AT&T

# MultiPoint Control Unit (MCU) Release 3.0 Installation and Testing

Graphics ©

# Contents

# Contents

# Contents

# Contents

# Contents
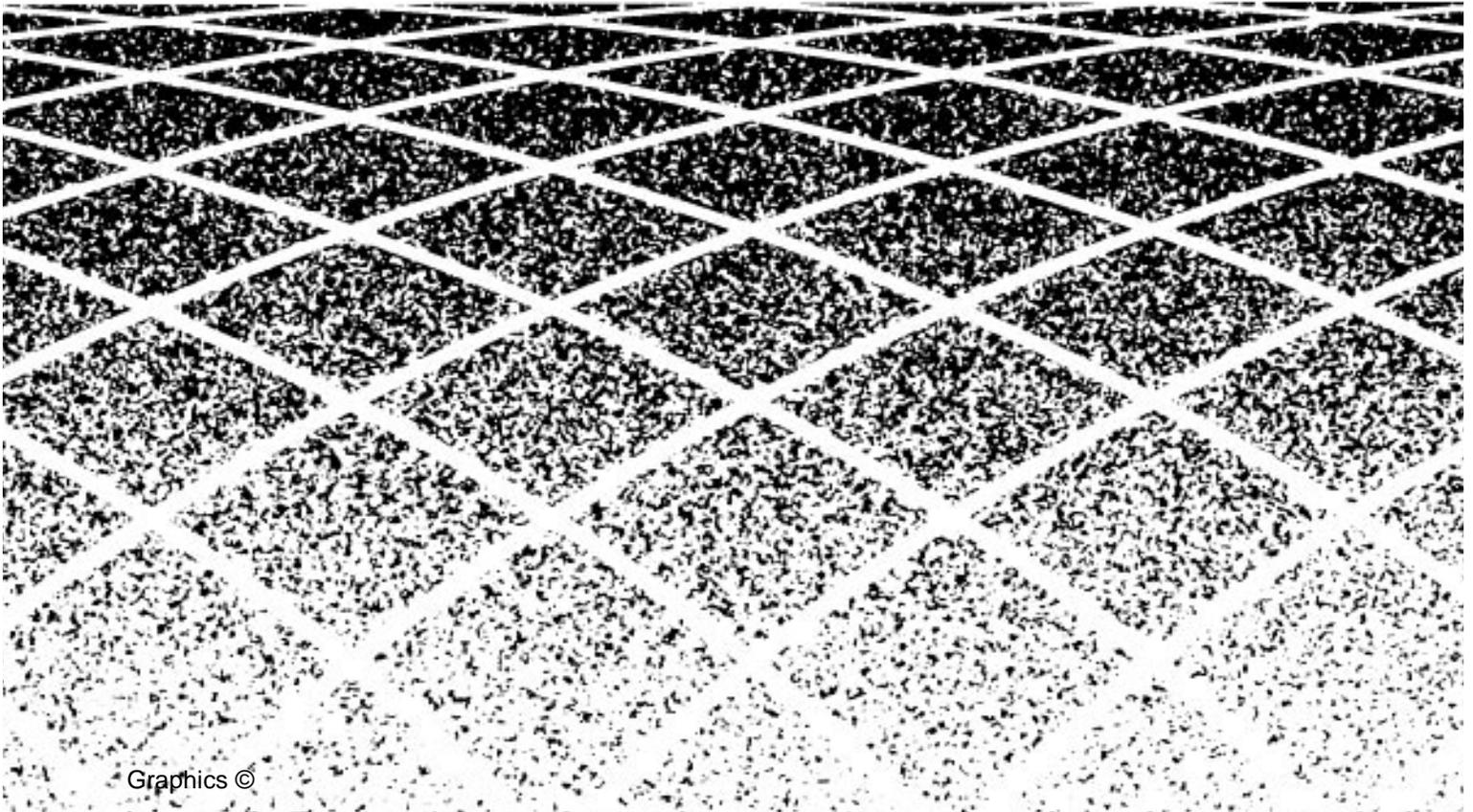
# Contents

# Contents

# Contents

# About This Document

This manual provides the background information and procedures for the Installation and Testing of the MultiPoint Control Unit (MCU) Release 3.0.

## Intended Audience

This manual is intended for engineering personnel located at the AT&T Video Technical Center (VTC), AT&T technician, and authorized installers of the MCU.

## Related Information

The following list of manuals provides supplemental information for the MCU:

- *AT&T MultiPoint Control Unit Installation Quick Reference,* 555-027-723

  Provides brief instructions on adding an AT&T MCU and components to enable you to do video conferencing.

- *AT&T MultiPoint Control Unit Maintenance,* 555-027-724

  Provides information about tests, alarms, and the actions you need to take to maintain your AT&T MCU.

- *AT&T MultiPoint Control Unit System Administration and Reports,* 555-027-727

  Provides detailed instructions that an AT&T MCU telecommunications manager can use for ongoing administration and reports using the MCU Management Terminal (MCU-MT).

- *AT&T Conference Reservation System User's Manual,* 555-230-520

  Provided with the optional AT&T Conference Reservation System, this manual gives detailed information and procedures that an AT&T CRS administrator and/or reservations agent can use to install CRS, set up and manage CRS databases, reserve conferences and perform CRS system administration.

## Organization

This manual contains six chapters. They are:

- Chapter 1, "Product Overview" describes the various MCU components, configuration examples, and high level operation of the system.

- Chapter 2, "Pre-Installation Procedures" discusses the checks you should make and the procedures you should follow before installing the MCU and its components.

- Chapter 3, "Installing the MCU and Components" explains how to install the MCU and its components.

- Chapter 4, "Connecting to the Network" provides the wiring and connections required for the MCU. It identifies the cross-connect fields, lists the hardware equipment room requirements, and provides procedures for installing cables.

- Chapter 5, "Activating the MCU" defines the steps necessary to "bring up" the MCU for subsequent administration.

- Chapter 6, "Administering the MCU" provides the administration procedures after the hardware installation and on-site tests have been completed.

- This manual also has a glossary and an index.

  $\Longrightarrow$ **NOTE:**
  For a description of the Expansion Services Module (ESM) and for directions on installing it, refer to the supplemental ESM document.

## Typographic Conventions

Several conventions are used to quickly convey information. These conventions are as follows:

- This *typeface* is used for references of titles of other documents and when referring to fields on screens.

- This **typeface** is used to identify commands and values for fields.

- This `typeface` is used when a word or phrase must be written on a paper form and when a message is returned by the MCU.

- The following icon:

### ⚠ WARNING:

emphasizes information that is important to your safety.

- The following icon:

### ⚠ CAUTION:

indicates information you need to prevent equipment damage.

- The following icon:

### ➡ NOTE:

identifies additional information pertinent to the text preceding it.

# Getting Help

If you need help with the procedures or other information in this document, and if you are a customer in the United States or Canada, be sure to call the Video Technical Center (VTC) at 800 242-2121. If you are a customer in Australia or the United Kingdom, call the Global Technical Access Center (GTAC) at 303 538-4666.

# Product Overview

<div style="text-align: right; font-size: 3em;">**1**</div>

## Overview

This manual is intended for engineers at the AT&T Video Technical Center (VTC), AT&T technicians, and authorized installers of the AT&T MultiPoint Control Unit (MCU).

## MCU Components

The AT&T MCU is a networking device that allows multiple remote video end-points to participate on a single Px64 video conference call. It is a multimedia product since it combines audio, data, and video.

The AT&T MCU can be connected directly to a network or behind a PBX (including DEFINITY® and System 85). The AT&T MCU connects to many different PBXs, Central Offices (CO), and Interexchange Carriers (IXC). Several network services are supported.

The AT&T MCU is fully compliant with the Px64 standards for multimedia communications recommended by the International Telecommunications Union (ITU-T, formerly CCITT) and supports compliant H.320 terminals.

**Table 1-1.   Release 2.0 Maximum Capacities and Supported Features**

| System Configuration | Maximum Capacity/ Supported Features |
|---|---|
| Number of Ports | 64 |
| Number of 2 Channel Ports per Conference | 24 |
| Number of H0 Ports per Conference | 32 |
| Audio Add-On | 1 port per conference (unless conference is cascaded, in which case the maximum is 2 ports). |
| Number of Conferences per MCU | 24 |
| Dynamic Conference Resizing | standard for EX model optional for FX model |
| Number of Speakers in a Conference | 26 (24 plus [assuming cascading] 2 Audio Add-ons) |
| Number of MCU Carriers | 1 for up to16 56k or 64k ports (or combined with no more than 12 H0 ports)<br><br>2 for 16 or more ports |
| Video Algorithm | Px64 (H.261) |
| Network Interface | DS1 (robbed bit) DS1 (PRI) EI |
| Px64 Access Bit Rates | 56k/64k 112k/128k bonded 336/384k 384k (H0) 768k 1472k 1536k |
| H.320 Interworking | 56/64k rate adaptation for 2 channels |
| Broadcasting | Video (full duplex) Data (half duplex) Audio (full duplex) |
| Data Bit Rates | 6.4k/32k |

**Table 1-1.   Release 2.0 Maximum Capacities and Supported Features  — *Continued***

| System Configuration | Maximum Capacity/ Supported Features |
| --- | --- |
| Password and Terminal ID support | standard |
| Maintenance Alarm Terminal (model 7444D) | 1 standard 2 optional |
| Call Detail Recording | optional |
| AT&T Conference Reservation System (CRS) | optional |

*See Chapter 6, "Administering the MCU" for details on Release 2.0 models.

# Technology Derived from DEFINITY

The MCU derives its processor, memory, backplane, cabinets, and software platform from DEFINITY. It also uses the latest DCP circuit packs, tone circuit packs, and DS1 circuit packs. The MCU circuit packs are housed in a cabinet called a Multimedia Server Module (MSM). The MSM can be either an Enhanced Single Carrier MSM (ESCC-MSM), a Single Carrier MSM (SCC-MSM), or a Multicarrier MSM (MCC-MSM). To support Px64 video, data, and audio exchange, the MCU has two multimedia conferencing boards: the Multimedia Interface (MMI) circuit pack and the Voice Conditioner (VC) circuit pack.

The MMI is a TN787B circuit pack that receives multimedia input from remote video endpoints via a DS1 circuit pack. It terminates Px64 H.221 protocol and aligns B-channels from an endpoint. The MMI multiplexes and demultiplexes the multimedia stream into separate audio, video, and data for conference purposes. In Release 2.0, the cable-ready MMI is connected directly to the DS1 circuit pack to increase efficiency and free up valuable resources on the TDM Bus.

The VC is a TN788 circuit pack, and it supplies the audio conferencing functions for multipoint conferences. It decodes G.728 (LD-CELP) to G.711 (PCM) and encodes G.711 (PCM) to G.728 (LD-CELP) when requested for a conference. It detects voice energy and level to determine who is viewed as the speaker by the conference participants. It gates off background noise and eliminates audio feedback for optimum voice quality.

**Table 1**-**2. MCU Internal Hardware**

| Circuit Pack | Number | Function |
|---|---|---|
| Processor | TN786B | Provides high level control handling |
| Network Control | TN777B | Provides the interface between the Processor Interface circuit pack and the rest of the system |
| Tone Detector | TN748D | Collects incoming digit information from trunks and supports testing of MCU resources |
| Tone/Clock | TN768 | Provides conference tones and supports testing of MCU resources |
| DS1 | TN767D | Terminates incoming DS1 trunks to the MCU |
| UDS1 | TN2207 | Terminates incoming UDS1 trunks to the MCU |
| Processor Interface | TN765 | Terminates incoming PRI D-channel for ISDN-PRI |
| Digital Line | TN754B | Supports maintenance alarm terminals (alarms and Automatic Circuit Assurance) and provides data connectivity for the MCU Scheduling Terminal (MCU-ST) and for the optional system printer and Call Detail Recording (CDR) |
| Multimedia Interface | TN787B | Terminates the H.221 Px64 protocol |
| Voice Conditioner | TN788 | Provides audio conferencing support |
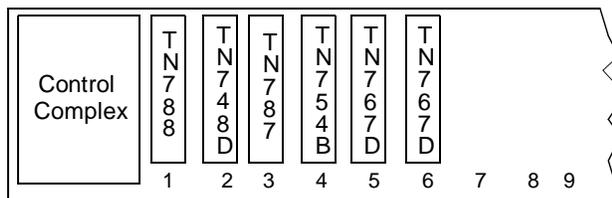


**Figure 1**-**1. Basic AT&T MCU Configuration (4 Ports)**

➡ **NOTE:**
For other AT&T MCU configurations, refer to *AT&T MultiPoint Control Unit (MCU) System Description*.

# AT&T Video Product Family

To provide a complete video solution to our customers, the MCU supports these new AT&T video endpoints:

■ The AT&T Group Video System (when upgraded to support Px64 with the LINK 64E option installed)

■ The AT&T TeleMedia Personal Video System Model 70, a PC-based multimedia workstation offered by AT&T NCR

For a list of supported non-AT&T video endpoints, see the *AT&T MultiPoint Control Unit Reservation Agent Manual.*

# External Components

The AT&T MCU is offered in increments of 4-port, 2-port, and 1-port configurations. Specifically, an MCU with 768k ports is offered in 1-port increments, while an MCU with 1472k or 1536k ports is offered in 2-port increments. An MCU with any of the other available port configurations is offered in 4-port increments.

A 24-port model has the capacity to support two simultaneous 12-party, two channel, 112k, 128k, or H0 (384k) conferences. Larger conferences can be achieved by connecting two AT&T MCUs (known as "cascading"). By using the cascading feature with two 24-port models, AT&T can support up to 46 video conference participants (known as "conferees") and two audio-only participants.

## ⇒ NOTE:
Cascading is an optional feature for DX and FX models. Cascading is standard with EX models.

For a two cabinet system (required for 20-and 24-port configurations), the control MSM is installed in position A and the second MSM, the port MSM, is installed in position B as shown in the next figure.

(Front View)
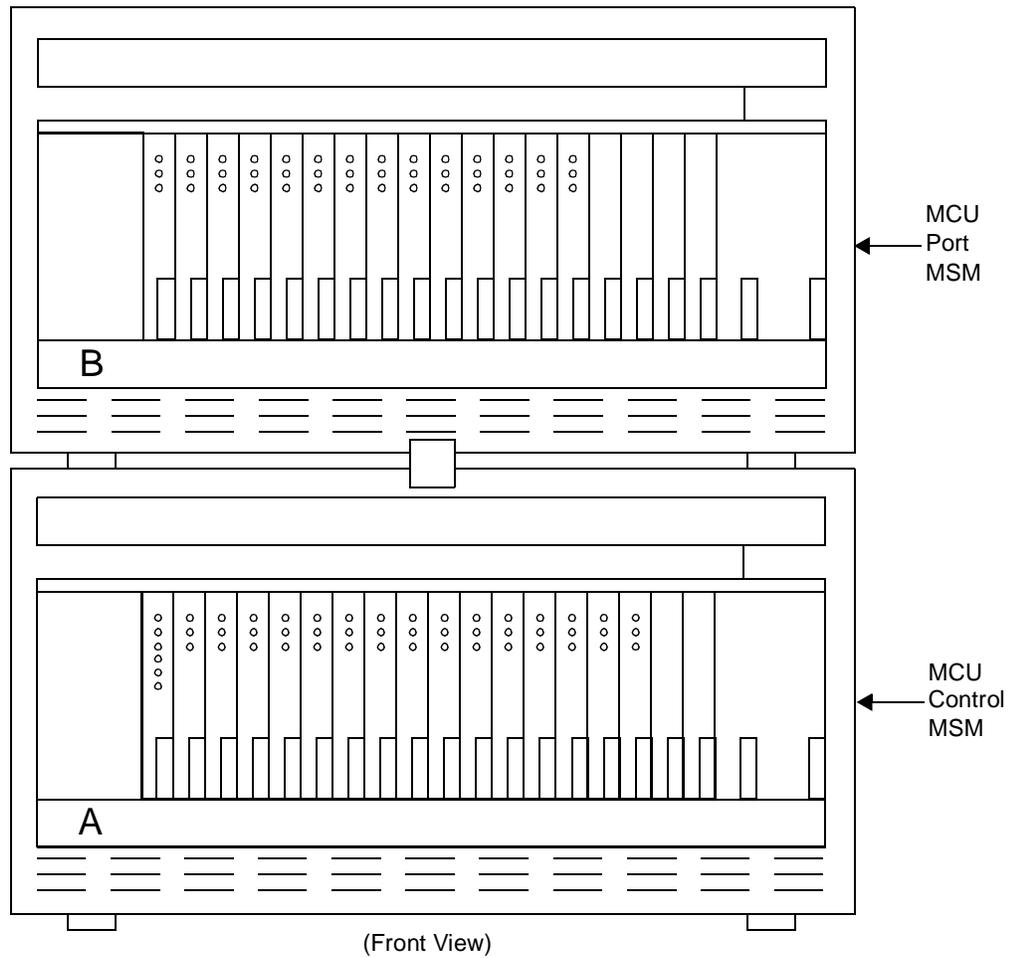
**Figure 1**-**2.    AT&T MCU 24**-**Port Configuration**

For a three cabinet system (required for 64-port configurations), the control MSM is installed in position A, and the second and third port MSMs are installed in positions B and C, respectively.

MCU
Port
MSM

MCU
Port
MSM

MCU
Control
MSM

(Front View)
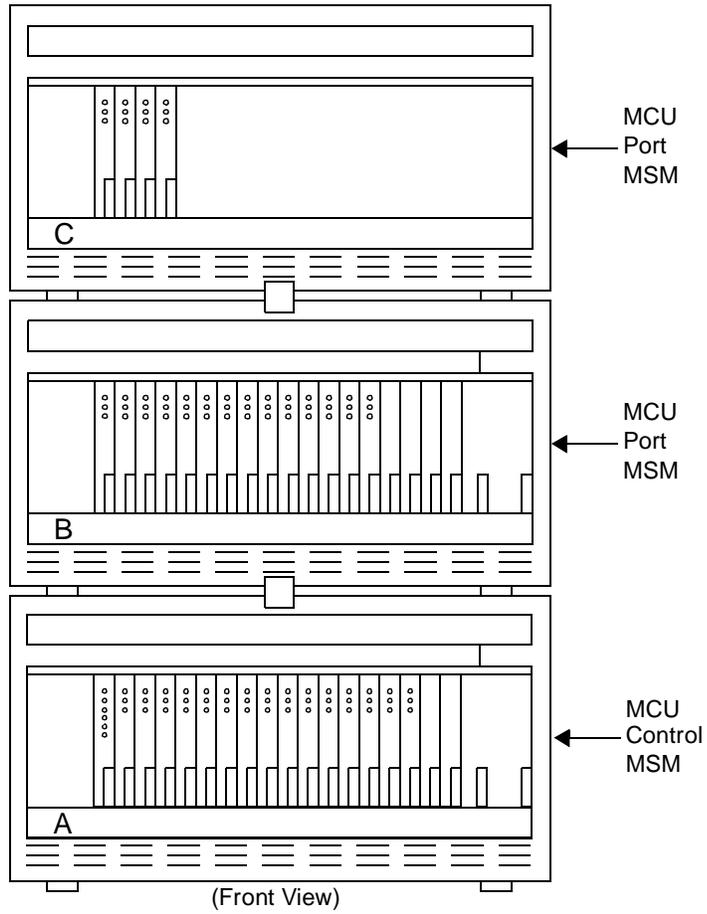
**Figure 1-3.    AT&T MCU 64-Port Configuration**

The AT&T MCU product offer includes the following equipment:

- **MCU Management Terminal (MCU-MT):** A 715 Business Communications Terminal (BCT) is used by the telecommunications manager to perform system administration, maintenance and troubleshooting. Ideally, it should be installed in close proximity to the MCU. It can also be used as an MCU-ST.

- **MCU Scheduling Terminal (MCU-ST):** A 715 BCT connected to the MCU via a data module (7400B) is used for scheduling conferences, registering endpoints, and basic troubleshooting. This terminal can also be used to perform MCU-MT activities.

    > **NOTE:**
    > An optional PC-based reservation system, the AT&T Conference Reservation System (CRS), automates the conference reservation process. It is a plug replacement for the MCU-ST.

- **DCP Maintenance Alarm Terminal:** One maintenance alarm terminal (model 7444D) is provided for terminal alarming, facility test calls, and Automatic Circuit Assurance (ACA). It should be installed near the MCU MSM or located on either the telecommunications manager's desk or the reservation agent's desk. The MCU supports up to three DCP alarm terminals (must be model 7444D).

- **Remote Access Port for Maintenance:** This port provides the connection to INADS and the VTC for alarms, remote administration and maintenance. The connection to INADS is only for alarms designated as major or minor.

- **Station Message Detail Recording Interface:** This port connects to an optional system printer to provide records on MCU port usage and length of call per endpoint for billing purposes.

- **System Printer:** An optional system printer can be connected through a data module (7400B) to print alarms and system reports. Printers can also be connected directly to the MCU-MT and the MCU-ST to print conference information and screens.

# Supported Network Configurations

The MCU connects to a serving network (AT&T, other IXC, LEC or private PBX) via DS1 Robbed Bit Signaling (RBS), DS1 or UDS1 ISDN-PRI signaling, or Channel Associated Signaling (CAS). The MCU supports connectivity over T1 or (only when it is behind the PBX) E1 facilities. E1 facilities are used to support international MCU capabilities and require use of the UDS1 TN2207 circuit pack. Only digital trunks are supported, including RBS, ISDN-PRI or (in Australia and the United Kingdom only) CAS . The ISDN-PRI feature NFAS is supported domestically but not in Australia and the United Kingdom. Another ISDN-PRI feature, D-channel backup, is supported both domestically and internationally.

Calls to and from the AT&T MCU can be 56k (combined by the MCU into two DS0 at 112k), 64k (combined by the MCU into two DS0 128k), 384k (H0), NxDS0, bonded 336/384k, 768k, 1472k, or 1536k.

Signaling is ISDN-PRI, RBS, or CAS, framing is D4 or ESF, and linecoding is B8ZS or ZCS. All calls are data calls.

## Connections Behind a PBX

The MCU connects to a PBX via DS1 or UDS1 trunks. The PBX functions as a tandem in front of the MCU so calls terminate on the MCU not the PBX. The PBX networking software determines the digits passed to the MCU.

DS1 (UDS1) trunks connecting the PBX to the network may be shared between PBX endpoints and the MCU. All AT&T PBXs with a DS1 (UDS1) ISDN-PRI/CAS interface support MCU connectivity for 56k/64k bandwidth. Also, all AT&T PBXs with a DS1 RBS interface supports MCU connectivity for 56k bandwidth. Note that UDS1 trunks do not support RBS and that 64k bandwidth does not use RBS. For 384k bandwidth, the AT&T MCU can be behind a DEFINITY G3V2 that is connected to AT&T SDDN SW384 services or networked privately to other DEFINITY G3V2s. For a 336k or 384k bonding connection, the caller must set up six calls using the same SDDN number.

## Connections Involving Bonding Compliant
## Inverse Multiplexer (IMUX)

The MCU may be served by an ANSI bonding compliant IMUX that is directly connected to the AT&T Switched Network. Callers can establish 336k bonding and 384k calls via this connection.

## Direct Network Connections

The MCU can be connected to IXCs and LECs via ISDN-PRI or DS1 robbed bit. Each video endpoint participating in an MCU conference *must* subscribe to the same network service as the MCU. Unlike voice services provided by IXCs, a subscriber to a given service cannot call endpoints connected to a service provided by another IXC. Even within the same IXC, such as AT&T Network Services, subscribers of one digital service cannot connect to subscribers of a different service, unless it is provisioned to do so.

However, the MCU can be connected to multiple network services. Therefore, if the MCU is connected to both AT&T and Sprint, for example, then any endpoint that is connected to either network can join an MCU video conference (provided all other criteria are met). Since the video endpoints view the connection to the MCU as a point-to-point call, the MCU accepts a call from an endpoint using the AT&T network and another endpoint using the Sprint network then places them in the same conference.
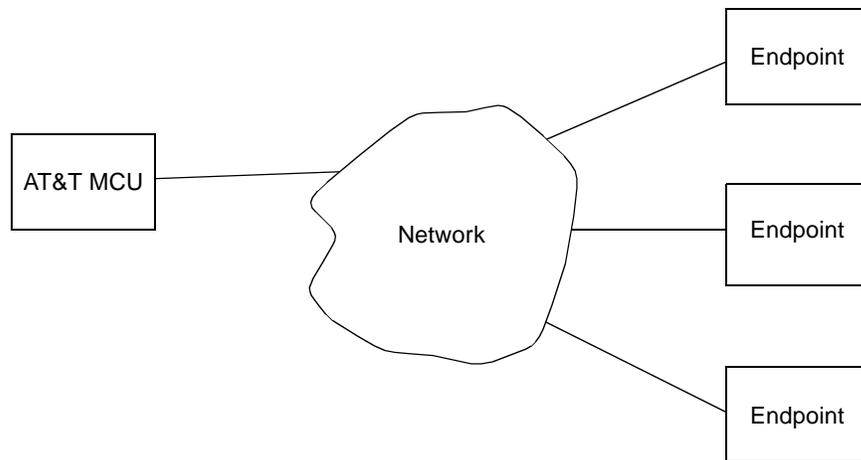


**Figure 1**-**4.** **Direct Network Connection**

## Call Routing and Establishment

The AT&T MCU Release 2.0 allows video conference calls to originate from the MCU and also be received by the MCU. Both incoming and outgoing calls gain access to the network via DS1 (UDS1) trunks. For incoming calls (Meet-Me calls) from the network, the MCU processes the call digits and routes the call based on

the designated digits. The MCU selects an MCU port from its available resources and terminates the call on the selected port (the number of available ports is determined by the hardware installed and administration settings).

For outgoing multimedia calls (dial-out) where the AT&T MCU calls the conferees or another AT&T MCU, the MCU pulses the digits over the network. The call is directed through the network and terminates on the conferee's video terminal. Once the network confirms that the call has been answered, the AT&T MCU provides the necessary multimedia ports from the MCU port resource pool (actually, the ports needed for the call have been previously allocated when the conference was reserved). The call is terminated to an extension associated with the dialed-out number.

Call establishment is the procedure used for making an outgoing call to a conferee's endpoint or cascading to another AT&T MCU. Call establishment is triggered by one of the following events:

■　　Conference status change: When a reserved or dedicated conference becomes active.

■　　Administration change: When a reservation agent adds a dial-out conferee or changes an existing dial-out conferee's destination number.

■　　Retry: When a second attempt is made to connect the dialed-out number.

After any of the above events occurs, a dial-out call is placed. Once the call is answered, the AT&T MCU connects the call to the allocated MCU ports.

The MCU offers 440 extensions to provide flexibility for assigning network numbers.

These extensions are administered to many types of data channels, to the maintenance phone, and to MCU-extensions.

Network numbers are assigned to the MCU as Meet-Me numbers. The MCU maps each Meet-Me number to one of the 440 extensions assigned to the MCU. Meet-Me numbers are mapped to MCU extensions via digit deletion/insertion or AAR tables. When a Meet-Me number is received by the MCU, it is mapped to an extension, which selects an available port for the call. If the video call is over two B-channels (112k or 128k), the MCU actually receives two incoming network calls for the same Meet-Me number. Both calls are routed to the same port. Similarly, a bonded 336k call occupies six B-channels, and the MCU receives six incoming network calls for the same Meet-Me number. On the other hand, a 384k (H0) call also occupies six B-channels, but the MCU receives just one incoming network call for this type of call. The MCU also receives just one incoming network call for a 768k call, which occupies 12 B-channels.

Conferees are unaware of the corresponding MCU extensions; they join a multi-point conference by dialing in on the assigned Meet-Me number or receive a call from the MCU.

Digits are sent to the MCU per network provisioning or per tandem PBX provisioning. The MCU also has AAR digit manipulation functionality. Digit manipulation can be done in the network, within the serving PBX, or on the MCU trunk group, and in the MCU call routing tables.

# Pre-Installation Procedures

# 2

## General

This chapter discusses the procedures you should follow before you install the MCU and its components.

## Basic Steps and Required Tools

The following table lists the basic installation steps and the tools and test equipment required to perform each step.

### ⇒ NOTE:
The MCU cabinet is referred to as the Multimedia Server Module (MSM).

**Table 2-1.   Tools and Test Equipment Needed for MCU Installation**

| Installation Step | Tool or Equipment | Recommended Type |
|---|---|---|
| Unpack the MSM | Tin Snips<br>Utility Knife<br>Adjustable Wrench | 6 or 8 inch |
| Position the MSM | Chalk Line<br>Ruler<br>Bubble Level | 30 inch |

**Table 2**-1.    **Tools and Test Equipment Needed for MCU Installation  —** *Continued*

| Installation Step | Tool or Equipment | Recommended Type |
|---|---|---|
| Install the MSM (includes procedures for earthquake protection mounting) | Electric Drill<br>Masonry Bit<br>Drill Bit (for computer floors)<br>Drift Punch<br>Adjustable Wrench<br>Ratchet<br>Sockets<br>Nut Driver<br>Screwdriver<br>Allen Wrench | Impact Type<br>1/2 inch<br>5/8 inch<br><br>Length to reach concrete floor<br>6 to 8 inch<br>1/2 inch<br>5/16, 1/2 and 3/4 inch<br>1/4 inch<br>8 inch, flat blade<br>AC: 1/8 inch<br>DC: 3/16 inch (supplied) |
| Check commercial power. Connect ground and power | Digital Multimeter | KS-20599 |
| Install administration devices | | |
| Install maintenance phone | | |
| Power up the MCU | | |
| Perform an initial test | Voltage Tester | TN2036 |
| Interconnect the MCU elements | | |
| Install auxiliary equipment | | |
| Wire the system | | |
| Contact the VTC | | |

# Environmental Checklist

Review the figures and checklist below to cover all environmental requirements.

### Floor Plan

Although floor plans depend on the size of the equipment room, be sure to keep the MSM clear of all objects (such as, shelves, windows, pictures) and allow for future space requirements needed for capacity upgrades. For example, the 24-port MCU requires two MSMs. If a customer is anticipating adding ports in the future, allow vertical space for the second MSM required to expand from 20 to 24 ports.
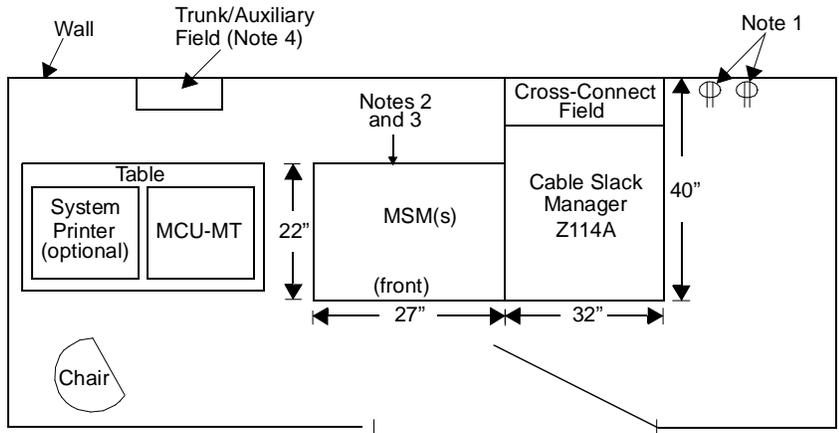
NOTES:

1. AC receptacles must be separately fused and not under control of a wall switch, receptacles must not be shared with other equipment, and should be located outside the cross-connect field area.
2. System must be grounded by one of the approved methods.
3. Earthquake protection may be required.
4. The trunk/auxiliary field may be located within the cross-connect field.

**Figure 2-1.   Typical Floor Plan for AC-Powered MCU with Single Carrier MSM**
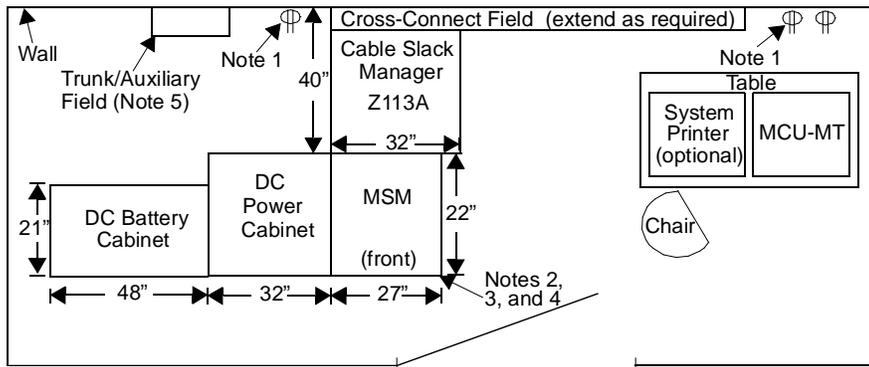
NOTES:

1. AC receptacles must be separately fused and not under control of a wall switch, receptacles must not be shared with other equipment, and should be located outside the cross-connect field area.
2. Allow at least 36 inches of space in front of the MSM to remove the door.
3. System must be grounded by one of the approved methods.
4. Earthquake protection may be required.
5. The trunk/auxiliary field may be located within the cross-connect field.

**Figure 2-2.   Typical Floor Plan for DC-Powered MCU with Single Carrier MSM**
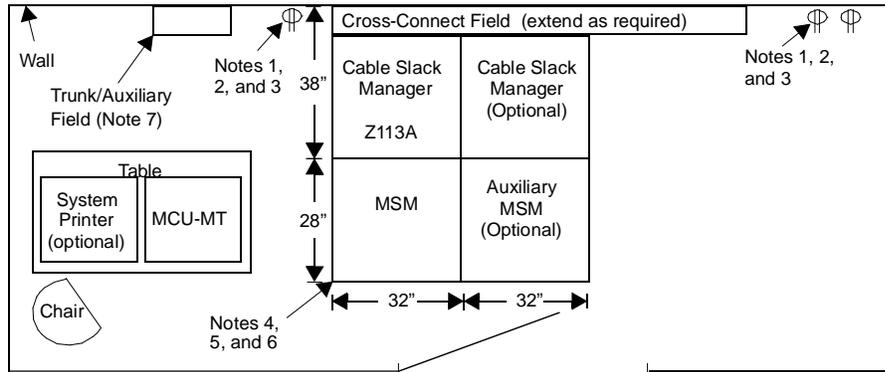
NOTES:

1. AC receptacles must be separately fused and not under control of a wall switch. Receptacles must not be shared with other equipment, and should be located outside the cross-connect field area.

2. An MSM requires a special 120 volt, 60 Hz, 50 amp AC receptacle (NEMA 5-50R receptacle or equivalent) or 250 volt, 60 Hz, 30 amp AC receptacles (NEMA L14-30R receptacle or equivalent).

3. Auxiliary MSMs require a special 120 volt, 60 Hz, 20 amp AC receptacle (NEMA 5-20R receptacle or equivalent).

4. Allow at least 36 inches of space in front of MSM to let door swing open.

5. System must be grounded by one of the approved methods.

6. Earthquake protection may be required.

7. The trunk/auxiliary field may be located within the cross-connect field.

**Figure 2-3.   Typical Floor Plan for AC-Powered MCU with Multicarrier MSM**
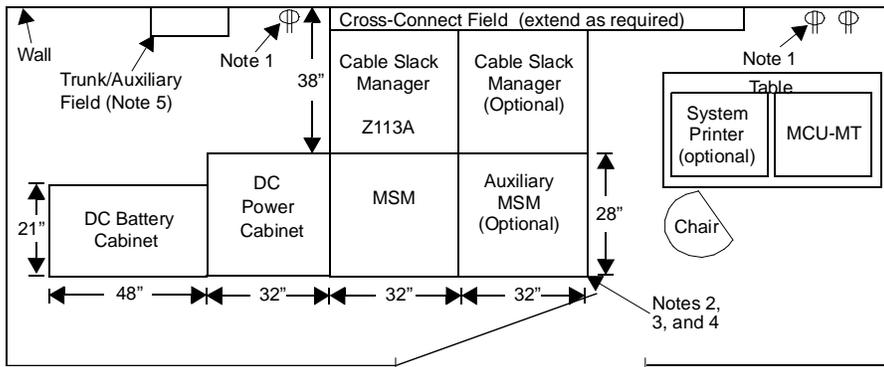
NOTES:
1. AC receptacles must be separately fused and not under control of a wall switch. Receptacles must not be shared with other equipment, and should be located outside the cross-connect field area.
2. Allow at least 36 inches of space in front of MSM to let door swing open.
3. System must be grounded by one of the approved methods.
4. Earthquake protection may be required.
5. The trunk/auxiliary field may be located within the cross-connect field.

**Figure 2-4.   Typical Floor Plan for DC-Powered MCU with Multicarrier MSM**

■ The floor must have a commercial floor loading code of at least 50 pounds per square foot.

