port.

Pin	Color	Function	Pin	Color	Function
1	W/BL	R (Line 1)	26	BL/W	T (Line 1)
2	W/O	R (Line 2)	27	O/W	T (Line 2)
3	W/G	R (Line 3)	28	G/W	T (Line 3)
4	W/BR	R (Line 4)	29	BR/W	T (Line 4)
5	W/S	R (Line 5)	30	S/W	T (Line 5)
6	R/BL	R (Line 6)	31	BL/R	T (Line 6)
7	R/O	R (Line 7)	32	O/R	T (Line 7)
8	R/G	R (Line 8)	33	G/R	T (Line 8)
9-25		NC	34-50		NC

Record the telephone number of each modem on the space above the display panel.



NOTE: This figure shows the MTDM rack on top.
Figure 11-2 shows it on bottom.

Figure 11-4. Modem Pooling Cabinet Cabling

4. The switch to the right of the RJ21X PERMISSIVE connector must be in the down position.
5. Set the eight Make Busy/Enable switches to the enable position (DOWN).
6. Connect one end of a 25-pair cable from the DCP LINE connector on the 46A2.
7. Connect the other end of this cable to the switch cross-connect field. Use the following table to patch a 4-wire DCP LINE circuit to a switch digital port (GPP) circuit. The switch ports use the same wire combinations.

Pin	Color	Function	Pin	Color	Function
1	W/BL	NC	26	BL/W	NC
2	W/O	Line 1	27	O/W	Line 1
3	W/G	Line 1	28	G/W	Line 1
4	W/BR	NC	29	BR/W	NC
5	W/S	Line 2	30	S/W	Line 2
6	R/BL	Line 2	31	BL/R	Line 2
7	R/O	NC	32	O/R	NC
8	R/G	Line 3	33	G/R	Line 3
9	R/BR	Line 3	34	BR/R	Line 3
10	R/S	NC	35	S/R	NC
11	BK/BL	Line 4	36	BL/BK	Line 4
12	BK/O	Line 4	37	O/BK	Line 4
13	BK/G	NC	38	O/BK	NC
14	BK/BR	Line 5	39	BR/BK	Line 5
15	BK/S	Line 5	40	S/BK	Line 5
16	Y/BL	NC	41	BL/Y	NC
17	Y/O	Line 6	42	O/Y	Line 6
18	Y/G	Line 6	43	G/Y	Line 6
19	Y/BR	NC	44	BR/Y	NC
20	Y/S	Line 7	45	S/Y	Line 7
21	V/BL	Line 7	46	BL/V	Line 7
22	V/O	NC	47	O/V	NC
23	V/G	Line 8	48	G/V	Line 8
24	V/BR	Line 8	49	BR/V	Line 8
25	V/S	NC	50	S/V	NC

8. Connect a ground strap from the signal ground (SG) to the frame ground (FG) on the 105A.
9. Make sure the cabinet is not connected to power, then connect the mounting power cords to the cabinet power strip.

Install the MTDM and 2296A Cables

1. Connect a Data Terminal Equipment (DTE) RS-232C cable from the back of each 2296A (data port) to the back of its paired MTDM (RS-232C connector at bottom).
2. At the back of the modem, make sure the power switch is OFF (0 position).
3. At the back of the mounting, connect one of the eight power cords to the AC power jack on the back of the modem.

2296A Option Settings (D-Lead Modem Pool)

1. First make sure that the power switch for each MTDM and each 2296A is OFF.
2. Plug the cabinet power cord into the circuit provided. The LCD display on the front of the 105A should light up.
3. Turn the power switch at the back of the modem ON (1).
4. Press the select button on the front of the mounting below the modem to be optioned. The button should light up and the display will show the information for this modem.
5. Press (MENU SEL) until `OPt` is displayed.
6. Press (.) (dot) once.
7. Press (10) nine times and then press (1) nine times to select option 99.
   Press (CHG). Then press (+-) to set this option to 1. This will unlock the modem's option settings.
8. Press and hold (.) (dot) until the display shows `def` (approximately 5 seconds). The default options for this modem are now selected.
9. Press (CHG). Default options are loaded into the modem.
10. Press (.) again, this time only momentarily. You should now be able to change specific options.
11. Press (10) five times to select option 50. Press (CHG). The display should show `y:50` (ASYNC).
12. Press (1) six times to select option 56. Press (CHG). The display should show `y:56` [Data Set Ready (DSR) turns on early].
13. If fallback (speed stepdown) is required from 9600 to 4800 baud, select option 73 by pressing (10) seven times and then (1) three times.
14. Press (SPD) until the desired speed (9.6 Kbps) is displayed.
15. Set option 99 to 2 to relock this modem's options.

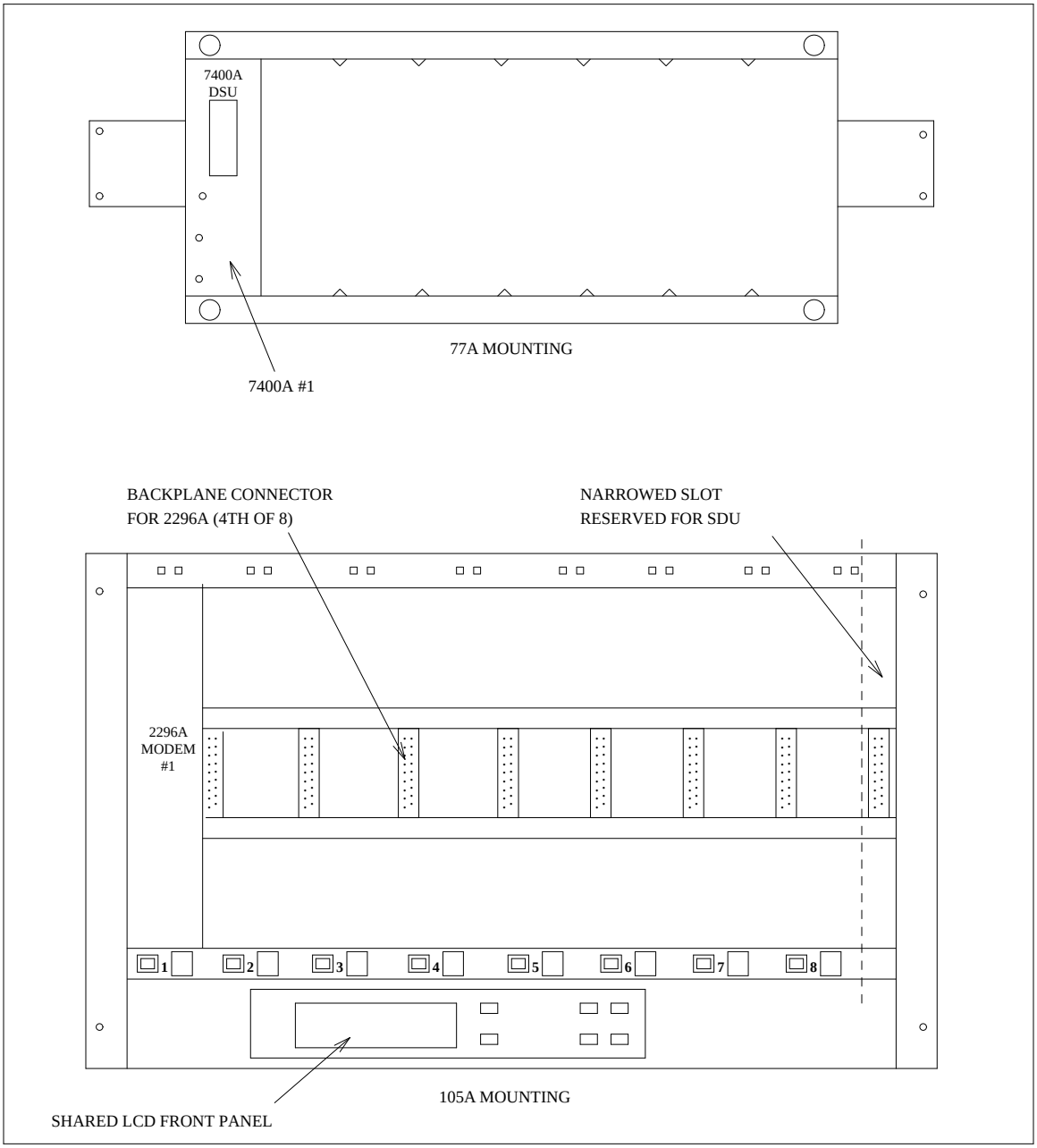


Figure 11-5. Modem Pooling Cabinet with 7400As Front View

INSTALLING A 7400A IN A MODEM POOL

The 7400A Data Service Unit (DSU) can replace the MTDM in modem pooling applications on a System 75, System 85, DEFINITY Generic 1, Generic 2, or Generic 3. Instructions for installing a 7400A DSU in the D-lead controlled (rack-mounted) modem pool instead of an MTDM are summarized in this section. To install the 7400A in a stand-alone modem pool, see the next section, *Installing Stand-Alone Modem Pools*.

1. Disconnect the power cord, the line cord, and the RS-232 cable from the 7400A.
2. Open the top door of the 7400A by inserting the tip of a ball-point pen into the small hole near the LINE label on the back panel. Push in on the tab on the hole while pulling up on that side of the door. Repeat the procedure for the other side of the door. Lift off the door and set it aside.
3. Rotate the 7400A so that you are viewing it from the front. Look straight down at the inside and locate the large silver arrow pointing toward the back of the set. The arrow points to the EIA connector board. The board is perpendicular to the plane of the arrow. You can see it at the point of the arrow.
4. Look at the EIA board from the front of the set. You should see *DTE* printed on the left hand corner of the board. If you see *DCE*, pull the board up until it is completely free. Rotate it until you can read *DTE* from the front of the 7400A and plug the board in again.
5. Close the door by hooking the hinges under the front housing and then snapping the rear tabs into place.
6. Check the position of the slide switch located near the front of the access door opening. It should be positioned to the left as viewed from the front of the unit (position B). This is the normal position for operation in a modem pool. There are some 9600 bps modems which will not operate properly with the switch in this position, particularly those modems employing data compression and error correction (such as the Hayes SMARTMODEM 9600). For these modems, position the switch to the right (position A).
7. Plug one end of the D8W-87 from the adapter harness into the labeled line (see step 13 for information on the adapter harness).
8. Plug the power supply cord into the receptacle labeled POWER on the 7400A.
9. Plug one end of the EIA-232-D cable into the port labeled PORT 1 on the 7400A, and the other end into the EIA port on the modem.
10. Make sure that your PBX is administered to support the 7400A in a modem pool arrangement. See the *7400A Modem Pool Installation Guide* (555-020-708).
11. Plug the power supply into an AC power outlet.
12. Use the front panel to set the 7400A options according to the following table. See the *7400A Data Module User's Manual* (505-020-706) for details.

Table 11-1. 7400A Settings for Modem Pool (9600 bps)

Set Option Screens	Option and Value Screens	
Set 300 Speed?	300	Off
Set 1200 Speed?	2400	Off
Set 2400 Speed?	2400	Off
Set 4800 Speed?	4800	Off*
Set 9600 Speed?	9600	On
Set 19200 Speed?	19200	Off
Set AT Control?	AT	Off
Set CI Lead?	CI	On
Set CI2 Lead?	CI2	On
Set CH Lead	CH	On
Set CH2 Lead?	CH2	On
Set LL Lead?	LL	On
Set Remote Loop?	Remloop	Grant
Set RL Lead?	RL	On
Set Sigls Disc?	Sigls Disc	On
Set TM Lead?	TM	On

* To enable stepdown (slower data transmission speed), set 4800 speed to **ON**. On the modem, set Options 50, 56, and 73 to **y**.

Continue the installation according to the following steps. The 7400A is configured for DTE modem pool operation with D-lead controlled 2296-type modems. The mounting package includes an adapter harness (WP90780L0), an OR-6316 bridging adapter, and a 2296 modem control cable (D-Lead).

13. Connect the 50-pin connector on the adapter harness to P1 on the bridging adapter [see Figure 11-6, *AUDIX Networking (Modem Pooling) With 7400A DSUs*]. Then plug each numbered connector (D8W-87 cords) on the harness into the LINE jack on the corresponding 7400A (see the numbered slots on the mounting rack).
14. Connect the 25-pair cable from the switch to J1 on the bridging adapter. For correct wiring of the switch cable, see the table titled *WP90780L0 25-Pair Cable Adapter for Use with Direct Cabling to Multiple Mount for DCP Installations* in the *7400A Data Module User's manual*.
15. Connect the 50-pin plug of the D-Lead cable to J2 on the bridging adapter.
16. Put the cover on the bridging adapter.
17. Connect the other end of the D-Lead cable to the Data Mode Control connector on the modem rack.

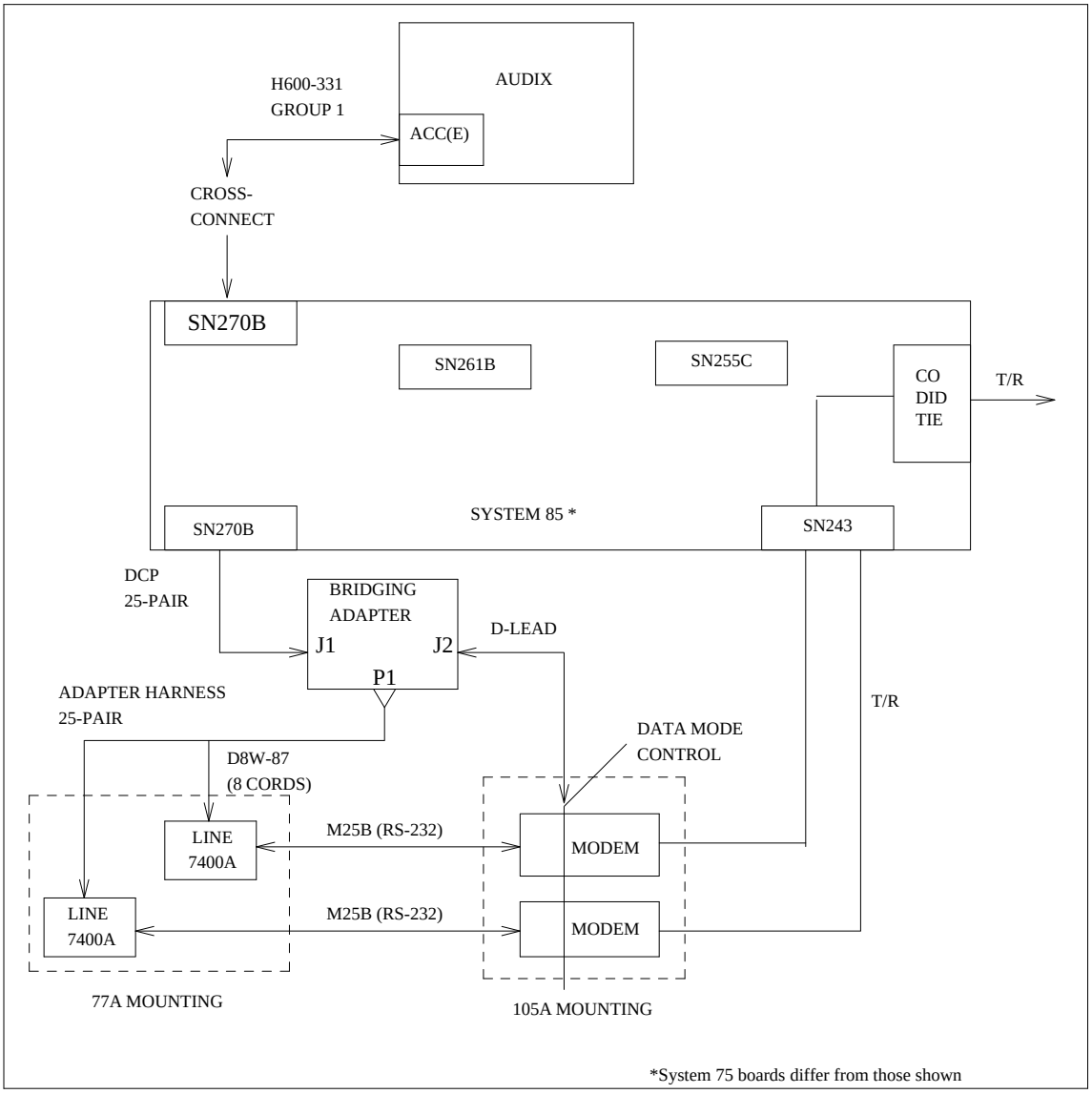


Figure 11-6. AUDIX Networking (Modem Pooling) with 7400A DSUs

18. From the back of the rack, connect the appropriate M25B cable to its RS-232 port on the back of each data module. Tighten the connector screws to hold the cables securely in place.

19. Drape each interface cable through its plastic twist lock and twist the top ends of the lock to secure each cable. Make sure each modem is interconnected through the RS-232 cable to the 7400A in the corresponding rack position.

20. To test the remote connection and the administration of the system, run the self-test as described in Section 2 of the *7400A Data Module User's* manual.

INSTALLING STAND-ALONE MODEM POOLS

Stand-alone modem pools can be used with System 75, System 85, Generic 1, Generic 2, and Generic 3. Although cabled as a stand-alone modem pool, the modems and data sets can still be mounted in racks if you have spare rack-type units that must be utilized.

System 75/85, System 75 XE, Generic 1, Generic 2, and Generic 3

If the AUDIX is equipped with the TN366B, TN539, or TN539B stand-alone modems and data sets can be used instead of the equipment associated with a switch's modem pool (that is, data cabinet, mountings, and D-Lead control). Use one of the following modems along with a 7400A DSU:

- AT&T Paradyne 3820 modem
- AT&T Paradyne DM424 modem
- AT&T 2296A modem

NOTE

Equivalent modems such as the AT&T Paradyne DL424 instead of the DM424 modem could be used.

Figure 11-7, *Analog Network Using Stand-Alone Modems and Data Sets*, shows how the modem and data set are cabled. Check the modem and data set options before installing them. Options are given on the following pages. The 7400A requires power from a rack-mount or from a separate unit.

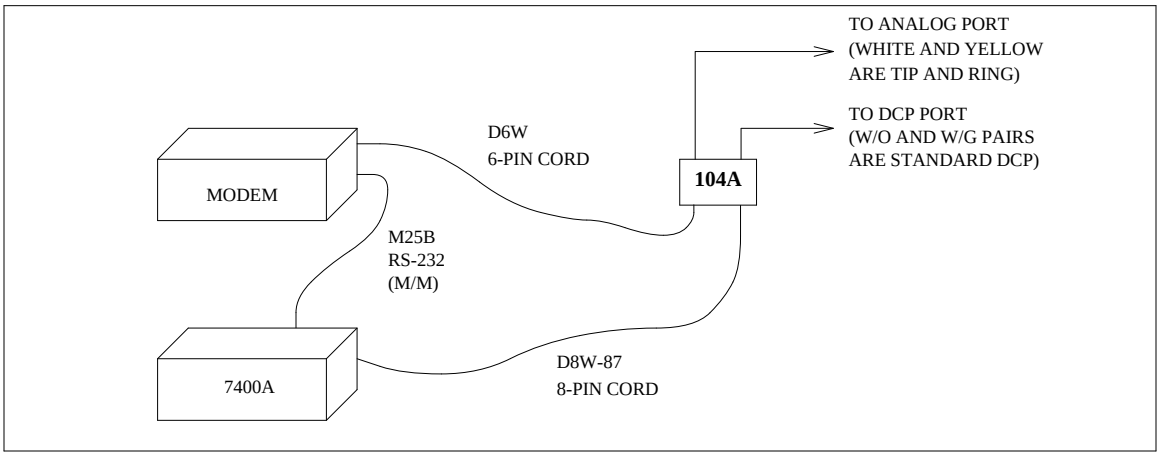


Figure 11-7. Analog Network Using Stand-Alone Modems and Data Sets

2296A Modem AUTOCALL Dialer Module, Type 2A4

The 2296A requires a dialer module when in a stand-alone modem pool. Follow these instructions before installing the modem.

1. *Disassembling the Modem:*
    a. Make sure power is turned OFF.
    b. Disconnect all cords from the modem.
    c. Turn the modem upside down and remove the six recessed screws along the edges of the modem.
    d. Hold the top and bottom halves of the housing together as you turn the modem right-side up.
    e. Gently remove the top half of the housing.
    f. Disconnect the ribbon cable that connects the front panel to the right side of the circuit pack (when facing the front of the modem).
    g. Remove the front panel by lifting it straight up.
    h. Lift the front of the circuit pack about 1 inch, pull the circuit pack forward about 1 inch, and set it down.
2. *Inserting the Dialer:*
    a. At the side of the modem's circuit pack labeled **EXPANSION SLOT A**, tilt the circuit pack up from the housing until the slot is visible (1 or 2 inches up).
    b. Orient the dialer module with the metal tab toward the rear of the modem circuit pack. Insert the dialer module in **EXPANSION SLOT A**.

       When fully inserted, the hole in the metal tab should be positioned over a threaded hole in the modem's circuit pack.
    c. Move the modem's circuit pack back to its original position with the connectors at the rear extending through the back of the housing. Make sure the notches cut into the sides of the circuit pack align with the supports in the housing.
    d. Fasten the dialer module in place with the screw shipped with the module.
    e. Keep a record of which dialer module is installed (AUTOCALL DIALER).
3. *Assembling the Modem:*
    a. Place the front panel back in the housing. Insert the bottom (hinged side) of the panel first, then rotate the front panel back into place.
    b. Reconnect the ribbon cable to the connector on the right side of the modem's circuit pack. Make sure the cable does not get in the way when replacing the top half of the housing and installing the screws.
    c. Replace the top half of the housing. Check the front and rear panels to be sure that the housing is positioned correctly.
    d. Hold the top and bottom halves of the housing while turning the modem over.
    e. Install the six screws and tighten.

2296A Modem Option Settings (Stand-Alone Modem Pool)

All 2296A modems now are shipped with a memory module. In earlier versions, a 140C1 Memory Module V1.1 or V1.2 had to be installed in the right-hand slot at the bottom. New modems have a 140F2 module which will work. The 2296A modem does **not** need the optional ACU board. If the data speed is slower than 19.2 Kbps, the MNP board is also not needed.

Two groups of switches are located at the top of the 2296A modem faceplate. Set the switches according to the following table:

SWITCH	OPTION	POSITION
S1	1	O(pen)
S2	1	C(losed)
	2	C(losed)
	3	O(pen)
	4	C(losed)
	5	C(losed)
	6	O(pen)
	7	O(pen)
	8	C(losed)

For instructions on how to set the 2296A option settings from the front panel, see *2296A Option Settings (D-Lead Modem Pool)* earlier in this chapter. Below is a summary:

- Set Option 99 to **1** (allows options to be changed).
- Set all options to their default.
- Set Option 50 (async/sync) to **y**.
- Set Option 56 (Early DSR) to **y**.
- Set the speed to **9600** (same as the MTDM).
- Set Option 99 back to **2** (two).

To set the options from a terminal, use the follow initialization string:

at&f x1 v0 m0 e0 &c1 &d2 &s1 s0=2 &w RETURN

If successful, the response will be `0`. A response of anything other than `0` indicates a fail.

DM424 Modem Option Settings (Stand-Alone Modem Pool)

Only switch 6 should be in the ON (DOWN) position. There is also a DIP switch at the back of the modem. All DIP switches should be in the OFF (UP) position. If you change any setting, make sure power is cycled. This will activate the new setting(s).

The modem initialization string must be entered manually from the keyboard of a 9600 bps terminal interface. If possible, use a terminal that does not require Data Set Ready (DSR) to be active; however, most terminals (including the 513 BCT and TELETYPE 5420) require that DSR be active at the modem in order for them to send characters to it. The DM424 modem has DSR active from the factory, but once the following initialization string is sent, DSR becomes inactive. [The ‘‘&b2’’ required for stand-alone modem pool operation deactivates DSR, even though the Modem Ready (MR) lamp would indicate otherwise.]

If you are using a terminal that requires DSR to be active and you need to resend the initialization string for any reason, or if you want to receive a response as to whether the initialization was successful, you need to first insert an RS-232 breakout box as described in the *RS-232 Breakout Box* section.

The initialization string required for the DM424 follows. Spaces have been inserted to improve readability; they are ignored by the command interpreter.

at&f *s0 *e0 &b2 x1 v0 m0 e0 &w RETURN

The terminal screen will show whether the initialization was successful (if you are using a terminal that requires DSR to be active, you need to have inserted an RS-232 breakout box in order to see the response). A successful response is `0`. A response of anything other than `0` indicates a fail.

Paradyne 3820 Modem Option Settings (Stand-Alone Modem Pool)

The modem initialization string must be entered manually from the keyboard of a 9600 bps terminal interface. If possible, use a terminal that does not require Data Set Ready (DSR) to be active; however, most terminals (including the 513 BCT and TELETYPE 5420) require that DSR be active at the modem in order for them to send characters to it. The Paradyne 3820 modem has DSR active from the factory, but once the following initialization string is sent, DSR becomes inactive. [The ‘‘&s1’’ required for stand-alone modem pool operation deactivates DSR, even though the Modem Ready (MR) lamp would indicate otherwise.]

If you are using a terminal that requires DSR to be active and you need to resend the initialization string for any reason, or if you want to receive a response as to whether the initialization was successful, you need to first insert an RS-232 breakout box as described in the *RS-232 Breakout Box* section.

The initialization string required for the Paradyne 3820 follows. Spaces have been inserted to improve readability; they are ignored by the command interpreter.

at&f0 &d2 &s1 \d3 \n0 e0 v0 x1 s41=3 s43=1 s76=1 s78=1 &w0 RETURN

The terminal screen will show whether the initialization was successful (if you are using a terminal that requires DSR to be active, you need to have inserted an RS-232 breakout box in order to see the response). A successful response is `0`. A response of anything other than `0` indicates a fail.

RS-232 Breakout Box

If you are using a terminal that requires DSR to be active (for example, a 513 BCT or TELETYPE 5420), you must install an RS-232 breakout box if you want to resend an initialization string or receive a response as to whether or not an initialization was successful (this is because the first initialization string you send turns DSR off).

To install the RS-232 breakout box:

1. Insert the breakout box in the RS-232 connection between the terminal and the modem.
2. Using the switches on the breakout box, open Pin 6 (DSR).
3. Jumper Pin 6 on the terminal side to +v on the breakout box. This will provide DSR active to the terminal.
4. At the terminal, type **AT** and press (RETURN). The modem should echo back ‘‘0’’ to the terminal.
5. At the terminal, type **AT&F** and press (RETURN). This will return the modem to the factory settings and DSR will be active again. The modem should echo back ‘‘OK’’.
6. Re-enter the initialization string.
7. Remove the breakout box and reconnect the modem to the modem pool.

Stand-Alone Modem Cabling

To install cabling, do the following:

1. Connect an M25B RS-232 (male to male) cable between the modem and the 7400A.
2. Connect the modular cord that comes with the modem to the back of the modem and to one side of a 104A connecting block.
3. Connect the D8W-87 cord that comes with the data set between the data set and the other side of the 104A connecting block.
4. Wire the connecting block to the ports on the switch. Wire the modem to the analog port and wire the 7400A to the digital port.

7400A DSU Option Settings (Stand-Alone Modem Pool)

The 7400A has an internal DCE/DTE card. The DTE side should be facing the front of the set. Set the following options when the 7400A is installed in a stand-alone modem pool. Use the buttons on the front panel. Start by pressing (NEXT).

Option	Setting
300	OFF
1200	ON
2400	ON
4800	ON
9600	ON
19200	OFF
AT CONTROL	ON
CI	OFF
CI2	OFF
CH	OFF
CH2	OFF
LL	OFF
REMLOOP	GRANT
RL	OFF
SGLS DISC	ON
TM	OFF

ADMINISTERING THE SWITCH FOR MODEM POOLING

This section describes switch administration for a System 75, System 85, or DEFINITY Generic 1, Generic 2, or Generic 3.

If you are adding modem pool members, fill in the following before starting. For System 75, System 75 XE, Generic 1, Generic 2 (universal module), and Generic 3, locate the TN circuit packs shown below. For System 85 and Generic 2 (traditional module), locate the SN packs:

- TN754 or SN270B connected to MTDM-1 _____ (equipment location)
- TN754 or SN270B connected to MTDM-2 _____ (equipment location)
- TN754 or SN270B connected to MTDM-3 _____ (equipment location)
- TN754 or SN270B connected to MTDM-4 _____ (equipment location)
- TN742/TN746B or SN243B connected to 2296A-1 _____ (equipment location)
- TN742/TN746B or SN243B connected to 2296A-2 _____ (equipment location)
- TN742/TN746B or SN243B connected to 2296A-3 _____ (equipment location)
- TN742/TN746B or SN243B connected to 2296A-4 _____ (equipment location)

NOTE

On System 75, Generic 1, or Generic 3, lines (or stations) and trunks can reside on the same board for analog circuits. For digital circuits, lines and trunks should *not* reside on the same pack or the modem-pool setup may experience difficulty.

On System 85 or Generic 2, only modem-pooling trunks can be assigned to one analog or digital board (you cannot mix trunks and lines for modem-pooling circuits).

System 75, Generic 1, and Generic 3 Administration

Use the following steps to administer the switch for modem pooling:

1. Using `change system-parameters feature`, set *Off-Premises Tone Detect Timeout Interval* to 25 seconds.
2. Using `add modem-pool next` (for System 75 or Generic 1) or `add modem-pool xxxx` (for Generic 3, where xxxx is the next available number), set *Group Type* to **combined** and press ENTER. The screen will be filled in as shown in Figure 11-8, *System 75, Generic 1, and Generic 3 Modem Pool Assignments*.

   Make the entries as shown. Analog and digital assignments correspond to the equipment locations of the TN742 or TN746B and the TN754 circuits, respectively. When all entries are made, press ENTER.

```
                              MODEM POOL GROUP

Group Number: 1                                  Group Type: combined


Modem Name: audix                                Hold Time(min): 5
Speed: 9600                        Duplex: full     Synchronization: async

PORT PAIR ASSIGNMENTS

   Analog Digital     Analog Digital      Analog Digital      Analog Digital
1: A0801  A0201    9:                  17:                 25:
2: A0802  A0202   10:                  18:                 26:
3: A0803  A0211   11:                  19:                 27:
4: A0804  A0212   12:                  20:                 28:
5:                13:                  21:                 29:
6:                14:                  22:                 30:
7:                15:                  23:                 31:
8:                16:                  24:                 32:


add modem-pool next
```

Figure 11-8. System 75, Generic 1, and Generic 3 Modem Pool Assignments

System 85 Administration

Use the following steps to administer a System 85 for modem pooling using a MAAP:

1. Assign a bearer capability of mode 0 data to the class of service for the AUDIX networking extensions (Proc 010, Word 4, Field 3 = 4).

Wd	1	2	3	4	PROC
4			4		010

2. Procedure 100, Word 1 (for the digital side):
   a. Enter the trunk group number (tgroup1) in Field 1. A dial access code is *not* required (Fields 2 through 5).
   b. Set Trunk Type to 102 (Field 6 = 102).
   c. Set Dial Access Restriction to 0 (Field 7 = 0).
   d. Set CO Line Appearance to 0 (Field 8 = 0).

Wd	1	2	3	4	5	6	7	8	PROC
1	tgroup1					102	0	0	100

3. Procedure 100, Word 2 (for the digital side):
   a. Enter the trunk group number (tgroup1) in Field 1.
   b. Set the data rate for each speed optioned for the data modules in the modem pool in Fields 2 through 10.

> **NOTE**
>
> A data rate of 64 Kbps should always be translated for the modem pool in addition to the data rates optioned on the data module; this will ensure that a modem pool is selected when an incoming data call is directed to an AUDIX DCP port. If 64 Kbps is *not* translated, the modem-pool setup may not work, or may not recover after a failure.

   c. Set Synchronous to 0 for asynchronous operation (Field 11 = 0).
   d. Set Duplex to 0 for full duplex (Field 12 = 0).
   e. Set Modem Pool Mode - Originate to 1 (Field 13 = 1).
   f. Set Modem Pool Mode - Answer to 1 (Field 14 = 1).
   g. Set Modem Pool - Modem Type to 1 (Field 15 = 1).
   h. Set Modem Pool - Clock to 0 (Field 16 = 0).
   i. Set Modem Pool - First Choice to 1 (Field 17 = 1).
   j. Set Test Type to 0 (to turn off periodic on-line testing) or 1 (to allow periodic on-line testing) (Field 18). Currently only R2V3 systems should have Field 18 set to 1. On other systems, Field 18 should be 0.
   k. Set Host Access Clock to 0 (Field 19 = 0).

Wd	1	2-10	11	12	13	14	15	16	17	18	19	PROC
2	tgroup1	*	0	0	1	1	1	0	1	$	0	100

* = data rate (translate 64 Kbps in addition to optioned rates, usually 9600 bps)
$ = test type (see item j above)

4. Procedure 100, Word 1 (for the analog side):
   a. Enter the trunk group number (tgroup2) in Field 1. A dial access code is *not* required (Fields 2 through 5).
   b. Set Trunk Type to 101 (Field 6 = 101).
   c. Set Dial Access Restriction to 0 (Field 7 = 0).
   d. Set CO Line Appearance to 0 (Field 8 = 0).

Wd	1	2	3	4	5	6	7	8	PROC
1	tgroup2					101	0	0	100

5. Procedure 180, Word 1:
   a. Enter the digital trunk group number (tgroup1) in Field 1.
   b. Set Digital Equipment Location to one of the digital trunk circuits (Fields 3 through 7).
   c. Set Analog Trunk Group to the analog trunk group number (Field 8).
   d. Set Analog Equipment Location to the analog trunk circuit (Fields 9 through 13) paired with the digital trunk circuit of Fields 3 through 7.

Wd	1	2	3-7	8	9-13	PROC
1	tgroup1		digital circuit	tgroup2	analog circuit	180

Modem Pooling Testing

After assigning modem pooling on System 85 or Generic 2, test the modem-pooling facilities as follows:

1. Use Procedure 100, Word 2 to enable demand testing:

   On System 85: Set Field 18 to 1 (if it is displaying a 0).

   On Generic 2: Set Field 7 to 1 (if it is displaying a 0).

2. Use Procedure 646 to test the modem pool:
   a. Press (NEXT TEST) once (Field 1 = 2).
   b. In Field 2, enter a '0'.
   c. In Field 3, enter the digital or analog trunk group number.
   d. Press (NEXT CIRCUIT) until Fields 7 through 11 display the equipment location just added.
   e. Press (EXECUTE). (If the test passes, field 12 will equal '0'.)

3. Use Procedure 100, Word 2 to disable demand testing (if you changed Field 7 or 18 to 1 prior to testing):

   On System 85: Set Field 18 back to 0 (if it was previously displaying a 0).

   On Generic 2: Set Field 7 back to 0 (if it was previously displaying a 0).

4. Use Procedure 620 to test the analog facilities:

   Run Test 2 on the analog circuits (SN243B).

5. Use Procedure 622 to test the digital facilities:

   Run Test 2 on the digital circuits (SN270B or TN754).

Generic 2 Administration

The following Manager II translations need to be completed on Generic 2 to implement modem pooling.

NOTE

DEFINITY Manager III and Manager IV are covered in their own documentation sets. Refer to the list of documents in Chapter 9 to find the appropriate manual for administering systems using Manager III or Manager IV.

1. Using Procedure 100, Word 1, make the assignments shown in Fields 1 through 9 for the digital side of the modem pool. Refer to Figure 11-9, *Manager II Administration for Digital Side of Modem Pooling (Proc 100, Word 1).*

   The trunk group (130) and the dial access code/trunk ID code shown are only examples; enter the appropriate values supplied by the BCSDC.

```
                    ENHANCED MODE - PROCEDURE: 100, WORD: 1
                              TRUNK GROUP TRANSLATION

1. Trunk Group: 130

DIAL ACCESS CODE/TRUNK ID CODE
   2. Digit 1: 2
   3. Digit 2: 1
   4. Digit 3: 5
   5. Digit 4: -

 6. Trunk Type: 102 Digital data modem pool (18)
 7.      Dial Access Restriction: 0 Access is allowed using DAC
 8.  Personal CO Line Appearance: 0 Not used for CO line appearance
 9. Public Network Access/Egress: 0 Disabled

DISPLAY ONLY
10. Signaling Type: 18  S-channel signaling, host access GPP, host access EIA



Connected to CC0 ON-LINE ♥ | MAJOR | MINOR | RUN TAPE | BUSY OUT | IN USE | WAIT |

enter command: _
|        | 2 Repeat | 3 Form |        | 5 Help | 6 Field | 7 Input | 8 Cmds |
```

Figure 11-9. Manager II Administration for Digital Side of Modem Pooling (Proc 100, Word 1)

2. Using Procedure 100, Word 2, make the assignments shown in Fields 1 through 7. Assign a custom BCCOS to the trunk group (trunk group 130 and a custom BCCOS of 10 are shown only as examples). The custom BCCOS should mirror the default BCCOS 1 as shown in Figure 11-10, *Manager II Administration for Digital Side of Modem Pooling (Proc 100, Word 2).*

NOTE

Refer to the *DEFINITY Generic 2 Administration Procedures* manual (555-104-506) for the default values of BCCOS 1 if needed.

```
                        ENHANCED MODE - PROCEDURE: 100, WORD: 2
                        TRUNK GROUPS - MODEM POOLING AND BCCOS

1.                          Trunk Group: 130
2. Bearer Capability Class of Service: 10

MODEM POOLING
   3. Originate Mode: 1
   4.    Answer Mode: 1
   5.     Modem Type: 1
   6.   First Choice: 1

 7. Test Type: 0









Connected to CC0 ON-LINE ♥ | MAJOR | MINOR | RUN TAPE | BUSY OUT | IN USE | WAIT |
                           |
enter command: _
|        | 2 Repeat | 3 Form |        | 5 Help | 6 Field | 7 Input | 8 Cmds |
```

Figure 11-10. Manager II Administration for Digital Side of Modem Pooling (Proc 100, Word 2)

3. Using Procedure 014, assign a custom BCCOS that is translated with all the speeds optioned for the data modules in the modem pool. The custom BCCOS should mirror the default BCCOS 1 except for the data rates chosen (BCCOS 1 automatically defaults to *all* speeds.)