■ AC receptacles must be separately fused and not under control of a wall switch, shared with other equipment or located inside the cross-connect field.

■ The MCU must be grounded by one of the approved methods.

■ Earthquake protection may be required by law (see Figure 2-5 on page 2-7). Areas designated with a 0 have a low susceptibility; higher numbers mean a greater susceptibility. Four is the highest number for the United States; three is the highest number for Canada.

■ The trunk and auxiliary fields may be located within the cross-connect field.

Seismic Risk Zone Maps

United States [1]
0
1
2
3
4

Canada [2]
0
1
2
3

Alaska

Hawaiian
Islands

1. Seismic data from "Uniform Building Code," International Conference of Building Officials, 1976, Whittier, California.

2. Seismic data from "The Supplement to the National Building Code of Canada," 1980, NRCC No. 17724.
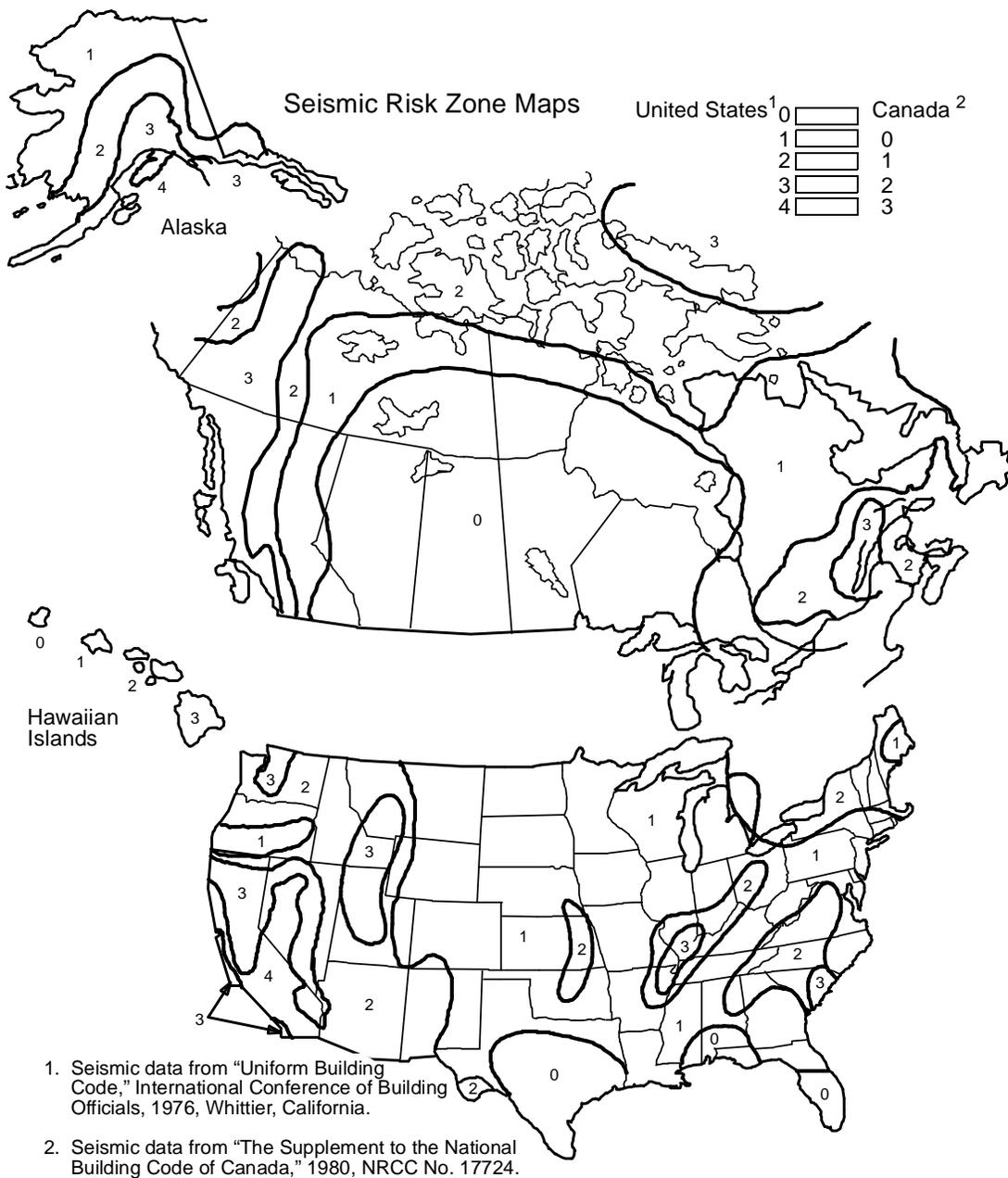
**Figure 2-5.   North American Continent Earthquake Environment**

## Floor Area

Floor area requirements in the equipment room vary depending on the type of MSM. Refer to the appropriate section.

## Requirements for ESCC-MSM or SCC-MSM

The ESCC-MSM or SCC-MSM is 27 inches (69 cm) wide and 22 inches (56 cm) deep. A single MSM is about 20 inches (51 cm) high, a two-cabinet system is 39 inches (99 cm) high, a three-cabinet system is 58 inches (1.5 m) high, and a four-cabinet system is 77 inches (2 m) high. The cable slack manager requires 38 inches between the MSM and wall. The system cabinets and the cable slack manager occupy about eight square feet (.74 square m) of floor space. Allow at least 36 inches in front of the MSM for door removal.

## Requirements for MCC-MSM

The MCC-MSM is 32 inches (81 cm) wide and 28 inches (71 cm) deep. The cabinet is 70 inches (1.8 m) high. The cable slack manager requires 38 inches between the MSM and wall. Each MSM (including the door opening) and cable slack manager occupy about 22 square feet (2 square m) of floor area. Allow at least 36 inches in front of the MSM for door removal.

## Desktop Space

The 715 BCTs used as the MCU Management Terminal (MCU-MT) and MCU Scheduling Terminal (MCU-ST) require approximately 3.2 square feet of desk space.

## Temperature and Humidity

The MCU should be installed in a well ventilated area. Temperatures should range between 40 and 120 degrees fahrenheit (4 to 49 degrees celsius). Relative humidity should range as follows:

■ From 40 degrees fahrenheit up to 84 degrees fahrenheit (29 degrees celsius) between 10 to 95 percent

■ From 85 degrees fahrenheit up to 120 degrees fahrenheit (49 degrees celsius), between 10 to 34 percent

Environments beyond these limits may reduce system life and impede operation.

➡ **NOTE:**
For altitudes above 5,000 feet, reduce the maximum short-term temperature by 1 degree fahrenheit for each 1,000 feet of elevation above 5,000

feet. For example, at 10,000 feet, the maximum short-term temperature is 115 degrees fahrenheit (46 degrees celsius).

The MCU can operate at the maximum short-term operational limits for a period not to exceed 72 consecutive hours or for more than 15 days in a year.

## Air Purity

Do not install the MSM in an area where the air contains excessive dust, lint, carbon particles, paper fiber or metallic contaminates, or corrosive gases (such as sulfur or chlorine).

## Lighting

Lighting should be sufficient for administration and maintenance personnel to perform tasks. The recommended light intensity level is 50 to 70 footcandles to comply with the standards set by the Occupational Safety and Health Act (OSHA).

## Noise

In most cases, electrical noise is introduced into the MCU through trunk and station cables, or both. However, electromagnetic fields near the MCU may also cause noise in the system. Therefore, the MCU and cable runs should not be placed in areas where a high electromagnetic field strength exists.

Radio transmitters (AM or FM), television stations, induction heaters, motors (with commutators) of 0.25 horsepower (187 watts) or greater, and similar equipment can cause interference. Motors without commutators and field strengths below 1.0 volt are unlikely to cause interference. These fields can be measured with a tunable meter, such as the Electro-Metrics Division Model R-70. To measure fields strengths greater than 1.0 volt, use a broadband meter, such as the HOLADAY HI3001 meter or the Instruments for Industry, Inc., Model EFS-1.

To estimate the field strength caused by radio transmitters, divide the square root of the emitted power of kilowatts by the distance from the antenna in kilometers. This yields the approximate field strength in volts per meter and is relatively accurate for distances greater than half a wavelength (150 meters for a frequency of 1000 kHz).

## Additional Considerations

Noise and heat generated by the MCU should also be considered when selecting its location. The ESCC-MSM or SCC-MSM produces 48 dBA of acoustic noise at a distance of five feet. When the door is open, there is an additional 1 dBA of noise.

The noise produced by an MCC-MSM system with a five-carrier cabinet at a distance of five feet (1.5m) is 51, 53, and 56 dBA at a low, medium, and high fan speed, respectively.

The following table shows the average and maximum power consumption and also the heat dissipation for the MSM. For each power consumption figure, the maximum system conference capacity is assumed.

**Table 2-2. MCU MSM Power Consumption and Heat Dissipation by System**

| Average Power Consumption | Maximum Power Consumption | Average Heat Dissipation |
|---|---|---|
| 710 watts | 730 watts | 2420 BTUs per hour |

# Electrical Requirements Checklist

Review the figures and checklist below to cover all electrical requirements for the MCU. This section includes considerations for power, grounding, lightning protection, sneak current protection, standby power and wiring requirements.

## Power Requirements

Each MSM requires a separate power outlet. These outlets must not be shared with other equipment, must not be under switch control, and should be located outside the cross-connect field. Any available power source can be used as long as the phase or leg provides 120 volt AC at the required drain.
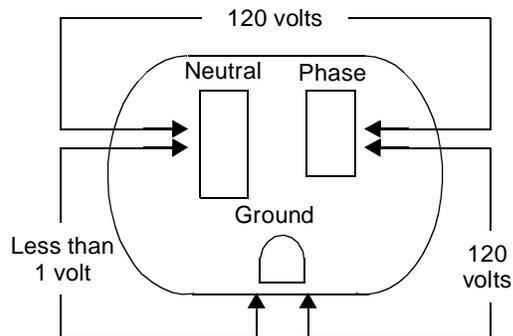
**Figure 2**-**6.** **Required Power Outlet**

### AC-**Powered MSM**

An AC-powered SCC-MSM or MCC-MSM is UL-listed at 10 amperes, 120 volts, or 1200 watts per cabinet. Therefore, the power required for a two cabinet system is 2400 watts.
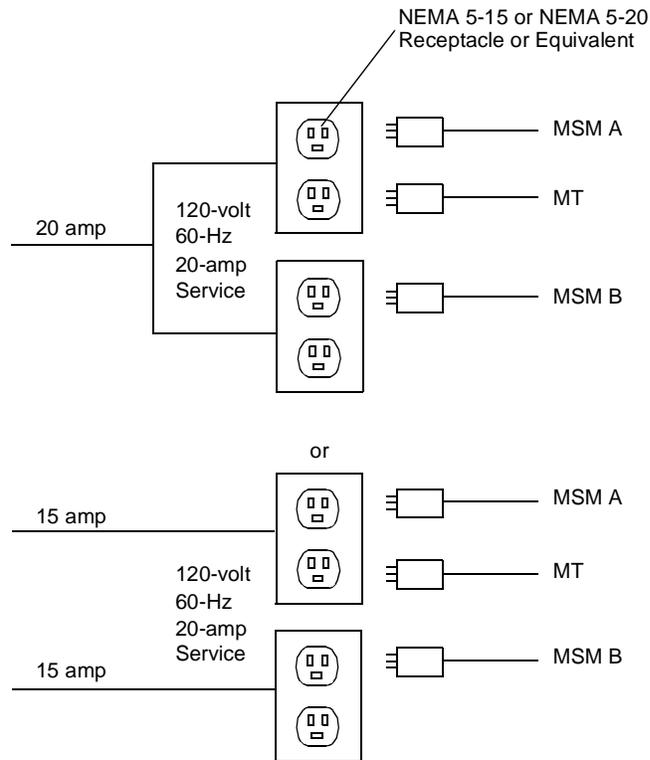
**Figure 2**-**7.   AC Power Requirements**

### DC-Powered MSM

A DC-powered MSM uses a 676B (-48V DC input) power supply. It provides +5 volts (275 watts) DC, -5 volts (27.5 watts) DC and -48 volts (225 watts) DC necessary for the MCU. The +12 volts DC used to program the FLASH ROM is generated by a +5v DC to +12v DC converter on the Network Control circuit pack (TN777B) and bussed on pin 008 (SPR1), an unused pin that is also bussed to the Processor Interface circuit pack (TN765).

A DC-powered MSM has the following input power requirements:

**Table 2-3.**

| Parameter | Requirements |
|---|---|
| Static Voltage | -48 V DC nominal, -42.5 V DC minimum, -52.5 V DC maximum (measured at input to MCU). |
| Dynamic Voltage | Transient change in voltage (+/- 5% of steady state voltage); allowed transient duration up to 200 ms. |
| AC Ripple Voltage | Maximum wideband AC ripple 450 mvpp in the 3 kHz-to-20 mHz band. |
| Low Voltage Disconnect | Automatic disconnect occurs when input voltage becomes less than -42.5 V DC (control provided with battery plant). |
| Overvoltage Protection | Input voltage must not exceed -52.5 V DC. |
| Voltage Drop | Maximum drop must not exceed 0.5 V DC one-way on feeder cable between the power board and the MCU.<br><br>Feeders must be UL-approved and CSA-certified.<br><br>Feeder gauge must be no smaller than 6 AWG and no larger than 1/0 gauge.<br><br>Recommended -48 V DC feeder cable (Royal Electrol #4905 or equivalent).<br><br>1-AWG is required for distances up to 50 feet.<br><br>Cable resistance must be equal to or less than 0.1290 ohms per 1,000 feet. |
| Current Draw | The battery plant rectifiers must be capable of providing current for the MCU, including current required for system holdover and charging the batteries. In addition, this may include DC current required for an inverter providing AC power to peripheral equipment (if installed), and for future growth.<br><br>The -48 V DC supplied by the battery plant to the system cabinet will be maintained between -42.5 and -52.5 V DC at all times ensuring proper operation and preventation of damage to hardware. |
| Circuit Breaker | A UL-listed and CSA-certified circuit breaker must be provided at the battery plant power board for each system cabinet feeder.<br><br>Recommended circuit breakers are 75 ampere Airpax UPL1-1-REC2-52-753 or Heinemann AM1-B2-A-75-2. |
| Redundancy | Redundancy of the battery chargers and rectifiers should be considered. It would also provide the additional current necessary to recharge the batteries after being fully discharged. |

**Table 2**-3.

| Parameter | Requirements |
|---|---|
| Electrical Noise | Voice band noise from the battery plant to the system must be less than 32 dBmC. |
| Grounding | A single point ground must be maintained.<br><br>A ground conductor must be installed from the isolated ground discharge bar to the closest approved ground via the shortest route required by the NEC/REC. The gauge must be no smaller than the largest conductor in the system and larger than 6 AWG.<br><br>The ground discharge bar must not be electrically connected to the chassis of the battery plant chargers, power board, or inverter.<br><br>All output power must be isolated from input power. |
| Lightning Protection | There must be adequate lightning protection in the battery plant to ensure that the MCU will not be damaged. |
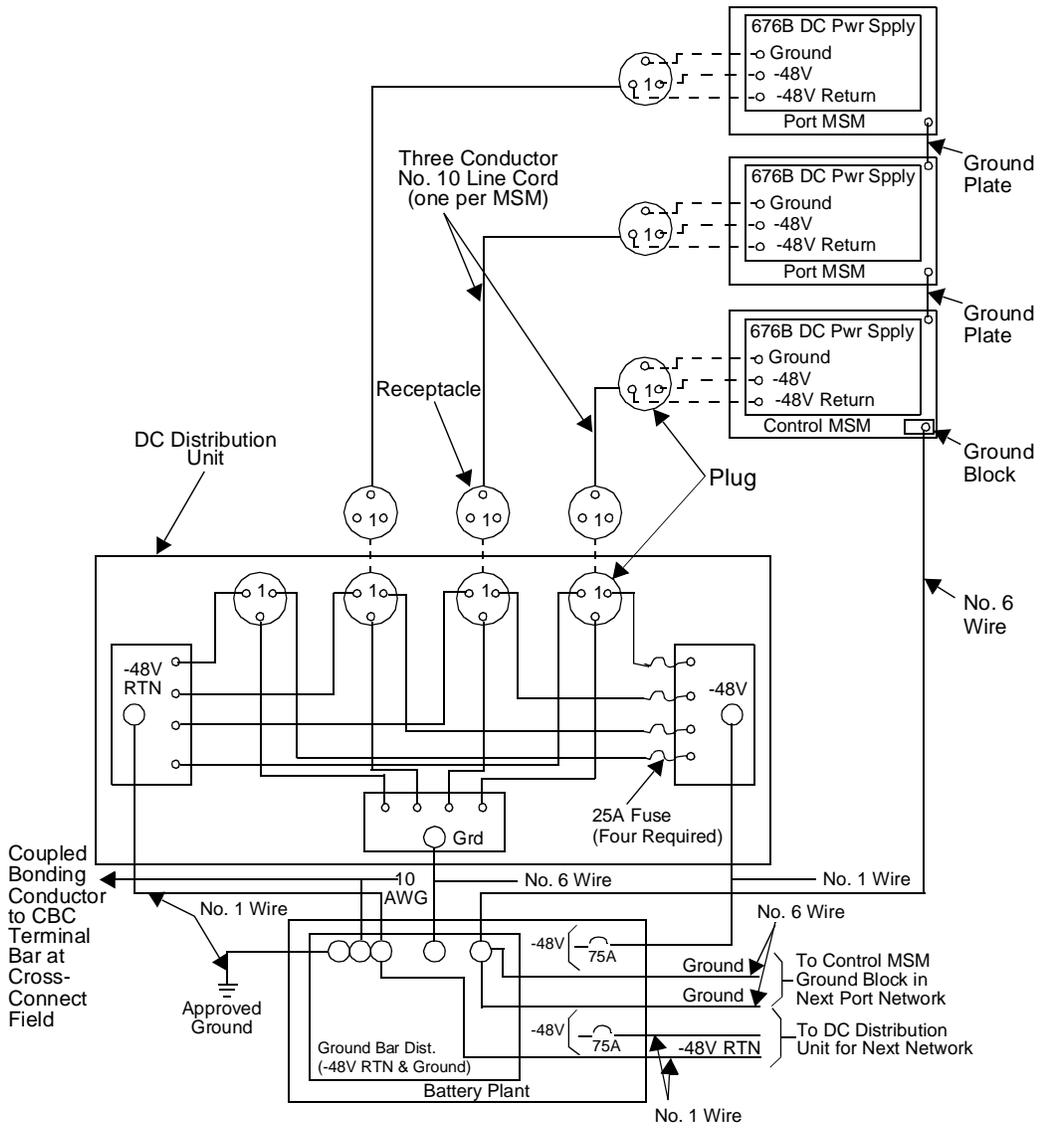
**Figure 2**-**8.    Typical DC Power and Grounding Layout**

## Grounding

An approved ground for the MCU in the equipment room is essential. Here are a number of suggestions:

- **Grounding Building Steel:** The metal frame of the building effectively grounded by one of the following items: acceptable metallic water pipe, concrete-encased ground, or a ground ring.

- Acceptable Water Pipe: A metal underground water pipe (at least 1/2 inch in diameter) in direct contact with earth for at least 10 feet. The pipe must be electrically continuous or made electrically continuous by bonding insulated joints, plastic pipe, or plastic meters, to the point where the protector ground wire is connected. A metallic underground water pipe must be supplemented by the metal frame of the building, a concrete-encased ground or a ground ring. If these grounds are not available, the water pipe ground can be supplemented as follows:

  ⇒ **NOTE:**
  All approved grounds must be bonded to form a single grounding electrode system as required in Section 250-81 of the National Electrical Code.

  - Metal underground gas piping system is an electrically continuous system that is uninterrupted with insulating sections or joints and without an outer nonconductive coating.

  - Other local metal underground systems or structures including local underground structures such as tanks and piping systems.

  - Rod and pipe electrodes of a 5/8 inch (solid rod) or 3/4 inch (conduit or pipe) electrode, driven to a minimum depth of 8 feet.

  - Plate electrodes exposed to a minimum of two square feet of metallic surface to the exterior soil.

- Concrete-Encased Ground: An electrode encased by at least two inches of concrete and located within and near the bottom of a concrete foundation or footing in direct contact with the earth. The electrode must be at least 20 feet of one or more steel reinforcing bars or rods, not less than 1/2 inch in diameter, or at least 20 feet of bare, solid copper wire not smaller than 4 AWG.

- Ground Ring: A buried ground that encircles a building or structure at a depth of at least 2 1/2 feet below the earth's surface. The ring must consist of at least 20 feet of bare copper conductor no smaller than 2 AWG.

Approved floor grounds are grounds on the floors of high-rise buildings suitable for connection to the ground terminal in the riser closet and to the MCU single point ground terminal. These grounds can be any one of the following:

- Building steel

- Grounding conductor for the secondary side of the power transformer feeding the floor

- Metallic water pipes

- Power feed metallic conduit supplying panel boards on the floor
- A grounding point specifically provided in the building for the purpose

### Lightning Protection

A coupled bonding conductor is tie-wrapped to all trunks. The coupled bonding conductor can be any one of the following:

- 10-AWG ground wire
- Continuous cable sheath
- Six unused pairs of wire

The coupled bonding conductor connects the MSM single-point ground block and runs all the way to the approved ground located nearest the telephone company-owned protector block at the building entrance.

### Sneak Current Protection

Sneak fuses protect the building wiring and circuit packs from "foreign potential" by providing a current interruption capability. Sneak fuse panels, when provided, are installed on the MCU side of the network interface. All incoming and outgoing trunks and off-premises station lines pass through the sneak fuses. Sneak current protection is required for installation in Canada. The sneak fuses must be CSA certified.

### Standby Power

The following provides battery reserve, uninterrupted power supply, and battery backup information.

- Battery Reserve: During commercial power failure, the power supply provides a 250-ms power holdover to allow the MCU to remain in service. If power is restored within 250 ms, there is no interruption of service. A battery reserve is automatically activated if commercial AC power fails.

  The battery, located inside the MSM on the top of the carrier, allows the power supply to provide a two minute battery reserve holdover to the control circuit packs and fans during power failure beyond 250 ms. All port circuit packs are out of service during this time.

  When commercial power is restored within two minutes, the MCU reinitializes the memory stored in the processor circuit pack. All port circuit packs remain out of service during the approximately 25 seconds required to restore the system. When commercial power is restored after two minutes,

the MCU also reinitializes. This time, however, the reinitialization takes longer (approximately 10 minutes) and the port circuit packs remain out of service for the duration.

If additional holdover power is necessary, an alternate, independent source of on-premises power is required to maintain the MCU for a limited time. An external, commercial UPS or battery backup arrangement can be used as an alternate source of power during a commercial power failure.

■ Uninterruptible Power Supply: If long-term holdover is required, an external UPS can be provided as an alternate source of power during a commercial power failure. Any UPS that meets the requirements given in the following table can be used with the MCU.

**Table 2-4. UPS Power Requirements by MSM**

| Volt-Ampere Rating | Frequency Hertz | Power Factor | Maximum Cut-In Time |
|:---:|:---:|:---:|:---:|
| 1200 | 60 +/- 5% | 0.6 | 200 ms |

■ Battery Back-Up: A battery supply and an inverter can be used to provide standby power for up to eight hours after a commercial power failure. When standby power is provided, the following items must be taken into consideration:

  ■ Size and weight of batteries

  ■ Size and weight of inverter

  ■ Heat dissipation

  ■ Air flow and circulation

  ■ Equipment receiving power

The standby power system contains the following:

  ■ Inverter

  ■ Batteries

  ■ Battery stand

The MSM requires a 120-volt AC input provided by the inverter. The size of the inverter is determined by the MCU configuration and the additional equipment to be provided with power in the event of a commercial power failure.

The size of the battery supply required depends on the length of time power is to be provided and the particular power demands of the system.

## House Wiring

House wiring includes all on-premises wiring on the customer side of the cross-connect field, which can be either 66-type or 110-type hardware. Wiring is distributed from the cross-connect field by 25-pair cables. The 25-pair cables are connected either directly to terminal wall jacks using adapters or to satellite locations.

Satellite locations are used when already present or when required by the length of the wiring runs. The 25-pair cables can be divided into either 3-pair or 4-pair wiring groups (4-pair groups are recommended). From the satellite locations, 4-pair, D-inside cables connect the satellite locations to information outlets (modular wall jacks).

# Installing the MCU and Components

# 3

## Installing the Single Carrier MSM

The Single Carrier MSM (SCC-MSM) is shipped in a polyethylene bag and packed in a cardboard container. It is fastened to a wood and styrofoam pallet with two carriage bolts. The cardboard container is strapped to the pallet with a metal band.

⚠ **DANGER:**
   *The SCC-MSM weighs approximately 130 pounds when fully loaded and requires two handlers.*

### Unpacking and Inspecting

1. Check the status of the SHOCKWATCH and/or TILTWATCH indicators on the cardboard container. The SHOCKWATCH and TILTWATCH indicators are normally white. If the container has been jarred or tilted beyond specifications, the indicators will be red, indicating potential damage. Report any damage per local instructions.

2. Remove the SCC-MSM from the cardboard container.

3. Remove all cardboard, tape, and plastic.

4. Open and remove the front door and rear screw-on panels from the SCC-MSM.

5. Remove all packing material from inside cabinet.

6. Inspect the SCC-MSM for damage caused during shipping. Report any damage per local instructions.

7. Check all circuit packs to be sure they are fully seated in the proper slots. Report any discrepancies between circuit pack type or quantity and the purchased configuration.

## Carrier Installation Sequence

For a SCC-MSM or ESCC-MSM configuration, install the ESCC-MSM in position "A." If the SCC-MSM is required, install it in position "B."

## Positioning the MSM

1. Place the MSM in position at the designated location.

2. Be sure the AC power receptacle is within 10 feet of the MSM. If earthquake protection is required, skip to *"Adding Earthquake Protection."*

3. If earthquake protection is not required, install hole plugs (provided with the cabinet) in the holes previously occupied by the two carriage bolts at the bottom rear of the MSM. Skip to *"Connecting Battery Leads."*

## Adding Earthquake Protection

⇒ **NOTE:**
Instructions for adding the earthquake front plate and earthquake ground plate are given at the appropriate point in the installation sequence.

1. Place the front mounting angle at the location selected for the front of the MCU control MSM.

2. Using the angle as the template, mark the location of the mounting bolts.

3. Drill two holes 1/2 inch in diameter and 1 1/2 inches deep at the spot marked in step 2.

4. Insert the concrete anchors.

5. Mount the front mounting angle to the floor using the 3/8-16 x 1.25 bolt with a nylon insulating washer.

6. Move the MSM back into place.

7. Attach the MSM to the angle with two No. 12-24 x 1/2 inch thread-forming screws.

8. Insert a pencil or marker through the holes previously occupied by the carriage bolts in the bottom rear of the MSM and mark the floor directly beneath each hole.

9. Remove the screws installed in step 5 and move the MSM out of the way.

10. Drill two holes 1/2 inch in diameter and 1 1/2 inches deep at the spot marked in step 8.

No. 12-24 x 1/2-inch
Thread-forming Screw
(four required)

MSM

Front
Mounting
Angle

3/8-16 x 1.25-inch Bolt
(two required)

Nylon Insulating Washer
(two required)

Concrete Floor

Concrete Anchor
(two required)
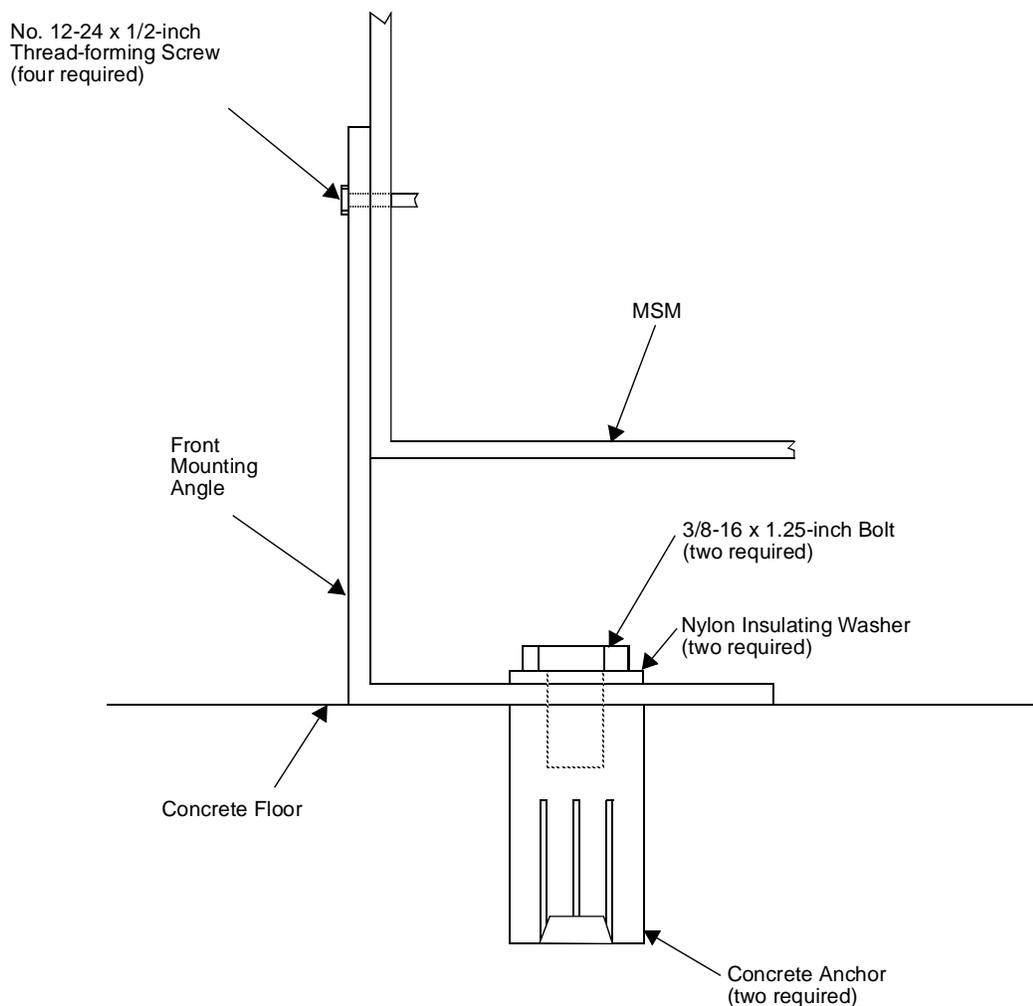
**Figure 3**-**1.    Front Mounting Angle**-**Concrete Floor**

11. Move the MSM back into place.

12. Attach the MSM to the front mounting angle using four No. 12-24 x 1/2 inch thread-forming screws.

13. In the rear of the MSM, lay the stiffener on the bottom of the MSM, aligning the stiffener with the holes in the bottom of the MSM.

14. Fasten the MSM to the floor using the 3/8-16 x 3.25 hex bolt and nylon insulating washer.

MSM

Nylon Insulating Washer
(two required)

3/8-16 x 3.25-inch
Hex Bolt
(two required)

Stiffener

MSM  Foot
(see Note)

Floor

Concrete Anchor
(two required)

Side View
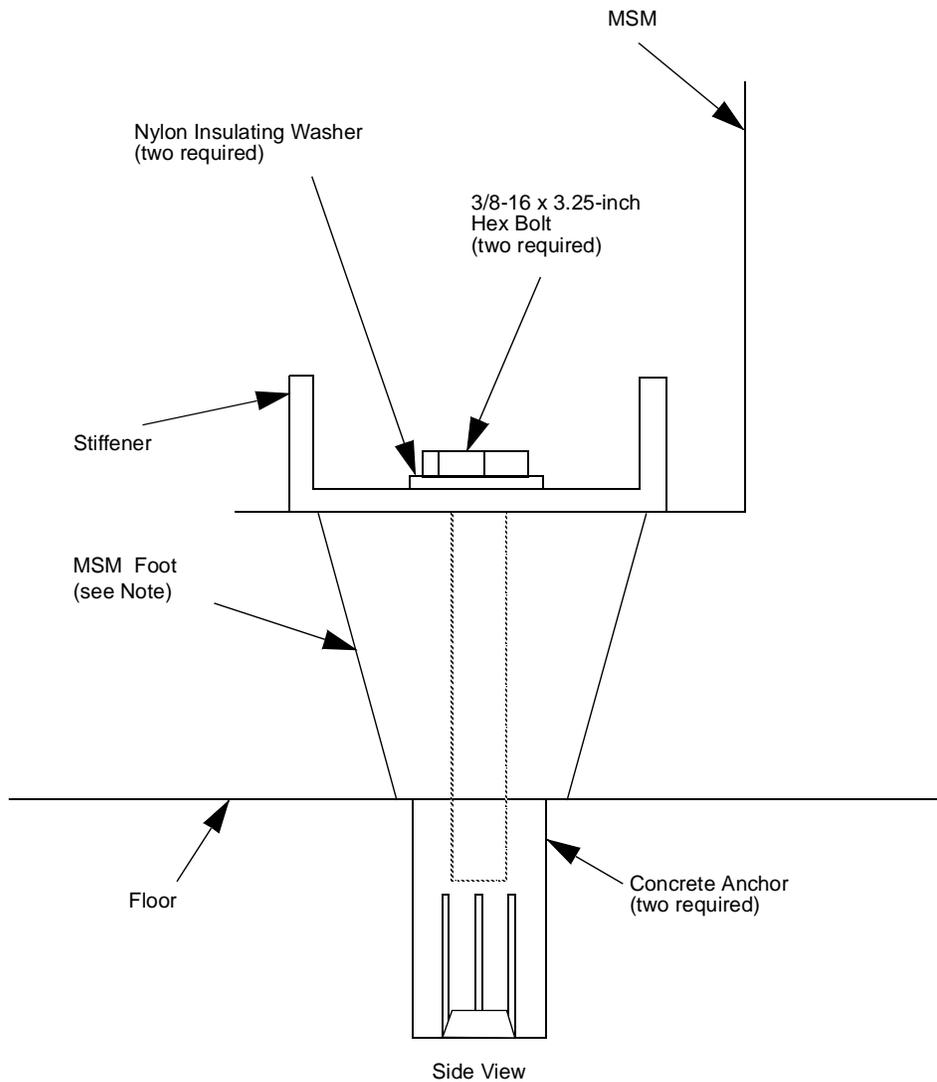
NOTE:  Bolt runs behind cabinet foot, not through it.

**Figure 3-2.    MSM Earthquake Mounting-Concrete Floor**

**Connecting Battery Leads**

**⇒ NOTE:**
This procedure is only for AC-powered MCUs. If a two cabinet, DC-powered MCU is being installed, skip to *"Installing the Second Cabinet."* For a single MSM installation, skip to *"Connecting DC Power."*

To confirm that an MCU is AC-powered, look at the front tab on the power supply (the hinge on the circuit board). The number WP91153 L3 identifies the power supply as AC.

The battery is located inside the cabinet on the top of the carrier. The control MSM is shipped with the battery lead disconnected to prevent the battery from discharging. Use the following steps to connect the battery:

1. Ensure that the circuit breaker is in the OFF position.

2. Remove the front panel. The battery lead is to the left of the battery (you may need to reach inside to get to it).

3. Connect the battery lead and push it back into the MSM.

4. If a second MSM is not being installed, skip to *"Connecting AC Power."*
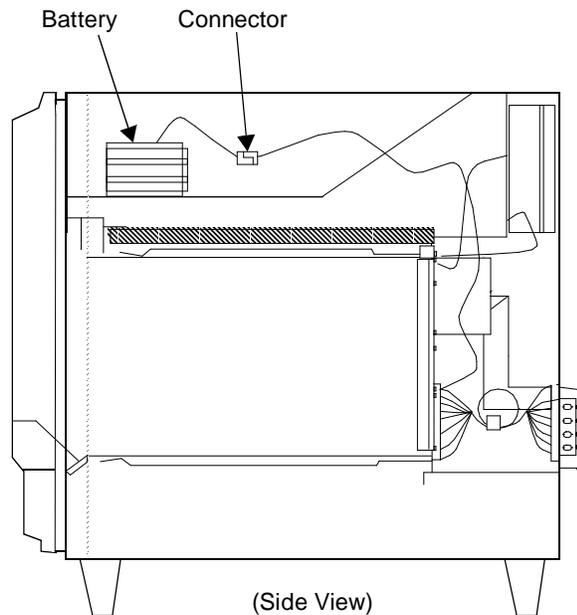


**Figure** 3-3. **Battery Location**

**Installing a Second MSM**

> ⇒ **NOTE:**
> This procedure is only for installing a second MSM. If you are performing a single MSM installation, skip to *"Connecting AC Power"* or *"Connecting DC Power,"* as appropriate.

1. Stack port MSM B on top of control MSM A. (The MSMs are labeled A and B on the front and back on the left side of the MSM carrier labels.)



(Front View)
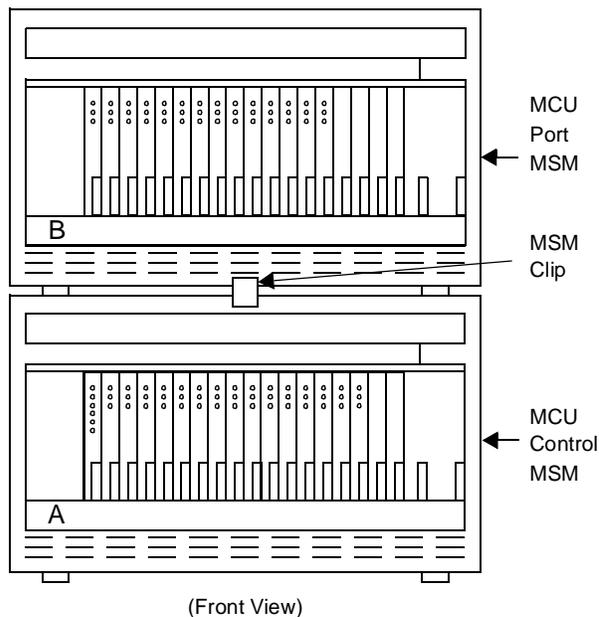
**Figure 3-4.    Installing a Second MSM**

2. Remove the TDM Bus terminator in slot 18 of MSM A backplane and move it to slot 17 of MSM B backplane.

3. Connect TDM Bus cables as shown in Figure 3-5. The TDM Bus cable is located behind the lower panel.

4. On the backplane of MSM B, to the right of slot 00, six pins are marked for the MSM address plug connections. Verify that the address plug for MSM B is in the right place as shown in Figure 3-5.
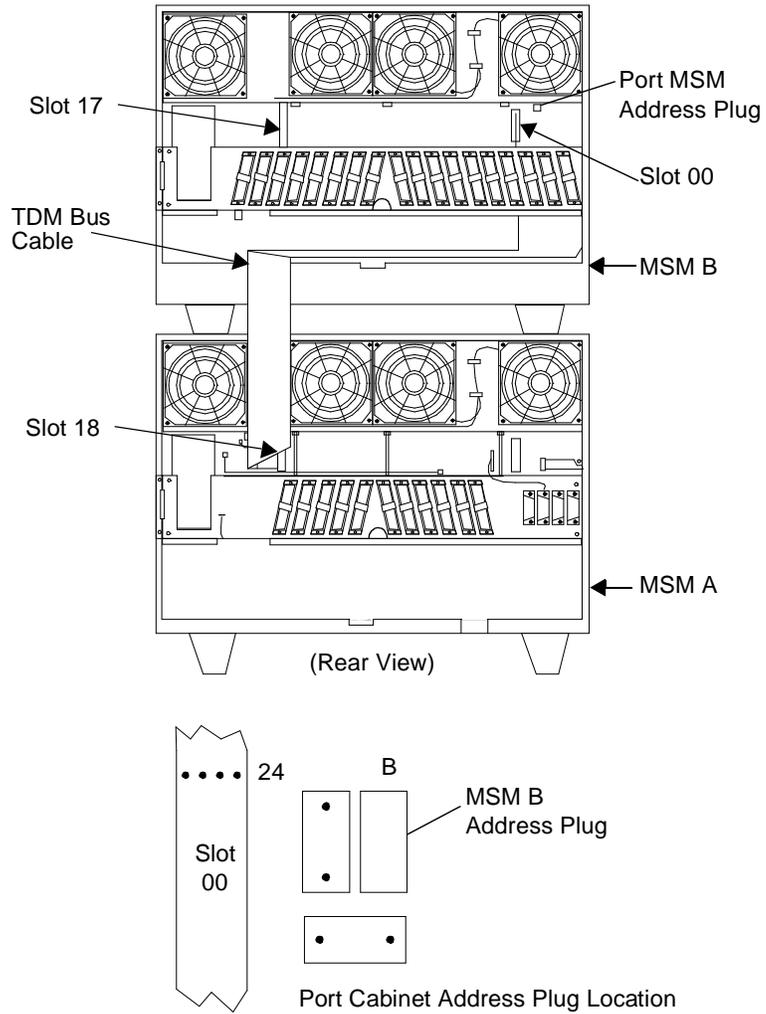
Figure 3-5.    TDM Bus Connections

***REVIEWERS: Can you indicate from where in the A carrier the cable extends to in the Bcarrier?

## Installing Ground Plates

**⟹ NOTE:**
This procedure is only for MCUs with two MSMs.

A ground plate is required between the two MSMs for ground protection and stabilization.

1. At the rear of the MSMs, replace the upper and lower panels (leave the screws loose). Refer to Figure 3-6.

2. On MSM B, place the top of the ground plate over the bottom of the lower rear panel so the four No. 8-32 x 3/8 inch screws at the bottom of the lower rear panel go through the four ground plate keyhole slots.

3. Slide the ground plate down over the top of the upper rear MSM panel of MSM A so the four No. 8-32 x 3/8 inch screws that attach the upper rear panel go through the four lower ground plate slots.

4. Ensure that the exposed portion of the TDM Bus cable between the MSMs does not get pinched.

5. Tighten the screws. If earthquake protection is required, skip to *"Installing Earthquake Plates."*

## Installing Cable Clamps

Two cable clamps are required for MCUs with two MSMs without earthquake protection.

1. At the rear of the MSMs, on each ground plate, install two cable clamps using the screws provided.

2. These clamps hold the 25 pair I/O or wallfield cables in place.

## Installing Cable Clips

1. At the front of the MSMs, install a cabinet clip between the MSMs. Refer back to Figure 3-4.

2. Hook the clip into the slot on MSM B and snap the straight leg of the clip into the slot on MSM A.
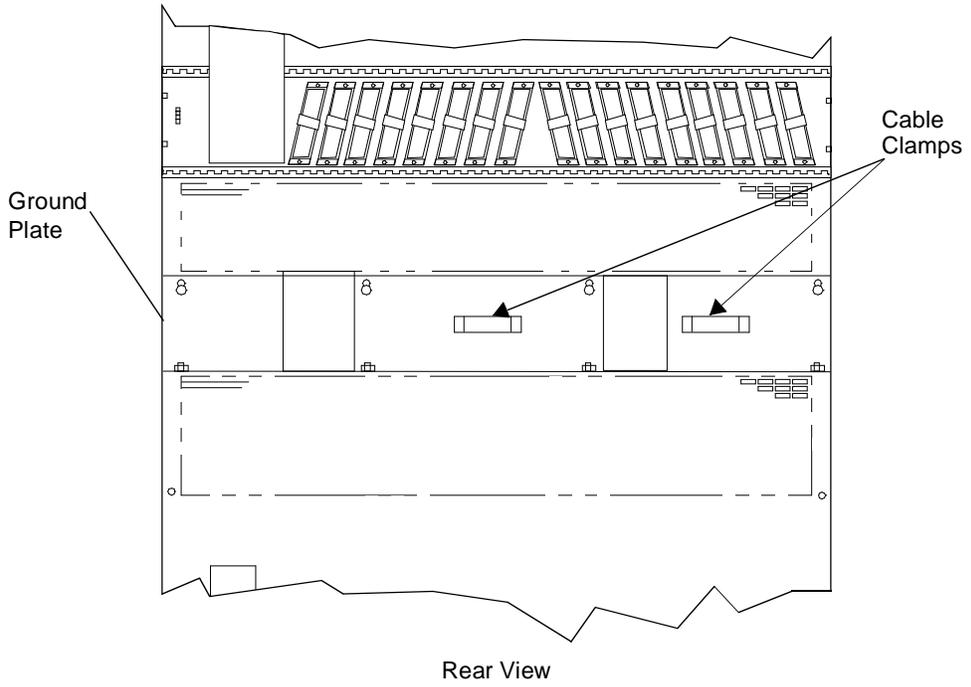
**Figure 3-6.    Ground Plate and Cable Clamp Locations**

**Installing Earthquake Plates**

> **⇒ NOTE:**
> This procedure is only for MCUs with two MSMs and earthquake
> protection.

The ground plate provides the ground connection and stabilization between
MSMs A and B. The earthquake front plate replaces the cabinet clip.

1. At the front of the MSMs, line up the holes in the top of the earthquake front
   plate with the holes at the bottom of MSM B and insert the four
   No. 8-32 x 3/8 inch screws. Do not tighten them yet.

2. At the front of the cabinets, line up the holes in the bottom of the
   earthquake front plate with the holes at the top of MSM A and insert the
   four No. 12-24 x 1/2 inch thread forming screws.

3. Tighten the earthquake plate screws.

Front
Earthquake
Plate
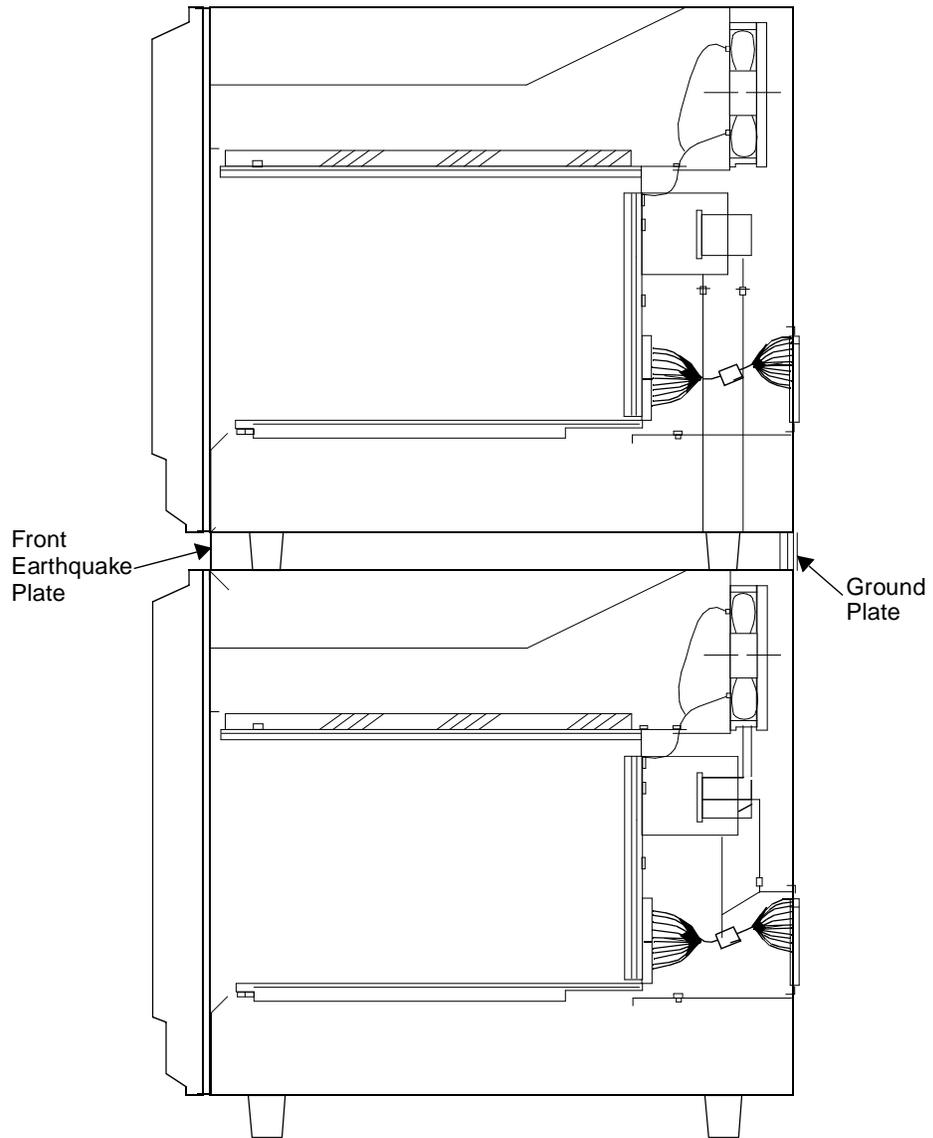
Ground
Plate

**Figure 3**-**7.    Ground Plate and Earthquake Front Plate**

4. If earthquake protection is required on a raised computer floor over a con-
crete subfloor:

a. Mark the locations where the four holes should be drilled to bolt the
MSM to the floor.

b. See CAUTION. Drill four holes 5/8-inch in diameter through the floor panels marked in step a.

⚠ **CAUTION:**
*Take care while drilling the holes through the raised floor that the drill bit does not penetrate any cables beneath the raised floor that would cause damage to the cable or injury to the installer.*

c. Insert a long punch through the holes drilled in step b and mark the concrete floor beneath the raised floor.

d. Remove the raised floor panel(s) in which the holes were drilled in step b.

e. Using the supplied anchor bits, drill a hole at each of the locations marked in step c. Stop drilling when the mark on the side of the bit reaches the floor level.

f. Insert a plug into the hole.

g. Drill the anchor into the hole until the mark on the bit reaches floor level again. Snap the top of the anchor bit off. Repeat for the other holes.

h. Replace the floor panel(s) removed in step d.

i. Fasten the MSM to the floor (see the next figure).

**3/8-inch Flat Washer (Stl.)**

**845557073 3/8-16 Thread Rod Cut to Needed Length Dependent on Floor Height**

**Raised Floor**

**Variable Height**

**3/8-16 Concrete Anchor Starr Part No. 3425**

**Concrete Sub-floor**
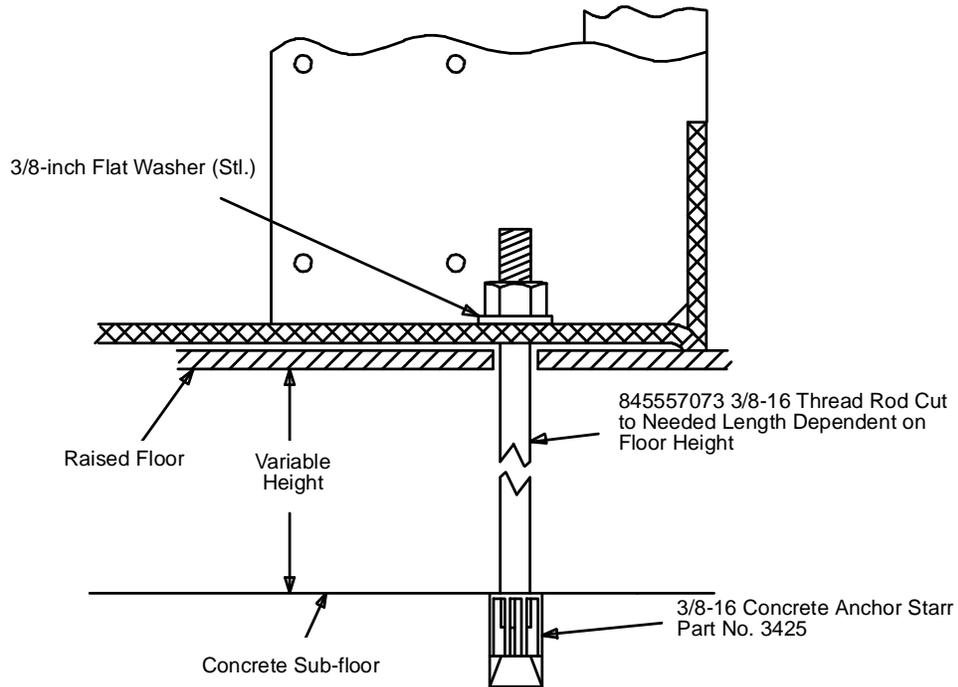
**Figure 3-8.   Earthquake Mounting—Computer Raised Floor**

# Connecting AC Power to Single Carrier MSMs

> ### ➡ NOTE:
> For DC-powered MCUs, skip to "DC-Powered MCU."

To confirm that an MCU is AC-powered, look at the front tab on the power supply (the hinge on the circuit board). The number WP91153 L3 identifies the power supply as AC.

### Safety Considerations

Be sure to follow these simple rules for your safety:

■   Never install telephone wiring during a lightning storm.

- Never install jacks in wet locations unless the jack is specifically designed for that environment.

- Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface.

- Use caution when installing or modifying telephone lines.
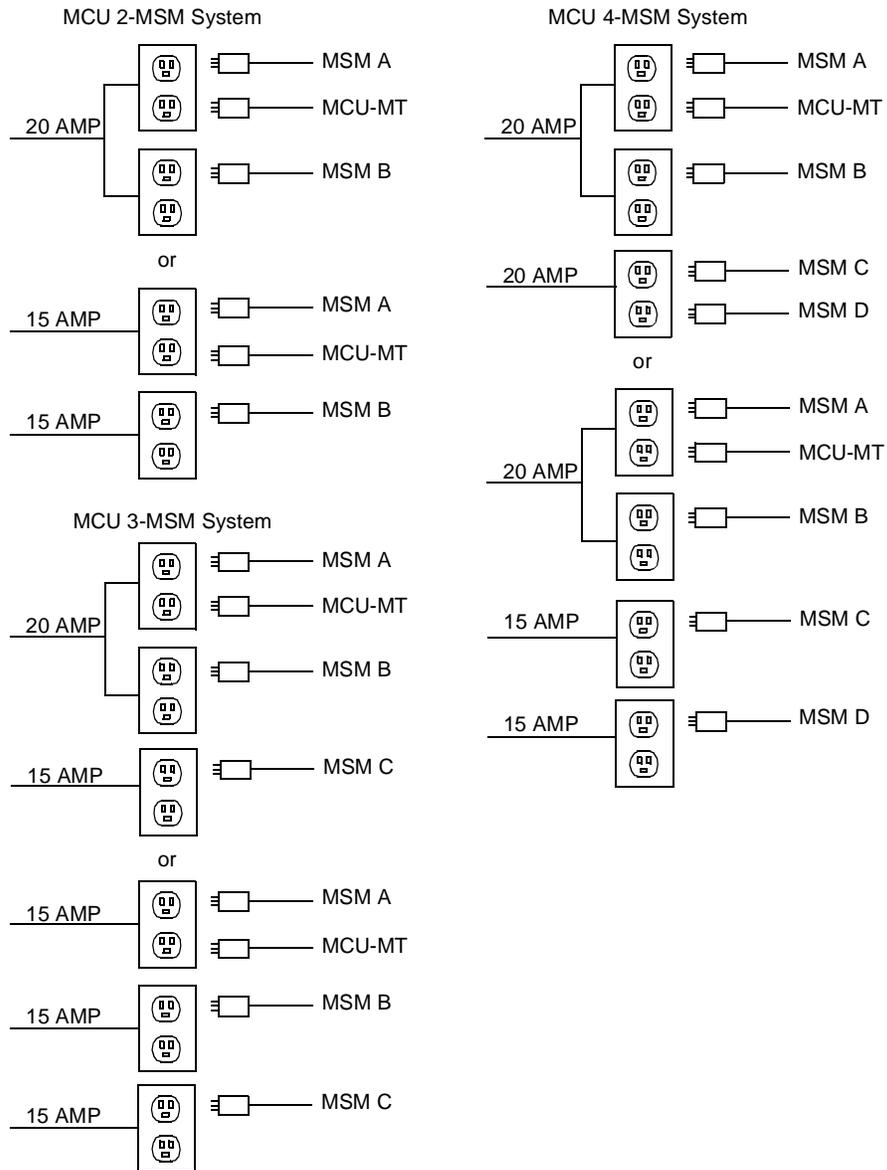
**Figure 3**-**9.   Typical AC Power Receptacle Requirements for Multiple MSM Setup**

## Grounding

Grounding is relatively simple for the AC-powered MCU; a single ground wire is connected from the MSM to an approved ground. Grounding must comply with the

general rules contained in Article 250 of the National Electrical Code, NFPA 70. The MCU requires a properly grounded 3-prong AC power receptacle for safe operation.

⚠ **CAUTION:**
*Do not cut or remove the third ground prong from the AT&T power cord. Do not use 2-wire extension cords or adapters, as this defeats the safety feature of the equipment. If the customer only has a 2-prong receptacle, have it replaced with a properly grounded 3-prong one by a qualified electrician.*

### Checking AC Power

1. Before beginning equipment installation, use an outlet tester or voltmeter to check the AC receptacle for the presence of ground as shown in Figure 3-10.

2. Before powering up, check the AC power.

⚠ **DANGER:**
*High voltage present.*

   a. Using KS-20599, list 4 digital voltmeter (VM), or equivalent, set the AC voltage range scale to greater than 250 volts AC.

   b. Measure voltage between the hot side and the neutral side of the receptacle.

   c. Verify the voltage measured from Phase to Neutral is 110 to 125 volts AC. Correct any power problem before proceeding.

   d. Measure voltage between the neutral side of the receptacle and receptacle ground.

   e. Verify the voltage between the neutral side of the receptacle and the receptacle ground reads between 110 and 125 volts AC. Correct any power problem before proceeding.

   f. Measure voltage from Neutral to Ground.

   g. Verify the meter reads less than 1 volt AC. Correct any grounding problem before proceeding.
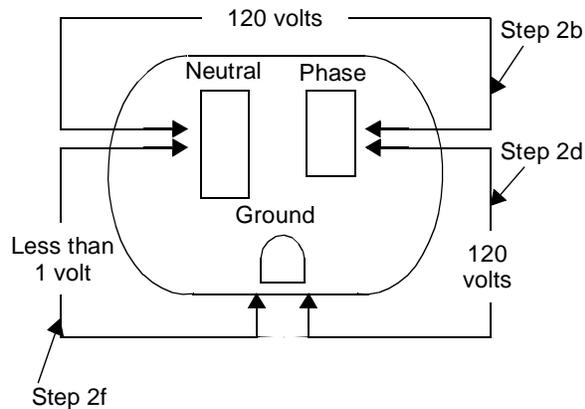
Figure 3-10.    Three-Prong 120 Volt AC Receptacle

## Connecting AC Power

Each MSM has its own power supply and the circuit breaker is located on the rear of each power supply.

1. Verify that the circuit breakers are in the OFF position.

2. Connect the MSM AC line cords first to the MSMs, then to the AC power receptacle.

    ⟹ **NOTE:**
    An external, commercial Uninterruptible Power Supply (UPS) or a battery backup arrangement may be used. Standby power is engineered to customer needs depending on the MCU size and configuration.

3. At the lower left rear of cabinet A, connect a 6-AWG ground wire to the MSM ground bar. Use a screwdriver to loosen and tighten the bolts that secure the ground wire to the ground bar.

    ⟹ **NOTE:**
    All approved grounds must be bonded together to form a single grounding electrode system.

4. Run the 6-AWG ground wire to an approved ground. The approved ground must be identified with an AT&T ground tag (FORM 15657NR or equivalent).

5. Connect a 10-AWG wire to the MSM ground bar. This ground wire (coupled bonding conductor) will later be tie-wrapped to the trunk cables and terminated at the coupled-bonding-conductor-terminal bar at the MCU's cross connect field.

MCU MSM

Single-Point Ground Block  Circuit Breaker  Power Supply  15-amp Plug

10-AWG Coupled Bonding Conductor (see Note)

OFF  OFF
ON  ON

6-AWG Ground Wire to Approved Ground (see Note)

Rear

NEMA 5-15- or NEMA 5-20- Receptacle, or Equivalent

Power Cord (10 feet)

120-volt 60-Hz 15- or 20-amp Service

MCU-MT Terminal

NOTE:  To Coupled Bonding Conductor Terminal Bar at Cross-Connect Field
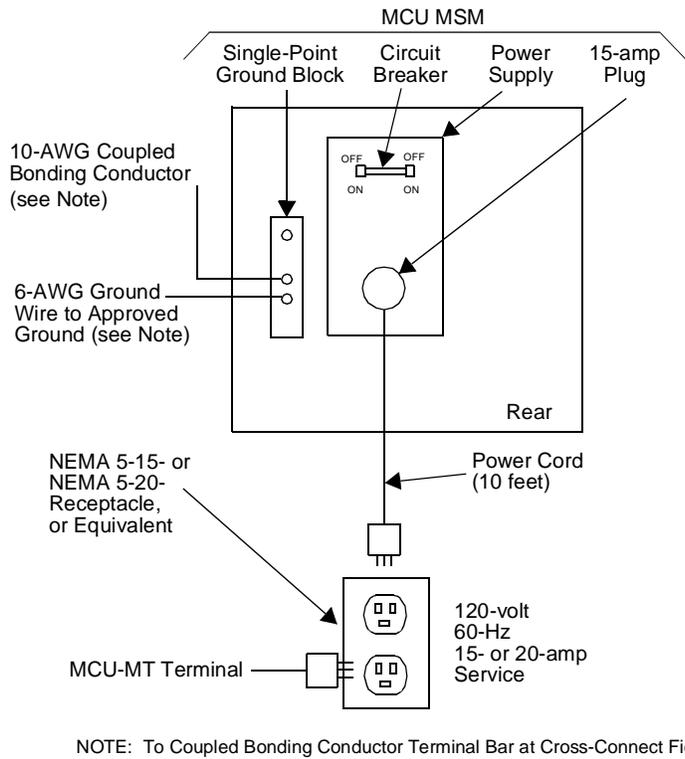
**Figure 3-11.   Typical Grounding and Power Arrangement**

## Connecting DC Power to Single Carrier MSMs

To confirm that an MCU is DC-powered, look at the front tab on the power supply (the hinge on the circuit pack). The number 676B identifies the power supply as DC.

Grounding the MCU must comply with the general rules for grounding contained in Article 250 of the National Electrical code, NFPA 70. All approved grounds must be bonded together to form a single grounding electrode system. Use the following procedure to ground the MCU and connect DC power:
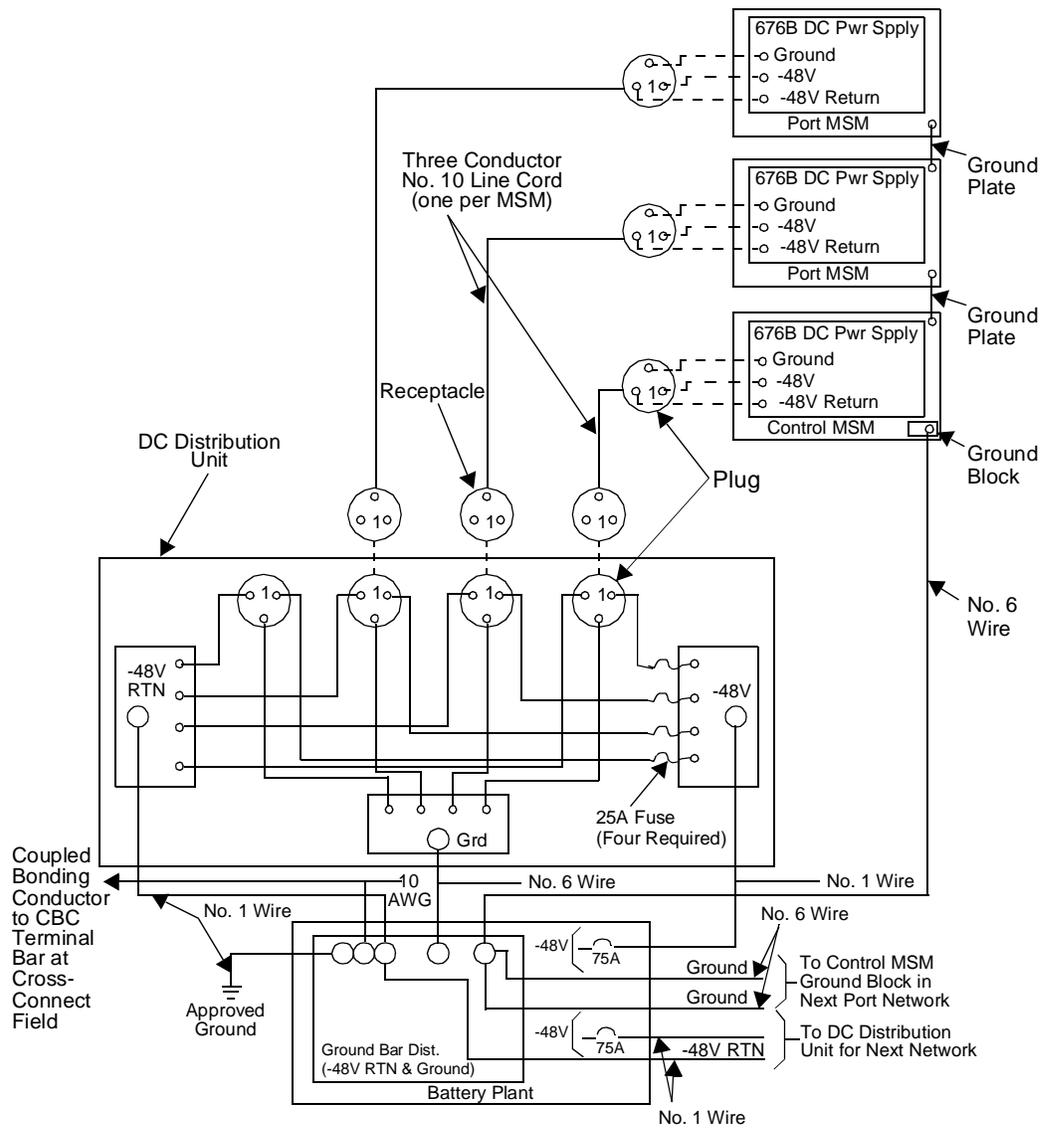
**Figure 3-12. DC Power Installation**

1. At the DC power cabinet, connect a 1-AWG ground wire to the DISCH GRD bar.

2. Route the ground 1-AWG wire out of the MSM and terminate it on the approved ground. The approved ground must be identified with an AT&T grounding tag (FORM 15657NR or equivalent).

1 AWG

DC Power Cabinet

(Approved
Ground)

Disch Grd

Bar
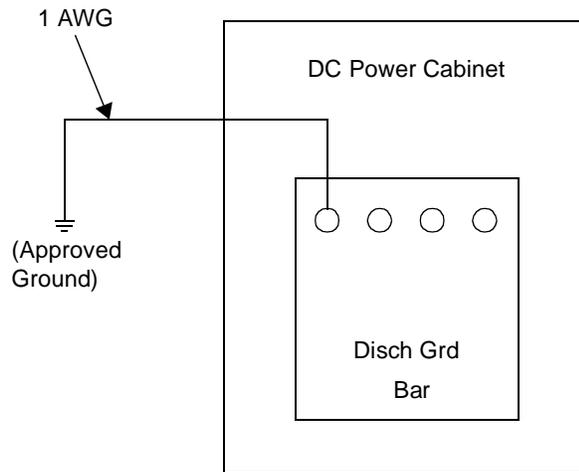
**Figure 3-13.  Power Plant Grounding**

3. Measure and cut a piece of 1-AWG cable long enough to reach between the GROUND CONNECTION terminal in the DC battery cabinet and the DISCH GRD bar in the DC power cabinet.

4. Crimp terminal lugs on each end of a 1-AWG wire.

5. At the DC power cabinet, connect a 1-AWG wire to the DISCH GRD bar.

6. Route a 1-AWG wire through one of the holes in the side of the cabinets and terminate it on the GROUND CONNECTION terminal in the DC battery cabinet.

6-AWG

Ground
Connection
Terminal

Disch Grd Bar

DC Battery Cabinet
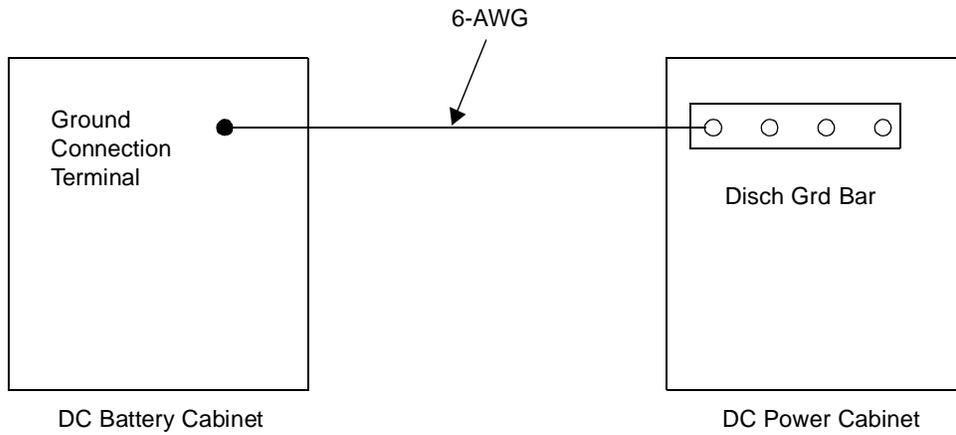
DC Power Cabinet

**Figure 3-14.    Frame Ground Grounding**

7. At the DC power cabinet, connect a 6-AWG cable to the DISCH GRD bar.

8. Route the 6-AWG cable to the DC power distribution unit.

9. Connect the 6-AWG cable to the GRD terminal block in the DC power distribution unit.

Front

Cabinet
Ground
Block

Power
Distribution
Unit

-48 VDC     48 VDC RTN

1 gauge up to
50 feet or
Engineered for
less than 1%
Voltage Drop

Rear

-48 VDC
75A

Ground Discharge
Bar

10-AWG CBC to CBC
Terminal Bar at PBX
Cross-Connect Field

Battery Plant

1 QWG
to Approved Ground
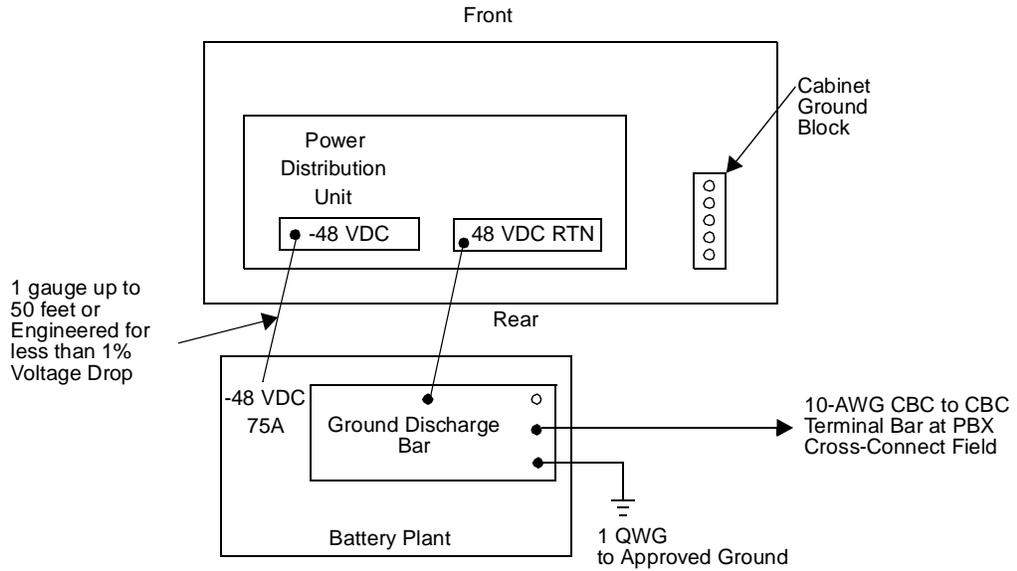
**Figure 3-15.    DC Power Distribution Unit Grounding**

10. At the DC power cabinet, connect a 6-AWG cable to the DISCH GRD bar.

11. Route the 6-AWG cable to the DC power distribution unit.

12. Connect the 6-AWG cable to the single-point ground block in MSM A.
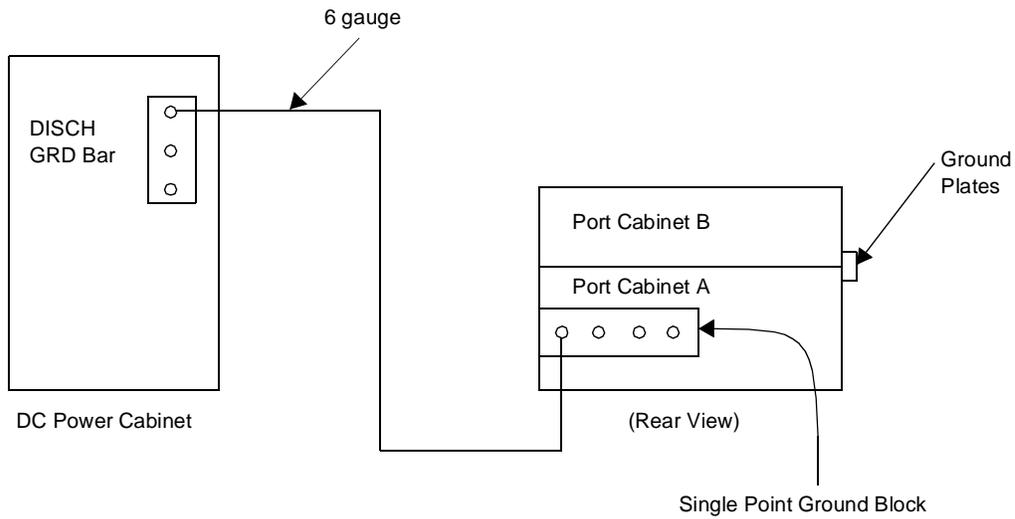
**Figure 3-16.    Ground Connection for Network**

13. At the DC power cabinet DISCH GRD bar, connect a 10-AWG wire to the ground bar. This ground wire (coupled bonding conductor) will later be tie-wrapped to the trunk cables and terminated at the coupled-bonding-conductor-terminal bar.
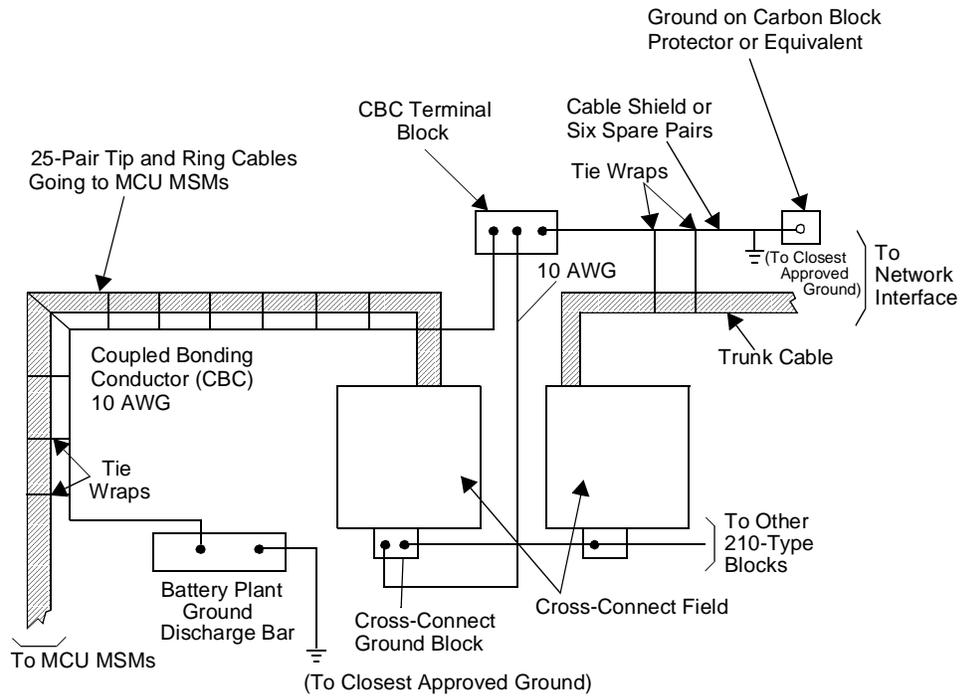
Figure 3-17.    **Coupled Bonding Conductor**

14. At the DC power distribution unit, connect the power cable to an available receptacle.

15. Repeat step 14 for MSM B.

16. Have an electrician connect AC power leads to the rectifiers utilizing instructions provided with the rectifiers in the DC power cabinet. Each rectifier should have its own branch circuit. Terminate leads on the AC INPUT terminal block of each rectifier.