   In Figure 11-11, *Manager II Administration for Digital Side of Modem Pooling (Proc 014, Word 1)*, a custom BCCOS of 10 is shown as an example only.

```
                    ENHANCED MODE - PROCEDURE: 014, WORD: 1
              BEARER CAPABILITY CLASS OF SERVICE - CALL OPTIONS

1. Bearer Capability COS: 10          DEFAULT CAPABILITIES
2.        Transport Mode: 0   Circuit    14.    Transport Mode: 0  Circuit
3.      Information Type: 0   Restrict   15.  Information Type: 0  Restricted
                                         16. Bearer Capability: 2  Mode 2

CALL TYPES AND ACTION TAKEN
   4.            Voice: 0 Circuit switch the call
   5. Voice Grade Data: 1 Insert a mode 2-to-analog modem pool facility
   6.           Mode 0: 0 Circuit switch the call
   7.           Mode 1: 0 Circuit switch the call
   8.           Mode 2: 0 Circuit switch the call
   9.           Mode 3: 0 Circuit switch the call
  10.  Unknown Digital: 0 Circuit switch the call
  11.   Unknown Analog: 1 Insert a mode 2-to-analog modem pool facility
  12.         Mode 3/2: 0 Circuit switch the call
  13.             X.25: 0 Circuit switch the call


Connected to CC0 ON-LINE ♥ | MAJOR | MINOR | RUN TAPE | BUSY OUT | IN USE | WAIT |

enter command: _
|  |  | 3 Data |  | 5 Help | 6 Field | 7 Input | 8 Cmds |
```

Figure 11-11. Manager II Administration for Digital Side of Modem Pooling (Proc 014, Word 1)

4. Using Procedure 014, Word 2, select the data rates that will be used by the data modules in the modem pool. Figure 11-12, *Manager II Administration for Digital Side of Modem Pooling (Proc 014, Word 2)*, shows data rates of 64 Kbps and 9600 bps and a custom BCCOS of 10 (these values are shown as examples only).

NOTE

A data rate of 64 Kbps should always be translated for the modem pool in addition to the data rates optioned on the data module; this will ensure that a modem pool is selected when an incoming data call is directed to an AUDIX DCP port. If 64 Kbps is *not* translated, the modem-pool setup may not work, or may not recover after a failure.

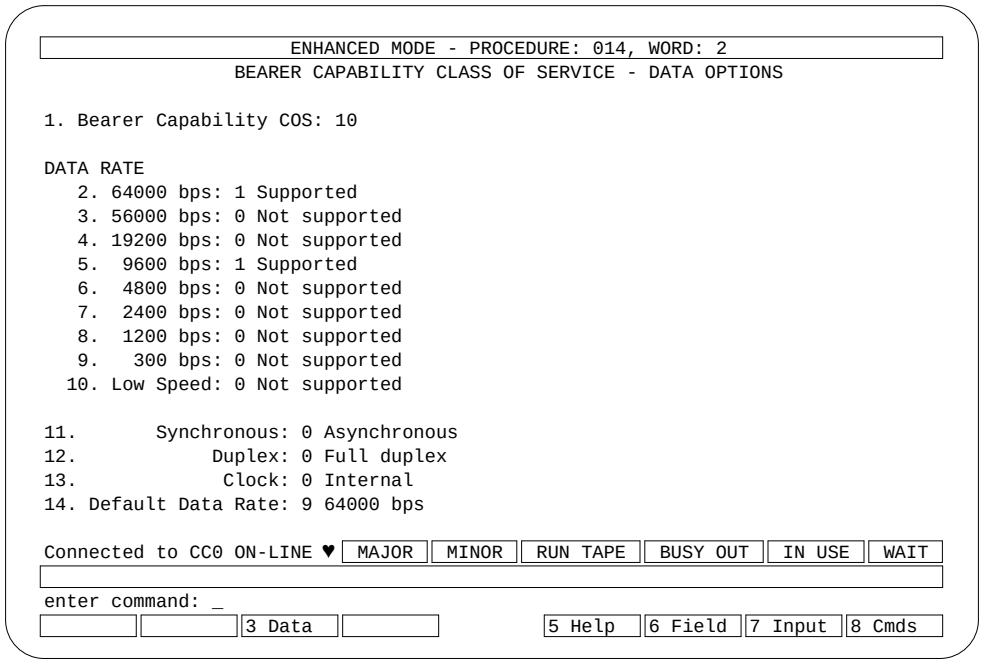


Figure 11-12. Manager II Administration for Digital Side of Modem Pooling (Proc 014, Word 2)

5. Using Procedure 100, Word 1, make the assignments shown in Fields 1 through 9 for the analog side of the modem pool. Refer to Figure 11-13, *Manager II Administration for Analog Side of Modem Pooling (Proc 100, Word 1).*

   The trunk group (131) and the dial access code/trunk ID code shown are only examples; enter the appropriate values supplied by the BCSDC.

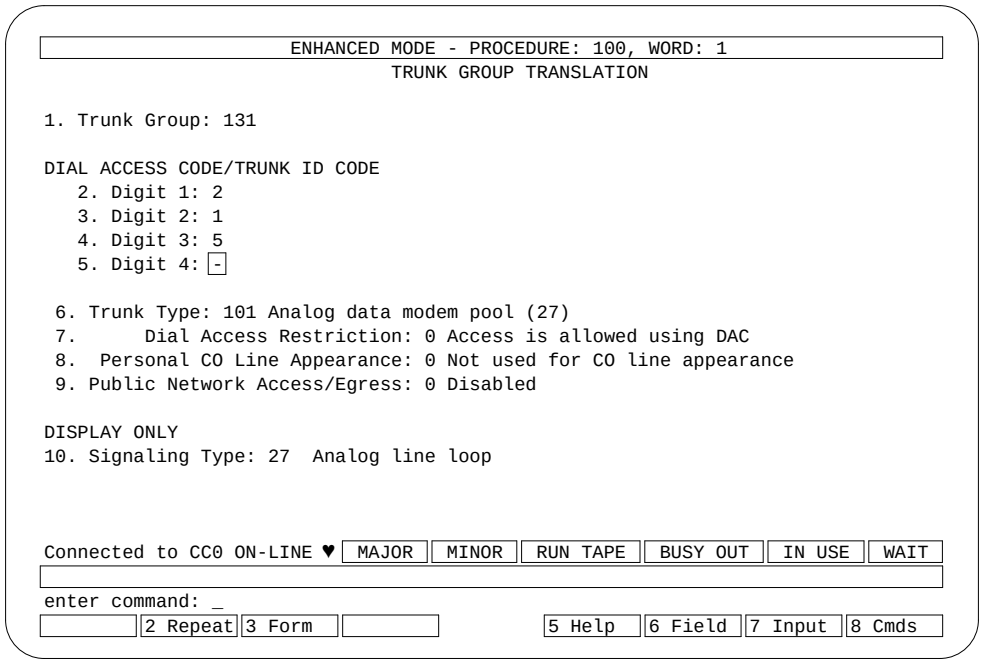


Figure 11-13. Manager II Administration for Analog Side of Modem Pooling (Proc 100, Word 1)

6. Using Procedure 100, Word 2, make the assignments shown in Fields 1 through 7. Assign BCCOS 5 to the trunk group (trunk group 131 is only an example). Refer to Figure 11-14, *Manager II Administration for Analog Side of Modem Pooling (Proc 100, Word 2).*

NOTE

BCCOS 5 is the default and should *not* be modified. However, if BCCOS 5 has been modified at your site, use a custom BCCOS that has the default values of BCCOS 5. Refer to the *DEFINITY Generic 2 Administration Procedures* manual (555-104-506) for default BCCOS values if needed.

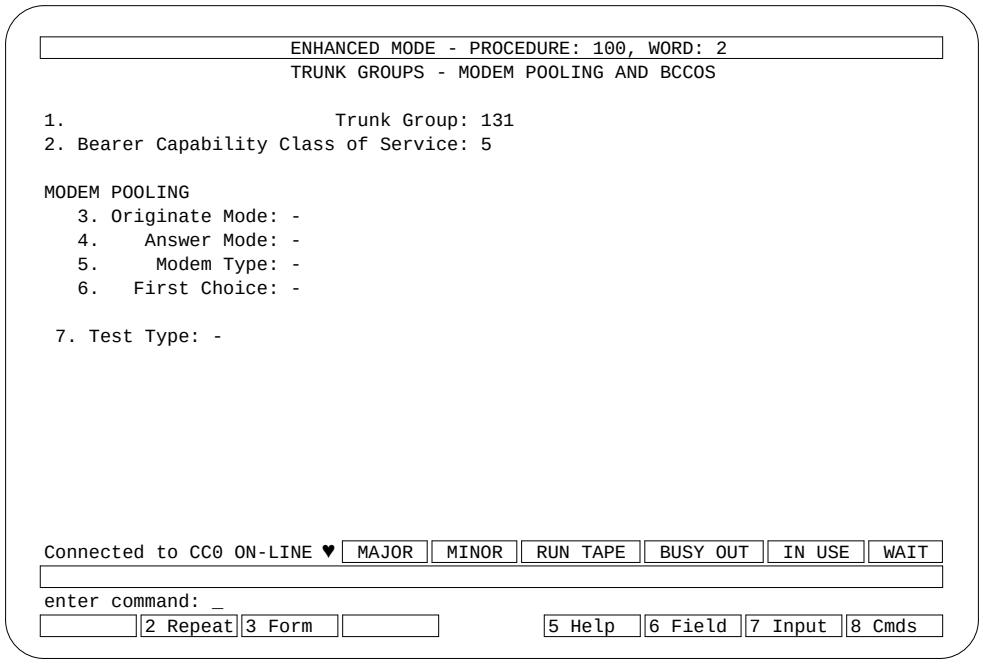


Figure 11-14. Manager II Administration for Analog Side of Modem Pooling (Proc 100, Word 2)

7. Use Procedure 180, Word 1 to pair up the digital trunk group with the analog trunk group.

   Use appropriate entries for this procedure. The trunk groups shown (130 and 131) are only examples.

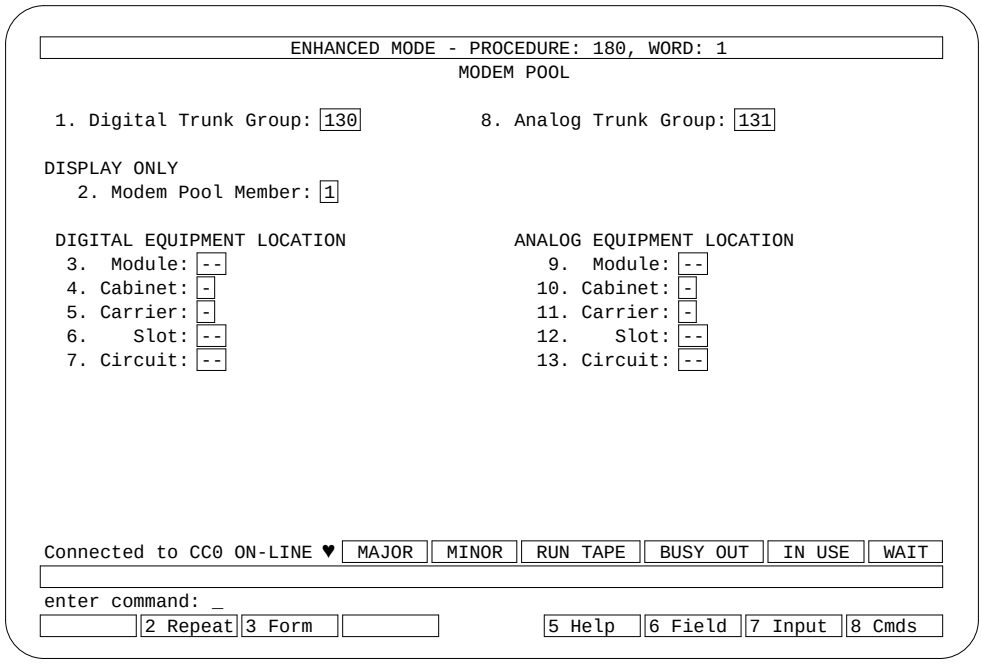


Figure 11-15. Manager II Administration for Modem Pool Pair (Proc 180, Word 1)

12. DCP Mode 3 Installation and Administration

Digital Communications Protocol (DCP) Mode 3 uses 64 Kbps, end-to-end, packet-mode operation for data transmission. It may be used in the following setups:

- *Local Networking:* If you are installing a DCP Mode 3 network for two or more colocated (*local*) AUDIX systems (the AUDIX systems are connected to the same switch), refer to Chapter 9, *DCP Cabling and Administration*. There you install and translate each AUDIX system with the extension numbers required for each network channel. There are no requirements except extension numbers for a local AUDIX network.
- *Remote Networking:* If you are installing a DCP Mode 3 network that requires interlocation facilities, these facilities are typically T1 Carrier employing common (clear) channel signaling or an Integrated Systems Digital Network (ISDN) pipe.

This chapter covers administration and testing for DCP Mode 3 AUDIX networking setups.

SWITCH COMPONENT INSTALLATION

See the appropriate switch and/or feature documentation for installing circuit packs and wiring trunks on the switch.

SWITCH ADMINISTRATION

See the appropriate switch and/or feature documentation for ISDN administration. For DS1 administration of either local or remote AUDIX networking setups, see the following sections.

System 75, Generic 1, and Generic 3 Administration

The DS1 circuit pack uses the Common Channel Signaling mode to provide 23 trunks for data transmission and one channel for signaling. The DS1 trunk group must be assigned for AV/D.

At this time, use standard AV/D DS1 administration. Any specific assignments that become necessary for AUDIX networking will be covered in future issues of this document.

System 85 Administration

The DS1 circuit pack uses the Common Channel Signaling mode to provide 23 trunks for data transmission and one channel for signaling. The DS1 trunk group must be assigned for AV/D using the following MAAP procedures.

1. *For local and remote AUDIX setups:* Assign a bearer capability of mode 0 data to the class of service for the AUDIX networking extensions (Proc 010, Word 4, Field 3 = 4).

Wd	1	2	3	4	PROC
4			4		010

2. Assign a trunk group and trunk type using Procedure 100, Word 1. Assign members to the trunk group using Procedure 116.
3. *For remote AUDIX setups only:* The trunk group used to transport the AUDIX networking call must be DS1, and the DS1 pipe must employ 24th channel signaling.
   a. Enter the trunk group number (tgroup) in Field 1.
   b. Make sure Touch Tone In and Touch Tone Out are set to 1 (Fields 6 and 7 = 1).
   c. AVD must be set to 1 (Field 17 = 1).

Wd	1	2	3	4	5	6	7	8	-	16	17	PROC
1	tgroup					1	1				1	101

4. *For remote networking configurations using AAR or ARS:* If the local AUDIX DCP extensions dial AAR or ARS to reach a remote AUDIX system, make sure the FRL assigned to the AUDIX networking extensions' cos is of a sufficient value to get over the pattern and preference to allow calls from mode 0 data endpoints (Proc 309, Word 5, Field 10 = 1, or Proc 321, Word 5, Field 9 = 1).

Generic 2 Administration

This section describes the Manager II translations that must be completed on Generic 2 to implement DCP Mode 3 networking on AUDIX systems.

NOTE

DEFINITY Manager III and Manager IV are covered in their own documentation sets. Refer to the list of documents in Chapter 9 to find the appropriate manual for administering systems using Manager III or Manager IV.

1. *For local and remote AUDIX setups:* You should have already assigned BCCOS 6 to the AUDIX DCP extensions in Chapter 9. Refer to Chapter 9 if necessary and check Figure 9-5, *Manager II Administration of a DCP Port (Proc 000, Word 3)*.
2. *For remote AUDIX setups only:* The trunk group used to transport the AUDIX networking call must be DS1, and the DS1 pipe must employ 24th channel signaling.

Using Procedure 100, Word 2, assign BCCOS 3 to the DS1 trunk group to provide 64K clear-channel signaling (trunk group 77 is only an example).

If BCCOS 3 has been modified at your site, use a custom BCCOS that has the default values of BCCOS 3. Refer to the *DEFINITY Generic 2 Administration Procedures* manual (555-104-506) for default BCCOS values if needed.

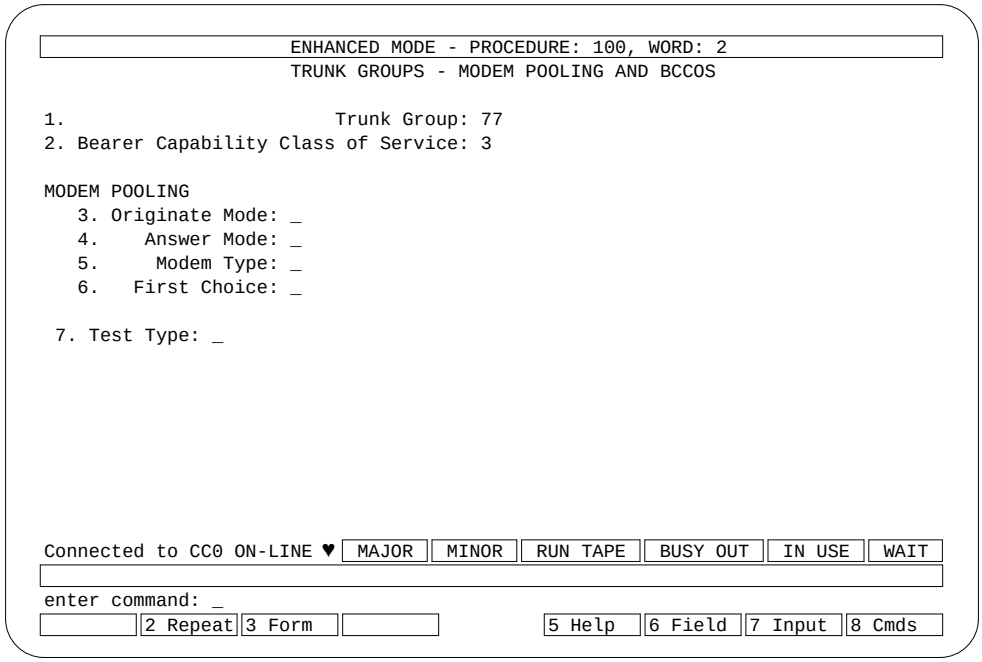


Figure 12-1. Manager II Mode 3 Administration (Proc 100, Word 2)

3. *For remote networking configurations using AAR or ARS:* If the local AUDIX DCP extension is dialing AAR or ARS to reach a remote AUDIX system, the appropriate pattern and preference must indicate BCCOS 3 (Proc 309, Word 5, Field 6 = 3, or Proc 321, Word 5, Field 5 = 3).

LOOPBACK TESTING FOR INTERLOCATED SYSTEMS

If the AUDIX systems to be networked are at different locations (interlocated) and a serving office (SO) will provide 64 Kbps service, you will need to test the connection between the local AUDIX system and the 64 Kbps serving office (SO), as shown in Figure 12-2, *64 Kbps Network Loop-Around Test*. If you have R1V7 software, you can do this via the `maintenance : network` form for the DCP ports (ports 1-4). If you have an MPDM/M1* connected to ports 5 and 6, they may also be tested for 64 Kbps operation using this form.

While a channel is in loopback mode, it will be unavailable to send information to remote systems or receive information from remote systems. Incoming calls will be answered, but the calling system will be unable to establish a connection; eventually it will drop the call and attempt to call back at its next scheduled transmission time.

Also, if you put a channel in loopback mode, any active calls will be dropped. It is therefore recommended before you perform this test you check the status of the channel. It is also not a good idea to perform this test during peak traffic times.

1. Go to the `maintenance : network` form. Set *select test* to **8** to test a 64 Kbps network connection. Press TAB to get to the *channel* field and then specify the channel (1-6) you want to use for the test. Press CHANGE or RUN and wait for the result.

   NOTE

   If you have an MPDM/M1* between the AUDIX system and the PBX, you may also test channels 5 or 6 (the RS-232 channels) for 64 Kbps operation.

2. Have the serving office place a call to the telephone number assigned to the channel you specified on the `maintenance : network` form. If the test is successful, any data the serving office sends over the AUDIX channel will be echoed back.
3. Go to the `maintenance : network` form. Set *select test* to **9** to take the channel out of loopback mode. Press TAB to get to the *channel* field and then specify the channel (1-6) you want to take out of loopback mode. Press CHANGE or RUN and wait for the result.

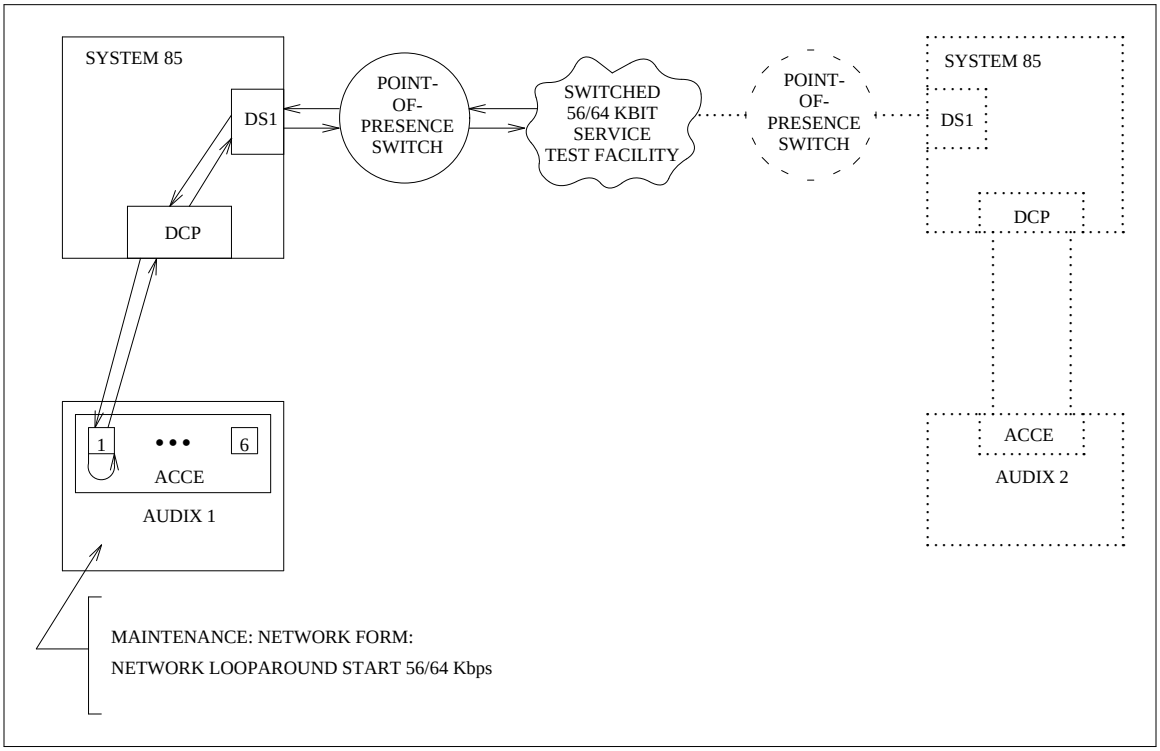


Figure 12-2. 64 Kbps Network Loop-Around Test

13. AUDIX System Administration

Before you can administer an AUDIX system for networking, the ACC or ACCE must be installed. If not done already, install the AUDIX Communications Controller (ACC or ACCE) circuit pack and make sure it is administered using the `maintenance : network` and the `system : translation : network port` form. form. Then use this chapter to administer the AUDIX system in association with one or more other AUDIX systems for networking.

NOTE

If the network includes R1V5 and/or R1V6 and/or R1V7 systems along with R1V3 and/or R1V4 systems, the Sending Restrictions feature on any R1V5 or later system must be turned off.

REMOTE UPDATES

Each AUDIX system in a network has its own data base with information on both local subscribers and remote subscribers. The system administrator may use the remote updates feature to make certain that every AUDIX data base has the same information for all subscribers across the network. When an AUDIX system sends remote update information for a subscriber to another system, it sends the voiced name, ASCII name, extension, and (for R1V5 and later systems) the community ID.

The remote updates will only be sent for subscribers whose extension numbers fall within the extension ranges administered on the `system : translation : machine : audix/amis/call delivery` form. For example, AUDIX A may be administered with an address range from 3000 to 3999. If AUDIX B's remote profile for AUDIX A only lists a subset of this range (such as extensions 3000 to 3100), AUDIX B will only request partial or complete updates for extensions 3000 to 3100 from AUDIX A.

Partial Updates

The AUDIX systems in the network can be administered so partial updates happen automatically. If all systems in the network are so administered, any time a subscriber profile is added, deleted, or modified from a system in the network, that system will automatically notify all other systems in the network of the change.

Complete Updates

The system administrator can also request a complete update from remote systems at any time using the `system : translation : remote updates` form. An update should be requested, for example, from every remote node in the network when a new network node is added. If the system administrator wants to request a complete update, they should do so outside of prime-time hours, so voice mail deliveries are not delayed. In addition, the local AUDIX system will automatically schedule a complete update from a remote system (to be executed during non-prime time hours) if it detects a discrepancy between its data base and that of a remote system.

NOTE

For R1V6 or later systems, remote updates have priority over voice mail and status messages that are to be sent over the network. For R1V5 and earlier systems, voice mail and status messages are higher priority than remote updates.

If the `updates in` field on the `system : translation : machine : audix/amis/call delivery` form for the local system is set to `y`, the local system will accept updated data base information from any remote AUDIX systems in the network for which the `updates out` field is set to `y`. Then, any time an administrator of a remote system adds, deletes, or modifies a subscriber profile, the remote system will notify the local system of the change. The local system can then update its own data base so the two systems have the same information about all subscribers.

If the `updates out` field on the `system : translation : machine : audix/amis/call delivery` form for the local system is set to `y`, the local system will send updated data base information to remote AUDIX systems in the network for which the `updates in` field is set to `y`. Then, any time the administrator of the local system adds, deletes, or modifies a subscriber profile, the local system will notify all remote systems of the change. The remote systems can then update their data bases so they agree with the local system.

Network Turnaround

On R1V7 systems, the system administrator has the option of allowing the network connection to be *turned around*. This option is activated using the `system : translation : machine : audix/amis/call delivery` form; it can be administered on a system-wide or per-machine basis.

- If network connection turnaround is implemented, the local machine will call a remote machine and do the following: notify the remote system that it has updated subscriber information, request updated subscriber information from the remote system, and send voice mail and updated message status information to the remote system. Then network connection will then be *turned around* and the remaining events will occur: the remote system will notify the local system that it has updated subscriber information, request updated subscriber information from the local system, and send voice mail and updated message status information to the local system.
- If the network turnaround feature is not implemented, the local machine will call a remote machine and do the following: notify the remote system of its updated subscriber information, request updated subscriber information from the remote system, and send voice mail and updated message status information to the remote system. The call will then be disconnected.

The network turnaround feature reduces system overhead time and long-distance charges by allowing all of these events to occur with a single call rather than two calls. If cost control from a central point is not critical, greater efficiency can be gained by implementing the network connection turnaround feature. The connection can only be turned around once during a single call.

If the system has an ACCE board installed, you can monitor the status of the network turnaround feature using the `activity` field on the `maintenance : network` form (see Chapter 14 for an illustration of this form).

SYSTEM PROFILES

To administer a network, the local machine, and each remote machine to which the local machine is connected, must have a profile administered on the local system. The `system : translation : machine : audix/amis/call delivery` form is much like the `subscriber : local` form, except that it is used to set up profiles for individual AUDIX systems rather than for individual subscribers. The profile for the system to which the administration terminal is connected should already be set up with some default values. These values may have to be changed now that the system will be part of a network. See *Setting Up the Local AUDIX System Profile* in this chapter. Once the local profile is set up, a remote profile must be set up for each remote system in the network. See *Setting Up a Remote AUDIX System Profile* in this chapter.

NOTE

The local system is always the system to which the terminal is connected. All others are considered remote systems regardless of where they are located.

SETTING UP THE LOCAL AUDIX SYSTEM PROFILE

Enter `sys trans ma au` on the path line. Press (RETURN). The screen should display a blank `system : translation : machine : audix/amis/call delivery` form. Press (ENTER). The form should be filled in with the values already assigned to the local system. See Figure 13-1, *Local AUDIX System Profile*.

The customer or the Account Team should provide you with a copy of the Administrator's Worksheet filled in with values to be entered on this form. If not, use the copy provided at the end of this chapter and fill in the values as you go. The following paragraphs provide guidelines for administering the local AUDIX system.

```
DCORP STATUS:  alarms: none,  logins: 1,  thresholds: none
PATH: system : translation : machine : audix/amis/call delivery
machine name: dcorp                local/remote (l/r)? l    password: setpace
extension length: 5      voice name (y/n)? _  voice id: 0  default community: __
network connection type: dcp    data rate: 64000  channel: _
dial string: 62000
address ranges (prefix      start   / end extension)              warnings
 1: ____________________    62001        /   63999
 2: ____________________    65000        /   65999
 3: ____________________    67000        /   67999
 4: ____________________    __________   /   __________
 5: ____________________    __________   /   __________
 6: ____________________    __________   /   __________
 7: ____________________    __________   /   __________
 8: ____________________    __________   /   __________
 9: ____________________    __________   /   __________
10: ____________________    __________   /   __________
message transmission schedule  (hh:mm)               updates (y/n)?  in _  out _
1. start: __:__   end:  __:__    interval:  __:__     network turnaround (y/n)? _
2. start: __:__   end:  __:__    interval:  __:__
3. start: __:__   end:  __:__    interval:  __:__     send to non-administered
new machine name: _______________                        recipients (y/n)? _

Error and confirmation information appears on this line.

| CHANGE OR RUN | ADD | DELETE |   | HELP | FIELD HELP |   | CLEAR FORM | EXIT | ENTER |
```

Figure 13-1. Local AUDIX System Profile

NOTE

Use TAB to move to the next field. Use SHIFT-TAB to move to the previous field.
Use BACKSPACE to move back one space in a field.
Use RETURN while in a field to move back to the beginning of a field.
Overwrite all unwanted characters with the spacebar or with DEL CHAR.
Use the screen-labeled HELP keys for form and field information.

Form Fields

- `machine name`

  If this field does not display the machine name desired, press SHIFT and TAB at the same time to go to *new machine name*. Enter the new name and press CHANGE or RUN. The new name will be displayed in this field. After you log off and log back on, this name will also be displayed in the upper left-hand corner of the AUDIX system screen.

  If you change the name of the local AUDIX system and it is running R1V5 or later software, reset the ACCE: access the `maintenance : network` form, enter a `5`, and press CHANGE or RUN. If you change the name of the local AUDIX system and it is running R1V3 or R1V4 software, restart the AUDIX system via the `startup` form.

- `local/remote`

  This display-only field should show `l`, for local system.

- `password`

  Enter 5 to 10 alphanumeric characters. This password does not have to be unique. Record it on paper so that it is not forgotten — you will need it when administering the other systems in the network. The password will not be displayed the next time you enter the form.

  If you change the password and the AUDIX system is running R1V3 or R1V4 software, run the network data audit. To run the audit, see the `maintenance : audits : fp` form. If the system is running R1V5 or later software, this step is not necessary.

  NOTE

  This machine password is not the same password as Initialization and Administration System (INADS). It is used only by remote AUDIX systems to access this local system.

- `extension length`

  This field should already be set to the correct length, the length of the switch extensions used by the local subscribers.

- `voice name`

  This field indicates the presence of a recorded machine name fragment; no assignment is required at this time. Instructions for recording names are given later in this chapter.

- `voice ID`

  This is a display-only field showing the identifier associated with this machine's name fragment. The identifier is used when recording the fragment. The local AUDIX voice ID is always **0**.

- `default community`

  The default community of AUDIX system subscribers for this machine. A community contains those subscribers who are able to send voice mail messages as permitted on the `system : sending restriction` form. This value can be overridden for individual subscribers on the `subscriber : local` form.

  Using this field and the `system : sending restriction` form, you can permit subscribers to send, or prevent them from receiving, digital networking messages on a community-of-interest basis. See the *AUDIX Feature Descriptions* for details about the sending restrictions feature.

- `network connection type`

  This field is only used when this system calls itself for testing purposes.

  This is the type of connection the AUDIX system will attempt to set up for the test call.

  — Enter `dcp` if the system has only Digital Communications Protocol (DCP) connections to the switch.

  — Enter `rs232a` if the system has only switched RS-232 connections to the switch. Check the option settings on the modems or data sets for synchronous or asynchronous to be sure. If they are set for synchronous, enter `rs232s`.

  — If the system has DCP and RS-232 connections, enter `dcp` for now.

- `data rate`

  This field is only used when this system calls itself for testing purposes.

This is the data rate the AUDIX system will try to use for the test call. The rate entered depends on the extent of the test (that is, the facilities involved in the loop). The first test will likely be a call to the switch and back to the AUDIX system. Or in the case of a direct RS-232 connection, a call out on one RS-232 channel and back in on the other.

— Enter `56000` or `64000` if the system has only DCP connections to the switch.

— Enter `64000` if the system has only direct connections to other systems.

— Enter `19200` if modems are used for switched RS-232 and the modems are set in Microcom Networking Protocol (MNP) mode (variable rate).

— Enter `9600` if modems are used for modem pooling or for switched RS-232 at a fixed rate of 9600 bps.

— Enter `19200` (asynchronous) if 7400A or 7400B data modules are used for switched RS-232 converted to DCP mode 2.

- `channel`

  This field is only used when this system calls itself for testing purposes.

  This field is used to specify an RS-232 channel (5 or 6) to be used to originate the test call. Whenever both RS-232 channels are connected in the same manner (both dedicated or both switched), this field can be left blank. If blank, the AUDIX system will choose one automatically.

- `dial string`

  This field is only used when this system calls itself for testing purposes.

  On R1V3 and R1V4 systems, zero (0) to 30 characters can be entered. On R1V5 or later systems, zero (0) to 65 characters can be entered. Permissible characters depend on the type of switch and/or modem through which the AUDIX system is dialing.

  The following are a few examples of dial strings:

  — 6000 — where the local system uses a DCP channel to call itself. The 6000 is an extension number assigned to one of the local system network channels (RS-232 or DCP) or to a hunt group of channels.

  — 9+2346000 — where the local system uses a DCP channel to call itself by going through the central office switch. The 234 is the office code assigned to the local switch, and 6000 is the same as the previous example. The ‘‘9’’ is the central office (CO) access code at the local switch. The ‘‘+’’ is a pause for dial tone.

  — 8+7896000 — where the local system uses a DCP channel to call itself by going through the private network switch. The ‘‘8’’ is the private network access code at the local switch. The 789 is the private network code for the local switch.

  — ATDT 6000 — where the local system uses an RS-232 channel and modem to call itself on the other RS-232 channel. The attention code (ATDT) is required by the modem (Hayes dialing). The 6000 is the extension of the other RS-232 channel on this system.

  — ATDT 9,2346000 — where the local system uses an RS-232 channel and modem to call itself on the other RS-232 channel. the same local dialing area. The ‘‘,’’ is a pause for a certain number of seconds. This number is defined in the modem manual.

  — *23 — where the local system uses a DCP channel to call itself through a MERLIN II that is acting as the DCP interface for a non-DCP switch. This string is used to dial a network channel of the local system (port 23).

— (blank) — where the local system uses a dedicated RS-232 channel to call itself. If another type of system is called, a dial string may be required.

The type of channel used for calling out of the AUDIX system is determined by the connection type assigned earlier. The loop used to get the call back to the AUDIX system and the type of channel used once the call gets there is determined by the dial string. See Chapter 14 for details on testing the network.

The following characters, valid only in R1V5 or later systems when a TN539 or TN539B is present, have special meaning within an AUDIX system dial string. They must be enclosed within double quotation marks, for example, "x". These characters are not passed on to the switch, modem, or endpoint in a network call. They are interpreted by the TN539 or TN539B ACCE. Special characters are described below:

— "W" indicates that multiple-stage dialing is to be used and that AUDIX system should wait for another dial prompt (dial tone or equivalent message) before sending the subsequent digits or characters.

— "B" in the dial string will be replaced with a BREAK character by the AUDIX system. This allows the AUDIX system, for example, to send a BREAK to a modem.

— "CR" in a dial string will be replaced by the AUDIX system with a carriage return character.

— "LF" in a dial string will be replaced with a line feed character.

- `address ranges/warnings`

The *prefix* is not used on the profile of the local AUDIX system.

The *start/ end extension* defines a block of switch extensions that can be used at the AUDIX system when assigning subscribers. Up to ten different ranges can be specified to pinpoint the exact set of extension blocks used **by the local system**. The length of the start and end extensions must agree with *extension length*. Leading zeros may be required to conform to this requirement. The end extension must be equal to or greater than the start extension.

The **warnings** field will indicate when a duplication or overlap of another range is being assigned. The `system : translation : address` form shows extension numbers in use.

— **Duplicate Range** (or full overlap) means that the range defined is also defined for another machine profile. In R1V3 and R1V4, up to eight duplicates may be defined. In R1V5 or later software, up to sixteen can be defined.

As an example, say that two colocated systems serve a scattering of different extensions between 2000 and 6999. Instead of trying to pin-point blocks of extensions, which may be impossible anyway, you can define the address range for both systems as *start:* 2000, *end:* 6999. A location across the country might use the same extensions as the local location. The address range(s) for the system serving that location might also require duplicate ranges.

— **Overlaps** means that the range defined is a subset of another range or is overlapping another range:

- You would be assigning a subset if you tried to assign 2000-3999 when 2000-5999 already exists. The new range would be disallowed. Instead, assign a duplicate of the existing range.

- You would be assigning an overlap if you tried to assign 5000-6999 when 2000-5999 already exists. The new range would be disallowed. Instead, assign two new ranges (2000-5999 and 6000-6999).

- `message transmission schedule`

  These fields are used for remote machine profiles only.

- `updates (y/n)? in _  out _`

  For now, leave these fields set to **n** since this will simplify testing. After testing is complete, set these fields to **y** if you want to activate the remote updates feature.

  On the local AUDIX system, if the `updates in` field on the `system : translation : machine : audix/amis/call delivery` form for the remote system is set to `y`, the local system will accept updated data base information from that remote AUDIX system.

  On the local AUDIX system, if the `updates out` field on the `system : translation : machine : audix/amis/call delivery` form for the remote system is set to `y`, the local system will send updated data base information to that remote AUDIX system.

  The Remote Updates feature of AUDIX Networking must be active (see the `system : translation : remote updates` form).

  If these fields are left **n** after testing, this system will not notify other systems of changes to its data base nor will it accept updated information from other systems in the network (neither partial nor complete updates will be permitted).

- `network turnaround (y/n)?`

  Network turnaround can be administered on a system-wide or per-machine basis. To disable this feature system wide, set this field to **n** on the local machine profile. To enable the feature, set this field to **y** on the local machine profile *and* on the appropriate remote machine profile(s).

  If the network connection turnaround feature is implemented, the local machine will call a remote machine and the following sequence of events will occur:

  1. The local system will notify the remote system that it has updated subscriber information to send.
  2. The local system will request updated subscriber information from the remote system (if the remote system previously notified the local system that it had updates to send). The remote system will then send its updated subscriber information to the local system.
  3. The local system will send voice mail to the remote system.
  4. The local system will send updated message status information to the remote system.
  5. The network connection will then be *turned around* and the remaining events will occur:
  6. The remote system will notify the local system that it has updated subscriber information to send.

7. The remote system will request updated subscriber information from the local system (if the local system previously notified the remote system that it had updates to send). The local system will then send its updated subscriber information to the remote system.
8. The remote system will send voice mail to the local system.
9. The remote system will send updated message status information to the local system.

Set this field to **n** if you do not want to implement network turnaround. In this case, only steps 1 through 4 will occur.

NOTE

If systems in the network are not all R1V7 and the network turnaround feature is enabled, calls may be dropped after steps 1 through 4 have been completed.

- `send to non-administered recipients (y/n)?`

  The default value is `y`. If this field is **y**, when a subscriber addresses a message to a remote extension that does not map to a remote subscriber known by the local AUDIX system, the local AUDIX system will add this potential subscriber to its data base and then send the message to every remote system in the network for which the subscriber address is valid.

  The AUDIX system does this in case a new subscriber has been added somewhere in the network and this remote system has not been made aware of it either through administrator communication or through remote updates. If the subscriber is found on a remote AUDIX machine, the local AUDIX system will deliver this message to the valid remote machine(s) and validate this new subscriber. If a valid remote subscriber cannot be found, the subscriber record will be deleted eventually by one of the system audits and the AUDIX system will change the status of the message from ‘‘undelivered’’ to ‘‘undeliverable’’ in the message sender’s voice mailbox.

  NOTE

  Any address should not map to more than one valid subscriber in the network. However, the AUDIX software does not enforce this, so it is possible for a message to be sent to more than one subscriber if an address is duplicated.

  If this field is **n**, when a subscriber addresses a message to a remote extension or name that does not map to a remote subscriber known by the local AUDIX system, the local AUDIX system will *not* send the message. The subscriber who is attempting to address the message will be notified that the extension is invalid.

  If the network administrators keep open lines of communication (or there is just one administrator for the entire network), chances are good that each system will be kept up-to-date. Therefore, the customer would want an `n` entered here so the local AUDIX system is not burdened with finding a subscriber that probably does not exist in the first place. (What usually has happened is that a user has misdialed.)

NOTE

Permitting subscribers to send messages to non-administered recipients may have a significant impact on the network. It may cause unnecessary calls to other systems and load up the local subscriber data base with unneeded records.

Saving Local System Data

When you have finished entering data in the fields, press CHANGE or RUN. If the system is running R1V5 or later software, any changes or additions to this form are put to use immediately. R1V3 and R1V4 require that the network data audit be run. To run the audit, see the `maintenance : audits : fp` form.

SETTING UP A REMOTE AUDIX SYSTEM PROFILE

Log in to the local AUDIX system using the display terminal and enter `sys trans ma au` on the path line. Press RETURN. A blank machine profile will be displayed. See Figure 13-2, *Remote AUDIX System Profile*, for a sample of what you will be entering. The customer or the Account Team should provide you with a copy of the Administrator's Worksheet filled in with values to be entered on this form. If not, use the copy provided at the end of this chapter and fill in the values as you go. The following paragraphs provide guidelines for administering remote AUDIX systems.

```
TROOP STATUS:  alarms: none,  logins: 1,  thresholds: none
PATH: system : translation : machine : audix/amis/call delivery
machine name: troop              local/remote (l/r)? r  password: ftroop
extension length: 4      voice name (y/n)? n  voice id: 1  default community: __
network connection type: dcp     data rate: 4800   channel: _
dial string: 9+6152890000
address ranges (prefix      start   / end extension)             warnings
 1: ____________________   0001          /   3999
 2: 615289______________   0001          /   3999
 3: IND_________________   0001          /   3999
 4: ____________________   __________   /   __________
 5: ____________________   __________   /   __________
 6: ____________________   __________   /   __________
 7: ____________________   __________   /   __________
 8: ____________________   __________   /   __________
 9: ____________________   __________   /   __________
10: ____________________   __________   /   __________
message transmission schedule  (hh:mm)              updates (y/n)?  in _  out _
1. start: 07:00   end:  17:00    interval:  01:00     network turnaround (y/n)? _
2. start: __:__   end:  __:__    interval:  __:__
3. start: __:__   end:  __:__    interval:  __:__     send to non-administered
new machine name: _______________                        recipients (y/n)? _
Error and confirmation information appears on this line.
| CHANGE OR RUN | ADD | DELETE |   | HELP | FIELD HELP |   | CLEAR FORM | EXIT | ENTER |
```

Figure 13-2. Remote AUDIX System Profile

Form Fields

- `machine name`

  Enter the name of the remote system. Press (ENTER) to make sure this name is not already assigned. At the bottom of the form you should see ‘‘doesn’t exist’’.

- `local/remote`

  This is a display-only field. It will display `r` once the remote system is administered on the local system.

- `password`

  Enter 5 to 10 alphanumeric characters. This password does not have to be unique. Record it on paper so that it will not be forgotten. You will need it when administering the other systems in the network. It will not be displayed the next time you enter this form.

  NOTE

  This is not the INADS login password. This password is used only by the local AUDIX system to access this particular remote AUDIX system.

- `extension length`

  Enter the length of the extensions used for this remote system.

- `voice name`

  This field indicates the presence of a recorded machine name fragment; no assignment is required at this time. Instructions for recording names are given later in this chapter.

- `voice ID`

  This is a display-only field showing the identifier associated with this machine’s name fragment. The identifier is used when recording the fragment. The remote AUDIX system voice ID is between 1 and 100.

- `default community`

  The default community of AUDIX system subscribers for this machine. A community contains those subscribers who are able to send voice mail messages as permitted on the `system : sending restriction` form. This value can be overridden for individual subscribers on the `subscriber : remote` form.

  Using this field and the `system : sending restriction` form, you can permit subscribers to send, or prevent them from receiving, digital networking messages on a community-of-interest basis. See the *AUDIX Feature Descriptions* for more information about the sending restrictions feature.

- `network connection type`

  This field is used when the local AUDIX system attempts to call this remote AUDIX system for the purpose of transmitting messages and updates.

  This is the type of connection the AUDIX system will attempt to set up for the connection to the remote AUDIX system.

  — Enter `dcp` if this remote system is accessed using normal DCP channels (that is, AUDIX channels 1-4).

  — Enter `rs232a` if this remote system is accessed using the RS-232 modems or data modules (unless these channels use synchronous modem pooling somewhere in the link; then use `rs232s`).

  — Enter `rs232s` if this remote system is accessed using direct RS-232 cabling.

- `data rate`

  This field is used when the local AUDIX system attempts to call this remote AUDIX system for the purpose of transmitting messages and updates.

  This is the data rate the AUDIX system will try to use for the call. The rate depends on the facilities involved in the call:

  — Enter `64000` if the remote system is colocated at the same switch as the local system.

  — Enter `64000` if the switch's Data Service 1 (DS1) interface to a T1 Carrier is used to call the remote system.

  — Enter `56000` if a 56 Kbps network is used.

  — Enter `64000` if direct RS-232 cabling is used to a colocated system.

  — Enter `19200` if modems (MNP mode) are used for switched RS-232.

  — Enter `9600` if modems (fixed rate) are used for switched RS-232.

  — Enter `19200` (asynchronous) if 7400A or 7400B data modules are used for RS-232 converted to switched DCP mode 2.

  — Enter `9600` if modems are used for DCP mode 2 (modem pooling).

- `channel`

  This field identifies which RS-232 channel is used when the local AUDIX system attempts to call this remote AUDIX system for the purpose of transmitting messages and updates.

  If one of the RS-232 channels is connected to this remote system, enter the number (5 or 6) of the channel here. If both RS-232 channels are connected to this remote system, leave this field blank.

- `dial string`

  This field is used when the local AUDIX system attempts to call this remote AUDIX system for the purpose of transmitting messages and updates. It will also be used whenever a connection test to this remote system is performed from the local system.

  On R1V3 and R1V4 systems, zero (0) to 30 characters can be entered. On R1V5 or later systems, zero (0) to 65 characters can be entered. Permissible characters depend on the type of switch and/or modem through which the AUDIX system is dialing.

  The following are examples:

— 6000 — where the local system uses a DCP channel to call itself. The 6000 is an extension number assigned to one of the remote system network channels (RS-232 or DCP) or to a hunt group of channels.

— 9+2346000 — where the local system uses a DCP channel to call a remote system located at a remote switch, but in the same local dialing area. The 234 is the office code assigned to the remote switch, and 6000 is the same as the previous example. The ‘‘9’’ is the central office (CO) access code at the local switch. The ‘‘+’’ is a pause for dial tone.

— 8+7896000 — where the local system uses a DCP channel to call a remote system located at a different network node. The ‘‘8’’ is the network access code at the local switch. The 789 is the network access code for the remote switch.

— <*number*>,,,,, — where the five commas following the number the local system dials to reach the remote system are used to cause the system to pause (each comma causes a 2-second pause). Pauses are needed for correct operation in certain modems such as the Telebit T1000, which requires a 10-second pause after dialing before starting its internal timers.

— ATDT 6000 — where the local system uses an RS-232 channel and modem to call a colocated system. The attention code (ATDT) is required by the modem (Hayes dialing). The 6000 is the same as the previous examples.

— ATDT 9,2346000 — where the local system uses an RS-232 channel and modem to call a remote system located at a remote switch but in the same local dialing area. The ‘‘,’’ is a pause for a certain number of seconds. This number is defined in the modem manual.

— *23 — where the local system uses a DCP channel to call a MERLIN II acting as the DCP interface for a non-DCP switch. This string is used to dial a remote system that is colocated at the MERLIN II (port 23).

— (blank) — where the local system uses a dedicated RS-232 channel to access a colocated remote AUDIX system. If another type of system is called, a dial string may be required.

The type of channel used for calling out of the AUDIX system is determined by the connection type assigned earlier. The loop used to get the call back to the AUDIX system and the type of channel used once the call gets there is determined by the dial string. See Chapter 14 for details on testing the network.

The following characters, valid only on R1V5 or later systems when a TN539 or TN539B is present, have special meaning within an AUDIX system dial string. They must be enclosed within double quotation marks, for example, "x". These characters are not passed on to the switch, modem, or endpoint in a network call. They are interpreted by the TN539 or TN539B ACCE. Special characters are described below:

— "W" indicates that multiple-stage dialing is to be used and that AUDIX system should wait for another dial prompt (dial tone or equivalent message) before sending the subsequent digits or characters.

— "B" in the dial string will be replaced with a BREAK character by the AUDIX system. This allows the AUDIX system, for example, to send a BREAK to a modem.

— "CR" in a dial string will be replaced by the AUDIX system with a carriage return character.

— "LF" in a dial string will be replaced with a line feed character.

NOTE

When finished entering the dial string, press ADD. This will create and save the remote machine profile. Continue administering the following fields.

- `address ranges/warnings`

  See the previous section (*Setting Up the Local AUDIX System Profile*) and the following for appropriate entries:

  — Assign a different range for each method that will be used to address messages to subscribers. Back in Figure 13-2, *Remote AUDIX System Profile*, the following three ranges are assigned to identify subscribers at a remote AUDIX system:

    - The first range does not use a prefix. The prefix is only required when one or more of the remote subscribers share the same extension numbers as the local subscribers. The AUDIX system uses the prefix to distinguish between local and remote subscribers in this case.
    - The second range uses the public network access code as the prefix. When addressing a message to a remote subscriber, the local subscriber enters the remote subscriber's number as if they were placing a call to that subscriber. This may be the easiest method in some instances.
    - The third range uses a location code as the prefix. This method simplifies addressing messages by requiring only an alphanumeric code in front of the extension number. Location codes, besides being shorter in length, are often more friendly to the user.

  — The prefix is used only by the AUDIX system to identify subscribers. It is not used for dialing out, so it does not need to match an area/office code. It consists of 0 to 27 alphanumeric characters. Added with the extension, up to 32 characters can be assigned to a range.

- `message transmission schedule`

  These fields are used to specify when the local AUDIX system will call this remote AUDIX system. Three cycles can be defined in each remote AUDIX system profile. Enter in military time (hh:mm), a start time, an end time, and an interval. Cycles may be assigned to minimize toll charges that might be incurred in transmitting messages to this remote system.

  The interval specifies the frequency of connections during the cycle. The total time of the cycles cannot exceed 24 hours. Cycles cannot overlap. A cycle can span across midnight. The default is one cycle from 00:00 to 23:59 at 1 hour (01:00) intervals. One hour intervals are fine during the installation of the network. After the network is completely set up, reset the interval to the interval furnished on the Engineering Worksheet (typically 5 minutes).

  If the transmission queue reaches a threshold of 150 messages, the local system will attempt a call to this remote system every minute (regardless of the administered interval) during the administered transmission times.

- `updates in/updates out`

  For now, leave these fields set to **n** since this will simplify testing. After testing is complete, set these fields to **y** if you want to activate the remote updates feature.

On the remote AUDIX system, if the `updates in` field on the `system : translation : machine : audix/amis/call delivery` form is set to `y`, it will accept updated data base information from the local AUDIX system (provided the local system's `updates out` field is set to `y`).

On the remote AUDIX system, if the `updates out` field on the `system : translation : machine : audix/amis/call delivery` form is set to `y`, it will send updated data base information to the local AUDIX system (provided the local system's `updates in` field is set to `y`).

The Remote Updates feature of AUDIX Networking must be active (see the `system : translation : remote updates` form).

If these fields are left **n** after testing, this remote system will not notify this local system of changes to its data base nor will this local system send update information to this particular remote system. (neither partial nor complete updates will be permitted).

NOTE

If the customer wants to use remote updates, make sure that on the `system : appearance` form the *prime time* field is not set for 24 hours. If prime-time is 24 hours, automatic, complete remote updates cannot run since they are scheduled to run in non-prime hours; remote updates would only run on demand.

- `network turnaround (y/n)?`

  Set this field to **y** to implement network turnaround. (This field must also be set to **y** on the local machine profile for network connection turnaround to work).

  If network connection turnaround is implemented, the local machine will call this remote machine and the following sequence of events will occur:

  1. The local system will notify this remote system that it has updated subscriber information to send.
  2. The local system will request updated subscriber information from this remote system (if this remote system previously notified the local system that it had updates to send). This remote system will then send its updated subscriber information to the local system.
  3. The local system will send voice mail to this remote system.
  4. The local system will send updated message status information to this remote system.
  5. The network connection will then be *turned around* and the remaining events will occur:
  6. The remote system will notify the local system that it has updated subscriber information to send.
  7. The remote system will request updated subscriber information from the local system (if the local system previously notified the remote system that it had updates to send). The local system will then send its updated subscriber information to the remote system.
  8. This remote system will send voice mail to the local system.
  9. This remote system will send updated message status information to the local system.

  Set this field to **n** if you do not want to implement network connection turnaround for this specific remote machine. In this case, only steps 1 through 4 will occur.

NOTE

If systems in the network are not all R1V7 and the network turnaround feature is enabled, calls may be dropped after steps 1 through 4 have been completed.

- `send to non-administered recipients (y/n)?`

  The default value is `y`. If this field is **y**, when a subscriber addresses a message to a remote extension that does not map to a remote subscriber known by the local AUDIX system, the local AUDIX system will add this potential subscriber to its data base and then send the message to every remote system in the network for which the subscriber address is valid.

  The AUDIX system does this in case a new subscriber has been added somewhere in the network and this remote system has not been made aware of it either through administrator communication or through remote updates. If the subscriber is found on a remote AUDIX machine, the local AUDIX system will deliver this message to the valid remote machine(s) and validate this new subscriber. If a valid remote subscriber cannot be found, the subscriber record will be deleted eventually by one of the system audits and the AUDIX system will change the status of the message from ‘‘undelivered’’ to ‘‘undeliverable’’ in the message sender’s voice mailbox.

  NOTE

  Any address should not map to more than one valid subscriber in the network. However, the AUDIX software does not enforce this, so it is possible for a message to be sent to more than one subscriber if an address is duplicated.

  If this field is **n**, when a subscriber addresses a message to a remote extension or name that does not map to a remote subscriber known by the local AUDIX system, the local AUDIX system will *not* send the message. The subscriber who is attempting to address the message will be notified that the extension is invalid.

  If the network administrators keep open lines of communication (or there is just one administrator for the entire network), chances are good that each system will be kept up-to-date. Therefore, the customer would want an `n` entered here so the local AUDIX system is not burdened with finding a subscriber that probably does not exist in the first place. (What usually has happened is that a user has misdialed.)

NOTE

Permitting subscribers to send messages to non-administered recipients may have a significant impact on the network. It may cause unnecessary calls to other systems and load up the local subscriber data base with unneeded records.

Saving Remote System Data

When you are finished entering the data, press (CHANGE or RUN). Any changes or additions to this form are put to use immediately unless the system is running R1V3 or R1V4 software; in this case, run a network data audit (see the `maintenance : audits : fp` form).

Exit the form and re-enter it to verify that the changes were accepted. Notice that the password is no longer displayed.

RECORDING AUDIX MACHINE NAMES

Voiced-in machine names can be used to identify subscribers' local machines. When a subscriber sends a message to another subscriber, the message header will indicate from which AUDIX system the message was sent, and thus, how to return the call.

A name should be recorded for each AUDIX system in the network. Only the AUDIX administrator can perform this function (the subscriber assigned with announcement control). The AUDIX administration or maintenance terminal is required. Complete the following steps:

1. At the administration or maintenance terminal, go to the `list : machine` form, and press ENTER. Note the voice ID number for the current system. Make a list of /ID numbers for all systems for which you are recording a name. The voice ID shown for a given system must be entered during the assignment of that system's voiced name.
2. From a voice terminal, dial the AUDIX system extension. The AUDIX system will respond with:

   Welcome to AUDIX. Please enter your extension and pound sign.
3. Enter the AUDIX administrator's extension and press #. The AUDIX system will respond with:

   Enter your password and pound sign.
4. Enter the administrator's password and press #. The AUDIX system will respond with:

   To create a message, press 1. To get .....
5. Even though ''9'' is not a voiced option, press 9. The AUDIX system will respond with:

   To record names.....
6. Press 6. The AUDIX system will respond with:

   Enter machine voice ID and pound sign.
7. The local AUDIX system's ID is always 0. For a remote AUDIX system, get the ID from the list created in step 1. Enter the ID and press #. The AUDIX system will respond with:

   After recording, press 1. Record at the tone.
8. Speak the machine name and press 1. You are then given a chance to replay, delete, and rerecord the name. You might want to record the system's dialing prefix along with the name. This will give subscribers additional feedback.

   When finished recording press * and #. The AUDIX system will respond with:

   To record another machine name, enter machine voice ID.....

   Repeat the sequence until a name has been recorded for each machine.
9. If you want to verify that the name has been recorded successfully, go to the `system : translation : machine : audix/amis/call delivery` form and display the profile for each system. The *voice name* field should now be set to `y`. If you want to remove the machine name, set this field to `n`.

ADMINISTERING PORTS

The `system : translation: network port` form only affects the local system. It is used to administer the RS-232 channels. It is also used to activate the DCP channels and to indicate the data rate that will be used when a DCP mode 2 call is received. Each DCP channel has its own rate. The default, 9600 bps, is typically used. The RS-232 channels cannot be equipped, but may be cabled up, if the system is equipped with a TN366 or TN366B. The system must have the TN539 or TN539B to equip and use the RS-232 channels.

Log in to an AUDIX administration or maintenance terminal and type `sys tra net` on the path line. Press RETURN. A `system : translation : network port` form will be displayed showing the factory default settings. The *port type* field shows that channel 5 and channel 6 of the TN539 or TN539B are the RS-232 channels.

```
AUDIX STATUS: alarms:     , logins: 1, thresholds: none
PATH: system : translation : network port
(PRESS ENTER TO DISPLAY CURRENT MODEM INITIALIZATION STATUS)

                         channel 5    channel 6
port type:                 rs232        rs232
equipped (y/n):              _            _
synch/asynch (s/a):          _            _
data rate (1):             _____        _____
data rate (2):             _____        _____
data rate (3):             _____        _____
switched/dedicated (s/d):    _            _

modem initialization strings:
  channel 5: ____________________________________________________________
  channel 6: ____________________________________________________________
modem initialization status:
  channel 5: _____________________________   channel 6: _____________________________

DCP ports – data rate for incoming Mode 2 calls or 0 if channel is not used
  channel 1: _____  channel 2: _____  channel 3: _____  channel 4: _____


Error and confirmation information appears on this line.
 CHANGE   ADD   DELETE        HELP   FIELD        CLEAR   EXIT   ENTER
 OR RUN                              HELP         FORM
```

Figure 13-3. The Network Port Form

Form Fields

- `equipped`

  For each RS-232 channel cabled, set *equipped* to `y`.

- `synch/asynch`

  This field indicates the operating mode for the channel.

  — If channel 5 is cabled through a modem or data set to the switch, enter an `a`. If it accesses a synchronous modem pool once inside the switch, however, you should enter an *s*.

  — If channel 5 is cabled directly to another system, enter an `s`.

  Set the fields appropriately for channel 6. Assignments may be different than channel 5.

- `data rates`

  Assign data rates for each RS-232 channel. The default value for *data rate (1):* is 9600. For modems that AT&T supports, the default value for both *data rate (2):* and *data rate (3):* is null (blank).

  — If the RS-232 channel is not converted to DCP the data rate administered should match the modem speed. The following values are typical:

    - If channel 5 is connected through the switch, set *data rate 1* to `19200`. Leave *data rate 2* and *data rate 3* blank.
    - If channel 5 is connected directly to another system, set *data rate 1* to `64000`. Set *data rate 2* to `56000`. Set *data rate 3* to `19200`.

  — If the RS-232 channel is converted to DCP, do one of the following:

    - Set *data rate 1* to `56000` (synchronous) if a Modular Processor Data Module (MPDM), Model M1*, is used on channel 5 for switched RS-232 converted to DCP mode 1. Leave data rate 2 and *data rate 3* blank.
    - Set *data rate 1* to `64000` (synchronous) if a Modular Processor Data Module (MPDM), Model M1*, is used on channel 5 for switched RS-232 converted to DCP mode 3. Leave data rate 2 and *data rate 3* blank.
    - Set *data rate 1* to any value between `1200` and `19200` (asynchronous) if a 7400A or 7400B data module is used on channel 5 for switched RS-232 converted to DCP mode 2. Leave data rate 2 and *data rate 3* blank.

  Set the fields appropriately for channel 6.

- `switched/dedicated`

  RS-232 channels converted to DCP mode 1 or DCP mode 3 via an MPDM/M1* *must* be administered as *dedicated* since these channels can only be used for incoming calls; they cannot be used for outgoing calls.

  — Enter `s` when the channel is connected to the switch through a modem or a 7400A or 7400B data module.

  — Enter `d` when the channel is connected directly to another system or if the channel is converted to DCP mode 1 or DCP mode 3 via a MPDM/M1*, data module.

- `modem initialization string`

  The modem initialization string is the character string that the TN539 or TN539B sends to initialize the modem connected to the corresponding RS-232 port. You can enter up to 65 printable ASCII characters; however, not all modems will accept that many. Most modems do not distinguish between upper- and lower-case letters, so you may enter them either way. If you are using an AT&T supported modem, you can get the appropriate dial string from the `modem initialization string` on the `system : translation : network port` form. If you are using modems other than the ones specified in this document, check the documentation shipped with the modem to determine the appropriate dial string and the number of characters allowed in the string. Usually, the ‘‘at’’ at the beginning of the string and spaces in the string are not counted as part of the string.

  — If the RS-232 channels are cabled directly to another system, leave this field blank.

  — If the RS-232 channels are cabled to the switch through an MPDM/M1*, leave this field blank.

  — If the RS-232 channels are cabled to the switch through a 7400A or 7400B, enter:

  ```
  at &c1 &r1 &d2 &s0 s0=1 &w
  ```

  — If the RS-232 channels are cabled to the switch through an AT&T Paradyne DM424 (or DL424), enter one of the following. The same string should be used for the modem at the called system:

  - for MNP 19.2 Kbps mode, enter:

    ```
    at&f *f3 *e3 s0=1 s2=128 m0 &w
    ```

  - for non-MNP mode, fixed at 9600 bps, enter:

    ```
    at&f *f3 s0=1 s2=128 m0 *e0 *s1 &w
    ```

  — If AT&T 2296A modems are used, enter one of the following:

  - for MNP 19.2 Kbps, enter:

    ```
    at&f &d2 &c1 s0=1 m0 \n3 \j0 \q2 \g1 \a2 \v1 \t2 &w
    ```

    Do not use MNP with a 2296 unless it is calling another 2296.

  - for non-MNP mode fixed at 9600 bps, enter:

    ```
    at&f &s0 &d2 &c1 s0=1 m0 s2=128 &w
    ```

  — If a MICROCOM QX 3296/C modem is used, enter one of the following. The same string should be used for the modem at the called system. Enter the string exactly as shown. It already approaches the maximum number of characters allowed by this modem (40 characters; spaces shown are not included in the 40 characters):

  - for MNP 19.2 Kbps mode, enter:

    ```
    at&f&d2&c1s0=1m0s2=128 \n3 \j0 \q2 \g0 \a2 %l0&w
    ```

    (The character after the ‘‘%’’ is the letter ‘‘l’’.

  - for non-MNP mode, fixed at 9600 bps, enter:

    ```
    at&f &s0 &d2 &c1 s0=2 m0 %l0 \x1 \j0 s2=128 &w
    ```

    The character after the ‘‘%’’ is the letter ‘‘l’’.

— For an AT&T Paradyne model 3820 modem connected to the RS-232 ports (*not* in a modem pool), enter the following for 9600 bps asynchronous operation. The same string should be used for the modem at the called system:

```
at&f0 &d2 m0 \n1 \q3 s0=1 s2=128 s76=1 s78=1 s41=3 &w0
```

— A Telebit T1000 stand-alone modem may be connected to the RS-232 ports (*not* in a modem pool). When the modem is first installed, power it up, open the front panel, and push the RESET button. This puts the modem in conventional mode. You can then enter the following dial string for 9600 bps asynchronous operation. The same string should be used for the modem at the called system:

```
at &fm0 &d2 &c1 &k3 s0=1 s2=128 &w0 &y0
```

For T1000 modems only, the System 75, Generic 1, or Generic 3 analog stations form *must* have the `distinctive audible alert` field set to **n**.

NOTE

Telebit modems can *only* make or receive calls from another Telebit modem (such as another T1000). This modem is only certified to work on RS-232 ports 5 and 6.

- `modem initialization status`

  This display-only field should be blank. If it is not blank, it is displaying the status of a previous initialization and it will be updated when you save your data.

- `DCP ports — data rate for incoming mode 2 calls or 0 if channel not used`

  This field does not apply for systems with the TN366 or TN366B. For systems with the TN539 or TN539B, this field indicates the data rate that the TN539 or TN539B will specify in response to a "data options query" from the switch for an incoming DCP Mode 2 call (a call that uses modem pooling to access this remote system). Permissible values are 0, 1200, 2400, 4800, 9600, and 19200. If the DCP channels are not to be used, enter `0` in each field. For System 75, Generic 1, or Generic 3, enter `0` for `channel 2` and `channel 4`.

  If the AUDIX system is using a 7400A or 7400B to talk with another AUDIX system that also uses a 7400A/B, the incoming DCP mode 2 data speed should match the speed set on the 7400A/B.

  If the AUDIX system is receiving mode 2 calls from other AUDIX systems as well, and these systems use speeds different from the 7400A/B, multiple speeds can be entered on the form. Contact the BCSDC for information on using multiple speeds.

Saving Data

After you have completed this form, press CHANGE or RUN to save any changes or additions.

If initialization strings were entered, the AUDIX system will now send these strings to the modems to initialize them. The *modem initialization status* fields show ‘‘pending’’. After a few seconds, press ENTER to display the status of this new initialization attempt. If ‘‘pending’’ is still displayed, repeat the wait-and-press ENTER procedure until some result is displayed. When a result is displayed, press SHIFT and TAB at the same time to get to the *modem initialization status* fields. Then press f5 (field help) for an explanation of the result.

ADMINISTERING SYSTEM LIMITS

Access the `traffic : feature : day` form by typing `tr f d` on the path line. Press RETURN. Record the number displayed in the *subscribers : local* field. You might add to this number the number of local subscribers the customer expects to add over the next 12 months; record the total. Also record the expected total of remote subscribers in the network (subscribers that reside somewhere in the network other than on the local system).

Next, access the `system : limits` form by typing `sy li` on the path line. Press RETURN. Administer the following fields.

Form Fields

- `subscribers, local`

  Set this field to the number (or expected number) of local subscribers, up to a maximum of 4000 (see Figure 13-4, *The System Limits Form*).

- `administered remote`

  Enter the number of administered and nonadministered remote subscribers that are expected to be included in the entire network, up to a maximum of 28,000. Do not put in a larger number than necessary.

  NOTE

  If the `send to non-administered recipients` field on the `system : translation : machine : audix/amis/call delivery` form is set to `y`, setting the `administered remote` field to 28,000 will not leave room for non-administered (unknown) subscribers to be added.

  This field is used for two purposes:

  — To calculate the system data (sdat) filesystem size requirements for *all* remote subscribers (both administered and nonadministered)

  — To calculate recommended filesystem size requirements for the other filesystems on the form for only the administered remote subscribers

  Because of this dual purpose, the `system : limits` form should be used in two steps, as described in the next section.

Calculating Filesystem Sizes

To calculate filesystem space requirements for *all* remote AUDIX subscribers (both administered and nonadministered), use the following procedure:

1. Move the cursor to the `subscribers, local` field and type the total number of administered local subscribers (for example, 2000).

2. Move the cursor to the `subscribers, administered remote` field and type the total number of administered *and* nonadministered remote subscribers (for example, 6000). Press F1 (CHANGE or RUN).

NOTE

AUDIX digital networks typically have a larger number of administered remote subscribers because the remote updates feature adds remote subscribers automatically. However, AMIS analog networks typically have a larger number of *non*administered remote subscribers because subscribers are less likely to be manually administered at each AMIS analog networking site.

3. Record the value displayed for the `system data` filesystem. This recommended filesystem size should accommodate *all* remote subscribers in the network (both administered and nonadministered).
4. Return to the `subscribers, administered remote` field and type the number of administered remote subscribers (for example, 4000). Press F1 (CHANGE or RUN).
5. The fields at the bottom of the screen indicate the recommended filesystem sizes for this system based on the limits you just entered. Record the recommended values for all the filesystems *except* the system data filesystem (which you calculated previously).

NOTE

If you have an AUDIX digital networking setup that shares voiced-in names among machines, increase the size of the `names` filesystem by 10 percent above the figure shown on this form.

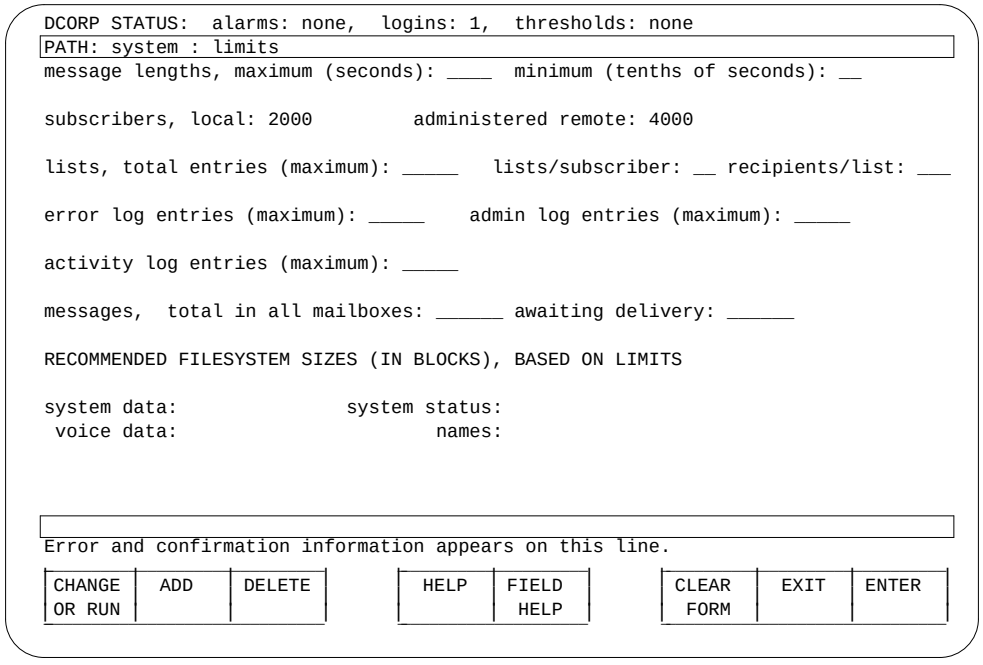


Figure 13-4. The System Limits Form

Comparing the Recommended File Sizes to Actual Sizes

Compare the filesystem sizes recorded in the previous section with the actual sizes. The filesystem sizes can be displayed using the `filesystem : list` form. The recommended values project worst-case situations, so if the actual sizes of these filesystems are close, it is probably not necessary to change them now. You should monitor filesystem use on an ongoing basis (see the *AUDIX Administration* document). They can be changed later if necessary.

Increasing the Size of a Filesystem

If a filesystem needs to be increased, the AUDIX system must be shut down. Go to the `shutdown` form and do a camp-on administrative shutdown.

To increase the size of a filesystem, go to the `filesystem : detail` form. Set *filesystem* to the name of the filesystem to be increased (for example, disk00.ss). Press TAB. Set *type* to the type of the filesystem. Press ENTER.

Tab to *size* and overwrite the current size with the new recommended size. Press CHANGE or RUN.

If there is not enough free space on the disk to allow the change, look on another hard disk (disk00 to disk06) for available space. If there is available space on another disk, do a physical copy of the filesystem from the original disk to the new disk (`filesystem : copy` form). Delete the original filesystem from the original disk and increase the size of the new filesystem to its recommended value.

If you cannot find available space on any of the other hard disks, call the Technical Service Center (TSC) and ask them to determine if any filesystems can be decreased in size (some filesystems may be largely free space). Once this is done, you should be able to increase the size of the original filesystem.

NOTE

If the filesystem is redundant, there must be space on both the primary and backup disk.

MOVING A SUBSCRIBER BETWEEN AUDIX SYSTEMS IN A NETWORK

At some time, you may need to move a subscriber (or a group of subscribers) from one AUDIX system to another in an AUDIX network. The recommended way to move a subscriber(s) from AUDIX system 1 to system 2 is shown below.

Make sure the remote update fields on the `system : translation : machine : audix/amis/call delivery` and `system : translation : remote updates` forms are set to `y` for the entire network.

1. Remove the subscriber(s) from system 1 using the `subscriber : local` form and the DELETE key.
2. Run the mailing lists audit using the `maintenance : audits : fp` form on the local and remote systems. These audits will delete references to the removed subscriber(s) from any mailing lists on system 1. Then run the subscriber data audit. This audit will prevent errors or redundancy in the subscriber data. This reduces the chances of introducing problems into the network.
3. Do one of the following:
   - — Run a connection test using the `maintenance : network` form. One at a time, connect to all systems in the network. This test will notify the other systems of an update pending.

     Now at each of the other systems, run a connect test to system 1. The subscribers removed from system 1 should now be deleted as remote subscribers at the other systems.
   - — If the network is not heavily loaded with voice mail between systems and the transmission intervals of the systems are set to 5 or 10 minutes, you can just wait for 30 minutes or so to make sure each system has had a chance to call all other systems.
4. Log in to system 2. Check the `subscriber : remote` form to verify that the removed subscriber(s) do not exist on this system. If the subscriber(s) still exist, remove them manually with the DELETE key. If you are moving a range of subscribers, you will want to remove their range of extension numbers from system 1's profile. Do this at system 1 (local machine profile) and at system 2 (remote machine profile).

NOTE

You will also want to remove the range from the other systems, but do not remove the range until you verify that the other systems no longer reference the removed subscribers.

If any of the moved subscribers were included on mailing lists, they will need to be re-administered on those mailing lists.

Now you are ready to add the subscriber(s) to system 2.

1. Check the profile for system 2 (local machine profile). If the subscriber extension(s) is not part of one of the defined ranges, alter one of the ranges or add a new one. Be careful not to create an overlap of another range.
2. Repeat step 1 at all other systems on system 2's profile (a remote profile for the other systems). This includes system 1.

3. Log back on to system 2 using an administration or maintenance terminal and add the subscriber(s) using the `subscriber : local` form.
4. From a voice terminal, log in to system 2 using the administrator's login. Go to voicing in the name and record the subscriber's name.

   If the name-record-by-subscribers feature is used, names will not be recorded until the first time subscribers log in to the AUDIX system.
5. Run a connection test from system 2 to all other systems and from all other systems to system 2. (Or wait for the transmission intervals.)
6. Log in to system 1 using an administration or maintenance terminal. Look at the `subscriber : remote` form to see that the subscriber(s) is now listed as a remote subscriber(s). If the subscriber(s) is not listed, check the `system : log` form for ''*a full update has been requested*''. If this is the case, you must do a full update from system 1 to system 2 using the `system : translation : remote updates` form.
7. Repeat step 6 for the other systems remote to system 2.