17. Ensure the associated circuit breakers at the AC power panel are in the OFF position.

# Installing the Multicarrier MSM

The MCU MCC-MSM is shipped in a polyethylene bag packed in a cardboard container. The MCC-MSM is fastened to a wood/Styrofoam pallet by four carriage bolts. The cardboard container is strapped to the pallet by two metal bands.

The cardboard container is strapped to the pallet with a metal band.

⚠ **DANGER:**
*The MCC-MSM may weigh as much as 800 pounds and may be top heavy. Use extreme caution.*

## Unpacking and Inspecting

1. Check the status of the SHOCKWATCH and/or TILTWATCH indicators on the cardboard container. These indicators are usually white. If the container has been jarred or tilted beyond specifications, the indicator will be red, indicating potential damage. Report any indication of damage per local instructions.

2. See DANGER. Cut and remove bands.

⚠ **DANGER:**
*Take care to avoid injury while cutting and removing bands.*

3. Determine which cabinet contains the ramp and open it first. The carton containing the ramp will have a "ramp enclosed label" on it.

4. See CAUTION. Cut the tape holding the container together.

⚠ **CAUTION:**
*Deep knife penetration may damage the MSM.*

5. Remove all cardboard, tape, and plastic from the MSM.

6. To open the MSM doors, use a screwdriver to turn the screws clockwise. The screws are located on the front and rear doors to release the door latches (Figures 3-18 and 3-19).

7. Lift off the front and rear doors (do not remove the screws from the door hinges).
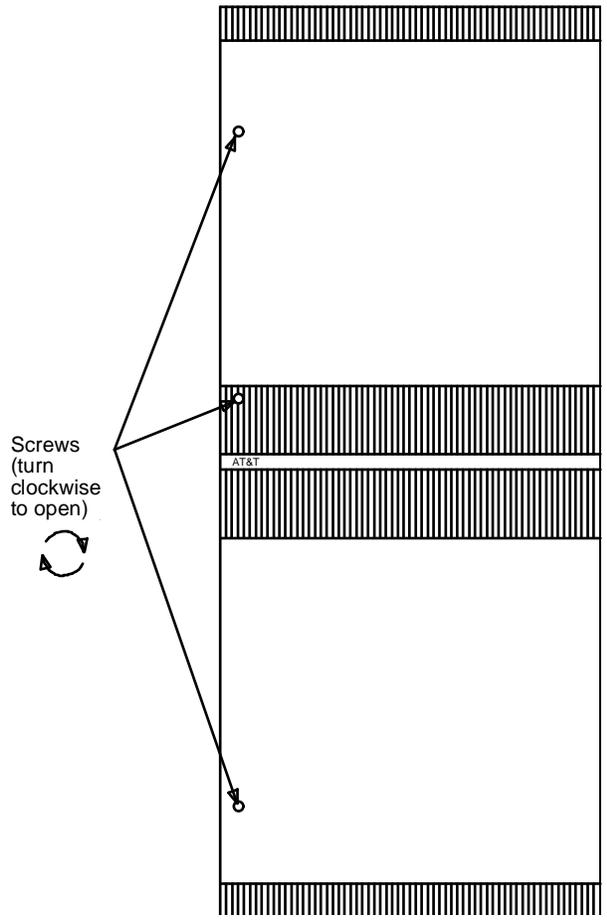
**Figure 3-18.   Location of MSM Door Latches (Front)**

Screws
(turn
clockwise
to open)
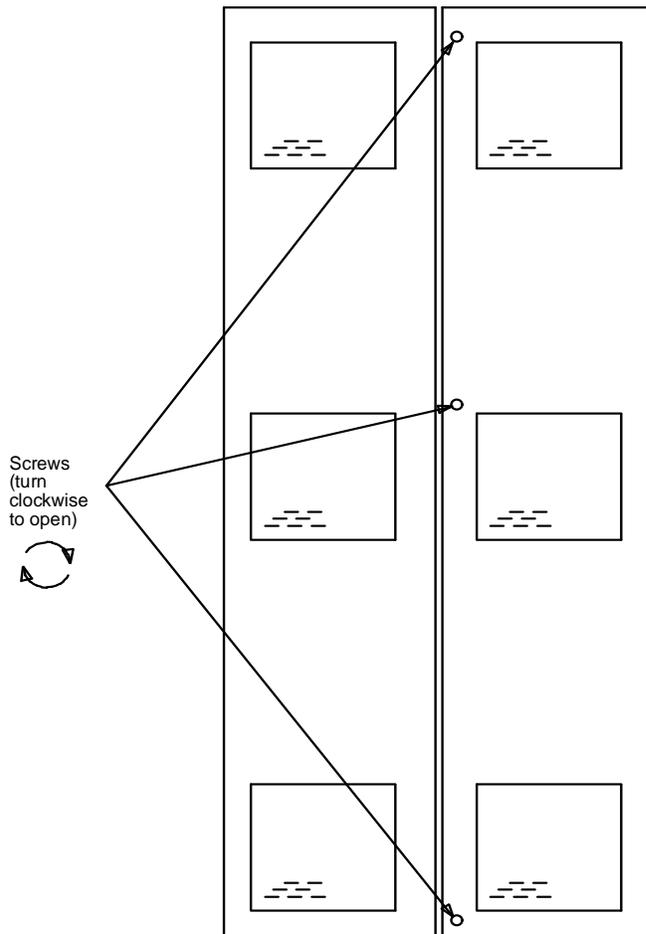
**Figure 3-19.   Location of MSM Door Latches (Rear)**

8. Remove all packing material from inside the MSM.

9. Inspect the MSM for any damage caused during shipping. Report any damages per local instructions.

10. Use an adjustable wrench to remove the carriage bolt nuts located at each bottom corner of the MSM.

11. Drive the carriage bolts downward until they clear the MSM.

12. Remove the ramp from the side of the MSM carton.

13. Remove the power cord stored under or inside the MSM of AC-powered systems, and lay it over the top of the MSM.

14. Remove the supporting block of wood by raising the rear corner of the MSM using a pry bar (if necessary). Repeat for the other rear corner of the MSM.

15. Screw the MSM stabilizing bolts all the way up to provide clearance between the MSM and the pallet when the MSM is rolled down the ramp.

16. Place the ramp as shown in Figure 3-20. Bolt it into position using the bolts provided in the plastic bag attached to the ramp.

17. Hold both sides of the rear of the MSM (it is recommended that another technician assist in moving the MSM).

18. Roll the MSM off the ramp and onto the floor

## Carrier Installation Sequence

Install the control carrier (which is analagous to an ESCC-MSM) in position "A." If a port carrier is required, install it in position "B."

## Checking Circuit Pack Configuration

1. Verify that all circuit packs are fully seated in proper slots according to the Customer Service Document (CSD) and Port Assignment Worksheet.

2. Report any discrepancies in circuit pack type or quantity.

(See Note 2)

(Top View)
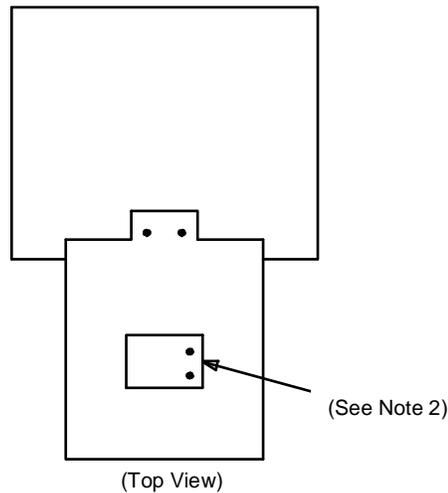
NOTES:
1. The ramp is stored in the side of the shipping container of one of the MSMs. Determine which MSM contains the ramp and unpack it first.
2. This bag contains the ramp mounting hardware (two bolts) and filler blocks.

**Figure 3-20.    Ramps Installed on Pallet**

## Positioning the MSM

Roll the MSM into position at the designated location. See Caution.

⚠️ **CAUTION:**
*If your system is supplied with cable ductwork, the MSMs must be spaced on 32-inch centers (+-1/8-in.), level, and square with respect to one another. These precautions are advised to prevent problems with ductwork installation. If your system is supplied with slack managers, the MSMs must be placed far enough from the connection field to lay down the (32-inch) slack managers and to provide a little extra room for the cables to access the managers.*

**⟹ NOTE:**

*Check location of the AC power receptacle. The receptacle must be on a separately fused circuit that is not controlled by a wall switch. It must be located within 10 feet of where the power cord leaves the base of the MSM and should be located outside the cross-connect field area.*

### Adding Earthquake Protection (If Provided)

1. If earthquake protection is required on a concrete floor:

   a. Insert a pencil or marker through the holes previously occupied by the carriage bolts (front and rear) in the bottom of the MSM, and mark the floor directly beneath each hole.

   b. Roll the MSM out of the way and drill four 1/2-inch diameter holes (about 1-1/2 inches deep) at the spots marked in the previous step.

   c. Insert anchors in the holes.

   d. Roll the MSM back into place, and align the MSM holes over the holes in the floor.

   e. Repeat this procedure from the beginning for each MSM being installed.

   f. When all MSMs are in place, adjust their leveling legs until the MSMs are level. See Caution.

**⚠ CAUTION:**

*If your system is supplied with cable ductwork, the MSMs must be level from front to rear and from side to side. They must be square with respect to one another to within + or -1/8-in.*

   g. Secure the MSM(s) to the floor with a 3/8-16 X 4.5 inch bolt and flat washer.

2. If earthquake protection is required on a raised computer floor over a concrete subfloor:

   a. Insert a pencil or marker through the holes previously occupied by the carriage bolts (front and rear) in the bottom of the MSM(s), and mark the floor directly beneath each hole.

   b. See CAUTION. Drill four holes 5/8-inch in diameter through the floor panels marked in step a.

**⚠ CAUTION:**
*Take care while drilling the holes through the raised floor that the drill bit does not penetrate any cables beneath the raised floor that would cause damage to the cable or injury to the installer.*

    c. Insert a long punch through the hole drilled in step b and mark the concrete floor beneath the raised floor.

    d. Remove the raised floor panel(s) in which the holes were drilled in step b.

    e. Drill four holes 1/2 inch in diameter and 1-1/2 inches deep at the spot marked in step c.

    f. Insert the anchors in the holes.

    g. Replace the floor panel(s) removed in step d.

    h. Repeat this procedure from the beginning for each MSM being installed.

    i. When all MSMs are in place, adjust their leveling legs until the MSMs are level. See Caution.

**⚠ CAUTION:**
*If your system is supplied with cable ductwork, the MSMs must be level from front to rear and from side to side. They must be square with respect to one another to within + or -1/8-in.*

    j. Fasten the MSM to the floor (see Figure 3-21).

3/8-inch Flat Washer (Stl.)

Nut (welded to frame)

Leveling Foot

845557073 3/8-16 Thread Rod Cut to Needed Length Dependent on Floor Height

3/8-16 Concrete Anchor Starr Part No. 3425

4 in.

Raised Floor

Variable Height

Concrete Sub-floor
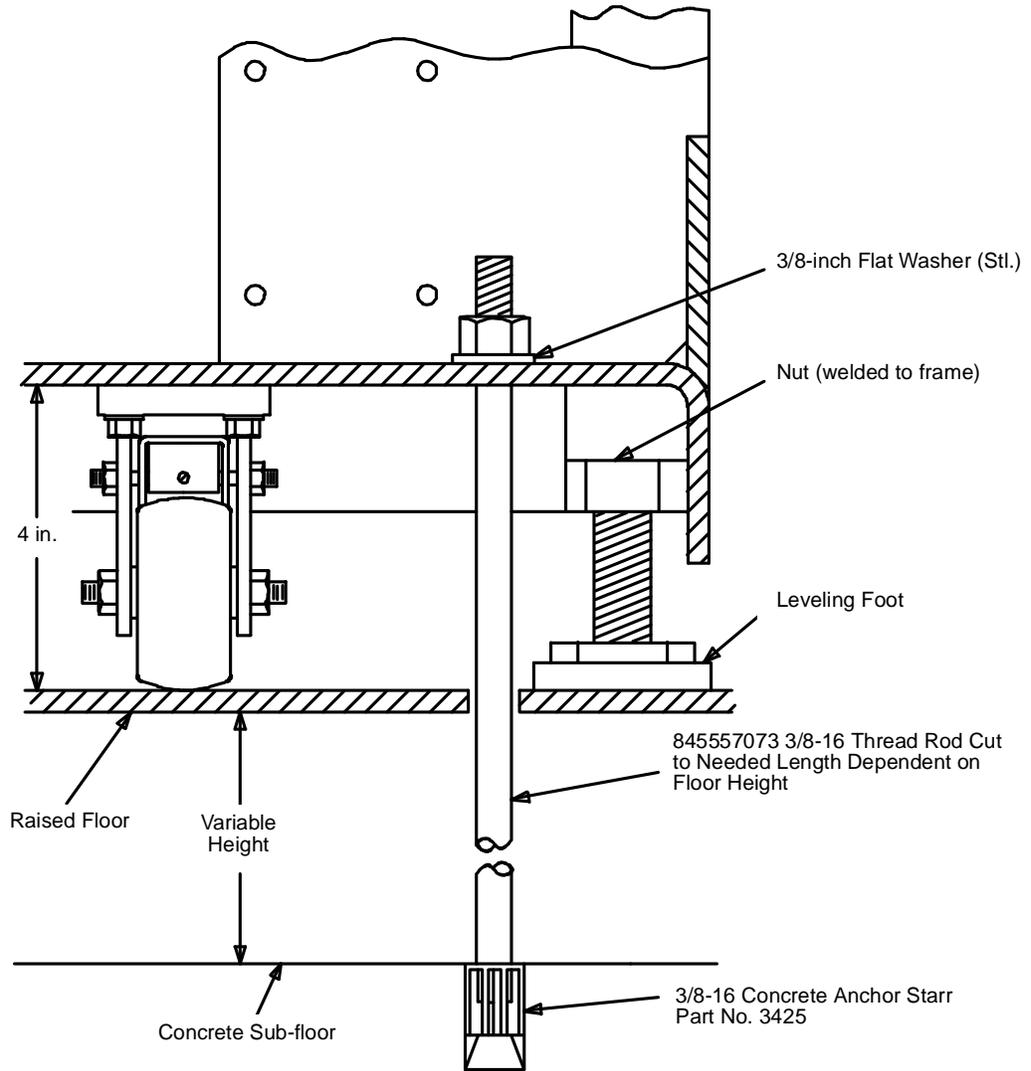
**Figure 3-21. Earthquake Mounting—Computer Raised Floor**

## Completing Cabinet Installation (Earthquake Protection not Provided)

1. Repeat the appropriate procedures from the previous sections for each MSM being installed.

2. When all MSMs are in place, adjust their leveling legs until the MSMs are level. See Caution.

⚠ **CAUTION:**
*If your system is supplied with cable ductwork, the MSMs must be level from front to rear and from side to side. They must be square with respect to one another to within + or -1/8-in.*

3. Adjust and lock the cabinet stabilizing bolts to keep the MSM from moving.

4. At the bottom of the MSM, install hole plugs (provided with the MSM) in the holes previously occupied by the four carriage bolts.

## Connecting AC Power to Multicarrier MSMs

The following procedures apply to AC-powered MCC-MSMs for MCUs.

The following figure shows a typical AC power and grounding layout. The switch may be powered by a 120 volt, a 220 volt, a 208 volt, or a 240 volt AC source, depending on which is required for the particular installation. The power circuit must be dedicated to the switch. It must not be shared with other equipment, and it **must not be** controlled by a wall switch. The AC receptacle should not be located under the cross-connect field. (The coupled bonding connector shown in the illustration is described later in this chapter.)
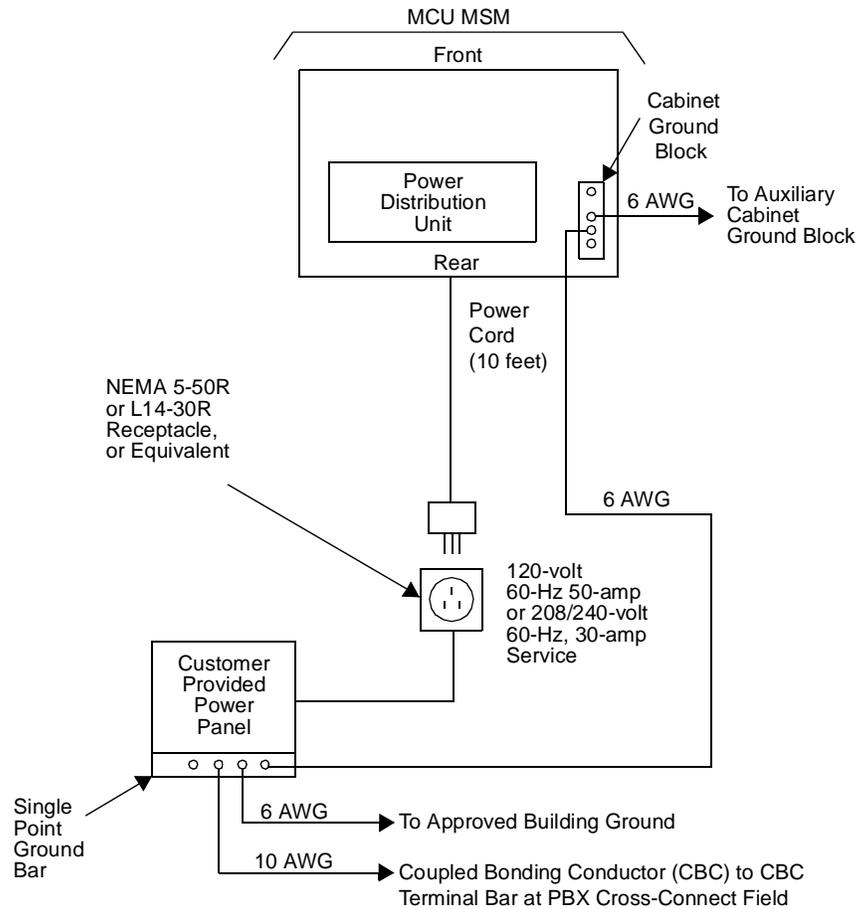
**Figure 3-22. Typical AC Power and Grounding Arrangement for a MCC-MSM**

It is necessary to note the difference between 208 volt and the other kinds of AC power. The most common power arrangements currently in use are single-phase 3-wire and three-phase 4-wire wye systems. Both arrangements are illustrated in the following figures. On a three-phase 4-wire system, 208 volt can be obtained from any two phases of the three phase system. Either method is satisfactory as long as 208 volt three-phase or 220 to 240 volt single-phase 50 to 60 Hz AC, centered around a neutral connection, is furnished at the correct amperage capacity and meets the national and local electrical codes.

The type of power required by a MCC-MSM is given on its rear door. The type of power required by a SCC-MSM is also given on its rear cover.
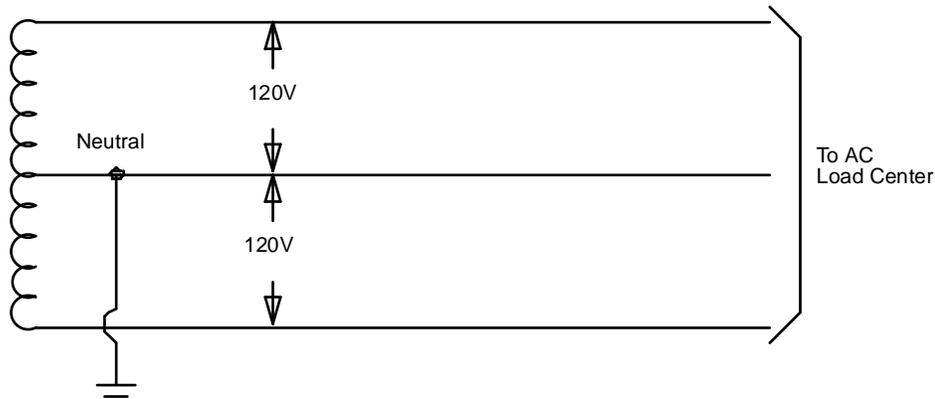
**Figure 3-23.**    **Single-Phase 3-Wire (220 to 240 VAC) System**
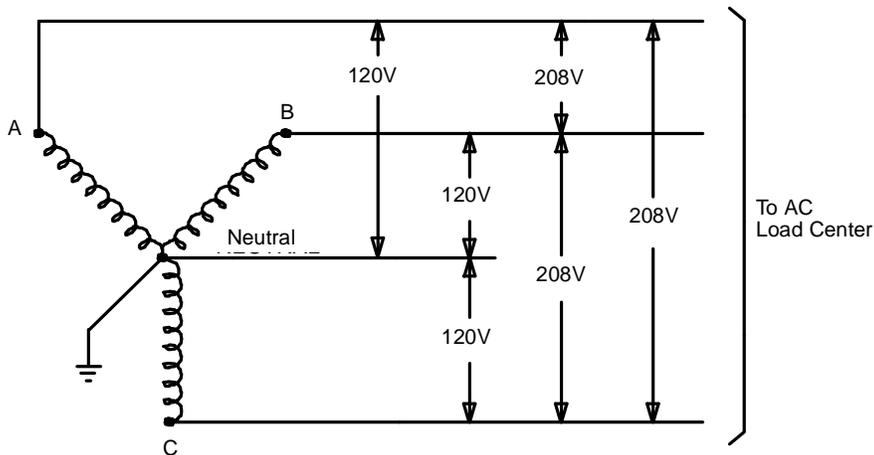
**Figure 3-24.**    **Three-Phase 4-Wire Wye 208 VAC System**

## Connecting to 50Hz Power through a Customer-Provided Transformer

International 50 Hz commercial power is often supplied without a centered neutral connection. In situations like this, the power must be transformed to work with the MCU. Use a transformer with a single-phase tapped primary and a center-tapped

secondary to provide compatible power. The following illustration shows an example of a properly wired transformer.
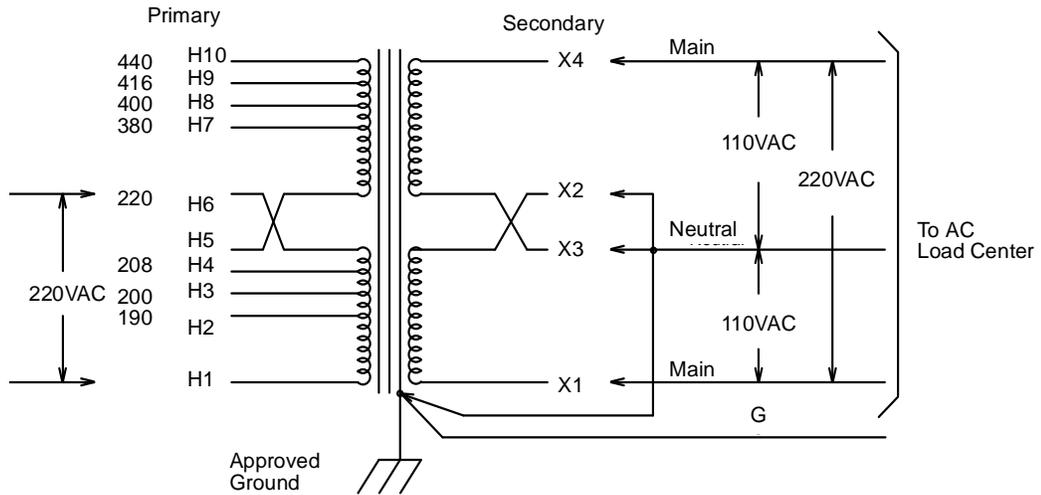


**Figure 3-25.    Typical Center-Tapped Isolation Transformer**

Transformers of several capacities are available. The size of the transformer specified for your system depends on the current requirements of the system. Table 3-1 shows a selection of transformers available for use with MCC-MSM systems. (The **Square-D** part number 3S67F transformer, a 3KVA model, is adequate to power one typical MSM.)

**Table 3-1. International 50Hz Transformers**

| Capacity | Square-D Part No. |
|----------|-------------------|
| 3.0 KVA | 3S67F |
| 5.0 KVA | 5S67F |
| 7.5 KVA | 7S67F |
| 10.0 KVA | 10S67F |
| 15.0 KVA | 15S67H |
| 25.0 KVA | 25S67H |

## Connecting Grounding

**⚠ CAUTION:**
*Grounding of the system shall comply with the general rules for grounding contained in Article 250 of the National Electrical Code, NFPA 70.*

Grounding is relatively simple for an AC-powered switch. Basically, the cabinets are connected to each other. Then, a single ground wire is connected from the MSM to the single-point ground terminal (SPGT) bar at the AC load center (or optional AC protector cabinet). The SPGT bar is connected to your approved ground by 6-AWG wire.

## Coupled Bonding Conductor

This conductor is connected to the single-point-ground-terminal bar and run adjacent to pairs in an associated cable. The mutual coupling between the bonding conductor and the pairs reduces potential differences in terminating equipment. The conductor consists of a 10-AWG wire that is tie-wrapped to the inside wiring cable and terminated at the coupled-bonding-conductor-terminal bar at the PBX cross-connect field.

**⚠ DANGER:**
*If the approved ground or approved floor ground can be accessed only inside a dedicated power equipment room, connections to this ground should be made by a licensed electrician.*

All approved grounds must be bonded together to form a single grounding electrode system.

To connect ground, do the following.

1. At lower right rear of the MSM, connect a 6-AWG ground wire to the MSM ground bar (Figure 3-21). See the accompanying note.

### ⇒ NOTE:
*A 1/8-inch allen wrench is required to loosen and tighten the bolts securing the ground wire to the ground bar.*

2. Run the ground wire to the single-point-ground-terminal bar at the AC load center (shown as "power panel" in Figure 3-22).

3. Run the ground wire to the the MSM, and connect it to the MSM ground bar (Figure 3-22).

4. At the AC load center, connect a 10-AWG wire single-point-ground-terminal bar. This ground wire (coupled bonding conductor) will later be tie-wrapped to the trunk cables and connected to the coupled bonding conductor ground bar at the cross-connect field and finally terminated at the customer-provided load center (Figure 3-22).

## Connecting Battery Leads

The battery holdover unit described under this heading is optional. It is usually not provided if the MSM is powered by an uninterruptible power supply.

MCC-MSMs containing an optional battery holdover unit are shipped with two of the six battery leads disconnected to prevent the batteries from discharging. To connect the batteries, do the following:

1. Verify that the main circuit breaker is in the off position (see Figure 3-26).

2. Remove the battery cover.

3. Connect the battery leads.

4. Replace the battery cover.

## Checking Commercial Power

Before powering up system, check the AC power.

1. Set KS-20599, list 4-digital voltmeter (VM), or equivalent, to AC voltage range scale greater than 250 VAC.

2. See DANGER. Measure voltage at receptacle (Figure 3-23).

⚠ **DANGER:**
*High voltage present.*

3. Is the MCU being powered by a 120 volt, a 208 volt, or a 240 volt source? If powered by a 120 volt source, verify that the meter reads 104 to 129 VAC. If your source is powered by a 208 or 220/240 VAC, verify that the meter reads 104 to 129 VAC between neutral and either hot line. If the power source is not within tolerance, correct the problem, then recheck the power levels.
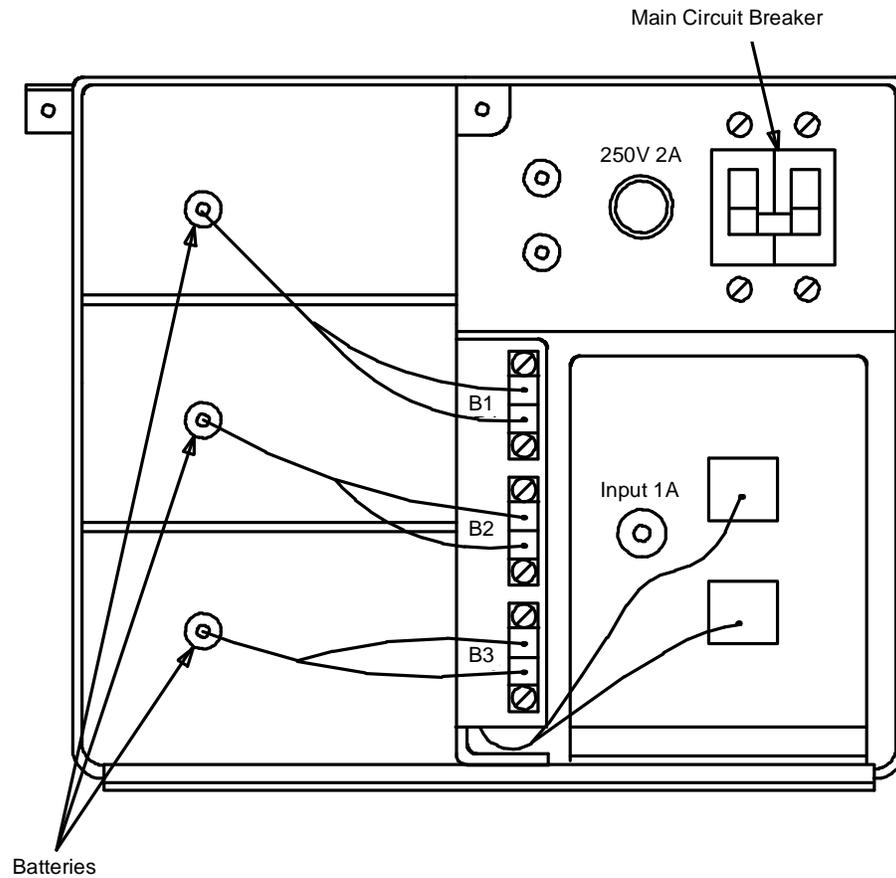
**Figure 3-26.** **Optional MCC-MSM Power Distribution Unit, Front View, no Battery Cover**
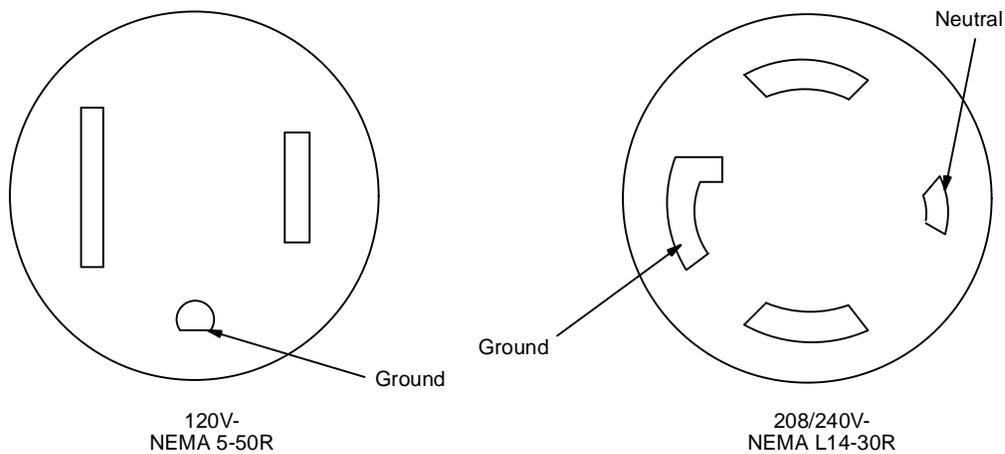
**Figure 3**-**27. AC Receptacle**

**Connecting AC Power**

The main circuit breaker on a MCC-MSM is located on the front of the
AC/DC power distribution unit (Figure 3-26).

1. Verify that the circuit breakers are in the **OFF** position.

2. Connect cabinet AC line cords to AC power receptacles (Figure 3-26).

# Connecting DC Power to Multicarrier MSMs

The following table lists the input parameters required for MCC-MSMs powered
by a -48VDC battery plant.