ADMINISTRATOR'S WORKSHEET

On this page and the following page are worksheets that will help the AUDIX Network Administrator keep track of the network. The first table is a sample. Make copies of the second table and keep it as a master.

Table 13-1. Sample Administrator Worksheet for AUDIX Networking

ADMINISTRATOR WORKSHEET FOR AUDIX NETWORKING												
				Address Ranges (up to 10)			Message Transmission Schedules (up to 3)				Subscribers	
Machine Name	Password	Ext. Length	Dial String (Data Port Grp Num)	Prefix	Start Ext.	End Ext.	Start	End	Interval	Updates in/out	local	Admin'd remote
Dallas	market	5	91303534001	30353	82000	86999	05:00	14:59	00:30	y/y	3000	2400
				53	82000	86999	15:00	19:59	01:00			
New York	market	4	91208981234	201898	1000	4999	08:00	16:59	00:30	y/y	2000	3400
				898	1000	4999	17:00	20:59	01:00			
Miami	market	3	91215815656	2015815	600	999	08:00	16:59	03:00	y/y	400	5000
				5815	600	999	17:00	20:59	01:00			

Table 13-2. Blank Administrator Worksheet for AUDIX Networking

ADMINISTRATOR WORKSHEET FOR AUDIX NETWORKING													
				Address Ranges (up to 10)			Message Transmission Schedules (up to 3)				Subscribers	
Machine Name	Password	Ext. Length	Dial String (Data Port Grp Num)	Prefix	Start Ext.	End Ext.	Start	End	Interval	Updates in/out	local	Admin'd remote
							:	:	:			

14. AUDIX Network Testing

If you have just installed a network, go to the section of this chapter entitled *Testing the Network Connections*. If you are troubleshooting a network, go to *Checking Administration Log Entries* and *Troubleshooting the Network.* Figures 14-1, 14-2, 14-3, and 14-4 show the `maintenance : network` form for various AUDIX software releases. This is the form you will use for network tests. Keep the following in mind when you perform network tests:

- There are six types of tests:
  - — Channel Internal Loop-Around Test — This test checks a single channel on the networking board. The test is local to the system being tested (Test 2).
  - — Modem Loop-Around Test — This test checks a single RS-232 channel and the modem connected to it, if so equipped. This test would not be used for RS-232 channels. The test is local to the system being tested (Test 6 — R1V5 or later RS-232 only).
  - — Network Loop-Around Start 56/64 Kbps Test — This test checks the transmission path from a 56 robbed-bit or 64 Kbps service office (SO) facility to the local AUDIX system. The test can be conducted for any of the six AUDIX channels. To conduct the test for channels 5 or 6 (RS-232 channels) you need an MPDM/M1* between the AUDIX system and the PBX.
  - — Remote Connection Test — This test checks the transmission path from one system to another (Test 1; machine name = a remote system machine name; dialing string is fixed). The dial string is set on the `system : translation : machine : audix/amis/call delivery`. Modem initialization strings are set on the `system : translation : network port` form.
  - — Near End Connection Test — This is a loop-around test; the local system calls itself [Test 1; machine name = the local system machine name and dial string is the network access code of the AUDIX Communications Controller (ACC) board]. When modem pooling is used in the network, the local modem pool is included in this test.
  - — Local Connection Test — This is a loop-around test; the local system calls itself [Test 1; machine name = the local system machine name and dial string is the extension number of the ACC board]. This test does not include modem pool facilities.
- The tests and, more specifically, the troubleshooting procedures, involve checking modem or data module settings, cabling, switch translations, and AUDIX system translations.
- AUDIX R1V3, R1V4, and R1V5 software limit the number of simultaneously active channels to four. To use all six channels simultaneously, an AUDIX system must have R1V6 or later software and a TN539 vintage 7 or TN539B ACCE.
- System 75, Generic 1, and Generic 3 only use channels 1 and 3 regardless of the AUDIX software used. The MERLIN II only uses channels 2 and 4. Do not try to use these channels for any tests.

This chapter also provides procedures for testing the Remote Updates feature and for testing voice mail between systems.

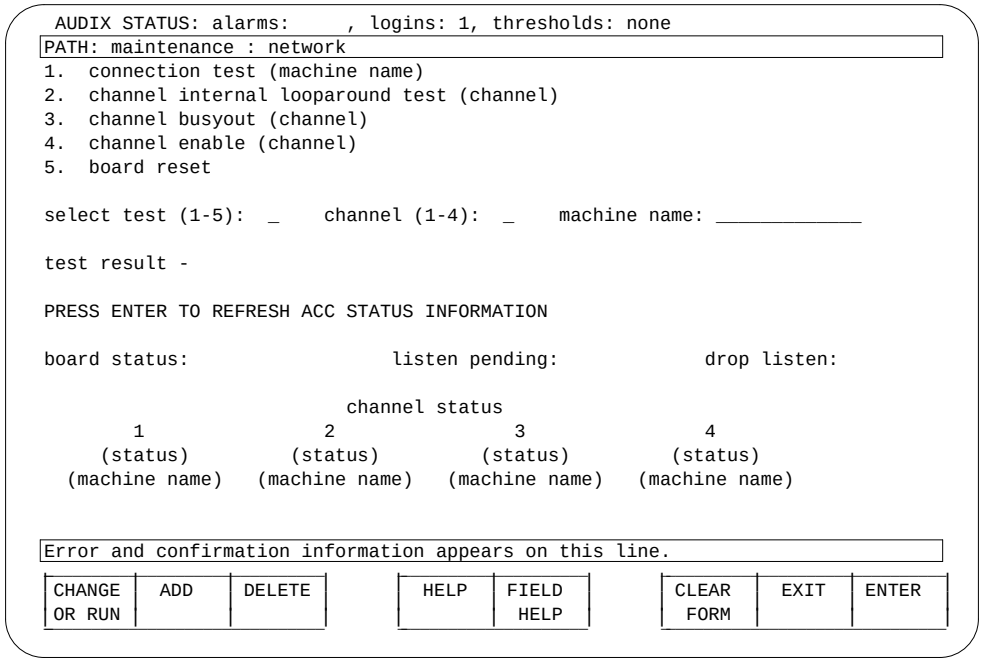


Figure 14-1. The Maintenance Network Form (R1V3 and R1V4)

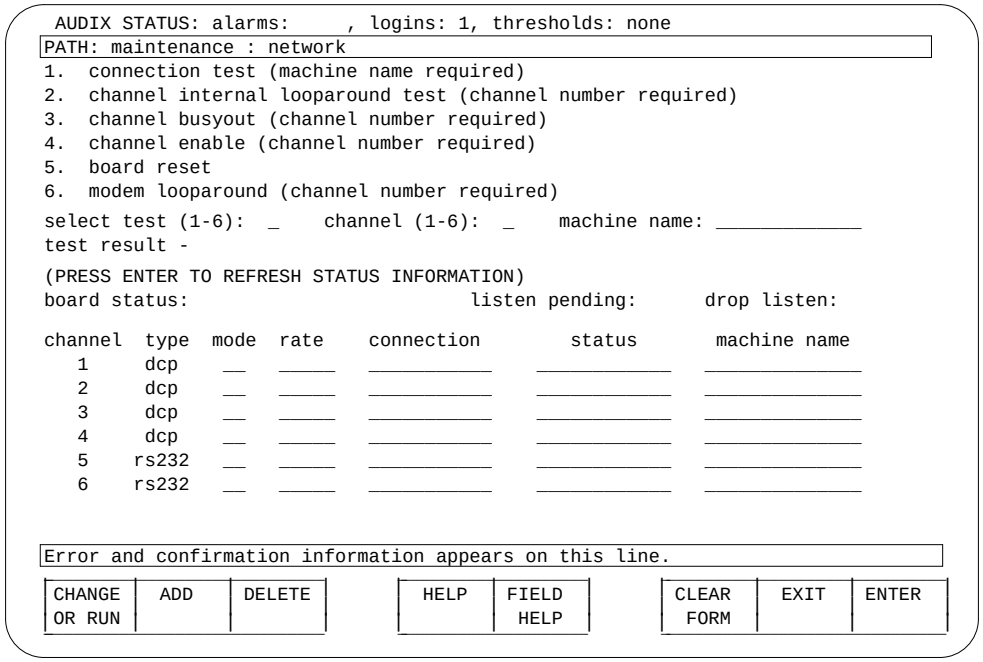


Figure 14-2. The Maintenance Network Form (R1V5)

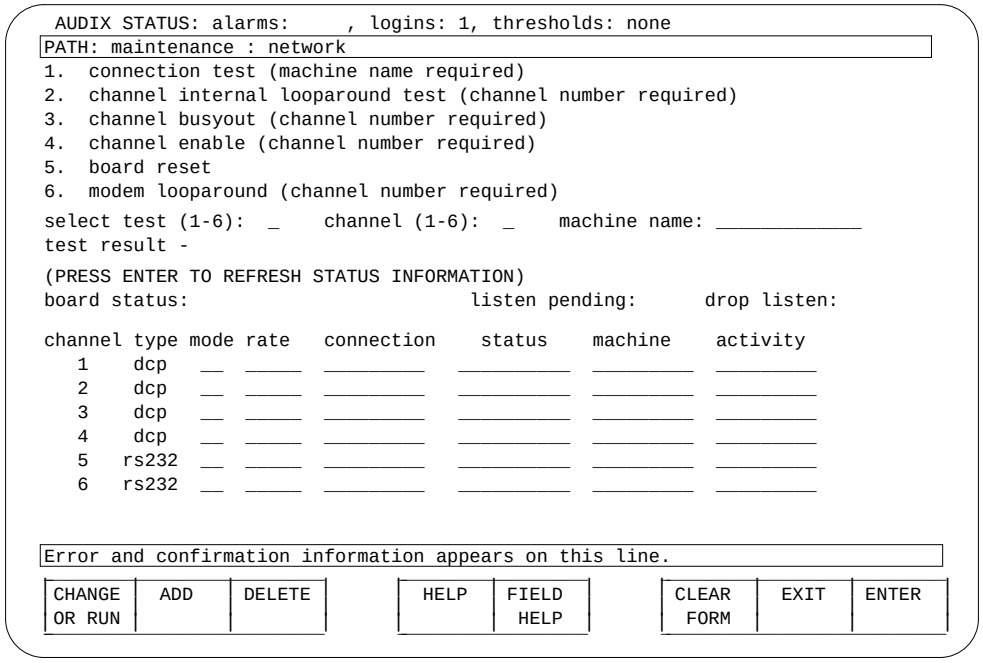


Figure 14-3. The Maintenance Network Form (R1V6)

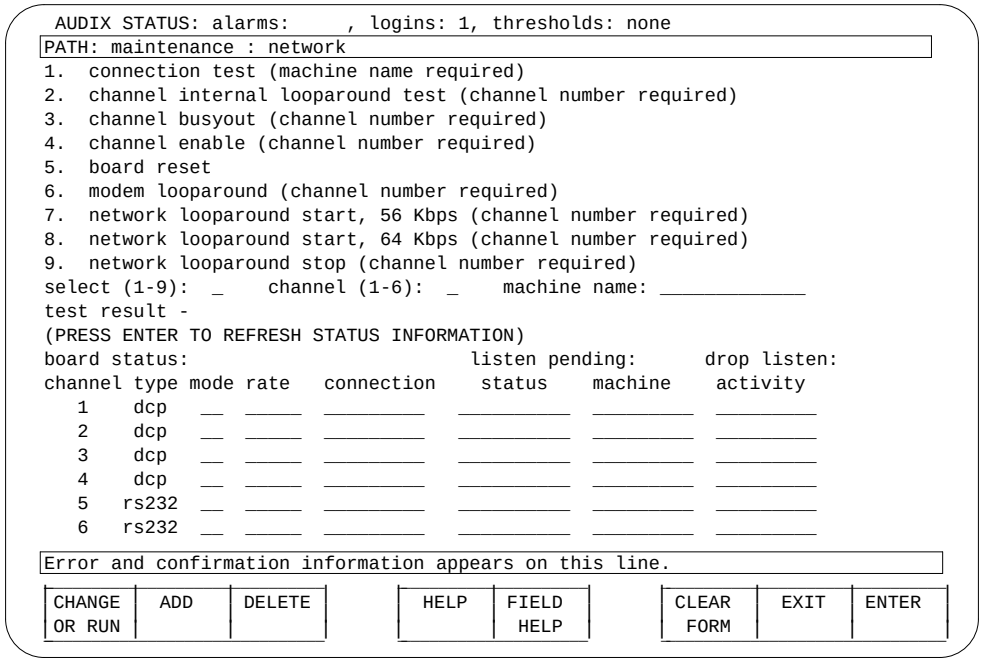


Figure 14-4. The Maintenance Network Form (R1V7)

TESTING THE NETWORK CONNECTIONS

Once the network cabling and translations have been established between the local AUDIX system and one of the remote AUDIX systems, you are ready for the following:

1. Perform a connection test from the local system to the remote system (remote connection test). Remember that a remote system is any system in the network other than the system being tested. Even though a colocated system is not normally thought of as a *remote* system, to the local system it is.
2. If the remote connection test fails, perform the appropriate loop-around connect test (near-end connection test, local connection test, or 56/64 Kbps network loop-around test). The loop-around tests should be performed from the local system and, if nothing is found, performed from the remote system as well.
3. If the remote connection test and the loop-around test both fail, perform the internal channel and/or modem loop-around tests, as appropriate.

If at any time you get a ‘‘failed’’ response to a test, check the `system : log` form for possible reasons for the failure.

Step 1: Performing Remote Connection Tests

If you want to perform a test of the transmission path from the local system to a remote AUDIX system, select the appropriate remote connection test:

- Remote DCP connection test
- Remote switched RS-232 connection test
- Remote switched RS-232 converted to DCP connection test
- Remote dedicated RS-232 connection test

Step 1A: Testing Remote DCP Connections

This test involves a path similar to Figure 14-5, *Remote Connection Test (Digital Path to Another AUDIX system)* (DCP Mode 1 or 3) or Figure 14-6, *Remote Connection Test (Analog Path to Another AUDIX system)* (DCP Mode 2 — modem pooling). In the case of a colocated network, the path looks like Figure 14-7, *Remote Connection Test (Colocated AUDIX system)* (DCP Mode 3).

NOTE

Connection and modem loop-around tests are not supported on RS-232 ports that are converted to DCP mode 1 or DCP mode 3 using MPDM/M1* data modules. This is because the MPDM/M1* data modules do not support outdialing for these configurations. Use the DCP ports to test the connection to the remote system for these configurations.

1. Log in to the local system using the AUDIX system administration or maintenance terminal.
2. Go to `maintenance : network` form.

3. Set *select test* to `1`.
4. Set *machine name* to the name of the remote system.
5. Press CHANGE or RUN. Wait for the result. If the test is not successful, check the reason printed on the screen and/or `system : log` and/or go to *Flowcharts For Troubleshooting the Network*.

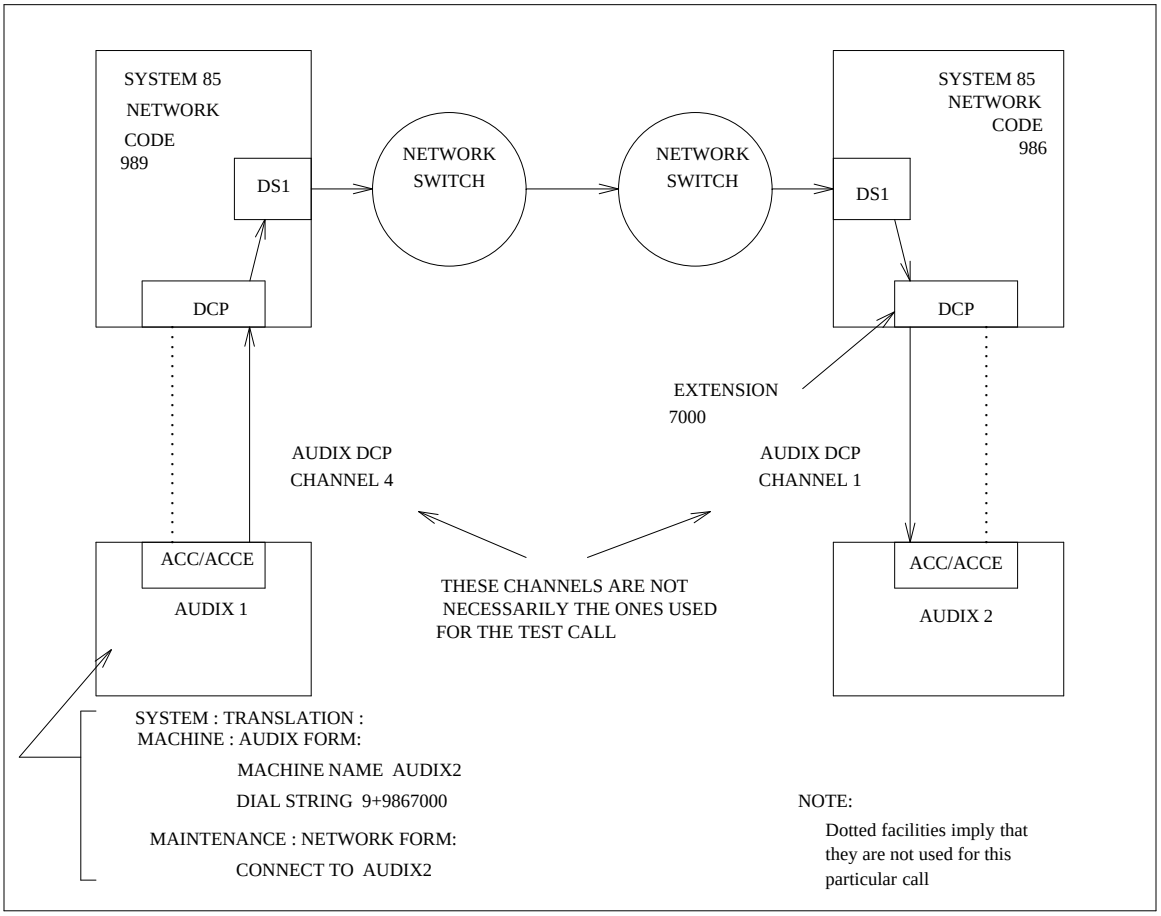


Figure 14-5. Remote Connection Test (Digital Path to Another AUDIX system)

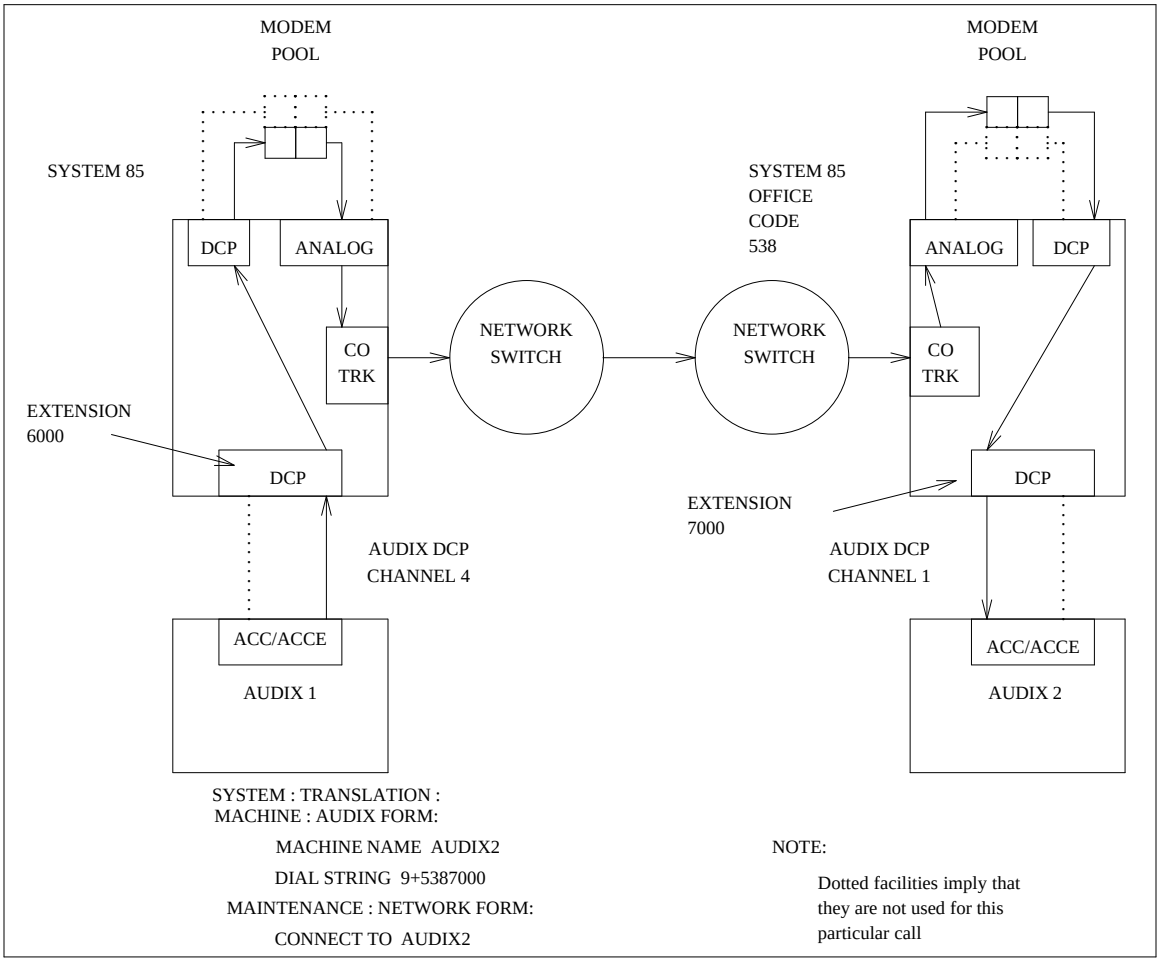


Figure 14-6. Remote Connection Test (Analog Path to Another AUDIX system)

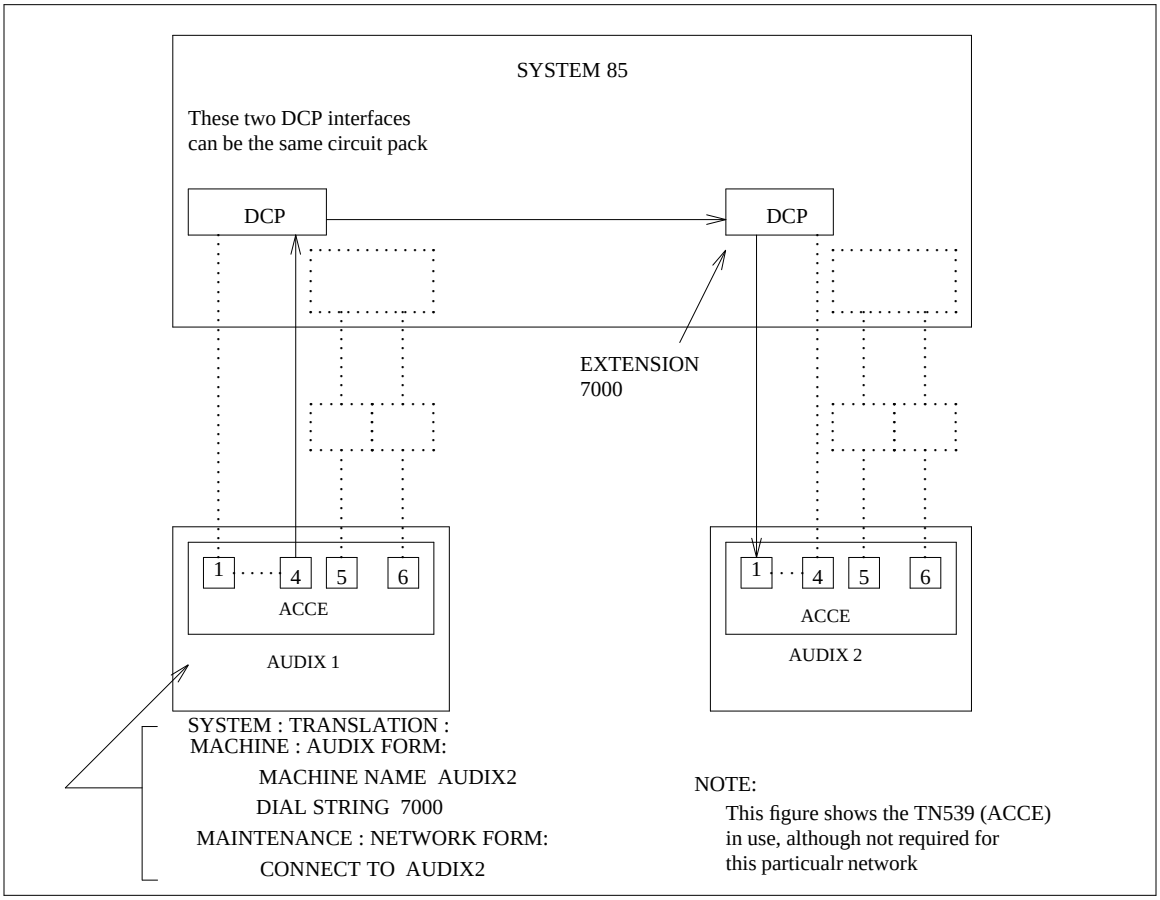


Figure 14-7. Remote Connection Test (Colocated AUDIX system)

Step 1B: Testing Remote Switched RS-232 Connections

This test involves a path similar to Figure 14-8, *Remote Connection Test (RS-232 to Tip/Ring)*, or Figure 14-9, *Remote Connection Test (RS-232 Colocated AUDIX system)*.

NOTE

Connection and modem loop-around tests are not supported on RS-232 ports that are converted to DCP mode 1 or DCP mode 3 using MPDM/M1* data modules. This is because the MPDM/M1* data modules do not support outdialing for these configurations. Use the DCP ports to test the connection to the remote system for these configurations.

1. Go to the `system : translation : machine : audix/amis/call delivery` form. Set *machine name* to the name of the AUDIX system to be called using the RS-232 channels. Press (ENTER). The other AUDIX system's machine profile should be displayed. If it is not displayed, it has not been assigned. Go to Chapter 13, *AUDIX System Administration*, and create the remote system profile.
2. The *network data phone number* (or dial string) must contain ATDT (the modem attention code), the central office (CO) access code, a comma as a pause, and the Direct Inward Dialing (DID) number associated with that AUDIX system's network hunt group.
3. Go to the `system : translation : network port` form. Make sure a valid modem initialization string is assigned for the channel you want to test. See Chapter 13 if you are unsure as to what should be assigned.
4. Go to the `maintenance : network` form. Make sure the channel you want to test is idle. In most cases either RS-232 channel can be used for this test. If a particular channel must be used and it is not idle, wait a few minutes until it is idle.
5. Go to *select test* and enter `1`.
6. Go to *machine name* and enter the name of the other AUDIX system. Press (CHANGE or RUN). Wait for the result. If the test is not successful, check the `system : log` and/or go to *Flowcharts For Troubleshooting the Network*.

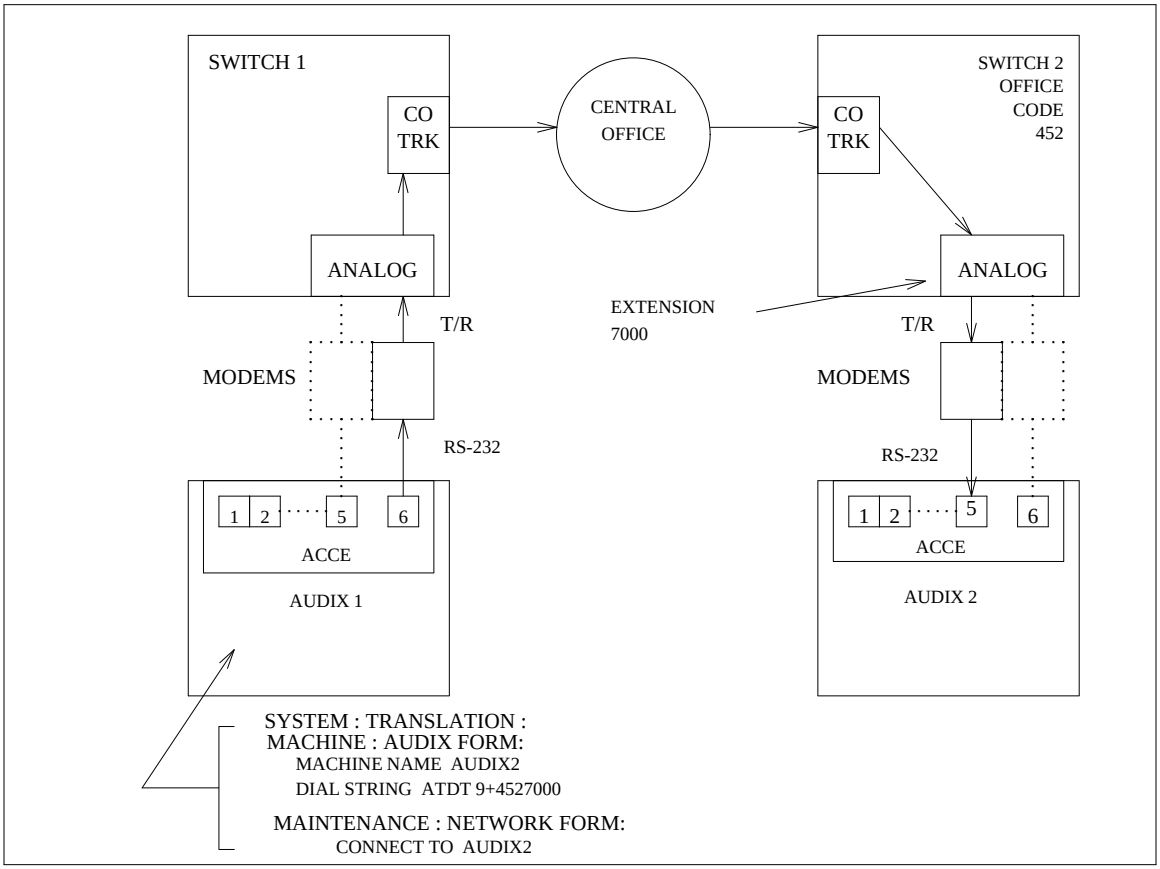


Figure 14-8. Remote Connection Test (RS-232 to Tip/Ring)

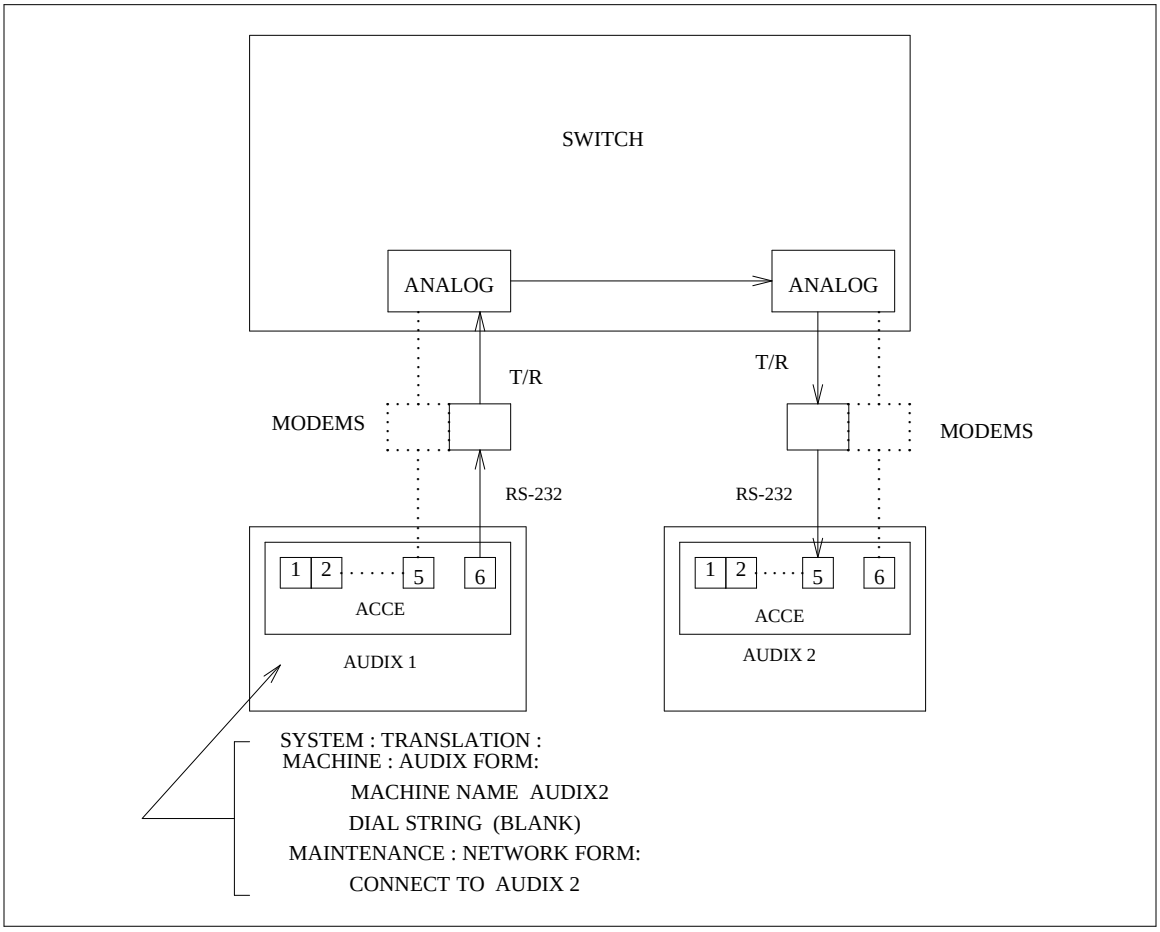


Figure 14-9. Remote Connection Test (RS-232 Colocated AUDIX system)

Step 1C: Testing Remote Switched RS-232 Converted to DCP Connections

This test involves a path similar to Figure 14-10, *Remote Connection Test (RS-232 Converted to DCP)*.

1. Go to the `system : translation : machine : audix/amis/call delivery` form. Set *machine name* to the name of the remote AUDIX system. Press ENTER. The remote AUDIX system's machine profile should be displayed. If it is not displayed, it has not been assigned. Go to Chapter 13, *AUDIX System Administration*, and create the remote system profile.
2. The *network connection channel* (or *channel*) should be blank unless channel 5 or channel 6 must be used for the call (in which case, enter the channel number).
3. The *network data phone number* (or dial string) should be blank. Press CHANGE or RUN if any changes were made.
4. Go to the `system : translation : network port` form. Make sure the *switched/dedicated* field for the channel(s) is set to `s`. Press CHANGE or RUN if any changes were made.
5. Go to the `maintenance : network` form. Make sure the channel to be tested is idle.
6. Go to *select test* and enter `1`.
7. Go to *machine name* and enter the name of the remote AUDIX system. Press CHANGE or RUN. Wait for the result. If the test is not successful, check the `system : log` and/or go to *Flowcharts For Troubleshooting the Network*.

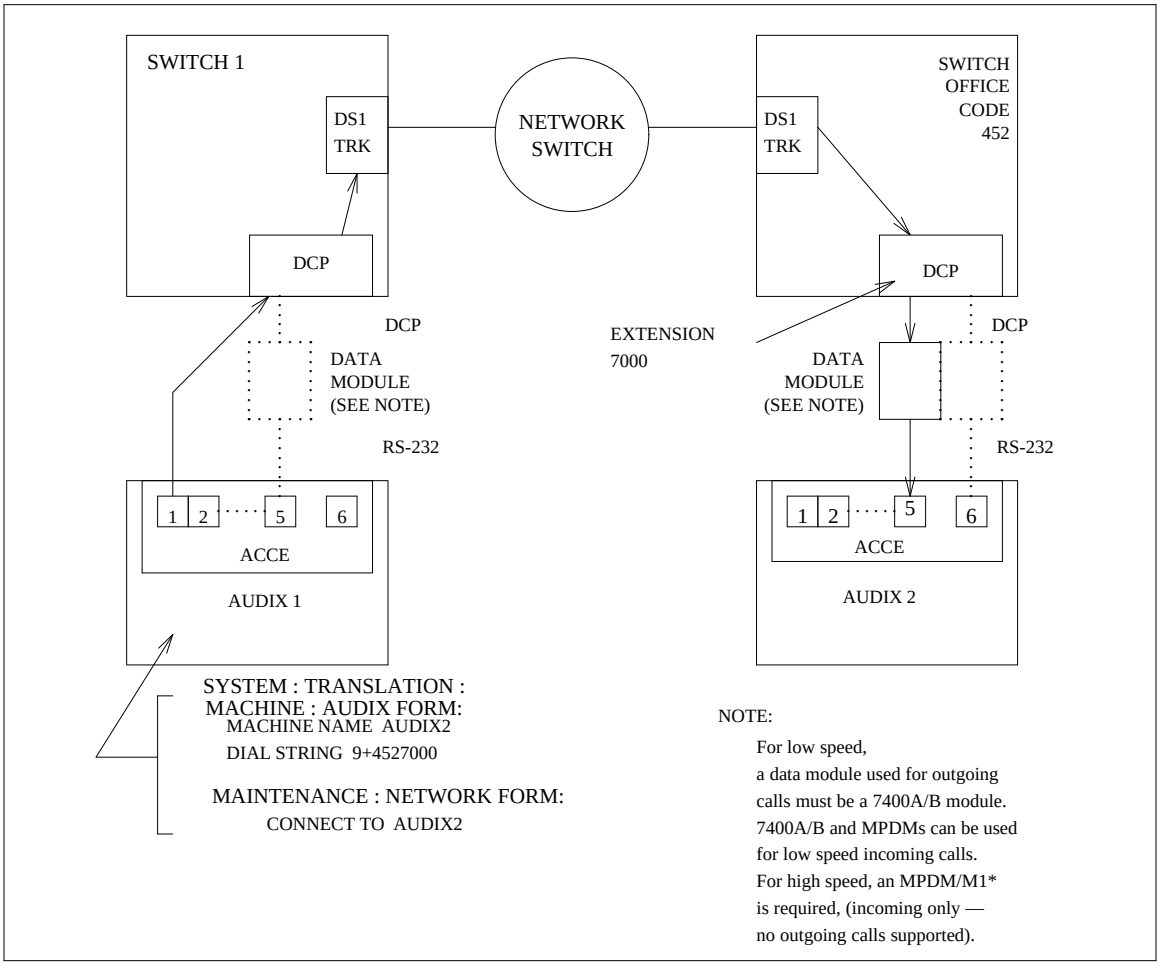


Figure 14-10. Remote Connection Test (RS-232 Converted to DCP)

Step 1D: Testing Remote Dedicated RS-232 Connections

This test involves a path similar to Figure 14-11, *Remote Connection Test (RS-232 Direct)*.

1. Go to the `system : translation : machine : audix/amis/call delivery` form. Set *machine name* to the name of the other AUDIX system. Press ENTER. The other AUDIX system's machine profile should be displayed. If it is not displayed, it has not been assigned. Go to Chapter 13, *AUDIX System Administration*, and create the remote system profile.
2. The *network connection channel* (or *channel*) should be set to the number of the channel that is cabled to the other AUDIX system. In Figure 14-11, the AUDIX system 1 RS-232 channel 5 is a switched connection and channel 6 is cabled to AUDIX system 2. The AUDIX system 2 profile at AUDIX system 1 should have a `6` in the *network connection channel* field.
3. The *network data phone number* (or dial string) should be blank. Press CHANGE or RUN if any changes were made.
4. Go to the `maintenance : network` form. Make sure the channel to be tested is idle.
5. Go to *select test* and enter **1**.
6. Go to *machine name* and enter the name of the other AUDIX system. Press CHANGE or RUN. Wait for the result. If the test is not successful, check the `system : log` and/or go to *Flowcharts For Troubleshooting the Network*.

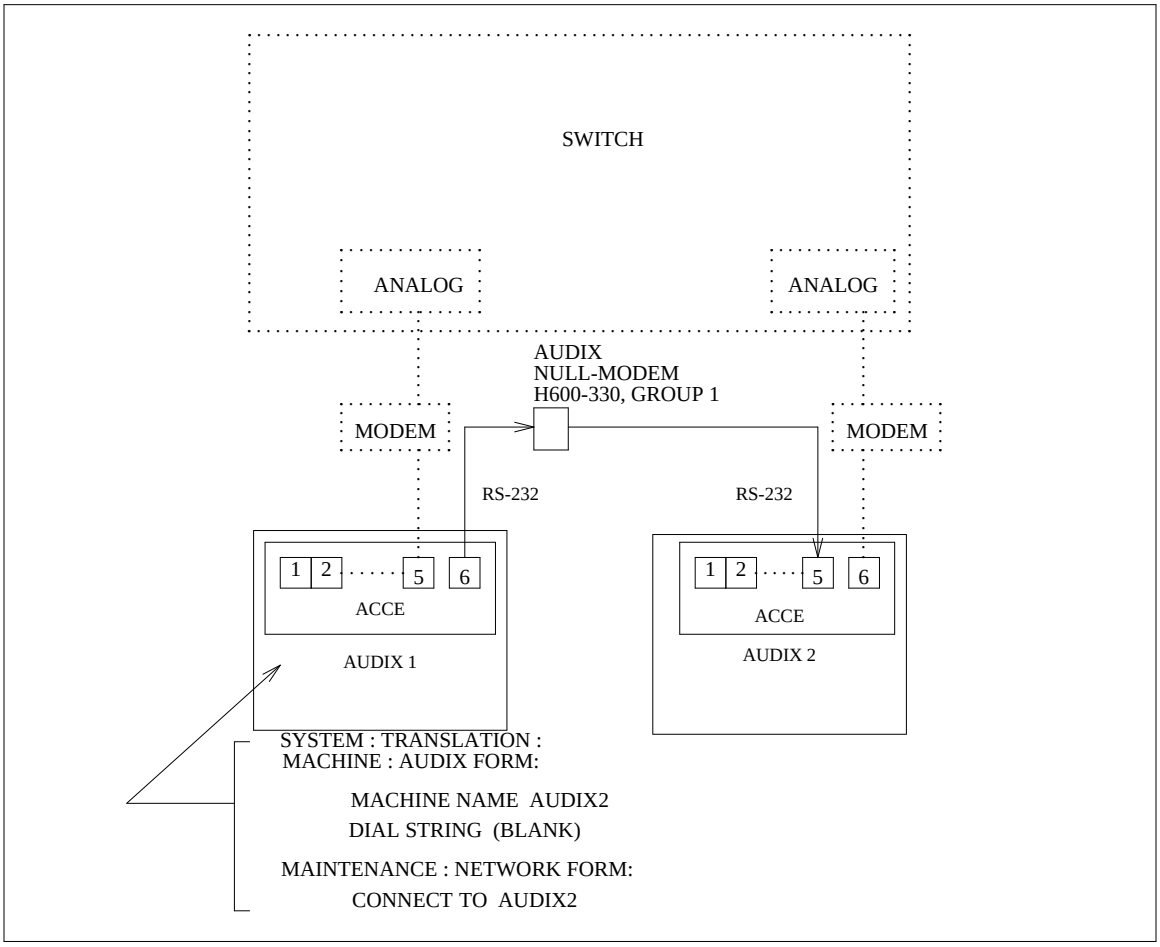


Figure 14-11. Remote Connection Test (RS-232 Direct)

Step 2: Performing Loop-Around Tests

If the appropriate test in Step 1 fails, perform the appropriate loop-around test:

- Near-end connection test
- Local connection test
- Network loop-around 56 Kbps
- Network loop-around 64 Kbps

Step 2A: Testing the Near-End Connection

This tests the loop shown in Figure 14-12, *Near End Connection Test (CO DCP Digital Loop-Around)*, the loop shown in Figure 14-13, *Near End Connection Test (CO DCP Analog Loop-Around)*, or the loop shown in Figure 14-14, *Near End Connection Test (CO RS-232 Analog Loop-Around)*.

1. Go to the `system : translation : machine : audix/amis/call delivery` form and press ENTER. The local machine profile should be displayed.
2. The *network data phone number* (or dial string) must be the CO or network access code, a pause, and the DID number associated with the *local* network hunt group.
   a. Use a plus sign as a pause if testing DCP channels.
   b. Use a comma as a pause if testing RS-232 channels. And make sure the dial string starts with the attention code (ATDT).
3. If a change was required, press CHANGE or RUN, exit the form and go to the `maintenance : audits : fp` form. Run a network data audit. This is necessary for R1V3 and R1V4 systems only; it is not necessary for R1V5 and later systems.
4. Go to the `maintenance : network` form.

   Set *select test* to `1`. Set *machine name* to the name of the local AUDIX system. Press CHANGE or RUN. Wait for the result. If the test is not successful, check the `system : log` and/or go to *Flowcharts For Troubleshooting the Network*.

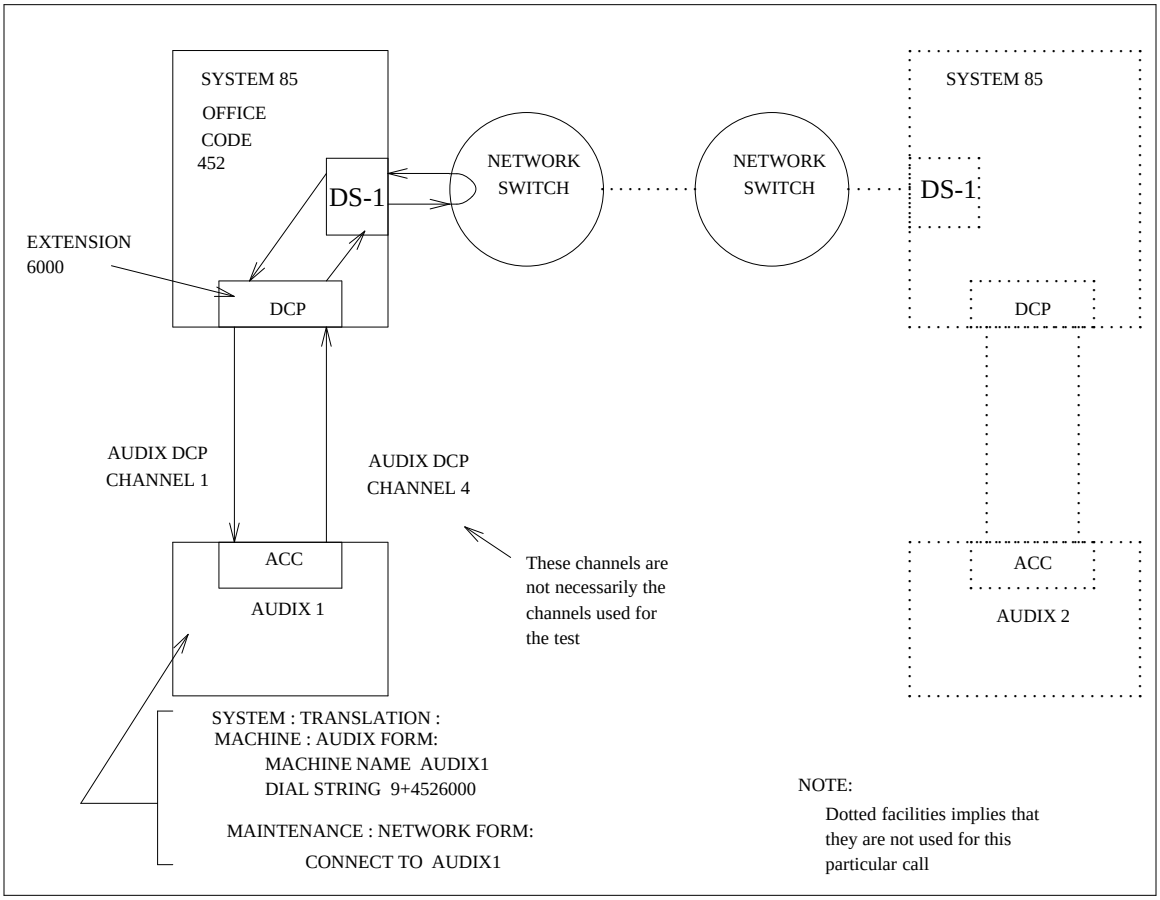


Figure 14-12. Near End Connection Test (CO DCP Digital Loop-Around)

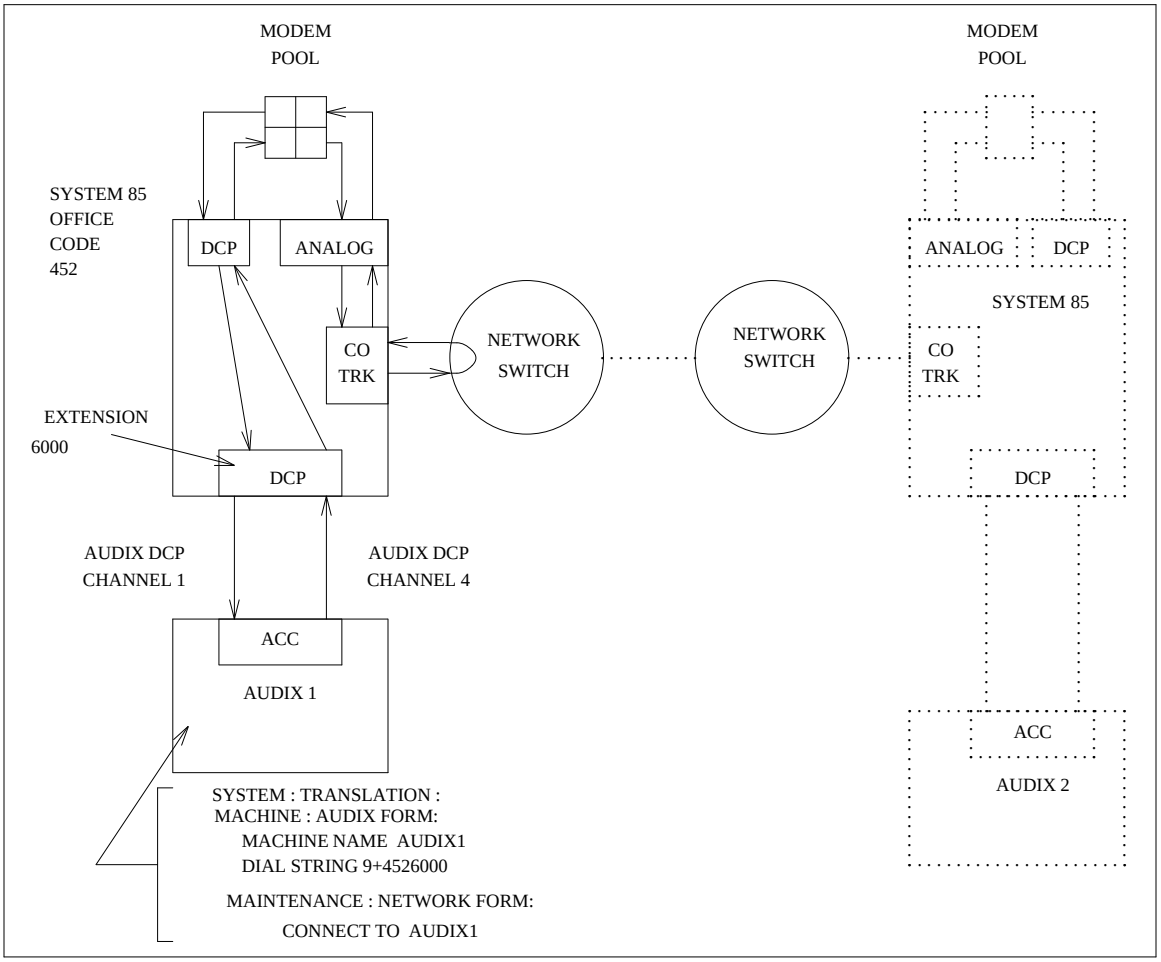


Figure 14-13. Near End Connection Test (CO DCP Analog Loop-Around)

Note that in Figure 14-13 for a DCP to analog loop, the modem pool modem and data set will be included in the test (two modem-data set pairs are required).

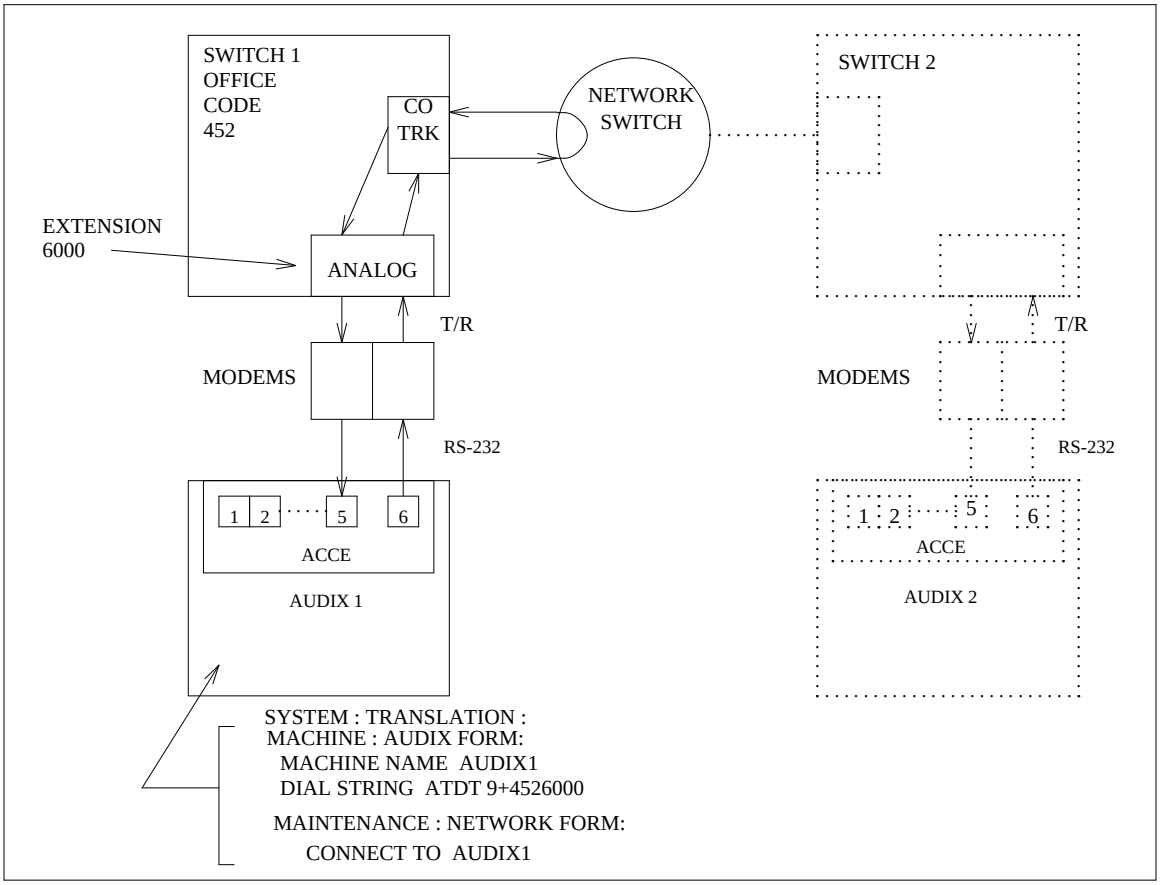


Figure 14-14. Near End Connection Test (CO RS-232 Analog Loop-Around)

Step 2B: Testing the Local Connection

This tests the loop shown in Figure 14-15, *Local Connection Test (DCP)*, Figure 14-16, *Local Connection Test (Switched RS-232)*, or Figure 14-17, *Local Connection Test (Dedicated RS-232)*. In the case of RS-232 direct, you must first arrange the cabling as shown in the figure.

1. Go to the `system : translation : machine : audix/amis/call delivery` form and press ENTER. The local machine profile should be displayed.
2. Make sure the *network data phone number* (or dial string) includes only the extension number assigned to the networking hunt group. If using switched RS-232 channels with modems, the string must still start with ATDT. If using direct RS-232 channels, the dial string should be blank.
3. If the phone number had to be changed, go to the `maintenance : audits : fp` form and run a network data audit. This applies to R1V3 and R1V4 systems only; it is not necessary for R1V5 and later systems.
4. Go to the `maintenance : network` form. Set *select test* to **1**. Press TAB.
   Set *machine name* to the name of the local machine. Press CHANGE or RUN. Wait for the result. If the test is not successful, check the `system : log` and/or go to *Flowcharts For Troubleshooting the Network*.

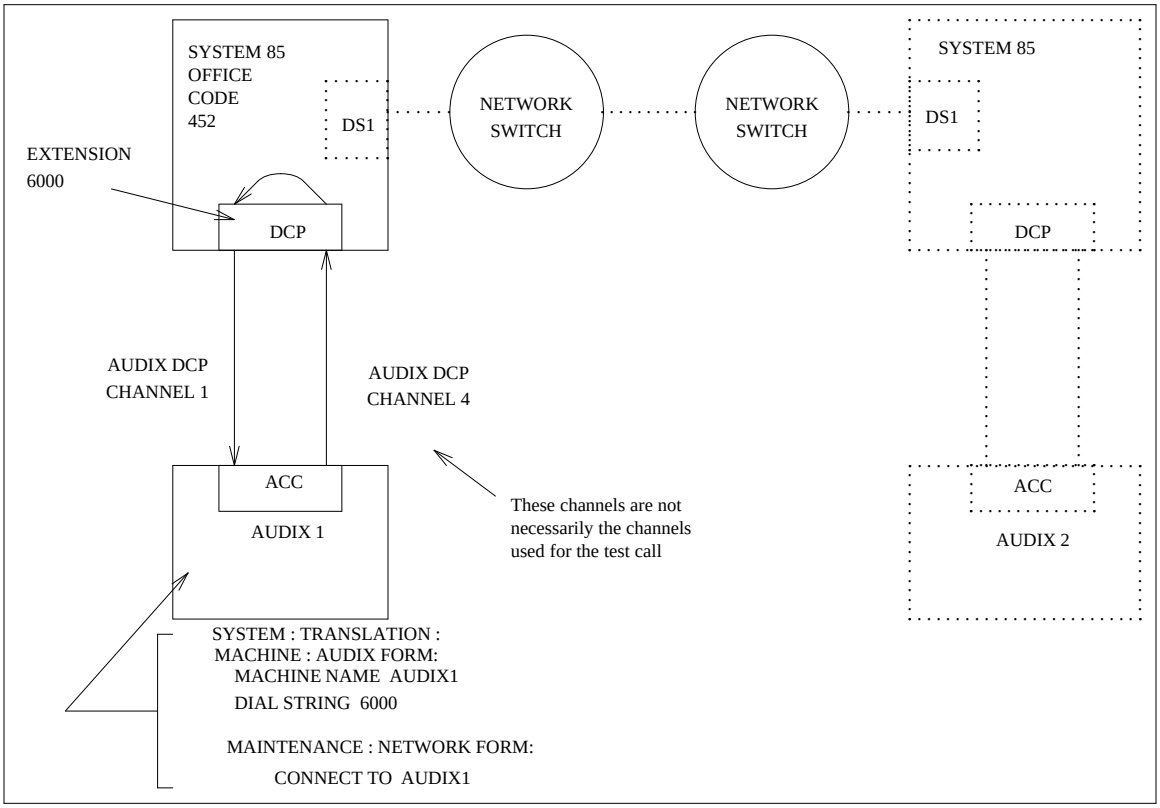


Figure 14-15. Local Connection Test (DCP)

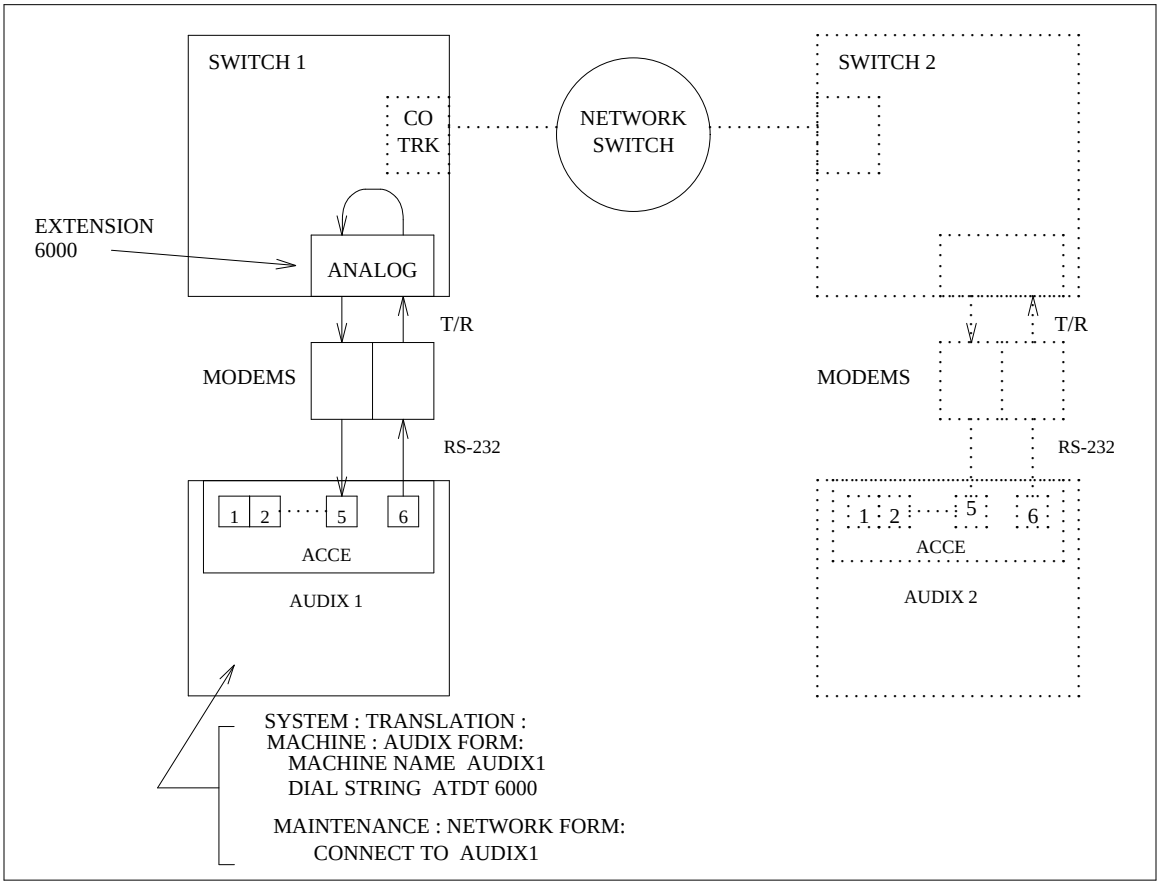


Figure 14-16. Local Connection Test (Switched RS-232)

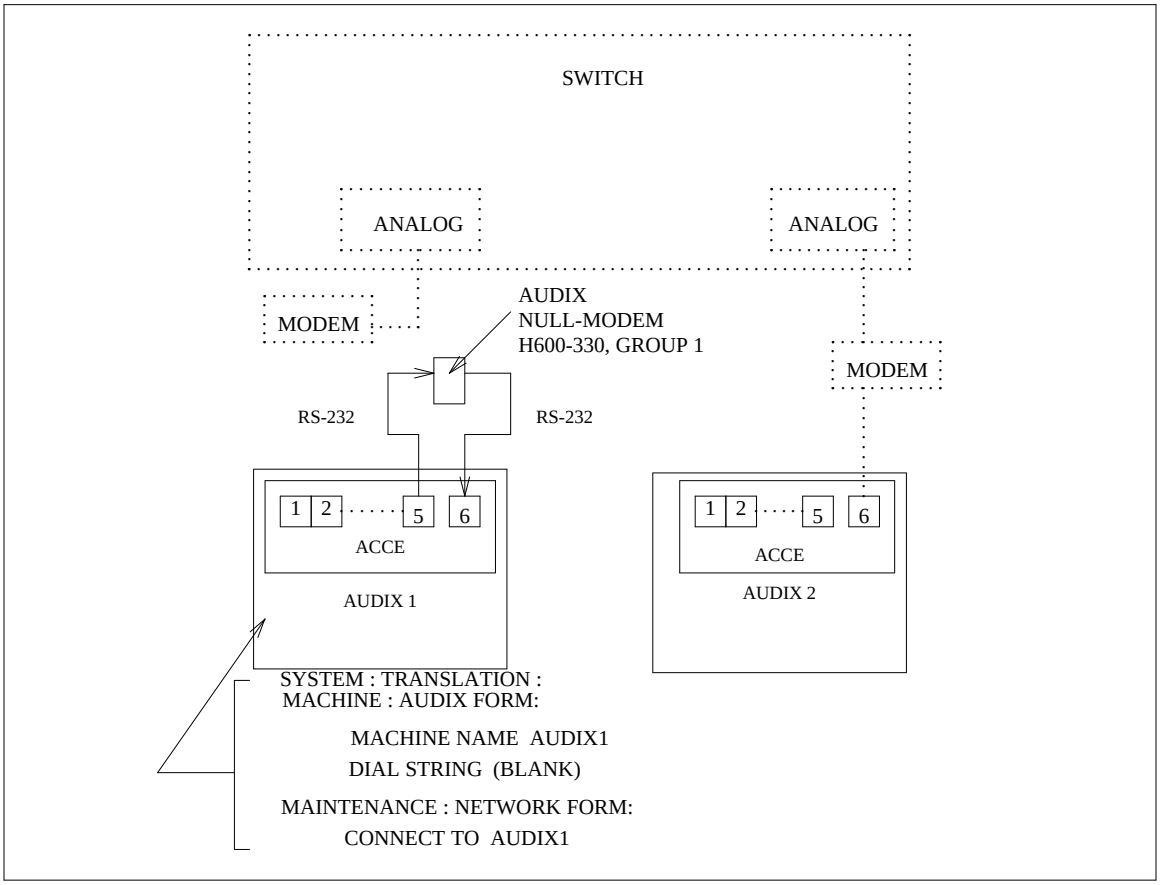


Figure 14-17. Local Connection Test (Dedicated RS-232)

Step 2C: Testing the 56/64 Kbps Network Connection

This tests the connection between the local AUDIX system and a 56 Kbps or 64 Kbps serving office (SO), as shown in Figure 14-18, *56/64 Kbps Network Loop-Around Test*.

While a channel is in loopback mode, it will be unavailable to send information to remote systems or receive information from remote systems. Also, if you put a channel in loopback mode, any active calls will be dropped. It is therefore recommended that before you perform this test you check the status of the channel. It is also not a good idea to perform this test during peak traffic times.

1. Go to the `maintenance : network` form. Set *select test* to **7** for to test a 56 Kbps network connection or to **8** to test a 64 Kbps network connection. Press TAB to get to the *channel* field and the specify the channel (1-6) you want to test. Press CHANGE or RUN and wait for the result.

   NOTE

   To test channel 5 or 6 (RS-232 channels) you need an MPDM/M1* between the AUDIX system and the PBX.

2. Have the serving office place a call to the telephone number assigned to the channel you specified on the `maintenance : network` form. If the test is successful, any data the serving office sends over the AUDIX channel will be echoed back.
3. Go to the `maintenance : network` form. Set *select test* to **9** to take the channel out of loopback mode. Press TAB to get to the *channel* field and the specify the channel (1-6) you want to take out of loopback mode. Press CHANGE or RUN and wait for the result.

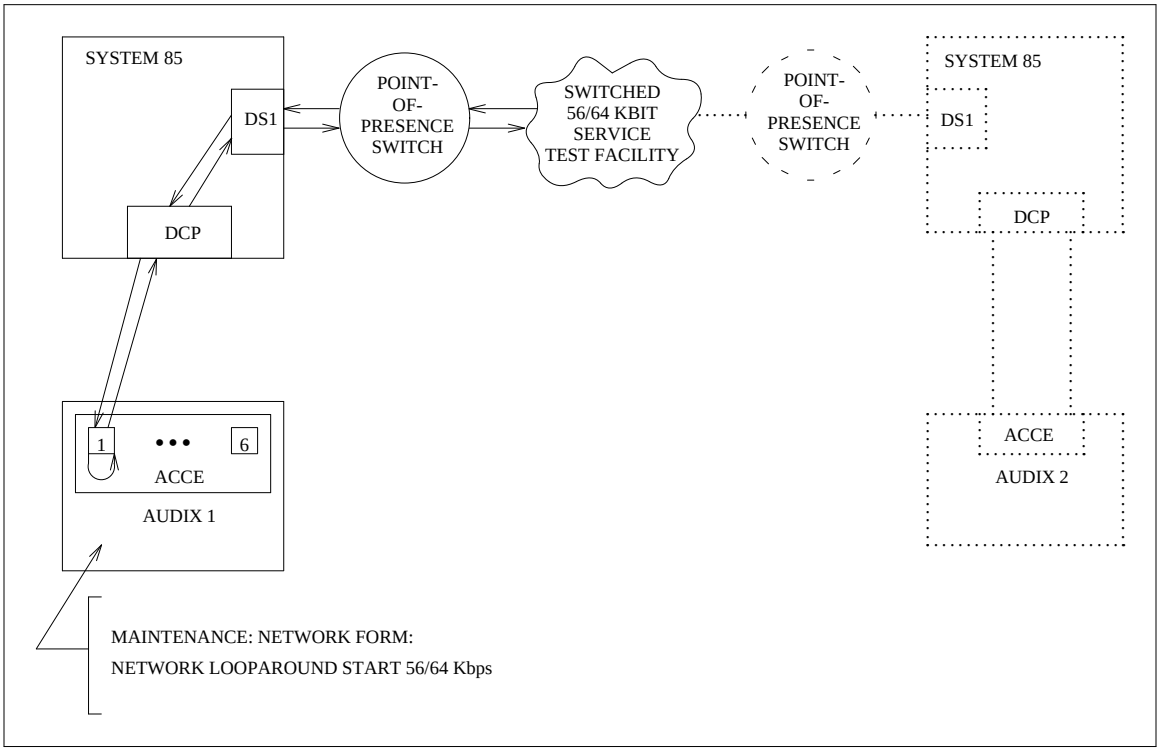


Figure 14-18. 56/64 Kbps Network Loop-Around Test

Step 3: Performing Channel or Modem Loop-Around Tests

If the appropriate tests in step one and step two fail, perform the appropriate test:

- Channel internal loop-around test
- Modem loop-around test

Step 3A: Channel Internal Loop-Around Test

This test is used to verify the operation of an individual channel on the ACC or ACCE board. No connection (that is, no call) is needed for this test.

1. Go to the `maintenance : network` form.
2. Set *select test* to `2`.
3. Go to *channel* and enter `1, 2, 3,` or `4`. Press CHANGE or RUN. Wait for the result. If the test is not successful, check the `system : log` and/or go to *Flowcharts For Troubleshooting the Network*.

NOTE

Use the modem loop-around test (test 6) for channel 5 or 6.

Step 3B: Modem Loop-Around Test

This test is only for modems connected to the RS-232 channels (that is, channel 5 or channel 6). It will test the loop to the modem and back. No action is required at the modem for this test.

1. If you are *not* using a MICROCOM QX 3296/C modem, go to step 2. If you are testing a MICROCOM QX 3296/C modem, you must first go to the `system : translation : network port` form. Record the three *data rate* fields and the *modem initialization string* field for the channel to be tested. These values will be restored once the test is completed. Now change the *data rate* fields to `2400` and change the *modem initialization string* field to `AT\n0`. Press CHANGE or RUN.
2. Go to the `maintenance : network` form. Set *select test* to `6`. Set *channel* to `5` or `6`. Press CHANGE or RUN. Wait for the result. If the test is not successful, check the `system : log` and/or go to *Flowcharts For Troubleshooting the Network.*
3. If you are testing a 3296/C, go back to the `system : translation : network port` and restore the original translations.

SETTING UP REMOTE UPDATES

Before activating the Remote Updates feature, check to see if calls between systems are toll calls. Also, check the number of subscribers that already exist (`traffic : feature : day` form). If there are much more than 100 local subscribers, the customer may want to wait for a low traffic period and/or discount calling time before updates are activated.

Step 1: Activating the Remote Updates Feature

Perform the following steps to activate remote updates. To start with, activate remote updates only between the local AUDIX machine and one remote machine.

1. Log in to the local AUDIX system and go to the `system : translation : remote updates` form. Set *allow full updates (y/n)?* to `y`. Press CHANGE or RUN.
2. Go to the `system : translation : machine : audix/amis/call delivery` form. Press ENTER to display the profile of the local system.
3. Set *updates in (y/n)? to* `y`. Set *updates out (y/n)?* to `y`. Press CHANGE or RUN.
4. Set *machine name* to the name of one of the remote AUDIX systems. Press ENTER. Repeat step 3.
5. *For R1V3 and R1V4 systems only:* Go to the `maintenance : audits : fp` form and run a network data audit. (This step is not necessary for R1V5 and later systems.)
6. Repeat steps 1 through 5 at the remote system you selected in step 4. Note that the ‘‘remote’’ system becomes the ‘‘local’’ system once you log in to it.

Step 2: Testing the Remote Updates Feature

Demand Update Procedure

This procedure will cause a full update from the specified system only.

1. Go to the `system : translation : remote update` form. Set *request full update from (machine name)* to the name of the remote AUDIX system and press CHANGE or RUN.
2. Go to the `maintenance : network` form and perform a connection test to the system specified in step 1. If this is the first remote update from this system, the connect test could take a long time if there are a large number of subscriber records to be sent.
3. Once the connect test has completed, go to *Log In to the Remote Adjunct.*

Log In to the Remote Adjunct

1. After the automatic or demand update has completed, log in to the remote system and check the `list : extension : remote` form to see if the subscribers from the local system are now identified by the remote system.

   NOTE

   You can also check the number of remote and non-administered remote subscribers shown on the `traffic : feature : day` form. The total of these two fields should equal the number of local subscribers shown on this same form at the other AUDIX system.

   Check the *type* field. If any of the subscribers are type `v` (verified) or are type `u` (unknown), there may be a minor problem. Most likely the subscriber(s) extension and/or name is duplicated somewhere in the network. Check the following:

   a. The subscriber's extension must be within the address range of their local AUDIX system.

   b. Go to the `subscriber : remote` form, enter the subscriber name or extension/machine name, and press ENTER. See if more than one machine name is listed. If so, the subscriber cannot be pinpointed to a single AUDIX system. Check for the appearance of the extension at multiple systems. Also, see if the subscriber's alphanumeric name on the `subscriber : local` form matches another subscriber's name. Keep in mind that the alphanumeric pattern is converted to a touch-tone key pattern. For example, 'Smith, Randy' (7-6-4-8-4, 7-2-6-3-9) and 'Smith, Sandy' appear the same to the AUDIX system.

   c. At the remote AUDIX system, check the administrator's log to see if the subscriber has a ''name not recorded'' entry. If so, record the name. The update facility, at the scheduled interval, will then transmit the change to the other AUDIX systems and will change the subscriber status to `administered .`

   d. `At the remote AUDIX system, see if the subscriber has a valid profile (subscriber : local).`

   e. See if the number of subscribers being added to the system (both local and remote) exceeds the limit assigned on the `system : limits` form.

2. Repeat step 2 at the local system to see that the subscribers at the remote system are now identified at the local system.

Step 3: Performing Voice Mail Test

1. *At the Local Switch*, create a message and manually address it to remote subscribers as follows:

   a. Log in to the AUDIX system and create a message such as ''I am testing manual addressing to remote subscribers. Please call me to verify that you have received the message.'' The message header will tell them who to call.

   b. When requested to enter an extension, enter a remote subscriber address as specified on the `system : translation : machine : audix/amis/call delivery` form, followed by #. Enter one remote subscriber from each remote switch.

   c. When finished addressing, press * * # for immediate delivery.

d. From the main activity menu, press option 4 to check the status of the message delivery.

— At this point, the status will be ‘‘REMOTE—UNDELIVERED.’’

— After the message has been delivered to the remote AUDIX system, the status will be ‘‘DELIVERED.’’

— After the remote subscriber has heard the message, the status will be ‘‘DELIVERED—ACCESSED.’’

2. *At the remote switch,* have the remote subscribers verify the following:

   a. Their MESSAGE lamp is lit.

   b. When they log in to the AUDIX system, the message header includes the AUDIX machine name (if assigned) and the subscriber ID.