**Table 3-2.** **-48 VDC Input Power Requirements**

| Parameter | Requirements |
|---|---|
| Static Voltage | -48 VDC nominal, -42.5 VDC minimum, -52.5 VDC maximum (measured at input to system cabinet) under normal operating conditions. |
| Dynamic Voltage | Transient change in voltage—+ or -5 percent of steady state voltage.<br><br>Allowed transient duration—Up to 200 milliseconds. |
| AC Ripple Voltage | Maximum Wideband AC ripple—450 mvpp in the 3 kHZ to 20 MHZ band. |
| Low Voltage Disconnect | Automatic disconnect—Occurs when input voltage becomes less than -42.5 VDC (control provided with battery plant). |
| Overvoltage Protection | Input voltage at switching cabinets shall not exceed 52.5 VDC. |
| Voltage Drop | Maximum drop—Must not exceed 0.5 VDC one way on feeder cables between the power board and the system cabinet.<br><br>Feeders must be UL approved and CSA certified.<br><br>Recommended -48 VDC feeder cable—**Royal Electric #X4905 or equivalent**<br><br>No. 1 AWG is required for distances up to 50 feet.<br><br>Cable resistance must be equal to or less than 0.1290 ohms per 1000 feet. |
| Current Draw | The battery plant rectifiers must be capable of providing current for the system, including that required for system holdover and for charging the batteries. In addition, this may include DC current required for an inverter that provides AC power to peripheral equipment if it is installed and for future growth. |

**Table 3**-**2.** -**48 VDC Input Power Requirements** — *Continued*

| Parameter | Requirements |
|---|---|
| Circuit Breaker | A UL listed and CSA certified circuit breaker must be provided at the battery plant power board for each system cabinet feeder.<br><br>The recommended circuit breakers are **75 ampere Airpax UPL-1-1REC2-52-753 or Heinemann AM1-B2-A-75-2.** |
| Redundancy | Redundancy of the battery chargers/rectifiers should be considered. This would also provide the additional current necessary to recharge the batteries after being fully discharged. |
| Electrical Noise | Voice band noise from the battery plant to the system must be less than 32 dBrnC. |
| Grounding | A single point ground must be maintained.<br><br>A ground conductor must be installed from the battery plant GROUND DISCHARGE BAR to the closest "Approved Ground'' via the shortest and most direct route as required by the NEC. The gauge must be no smaller than the largest conductor in the system and larger than 6 AWG.<br><br>Grounding between the system cabinet and the battery plant should be connected using the procedures given later in this chapter. |
| Lightning Protection | There must be adequate lightning protection in the battery plant to insure that the system will not be damaged. |

The following illustration shows a typical power and grounding layout for a DC-powered MCC-MSM. The size of the wire required for the -48 volt DC and -48 volt return must be engineered to ensure the -**48 volt DC supplied by the battery plant to the MSMs will be maintained between -42.5 and -52.5 volt DC at all times** to ensure proper operation and to prevent hardware damage.
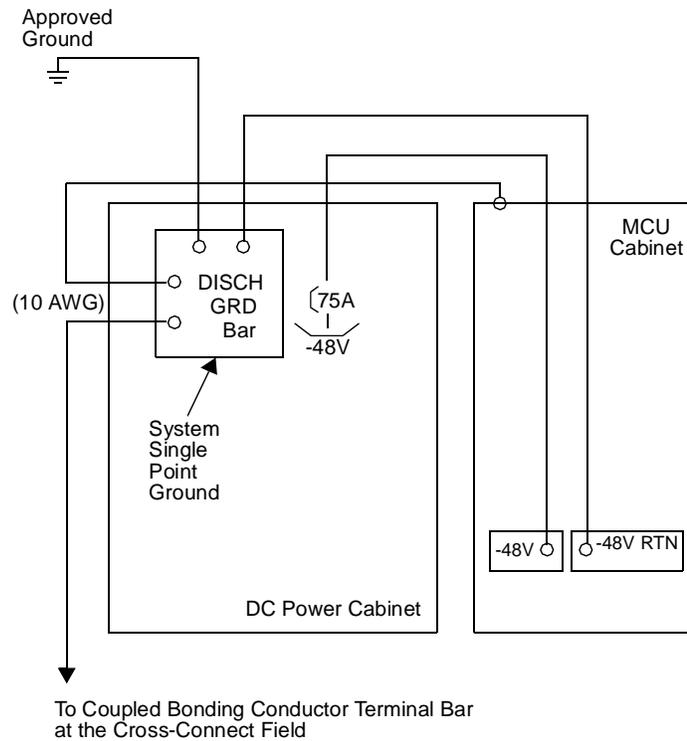
**Figure 3-28.    Typical Power and Grounding Arrangement for DC-Powered MCC-MSM**

**Connecting Grounding**

> ⚠ **CAUTION:**
> *Grounding of the system shall comply with the general rules for grounding*
> *contained in Article 250 of the National Electrical Code, NFPA 70.*

The grounding scheme for the DC-powered switch is more complex than that of
an AC-powered switch.

## Coupled Bonding Conductor

This conductor is connected to the single-point-ground-terminal bar and run adjacent to pairs in an associated cable. The mutual coupling between the bonding conductor and the pairs reduces potential differences in terminating equipment. The conductor consists of a 10-AWG wire that is tie-wrapped to the inside wiring cable and terminated at the coupled-bonding-conductor-terminal bar at the PBX cross-connect field.

## Connecting DC Battery and Power Cabinet Frame Grounds

1. Measure and cut a piece of 6-AWG wire (Comcode 846110971) long enough to reach between the **GROUND CONNECTION** terminal in the DC battery cabinet and the **DISCH GRD** bar in the DC power cabinet.

2. Crimp the terminal lugs on each end of the wire.

   ### ⇒ NOTE:
   *Terminal lugs are furnished as part of D-181895, Kit of Parts.*

3. At the DC power cabinet, connect wire to the **DISCH GRD** bar.

4. Route the wire through one of the holes in the side of the cabinets and terminate it on the **GROUND CONNECTION** terminal in the DC battery cabinet.

## Connecting Power Plant Ground

1. At the DC power cabinet, connect a 1-AWG ground wire to the **DISCH GRD** bar.

2. Route the ground wire out of the cabinet and terminate it on the approved ground as shown in the following figure. The approved ground must be identified with an AT&T supplied grounding tag (FORM 15657NR or equivalent).

1 AWG

DC Power Cabinet

(Approved
Ground)

DISCH GRD Bar
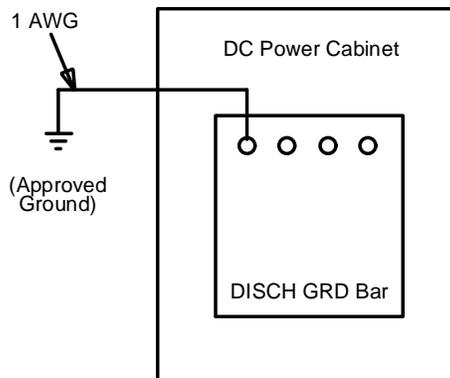
**Figure 3**-**29. Power Plant Grounding**

## Connecting AC Power to a DC Power Cabinet

1. Have an electrician connect AC power leads to the rectifiers in the DC power cabinet. Each rectifier should have its own branch circuit. Terminate leads on the **AC INPUT** terminal block of each rectifier.

2. Ensure that the associated circuit breakers at the AC power panel are in the **OFF** position.

## Connecting System Cabinet Ground Wires

There are two approved methods of grounding the system cabinets. Either method is sufficient. The element common to both methods is that the cabinets that make up the system are wired in a series from the most distant cabinet to the DC power cabinet. You can either wire the tops of the cabinets together or wire the cabinet's ground blocks together. Determine which method the system has been engineered for and then follow the appropriate instructions in the following section.

## Connecting Top-Mounted Cabinet Grounds

1. Measure and cut a piece of 6-AWG wire long enough to reach from the **DISCH GRD** bar in the DC power cabinet to the top rear corner of the cabinet as shown in the next two illustrations.

2. Crimp terminal lugs on each end of the wire.

> **⇒ NOTE:**
> *Terminal lugs are furnished as part of D-181895, Kit of Parts.*

3. At the DC power cabinet, connect wire to the **DISCH GRD** bar. Route wire out of DC power cabinet and up to the top rear corner of the MSM.

4. On top of the MSM, terminate the 6-AWG ground wire as shown in Figure 3-30.
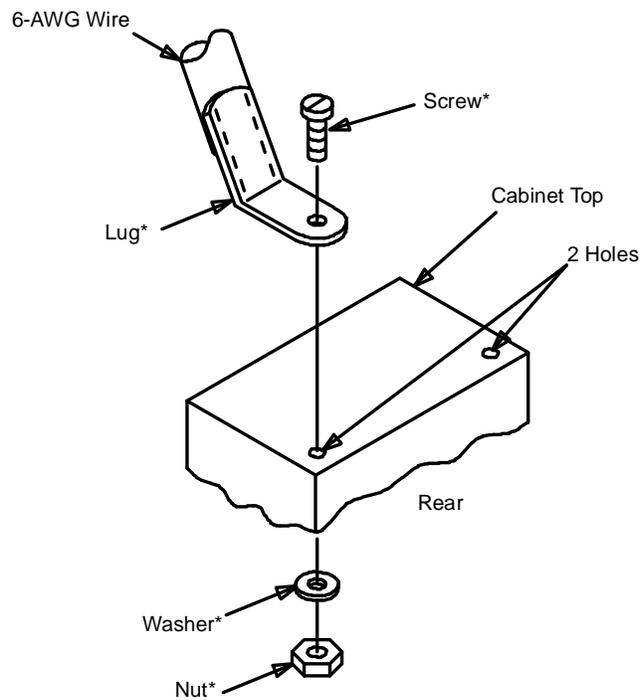


* Included in D-181895, Kit of Parts (Comcode 105434559)

**Figure 3-30. MSM Frame Ground Connections**

Top View of
MCU Cabinets

6-AWG Wire

DC Power
Cabinet

To Aux
Cabinet
(if provided)

DISCH
GRD Bar

Front of Cabinets
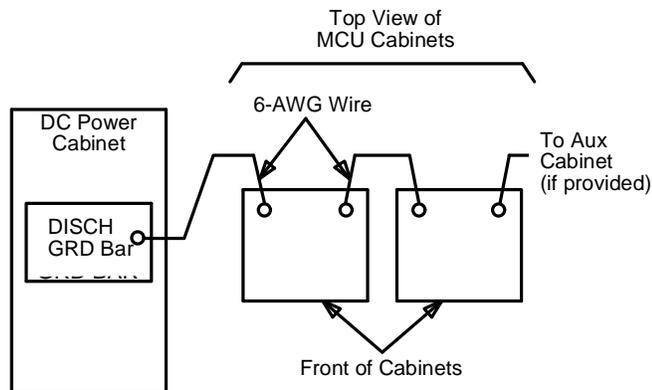
**Figure 3-31.    Frame Ground Attachment**

5. If the switch is equipped with an auxiliary MSM, go to the next step. If it is not, the MSM is grounded and the job is done.

6. Cut a piece of 6-AWG wire long enough to reach between the MSM and the aux MSM.

7. Crimp terminal lugs on each end of the wire.

8. Connect wire at the top rear corner of the MSM (per the previous figures).

9. Terminate the other end of the wire at the top rear corner of the aux MSM.

### Connecting to the MSM's Ground Blocks

1. At the bottom rear of the MSM (shown in the next figure), use an allen wrench to connect a 6-AWG wire to the MSM ground block.

2. Route the wire out of the MSM and into the DC power cabinet.

3. At the DC power cabinet, terminate the wire on the **DISCH GRD** bar.

4. If the switch is equipped with one or more AUX MSMs, wire from the main MSMs ground block to the first AUX MSMs ground block.

5. Continue to wire serially from ground block to ground block until all of the MSM are connected through a series of ground blocks to the discharge ground bar at the DC power cabinet.

DC Power Distribution Unit

To Circuit Breaker in DC Power Cabinet

-48V DC

To DC Power Cabinet DISCH GRD Bar

-48V RTN

Bottom of Cabinet

Power Distribution Unit Ground Block

Cabinet Ground Block

To DC Power Cabinet DISCH GRD Bar
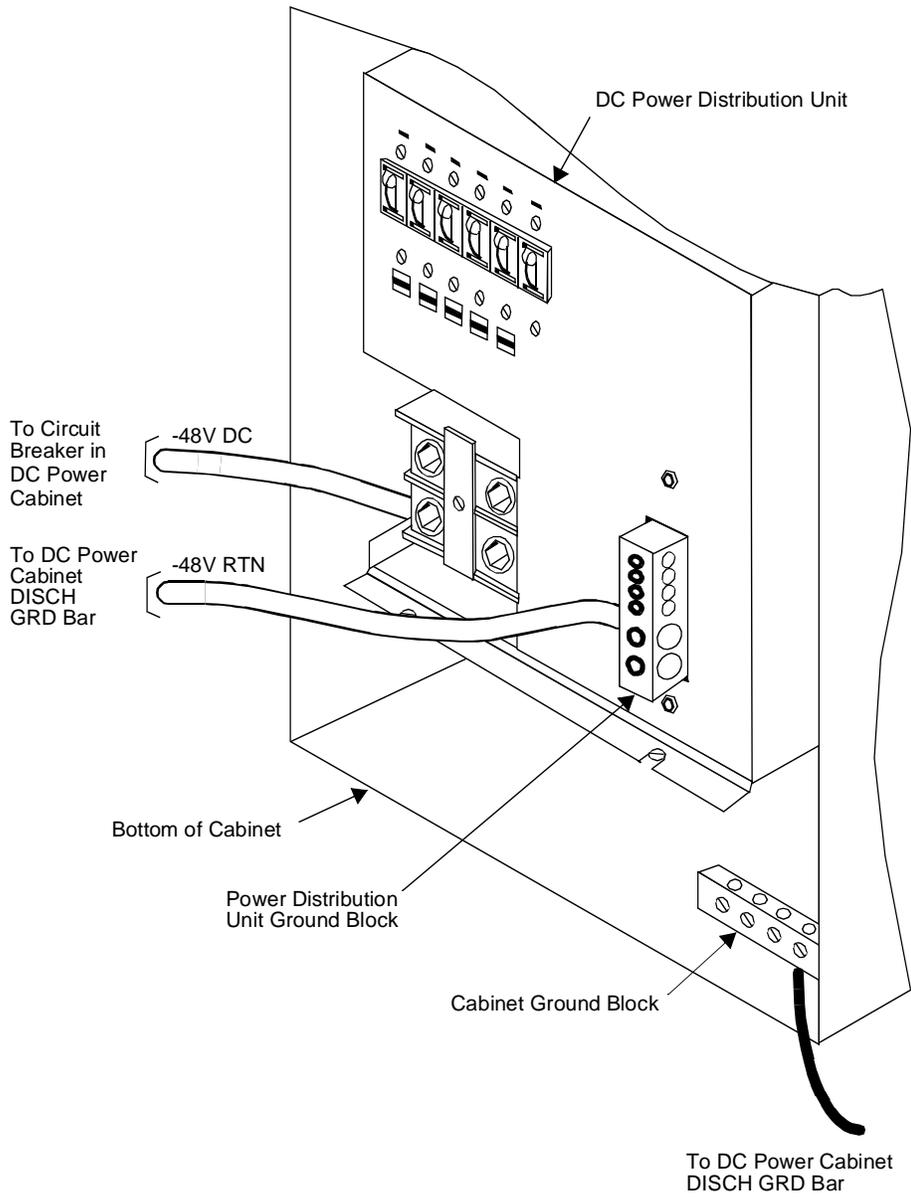
**Figure 3-32.  Power and Ground Connections for a DC-Powered MCC-MSM**

**Connecting DC Power to the MSM**

➡ **NOTE:**

*Check the DC power plant's documentation to find out if the power plant must be tested before it is connected to your system. If so, perform these tests in the suggested sequence.*

The main circuit breaker on a DC-powered MCC-MSM is located on the front of the DC power distribution unit (shown in the following figure).
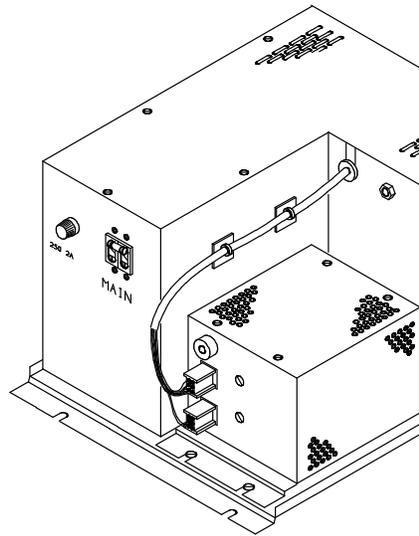


**Figure 3-33.    MCC-MSM DC Power Distribution Unit, Front View**

The circuit breakers on the rear of the DC power distribution unit (CB1 through CB6) control the power to the individual carriers. The following table shows the circuit breaker to carrier relationship.

**Table 3-3.  Circuit Breaker Definition**

| Circuit Breaker | Associated Carrier |
|-----------------|--------------------|
| CB1             | Carrier A          |
| CB2             | Carrier B          |
| CB3             | Carrier C          |
| CB4             | Carrier D          |
| CB5             | Carrier E          |
| CB6             | Filter             |

Connect power to the MSM as follows:

1. Set the main circuit breaker to OFF.

2. At the MSM:

    a. Using a 3/8-inch allen wrench, connect the -48 volt DC lead as shown in Figure 3-32.

    b. Using a 3/16-inch allen wrench, connect the -48 volt RTN lead as shown in Figure 3-32.

3. Route the leads out of the MSM through the mouse hole in the lower rear cover and over to the DC power cabinet.

4. At the DC power cabinet:

    a. Terminate the -48VDC lead on a **DC OUTPUT** circuit breaker.

    b. Terminate the -48V RTN lead on the **DISCH GRD** bar.

5. Repeat the procedure for each MSM.

# Installing the Management Terminals

The MCU is administered using the MCU Management Terminal (MCU-MT). Conference scheduling and troubleshooting is performed using the MCU Scheduling Terminal (MCU-ST). Both the MCU-MT and the MCU-ST are AT&T model 715 Business Communication Terminals (BCT).

The MCU-MT must be located in the same equipment room as the MCU MSM. It can either be directly connected to the MSM or within 50 feet of the MSM. The other terminal, the MCU-ST, can be located remotely.

## Installing the MCU-MT

The MCU-MT is primarily used for administration and maintenance functions. However, if needed, it can also provide the same conference scheduling and troubleshooting functions as the MCU-ST.

1. Unpack the MCU-MT and inspect it for damage.

2. Connect the MAIN PORT or P2 (DTE) of the MCU-MT to the TERM connector on the MCU with an M25B (EIA) cord or equivalent. The TERM connector interfaces with the TN786B Processor Interface circuit pack.

3. On the MCU-MT, connect the keyboard cord to the KBD jack on the rear of the terminal.

4. Plug in the AC power and turn on the terminal (power switch is at the rear of the terminal).

5. Using the keyboard, hold down CTRL and press F1 to view the default values.

6. Move the cursor to the *User Preference* field and press RETURN.

7. Move to the *Font Size* field and press F4 to select **large**.

8. Press F1 to return to the SETUP menu.

9. Advance the cursor to the *Display Options (per window)* field and press RETURN.

10. Move to the *Autowrap* field and press F4 to select **off** for both the *PRIMARY/WINDOW 1* and *WINDOW 2* fields.

11. Press F1 to return to the SETUP menu.

12. Go to the *Keyboard Options (per window)* field and press RETURN.

13. Move to the *Enter Key* field. In the *Primary/Window 1* field, press ESC and type **SB. *****REVIEWERS: Is any action required for Primary/Window 2?**

14. Press F5 to save the changes.

15. Press F1 to return to the SETUP menu and exit.

## Installing the MCU-ST or System Printer

> ⇒ **NOTE:**
> If the customer purchased the optional AT&T Conference Reservation System (CRS), it is a plug replacement for the MCU-ST. CRS allows the reservation agent to use a PC to schedule and reserve conferences on the MCU in advance of the conference date. It replaces the MCU-ST for conference scheduling and 24-hour reservations. See *AT&T Conference Reservation System User's Manual* for installation instructions.

The MCU-ST, also known as the remote manager terminal, is primarily used for scheduling conferences but can also be used to perform administration and maintenance functions if needed. The optional system printer is used for printing alarm and system reports.

The MCU-ST and the system printer may be located some distance from the MCU. If the distance between the MCU and the MCU-ST or system printer is greater than 50 feet, it is considered a remote connection. Also, any terminal that is not connected to the DTE connector on the back of the control carrier is considered a remote connection. A 7400B data module (included with the MCU) and an M25B cable are used to connect either the MCU-ST or the system printer to the MCU.
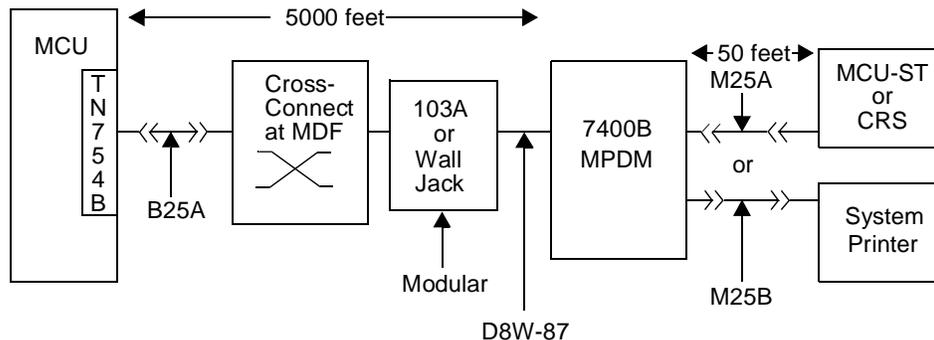


**Figure 3-34.  Typical Remote Connection for MCU-ST, AT&T CRS, or System Printer**

### Setting the 7400B Data Module for the MCU-ST

Follow the instructions below to set the 7400B data module before connecting it to the MCU-ST.

1. Connect a dumb terminal to the 7400B data module using a DSF cable (25-pin RS232 cable).

2. Enter the following commands:

    a. Enter **at** and the screen displays OK.

    > ⇒ **NOTE:**
    > If OK is not displayed, press RETURN, then enter **at&s0&c0**.

    b. Enter **at&v** to view the options. Look at the top line of the active profile.

    c. Enter **at&c1&d2&s1&s0=1&w0&w1&y0**.

3. These settings produce the following results:

    **&c1** sets the data carrier detect (DCD) circuit to operate according to the EIA standard

    **&d2** sets the data module to go on hook when an on-to-off transition is detected on the data terminal ready (DTR) input, disconnecting the call

    **&s1** sets the data module to respond to the data set ready (DSR) signal

    **&s0=1** turns on the automatic answer feature and causes the data module to answer on the first ring

    **&w0** causes the current configuration to be stored in data profile storage location 0

    **&w1** causes the current configuration to be stored in data profile storage location 1

    **&y0** selects the configuration stored in data profile storage location 0 to become the current configuration every time the data module is powered on

## Installing the MCU-ST

1. Unpack the MCU-ST and inspect for damage.

2. Connect the MAIN PORT or P2 (DTE) of the MCU-ST to the 7400B data module with an M25B (EIA) cord or equivalent. The 7400B data module is connected with a D8W-87 cable to the wall jack.

3. On the MCU side, connect the B25A cable to the TN754B Digital Line circuit pack.

4. On the MCU-ST, connect the keyboard cord to the KBD jack on the rear of the terminal.

5. Plug in the AC power and turn on the terminal (power switch is at the rear of the terminal).

6. Using the keyboard, hold down CTRL and press F1 to view the default values.

7. Move the cursor to the *User Preference* field and press RETURN.

8. Move to the *Font Size* field and press F4 to select **large**.

9. Press F1 to return to the SETUP menu.

10. Advance the cursor to the *Display Options (Per Window)* field and press RETURN.

11. Move to the *Autowrap* field and press F4 to select **off** for both the *PRIMARY/WINDOW 1* and *WINDOW 2* fields.

12. Press F1 to return to the SETUP menu.

13. Go to the *Keyboard Options (per window)* field and press RETURN.

14. Move to the *Enter Key* field. In the *Primary/Window 1* field, press ESC and type **SB**.

15. Press F5 to save the changes.

16. Press F1 to return to the SETUP menu and exit.

### Setting the 7400B Data Module for the System Printer

Follow the instructions below to set the 7400B data module before connecting it to the system printer.

1. Connect a dumb terminal to the 7400B data module using a DSF cable (25-pin RS232 cable).

2. Enter the following commands:

   a. Enter **at** and the screen displays OK.

   > ⇒ **NOTE:**
   > If OK is not displayed, press RETURN then enter **at&s0&c0**.

   b. Enter **at&v** to view the options. Look at the top line of the active profile.

   c. Enter **at&f&c1&d2e0q1s0=1&w0&y0**.

3. These settings produce the following results:

   **&f** resets the options to the factory defaults

   **&c1** sets the data carrier detect (DCD) circuit to operate according to the EIA standard

   **&d2** sets the data module to go on hook when an on-to-off transition is detected on the data terminal ready (DTR) input, disconnecting the call

   **e0** turns off the echo

   **q1** turns off the result codes which would be the normal response of the data module to commands it receives

   **s0=1** turns on the automatic answer feature and causes the data module to answer on the first ring

   **&w0** causes the current configuration to be stored in data profile storage location 0

   **&y0** selects the configuration stored in data profile storage location 0 to become the current configuration every time the data module is powered on

**Installing the System Printer**

1. Unpack the system printer and inspect for damage.

2. Connect the MAIN PORT or P2 (DTE) of the system printer to the 7400B data module with an M25B (EIA) cord or equivalent. The 7400B data module is connected with a D8W-87 cable to the wall jack.

3. On the MCU side, connect the B25A cable to the TN754B Digital Line circuit pack.

# Installing a Maintenance Alarm Terminal

⟹ **NOTE:**
When the MCU and the maintenance alarm terminal are located in separate buildings, a line current protector must be installed at the entry and exit points of *all* buildings through which the line passes. Verify that only the AT&T 4-type protectors or ITW LINX LP-type protectors are used.

One maintenance alarm terminal for alarm status (model 7444D) is provided with the MCU; up to two more are optional. Run the wiring as shown in Figure 3-35.
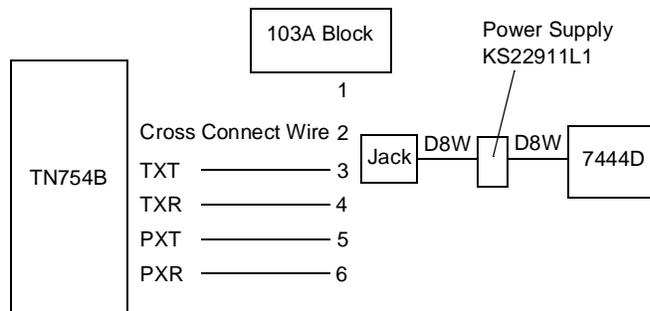


**Figure 3-35. Maintenance Alarm Terminal Wiring**

### Maintenance Alarm Terminal Lead Designations

The following table provides lead designations for terminating the maintenance alarm terminal on the TN754B. It also includes the lead designations for terminating 25-pair cables on the TN767D or TN2207 circuit pack. The battery and ground leads are shown for the TN786B Aux jack for connecting the INADS line or an external alarm.

**Table 3-4. Lead Designations**

| 110 Pin | Color | Dig. Line TN754B | DS1 (UDS1) Tie Trunk TN767D (TN2207) | Aux Jack TN786B |
|---------|-------|------------------|--------------------------------------|-----------------|
| 01 | W-BL | | | Major |
| 02 | BL-W | | | Major |
| 03 | W-O | TXT1 | | Minor |
| 04 | O-W | TXR1 | | Minor |
| 05 | W-G | PXT1 | | |
| 06 | G-W | PXR1 | | |
| 07 | W-BR | | | |
| 08 | BR-W | | | |
| 09 | W-S | TXT2 | | |
| 10 | S-W | TXR2 | | |
| 11 | R-BL | PXT2 | | |
| 12 | BL-R | PXR2 | | |
| 13 | R-O | | | |
| 14 | O-R | | | |
| 15 | R-G | TXT3 | | |
| 16 | G-R | TXR3 | | |
| 17 | R-BR | PXT3 | | |
| 18 | BR-R | PXR3 | | |
| 19 | R-S | | | |
| 20 | S-R | | | |

**Table 3**-4.   **Lead Designations** — *Continued*

| 110 Pin | Color | Dig. Line TN754B | DS1 (UDS1) Tie Trunk TN767D (TN2207) | Aux Jack TN786B |
|---------|-------|------------------|--------------------------------------|-----------------|
| 21 | BK-BL | TXT4 | | E. GND |
| 22 | BL-BK | TXR4 | | M. -48 |
| 23 | BK-O | PXT4 | | E. GND |
| 24 | O-BK | PXR4 | | R. -48 |
| 25 | BK-G | | | G. GND |
| 26 | G-BK | | | - -48 |
| 27 | BK-BR | TXT5 | | X. GND |
| 28 | BR-BK | TXR5 | | T. -48 |
| 29 | BK-S | PXT5 | | R. GND |
| 30 | S-BK | PXR5 | | P. -48 |
| 31 | Y-BL | | | O. GND |
| 32 | BL-Y | | | W. -48 |
| 33 | Y-O | TXT6 | | E. GND |
| 34 | O-Y | TXR6 | | R. -48 |
| 35 | Y-G | PXT6 | | |
| 36 | G-Y | PXR6 | | |
| 37 | Y-BR | | | A. GRD |
| 38 | BR-Y | | | C. -48 |
| 39 | Y-S | TXT7 | | C. GND |
| 40 | S-Y | TXR7 | | P. -48 |
| 41 | V-BL | PXT7 | | W. GND |
| 42 | BL-V | PXR7 | | R. -48 |
| 43 | V-O | | L1* | |
| 44 | O-V | | L1 | |
| 45 | V-G | TXT8 | L0 | EXT. |
| 46 | G-V | TXR8 | L0* | ALARM |

**Table 3-4. Lead Designations — *Continued***

| 110 Pin | Color | Dig. Line TN754B | DS1 (UDS1) Tie Trunk TN767D (TN2207) | Aux Jack TN786B |
|---------|-------|------------------|--------------------------------------|-----------------|
| 47 | V-BR | PXT8 | LBACK2 | |
| 48 | BR-V | PXR8 | LBACK1 | |
| 49 | V-S | | | T (INADS) |
| 50 | S-V | | | R (INADS) |

*Denotes the ring side or high side of a pair.

## Installing the INADS Interface

The INADS trunk is a two-way, rotary dial, loop start trunk that connects to the TN786B Processor circuit pack through the INADS terminals at the trunk/auxiliary cross-connect field. The INADS trunk is used only for the INADS connection.

1. Determine the INADS trunk appearance at the green trunk/auxiliary cross-connect field.

2. Label terminals for INADS trunk appearance (IN).

3. Install jumpers between INADS trunk appearance (IN) and INADS terminals.

When Using 110-Type Hardware

To Network
Interface
Facility

25

50

1 Pair of Wires

To Control
Carrier
Auxiliary
Connector

INADS

When Using 66-Type Hardware

Part of 66-Type
Connecting Block
Associated with
Central Office
Leads

Part of 66-Type
Connecting Block
Associated with
Auxiliary
Connector

A  B  C  D

43
44
45
46
47
48
49
50

INADS

A  B  C  D

43
44
45
46
47
48
49
50

Green
Trunk/Auxiliary
Field

Yellow
Trunk/Auxiliary
Field

**Figure 3-36.   Connections at Trunk/Auxiliary Field for INADS Trunk**

# Cabling for DS1 or UDS1 Tie Trunks

DS1 or UDS1 tie trunks provide digital data service between an MSM and a PBX or between the MCU and a data network using T1 or E1 carrier facilities through a Channel Service Unit (CSU). The TN767D DS1 (TN2207 UDS1) tie trunk circuit pack provides connection capability to the DS1 (USD1) facility for 24 independent trunks. The following table shows the lead designations for the DS1 (UDS1) circuit pack.

> **NOTE:**
> For details on installing trunk cables, see Chapter 4, "Connecting to the Network".

The H600307 connector cable (comcode 104307376) is used to connect the DS1 (UDS1) tie trunk to a PBX or to a CSU. This cable is a 50-foot shielded cable equipped with a 50-pin male connector on each end.

> **NOTE:**
> In the United Kingdom, an 888A adapter is required to link the 25-pair cable to the coaxial cable leading to the network.

**Table 3-5.   Connector Cable Lead Identification**

| Wire Color | Lead Designation | 110 HW | 25 Pair Cable | Conn. Pin # |
|---|---|---|---|---|
| W-G | LI | 43 | V-O | 47 |
| G | LI | 44 | O-V | 22 |
| W-BR | LO | 45 | V-G | 48 |
| BR | LO | 46 | G-V | 23 |
| W-S | LBACK2 | 47 | V-BR | 49 |
| S | LBACK1 | 48 | BR-V | 24 |

# Connecting to the Network

<span style="font-size:3em;">**4**</span>

## Overview

This section describes the wiring and connections required for the MCU. It identifies the cross-connect fields, lists the hardware equipment room requirements, and provides procedures for installing cables.

## Hardware Equipment Room

In the equipment room, 66- or 110-type hardware is used for the cross-connect field. A cross-connect field contains a trunk/auxiliary field, and a distribution field (port, auxiliary, and maintenance alarm terminals).

### Trunk/Auxiliary Field

The trunk/auxiliary field contains three distinct cross-connect areas (AT&T SYSTIMAX standards):

- Green field: This field terminates the network interface leads from the CO and provides the terminals to cross-connect the CO leads to the purple or yellow fields as required. A single row of the 66-type connecting block or 110-type terminal block can terminate 24 one-pair, 8 three-pair, or 12 two-pair trunks.

- Purple field: This field terminates the trunk circuits from the MCU with WP-90929, List 1 and List 3 (110-type terminal block) or WP-90929, List 2 or List 4 (66-type connecting block) concentrator cables. Also, 25 pair cables can be used to terminal trunk circuits from the MCU with each trunk circuit

pack connecting to one 25 pair row of the 66-type connecting block/110-type terminal block. Each 66-type connecting block or 110-type terminal block row can terminate 24 one-pair, 8 three-pair, or 12 two-pair trunks.

■ Yellow field: This field provides cross-connection terminals for the INADS trunk lead from the MCU. One 25-foot cable is required for the INADS connection.

## Distribution Field

The distribution field contains the following cross-connect area:

■ Purple field (port field): This area terminates the 25-pair cables from the MCU for the maintenance alarm terminals. Each line circuit pack connects to one 66-type connecting block or to one 25-pair row of the 110-type terminal block. One 25-pair cable is required for each line circuit pack.

**Table 4-1.    Distribution Field-110A-Type Terminal Blocks**

| 3-Pair Port Field (Purple) | 4-Pair Station Field (Blue) | 3-Pair Station Field (Blue or White) |
|---|---|---|
| 110AC1-300STM/6 | 110AB1-100FT | 110AC1-100FT |
| 110AC1-300STF/6 | 110AB1-300FT | 110AC1-300FT |
| | | 110AC1-300STM/6 |
| | | 110AC1-300STF/6 |

## 66-Type Hardware

The following figure shows a typical cross-connect field using 66-type hardware. It is possible only a few 66-type connecting blocks will be required in the trunk/auxiliary field for the green and yellow fields. For this reason, if 157B connecting blocks mounted on a purple 183-type of 166-type backboard is used as the trunk/auxiliary field, then some of the extra connecting blocks in the purple field can be used as the green and yellow fields to avoid ordering extra backboards and connecting blocks.

When this is done, the green and yellow fields should be clearly identified to avoid confusion. When white backboards are required for cross-connections with a satellite closet, they must be ordered from an outside vendor. If a blue backboard

is used for these cross-connections, then the part of the blue field that is functionally used as the white field, should be clearly identified.



Trunk/Auxiliary Field

187B1 Backboards

Station Distribution Field

Port Distribution Field
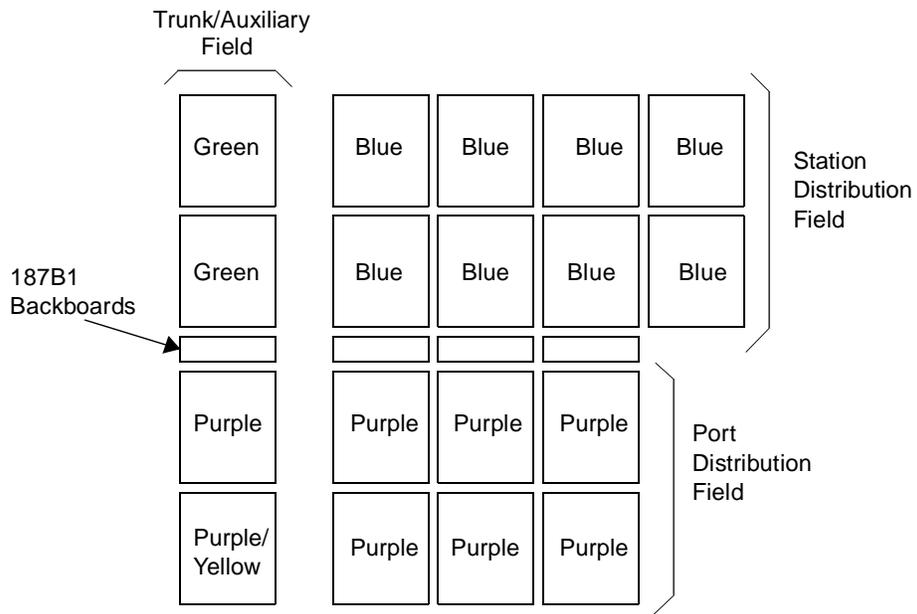
**Figure 4-1.    Typical Cross-Connect Field Arrangement Using 66-Type Hardware**

The 66-type connecting blocks can be mounted directly onto the wall without using colored backboards. If this is the case, all the cross-connect field functional colors should be identified on the wall.

### Cross-Connect Field Using 110-Type Hardware

The cross-connect field is located directly behind the MSM. The following figure shows a typical cross-connect field installation using 110A-type terminal blocks.