3. *At the Local Switch,* repeat steps 1 and 2 only this time use a mailing list as follows:

   a. Log in to the AUDIX system and create a mailing list. Include a subscriber from each AUDIX system.

   b. Create a message and address it to the mailing list. The message should include something like ‘‘I am testing list addressing to remote subscribers. Please call me to verify that you have received the message.’’

   c. When finished, press (*) (*) (#) for immediate delivery.

   d. Press option 4 to check the status of the message delivery.

   e. Have the remote subscribers check for new messages.

4. Repeat Steps 1, 2, and 3 at each of the AUDIX systems in the network.

Step 4: Activating Remote Updates for Additional AUDIX Systems

1. If everything went okay in the previous procedures, add a third system to the remote updates facility. You will then have three machine profiles on three different systems with the Remote Updates feature active.

2. The next scheduled transmission interval at each AUDIX system will cause an update at the other two AUDIX systems. If done during out-of-hours, you can run a demand update using the `system : translation : remote update` form.

3. Check each system for the appearance of two sets of remote subscribers.

4. Run test calls to/from the newly added system.

5. If everything went okay, add additional systems one at a time.

CHECKING ADMINISTRATION LOG ENTRIES

The system administrator's log can be found on the `system : log` form. The following entries may appear in this log to help solve network connect failures. There are other entries not shown here that report other areas of concern such as a subscriber that has no name recorded.

- One of these entries may occur when the local system rejects an incoming network call from another system (TN539 or TN539B ACCE only):
  - — ''Rejected login from remote machine *machine name* - invalid password''
  - — ''Rejected login from remote machine *machine name* - unknown machine name''
  - — ''Rejected login from remote machine *machine name*'' (This entry means the call was rejected for some other reason.)
- One of these entries may occur when the local system has an outgoing network call to another system rejected (TN539 or TN539B ACCE only):
  - — ''Connect to machine *machine name* aborted - invalid machine name''
  - — ''Connect to machine *machine name* aborted - invalid password''
  - — ''Connect to machine *machine name* aborted - permission denied''
  - — ''Connect failure to machine *machine name*'' (see NOTE)
    (This entry means that there was a problem at the switch: no dial tone, no ringing, busy, dial denied, try again, no carrier, no answer, answered - no response, no resources, protocol handshake failure, premature hang up, or some other reason.)
  - — ''Continuing connect failure to machine *machine name*'' (see NOTE)
- One of these entries may occur when the local system has an outgoing network call to another system rejected (TN366 or TN366B only):
  - — ''Machine *machine name* rejected login''
  - — ''Connect failure to machine *machine name*'' (see NOTE)
  - — ''Continuing connect failure to machine *machine name*'' (see NOTE)

NOTE

The called system will reject a network call if it is very low on voice message space. Local subscribers are given preference over incoming networked messages if disk space is low.

TROUBLESHOOTING THE NETWORK

These flowcharts should help you to troubleshoot the network when you get a ‘‘failed’’ result for one of the tests. The `system : log` form might also help with troubleshooting the network. A list of network-related entries in this log are provided in the previous section, *Administration Log Entries for Networking*. Test procedures can also be found under *Testing the Initial Setup of the Network*.

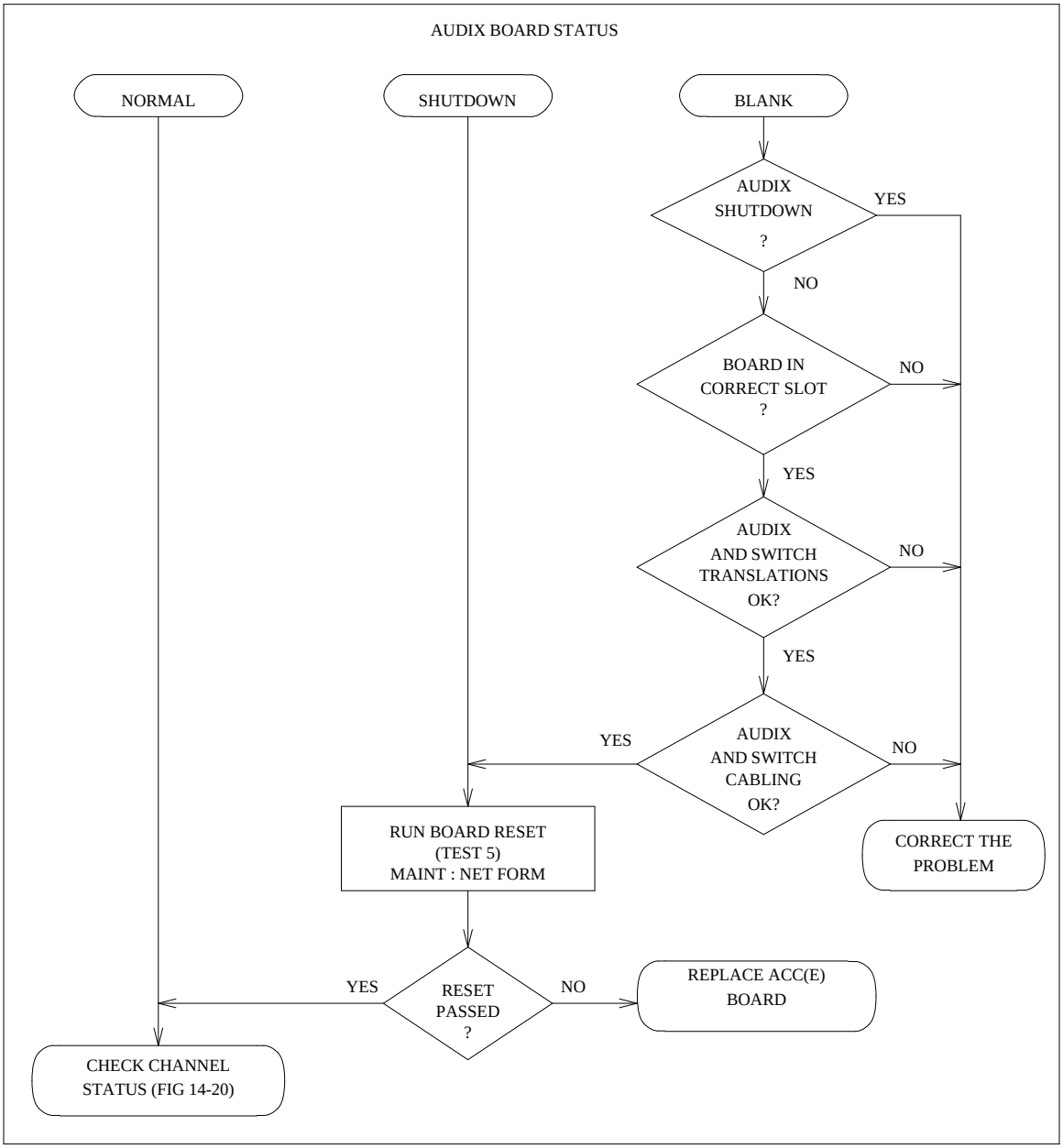


Figure 14-19. Checking the ACC(E) Board Status

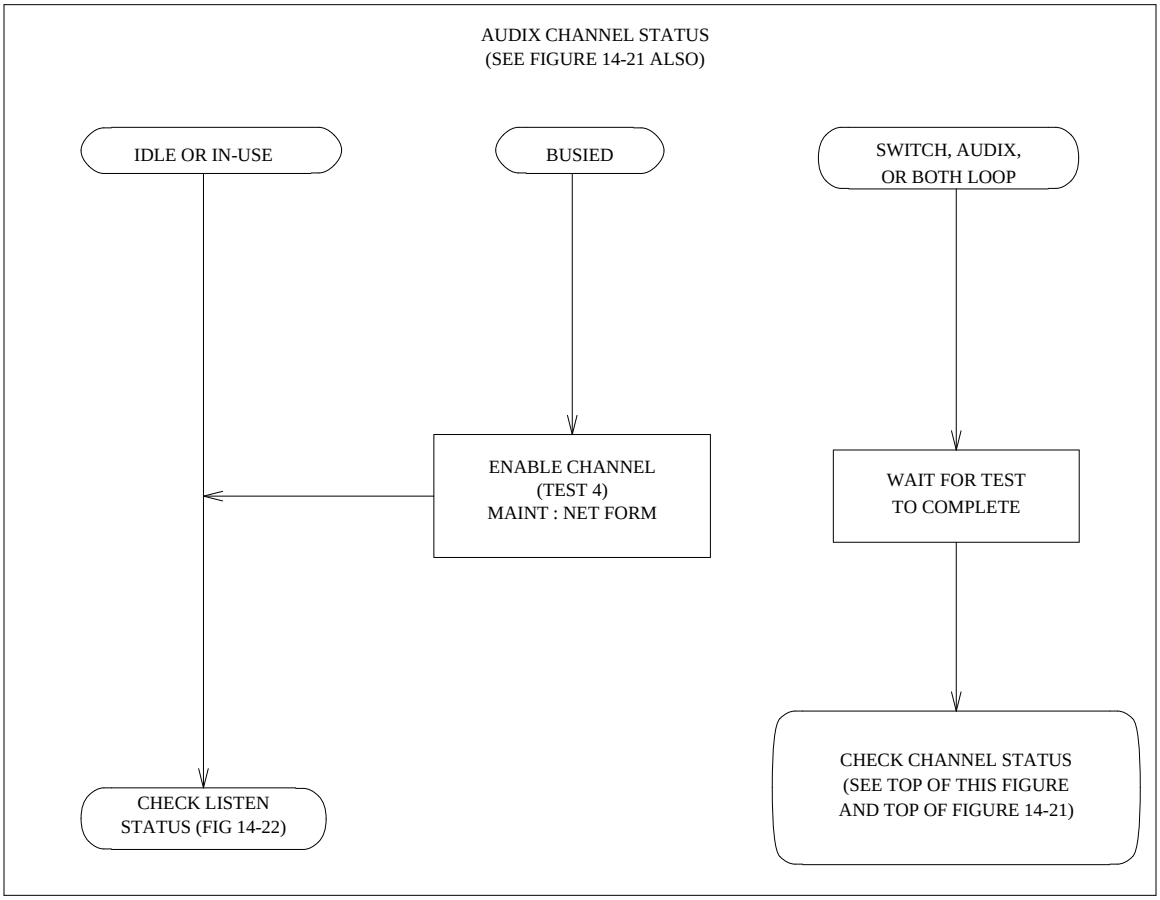


Figure 14-20. Checking the ACC(E) Channel Status

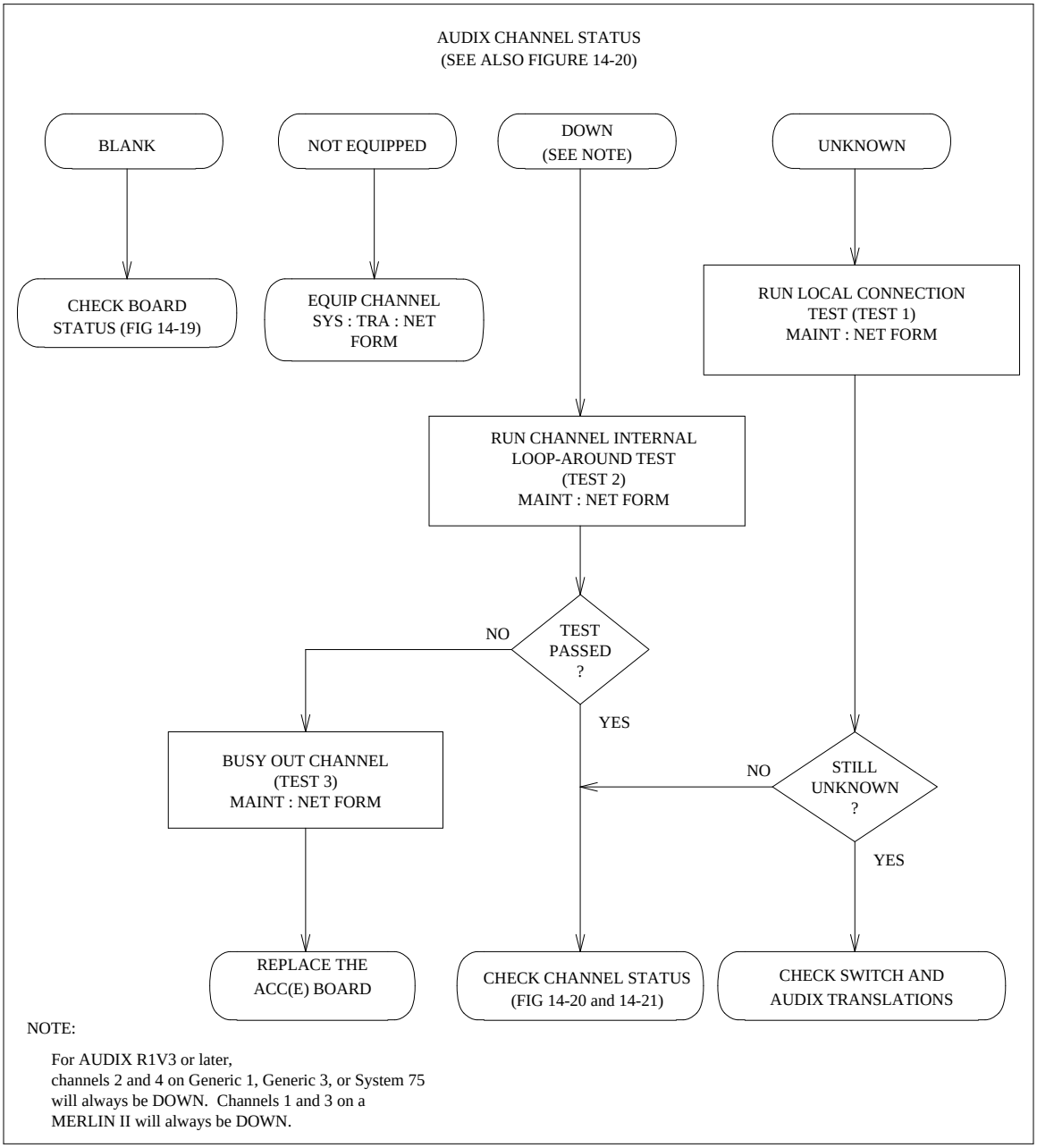


Figure 14-21. Checking the ACC(E) Channel Status

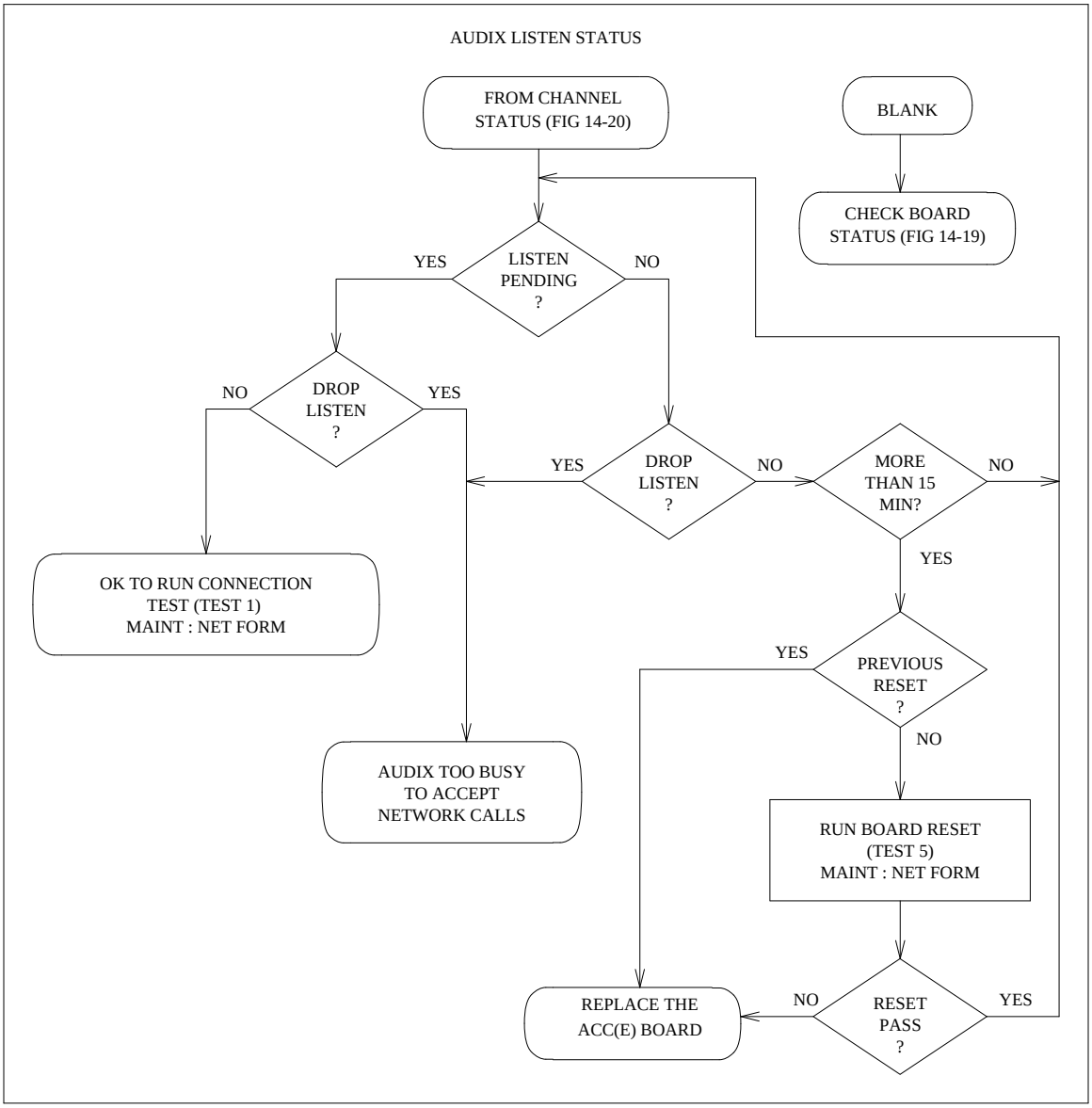


Figure 14-22. Checking the AUDIX Listen Status

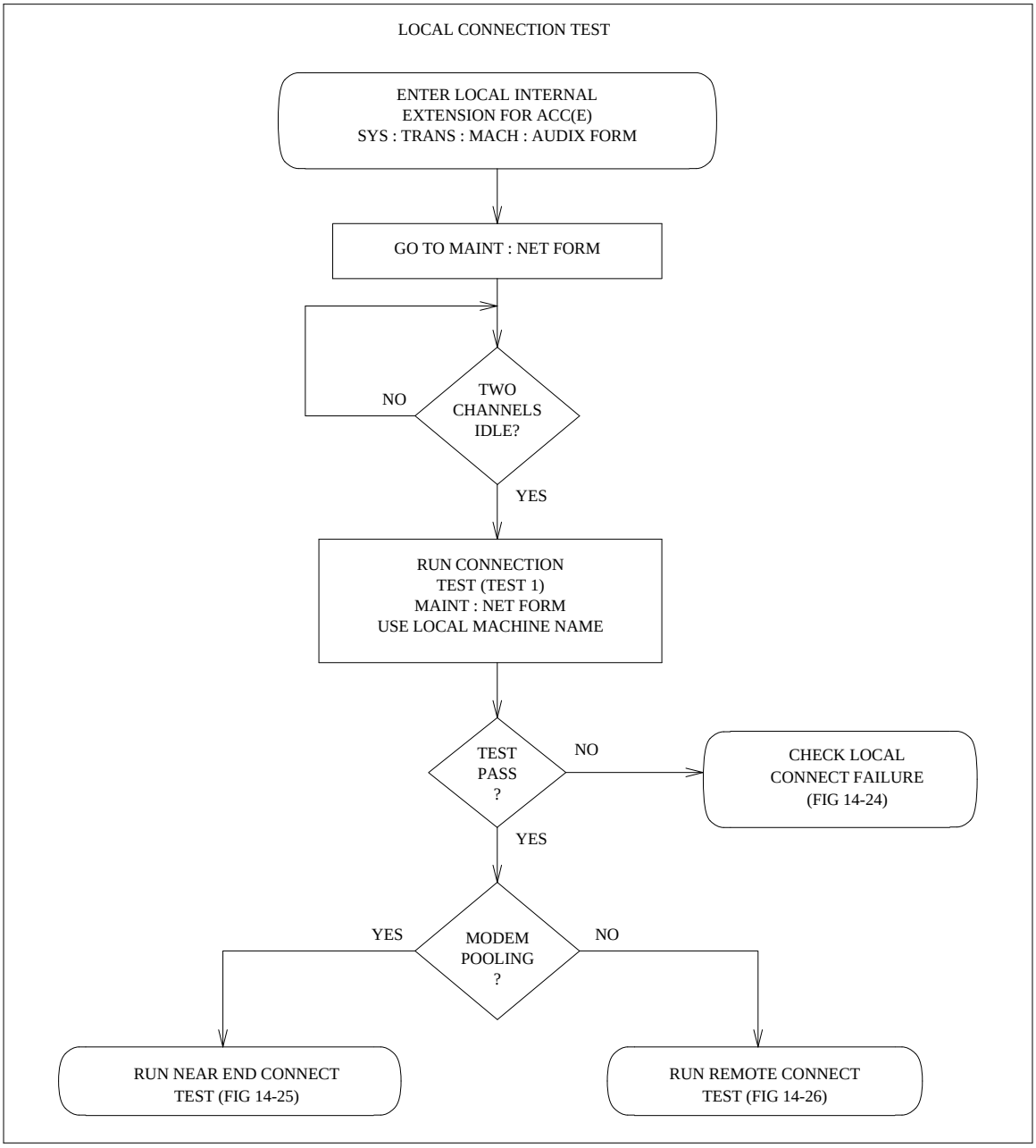


Figure 14-23. Local Connection Test

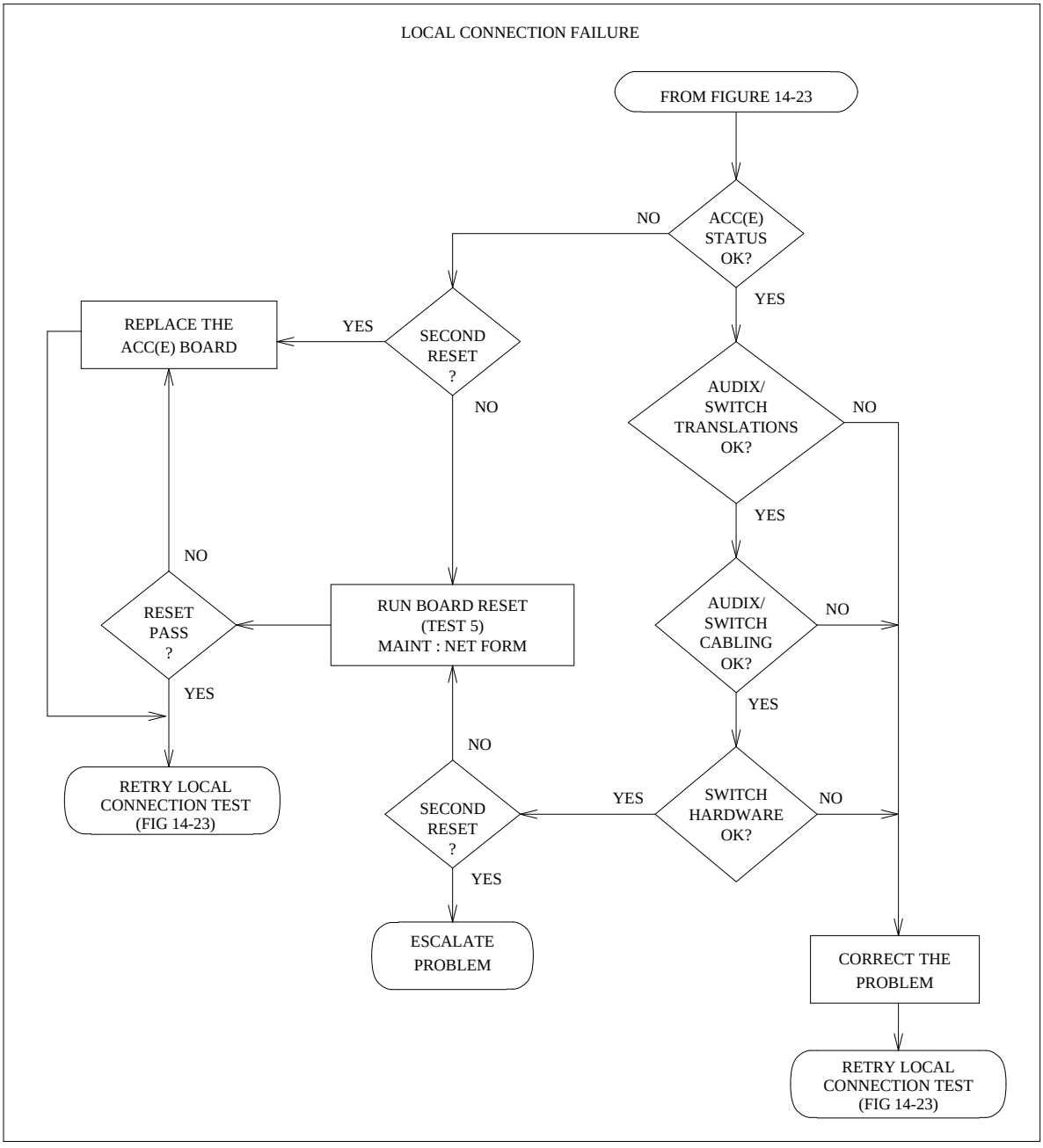


Figure 14-24. Local Connection Failure

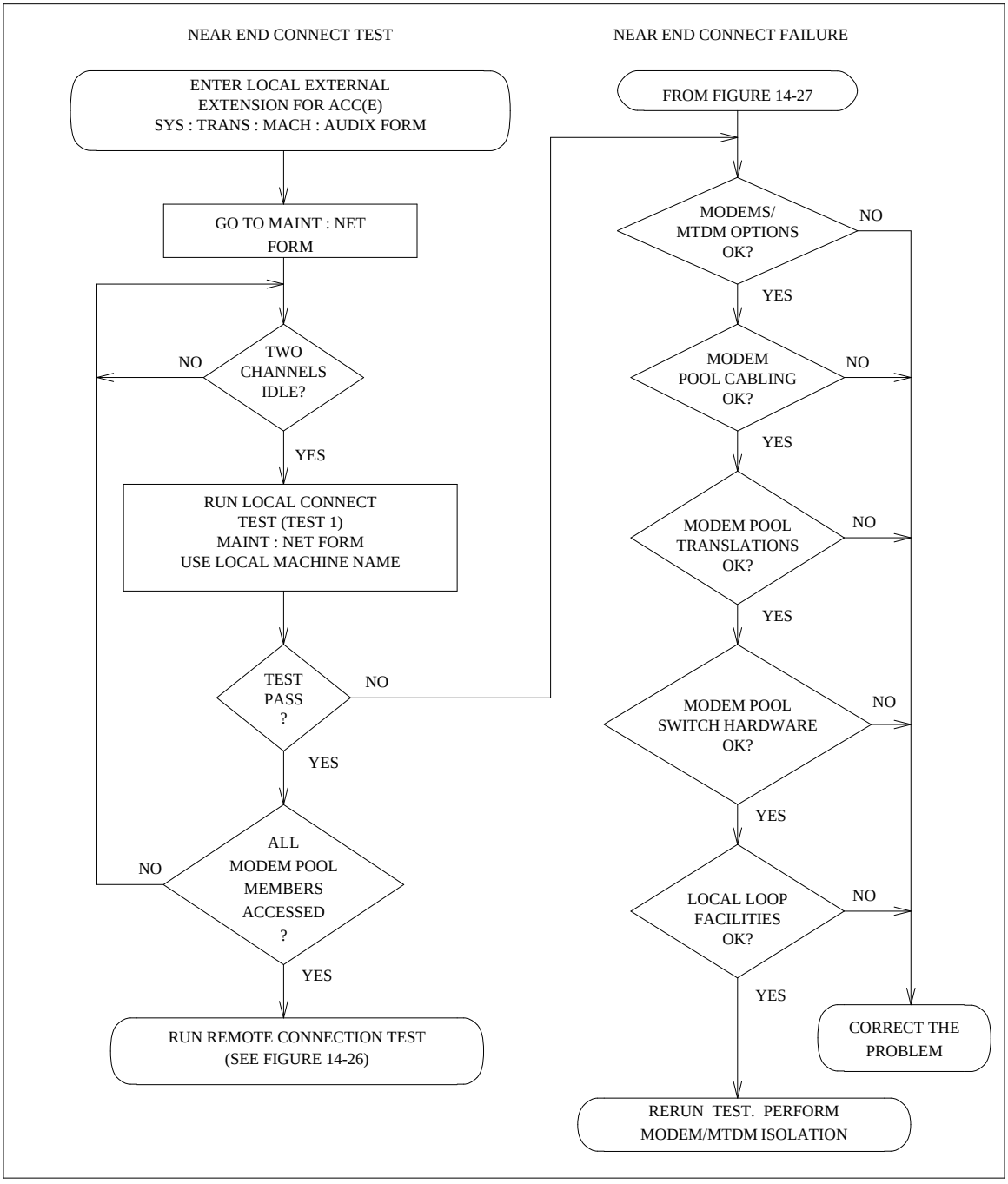


Figure 14-25. Near End Connection Test and Failure

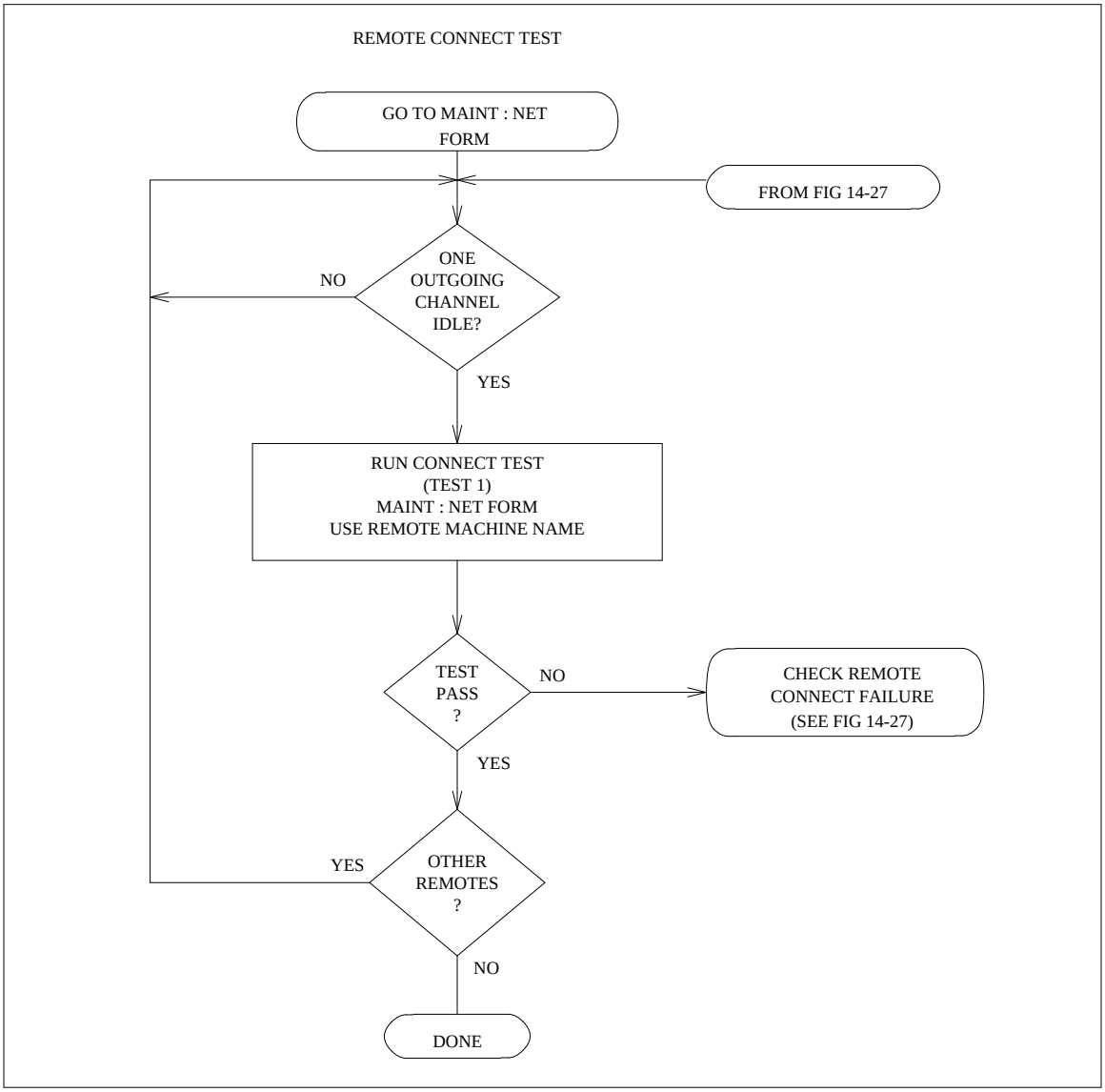


Figure 14-26. Remote Connection Test

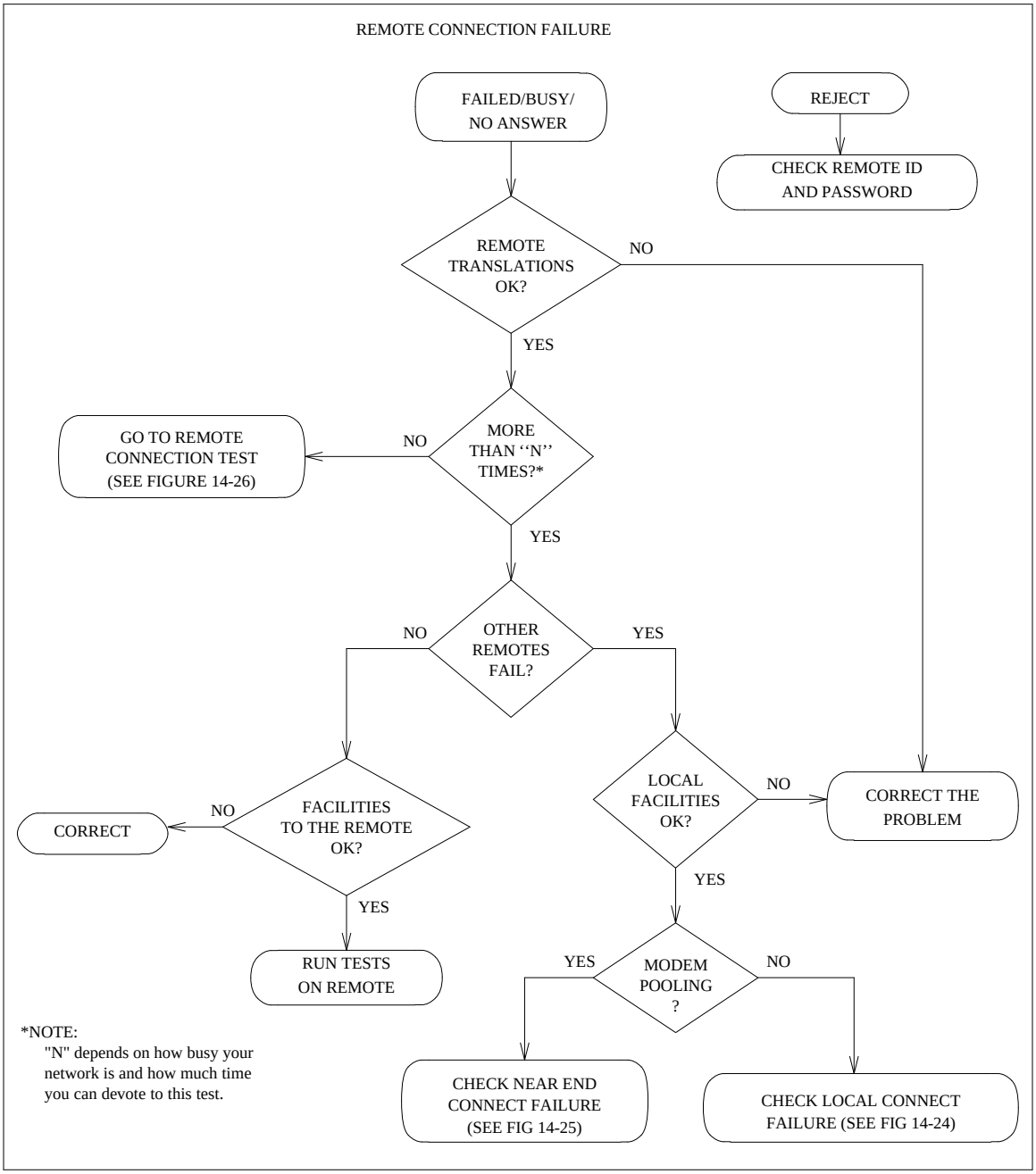


Figure 14-27. Remote Connection Failure

A. Network Considerations

This appendix is targeted for the Business Communications Systems Design Center (BCSDC). Appendix B, *Sales Engineering Notes*, contains the information that must be completed by the account team and sent to the BCSDC. Every AUDIX Networking installation *must* be engineered by the BCSDC.

NOTE

The information in this appendix may also be useful to the AUDIX Networking coordinator. The worksheet provided in this appendix should help the coordinator with equipment assignments and extension numbers.

BCSDC CONSIDERATIONS

The BCSDC should consider the following:

- *AUDIX and Switch Equipment:* See Chapters 1 through 7 for AUDIX system and switch requirements for each particular setup.
- *Disk Drive Capacities:* When an AUDIX system is networked with another AUDIX system, additional demands may be placed on the storage devices. Each AUDIX system is not only asked to store the names, profiles, and messages of its local subscribers, but also the names, profiles, and messages from remote subscribers.