D Ring

Trunk/
Auxiliary
Field

Distribution
Field

Z114A Cable
Slack Manager

MCU
MSM

Z113A Cable
Slack Manager

25-Pair Cable
To MCU MSM
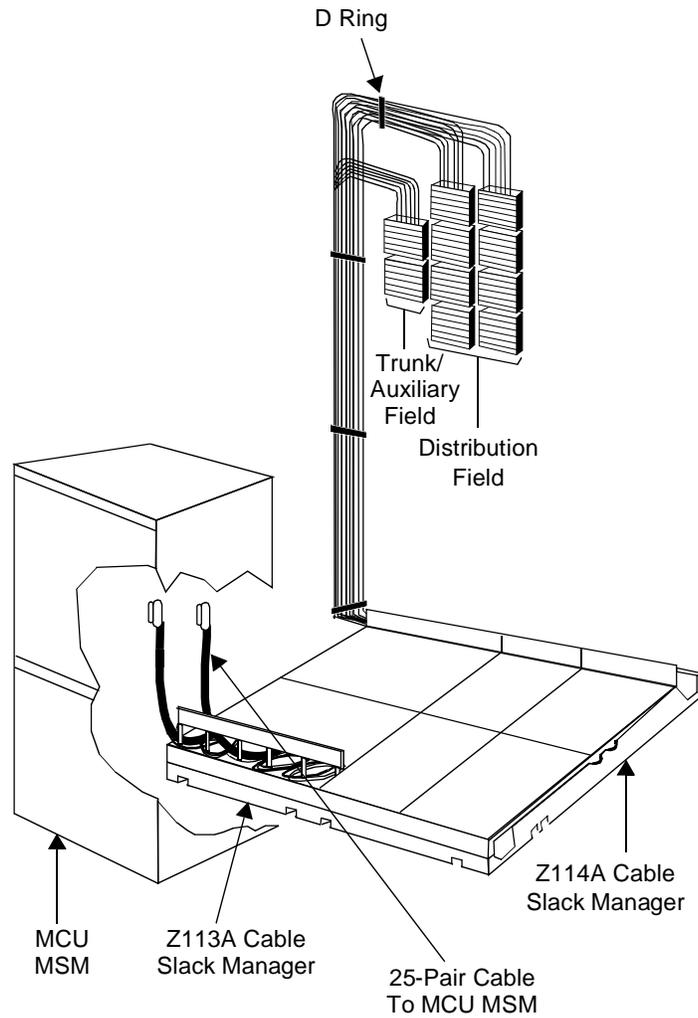
**Figure 4-2.   Typical Cross-Connect Field Installation Using 110A-Type Hardware**

### Cross-Connect Field Using 66-Type Hardware

The following figure shows a typical cross-connect field installation using 66-type hardware.



Trunk/
Auxiliary
Field

Distribution
Field

Z114A Cable
Slack Manager

MCU
MSM

Z113A Cable
Slack Manager

25-Pair Cable
To MCU MSM
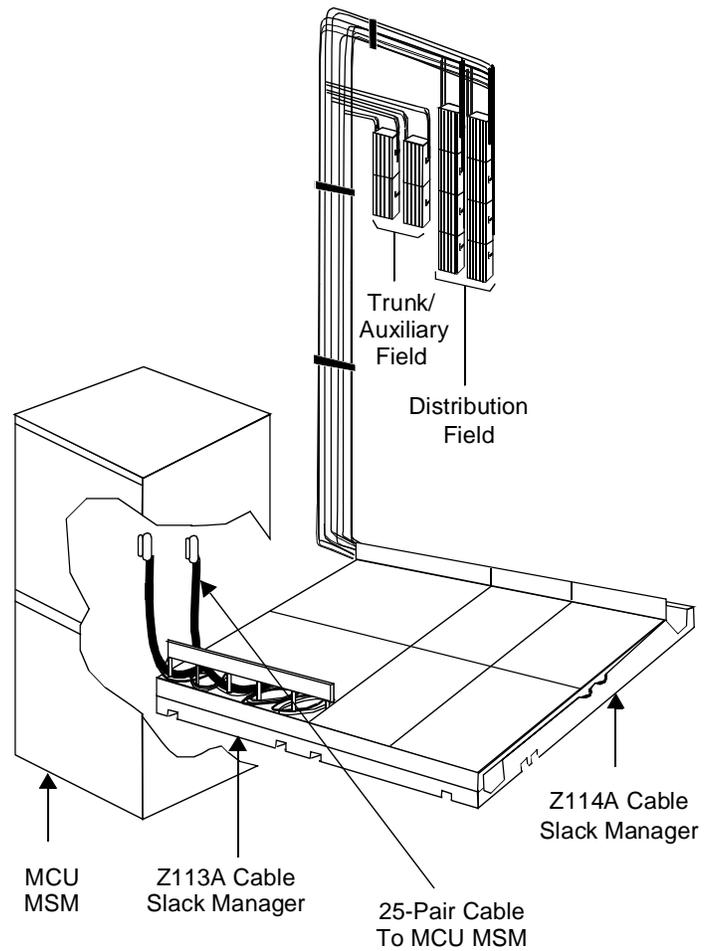
**Figure 4-3.    Typical Cross-Connect Field Installation Using 66-Type Hardware**

# Equipment Requirements

Review the following requirements for connecting the MCU to the network.

## Wall Space for 110-Type Hardware

The trunk/auxiliary field and the distribution field are mounted on the same wall. Each 110P-type terminal block is 8 1/2 inches wide. Vertical patch cord troughs are 5 5/16 inches wide and horizontal patch cord troughs are 23 inches wide.

Each 110-A type terminal block is 10 13/16 inches wide; however, no horizontal patch cord troughs are used and the blocks are shorter than 110P-type terminal blocks. This allows the 110A-type terminal blocks to be stacked. Therefore, the 110A-type hardware requires less space than the 110P-type hardware on a per-station basis.

## Wall Space for 66-Type Hardware

The trunk/auxiliary field and the distribution field are mounted on the same wall. If the 66-type connecting blocks are mounted directly on a wall, the space require-ments of a 183-type backboard should be used to determine the required wall space for the connecting blocks.

This method allows enough wall space between the connecting blocks for jumper wires and cable connections. The 183A-type backboard mounts four 66-type connecting blocks and is 8 1/2 inches wide and 20 inches tall. The 183B-type backboard mounts eight 66-type connecting blocks, and is 17 inches wide and 20 inches tall.

# Installing Equipment Room Hardware

The procedures for installing hardware assume a system technician is performing the installation alone. If possible, locate the cross-connect field directly behind the MCU cabinet.

## Wall Mounting 110A-Type Terminal Blocks

The 110A-type hardware can be stacked in almost any arrangement at any height or location on the wall. One arrangement is shown in the following figure. The dis-tance between the mounting screw holes on the terminal blocks is 10 13/16 inches. If a vertical patch cord trough is used, the distance between the mounting screws is 5 5/16 inches.

### Wall Mounting 66-Type Connecting Blocks

The first column of 66-type connecting blocks should be aligned with the left side of the MSM. This arrangement allows for orderly growth toward the right side of the cross-connect field.

The connectorized 66-type connecting blocks are factory wired for cable routing from the top so the cable connector aligns with the connector on the connecting block. If cable routing from the bottom is desired, then the connector on the connecting block must be removed and rotated 180 degrees. Then the connector must be relocated in the previously unoccupied hole since the connecting block leads are not long enough to reach the hole where the connector was previously mounted. The VELCRO cable retainer must also be relocated.

To install the cross-connect field, use the following procedure:

1. Draw a level horizontal line on the wall 12 inches above the floor.

2. Place the bottom of the first backboard/connecting block on the line and align it vertically with the left side of the MSM. Mark the mounting holes.

3. Remove the backboard and connecting block and drill holes in the wall for 3/4 inch No. 12 wood screws.

4. Move the backboard and connecting block into place and fasten it to the wall with 3/4 inch No. 12 wood screws.

5. The next backboard and connecting block is mounted to the right or above the one previously installed, depending on the space requirement. Repeat steps 2 through 4 until each backboard or connecting block is installed.

> **NOTE:**
> The 66-type connecting blocks should not be installed more than 78 1/2 inches above the floor.

# Labeling the Cross-Connect Field

The following figure shows the graphic symbols used (instead of words) on labels for the MCU, cross-connections, information outlets, and cables. The labels are color-coded to identify system wiring as follows:

- Green: Leads to the Central Office (CO)

- Purple: Leads to MCU ports

- Yellow: Leads to the INADS connection

|  | | Designations |
|---|---|---|
|  | **MSM** | **1,2,3...n** |
|  | **Carrier** | **A,B** |
|  | **Slot** | **1,2,3...20** |
|  | **Information Outlet** | **1,2,3...560** |
|  | **Site/Satellite Closet** | **A,B,C,D,E,F** |
|  | **Tie Circuit** | **1,2,3...n** |
|  | **Floor** | Write Floor or Building Identification on Label as Required for Easy Identification |
|  | **Building** | |

**Figure 4-4.   Label Graphic Symbols and Designation Nomenclature**

# Installing Cables

The purple port label shown in the following figure is installed with both ends of the 25-pair cables that connect to the trunk/auxiliary field and/or the distribution field.

| Label Name | Range | Sample Label |
|---|---|---|
| Port Cable | 1A1-1A10, 1B1-1B20, 1C1-1C20, 1D1-1D20, 1E1-1E20 | ← Purple |
| Building | Field Identified | Blue/Yellow |
| Floor | Field Identified | Blue/Yellow |
| Auxiliary Cable | Field Identified | Yellow |
| Site or Satellite | A-F and/or Field Identified | Blue/Yellow |
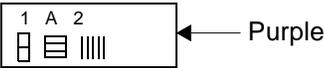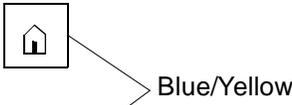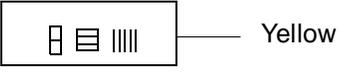
**Figure 4-5.    Equipment Room Cabling Labels**

The blue/yellow label is for 25-pair cables that connect to site/satellite closets.

**\*\*\*REVIEWERS: Should the ranges for "Port Cable" containing 'C,' 'D,' or 'E' be deleted?**

**Table 4-2.    Cable/Connector/Building Label Ordering Information**

| Description | Quantity Per Code | Comcode |
|---|---|---|
| 201A Labels | 34 sheets | 103969994 |

## Guidelines for Routing Cables

The following two figures show typical cable routing from the MSM to the top and bottom of the cross-connect field, respectively.
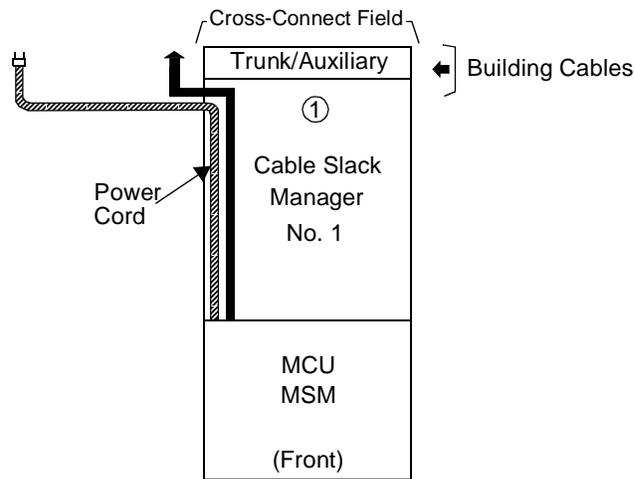


① Cables Run from MSM to Trunk/Auxiliary

**Figure 4-6. Cable Routing from MSM to Cross-Connect Field (using top)**

The following guidelines should be followed when routing cables from the MSM to the cross-connect field.

■ When cable routing is to the top or bottom of the cross-connect field, each port cable is connected at the MSM and then routed along the front trough of the cable slack manager to the connecting/terminal block where the cable is to be terminated.

Cross-Connect Field

Trunk/Auxiliary ← Building Cables

Cable Slack Manager No. 1

①

Power Cord

MCU MSM

(Front)
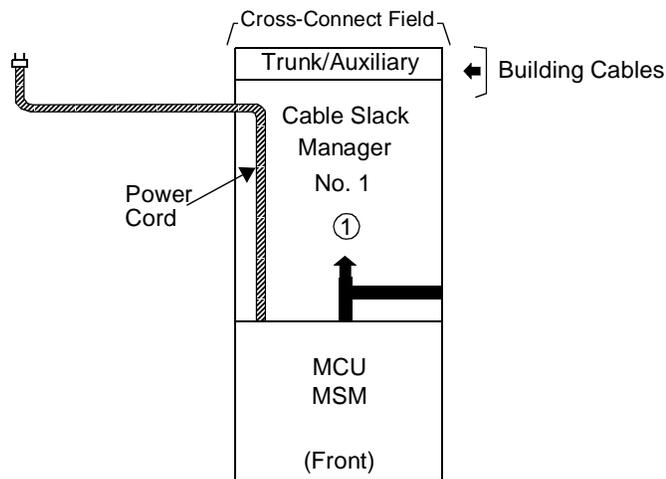
① Cables Run from MSM to Trunk/Auxiliary Field

**Figure 4-7. Cable Routing from MSM to Cross-Connect Field (using bottom)**

■ Enough slack must be left at the MSM end of the cable to allow for proper dressing of the cables.

■ Route the cable from the MSM to the wall. Place the cable beside one of the rows of columns in the cable slack manager (see NOTE).

⇒ **NOTE:**
Retainers mounted on columns keep the cable from protruding above the top of the base of the cable slack manager.

■ Determine the length of the cable required to reach from the cable slack manager to the assigned connecting/terminal block.

■ The cable must be supported on the wall using D rings.

■ Cable slack is stored by coiling the cable around the columns in the cable slack manager. The first run should always go across the full length of the five columns in the cable slack manager.

■ Connect the cable to the assigned connecting/terminal block.

### Installing Control Carrier Outputs Cable

The control carrier AUXILIARY connector outputs support the INADS trunk connection. There is one connector on the back of the control carrier that is labeled *AUX*. A 25-pair cable connects this control carrier AUXILIARY connector to a 66-type connecting block or 110-type terminal block in the yellow field of the trunk/auxiliary field.

### 110-Type Hardware

Place the appropriate AUXILIARY connector label on the assigned 110-type terminal block row. On the control carrier cable, place a yellow auxiliary label on the connectors at each end of the cable. Write the letters AUX on each label.

### 66-Type Hardware

Write the lead designations for the AUXILIARY connector on the 66-type connecting block. If cable labels are used, place a yellow auxiliary label on the connectors at each end of the cable. Write the letters AUX on the connectors at each end of the cable.

### Connecting the Control Carrier Outputs Cable

Plug the connector cable in the AUXILIARY connector on the rear of the control carrier. Route the connector cable through the cable slack manager to the assigned 66-type connecting block or 110-type terminal block in the yellow field of the trunk/auxiliary field.

Use this procedure to install the cables:

1. For 110-type hardware (see step 2 for 66-type hardware), connect patch cords or jumper wires from the terminal block in the green field to the associated terminal block in the purple field.

2. For 66-type hardware, install bridging clips on the 66-type connecting blocks as required.

   $\Longrightarrow$ **NOTE:**
   The left half of the 66-type connecting block is designated as part of the green field and the right half is designated as part of the purple field.

3. Connect the single-fingered end of the concentrator cables to the 110-type terminal block or 157B connecting block connectors associated with the purple row.

4. At the rear of the MSM, connect the other end (2/3 fingered end) of the concentrator cables to the appropriate carrier slots. Equipped carrier slots are identified on the CSO. Mark the nomenclature strips above the carrier to identify the equipped slots.

5. Label connectors on each end of the cables that connect to the MSM.

6. Dress cables down the sides of the MSM and store the excess cable slack in the cable slack manager as described previously.

## Installing Grounds for CBC

A Coupled Bonding Conductor (CBC) must be tie-wrapped to all trunk cables. The CBC connects the cabinet single-point ground block to the approved ground located nearest the telephone company owned protector block at the building entrance facility (see Figure 4-8).

### ⇒ NOTE:
The CBC is a conductor that is connected to ground and run adjacent to the pairs in an inside wiring cable. The mutual coupling between the bonding conductor and the cable pairs reduces potential differences in terminating equipment. The conductor consists of a 10-AWG wire that is tie-wrapped to the inside wiring cable.

10 gauge CBC

Trunk
Circuits

Single-
Point
Ground
Block

MCU
MSM

Cable Ties

Trunk/
Auxiliary
Field

Cable
Entrance
Terminal
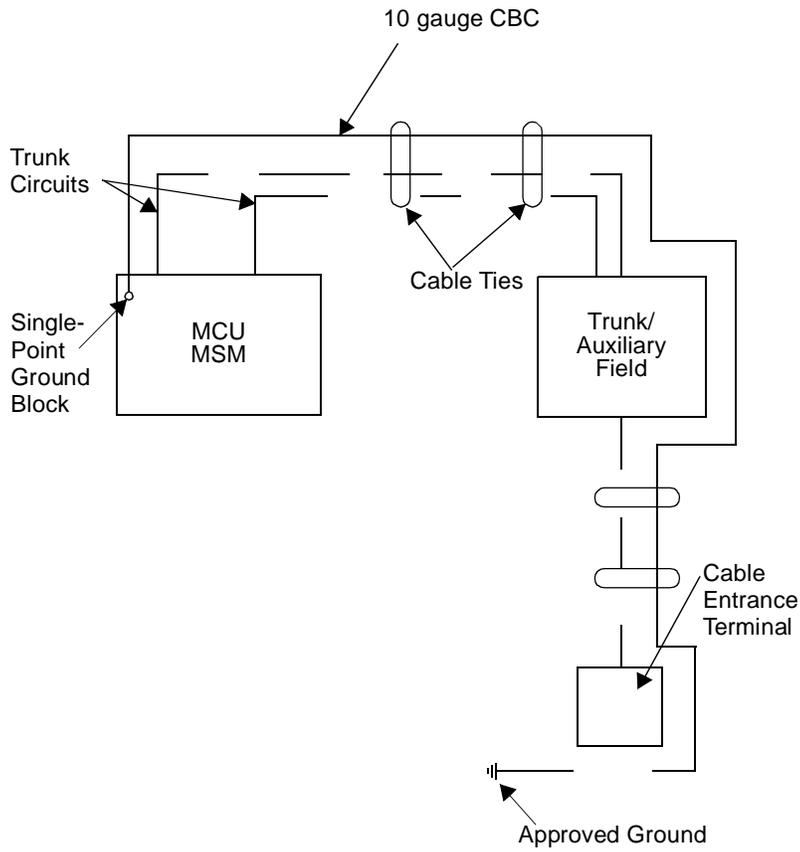
Approved Ground

**Figure 4-8.  Installing the Coupled Bonding Conductor**

## Approved Grounds

An approved ground is the closest acceptable medium for grounding the building entrance protector, entrance cable shield, or single-point ground of MCU equipment. If more than one type of approved ground is available on the premises, the grounds must be bonded together as required in Section 250-81 of the National Electrical Code. See  Grounding on page 2-15 in Chapter 2 for a list of approved grounds.

### ⚠ DANGER:

*If the approved ground or approved floor ground can only be accessed inside a dedicated power equipment room, then only a licensed electrician should make the connections to the ground.*

## Installing DS1 or UDS1 Trunks

The following figures show the connections between the MCU to a PBX and between the MCU and a CSU for a direct network connection.  In this example, the DS1 circuit pack is used. For information on installing a CSU, see the documentation provided with the unit.
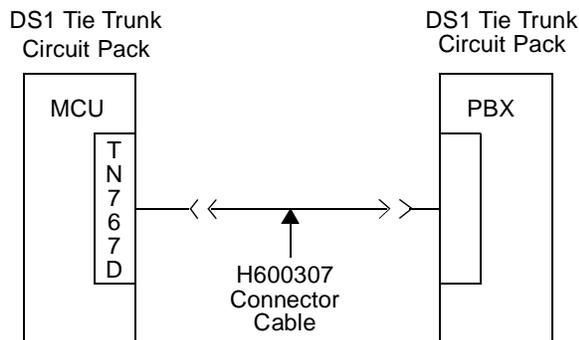


**Figure 4-9.    Connections for DS1 Trunks Between the MCU and PBX**
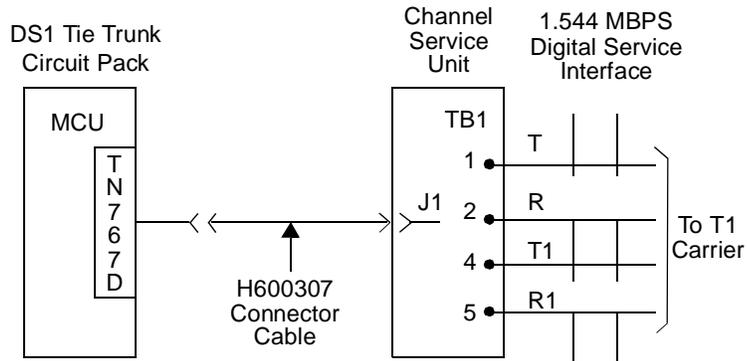
**Figure 4-10.    Connections for DS1 Trunks Between the MCU and CSU**

# Activating the MCU

# 5

## Powering Up

To activate the MCU, the on-site technician must perform the following steps:

1. Verify the slide on the memory card, shipped with the MCU, is not in the write-protect position as shown in Figure 5-1.

2. Install the memory card.

3. Verify that all cabinet power modules are OFF.

4. Plug the MSM power cable into the appropriate receptacle. For DC-powered systems, go to step 6.

5. For AC-powered systems, ensure that the associated circuit breakers at the AC power panel are in the ON position.

6. At the DC battery cabinet, set the circuit breaker to ON.

7. At the DC power cabinet, set the circuit breaker on associated rectifiers to ON.

8. In each MSM, in front of the power distribution unit, set the MAIN circuit breaker to ON.

9. In each MSM, at the rear of the power distribution unit, set each of the circuit breakers to ON.

> **⇒ NOTE:**
> This action starts the system initialization test. All red LEDs on the circuit packs go on, then off. Some LEDs will remain on until translations are completed (for example, the DS1 circuit pack).
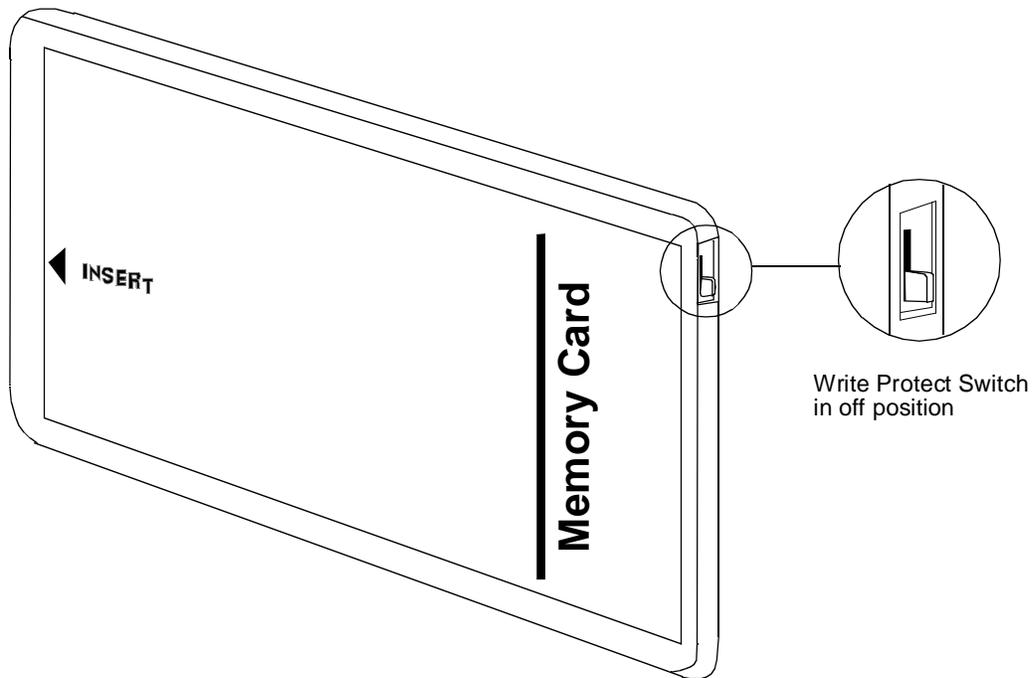


**Figure 5-1.   Memory Card**

10. After several minutes, check the MCU Managment Terminal (MCU-MT) to verify that all tests pass. **\*\*\*REVIEWERS: How? Where?**

> **⇒ NOTE:**
> If any message indicates a test failed or the message, "`spe down mode`" is displayed, refer to the *AT&T MultiPoint Control Unit Maintenance Manual* to clear the problem.

11. About two minutes after "`RESET 4 (REBOOT) PERFORMED`" is displayed, verify the screen displays: `Login:`

**⚠ CAUTION:**
*To prevent damage from static electricity, always wear an EMC wrist strap (comcode 900 698 226) when handling circuit packs.*

**⚠ WARNING:**
   **White-labeled control circuit packs must not be reseated without powering down first.**

12. If any of the red LEDs that remain on should be off, refer to the *AT&T Multi-Point Control Unit Maintenance Manual* to identify and clear the problem.

**⇨ NOTE:**
   Alarms appear in the Alarm Log (available from the MCU-MT) when power is applied to the MCU before all equipment connecting to port circuit packs is installed. Normally, some alarms are logged when power is applied, but they should be resolved quickly. If no equipment is connected to the port packs, alarms associated with these ports can take up to four hours to come in, but clear automatically after all equipment is installed and operating correctly.

## Logging In

The following table shows the MCU logins. The on-site technician should change the craft password. INADS is responsible for changing the AT&T login passwords. The customer needs to provide passwords for all the customer logins.

**Table 5-1.    MCU Logins**

| User | Login |
| --- | --- |
| On-site system technician | craft |
| Customer administrator | cust |
| Remote administrator | rcust |
| Reservation agent | agent |
| Display only | browse |

Perform the following procedure to log in to the MCU:

1. At the MCU-MT, verify the screen displays: `Login:`

2. Enter **craft** and press RETURN.

3. Verify the screen displays: `password:`

4. Enter **crftpw** and press RETURN.

   ⇒ **NOTE:**
   > For security purposes, the password is not displayed as you enter it. The MCU verifies the login and password. If an invalid login or incorrect password name is entered, the screen displays: `login incorrect.` Try again.

5. Verify the software version. **\*\*\*REVIEWERS: How?**

6. Verify the screen displays: `Terminal Type (Enter 715, 513, 4410, or 4425): [715]).`

7. Press RETURN.

8. The screen should now display: `command:`

9. Type **change password craft** and press RETURN.

10. Verify the screen displays the Password Change form.

11. At the *Your Current Password* field, enter **craftpw** and press RETURN.

12. In the *New Password For Login Name* field, enter the new password (see **NOTE**) and press RETURN.

    ⇒ **NOTE:**
    > Valid passwords have four to seven alpha or numeric characters or a combination of both. Passwords should be selected on the basis of local procedures and recorded in accordance with those procedures.

13. Reenter the new password in the *New Password (enter again)* field and press SUBMIT.

14. Verify the screen displays: `command successfully completed` followed by `command:`

## Setting the Date and Time

The 24-hour conference scheduling system uses the MCU system clock to know when to begin and end conferences. It is vital that the clock is correctly set to ensure conference functionality; if the AT&T Conference Reservation System (CRS) is installed, you must synchronize the date and time on the MCU with the date and time set on CRS.

The system clock is affected only if when power is interrupted for more than two minutes. The optional Uninterrupted Power Supply (UPS) may be used to protect against power outages to the MCU.

The date and time are set using the Set Date and Time form. Use the following procedure to set the date and time:

⇒ **NOTE:**
   Be sure to obtain the accurate time by calling the National Bureau of Standard Time at **202 844-1234**.

1. At the *command:* prompt, type **set time** then press RETURN.

2. At the *Day of the Week* field, enter the day of the week.

3. At the Month field, enter the current month.

4. In the *Day of the Month* field, enter the current day (**1** through **31**).

5. In the *Year* field, enter the current year.

6. In the *Hour* field, enter the current hour in military time. (**00** is midnight, 12 is noon, **23** is 11 p.m. The p.m. time is hour plus 12.)

7. In the *Minute* field, enter the current minute (**0** through **59**).

   ⇒ **NOTE:**
      Seconds are reset to **00** for the minute selected.

8. Press ENTER.

9. When the screen displays: `command successfully completed` followed by `command:`, enter **display time** to verify the setting.

## Contacting the VTC

At this point in the installation, the on-site technician must call the VTC to perform administration described in Chapter 6, "Administering the MCU". After the VTC completes the administration, the on-site technician must be contacted to complete the remaining installation steps that follow in this section.

# Maintenance Alarm Terminals

After the VTC completes the MCU administration, the on-site technician should proceed with these remaining installation steps.

## Labeling the Maintenance Alarm Terminal

Place the following labels shown in Tables 5-2 through 5-4 on each of the maintenance alarm terminals administered by the VTC.
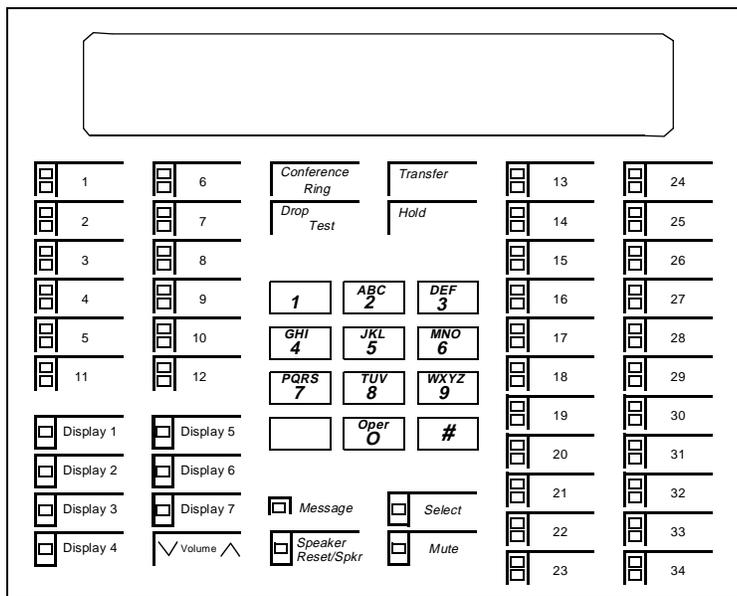


**Figure 5-2.    Model 7444B Maintenance Alarm Terminal**

**Table 5-2.    7444D Maintenance Alarm Terminal Button Assignments 1 through 10**

| Button | Assignment | Button | Assignment |
|--------|-----------|--------|-----------|
| 1 | call-appr | 6 | ac-alarm |
| 2 | call-appr | 7 | smdr1-alrm |
| 3 | call-appr | 8 | pr-sys-alm |
| 4 | | 9 | trk-ac-alm |
| 5 | aca-call | 10 | verify |

**Table 5-3.    7444D Maintenance Alarm Terminal Button Assignments 11 through 34**

| Button | Assignment | Button | Assignment |
|--------|-----------|--------|-----------|
| 11 | | 23 | |
| 12 | | 24 | link-alarm Lnk #: 1 |
| 13 | major-alrm | 25 | link-alarm Lnk #: 2 |
| 14 | minor-alrm | 26 | link-alarm Lnk #: 3 |
| 15 | warn-alrm | 27 | link-alarm Lnk #: 4 |
| 16 | mmi-cp-alm | 28 | |
| 17 | vc-cp-alm | 29 | |
| 18 | ds1-alarm | 30 | |
| 19 | | 31 | |
| 20 | | 32 | |
| 21 | | 33 | |
| 22 | | 34 | |

***REVIEWERS: Should an assignment for the ttr alarm be included in the previous table?**

**Table 5-4.    7444D Display Button Assignments 1 through 7**

| Button | Assignment |
|--------|------------|
| 1 | normal |
| 2 | inspect |
| 3 | trk-id |
| 4 | trunk-name |
| 5 | date-time |
| 6 | timer |
| 7 |  |

## Testing the Maintenance Alarm Terminal

The on-site technician should use the following procedure to test each of the installed maintenance alarm terminals:

1. Go off hook on a maintenance alarm terminal.

2. Verify that dial tone is received.

3. Verify that the "normal" button is lit. If it is not lit, press it and the LED should come on.

4. Press the DATE/TIME button. The date and time displays for a few seconds, then returns to the previous display.

5. If any alarm button is lit, go to the MCU-MT and enter **display alarm** to verify that the corresponding alarm is active. See the *AT&T MultiPoint Control Unit Maintenance Manual* for information on resolving alarms.

## Saving Translations

The save translation command copies the current system translations onto the memory card located on the network control circuit pack. Use the following procedure to save translations on the original system memory card and to make a backup memory card (not included):

> **NOTE:**
> To order the 1 Mb backup memory card, use comcode 601376676.

1. Be sure the system memory card is inserted in the network control circuit pack.

2. At the `command:` prompt, type **save translation** and press RETURN. Wait two minutes.

3. Check for a **0** in the *Error Code* column; it indicates the save translation was successfully completed.

   > **NOTE:**
   > If a number other than **0** appears, the save translation process did not complete. Record the number in the *Error Code* field along with any *Error Message* and notify maintenance support.

4. If the save translation procedure was successful and the customer has a backup memory card, remove the system memory card and insert the backup memory card. Repeat steps 2 and 3, then swap the memory cards. Place the backup memory card in a safe place.

## Testing the Network

Test the connection of each DS1 or UDS1 circuit pack to the network as follows:

1. At the MCU-MT, enter **test ds1 *location* long** where *location* is the cabinet and slot address of the DS1 (UDS1) circuit pack (for example, **1a05**).

2. Verify that all board level tests pass. If not, check the network connections. If you need assistance, call the VTC at **800 VIDEOGO** (800 843-3646).

   ### ⇒ NOTE:
   If the board level tests pass but the port level tests either abort or fail, network service is not turned on.

## Logging Off

After initializing the MCU, log off the system to prevent unauthorized changes to the data entered and to save the changes that were made.

1. At the MCU-MT, enter **logoff**.

2. The screen displays: Login:

## Calling INADS

The final step in the on-site installation procedure is to call INADS to report a new system installation and to test the INADS interface as follows:

1. The on-site technician calls INADS to report a new system installation and asks them to call the MCU.

2. INADS displays the System Parameters Maintenance form to confirm the product identification.

3. INADS enters **test inads-link**.

4. INADS terminates the login and disconnects.

5. INADS checks the trouble ticket generated by the test. It should show "INADS,n,MINOR" to indicate a minor off-board alarm was reported.

6. INADS calls back and checks the error log to verify there are no problems.

7. INADS displays the Change Password form (see "Changing Passwords" on page 5-11 for details) and changes the appropriate passwords.

8. INADS displays the Maintenance-Related System Parameters form (see "Setting System Maintenance Parameters" on page 5-11) to establish customer-supplied alarm thresholds and contact numbers.

9. INADS terminates the login and disconnects.

**Changing Passwords**

 **CAUTION:**
*The craft password must be changed to prevent unauthorized administration of the MCU. After AT&T passwords are changed, do not reveal them to the customer or any unauthorized person.*

If it is necessary to void or deny access to a particular login, the login may be voided by changing the password of the login to VOID. After the login's password is VOID, the login is denied access to the MCU. The VOID password can then be changed or reinstated by a higher level login.

1. Verify the screen displays: `command:`

2. Enter **change password *login***.

3. Verify the screen displays the Password Change Form.

4. At the *Your Current Password* field, enter the password you entered to log in.

5. In the *New Password For Login Name* field, enter the new password (see NOTE).

 **NOTE:**
Valid passwords have four to seven alpha or numeric characters or a combination of both.

6. Reenter the new password in the *New Password (enter again)* field.

7. Verify the screen displays: `command successfully completed` followed by `command:`

**Setting System Maintenance Parameters**

The Maintenance-Related System Parameters form identifies MCU scheduled maintenance parameters and maintenance thresholds. The fields are defined as follows; specific entries must be obtained from the customer.

Use the following procedure under the craft login to change maintenance parameters:

1. At the `command:` prompt, type **change system-parameters maintenance** then press RETURN.

2. Verify the screen displays the Maintenance-Related System Parameters form.

3. From the *Product Identification* field, use TAB and RETURN to advance to the fields you want to change.

> ⇒ **NOTE:**
> An entry must be made in the *Product Identification* field and the *OSS Telephone Number* field.

4. When the form is completed, verify the screen displays: `command suc-cessfully completed` followed by `command:`

5. To verify the form, type **display system-parameters maintenance** then press RETURN.

The following list identifies the fields on the Maintenance-Related System Parameters form and their related values.

■ *Product Identification*

Identifies the MCU to an Operations Support System (OSS). The number must start with a **1** and contain 10 digits. The last nine digits are the serial number of cabinet A.

■ *OSS Telephone Number*

Provides the number the MCU uses for alarm origination. The number is obtained from the Technical Support Center (TSC).

■ *Alarm Origination Activated*

Indicates whether or not alarm origination is activated. If **y**, all major and minor alarms (not warning alarms) result in an automatic call to an OSS. If **n**, no alarms are reported to the OSS.

■ *Cleared Alarm Notification*

Clears all alarms at INADS after all Major and Minor alarms have been resolved on the MCU.

■ *Restart Notification*

Originates a call to INADS when a software-requested restart occurs. Normally this is due to a software problem.

■ *Test Remote Access Port*

Specifies whether or not to test the remote access port on the processor board. If a trunk for remote access and alarm origination is not provided, running tests on the remote access port (using the **test processor** or **test maintenance** commands) results in tests failing. This causes maintenance to be unnecessarily alarmed and additionally, can possibly cause destructive tests to run.

- *CPE Alarm Activation Level*

  Indicates the level when the Customer Premises Equipment (CPE) alarm is activated. If the level is **major**, the CPE alarm is activated only on major alarms. If the level is **minor**, the CPE alarm is activated for major and minor alarms. If the level is **warning**, the CPE alarm is activated for all alarms. If the level is **none**, the CPE does not activate for any alarm.

- *Start Time*

  Specifies the hour and minute the daily scheduled maintenance procedures start. The scheduled maintenance procedures are as follows: daily maintenance and save translations.

- *Daily Maintenance*

  A display-only field shows that maintenance tests are automatically run every day.

- *Save Translation*

  Specifies how frequently the MCU translation data is automatically saved to tape. The choices are as follows: **daily**, **no**, **Sunday**, **Monday**, **Tuesday**, **Wednesday**, **Thursday**, **Friday**, and **Saturday**.

## Maintenance-Related System Parameters Form, Page 2 of 2

- *Minimum Thresholds for TTRs*

  This field provides the number of touch-tone receivers in the MCU. When fewer than this number are in service, a Warning alarm is raised. Enter a number from **1** to **20**.

- *Minimum Threshold for CPTRs*

  This field shows the number of CPTRs that must be in service for the MCU. When fewer than this number are in service, a warning alarm is raised.

- *Minimum Threshold for Call Classifier*

  This field establishes the number of call classifier ports that must be in service for the MCU. When fewer than this number are in service, a warning alarm is raised.

- *ISDN-PRI Test Call Extension*

  This field defines the extension number for an ISDN-PRI test call. The extension number must match the MCU dialplan. A far end ISDN node tests the ISDN-PRI between the far end and the MCU.

# Administering the MCU

# 6

## Overview

The administration procedures outlined in this section are performed after the on-site technician has completed the hardware installation and on-site tests. Each procedure is presented in the order it is to be performed.

## Changing Administration Permissions

The Permission Administration form is used to change the Command Permission Categories that an authorized user (reservations agent, system administrator, and on-site technician) can access. Each is identified by a login name. Prior to installation, these passwords are voided; the VTC must reinstate them with new customer-selected passwords.

Only the VTC is authorized to change the *Administer Permissions* field. System administrators and reservation agents cannot change the default permissions for themselves or others unless the VTC changes the *Administer Permissions* field to **y** for the customer.

**Table 6-1. Default Permissions for Each Login**

| Login | Default Permissions |
|-------|---------------------|
| craft | All permission categories except Administer Permissions |
| cust | Display administration and maintenance data, administer conferences, features, Meet-Me numbers, maintenance alarm terminals, and trunks |
| rcust | Display administration and maintenance data, administer conferences, Meet-Me numbers, maintenance alarm terminals, and trunks |
| agent | Display administration and maintenance data, administer conferences and Meet-Me numbers |
| browse | Display administration and maintenance data |

Use the following procedure to change permissions:

1. At the *command:* prompt, type **change permission *login*** then press RETURN.

2. Verify the screen displays the Permission Administration screen.

3. From the *Display Admin. and Maint. Data?* field, use TAB and RETURN to advance to the fields you want to change. Type **y** or **n** as appropriate, followed by ENTER.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display permission *login*** then press RETURN.

## Permission Administration Form

The following list identifies the fields on the Command Permission Categories form. Enter **y** for each field you want the login to access; enter **n** for each field you do not want the login to access.

■ *Login name*

Displays the login whose permissions are being changed.

■ *Display Admin. and Maint. Data*

Shows administration screens and maintenance data.

■ *System Measurements*

Displays system measurement data.

- *Administer Stations*

  Specifies whether or not this login is permitted to change maintenance phone assignments and extensions for the MCU.

- *Administer Permissions*

  Specifies whether or not this login is permitted to change the command permissions for logins of the MCU.

- *Administer Trunks*

  Specifies whether or not this login is permitted to change trunk groups and assignments for the MCU.

- *Administer Meet-Me Numbers*

  Specifies whether or not this login is permitted to change Meet-Me number assignments.

- *Administer Features*

  Specifies whether or not this login is permitted to add or remove features from the MCU.

- *Administer Conference Records*

  Specifies whether or not this login is permitted to administer conference records, including scheduling conferences and updating conference reservations.

- *Maintain Stations*

  Specifies whether or not this login can perform maintenance commands on the MCU maintenance phones.

- *Maintain Switch Circuit Packs*

  Specifies whether or not this login can perform maintenance tests on the MCU circuit packs.

- *Maintain Trunks*

  Specifies whether or not this login can perform maintenance tests on the MCU trunks.

- *Maintain Process Circuit Packs*

  Specifies whether or not this login can perform maintenance tests on MCU processor circuit packs.

- *Maintain System*

  Specifies whether or not this login can perform system maintenance tests on the MCU.

## Selecting Customer-Options

The Optional Features form specifies port capacity, optional features, and model name of the MCU.

Use the following procedure to change customer options:

1. At the *command:* prompt, type **change system-parameters customer-options** then press RETURN.

2. Verify the screen displays the Optional Features form.

3. From the *Model Name* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display system-parameters customer-options** then press RETURN.

### System Parameter Customer-Options Form

The following list identifies the fields on the Optional Features form and their possible values.

Under MCU Features, here are the fields and their related values:

■ *Model Name*

Depending on the customer's order (shown by the model PEC associated with an order), enter **DX**, **FX** or **EX**. For service providers, enter **GS**, **MS** or **VS** as appropriate. Each selection brings up additional fields specific to the available features as described in the following table:

⟹ **NOTE:**
The three service provider models, **GS**, **MS**, and **VS**, have the same features as the **EX** model.

**Table 6-2. MCU Models and Features**

| Model Name | Feature | Feature Type |
|---|---|---|
| DX | 4 to 16 port capacity | 4 port standard<br>increments of 4 up to 16 optional |
| | Power | AC standard; DC optional |
| | T1 | standard |
| | PRI | standard |
| | G.711 audio | standard |
| | G.728 audio | standard |
| | Automatic Control | standard |
| | Audio add on | optional |
| | Cascading | optional |
| FX | 4 to 24 port capacity | 4 port standard<br>increments of 4 up to 24 optional |
| | Power | AC standard; DC optional |
| | T1 | standard |
| | PRI | standard |
| | G.711 audio | standard |
| | G.728 audio | standard |
| | Automatic Control | standard |
| | User Control | standard |
| | Advanced Control | optional |
| | Notification Tones | optional |
| | Audio add on | optional |
| | Dial out | standard |
| | Cascading | optional |
| | Dynamic resizing | optional |
| EX | 4 to 24 port capacity | 4 port standard<br>increments of 4 up to 24 optional |
| | Power | AC standard; DC optional |

**Table 6-2. MCU Models and Features — *Continued***

| Model Name | Feature | Feature Type |
|---|---|---|
| | T1 | standard |
| | PRI | standard |
| | LD-CELP | standard |
| | Automatic Control | standard |
| | User Control | N/A in R1.0 |
| | Advanced Control | standard |
| | Notification Tones | standard |
| | Dial out | standard |
| | Cascading | standard |
| | Dynamic resizing | standard |

■ *Max. 2B Port Capacity*

Enter the total number of ports (**0**, **4**, **8**, **16**, **20**, **24**, **32**, **36**, **40**, **44**, or **48**) in the configuration. The default setting is **4** ports.

**⇒ NOTE:**
   **DX** models can have a maximum of 16 ports.

■ *Max. 384k Port Capacity*

Enter the number of ports (**0**, **4**, **8**, **12**, **16**, **20**, **24, 28, or 32**) available for 384K conferencing. These ports may be used for 2B conferences when they are not reserved for 384K conferences. The number of H0 ports is always less than or equal to the number of 2B ports installed. The default setting is **0**.

**⇒ NOTE:**
   The combined total of 2B and H0 ports cannot exceed 48.

■ *Max. 768k Port Capacity*

Enter the number of ports (**0**, **4**, **8**, **12**, **16**, **20**, **24,** or **28)** available for 768k conferencing**.**

■ *Max. 1472k Port Capacity*

Enter the number of ports (**0**, **4**, **8**, **12**, or **16)** available for 1472k conferencing**.**

■ *Max. 1536k Port Capacity*

Enter the number of ports (**0**, **4**, **8**, **12**, or **16)** available for 1536k conferencing**.**

■ *Max. Bonding Port Capacity*

Enter the number of bonding ports (**0**, **4**, **8**, or **12)** available for bonding conferencing**.**

■ *ISDN-PRI*

Display-only field shows **y** to indicate that ISDN is supported.

⇒ **NOTE:**

For DX and FX models, this is a changeable field depending on whether the customer wants ISDN-PRI trunks supported. The default setting is **n**.

■ *Audio Add-on Ports*

Enter the maximum number (**0**, **2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22,** or **24**) of audio-only participants that can join a conference. The default setting is **0**.

■ *Advanced Control*

Display-only field shows a **y** to indicate that both broadcast mode with auto scan and presentation mode are supported. Broadcast mode allows one endpoint (known as the broadcaster) to be viewed for the entire conference by all participants. The broadcaster views a continuous rotation of participating endpoints. No return audio is heard. Presentation mode is similar to broadcast mode except the audio portion is a summation of all participating endpoints, not just the broadcaster.

■ *Automatic Control*

Display-only field shows a **y** to indicate that the MCU supports voice activated switching where the speaker is viewed by all parties except the party speaking who views the previous speaker.

■ *User Control*

Display-only field shows a **y** to indicate that the MCU supports chair control where the conferee designated as the chair controls who is viewed by all parties.

■ *Cascading*

Display-only field shows **y** to indicate that the MCU can be connected to another AT&T MCU in order to combine resources of up to 46 ports.

**NOTE:**
> For DX and FX models, this field is changeable to specify when the customer purchased the optional cascading feature. The default setting is **n**.

- *Dial-out*

  Display-only field shows a **y** to indicate that the MCU can dial out to add video endpoints to a conference. The default setting is **n**.

- *Dynamic Resizing*

  Display-only field shows a **y** to indicate that the list of conferees scheduled to join a conference can be changed even during an active conference.

- *Notification Tones*

  Display-only field shows a **y** to indicate that the MCU supports the entry and exit tones when a conferee enters or disconnects from a multipoint conference and also indicates if the MCU supports the warning tone that notifies conference participants when 10 minutes remain in an active conference.

- *External Reservation System*

  Enter **y** if the customer ordered the optional AT&T Conference Reservation System (CRS). This activates the OSSI interface. The default setting is **n**.

- *Fax*

  Indicates that the adjunct reservation system can use Fax. This field appears only when *External Reservation Sys* is **y**.

- *Option A*

  Indicates that the adjunct reservation system has a growth option. This field appears only when *External Reservation Sys* is **y**.

- *Option B*

  Indicates that the adjunct reservation system has a growth option. This field appears only when *External Reservation Sys* is **y**.

- *Option C*

  Indicates that the adjunct reservation system has a growth option. This field appears only when *External Reservation Sys* is **y**.

# Dial-Out Administration

The dial-out feature allows the AT&T MCU to automatically originate calls to video conferees (not audio-only) to join a conference. The conferees' video terminals are not directly connected to the MCU; they gain access via data trunks. Administered connections are used to establish and terminate the call from the MCU to the endpoints. The dial-out feature therefore requires coordination among the video endpoints, trunks, and MCU.

Dial-out administration involves outgoing trunk groups, AAR/ARS routing patterns, and administered connections.

Use the following procedure to change the COR:

1. At the *command:* prompt, type **display administered-connection** then press RETURN.
2. Verify the screen displays the Administered Connection screen.
3. From the *FRL* field, use TAB and RETURN to advance to the fields you want to change.
4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*
5. To verify the form, type **display cor #** then press RETURN.

## Establishing Administered Connections

For dialing out, use the Administered Connection form to establish a connection that is automatically reestablished whenever the MCU is restarted.

The following commands can be used to administer connections:

**Table 6-3.    Administered-Connection Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| add | administered-connection | 1-128 or next |
| change | administered-connection | 1-128 or next |
| display | administered-connection | 1-128, next, print or schedule |

**Table 6-3.   Administered-Connection Administration Commands  — *Continued***

| Action | Object | Qualifier |
|--------|--------|-----------|
| duplicate | administered-connection | 1-128 or next |
| list | administered-connection | 1-128 or next |
| remove | administered-connection | 1-128, count, print or schedule |

Use the following procedure to establish administered connections:

1. At the *command:* prompt, type **add administered-connection x**, then press RETURN.

2. Verify the screen displays the Administered-Connection form.

3. From the *Enable* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display administered-connection x**, then press RETURN.

## Administered-Connection Form

The following list identifies the fields on the Administered-Connection form and their related values:

■   *Connection Number*

    This display-only field shows the Administered-Connection number.

■   *Enable*

    Enter **y** to indicate that an attempt will be made to establish the administered connection whenever the MCU is restarted or the connection is due to be active. The default is **y**.

■   *Originator*

    Displays the extension of the Meet-Me user who is currently using this administered connection.

■ *Destination*

Enter the address of the destination access or data endpoint (**0** through **9)**. This endpoint does not have to be local to the MCU. If a local endpoint is entered, it must be assigned to either an access or data endpoint. Up to 36 characters can be entered. The default is blank.

⇒ **NOTE:**
A FAC is restricted to AAR, ARS, and CDR account code dialing.

■ *Name*

Enter an optional name (up to 15 characters) for the connection, such as **MCU-ST.**

■ *Continuous*

Enter **y** if the administered connection is enabled whenever the MCU is restarted. Enter **n** if you want to schedule the connection to be active only during certain times. If you enter **n**, the following three fields are displayed.

■ *Start Days (Sun through Sat)*

Displays only when **n** is entered in the *Continuous* field. Enter a **y** for each day you want to establish the administered connection; otherwise enter n. If you enter **y**, the administered connection begins on the day specified and continues for the duration set in the *Duration* field.

■ *Start TIme*

Displays only when **n** is entered in the *Continuous* field. Enter the time of day when an attempt to make the connection should occur. Valid entries are **00:00** to **23:59**. The default is **00:00**.

■ *Duration*

Displays only when **n** is entered in the *Continuous* field. Enter the period of time that the scheduled administered connection should remain active. The maximum duration is one minute less than a week. Valid entries are **000** through **167** for hours, **00** through **59** for minutes. The default is **000:00**.

■ *Alarm Type*

Enter the type of alarm to be generated if the administered connection cannot be established or fails and cannot be reestablished and the number of failures equals the alarm threshold. The valid entries are **major**, **minor**, **warning**, or **none**. The default is **warning**.

■ *Alarm Threshold*

Enter the number of times an attempt to establish or reestablish a connection should be tried before an alarm is raised. Valid entries are **1** through **10.** The default is **5**.

- Retry Interval

  Enter the number of minutes between attempts to establish or reestablish the connection. Valid entries are **1** through **60**. The default is **2**.

- *Auto Restoration*

  Enter **y** to indicate that an attempt is to be made to reestablish the connection that has failed; otherwise, enter **n**. Auto restoration is only available for an administered connection that is established over ISDN-PRI and SDDN trunk groups. The default is **n.**

- *Priority*

  Enter a number in a range from **1** to **8** to determine the order in which the administered connections are to be established (the highest priority is **1**).

# Setting the Class of Restriction

The Class of Restriction (COR) feature is used to define the calling capabilities of MCU trunk groups, hunt group, data module, data extensions, and maintenance alarm terminal. You can assign one COR to all the above groups or assign as many as necessary (up to 64) to effect the desired restriction.

For example, you may assign the maintenance alarm terminals a COR with no outside calling privileges. Likewise, you should restrict MCU trunk groups to incoming calls only.

The following commands can be used to access the Class of Restriction (COR) form.

**Table 6-4.   Class of Restriction Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| change | cor | 0 to 63 |
| display | cor | 0 to 63, print or schedule |

Use the following procedure to change the COR:

1. At the *command:* prompt, type **change cor #** then press RETURN.

2. Verify the screen displays the Class of Restriction screen.

3. From the *FRL* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display cor #** then press RETURN.

### Class of Restriction Form

The following list provides the fields on the Class of Restriction form and their related values.

### Class of Restriction Form Page 1 of 1

■ *COR Number*

Display-only field shows the COR number entered.

■ *FRL*

Since the MCU does not allow outgoing calls, this field does not apply.

■ *APLT*

This field is not currently used.

■ *Calling Party Restriction*

This field specifies the restrictions, if any, of the calling party to originate calls. This field is set to **none**.

■ *Partitioned Group Number*

This field is not used. Leave it at the default of **1**.

■ *Called Party Restriction*

This field specifies the restrictions on the called party. Leave it at the default of **none**.

■ *Service Observing*

This field is not currently used. Leave it at the default setting of **n**.

■ *Forced Entry of Account Codes*

Since the MCU only accepts incoming calls, this field is not currently used. Leave it at the default setting of **n**.

■ *Priority Queuing*

This field is not currently used. Leave it at the default setting of **n**.

■ *Direct Agent Calling*

This field is not currently used. Leave it at the default setting of **n**.

■ *Restricted Call List*

This field is not currently used. Leave it at the default setting of **n**.

■ *Facility Access Trunk Test*

This field specifies whether or not facility access trunk tests are permitted. If set to **n**, intercept treatment is given when this test is attempted. An associated feature button, **trk-ac-alm**, on the maintenance voice terminal lights when a successful facility access test occurs. Pressing one of the alarm buttons when its associated status lamp is on turns off all LEDs on all buttons whether or not the access is still in progress or has completed. The default is **n**.

> **NOTE:**
> You change to **y** when you are ready to perform a facility access trunk test. Change it back to **n** when the test is complete.

■  *Calling Permissions*

Since the MCU only accepts incoming calls, leave these fields set to **n**.

## Setting the Class of Service

The Class of Service (COS) feature is used to administer access permissions for call processing features that require dial code and/or feature button access permission. COS does not apply to trunk groups. All COSs (**0** through **15**) have the same settings-all fields defaulted to **n** except *Data Privacy* which is set to **y**. Therefore, you can select **0** through **15** for any of the features that require a COS.

> **NOTE:**
> Do not change the defaults.

The following commands can be used to access the Class of Service (COS) form.

**Table 6-5.  Class of Service Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| change | cos | |
| display | cos | print or schedule |

Use the following procedure to change the COS:

1. At the *command:* prompt, type **change cos** then press RETURN.

2. Verify the screen displays the Class of Service screen.

3. From the *Auto Callback* row, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display cos** then press RETURN.

**Class of Service Form**

The following list provides the fields on the Class of Service form and their related values.

**Class of Service Form Page 1 of 1**

- *Auto Callback*

    This feature is not presently available. Leave all entries set to **n**.

- *Call Fwd-All Calls*

    This feature is not currently available. Leave all entries set to **n**.

- *Data Privacy*

    The MCU should be set for data privacy. All entries should be set to **y**.

- *Priority Calling*

    This feature is not currently available. Leave all entries set to **n**.

- *Console Perms*

    This feature is not used. Leave all entries set to **n**.

- *Off-hook Alert*

    This feature is not currently available. Leave all entries at the default of **n**.

- *Client Room*

    This field is not currently used. Leave all entries set to **n**.

# Changing the Numbering Scheme

Perform the following three procedures to change the MCU dial plan and to specify when the MCU is connected behind a PBX.

**Administering the Dial Plan**

Through administration of the dial plan, the MCU identifies calls from the network and routes them to available video ports. This is done through the Dial Plan Record form.

The MCU is preset with a 5-digit dial plan. Each video port is identified by a unique 5-digit extension.

The following commands can be used to access the Dial Plan Record form.

**Table 6-6.   Dial Plan Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| change | dialplan | |
| display | dialplan | print or schedule |

Use the following procedure to change the dial plan:

1. At the *command:* prompt, type **change dialplan** then press RETURN.

2. Verify the screen displays the Dial Plan Record screen.

3. From the *Area Code* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display dialplan** then press RETURN.

### Dial Plan Form

The following list shows the fields on the Dial Plan Record and related values.

### Dial Plan Form, Page 1 of 6

■   *Area Code*

   Enter the area code number where the MCU is located.

■   *Local PBX*

   Reserved for future use.

■   *ARS Prefix 1 Required*

   Enter **y** if a prefix of "1" is required.

■   *Uniform Dialing Plan*

   If UDP is administered, enter **y.** UDP provides a common 4- or 5-digit dial plan that can be shared between the MCU and a PBX.

■   *Plan Length*

   When UDP is administered, enter the number of digits in the dial plan (**4** or **5**).

■ *First Digit Table*

This table consists of fields for each possible first digit and dialed number length. If the first digit of an extension number is **3** and the length of the extension number is **5** digits, enter **extension** in the third row, fifth column. Likewise, if trunk access codes (TAC) begin with a **1** and are **3** digits long, enter **tac** in the first row, third column.

### Dial Plan Form, Page 2 through 6 of 6

■ *Code*

Enter the number representing the first one, two, three, or four digits of a 4- or 5-digit extension.

■ *LCL*

Enter **n** if the code above is located on a remote PBX.

■ *RNX*

When UDP is selected, the code yields the associated RNX which is used to select a Routing Pattern for the call.

■ *ID*

Leave this field blank.

## Administering AAR

The Automatic Alternate Routing (AAR) Analysis form must be changed when the MCU is being connected behind a PBX. Use the form to specify the home AAR code.

**Table 6**-7. **AAR Analysis Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| change | aar analysis | 0-9, x or X (dialed string) |
| display | aar analysis | 0-9, x or X (dialed string) |
| list | aar analysis | start dialed string, count, rp, part, print or schedule |

Use the following procedure to change AAR when the MCU is connected behind a PBX:

1. At the *command:* prompt, type **change aar analysis #** then press RETURN.

2. Verify the screen displays the AAR Analysis screen.

3. From the *Partitioned Group Number* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display aar analysis #** then press RETURN.

## AAR Analysis Form

The following list provides the fields on the AAR Analysis form and their related values.

- *Percent Full*

  Displays the percentage of the system's memory resources that have been utilized.

- *Partitioned Group Number*

  The PGN associated with this table for use with corresponding paper forms. Valid entries are **1** to **8**. The default is **1**.

- *Dialed String*

  Enter the dialed string of significant digits. Up to 18 characters (**0** through **9**) are allowed. A wild card character (**x** or **X**) may be used as a substitute for any digit occurring in the string at the character position where used. The default is blank.

- *Min*

  Enter the minimum number of digits needed to validate and route the call. Valid entries are **0** through **7**. The default is blank.

- *Max*

  Enter the maximum number of digits that can be used to validate and route the call. Valid entries are **0** through **17**. The default is blank.

- *Route Pat*

  Enter the routing pattern number (**1** through **254**) on a pointer to an associated RHNPA form (**r1** through **r32**) to be used to route the call once all identifying digits have been received. The default is blank.

■ *Call Type*

Enter **haar** for home aar address to indicate the call will be terminated locally instead of routing to another node. If the location code is deleted from the dialed number, the remaining digits are used to route the call to a local extension.

## Administering Feature Access Codes

Feature Access Codes (FAC) activate or deactivate certain system features. The following commands are used to administer the Feature Access Code form.

> ### ⇒ NOTE:
> It is unlikely that you will need to change this form.

**Table 6-8.    System Parameters Features Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| change | feature-access-codes | |
| display | feature-access-codes | print or schedule |

Use the following procedure to change the FAC to activate or deactivate certain system features:

1. At the *command:* prompt, type **change feature-access-codes** then press RETURN.

2. Verify the screen displays the *Feature Access Code* screen.

3. From the *Auto Alternate Routing (AAR) Access Code* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display feature-access-codes** then press RETURN.

### Feature Access Code Form

The following list provides the fields on the Feature Access Code form and their related values.

■ *Auto Alternate Routing (AAR) Access Code*

Enter the digits required to access this feature.

■ *Auto Route Selection (ARS)-Access Code 1/2*

Enter the digits required to access this feature.

■ *Data Privacy Access Code*

Enter the digits required to access this feature.

■ *Facility Test Calls Access Code*

Enter the digits required to access this feature.

### Feature Access Code Form, Page 2 of 2

■ *Group Control Restrict Activation/Deactivation*

Enter the digits required to activate or deactivate this feature.

■ *Hunt Group Busy Activation/Deactivation*

Enter the digits required to activate or deactivate this feature.

■ *Print Messages Access Code*

Enter the digits required to access this feature.

■ *SMDR Account Code Access Code*

Enter the digits required to access this feature.

■ *User Control Restrict Activation/Deactivation*

Enter the digits required to activate or deactivate this feature.

# Supporting the MCU-ST, System Printer or CRS

For the remotely-connected MCU Scheduling Terminal (MCU-ST), system printer or the PC-based AT&T Conference Reservation System (CRS), use the Data Module form to identify the extension number and related information about the remote adjunct.

The following commands relate to the data modules:

**Table 6-9.    Processor Interface Data Module Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| add | data-module | xxxx (extension or next) |
| change | data-module | xxxx (extension) |
| display | data-module | xxxx (extension) print or schedule |
| list | data-module | starting extension number or count or print or schedule |

**\*\*\*REVIEWERS: Should we include "xxxxx" instead of "xxxx" to accommodate a five-digit dial plan?**

Use the following procedure to add the data module to connect an MCU-ST, system printer or CRS:

1. At the *command:* prompt, type **add data-module xxxx** then press RETURN.

2. Verify the screen displays the Data Module screen.

3. From the *Type* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display data-module xxxx** then press RETURN.

## Data Module Form

The following list identifies the fields on the Data Module form and the possible values.

- *Data Extension*

  This display-only field provides the extension assigned to the data module.

- *BCC*

  This display-only field shows a **2** for the device speed.

- *Type*

  Enter **pdm**.

- *Port*

  Enter the number of the processor interface port where either the MCU-ST or CRS is connected.

- *Name*

  Optional field that identifies the name of the adjunct.

- *COS*

  Enter the desired Class of Service. The default is **1**.

- *COR*

  Enter the desired Class of Restriction. The default is **1**.

- *ITC*

  Specify whether this is restricted (112 k) or unrestricted (128 k).

- *Connect to*

  Specify what device is being connected to the data module. Valid entries are **DTE** and **DCE**.

- *Remote Loop-Around Test*

  Change this field to **y** whenever you want to perform this test.

- *Ext*

  The extension number of the station with a data extension button for this data module.

- *Name*

  The name of the individual or group assigned the data extension.

# Administering System Features

The Feature-Related System Parameters form sets the parameters for various MCU features.

**Table 6-10.** **System Parameters Features Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| change | system-parameters features | |
| display | system-parameters features | print or schedule |

Use the following procedure to change the Feature-Related System Parameters form:

1. At the *command:* prompt, type **change system-parameters features** then press RETURN.

2. Verify the screen displays the Feature-Related System Parameters screen.

3. From the *AAR/ARS Dial Tone Required* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display system-parameters features** then press RETURN.

## Features-Related System Parameters Form

The following list shows the fields on the lower half of the Features-Related System Parameters form and their related values.

The Other Features section of the Features-Related System Parameters form has the following fields:

■ *Dial-out retry limit*

Specify the number of times (**0** through **9**) the MCU should attempt to redial a video endpoint.

■ *AAR/ARS Dial Tone Required*

  Enter **y** when a second dial tone is required on an incoming tie trunk call that is routed by AAR/ARS.

■ *Automatic Circuit Assurance (ACA) Enabled*

  Enter **y** if ACA measurements are being taken.

■ *ACA Referral Calls*

  Specify where the ACA referral calls are generated-**local**, **remote** or **primary**.

■ *ACA Referral Destination*

  Enter the extension that is to receive the local ACA referral call.

■ *ACA Short Holding Time Originating Extension*

  Enter an unassigned extension number in this field and the long holding time field. Do not enter the same extension number in both this field and in the field described in the next bullet item.

■ *ACA Long Holding Time Originating Extension*

  Enter an unassigned extension number in this field and the short holding time field. Do not enter the same extension number in both this field and in the field described in the preceding bullet item.

## Feature-Related System Parameters Form, Page 2 of 3

■ *Primary Output Layout*

  Only a primary SMDR output device is allowed. Possible values are **printer** and **expanded** layouts.

■ *Primary Output Destination*

  Enter the extension number assigned to the SMDR device. This is the extension of the MDPM or EIA (the DCE connector).

■ *Use ISDN Layouts*

  Displayed only when ISDN-PRI is selected on the System Parameters Customer Options form. Enter **y** if the SMDR port outputs data in ISDN format.

■ *EIA Device Bit Rate*

  Enter the operating speed of the EIA interface (**300, 1200, 2400, 4800**, or **9600**).

- *Disconnect Information in Place of Facility Restriction Level*

    Enter **y** to allow call disconnect data to be recorded in the place of an FRL data on the SMDR report. The call disconnect data is printed on the SMDR report instead of the FRL data. An **n** response enables FRL field data to be recorded on the SMDR report.

- *Suppress SMDR for Ineffective Call Attempts*

    Enter **y** to suppress recording unsuccessful call attempts.

- *Privacy-Digits to Hide*

    This field is set to **n**. It is not used.

## Feature-Related System Parameters Form, Page 3 of 3

- *Printer Extension*

    Enter the data module extension number associated with the system printer or enter **eia** when the DCE jack is used to interface with the printer.

- *EIA Device Bit Rate*

    Enter the required printer speed setting (**1200**, **2400**, **4800**, or **9600**).

- *Lines Per Page*

    Specify the number of lines per page required for the report (**24** through **132**). The default setting is **60**.

# Administering Network Facilities

The following three forms relate to network facilities.

## ISDN-PRI Network Facilities

The Network Facilities form allows new ISDN services to be defined. The following command can be used with this form:

**Table 6-11.    ISDN-PRI Network Facilities Commands**

| Action | Object | Qualifier |
|---|---|---|
| change | isdn network-facilities | |
| display | isdn network-facilities | |

Use the following procedure to change the Network-Facilities form when ISDN services are being used:

**⚠ CAUTION:**
*Do not change this form unless instructed to do so by QPPCN or AT&T Bell Laboratories.*

1. At the *command:* prompt, type **change isdn network-facilities** then press RETURN.
2. Verify the screen displays the Network-Facilities form.
3. From the *Name* field, use TAB and RETURN to advance to the fields you want to change.
4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*
5. To verify the form, type **display isdn network-facilities** then press RETURN.

### Network Facilities Form

The following list shows the fields on the Network Facilities form and their related values.

■ *Name*

Specify the name of the indicated service/feature (up to 15 characters). Upper and lowercase characters are important; enter the name of the service or feature exactly as given.

■ *Type*

A **0** indicates the associated entry is a feature. A **1** indicates the associated entry is a service.

■ *Coding*

Specify the encoding value of the associated feature or service.

### Administering Digital Trunks

DS1 Trunk Service provides a set of digital trunks utilizing the DS1 circuit pack (TN767D) that support MCU communications. Digital interfaces are supported for the following types of trunks:

- **ISDN-PRI**

  When the DS1 interface provides ISDN-PRI trunk group service, a TN767D DS1 circuit pack must be used. ISDN-PRI trunks provide end-to-end digital connectivity within the network and can provide national and international digital connectivity to other ISDNs that support the PRI standard. The TN767D DS1 circuit pack utilizing "isdn-pri" signaling must be used when supporting ISDN-PRI trunks. This mode of signaling supports 23 trunks for data transmission and one trunk for signaling (112k/128k or 384 k facility).

- **DS1 tie trunks**

  The TN767D DS1 circuit pack supports DS1 tie trunks in RBS mode. The RBS mode supports 24 trunks for transmission on the circuit pack because the least significant bit (robbed) in every sixth frame of data transmission is replaced by a signaling bit (112k facility).

The DS1 circuit pack provides a DS1 format (digital data rate of 1.544 Mb), digital, multichannel interface between the MCU and T1 transmission facilities or it can be directly connected to local DS1 interface (behind a PBX).

The following commands relate to the DS1 circuit pack:

**Table 6-12.    DS1 Circuit Pack Administration Commands**

| Action | Object | Qualifier |
|---|---|---|
| add | ds1 | location |
| change | ds1 | location |
| display | ds1 | location |
| list | measurements ds1 | location |
| remove | ds1 | location |

## Administering DS1 Circuit Packs

The DS1 Circuit Pack form is used to administer parameters for the TN767D DS1 circuit pack. The circuit pack must be physically installed before it can be administered.

Use the following procedure to change the Feature-Related System Parameters form:

1. At the *command:* prompt, type **add ds1 xx** then press RETURN.
   **(\*\*\*REVIEWERS: What does "xx" represent?).**

2. Verify the screen displays the DS1 Circuit Pack form.

3. From the *Name* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display ds1 xx** then press RETURN.

### DS1 Circuit Pack Form

The following list identifies the fields on the DS1 Circuit Pack form and the possible values:

**DS1 Circuit Pack Form Page 1 of 1**

■ *Location*

This display-only field shows the location of the DS1 interface circuit pack. The first character identifies the network, the second character identifies the carrier, the third and fourth characters identify the slot number in the carrier, and the last two characters identify the circuit number.

■ *Name*

Enter the name of the DS1 link (up to 15 characters). This is usually the destination of the link.

■ *Line Compensation*

Enter a number from **1** through **5** as appropriate:

**1** = 000 - 133 feet

**2** = 133 - 266 feet

**3** = 266 - 399 feet

**4** = 399 - 533 feet

**5** = 533 - 655 feet

■ *Zero Code Suppression*

Enter either **b8zs** for bipolar eight zero suppression or **zcs** (0 code suppression). The selection must match the method used on the other end of the link. This entry indicates which line coding format is used to ensure the data meets T1-carrier requirements.

■ *Framing Mode*

Enter **d4** or **esf** to match the method used on the other end of the link. The network diagram should indicate which choice is correct for the particular DS1/T1 span.

■ *Signaling Mode*

Enter either **robbed-bit** or **isdn-pri** to match the method used on the other end of the link. If the default, **robbed-bit**, is selected, the *DMI-BOS* field is displayed. RBS is also known as in-band signaling.

■ *Connect*

Displayed only when **isdn-pri** is selected, this field specifies what is on the far end of the MCU in order to control Layer 3 protocol. Allowable entries are **network**, **pbx**, and **host**.

- *Interface*

   Displayed only when the *Connect* field value is **pbx**. Enter **network** or **user** in this field to establish what is needed for the Layer 2 protocol and to handle Layer 3 glare conditions. When the far-end is a DEFINITY G1 or G3, the interface field on one end must be **network** while the other end must be **user**.

- *Country Protocol*

   This field defines the version of ISDN-PRI provisioned on the DS1. The choices are AT&T custom PRI (**AT&T-pri**) or 5ESS standard PRI (**5ESS-pri**). When the DS1 is connected to a 4ESS, DEFINITY PBX version G3i or later release, or G1.1, this field should be set to **AT&T-pri**. When the DS1 is connected to a 5ESS, the ISDN-PRI version can be either custom or standard depending on how the DS1 is provisioned. Note that only 5ESS standard (**5ESS-pri**) is supported for H0 calls. The default setting is **AT&T-pri**.

- *Slip Detection*

   Enter **y** to maintain a slip count record for each DS1 interface. The slip count determines if the T1-span is experiencing errors and, if so, the severity of the errors (type alarm). Enter **n** when DMI-BOS is used or when testing is not required. **\*\*\*REVIEWERS: How is all of this checked?**

- *Remote Loop-Around Test*

   Enter **y** to allow testing when the DS1 is connected to appropriate equipment, such as a DMI interface. The response should be **n** unless testing is extremely important.

## Providing a Synchronization Plan

The Synchronization Plan form is used to assign primary and secondary external synchronization sources. It provides synchronization between the MCU and the digital facilities it uses. The MCU must be synchronized to the incoming data rate of 8000 frames per second. This timing information reference may be derived from DS1 facilities. Loss of the reference signal, excessive phase changes, and variation in timing frequency can cause loss of data or dropped Px64 connections.

The following commands relate to the synchronization plan:

**Table 6-13.  Synchronization Plan Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| change | synchronization | |
| display | synchronization | print or schedule |
| set | synchronization | |

Use the following procedure to change the Synchronization Plan form:

1. At the *command:* prompt, type **change synchronization** then press RETURN.

2. Verify the screen displays the Synchronization Plan form.

3. From the *Stratum* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display synchronization** then press RETURN.

### Synchronization Plan Form

The following list provides the fields on the Synchronization Plan form and the related values:

■ *Stratum*

Enter the stratum level being used (the default for Stratum 4 is **4**).

⟹ **NOTE:**
    Stratum 3 is not supported with the MCU.

■ *Primary*

Specify the four-character DS1 circuit pack location for the DS1 circuit pack that will function as the primary synchronization source.

■   *Secondary*

Specify the four-character DS1 circuit pack location for the DS1 circuit pack that will function as the secondary circuit pack if the primary circuit has a failure.