  Also, whenever a message is addressed to a remote subscriber, the message is placed in a queue until it can be sent to the remote machine. If the transmission interval is set to deliver remote messages only once or twice a day, the queue area of a particular machine may be asked to store up to 150 messages. Once this limit is reached, a connection to that machine is attempted in order to transmit the messages in queue.
- *Trunking:* AUDIX R1V6 or later software can support up to six network calls at one time (provided the system has a TN539 vintage 7 or a TN539B ACCE). However, an AUDIX R1V6 or later system connected to a System 75, System 75 XE, DEFINITY Generic 1 or Generic 3, or MERLIN II network can only support four simultaneous calls (two DCP and two RS-232) if the AUDIX system has a TN539 vintage 7 or TN539B with six ports.

  AUDIX R1V5 systems can support four simultaneous calls no matter what switch is used, provided the system has the TN539 or TN539B with six ports (with MERLIN II networking this is assuming two RS-232 ports and two DCP ports).

  With that in mind, new trunk circuits may or may not be required between switches in the network. AUDIX system traffic may be able to share existing trunk circuits with other types of inter-node traffic. AUDIX network traffic is determined by the following:

  — The configuration of the network (see Figure A-1, *Trunking Requirements in an AUDIX Network*).

  — Does the customer intend on using AUDIX system remote updates feature? If so, and this is generally the case, only a slight additional load is placed on the networking links once the initial exchange of subscriber data is made.

— What networking transmission interval is selected (that is, the amount of time between scheduled calls to other systems for passing messages). Does the customer want several short calls spread out during the day or one or two longer calls made during off-hours.

— The amount of voice mail typically addressed to remote subscribers.

— The typical length of these remotely addressed messages.

- *Administration:* Each AUDIX system and each switch in the network requires administration. Once you have determined how the network should be configured, give the information to the coordinator (appointed by the customer and/or AT&T representative) who will make sure each step of the order is completed successfully. This will make troubleshooting of any problems simpler. The steps are:

  1. *Install, assign, and test the switch* for any newly required trunk facilities. This may include modem pooling. **Facilities administration may cause service interruptions.** For example, if the Alternate Voice/Data (AV/D) bit needs to be set for a Data Services 1 (DS1) trunk group, all trunks must be removed from the group, the group deleted, and everything added back (with AV/D now activated).

  2. *Install, assign, and test the AUDIX system(s)* for local service. **This usually requires data link administration which may cause service interruption of other features such as Call Management System (CMS), Distributed Communications Service (DCS), and Message Center.** If the AUDIX Communications Controller (ACC) board is already installed, busy out its channels so the system does not acknowledge them until the network is installed. If the ACC is not installed, leave it out until after the AUDIX network is installed.

     NOTE

     The network channels must be busied out after any reboot.

  3. *Assign the AUDIX systems* for networking service one at a time.

- *Communities of interest*: Whenever possible, it is recommended that an entire community of interest be administered on a single AUDIX system. Communities of interest consist of subscribers who will exchange messages frequently (for instance people in the same department or working on the same project).

  This arrangement is not required, but by keeping all members of a community of interest on the same machine, remote message traffic could be reduced. Also, remote message throughput could be increased and remote message delivery times could be decreased.

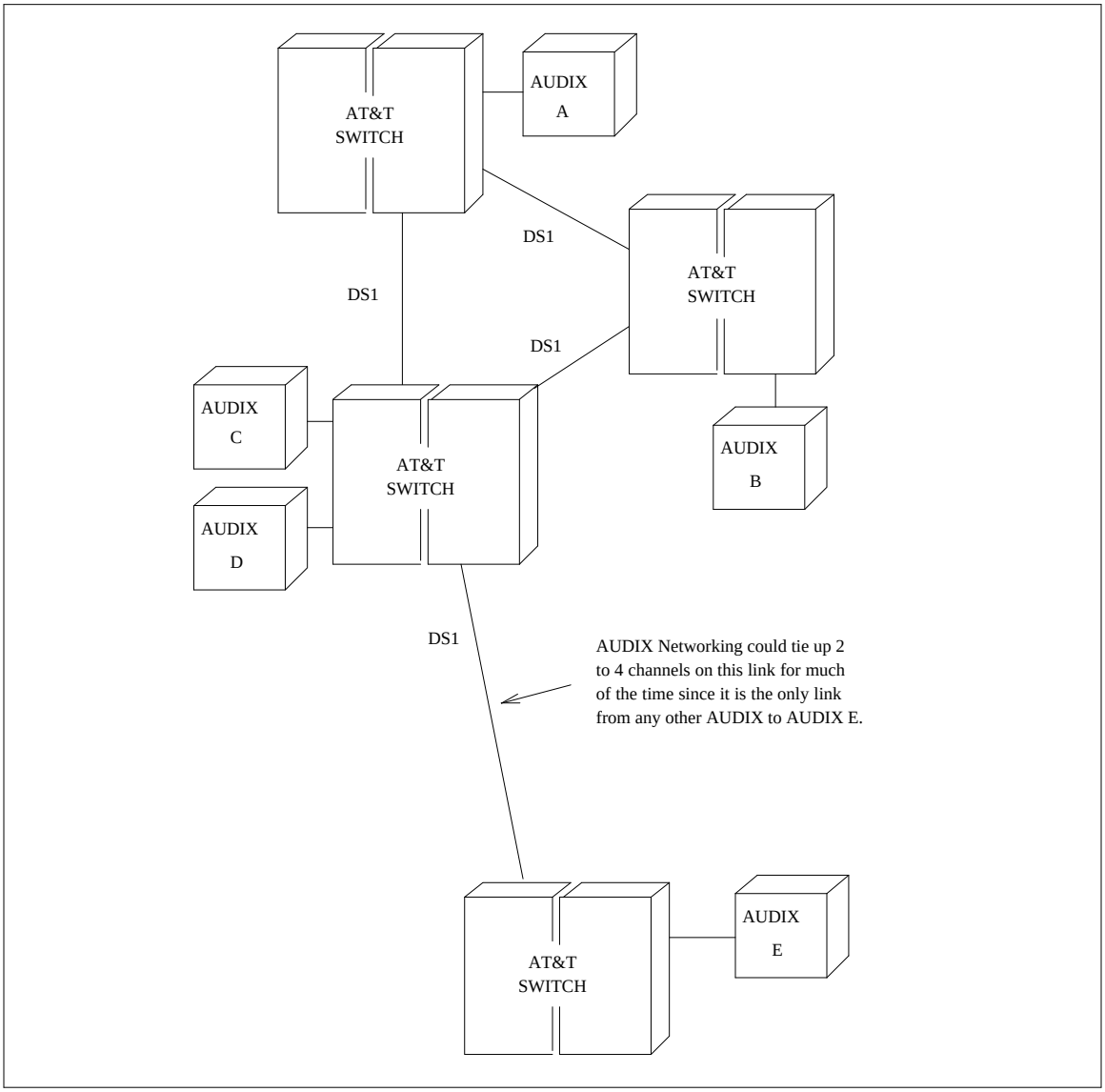


Figure A-1. Trunking Requirements in an AUDIX Network

AUDIX NETWORK PLANNING WORKSHEET

Network Coordinator: *Fill out* one of the following worksheets for each AUDIX system in the network. *Then give* the set of worksheets to the account team or the technician to be used to set up and administer the AUDIX network correctly. This section provides an explanation of each field.

NOTE: Keep this worksheet as a master copy. Make copies for each AUDIX system.

Machine Name Unique name chosen by the customer. Used to identify the AUDIX system and the users at the system. The machine name will appear on the STATUS line of the AUDIX administration or maintenance terminal after a restart. On R1V5 or later systems, you may simply reset the ACC or ACCE and re-login.

Machine Password This password is used by other AUDIX systems to gain access to this system when delivering network messages. The password should be unique for security reasons, but must be consistent across the entire network for that machine.

Address Ranges A specific range or set of ranges that define the dial plan of the AUDIX users on this AUDIX system. Use specific ranges if possible (up to 10 are allowed). This will save the AUDIX system from processing misaddressed messages. If this is not possible, turn the *send messages to non-administered remote subscribers* flag off.

Prefixes are optional codes that precede the required extension ranges. A prefix can be up to 27 characters and may be the same as an RNX number, a DID number, or an alphabetic code that is a mnemonic of a location or machine.

Starting/Ending Extensions are required 3- to 5-digit numbers. At least one of the address ranges should have *no* prefix; the local machine never requires a prefix.

Duplicate address ranges (also called full overlaps) can only appear in the network up to 8 times in an R1V3 or R1V4 network. In networks running R1V5 or later software, up to 16 full overlaps are allowed. No subset or overlap of an existing range can be assigned.

DCS networks normally never use prefixes (since the intent is to make the networked machines appear as one large machine). **If the AUDIX system is connected to a switch that is a node in a DCS environment, the address range(s) should include the entire DCS environment.** See Figure A-3, *Address Ranges When Dealing with a DCS Environment*.

Examples:
System1= 2000-3999; System2= 5000-5999: This is okay.
System1= 2000-3999; System2= 2000-3999: This is okay (full overlap).
System1= 2000-3999; System2= 3000-5999: This is *not* okay (partial overlap).
System1= 2000-3999; System2= 2000-2999: This is *not* okay (subset)

Class of Service This is the class-of-service assigned on the switch for the digital (DCP) and RS-232 extensions to which the ports are assigned.

AUDIX NETWORK PLANNING WORKSHEET

Machine Name _____ Machine Password _____

Address Ranges:	Prefix	Starting Extension	Ending Extension
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Class of Service for Networking ports: _____ (Use a separate class of service with only touch tone and data privacy on it.)

EXTENSIONS:

Type of Connectivity and quantity of DCP extension numbers, if applicable, will depend upon the design. At least one of the extension numbers must be a DID. Please identify which one is the DID number.

DCP Extension Numbers:_____ RS232 Connectivity Extension Numbers:_____
_____ _____
_____ RS232 (Converted to DCP Connectivity) Extension Numbers: _____
_____ _____

System 75/G1 Extension Number of Hunt Group(s), if applicable _____

EQUIPMENT (Switch Ports):

Digital Equipment Locations: ___-___-___-___-___(DCP) ___-___-___-___-___(RS232 Converted)
___-___-___-___-___(DCP) ___-___-___-___-___(RS232 Converted)
Analog Equipment Locations: ___-___-___-___-___(RS232)
___-___-___-___-___(RS232)

DIAL STRING:

The Dial String to route messages out of this Audix may need to incorporate various switch routing options. Please identify which switch option this design will implement and the trunk or feature access code being used to accomplish this. (Mark to the left of the category with an "X".)

____DCS; Main/Satellite; Multi-digit Steering, etc. (Incoming extension numbers will be utilized)
____ETN/PNA (FAC _____) ____ARS (FAC_____)
____Dedicated (Static) Trunk Group (TAC _____) ____OTHER (TAC/FAC _____)

For those routing options which utilize a feature access code or only an extension number, please identify the trunk group number and trunk access code of the facility providing the transmission path:
TG_____TAC_____

Switchroom Telephone Number: _____ AUDIX Remote Maintenance Number: _____
(Preferably through INADS)

Figure A-2. AUDIX Networking Worksheet

DCP Extension Numbers

The switch data port extensions used for the AUDIX DCP network ports. System 85 and DEFINITY Generic 2 traditional modules require four extensions assigned in a hunt group. Make the hunt group accessible to Direct Inward Dialing (DID), DCS, or tie trunks (DID is the most common). Generic 2 universal modules require at least a TN366B vintage 2 ACC, a TN539 vintage 4, or a TN539B ACCE in the AUDIX system in order to support four channels.

System 75, System 75 XE, Generic 1, Generic 3, and MERLIN II require two extensions. If the Generic 2 universal module is connected to a TN366 or TN366B vintage 1 ACC, it is also limited to two extensions.

RS232 Connectivity Extension Numbers

The RS-232 numbers refer to the new ports (channels 5 and 6) available in R1V5 or later AUDIX systems equipped with a TN539 or TN539B ACCE. Two extension numbers are required and should be in their own hunt group with a DID number as the lead extension.

This field refers to *analog* RS-232 connections where the AUDIX system is to be accessed via a switched RS-232 connection (that is, the AUDIX system will be cabled to a switch port through a modem). This is specified as an *rs232a* (asynchronous) type of connection on the AUDIX `system : translation : network port` form.

NOTE

If one AUDIX system is directly connected to another through a null-modem cable, no switch extension numbers are necessary.

RS232 (Converted to DCP Connectivity) Extension Numbers

The RS-232 numbers refer to the new ports (channels 5 and 6) available in R1V5 or later AUDIX systems equipped with a TN539 or TN539B ACCE. This field refers to *digital* RS-232 connections where the AUDIX system is to be accessed via an MPDM/M1* or 7400A data module. This is specified as an *rs232s* (synchronous) type of connection on the AUDIX `system : translation : network port` form.

Hunt Group Extension Number(s)

On System 75, DEFINITY Generic 1, or Generic 3 systems, this is the soft extension (DID) number used to access the AUDIX network hunt group. Typically only one hunt group is assigned.

Equipment (Switch Ports)

This is the equipment location code for the DCP and/or RS-232 ports (formerly called the Equipment Line Location).

Dial String

At times it is appropriate for AUDIX to use the switch's routing features. Select any that apply to your switch and indicate the Feature Access Code (FAC), Trunk Access Code (TAC), or Trunk Group (TG) as required.

Switchroom Number

DID telephone number of the switch room. This number is used to contact the technician.

AUDIX Remote Maintenance Number

The Remote Maintenance Terminal (RMT) DID number assigned to the modem connected to the AUDIX maintenance port H00. This allows remote services personnel to log in for troubleshooting and/or administration.

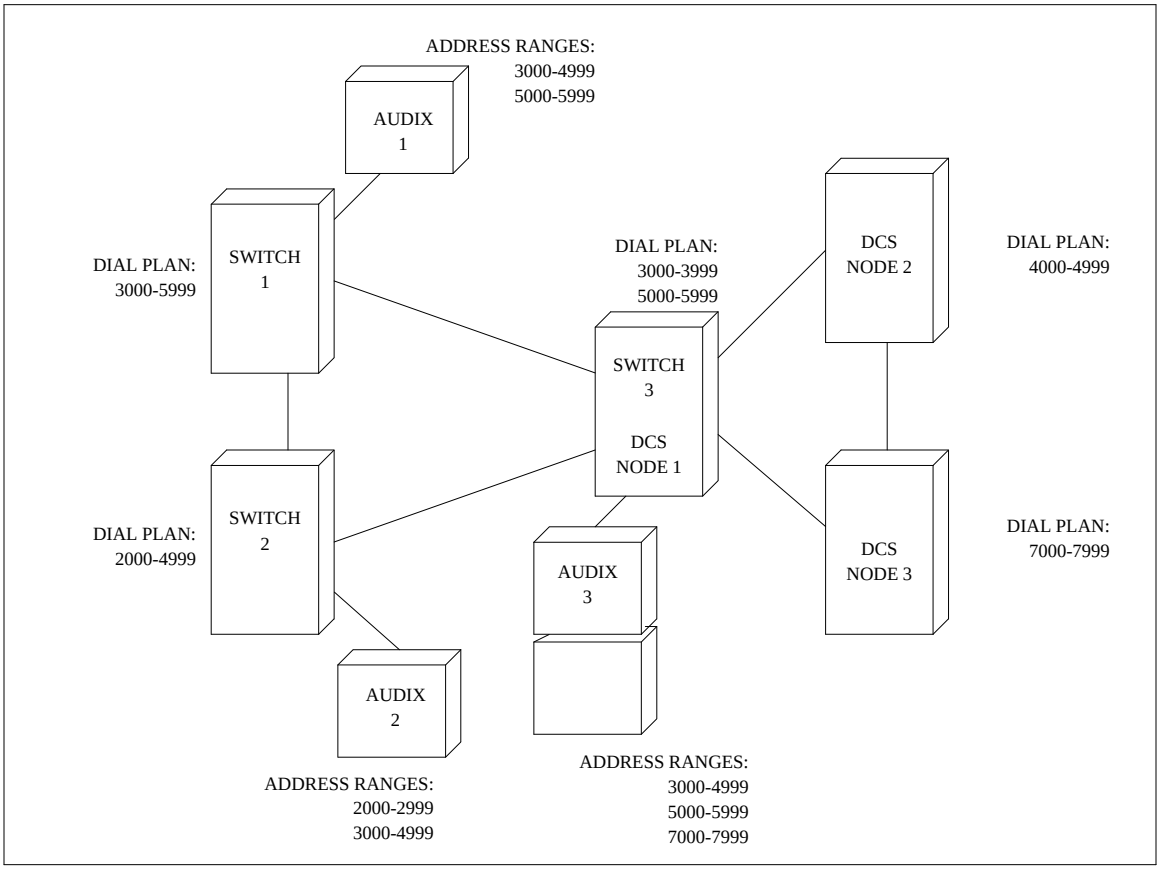


Figure A-3. Address Ranges When Dealing with a DCS Environment

Legend:

‘‘Dial Plan’’ indicates the extensions in use at the switch. These are both AUDIX subscriber extensions and non-subscriber extensions.

‘‘Address Ranges’’ indicates the extensions assigned on the `system : translation : machine : audix/amis/call delivery` form for the local system.

The purpose of Figure A-3 is to show that the address ranges assigned at AUDIX system 3 should include the dial plan of the entire DCS environment (Nodes 1 through 3), even though AUDIX system 3 serves only Node 1. The reason for this is that a caller at Switch 2, after unsuccessfully reaching a ‘‘live’’ person at Switch 3, cannot transfer out of the AUDIX system to a person at Node 2 or Node 3 unless the extensions at those nodes appear in the address range(s) along with Node 1’s.

Figure A-3 also shows how multiple ranges and duplicated ranges are used as opposed to using 0000 – 9999 at all systems. Using 0000 – 9999 would require memory allocation for extensions that do not exist.

B. Sales Engineering Notes

This appendix contains information intended to assist the AT&T sales engineer. The account team should provide any information requested in this appendix to the BCSDC.

BASIC AUDIX AND MISCELLANEOUS AUDIX FEATURES

There is no formal engineering responsibility for basic and miscellaneous AUDIX features. Basic designs for new AUDIX systems, whether stand-alone or integrated with a compatible switch, should be completed at the branch office. This includes sizing of the voice ports and disk space when associated with normal AUDIX operation.

DCS NETWORKS AND AUDIX

If an AUDIX system that uses Mode 3 networking is to be added or installed as part of a Digital Communications System (DCS) network, the BCSDC must be contacted in order to account for the increased traffic the AUDIX system will create on the tie-trunks among the DCS switch nodes (AUDIX voice calls use the DCS network tie-trunk facilities).

ENGINEERING WORKSHEETS

When a customer is implementing an AUDIX network, the branch must submit an E1154 form and Design Implementation Guide (DIG) forms to the the Business Communications Systems Design Center (BCSDC) before any network engineering will be completed. The branch office should also order a *Design Implementation Guide* from the BCSDC. To order this document, contact the Design Center Control Desk at (303) 850-8884.

The BCSDC will provide the branch office with worksheets that the branch must complete if a customer has ordered DCS AUDIX, AUDIX Networking, and/or DC AUDIX. The BCSDC is responsible for the power equipment for DC AUDIX.

QUALITY PROTECTION PLAN CHANGE NOTICE (QPPCN)

Any upgraded equipment may be ordered by using a Price Element Code (PEC) or, in some cases, by a QPPCN through the QPPCN Coordinator. Marketing should verify that QPPCNs are kept up-to-date and, with each addition, make sure that any specific QPPCNs which apply to that addition have been completed.

UPGRADES, SOFTWARE, AND VINTAGES

It is a Marketing responsibility to verify that correct software exists in both the Private Branch Exchange (PBX) and the AUDIX system and that correct vintages of circuit packs exist in the AUDIX system to accommodate any added features. For example, a Distributed Communications System (DCS) environment with more than five PBXs in the cluster will require checking if the TN533 SCPI is the correct vintage. Use the `maintenance : system : vintage` form documented in the appropriate AUDIX forms reference manual to determine required minimum vintages.

C. AMIS Analog Networking

The AMIS Analog Networking feature is an alternative to digital networking for exchanging messages between voice mail systems. Customers using the AMIS Analog Networking feature can exchange voice mail messages with any other voice mail system, anywhere in the world, provided both systems have AMIS analog capabilities. (Messages can even be exchanged with voice mail systems made by vendors other than AT&T.) The system administrator can administer a range of remote systems that can be addressed via *casual* addressing (known as *two-step* addressing); individual remote voice mail systems do not need to be administered. However, the system administrator can also choose to *pre-administer* any specific remote voice mail systems with which their AMIS analog traffic is heavy for *one-step* addressing (this simplifies the addressing procedure).

If subscribers are to receive AMIS analog messages, the system administrator must have administered the local AUDIX to accept incoming AMIS messages. The body of an AMIS analog message is the same as any other voice mail message, but the header information may be different. For messages from remote systems administered for two-step addressing, the header includes the telephone number of the voice mail system and the mailbox ID from which the message was sent.

Two types of remote AMIS connections can be defined:

- *amisac* — (AMIS casual, referred to as AMIS two-step addressing) In most cases to address AMIS analog messages via two-step addressing, users must know the AMIS prefix (if one is defined), the full telephone number (area code and country code may be necessary) of the receiving voice mail system, and the mailbox ID of the user who is to receive the message.
- *amisap* — (AMIS pre-administered, referred to as AMIS one-step addressing) Subscribers can address AMIS analog messages to systems administered for one-step addressing in exactly the same way they do to a remote system networked in any other manner. When a remote system is administered for one-step addressing, remote subscribers can be administered on the local system. These administered remote subscribers can be addressed by name as well as by extension.

See *AUDIX Administration* (585-305-501) for information on administering the AMIS Analog Networking feature. See *AUDIX Feature Descriptions* (585-305-203) for an overview of the AMIS Analog Networking feature.

Abbreviations

AC	Alternating Current
ACC	AUDIX Communications Controller (for networking)
ACCE	AUDIX Communications Controller — Enhanced
ACD	Automatic Call Distribution
ACP	Advanced Communications Package
ADAP	AUDIX Data Acquisition Package
ADFTC	Analog/Digital Facilities Test Circuit
ADU	Asynchronous Data Unit (Z3A)
AE	Account Executive
AMIS	Audio Messaging Interchange Specification
AMW	Automatic Message-Waiting Lamp
AMWI	Audible Message-Waiting Indicator
AMWL	Automatic Message-Waiting Lamp
AP	Applications Processor
API	Applications Processor Interface
AUDIX	Audio Information Exchange
AUDIX-L	Audio Information Exchange – Large
AUDIX-S	Audio Information Exchange – Small (renamed ‘‘one-cabinet AUDIX’’)
AUX	Auxiliary
AVD	Alternate Voice/Data
AWG	American Wire Gauge
BC	Bus Controller (TN506B)
BCSDC	Business Communications Systems Design Center
BCT	Business Communications Terminal
BCSDC	Business Communications Systems Design Center
BI	Bus Interface (TN716B)
bps	bits per second
BRI	Basic Rate Interface
BTU	British Thermal Unit
CCITT	International Consultive Committee for Telephony and Telegraphy

CMS	Call Management System
CO	Central Office
CPU	Central Processing Unit
CSM	Centralized System Management
CSSO	Customer Service Support Organization
DBP	Data Base Processor (Subsystem)
DBP-CPU	Data Base Processor Central Processing Unit (TN509, TN549, or TN472C)
DBP Bus	Data Base Processor Bus (also VME Bus)
DBPI	Data Base Processor Interface (UN160B)
DBP-RAM	Data Base Processor Random Access Memory (TN508 or TN532)
DC	Direct Current
DCE	Data Communications Equipment
DCIU	Data Communications Interface Unit
DCP	Digital Communications Protocol
DCS	Distributed Communications System
DFC	Dedicated Function Computer (also DBP-CPU)
DID	Direct Inward Dialing
DIM	Disk Interface Module (UN161B on AUDIX-L)
DLC	Digital Line Circuit (TN754)
DMI	Digital Multiplexed Interface
DOSS	Delivery Operations Support System
DRAM	Dynamic Random Access Memory
DS1	Digital Service 1
DSI	Digital Service Interface
DSL	Digital Subscriber Line
DSO	Data Service Organization
DSU	Data Service Unit
DTE	Data Terminal Equipment
EDC	Electronic Document Communications
EDI	Engineering Drawing Information
EIA	Electronic Industries Association
EMC	Electro-Magnetic Compatibility
EMI	Electro-Magnetic Interference

EPROM	Erasable Programmable Read Only Memory
ES	Enhanced Services
ESS	Electronic Switching System
ETN	Electronic Tandem Network
EUCD	Enhanced Uniform Call Distribution
FAC	Feature Access Code
FP	Feature Processor (Subsystem)
FP-BI	FP Bus Interface (TN716B)
FP-CPU	FP Central Processing Unit (TN523 or TN591)
FP-PE	FP Processor Element (includes BI, CPU, and RAM)
FP-RAM	FP Random Access Memory (TN734)
FSD	Fixed Storage Drive (AUDIX-L)
FSW	Failure Status Word
GND	Ground
GPP	General Purpose Port (SN270B)
HDD	Hard Disk Drive (AUDIX)
HDLC	High-Level Data Link Controller
ID	Identification
IDI	Isolating Data Interface
INADS	Initialization and Administration System
INT	Interface Board 1 to 3 for System 75 SCI
IPC	Intelligent Peripheral Controller (TN507C on AUDIX-L)
ISCN	Information Systems Change Notice
ISDN	Integrated Services Digital Network
ISLU-T	Integrated Services Line Unit — T Interface
K or Kbyte	Kilobyte (1024 bytes)
LADS	Local Area Data Set
LAT	Local Administration Terminal
LDN	Listed Directory Number
LEC	Local Exchange Carrier
LED	Light-Emitting Diode
LMT	Local Maintenance Terminal
LWC	Leave Word Calling

MAAP	Maintenance and Administration Panel
MADU	Multiple Asynchronous Data Unit
Mbyte	Megabyte (≃ one million bytes)
M Bus	Memory Bus
MCS	Message Center Service
MDM	Modular Data Module
MEM	Memory (also RAM)
MFAT	Multifunction Analog Terminal
MFET	Multifunction Electronic Terminal
Mhz	Megahertz
MI	Maintenance Interface (TN531 or TN511)
MLHG	Multiline Hunt Group
MMC	Material Management Center
MMS	Material Management Services
MNP	Microcom Networking Protocol
MPSI	Multiprotocol Switch Interface
MON	Processor Monitor (TN535)
MPDM	Modular Processor Data Module
ms	Millisecond
MSC	Message Service Center
MSS	Message Service Center
MT	Multi-Tasking Terminal
MTBF	Mean Time Between Failures
MWI	Message-Waiting Indication
NC	Network Controller (TN727) (also NETCON)
NT1	Network Termination 1 Unit
OLS	Off-Line Switcher
PBX	Private Branch Exchange
PC	Power Converter (AUDIX-L), or Personal Computer
PDM	Processor Data Module
PE	Processor Element
PEC	Price Element Code
PI	Processor Interface

PIB	Processor Interface Board (same as PI)
PMX	Private Message Exchange
PRI	Primary Rate Interface
PROC	Procedure
PROFS	Professional Office System
PROM	Programmable Read Only Memory
QPPCN	Quality Protection Plan Change Notice
RAM	Random Access Memory
RAT	Remote Administration Terminal
RCD	Removable Cartridge Drive (AUDIX)
RCRC	Regional Customer Response Center
REC	Regional Engineering Center
RMATS	Remote Maintenance, Administration, and Traffic System
RMT	Remote Maintenance Terminal
ROM	Read Only Memory
RSD	Removable Storage Drive (AUDIX-L)
SADI	SCSI-to-AUDIX Disk Interface (AUDIX)
SAI	Synchronous/Asynchronous Interface (TN719 on AUDIX-L)
SAT	System Administration Terminal
S Bus	System Bus
SCA	Switch Communications Adapter
SCI	Switch Communication Interface
SCP	Switch Communications Processor (TN521)
SCPI	Switch Communications Processor Interface (TN533)
SCSI	Small Computer Systems Interface
SDU	Synchronous Data Unit (Z3B1)
SI	Switch Interface (also TN727 NC)
SIM	System Implementation Manager
SMDI	Simplified Message Desk Interface
SMSI	Simplified Message Service Interface
SMT	System Management Terminal
SNC	Service Node Controller
STRC	Sales and Technical Response Center

TAC	Technical Assistance Center
TC	Tone and Clock (TN714) (also Technical Consultant)
TCM	Terminal Change Management
TD	Time Division (also Transmit Data)
TDBI	Time Division Bus Interface (TN500)
TD Bus	Time Division Bus
TE	Terminal Equipment
TMC	Technical Marketing Center
TMS	Time Multiplexed Switch
TSC	Technical Service Center
TSO	Technical Support Operations
TRACS	Translation Recovery, Additions and Conversion System
UCD	Uniform Call Distribution
UDM	Universal Data Module
UL	Underwriters Laboratories
UM	Unified Messaging
UPS	Uninterruptible Power Supply
VB	Voice Buffer (TN520)
VDN	Vector Directory Number
VMAAP	Visual Maintenance and Administration Panel
VME Bus	Versa-Module European Bus (also DBP Bus)
VMWI	Visual Message-Waiting Indicator
VPC	Voice Processor Computer (TN501B)
VPT	Voice Port (TN747B)
VSFI	Voice Store and Forward Interface (UN162)
VSP	Voice Session Processor
VSP-BI	Voice Session Processor Bus Interface (TN716B)
VSP-CPU	Voice Session Processor Central Processing Unit (TN523 or TN591)
VSP-PE	VSP Processor Element (includes BI, CPU, and RAM)
VSP-RAM	Voice Session Processor Random Access Memory (TN734)
WGS	Work Group System

Glossary

1A ESS Switch An AT&T Central Office (CO) switch that supports integrated AUDIX applications (AUDIX R1V4 and later).

5ESS Switch An American Telephone and Telegraph (AT&T) switch that supports Integrated Systems Digital Network (ISDN) protocol and integrated AUDIX applications (AUDIX R1V4 and later). The 5ESS Switch is a central office (CO) that connects the Customer Premises Equipment (CPE) to an ISDN network over a U interface (2-wire outside plant wiring) through a Network Termination 1 (NT1) unit, or directly from the switch through an Integrated Services Line Unit (ISLU) T interface (4-wire).

Accessed Message Voice mail that a recipient has received and scanned (either the entire message or just the header).

Active Filesystems The filesystems used by AUDIX to provide service. These include types sdat, boot, sst, vtext, vdat, and adat. Most are activated by the `system : filesystem` form. The adat filesystem is activated using the `system : announcement : filesystem` form (See also ‘‘Mount/Unmount’’).

Activity An option in the highest-level menu voiced to an AUDIX subscriber after first accessing the AUDIX system. Selecting an activity is the starting point for all user operations.

Activity Menu The list of main options voiced to subscribers when they first access AUDIX. To hear the complete menu, press * H. To interrupt an activity and return to the activity menu, press * R.

Address A memory location in disk or Random Access Memory (RAM). Also, subscriber identification indicating to whom AUDIX is to deliver a message.

Adjunct A separate system that is closely integrated with a switch, such as an AUDIX or an Applications Processor (AP).

Administration The activity of setting up a system (such as the switch or AUDIX) so that it will function as desired. Options and defaults are set up (translated) by the AUDIX system administrator or service personnel.

Administrative Shutdown An option on the `shutdown` form used to shutdown the system software for administrative reasons, either gradually as calls are ended (camp-on) or immediately (forced). Filesystems are closed but left mounted.

Advanced Communications Package (ACP) A 3B2 Applications Processor (AP) designed for the 5ESS Switch and compatible with AUDIX central office (CO) applications.

Alarm Board The CDR1B, which monitors the system for alarms and passes warnings or faults to the Maintenance Interface (MI) board, which alerts remote service personnel over the alarm link leading to the switch.

Alarm Link A 25-pair cable connection from the back of the AUDIX cabinet to alarm-reporting facilities on the switch. The link notifies remote service personnel about an AUDIX problem.

Alarm Log A list of faults, including unit and device numbers, that is stored in a software file on disk. The `maintenance : active alarm : display` form shows alarm log faults in severity order. Use the `maintenance : active alarm : specification` form to select alarms by device, date, and so forth.

Alarms Hardware, software, or environmental problems (detected by maintenance testing) that may affect system operation. Alarms (or faults) are classified as major, minor, or warning. They are reported to services personnel through the alarm link and logged in the alarm log on disk.

Alphanumeric Alphabetic, numeric, or punctuation symbols.

Alternate Tracking A disk drive procedure where bad tracks are mapped out on a defect map that lists bad tracks and alternate tracks to use. The Data Base Processor (DBP) reads this information during system initialization or when equipping a disk drive or removable cartridge.

Analog A continuous signal (versus digital, discrete signals).

Announcement Fragment A numbered piece of spoken AUDIX information that makes up a system message or prompt.

Applications Processor (AP) The AP 16 or 3B5 AP switch adjunct on a PBX that provides such services as Directory, Electronic Document Communications (EDC), Message Center, and Unified Messaging. The AP on a 5ESS Switch is called an Advanced Communications Package (ACP).

Applications Processor Interface (API) Robust type of data link connection to an integrated 5ESS Switch in AUDIX R1V4 software.

Architecture The composition and functional components of a system.

Asynchronous Data Unit (ADU) A small device that can extend data transmissions far beyond recommended Electronic Industries Association (EIA) limits over building wiring. AUDIX and terminals may connect to Z3A1, Z3A2, and Z3A4 ADUs.

Asynchronous Transmission A form of serial communications where each transmitted character is bracketed with a start bit and one or two stop bits. The AUDIX display terminals use an asynchronous link to the Maintenance Interface (MI).

Audio Information Exchange (AUDIX) A complete voice mail message system operated by a touch-tone telephone and integrated into a switch.

AUDIX Data Acquisition Package (ADAP) A software package compatible with AUDIX R1V2 or later software. ADAP allows the AUDIX administrator to transfer subscriber, maintenance, or traffic data from AUDIX to a compatible 62xx or 63xx Personal Computer (PC) or Work Group System (WGS).

AUDIX Basic (R1V1) The basic AUDIX software. This version is only available on currently installed AUDIX-L machines.

AUDIX Enhanced (R1V2) An enhanced version of AUDIX software providing new user features. This version may run on any AUDIX machine in the field.

AUDIX Enhanced II (R1V3) The second enhanced version of AUDIX software. It may run on AUDIX or AUDIX-L machines and includes the Automated Attendant, Networking, Outcalling, and Standalone features.

AUDIX Enhanced III (R1V4) The third enhanced version of AUDIX software. It includes all features from previous releases, plus support of integrated 1A ESS Switch and 5ESS Switch interfaces, File Redundancy, Standalone Message Notification, Executive Features summary, administrable login ID length, and the Text Service Interface.

AUDIX Release 1 Version 5 AUDIX Release 1 Version 5 includes R1V4 features, plus Multiple Personal Greetings, Message Sending Restrictions, Priority Messaging, enhancements to Automated Attendant, and Call Detail Recording (off a PC interface).

AUDIX Release 1 Version 6 A version of AUDIX software that includes all the R1V5 features plus AMIS Analog Networking, Message Delivery, End-of-Message Warning and six simultaneously active networking ports.

AUDIX Release 1 Version 7 A version of AUDIX software that includes all features from previous releases, plus network connection turnaround and loop-around testing, the Undelete Message feature, and administrable coverage for the Escape to Attendant feature.

AUDIX-L (Large) AUDIX-L is the original AUDIX model. Its equipment is arranged in two AT&T System 85-type equipment cabinets. AUDIX-L can run any version of AUDIX software.

AUDIX-S (Small) The AUDIX-S model, now called the ‘‘one-cabinet AUDIX,’’ is physically the smallest member of the AUDIX family. All AUDIX-S hardware is housed in a single, half-height cabinet. AUDIX-S runs R1V2 or later software.

AUDIX Two-Cabinet Configuration The newest AUDIX model consists of a one-cabinet (AUDIX-S) base cabinet with an expansion cabinet on top. The two-cabinet AUDIX offers 32 ports and greater disk storage than an AUDIX-L. It runs R1V3 or later software.

Audit A software program that resolves filesystem incompatibilities and updates restored filesystems to a workable level of service. Audits are run nightly or after a failure.

Automated Attendant An R1V3 AUDIX feature that allows the customer to set up a main number with a menu of options that route callers to an appropriate department at the touch of a button.

Automatic Call Distribution (ACD) The System 85 call-distribution group of analog ports that connect to AUDIX.

Background Testing Testing that runs when the system is not busy performing other service tasks.

Backup A duplicate copy of a filesystem saved on a Removable Cartridge Drive (RCD) cartridge or on an Hard Disk Drive (HDD) volume separate from the original. The backup filesystem may be copied back (restored) if the active version is damaged (corrupted) or lost.

Basic Call Transfer A switchhook-flash method used on AUDIX Standalone and many switches to send the AUDIX transfer command over analog voice ports.

Basic Rate Interface (BRI) International standard protocol for connecting a station terminal to an Integrated Systems Digital Network (ISDN) switch. ISDN BRI supports two 64 Kbps information bearer channels (B1 and B2), and one 16 Kbps call status and control (D) channel (a 2B + D format). Also called *Basic Rate Access*.

Baud Rate Transmission signaling speed (see ‘‘bps’’).

Binary Digit (Bit) Two-number notation that uses the digits 0 and 1. Low-order bits are on the right (for example, 0001=1, 0010=2, and so forth). Four bits make a nybble; eight bits make a byte.

Blank Cartridge One or more spare removable cartridges required to back up system information.

Block Service Prevent use of a port, channel, or entire system through a fault or maintenance procedure.

Body The part of AUDIX voice mail that contains the actual spoken message.

Boot (or Reboot) An activity that brings up (initialize) a system by loading programs from disk to Feature Processor (FP) memory, activated by the Control Mode Menu (Function 5), a power up, or the Maintenance Interface (MI) toggle switch. Control Mode Menu (Function 6) does a partial reboot [the FP is restarted and the Data Base Processor (DBP) initialized].

Boot Filesystem The filesystem selected during system initialization, either automatically or manually, that the system tries to load its initial programs from. The filesystem name is ‘‘boot_f’’ for the active version and ‘‘boot_e’’ for the backup copy.

bps (bits per second) The number of binary units of information (1s or 0s) that can be transmitted per second. Mbps refers to a million bits per second; Kbps refers to a thousand bits per second.

Buffer Memory used to compensate for time differences in transmission by temporarily storing data.

Bulletin Board See **Information Service**.

Bus The circuitry that links the various AUDIX subsystems together. The major AUDIX buses are the Data Base Processor (DBP) or Versa-Module European (VME), S (System), TD (Time Division), and M (Memory) bus.

Business Communications Terminal (BCT) The currently recommended terminal for AUDIX maintenance or system administration.

Busy-Out/Release To remove an AUDIX device from service (make it appear ‘‘busy’’ or in use), and later restore it to service (release it). The AUDIX data link, voice ports, or Voice Buffer (VB)/Time Division Bus Interface (TDBI) channels may be busied out if faulty or while maintenance tests are run.

Byte A binary element string operated on as a unit and equal to eight bits.

Call Answer An AUDIX feature that allows AUDIX to answer a call and record a message when the subscriber is unavailable. Callers may be redirected to AUDIX through the call coverage or Call Forwarding switch features. Subscribers may record a personal greeting for these callers.

Call Coverage A switch feature that defines a preselected path for calls to follow if the first (or second) coverage points are not answered. AUDIX may be placed at the end of a coverage path to handle redirected calls through call coverage, Send All Calls, Go To Cover, and so forth.

Call-Distribution Group The set of analog port boards on the switch that connects subscribers and users to AUDIX by distributing new calls to idle ports. This group (or *split*) is called Automatic Call Distribution (ACD) on System 85, Enhanced Uniform Call Distribution (EUCD) on a DIMENSION PBX, and Uniform Call Distribution (UCD) on System 75.

Call Vectoring A System 85 R2V4 and DEFINITY Generic 2 and Generic 3 feature that uses a vector (switch program), allowing a switch administrator to customize the behavior of calls sent to an ACD group.

Camp-On A shutdown option that waits for ports to become idle before blocking service to them, allowing subscribers to finish calls in progress. A data link busy-out uses camp-on blocking.

Central Office (CO) A main telephone office where private customer lines a terminated and connected to the public network through common carriers.

Central Processing Unit (CPU) The hardware that controls AUDIX subsystem operation (data transfer, Input/Output, and logical instructions) by executing instructions obtained from memory. The Feature Processor (FP) and Data Base Processor (DBP) CPUs form the major AUDIX subsystems. AUDIX-L also has a Voice Session Processor (VSP) CPU to assist the FP-CPU.

Circuit Pack Carrier The physical box that contains circuit packs and connects them to a backplane.

Class of Service (COS) The standard set of features given to subscribers when they are first administered (set up with an AUDIX Voice Mailbox).

Colocated An AUDIX installed in the same physical location as the host switch (also called a local installation).

Closing Filesystems Taking an active filesystem out of service, usually by doing an administrative or maintenance shutdown. Closed filesystems may still be mounted (operated on but not written to).

Colocated Adjunct Two or more adjuncts that are serving the same switch (i.e., each has voice port connections to the switch) or that are serving different switches but can be networked through a direct RS-232 connection due to their proximity.

Commands For AUDIX users, commands are one- or two-key touch tones that control a Voice Mailbox activity or function (such as 0 or *H). A *processor* command is an instruction to the system, usually sent from a display terminal (such as CTRL + c).

Configuration The particular composition and hardware selected for a system, including external connections, internal options, and peripheral equipment.

Control Mode A state of the AUDIX machine where firmware is in control and software is shut down. The maintenance terminal displays the Control Mode Menu and forms are not available.

Control Mode Menu A list of Control Mode functions that may be done while software is shutdown. The menu appears on the maintenance terminal and includes the options: (1) system status, (2) environmental alarm status, (3) initialization history, (4) restart, (5) reboot, (6) restart with Data Base Processor (DBP) reboot.

Corrupt Filesystem A damaged filesystem. It may have an usually small or large size, or a negative number on the `filesystem : list` form.

Create Message Activity Activity 1 on the Activity Menu, used by AUDIX subscribers to record or edit a voice mail message.

Customer Premises Equipment (CPE) Any Integrated Systems Digital Network (ISDN) data or Terminal Equipment (TE) that is installed at the customer site, not the central office (CO). The Network Termination 1 (NT1) unit is the normal boundary between Customer Premise Equipment (CPE and CO (off-site) equipment.

Data Base A collection of filesystems and files in disk memory that store the voice and nonvoice (program data) necessary for AUDIX system operation.

Data Base Processor (DBP) One of the major AUDIX subsystems that interacts with the other subsystems to move voice and nonvoice data to and from disk.

Data Base Processor Interface (DBPI) This processor (UN160B) talks to a Voice Buffer (TN520) over the S-bus, and to the Data Base Processor (DBP) through the Voice Storage and Forward Interface (VSFI) UN162 circuit pack and the DBP/VME Bus.

Data Communications Equipment (DCE) Standard type of data interface normally used to connect to Data Terminal Equipment (DTE) devices. DCE devices include the Data Service Unit (DSU), the Isolating Data Interface (IDI), and the Modular Processor Data Module (MPDM).

Data Communications Interface Unit (DCIU) A switch device that allows nonvoice (data) communication between AUDIX and a System 85 or DIMENSION PBX. The DCIU is a high-speed synchronous data link that communicates with the Common Control switch processor over a Direct Memory Access (DMA) channel that reads data directly from FP memory.

Data Link The connection from the AUDIX cabinet to the switch DCIU or SCI Interface boards that enables nonvoice (data) messages to pass between AUDIX and the switch, such as message-waiting lamp, time, and call-status information. The link varies according to the type of AUDIX and switch used. Each AUDIX adjunct needs one data link.

Data Service Unit (DSU) DATAPHONE II 2500 DSUs are synchronous DCE devices used for extended-local AUDIX connections. The 2600 or 2700 series may also be used; these are more expensive DSU options and support diagnostic testing and the DATAPHONE II Service network system.

Data Terminal Equipment (DTE) Standard type of data interface normally used for the endpoints in a connection. Normally AUDIX, most terminals, and the switch DCIU or SCI are DTE devices.

Data Set AT&T term for modem; a data set usually includes the telephone. See also **modem**.

DBP Bus The main bus in the DBP subsystem that interconnects the DBP-CPU, RAM, disk controller, and VSFI. The BC circuit pack is the primary bus controller.

Dedicated Line A communications path that does not go through a switch. A dedicated (hard-wired) path may be formed with directly connected cables. LADS, ADUs, or other devices may also be used to extend the distance that signals can travel directly through the building wiring.

Default A value that is automatically supplied if no other value is specified.

Defect Map See **Alternate Tracking**.

Delivered Message Voice mail that has been successfully transmitted to a recipient's incoming mailbox.

Demand Testing Testing performed on request (usually by service personnel using a form).

Device A replaceable piece of hardware shown on the alarm and error log forms (part of a unit).

Dial-Ahead/Dial-Through The act of interrupting or preceding AUDIX system announcements by typing (buffering) touch-tone commands in the order the system would normally prompt for them.

Digital Discrete data or signals such as 0 and 1.

Digital Communications Protocol (DCP) A 64 Kbps digital data transmission code with a 160 Kbps bipolar bit stream divided into two information (I) channels and one signaling (S) channel.

Digital Subscriber Line (DSL) The ISDN Basic Rate Access (BRI) DSL is the 2B+D format used for the T 4-wire (2-pair) interface which connects CPE to ISDN.

Directory An AUDIX feature allowing you to hear a subscriber's name and extension after typing *D at the activity menu. Also, a group of related files accessed by a common name in software, such as the *mount point* on disk where filesystems are located (for example, /ss, /sd, /vd).

Disk Controller The IPC/DIM or SADI circuit pack(s) that control up to four disk drives. AUDIX-L has two disk controllers (0 and 1). The AUDIX one- and two-cabinet configurations have one (controller 0).

Disk Device The drive number associated with a disk controller that indicates its physical position. Device numbers on AUDIX may be 0 to 2; the controller is always 0 (so disk02 is written 0/2).

Disk Interface Module (DIM) An AUDIX-L circuit pack (UN161B) that controls up to four disk drives; the DIM and IPC comprise a disk controller. On AUDIX, the disk controller is the SADI.

Display Terminal A data terminal with a screen and keyboard used for displaying AUDIX forms and performing maintenance or administration activities.

Distributed Communications System (DCS) The connection of two or more switches over logical and physical data links to provide full or partial feature transparency. Voice links are provided with tie trunks. The DCS configuration is set up using the `system : translation : switch connection` form.

Distribution List See **Mailing List**.

Ductwork The overhead structure used for holding cables and supplying power to an AUDIX-L system. Ductwork is optional for most switches, although it may be used to conform to an equipment room layout.

Duplex See **Half-Duplex** or **Full-Duplex**.

Electronic Document Communications (EDC) An AP program used for composing and sending text messages to other AP and switch users.

Enabled/Disabled The state of a hardware (DBP) device that indicates whether or not the AUDIX system can use it. Devices must be equipped before they can be enabled (made active).

Enhanced Uniform Call Distribution (EUCD) See **Call-Distribution Group**.

Environmental Alarm Power, temperature, and airflow alarms that are monitored and reported to the MI through the alarm board, displayed by the Control Mode Menu (Function 2) or the alarm log.

Equipped/ Unequipped The state of a DBP or VSP device that indicates whether or not AUDIX software has recognized it. Devices must be equipped before they can be enabled (made active) using either the `maintenance : dbp : equip` or `maintenance : vsp : equipage` form.

Error Log A list of errors in a software file on disk. The `maintenance : error : display` form normally shows errors in historical order. The `maintenance : error : specification` form can be used first to select errors to display based on type, time, and so forth.

Errors Problems detected by the system during maintenance self-tests and recorded in the error log. Errors can produce an alarm (fault) if they exceed a threshold.

Escape to Attendant An AUDIX Enhanced feature that allows an AUDIX subscriber with the Call Answer feature to have a personal attendant or operator administered to potentially pick up an unanswered call. A system-wide extension could also be used to send callers to a live agent.

Executive Features A set of features introduced in R1V4 software that include Private Messaging (**P), Allow Forwarding (**F), Untouched Message (**H or Hold), and a Security Password Length, where a minimum-length password up to 15 characters long is administered to increase system security.

Exit Command An AUDIX Enhanced II (R1V3) feature that allows callers to use the **X (Exit) command to have AUDIX disconnect a call *without* hanging up. This is especially useful during calls made from a toll phone or for ending Outcalling sessions from a remote location.

Expansion Cabinet The upper cabinet of an AUDIX two-cabinet configuration, where the base cabinet is the AUDIX one-cabinet system.

Extended RAM Test Initialization option selected during a nonstandard initialization that runs extended hardware tests on the FP processor memory (tests take about 10 to 15 minutes).

Failure Status Word (FSW) Failure codes in bytes reported by a processor's firmware. Use the Control Mode Menu (Function 1) or the `maintenance : system : hardware status` form to show these bytes.

Faults See **Alarms**.

Feature Processor (FP) The major AUDIX subsystem that controls feature operation, communicates with the switch through the data link, and supports the maintenance and administration interfaces.

Field An area on a form, menu, or report where you can type or display information. For input fields, fill in the blanks or type over information already there. Read-only or output fields cannot be changed; you usually press ENTER to display information.

File A collection of like records (data) stored under a single name in software.

File Cabinet A storage area for subscribers to keep copies of messages for future reference or action.

File Redundancy An AUDIX R1V4 feature that allows data from crucial filesystems to be continuously copied to backup (mirror) filesystems while the system is running. If the system has some problem where an original ''master'' filesystem cannot be used, the backup ''slave'' filesystem is placed in service automatically.

Filesystem A collection of related files (programs or data) stored on disk. Six types of filesystems are required to initialize AUDIX and provide full service: adat, sdat, sst, vdat, vtext, and boot.

Fixed Storage Drive (FSD) A permanently mounted disk drive on AUDIX-L.

Form A screenful of related data that can be shown on the display terminal. AUDIX software transfers screen forms out to the terminal where the user can display, add, or change information. Also called *Screen Form*.

Format To set up a disk with a predetermined arrangement of characters so the system can interpret meaningful information. If a disk is reformatted, all data is erased.

Full-Duplex Simultaneous two-way, independent, asynchronous transmission in both directions.

Full Service A fully functional AUDIX system with data and voice link communication with the switch that answers calls with good quality and no alarms.

Function Individual steps or procedures within a Voice Mailbox activity.

Function Keys See **Programmed Function Keys**.

Generic 1, 2, or 3 AT&T DEFINITY Communications System software releases. *Generic 1, Generic 3i,* and *Generic 3s* correspond to the new generation of System 75-based software. *Generic 2* and *Generic 3r* correspond to the new release of System 85-based software.

Generic 4 or 5 Compatible 5ESS Switch software, used for integrated AUDIX applications in R1V4.

Generic 7, 8, or 9 Compatible 1A ESS Switch software, used for integrated AUDIX applications in R1V4. The different generics support different types of message-waiting indication capability.

Generic-Program Cartridge A copy of the uncustomized software shipped with a new system.

Get Messages See **Scan Incoming Mailbox Activity**.

Grade of Service (GOS) The level of service subscribers receive based on the number of seconds they have to wait before AUDIX answers a call.

Guest Password An AUDIX Enhanced feature that allows people who are *not* AUDIX subscribers to leave messages on AUDIX by dialing a subscriber's extension and entering a system-wide guest password.

Half-Duplex Asynchronous transmission between devices in either direction, but not both directions at once.

Hard Disk Drive (HDD) A permanently mounted, 170-Mbyte fixed disk drive on AUDIX.

Header Information that AUDIX creates to identify a message. A message header includes the originator or recipient, type of message, creation time, and delivery time.

Help A command run by pressing HELP or CTRL ? on a display terminal to show the options available at your current form position. In AUDIX, press * H to get a list of options.

Hexadecimal Alphanumeric numbering scheme used in some error messages to represent the numbers 0 to 15. Hexadecimal digits include the numbers 0 to 9 and the characters A, B, C, D, E, and F.

Host Switch The switch directly connected to AUDIX over the data link; also, the physical link connecting AUDIX to the rest of a DCS network. See also **Distributed Communications System**.

Hunt Group A group of analog ports on the switch, usually administered to search for available ports in a circular pattern. Used on AUDIX Standalone systems and some switches.

Information Service An AUDIX feature that allows a message to be played to callers who dial the extension. Callers cannot leave a message (it is a listen-only service). Also called *Bulletin Board*.

Inactive Filesystem Any filesystem that is not administered as an active filesystem on the `system : filesystem` or `system : announcement : filesystems` forms.

Initialization The process of bringing a device or system to a predetermined starting state. The full AUDIX start-up (boot) procedure tests hardware; loads the boot filesystem programs; locates, mounts, and opens other required filesystems; and starts normal service.

Initialization and Administration System (INADS) — A computer-aided maintenance system that offers AUDIX maintenance services at a centralized location. Major and minor alarms are sent over the AUDIX ALARM (H02) link using existing switch alarm-reporting facilities.

Initialization History — Function 3 on the Control Mode Menu that displays the last hardware initialization message.

Initialization Options — A series of initialization choices available by manually selecting a nonstandard initialization. The options include extended RAM tests, standard or nonstandard boot, and stop points.

Initialization Stop Points — An initialization option available through manual selection of initialization options, allowing the initialization to be halted at some point, then resumed, for diagnostic purposes.

Initializing a Disk — Erasing a disk directory, then reading its volume label (name) from the `maintenance : dbp : equip` form. Old disk contents are no longer accessible.

Integrated AUDIX — An AUDIX with a data link. Compatible switch software is required.

Integrated Message Notification (IMN) — A feature that allows several message services to alert users of new messages through a common service using descriptive announcements and the message-waiting lamp. Also called *Unified Messaging*.

Integrated Services Digital Network (ISDN) — A protocol being developed in response to a recommendation from an international standards body. It defines how equipment from different manufacturers should communicate with one another in end-to-end digital connections using standard interfaces.

Integrated Services Line Unit — T Interface (ISLU-T) — A 4-wire (2-pair) connection from CPE devices directly to the ISDN switch. This connection may be used instead of installing an NT1 to convert 4-wire signals to the 2-wire U interface.

Intelligent Peripheral Controller (IPC) — AUDIX-L circuit pack (TN507C) that works with the DIM (UN161B) to comprise the DBP disk controller.

Intelligent Unit — Any circuit pack or group of packs controlled by a single microprocessor or microcontroller that coordinates maintenance activities for that unit.

Interface — The device or software that forms the boundary between two devices or parts of a system, allowing them to work together.

Isolating Data Interface (IDI) — A synchronous, full duplex data device used for direct cable connections between an AUDIX with an SCPI and the switch DCIU.

Label The name assigned to a disk device (either a removable cartridge or permanent drive) through software. Cartridge labels may have a generic name (such as 1:3) to indicate the software release, or a descriptive name if used for backup purposes (such as back1). Permanent disk drive labels usually indicate the position of the disk (such as disk00).

Leave Word Calling (LWC) A switch feature that allows the calling party to leave a standard (nonvoice) message for the called party using a feature button or dial-access code.

Light-Emitting Diode (LED) Indicator on a circuit pack faceplate or disk drive to show status of AUDIX operations and possible fault conditions.

Listen to Messages See **Scan Incoming Mailbox Activity**.

Link One of 20 data links shown on the **`system : translation : switch connection`** form that terminate on a switch port number.

Load To read software from external storage (such as disk) and place a copy in system memory.

Local Administration Terminal (LAT) The system administrator's display terminal used to set up AUDIX subscribers, check traffic and space, and so forth. for that site. Usually has a printer attached.

Local Adjunct The adjunct to which the administration or maintenance terminal is connected. All other adjuncts, including colocated adjuncts, are considered remote to this adjunct.

Local Area Data Set (LADS) A signal-extending data device used for connecting AUDIX to a switch DCIU for distances greater than 400 feet.

Local Installation A switch, adjunct, or piece of peripheral equipment installed physically near the host switch or system. See also **Colocated**.

Local Maintenance Terminal (LMT) A display terminal located near the AUDIX cabinet (usually directly cabled) which is temporarily attached to the MAINT connector during an on-site service visit.

Local Network An AUDIX network in which all AUDIX systems are connected to the same switch.

Login A unique code used to gain approved access to the AUDIX system, either a subscriber's Voice Mailbox or a display terminal. See also **Password**.

Mailbox A portion of disk memory given to each subscriber for creating and storing outgoing and incoming messages. Space is usually allocated as needed.

Mailing List A group of subscribers addresses assigned a list ID# and public or private status. A mailing list may be used to simplify sending messages to several subscribers.

Maintenance The process of identifying and correcting system problems, and taking steps to prevent them.

Maintenance Interface (MI) An intelligent circuit pack that has two RS-232C ports for maintenance and administration, a shutdown toggle switch, and system alarm LEDs. The MI controls system maintenance, modes, initialization, and alarm functions.

Maintenance Port (MAINT) The RS-232C (H00) connector on the rear of the cabinet that connects the LMT (over cables) or the RMT (over a modem) to AUDIX.

Maintenance Shutdown The process of closing all filesystems, leaving them unmounted and inaccessible (normally used before a system power down). This may be done with the MI toggle switch or `shutdown` form.

Major Alarm An alarm detected by AUDIX software that affects at least one fourth of the AUDIX ports in service. Often a major alarm indicates that no AUDIX service is available.

Manager A software module responsible for the operation of one part or function of the system.

Memory A device which can store logic states such that data can be accessed and retrieved. Memory may be temporary (such as system RAM) or permanent (such as disk).

Message Categories Groups of messages in subscribers' mailboxes. Categories include new, unopened, and old for the incoming mailbox, and delivered, accessed, undelivered, not deliverable, and file cabinet for the outgoing mailbox.

Message Center An AP call-answering feature that allows an agent to enter a message for a busy or unanswered extension. Also called *Message Center Service (MCS)*.

Message Line The third line from the bottom of a terminal screen where help information and error messages are displayed.

Message-Waiting Lamp An LED on a voice terminal (telephone) that alerts subscribers to new messages. Also called Automatic Message-Waiting (AMW) Lamp.

MI Toggle Switch A switch on the MI (TN511) circuit pack used to shut down system software by moving it off-center (left or right), or reinitialize a system when returned to center position.

Microcom Networking Protocol This provides on-line compressing data for increased throughput, provides error detection, correction, and retransmission, and provides data rate matching with the opposite endpoint.

Minor Alarm An alarm detected by maintenance software that affects less than one fourth of the AUDIX ports in service, but has exceeded error thresholds or may impact service.

Mirroring See **File Redundancy**.

Mode An operating state in which the system can perform certain tasks. AUDIX modes include control mode, normal mode, administrative or maintenance shutdown mode, and initialization.

Modem A modulator/demodulator device for transmitting analog (continuous) signals.

Modem Pool A group of modems set up to accept incoming data calls from a remote device. The switch's modem-pooling feature inserts modems into the link automatically. The transmission rate could range from 1200 to 9600 bps depending on facilities.

Modular Processor Data Module (MPDM) A data device that converts RS-232C or RS-449 protocol signals to Digital Communications Protocol (DCP) used by the System 75/85 switch. MPDMs may connect AUDIX to a switch DCIU or SCI link, or connect terminals to a switch port board.

Modular Trunk Data Module (MTDM) A Data Terminal Equipment (DTE) device that converts RS-232C or RS-449 signals to Digital Communications Protocol (DCP) used by the System 75, System 85, or Generic 1 or 2 PBXs. MTDMs are often used in modem pools.

Mount Point A software abbreviation for a filesystem that allows software to find it independent of its physical location. Similar to a ''directory.''

Mount The process of identifying a filesystem to software and make it accessible by the DBP.

Mounted The state of a filesystem when it is identified to the software and accessible by the DBP.

Network Termination 1 (NT1) Unit A physical and electrical interface between the 2-wire U interface and the 4-wire T interface. The NT1 unit marks the boundary between Customer Premises Equipment (CPE) and the ISDN network.

Networking An R1V3 AUDIX feature that allows the customer to link together up to 100 remote AUDIX machines for a total of up to 36,000 subscribers.

Nonstandard Boot A manual initialization option run by typing ''n'' after the standard/nonstandard boot question. This must be followed with controller, device, and boot filesystem information.

Nonstandard Initialization A manual initialization option run by typing ''n'' to the standard/nonstandard initialization question. Subsequent questions allow you to specify a type of initialization.

Normal Mode The state of the AUDIX system after hardware initialization, where software is running and maintenance and administration forms are available.

Not Deliverable Message A message that could not be delivered after a number of attempts specified by the system administrator (up to ten). This usually means the subscriber's mailbox is full.

Null Modem A device that rearranges (crosses over) the leads in a cable, allowing signals to be exchanged between two Data Terminal Equipment (DTE) devices. A null-modem cable is required to directly connect a display terminal to the AUDIX MI administration or maintenance connectors in a hard-wired local installation.

On-Line Help A feature introduced in AUDIX Enhanced software allowing system administrators and maintenance personnel to obtain screen form information by pressing a key for the PATH line, field, or form.

One-Cabinet AUDIX Current name for the 16-port AUDIX-S (Small) system. This half-height cabinet supports up to 2,000 subscribers. See **AUDIX-S**.

Operating System The set of programs that runs the hardware and interprets software commands.

Opening a Filesystem The process of making an inactive filesystem capable of providing service through a restart or a reboot.

Oryx/Pecos The AUDIX operating system (application software shipped on the generic program cartridge from the factory), a set of programs that runs hardware and interprets software commands.

Outcalling An R1V3 AUDIX feature that allows AUDIX to dial subscribers' numbers to inform them they have new messages (often used with AUDIX Standalone or if the phones do not have message-waiting lamps).

Password A code assigned to every terminal user for security reasons. After dialing AUDIX, subscribers must dial their personal password correctly to log on to AUDIX.

Password and List Administration Activity Activity 5 on the Activity Menu that allows subscribers to change their password, or to create, scan, or edit mailing lists.

Path The form string (or location) typed on the second line of an AUDIX screen form that identifies the form to display. Parts of a path name are called segments. Each part must be typed with enough characters to uniquely name that segment, followed with ENTER.

Path Line The second line from the top of a terminal display form used to identify the form you wish to display. Type segments individually followed by ENTER or a carriage return; you need to type only enough characters to name a unique form (such as **`m : ac : d`**).

Peripherals The voice terminals, printers, display terminals, and other devices external to the AUDIX cabinet, but necessary for full AUDIX operation and maintenance.

Personal Computer (PC) An AT&T 62xx or 63xx desktop computing device, required for the AUDIX Data Acquisition Package (ADAP) and Text Service Interface.

Personal Greeting Administration Activity Activity 3 on the Activity Menu that allows subscribers with the Call Answer feature to record a personal message. This greeting is played to callers who are redirected to AUDIX. The Information Service and Automated Attendant features also use this option for recorded messages or menus.

Port A connection or link between two devices, allowing information to travel through it to a desired location. For example, a switch port connects to an AUDIX voice port to allow a subscriber on a voice terminal to leave a message on disk.

Power Down The activity of turning off system power before changing hardware or reinitializing a faulty system. Always shut down the system software before turning power off, or data will be lost.

Power Up The activity of turning power on to start system initialization and automatic self-tests; disks spin up.

Primary Rate Interface (PRI) International standard protocol for connecting a switch or PBX to a computer, network, or another switch. PRI supports twenty-three 64 Kbps information and one 64 Kbps signaling channel [called 23B+D format or Extended Digital Subscriber Line (Extended DSL)] over high-speed T1 facilities.

Private Mailing List A list of addresses that only the owning subscriber can access.

Private Messaging One of the R1V4 Executive Features that allows a subscriber to send a voice mail message that cannot be forwarded by the recipient using the **P command. The **F (Allow Forwarding) command cancels Private Messaging.

Programmed Function (PF) Keys — User- or system-coded keys that allow information to be inserted or functions to be done by simply pressing the key.

Processor Interface (PI) — A System 75, System 75 XE, Generic 1, Generic 3i, and Generic 3s data link; AUDIX usually uses the Electronic Industries Association (EIA) port connection (one of four links). Also called *Processor Interface Board* or *PIB.*

Processor Data Module (PDM) — See **Modular Processor Data Module (MPDM)**.

Processor Element (PE) — The combination of CPU, RAM, and BI boards that together make up the FP [or AUDIX-L Voice Session Processor (VSP)]. The CPU controls the other PE boards and is the heart of that subsystem.

Protocol — A set of conventions or rules governing the format and timing of message exchanges (signals) to control data movement and the detection and possible correction of errors.

Public Mailing List — A list of addresses that any subscriber can use if that subscriber knows the owner's list ID# and extension number. Only the owner can modify a public list.

R1V1, R1V2, R1V3, R1V4 — The release and version of software. See AUDIX Basic (R1V1), AUDIX Enhanced (R1V2), and AUDIX Enhanced II (R1V3), and AUDIX Enhanced III (R1V4) for details.

Real-Time Clock — The internal AUDIX clock which may or may not be synchronized with the clock in the switch.

Reboot — Any boot after the first system initialization. See also **Boot**.

Reinitialization — The process of repeating an initialization completely or in part, either automatically or manually.

Remote Adjunct — Any adjunct other than the adjunct to which the administration or maintenance terminal is connected.

Remote Installation — A system, site, or piece of peripheral equipment that is installed in a different location from the host switch or system.

Remote Maintenance — The service personnel at a centralized maintenance site who can access the AUDIX through the remote MAINT connection to perform off-site troubleshooting or routine checks.

Remote Maintenance, Administration, and Traffic System (RMATS) — An early remote maintenance service; see *INADS.*

Remote Maintenance Terminal (RMT) — A display terminal at the remote maintenance site which dials-in to AUDIX over a modem connected to the MAINT port.

Remote Network — An AUDIX network in which the AUDIX systems are integrated with more than one switch.

Removable Cartridge Drive (RCD) A 20- or 50-Mbyte AUDIX disk drive with a removable magnetic-media cartridge. AUDIX-L uses a Removable Storage Drive (RSD) with an 80-Mbyte magnetic-media cartridge.

Removable Storage Drive (RSD) An AUDIX-L disk drive that permits removal and replacement of the 80-Mbyte magnetic-media cartridge. One RSD is required per system for software updates and backup procedures.

Replaceable Unit Any removable device that the system can identify as faulty. The unit may have more than one part (such as the FP-PE, which controls three circuit packs).

Reset A low-level hardware function that causes various processors to interrupt, then begin to execute their RAM initialization.

Resolved Alarm Log A list of the date and time at which alarms were activated and resolved (or *retired*), shown by the `maintenance : resolved alarm : display` form. The `maintenance : resolved alarm : specification` form can be used to select resolved alarms to display based on type or time.

Restart (AUDIX) An AUDIX Enhanced feature that allows subscribers who have reached AUDIX through the Call Answer feature to access their own mailboxes by typing the *R (Restart) command. This is especially useful for long-distance calls or for AUDIX Standalone users who wish to access AUDIX when all the Voice Mail ports are busy.

Restart (System) A partial system initialization from FP memory using booted programs already in RAM. This can be done using the Control Mode Menu (Function 4) or the `startup` form. A restart resets the FP and opens and mounts all filesystems that need to be active for full service.

Retention Time The amount of time messages are saved on disk before being automatically deleted from a subscriber's mailbox.

Return Call to Sender An AUDIX Enhanced feature that allows subscribers to immediately place a call to the originator of an incoming message if that person is in the switch's dial plan.

S Bus The main bus of the AUDIX system which connects all other major processor subsystems (FP and DBP) as well as the minor processors (VB, SCPI, and DBPI).

Scan To listen to a message body or header.

Scan Incoming Mailbox Activity Activity 2 on the Activity Menu which allows subscribers to review, forward, or respond to messages they have received from other subscribers or through the Call Answer feature.

Scan Outgoing Mailbox Activity Activity 4 on the Activity Menu which allows subscribers to review, edit, or redirect messages they have scheduled for delivery, or to check the status of messages that are already sent.

Scheduled Delivery Time A time and/or date that a subscriber optionally assigns to a message that tells AUDIX when to deliver it. If a delivery time is omitted, AUDIX sends the message immediately.

Screen-Labeled Keys The top row of eight keys on a display terminal whose functions are marked by reverse video blocks at the bottom of the screen. The keys' functions change when the screen labels change.

SCSI-to-AUDIX Disk Interface (SADI) The SADI (TN475B) is the AUDIX disk controller. It uses the Small Computer Systems Interface (SCSI) protocol to communicate with the AUDIX disk drives. The SADI's LEDs show which drives are active. The 50-pin drive data cable is called the SCSI cable.

Simplified Message Service Interface (SMSI) Type of data link connection to an integrated 1A ESS Switch or 5ESS Switch in AUDIX R1V4 software.

Service Not Started A message displayed at the end of unsuccessful initialization which indicates software problems, such as a missing or corrupt (bad) filesystem. Normally the system can still display forms, but cannot provide service (answer calls). You may log in after this message.

Shutdown A procedure required to disable system operation and protect customer data stored on disk before a power down. Select the type of shutdown based on the tasks you need to perform and their urgency, using either the `shutdown` form or MI toggle switch.

Split A group (or queue) of analog ports on the switch. See also **Call-Distribution Group**.

Standalone An R1V3 AUDIX feature that allows AUDIX to connect to any switch without using a data link. This allows AUDIX to work with a switch built by a different vendor or one that runs an incompatible load of software.

Standard Initialization (Standard Boot) The normal automatic (default) initialization of the AUDIX system, where firmware first scans for the program ''boot_f'' on disk 0/0. If not found, the firmware looks for another boot filesystem to load until all possible combinations have been examined.

Start Service A message displayed at the end of a successful initialization, indicating that system software is active and display forms are available.

Start-up See **Restart**.

Status Line The top line of an administration or maintenance form displayed on a terminal, showing the active system alarms (if any), logins (up to two), and threshold (disk space) violations.

Subscriber A person to whom the AUDIX administrator assigns the ability to access the Voice Mailbox feature. Subscribers may also be assigned the optional Call Answer feature on the `subscriber : local` or `cos` forms or given LWC permission through the switch.

Subsystem A major functioning element of AUDIX software and hardware. Subsystems include the Feature Processor (FP), Data Base Processor (DBP), and (on AUDIX-L only) the Voice Session Processor (VSP). VSP devices on AUDIX are run by the FP.

Switch An analog, digital, or electronic system where data and voice transmissions are not confined to fixed communications paths, but are routed among available ports or channels.

Switch Communications Adapter (SCA) Custom device used for making AUDIX connections to a 5ESS Switch.

Switch Communication Interface (SCI) The System 75 data link device. An AUDIX adjunct connects to the SCI TN738 Interface-2 (INT2) board through an MPDM.

Switched Access A connection made from one endpoint to another through switch port boards. This allows the endpoint (such as a terminal) to be used for several applications.

Synchronous Transmission A type of transmission where the data characters and bits are exchanged at a fixed rate with the transmitter and receiver synchronized. This allows greater efficiency and supports more powerful protocols. The AUDIX-to-switch data link is synchronous.

System Administrator Person usually at customer site who is responsible for AUDIX system administration and possibly Networking coordination.

System Administration Activity Activity 9 on the Activity Menu which may be used only by an AUDIX system administrator who has announcement-control permission. This option allows the administrator to record, play, or edit subscriber names or system announcement fragments.

System Status Function 1 on the Control Mode Menu that shows the Failed Status Words (FSW) last reported to the MI before shutdown. These bytes are updated every 30 seconds.

T Interface The standard ISDN 4-wire (2-pair) interface used for terminal connection and data transmission on the customer premises. Also called **S Interface**.

T1 Carrier A short-haul digital transmission line that uses time-division multiplexing. A bipolar signal is transmitted at 1.544 Mbps along 16- to 20-gauge copper-conductor cables.

TD Bus A main AUDIX bus that connects the VPT, VPC, and TDBI ports together during a call.

Terminal Line The second line from the bottom of the display terminal screen that shows cursor line, column position, caps status, and current input mode.

Terminal Type The last required entry before gaining access to the AUDIX display forms, giving the type of display terminal. All compatible terminals must use types ‘‘5420’’ or ‘‘513.’’

Text Service Interface An AUDIX R1V4 feature that allows AUDIX headers to be sent to electronic mail services such as IBM PROFS using a PC/PBX 2780/3780 interface.

Threshold A boundary used to indicate when available disk space is getting low. Both subscribers and filesystems are assigned thresholds.

Time Division Bus Interface (TDBI) The TDBI (TN500) provides a 16-port interface between the VB and the VPCs (up to 4 boards) over the TD bus. AUDIX may use the 8-port TN477 TDBI-8.

Tone Generator A device acoustically coupled to a rotary phone, used to produce touch-tone sounds when subscribers cannot use a regular touch-tone generating voice terminal.

Traffic The flow of attempts, calls, and messages across a telecommunications network.

Translations Software assignments telling a system what to expect on a certain voice port or the data link, or how to handle incoming data. They customize AUDIX and switch features for users.

Triplet An alarm or error code consisting of a unit, fault, and device number.

Type The name entered on a screen form that identifies a kind of filesystem to software. Six types must be active for AUDIX to operate: boot, adat, sdat, sst, vdat, and vtext.

U Interface The standard ISDN 2-wire (1-pair) interface to the 5ESS Switch. It connects to the NT1 unit and carries signals off-premises to the CO.

Undelivered Message A message that has not yet been sent to a subscriber's incoming mailbox. The message resides in the sender's outgoing message and may be modified or redirected by the sender.

Unequip See **Equipped/Unequipped**.

Unfinished Message A message that has been recorded but not approved or addressed, usually the result of an interrupted AUDIX session. In R1V1, the message must either be addressed or deleted before another message can be recorded. Also called *Working Message*.

Unified Messaging A switch software feature that allows various message-handling services to keep track of new messages from all internal, switch, and AP sources on the system, including Message Center, EDC, LWC, and electronic mail services such as AT&T Mail and UNIX System mail.

Uniform Call Distribution (UCD) The System 75 call-distribution group of analog port boards that connects users to AUDIX.

Unit A missing or corrupt piece of software, hardware, or group of hardware devices. All AUDIX alarms are recorded against and ordered by a specific unit number.

Unmount The process of making a filesystem inaccessible to the DBP. See also **Mount**.

Untouched Message One of the R1V4 Executive Features that allows a subscriber to keep a message in its current category by using the **H (Hold) command. If the message is in the new category, message-waiting indication remains active (for example, the message-waiting lamp will remain lit).

User Population A combination of light, medium, and heavy users on which AUDIX configuration guidelines are based.

Vector A customized program in the switch for processing incoming calls.

VME Bus The Versa Module European Bus. See **DBP Bus**.

Voice Buffer The TN520 circuit pack that works with the TDBI circuit pack to support the AUDIX voice ports by moving blocks of voice information to and from the DBP.

Voice Link The AUDIX VPT connection(s) to a call-distribution group (or hunt group) of analog ports on the switch.

Voice Mailbox The standard AUDIX feature assigned to all subscribers giving them access to disk space on which to store, create, and send voice mail messages.

Voice Message Digitized voice information stored by AUDIX on disk memory. Also called *Voice Mail*.

Voice Port Trunk (VPT) The TN747B circuit pack that provides the voice interface between the AUDIX voice ports and the analog ports on the switch used to connect subscribers' voice terminals during a call.

Voice Processor (VPC)	The TN501B 2-port circuit pack that analyzes and compresses voice signals, detects touch-tones and silence, controls playback and recording volume, and controls playback speed.
Voice Session Processor (VSP)	A major AUDIX-L subsystem that processes the voice and data information that control the AUDIX call setup operation, including port hardware and buffers. On AUDIX, the FP controls these boards (TDBI, VB, VPC, and VPT packs).
Voice Store and Forward Interface (VSFI)	The UN162 circuit pack transfers voice information between the DBP bus and S bus.
Voice Terminal	A telephone used for spoken communications with AUDIX. A touch-tone telephone with a message-waiting lamp is recommended for all AUDIX subscribers.
Voicing	Either speaking a message into the AUDIX system during recording, or having the system playback a message or prompt to a subscriber.
Volume	A physical removable cartridge or disk drive device. Volume *labels* are disk software names.
Work Group System (WGS)	A 6312, 6286, 6386, or equivalent WGS is a PC-like device required for the AUDIX Data Acquisition Package (ADAP) and the Text Service Interface.

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