■   *Location*

Displays the location of each DS1 circuit pack administered on the DS1 Circuit Pack form.

■   *Name*

Displays the name of each DS1 circuit pack administered on the DS1 Circuit Pack form.

■   *Slip*

Displays the slip detection parameter for each circuit pack administered on the DS1 Circuit Pack form.

⟹ **NOTE:**

The DS1 Circuit Pack location, name and slip display continues onto page 2 if necessary.

## Administering ISDN-PRI D-channels

ISDN-PRI forms provide end-to-end digital connectivity instructions and support a wide range of services.

### Processor Interface Data Module

The processor interface data modules are integrated into the processor interface circuit pack to provide the ISDN-PRI interface. Connection to this interface is provided via a DS1 interface. One direct EIA connection is available. When used, the physical channel assignment is **01**.

The following commands relate to the data modules:

**Table 6-14.   Processor Interface Data Module Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| add | data-module | xxxx (extension or next) |
| change | data-module | xxxx (extension) |

**Table 6-14.** Processor Interface Data Module Administration Commands — *Continued*

| Action | Object | Qualifier |
|--------|--------|-----------|
| display | data-module | xxxx (extension) print or schedule |
| list | data-module | starting extension number or count or print or schedule |

Use the following procedure to add the data module for the processor interface:

1. At the *command:* prompt, type **add data-module xxxx** then press RETURN.

2. Verify the screen displays the Data Module form.

3. From the *Type* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display data-module xxxx** then press RETURN.

## Processor Interface Data Module Form

The following list identifies the fields on the Processor Interface Data Module form and the possible values.

■ *Data Extension*

This display-only field provides the extension assigned to the data module.

■ *Type*

Enter **procr-infc**.

■ *Physical Channel*

Enter the two-digit circuit number of the processor interface port (**01** through **04** for the ESCC, **01** through **08** for the MCC).

■ *Name*

Optional field that identifies the name of the port, such as a 5ESS link.

■ *COS*

Enter the desired Class of Service. The default is **1**.

■ *COR*

Enter the desired Class of Restriction. The default is **1**.

■ *Maintenance Extension*

Use the next consecutive extension number that appears in the *Data Extension* field.

■ *Ext*

No entry required. This extension number is assigned automatically.

■ *Name*

Make no entry. This name is automatically assigned.

## Processor Interface Links

The Processor Interface Links form identifies, describes and enables processor interface links for ISDN-PRI between the MCU and ISDN.

The following commands relate to the processor interface links:

**Table 6-15. Processor Interface Links Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| change | communication-interface | links |
| display | communication-interface | links print or schedule |

Use the following procedure to change the Processor Interface Links form:

1. At the *command:* prompt, type **change communication-interface links** then press RETURN.

2. Verify the screen displays the Processor Interface Links form.

3. Use TAB to skip the *Enable* field. You do *not* want to enable the links at this time.

4. Use t TAB and RETURN to advance to the fields you want to change.

5. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

6. To verify the form, type **display communication-interface links** then press RETURN.

## Interface Links Form

The following list provides the fields on the Interface Links form and their related values.

- *Link*

  This display-only field indicates the physical interface link number (**1** through **4** [or **8** with an MCC-MSM]) that connects to another node in the ISDN network.

- *Enable*

  Enter **y** to enable the link.

  ⟹ **NOTE:**

  All fields on this form may be initially entered except the *Enable* field which must be set to **n**. After administering the processor channels and signaling groups, you must return to this form and enter **y** in this field.

- *Est Conn*

  Enter **y** is this field for ISDN signaling.

- *PI Ext*

  This display-only field shows the data extension assigned on the Processor Interface Data Module form.

- *Prot*

  Enter **ISDN** for the protocol type to be established on the link.

- *Digits*

  Leave this field blank.

- *Brd*

  Enter the TN767D DS1 circuit pack address that has been administered as using ISDN signaling.

- *DTE/DCE*

  No entry is required. Use to specify when the connection is to a DTE or a DCE.

- *Identification*

  Enter a name for the link (up to 15 characters) [for example, 5ESS-link1].

### Processor Channel Assignments Form

The Processor Channel Assignments form assigns channels to the MCU's interface links.

The following commands relate to the processor channels:

**Table 6-16.    Processor Channels Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| change | communication-interface | processor channels |
| display | communication-interface | processor channels, print or schedule |

Use the following procedure to change the Processor Channels form:

1. At the *command:* prompt, type **change communication-interface processor channels** then press RETURN.

2. Verify the screen displays the Processor Channels form.

3. From the *Appl* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display communication-interface processor channels** then press RETURN.

### Processor Channels Form

The following list provides the fields on the Processor Channels form:

■  *Proc Chan*

This display-only field indicates the 64 channels that are available.

■  *Appl*

Enter **ISDN** the type of application that connects to this processor channel.

■  *Link*

Enter a number (**1** through **4** for ESCC; **1** through **8** for MCC) to identify the interface link/channel pair used to establish a connection.

- *Chal*

  This field, along with the *Link* field identifies the link and channel pair that is associated with the local processor channel. This field should remain blank.

- *Priority*

  Enter **h** for high or **l** for low to indicate the priority of this channel. Assignments should be made based on the operational speed of the links.

- *Remote Proc Chan*

  Leave this field blank.

- *Machine ID*

  Leave this field blank.

## Administering Signaling Groups

The Signaling Group form identifies groups of ISDN DS1 interface B-channel for which a given D-channel or D-channel pair will carry associated signaling information. The NFAS features allows a D-channel to convey signaling information for B-channels that are located on DS1 facilities other than the one containing the D-channel. With NFAS, signaling group does not necessarily correspond to a single DS1 interface.

The Signaling Group form is administered to show how B-channels and D-channels are related.

The following commands can be used with the Signaling Group form:

**Table 6-17.   Signaling Group Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| add | signaling-group | 1-8 or next |
| change | signaling-group | 1-8 |
| display | signaling-group | 1-8 print or schedule |
| list | signaling-group | 1-8 print or schedule |
| remove | signaling-group | 1-8 |

Use the following procedure to change the Processor Interface Links form:

1. At the *command:* prompt, type **add signaling-group x** then press RETURN.

2. Verify the screen displays the Signaling Group form.

3. From the *Associated Signaling* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display signaling-group x** then press RETURN.

## Signaling Group Form

The following list identifies the fields on the Signaling Group form and their related values.

■ *Group Number*

This is a display-only field that provides the signaling group number used as a qualifier in the above commands.

■ *Associated Signaling*

Enter **n** to indicate NFAS; enter **y** to select FAS (with FAS, the D-channel can only carry signaling information for B-channels on the same DS1 circuit pack).

■ *Max Number of NCA TSC*

Leave this field set to **0**.

■ *Primary D-Channel*

Enter the six characters for the port number associated with the DS1 interface circuit pack port. Port Number 24 is used to assign the primary D-channel in the signaling group. Both FAS and NFAS are always the 24th port on the DS1 interface circuit pack.

■ *Max Number of CA TSC*

Leave this field set to **0**.

■ *Secondary D-channel*

When NFAS is selected, this field is displayed. Enter the six characters for the port number associated with the DS1 interface circuit pack port used for secondary (backup) D-channel signaling.

■ *Trunk Group for NCA TSC*

This field is not used.

- *Trunk Brd*

  When using NFAS, enter a four-character DS1 interface circuit pack number that has trunk members belonging to this Signaling Group. The four characters are the port network number, carrier letter, and two-digit slot number (**01** through **18**). The default is blank.

- *Interface ID*

  When using NFAS, enter an interface ID (**0** through **31**) for the corresponding DS1 interface circuit pack. The interface ID is referenced by both ends to determine which B-channel is to be used to establish a call; therefore the interface ID numbers on both ends must be the same. The 4ESS switch must start with 0, *Trunk Brd* 1 which should be the primary D-channel. If a secondary D-channel is used, it should be *Trunk Brd* 2 ID 1.

  > ⇒ **NOTE:**
  > Pages 2 through 5 are not used.

### Processor Interface Links

The Processor Interface Links form identifies, describes and enables processor interface links between the MCU and ISDN.

The following commands relate to the processor interface links:

**Table 6-18.    Processor Interface Links Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| change | communication-interface | links |
| display | communication-interface | links print or schedule |

Use the following procedure to enable the links:

1. At the *command:* prompt, type **change communication-interface links** then press RETURN.

2. Verify the screen displays the Processor Interface Links form.

3. Enter **y** in the *Enable* field. You are ready to enable the links at this time.

4. Use TAB and RETURN to advance to the fields you want to change.

5. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

6. To verify the form, type **display communication-interface links** then press RETURN.

### Interface Links Form

The following list provides the fields on the Interface Links form and their related values.

■  *Link*

   This display-only field indicates the physical interface link number (**1** through **4**) that connects to another node in the ISDN network.

■  *Enable*

   Enter **y** to enable the link.

**➡ NOTE:**
> Set this field to **y** only after administering processor channels and signaling groups.

- *Est Conn*

  Enter **y** is this field for ISDN signaling.

- *PI Ext*

  This display-only field shows the data extension assigned on the Processor Interface Data Module form.

- *Prot*

  Enter **ISDN** for the protocol type to be established on the link.

- *Digits*

  Leave this field blank.

- *Brd*

  Enter the TN767D DS1 circuit pack address that has been administered using ISDN signaling.

- *DTE/DCE*

  Specify whether the connection is to a DTE or a DCE.

- *Identification*

  Enter a name for the link (up to 15 characters).

# Administering Trunk Groups

The following commands can be used with the trunk form:

**Table 6-19.    Trunk Group Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| add | trunk-group | 1-99 (next) |
| change | trunk-group | 1-99 or TAC X |
| display | trunk-group | 1-99 or TAC X print or schedule |
| list | trunk-group | print or schedule |
| remove | trunk-group | 1-99 or TAC X |

Use the following procedure to add the trunk groups:

1. At the *command:* prompt, type **add trunk-group x** then press RETURN.

2. Verify the screen displays the Trunk Group form.

3. From the *Group Type* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display trunk-group x** then press RETURN.

## ISDN-PRI Trunk Group Form

The following list identifies the fields on the Trunk Group form (when the *Group Type* is **ISDN-PRI**) and their possible values:

### Trunk Group Form Page 1 of 10

■ *Group Number*

This is a display-only field.

■ *Group Type*

Enter **isdn-pri** to identify the trunk group.

- *SMDR Reports*

  Enter **y** to track incoming calls made on all trunks in the trunk group.

- *Group Name*

  Enter a name up to 15 characters to describe this trunk group. The default is **OUTSIDE CALL.**

- *COR*

  Enter a number from **0** through **63** that reflects the desired Class of Restriction.

- *TAC*

  Enter the trunk access code that must be dialed to access the trunk group. A different TAC must be assigned to each trunk group. SMDR uses the TAC to identify the trunk group on SMDR reports. Allowable entries must match the dial plan.

- *Direction*

  This display-only field is set to **incoming** since the MCU allows only incoming calls.

- *Outgoing Display*

  Since the MCU does not allow outgoing calls, this field should be set to **n**.

- *Dial Access*

  Enter **y** to allow this trunk group to be accessed via a TAC; otherwise, enter **n**. Access via ARS is allowed regardless of this entry.

- *Service Type*

  Indicates the service for which this trunk group will be dedicated. The valid entries include **accunet**, **cbc, sddn**, **sdn**, **tie,** or **tandem** and any user-defined or selected service as administered on the Network Facilities form.

- *Test Call ITC*

  Controls the encoding of the ITC codepoint of the Bearer Capability IE in the SETUP message. Since the ISDN Testcall does not go through routing, it is never blocked due to an incompatible ITC. Values are **rest** for restricted, **unre** for unrestricted.

- *Far End Test Line No:*

  Specify the number that is sent to the far-end ISDN test line extension. When test trunk is entered, this number is sent to the far-end to establish a call that tests the integrity of the trunk member under test. The number does not pass through routing or undergo digit manipulation. The digits entered here must be what the far-end expects. For example, for an ISDN tandem trunk, the far-end test number must be a 7-digit ETN number. Up to 15 digits may be entered in this field.

- *Test Call BCC*

  Controls the encoding of the Bearer Capability IE (BCIE) in the SETUP message. Values are:

  **0** = voice

  **1** = DCP Mode 1

  **2** = Mode 2 async

  **3** = Mode 3 circuit

  **4** = DCP Mode 0 (default)

- *Display, TCM, Lookahead Codeset*

  (Not applicable to the MCU).

- *Max Message Size to Send*

  Defines the maximum size of ISDN-PRI messages the MCU can receive (260 byte messages).

- *Trunk Hunt*

  Enter the order in which the MCU should find available trunks. Values are **descend** and **ascend**. The value should be the opposite from that for the other end of the trunk group.

- *Connected To*

  Enter **main.**

- *Connected to Toll*

  Enter **y** if this trunk is associated with toll calls.

- *DTT to DCO Loss (Audio only)*

  Specify the loss plan to be used for this trunk group for interconnections from a DIU-CO to a DIU-DTT. Values can be **normal** or **low**. **Normal** corresponds to a (0, -6) dB gain pair and is the default. Choose **low** only if private network users complain about loss of calls. Low corresponds to (+3, -3) dB gain pair and is used for internetwork applications which do not typically encounter echo, stability, or overload problems due to reduced loss.

- *Synchronization*

  Specifies whether the trunk group uses synchronous or asynchronous communications. The default setting is **async**.

- *Duplex*

  Specifies if the trunk group will use half or full-duplex. The default setting is **full**.

## Trunk Group Form Page 2 of 10

■ *ACA Assignment*

Indicates whether or not Automatic Circuit Assurance (ACA) measure-ments are taken for this trunk group. If yes, the following three fields are displayed: *Long Holding Time*, *Short Holding Time,* and *Short Hold Thresh-old*.

■ *Wideband Support*

Indicates whether or not wideband is supported on this trunk group. If yes, page 3 of the Trunk Group form appears.

■ *Data Restriction*

Leave this field set to **n**. When set to **y** this prevents generation of tones on a data call that cause erroneous data transmission.

■ *NCA-TSC Signaling Group*

Enter the signaling group number (**1** through **8**) where an NCA TSC is routed out on. The signaling groups entered are chosen by a round-robin method. To balance the load of sending TSCs on every signaling group, a signaling group number can be entered twice to increase the probability of its use.

■ *Send CPN*

If **y** is entered, the CPN (Calling Party's Number) Prefix Table is accessed to construct the actual number to be sent over the network. The CPN Prefix Table can override the Send CPN field entry for any administrable block of extensions.

■ *Send Name*

If **y** is entered, the calling party's name (as administered) is sent to the net-work on incoming calls.

■ *Maintenance Tests*

If **y** is entered, hourly maintenance tests are performed automatically on this trunk group.

## Trunk Group Form, Page 3 of 10

■ *H0*

Enter **y** to support 384Kb bandwidth conferencing (also known as H0).

■ *NXDS0*

This field specifies a unique network arrangement and is reserved for the service provider market. If selected, the *Contiguous* field is displayed.

■ *Contiguous*

This field, along with the *NXDS0* field, are reserved for the service provider market.

### Trunk Group Form, Page 4 of 10

■ *Port*

Enter the trunk port number (up to six characters).

■ *Name*

Enter the name of the member of the trunk group (up to 10 characters). The name can be the seven-digit telephone number or a 10-digit trunk circuit identification number (provided by the trunk supplier).

■ *Sig Grp*

Enter the signaling group number (**1** through **8**). If a DS1 interface appears in one and only one signaling group, then the number of that signaling group appears as a default in this field for any trunk on that interface. If a DS1 circuit pack appears in more than one signaling group, then this field must be completed manually.

> ⇛ **NOTE:**
> The fields and values on pages 4 through 10 are continuations of page 3.

### Tie Trunk Group Form

The following list identifies the fields on the Trunk Group form (when *Group Type* is **TIE**) and their values:

### Trunk Group Form, Page 1 of 9

■ *Group Number*

This is a display-only field. When supporting DCS, the far-end node trunk group must be assigned the same Group Number.

■ *Group Type*

Enter **tie** to identify the trunk group.

■ *SMDR Reports*

Enter **y** to track incoming calls made on all trunks in the trunk group.

■ *Group Name*

Enter a name up to 15 characters to describe this trunk group. The default is **OUTSIDE CALL.**

- *COR*

  Enter a number from **0** through **63** that reflects the desired Class of Restriction.

- *TAC*

  Enter the trunk access code that must be dialed to access the trunk group. A different TAC must be assigned to each trunk group. SMDR uses the TAC to identify the trunk group on SMDR reports. Allowable entries must match the dial plan.

- *Direction*

  This display-only field is set to **incoming** since the MCU allows only incoming calls.

- *Outgoing Display*

  Since the MCU does not allow outgoing calls, this field should be set to **n**.

- *Dial Access*

  Enter **y** to allow this trunk group to be accessed via a TAC; otherwise, enter **n**. Access via ARS is allowed regardless of this entry.

- *Comm Type*

  This display-only field is set to **rbavd** for Robbed Bit Audio Voice and Data.

- *ITC*

  Controls the encoding of the ITC codepoint in the SETUP message. Values are **rest** for restricted, **unre** for unrestricted. Default setting is **rest**.

- *Trunk Type (in/out):*

  Specify the type of trunk. The default is **wink/wink**.

- *Incoming Rotary Timeout (sec)*

  Specify the number of seconds before an incoming rotary call is timed out. The default is **5**.

- *Outgoing Dial Type*

  This field should be set to **tone**.

- *Incoming Dial Type*

  This field should be set to **tone.**

- *Disconnect Timing*

  Specify in milliseconds the disconnect time. The default is **500** milliseconds.

- *Digits*

  Leave this field blank.

- *Digit Treatment*

  If inserting digits at the trunk group level, set this field to **insert**.

- *DTT to DCO Loss*

  Specify the loss plan to be used for this trunk group for interconnections from a DIU-CO to a DIU-DTT. Values can be **normal** or **low**. **Normal** corresponds to a (0, -6) dB gain pair and is the default. Choose **low** only if private network users complain about loss of calls. Low corresponds to (+3 or -3) dB gain pair and is used for internetwork applications which do not typically encounter echo, stability or overload problems due to reduced loss.

- *Connected to Toll*

  Leave this field set to **n**.

- *Incoming Dial Tone*

  Leave this field set to **y**.

- *Synchronization*

  Specifies whether the trunk group uses synchronous or asynchronous communications. The default setting is **async**.

- *Duplex*

  Specifies if the trunk group will use half or full-duplex. The default setting is **full**.

### Trunk Group Form, Page 2 of 9

- *ACA Assignment*

  Indicates whether or not Automatic Circuit Assurance (ACA) measurements are taken for this trunk group. The default is **y**. When ACA measurements are enabled, three related fields are shown where you need to specify the *Long Holding Time* (in hours), *Short Holding Time* (in seconds), and *Short Holding Time Threshold* (number of short holding time occurrences before alarming.

  ⇒ **NOTE:**
  > Since video conference calls generally last several hours, be sure to set the Long Holding Time high enough to accommodate the average length (up to 10 hours). Descriptions of long holding time, short holding time, and short holding time thresholds are found under *"Automatic Circuit Assurance Reports"* in the *"Checking MCU Performance"* section.

- *Data Restriction*

  Leave this field set to **n**. When set to **y** this prevents generation of tones on a data call that cause erroneous data transmission.

- *Suppress # Outpulsing*

  Leave this field set to **n**.

- *Maintenance Tests*

  If **y** is entered, hourly maintenance tests are performed automatically on this trunk group.

### Trunk Group Form, Page 3 of 9

- *Port*

  Enter the trunk port number (up to six characters).

- *Name*

  Enter the name of the member of the trunk group (up to 10 characters). The name can be the seven-digit telephone number or a 10-digit trunk circuit identification number (provided by the trunk supplier).

- *Sig Grp*

  Enter the signaling group number (**1** through **8**). If a DS1 interface appears in one and only one signaling group, then the number of that signaling group appears as a default in this field for any trunk on that interface. If a DS1 circuit pack appears in more than one signaling group, then this field must be completed manually.

> **NOTE:**
> The fields and values on pages 4 through 9 are continuations of page 3.

## Administering Meet-Me Numbers

The MCU is viewed as a node in the network. When it is installed behind a PBX, the PBX functions as the public network node. Each network service has its own dialing plan. When installing the MCU, be sure that the endpoints participating in video multipoint conferences subscribe to the same network as the MCU.

Two factors are used in assigning network numbers to endpoints: the type of service, such as SDDN and SDS, and the type of network access facility that connects the endpoint, in this case, the MCU.

The MCU is given many network numbers (addresses) that correspond to its location based on these factors. These numbers are known as Meet-Me numbers, the numbers conference participants dial to join a multipoint conference. Each endpoint that joins a conference must dial into the conference using a preassigned Meet-Me number. This number can be a typical 7- to 10-digit phone number, an

international number or an extension number that directs the call through a private PBX network.

Meet-Me numbers can be assigned to a particular endpoint (used by the endpoint whenever joining an MCU conference call) or can be shared among endpoint users (the Meet-Me number is assigned on a per conference basis).

The following commands relate to Meet-Me number administration:

**Table 6-20.  Meet -Me Number Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| add | meet-me | XXXXX (extension) or next |
| change | meet-me | XXXXX (extension) |
| display | meet-me | XXXXX or count (1-200), print or schedule |
| list | meet-me | XXXXX or count (1-200), print or schedule |
| remove | meet-me | XXXXX |

Use the following procedure to add MCU-extensions.

1. At the *command:* prompt, type **add mcu-ext xxxxx** then press RETURN.

2. Verify the screen displays the MCU-Extensions form.

3. From the *Extension* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display mcu-ext xxxxx** then press RETURN.

## MCU-Extension Form

The following list identifies the fields on the MCU-Extension form and their related values.

■  *Extension*

   Display-only field that shows the five-digit extension number associated with the new Meet-Me number.

- *Name*

  Optional field that provides up to 15 alphanumeric characters to identify the Meet-Me number. Typically, the associated network number is entered in this field or the location of the endpoint or name of the individual who is assigned to this MCU-extension.

- *Audio Only*

  Specify whether this MCU-extension is audio-only.

- *Bandwidth Per Channel*

  Specify the bandwidth assigned to this MCU-extension.

# Administering Data Communications

For configurations that include an MCU-ST or the PC-based CRS, follow the procedures below.

## Establishing Network Control Channels

Use the Data Module form to establish network control channels for an MCU-ST or CRS. The following commands relate to the data modules:

**Table 6-21.    Processor Interface Data Module Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| add | data-module | xxxx (extension or next) |
| change | data-module | xxxx (extension) |
| display | data-module | xxxx (extension) print or schedule |
| list | data-module | starting extension number or count or print or schedule |

Use the following procedure to establish network control channels for the MCU-ST or CRS:

1. At the *command:* prompt, type **change data-module xxxx** then press RETURN.

2. Verify the screen displays the Data Module form.

3. From the *Type* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display data-module xxxx** then press RETURN.

## Data Module Form

The following list identifies the fields on the Data Module form and the possible values.

■ *Data Extension*

This display-only field provides the extension assigned to the data module.

■ *BCC*

Display-only field shows a **2** for the device speed.

■ *Type*

Enter **netcon**.

■ *Physical Channel*

Enter the two-digit circuit number of the processor interface port where the CRS or remote MCU-ST is connected (**01** through **04**).

■ *Name*

Optional field that identifies the name of the circuit pack.

■ *COS*

Enter the desired Class of Service. The default is **1**.

■ *COR*

Enter the desired Class of Restriction. The default is **1**.

■ *Maintenance Extension*

Use the next consecutive extension number that appears in the *Data Extension* field.

■ *ITC*

Information Transfer Capability used for routing calls according to the endpoint's ITC. The default is **restricted**.

■ *Ext*

No entry required. This extension number is assigned automatically.

■ *Name*

Make no entry. This name is automatically assigned.

## Assigning Hunt Groups

Hunt groups are required for the MCU-ST and CRS.

**Table 6-22. Hunt Group Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| add | hunt-group | 1-99 or next |
| change | hunt-group | 1-99 |
| display | hunt-group | 1-99, print or schedule |
| list | hunt-group | print or schedule |
| remove | hunt-group | 1-99 |

Use the following procedure to add the hunt groups:

1. At the *command:* prompt, type **add hunt-group x** then press RETURN.

2. Verify the screen displays the Trunk Group form.

3. From the *Group Extension* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display hunt-group x** then press RETURN.

## Hunt Group Form

The following list identifies the fields on the Hunt Group form and their related values:

### Hunt Group Form, Page 1 of 6

- *Group Number*

  Displays the hunt group number (**1** through **99**).

- *Group Extension*

  Enter an unused extension number (1 to 5 digits) to be assigned to the hunt group.

- *Group Type*

  Leave at **ucd** to support MCU-ST or CRS.

■ *Group Name*

Enter a 15-character string to identify the group, such as *remote admin.*

■ *COR*

Enter a COR (**0** through **63)** for the desired restriction of this hunt group. The default is **1**.

■ *ISDN Caller Disp*

Leave this field blank.

### Hunt Group Form Page 2 through 6

Enter the appropriate data extensions for the four netcon channels.

### ⇒ NOTE:
Do not use the maintenance extension numbers.

### Establishing Administered Connections

For the MCU-ST and CRS, use the Administered Connection form to establish a connection that is automatically reestablished whenever the MCU is restarted.

The following commands can be used to administer connections:

**Table 6-23. Administered-Connection Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| add | administered-connection | 1-128 or next |
| change | administered-connection | 1-128 or next |
| display | administered-connection | 1-128, next, print or schedule |
| duplicate | administered-connection | 1-128 or next |
| list | administered-connection | 1-128 or next |
| remove | administered-connection | 1-128, count, print or schedule |

Use the following procedure to establish administered connections:

1. At the *command:* prompt, type **add administered-connection x** then press RETURN.

2. Verify the screen displays the Administered-Connection form.

3. From the *Enable* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display administered-connection x** then press RETURN.

## Administered-Connection Form

The following list identifies the fields on the Administered-Connection form and their related values:

- *Connection Number*

  This display-only field shows the Administered-Connection number.

- *Enable*

  Enter **y** to indicate that an attempt will be made to establish the administered connection whenever the MCU is restarted or the connection is due to be active. The default is **y**.

- *Originator*

  Enter the assigned extension of the originating access endpoint or data endpoint. The endpoint is a 7400B data module, the MCU-MT, the MCU-ST or CRS. This endpoint must be local to the MCU. The default is blank.

- *Destination*

  Enter the address of the destination access or data endpoint (**0** through **9)**. This endpoint does not have to be local to the MCU. If a local endpoint is entered, it must be assigned to either an access or data endpoint. Up to 36 characters can be entered. The default is blank.

  ⇒ **NOTE:**
  A FAC is restricted to AAR, ARS, and CDR account code dialing.

- *Name*

  Enter an optional name (up to 15 characters) for the connection, such as **MCU-ST.**

- *Continuous*

  Enter **y** if the administered connection is enabled whenever the MCU is restarted. Enter **n** if you want to schedule the connection to be active only during certain times. If you enter **n**, the following three fields are displayed.

- *Start Days (Sun through Sat)*

  Displays only when **n** is entered in the *Continuous* field. Enter a **y** in each day you want to establish the administered connection; otherwise enter n. If you enter **y**, the administered connection begins on the day specified and continues for the duration set in the *Duration* field.

- *Start TIme*

  Displays only when **n** is entered in the *Continuous* field. Enter the time of day when an attempt to make the connection should occur. Valid entries are **00:00** to **23:59**. The default is **00:00**.

- *Duration*

  Displays only when **n** is entered in the *Continuous* field. Enter the period of time that the scheduled administered connection should remain active. The maximum duration is one minute less than a week. Valid entries are **000** through **167** for hours, **00** through **59** for minutes. The default is **000:00**.

- *Alarm Type*

  Enter the type of alarm to be generated if the administered connection cannot be established or fails and cannot be reestablished and the number of failures equals the alarm threshold. The valid entries are **major**, **minor**, **warning** or **none**. The default is **warning**.

- *Alarm Threshold*

  Enter the number of times an attempt to establish or reestablish a connection should be tried before an alarm is raised. Valid entries are **1** through **10.** The default is **5**.

- Retry Interval

  Enter the number of minutes between attempts to establish or reestablish the connection. Valid entries are **1** through **60**. The default is **2**.

- *Auto Restoration*

  Enter **y** to indicate that an attempt is to be made to reestablish the connection that has failed; otherwise, enter **n**. Auto restoration is only available for an administered connection that is established over ISDN-PRI and SDDN trunk groups. The default is **n.**

- *Priority*

  Enter a number in a range from **1** to **8** to determine the order in which the administered connections are to be established (the highest priority is **1**).

# Administering the Maintenance Alarm Terminal

Use the Station form to assign alarm buttons to the DCP alarm terminals. One maintenance alarm terminal (model 7444D) comes standard with the MCU; up to three maintenance alarm terminals are supported.

The following commands can be used to administer the maintenance alarm terminals.

**Table 6-24. Station Administration Commands**

| Action | Object | Qualifier |
|---|---|---|
| add | station | extension or next |
| change | station | extension |
| display | station | extension |
| duplicate | station | |
| list | station | extension, type, count, port, print or schedule |
| remove | station | extension |

Use the following procedure to add a maintenance alarm terminal:

1. At the *command:* prompt, type **add station xxxx** then press RETURN.

2. Verify the screen displays the Station form.

3. From the *COR* field, use TAB and RETURN to advance to the fields you want to change.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display station xxxx** then press RETURN.

## Station Form

The following list shows the fields on the Station form and their related values.

**Station Form, Page 1 of 5**

- *Extension*

  A display-only field that shows the extension number of the maintenance phone being administered.

- *Type*

  This display-only field shows the alarm terminal assigned to this extension. The value is **7434D**.

  ⇒ **NOTE:**
  The 7444D is the only model maintenance alarm terminal supported. However, for administration purposes it is administered as if it was a 7434D.

- *Port*

  Specify the port on the MCU that is associated with this maintenance alarm terminal. This port is located on a TN754 Digital Line circuit pack.

- COR

  The class of restriction (**0** through **63**) assigned to this alarm terminal. The default is **1**.

- *COS*

  The class of service (**0** through **63**) assigned to this alarm terminal. The default is **1**.

- *Name*

  A label that identifies this maintenance alarm terminal.

- *Data Module*

  When **y** is entered, a data module must be administered for this maintenance alarm terminal.

- *Display Module*

  Set to **y** if the alarm terminal is equipped with a display (this is the correct setting for the 7444D).

**Station Form Page 2 of 5**

- *Room*

  Specify the room number where the alarm terminal is located.

- *Headset*

  Enter **y** if a headset is being used with this alarm terminal.

■ *Jack*

Specify the jack number where the alarm terminal is connected.

■ *Cable*

Enter the cable number that connects the jack to the MCU.

■ Button Assignments

Assign the desired features on the appropriate buttons. The recommended maintenance alarm terminal button assignments are as follows:

**Table 6-25.   Maintenance Alarm Terminal Button Assignments**

| Button | Assignment | Description | Button | Assignment | Description |
|--------|-----------|-------------|--------|-----------|-------------|
| 1 | call-appr | originate/receive calls | 6 | ac-alarm | administered connection alarm |
| 2 | call-appr | originate/receive calls | 7 | smdr1-alrm | SMDR interface failure |
| 3 | call-appr | originate/receive calls | 8 | pr-sys-alm | system printer alarm |
| 4 | | | 9 | trk-ac-alm | facility test call alarm |
| 5 | aca-call | identify trunk trouble | 10 | verify | make test calls |

### Station Form, Page 3 of 5

■ *Button Assignments*

Use this continuation of screen 2 to assign features to the appropriate buttons.

**Table 6-26.   Maintenance Alarm Terminal Button Assignments**

| Button | Assignment | Description | Button | Assignment | Description |
|--------|------------|-------------|--------|------------|-------------|
| 11 | | | 23 | | |
| 12 | | | 24 | link-alarm Lnk #: 1 | link alarm |
| 13 | major-alrm | major alarm | 25 | link-alarm Lnk #: 2 | link alarm |
| 14 | minor-alrm | minor alarm | 26 | link-alarm Lnk #: 3 | link alarm |
| 15 | warn-alrm | warning alarm | 27 | link-alarm Lnk #: 4 | link alarm |
| 16 | mmi-cp-alm | MMI circuit pack alarm | 28 | | |
| 17 | vc-cp-alm | Voice Conditioner circuit pack alarm | 29 | | |
| 18 | ds1-alarm | | 30 | | |
| 19 | | | 31 | | |
| 20 | | | 32 | | |
| 21 | | | 33 | | |
| 22 | | | 34 | | |

### Station Form, Page 4 of 5

■   *Display Button Assignments*

Assign the display button appearances to the appropriate buttons as shown:

**Table 6-27. Maintenance Alarm Terminal Display Button Assignments**

| Button | Assignment |
|--------|------------|
| 1 | normal |
| 2 | inspect |
| 3 | trk-id |
| 4 | trunk-name |
| 5 | date-time |
| 6 | timer |
| 7 | |

### Station Form, Page 5 of 5

This screen displays only when **y** is entered in the *Data Module* field on the first screen.

- *Data Extension*

   This display-only field shows the extension of the data module.

- *BCC*

   Display-only field shows a **2** for the device speed when the ISDN-PRI option is enabled.

- *ITC*

   The Information Transfer Capacity refers to how calls are routed to restricted or unrestricted facilities. The default is **restricted**.

- *Name*

   Enter the name associated with the data module extension. This field can be left blank.

- *COR*

   Enter the desired Class of Restriction (**0** to **63**). The default is **1**.

- *COS*

   Enter the desired Class of Service (**0** to **15**). The default is **1**.

■ *Assigned Member Ext and Name*

Enter the extension number assigned to the data module. The length of the extension number must agree with the dial plan.

# Alphanumeric Dialing

This feature allows a system administrator to change a mapped string (the actual digit dialing string) to an alpha name associated with the string. It is used to replace extension numbers with easier to remember alpha characters. For example, you could replace the netcon hunt group extension assigned for remote administration with the alpha name **CRS**.

The Alphanumeric Dialing Table form consists of 200 paired alpha name and/or mapped string fields. Entries may be made in any order on the form; however, before the form is displayed for changing or reviewing, the entries are sorted alphanumerically by alpha name. All entries are moved to the beginning of the table, leaving any blank entries at the end.

The following administration commands access the Alphanumeric Dialing Table form.

**Table 6-28.   Station Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| change | alphanumeric-dial-table | |
| display | alphanumeric-dial-table | print |

Follow the procedure below to use the alphanumeric dialing feature:

1. At the *command:* prompt, type **change alphanumeric-dial-table** then press RETURN.

2. Verify the screen displays the Alphanumeric Dialing Table form.

3. From the *Alpha-name* field, enter the first alpha name associated with a mapped string (see below for details). Use TAB or RETURN to advance to the next field.

4. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

5. To verify the form, type **display alphanumeric-dial-table** then press RETURN.

**Alphanumeric Dialing Table Form**

The following list shows the fields on the Alphanumeric Dialing Table form and their related values.

**Alphanumeric Dialing Table Form,**
**Page 1 through 6 of 6**

■   *Alpha-Name*

This field accepts up to 8 alphanumeric characters that must begin with an alpha character and may not have any blank spaces between characters. All alpha names in the table must be unique and cannot be referenced in their own mapped string. The alpha names can be used in any other mapped string and multiple times in a mapped string. The default is blank.

■   *Mapped String*

Enter from 1 to 24 characters containing alphanumeric, readability, delimiters and/or special characters. This entry is used to generate the final dialing string and can include Feature Access Codes. Numbers 0 through 9, letters a through z (uppercase letters are mapped to lowercase) and character delimiters, such as / and - are permitted. A mapped string may not contain an alpha name whose mapped string also contains an alpha name.

## Testing the MCU

The following test procedure is conducted by the VTC when the customer requests the Application Start-Up package. After remote administration is complete, perform the following steps. This procedure checks the ports and manual scheduling system.

1. Perform **test trunk-group xx long** on all assigned trunk groups. If any test fails, see DS1-TRK in the *MCU Maintenance Manual*.

2. See "Creating a Conference Record" on page 6-65 to reserve a three-party conference on the MCU.

3. Follow the Application Start-Up Procedures as defined by Market Management for testing multipoint operation.

## Creating a Conference Record

The Conference Record form is used to coordinate and schedule resources of the MCU. The MCU stores up to 200 records. The following administration commands access the Conference Record form.

**Table 6-29.    Conference Record Administration Commands**

| Action | Object | Qualifier |
|--------|--------|-----------|
| add | conference | ID or next |
| change | conference | ID or next |
| display | conference | ID, print or schedule |
| list | conference | ID, class, status, count, print or schedule |
| remove | conference | ID |

Use the following procedure to add a conference record:

1. At the *command:* prompt, type **add conference 1** then press RETURN.

2. Verify the screen displays the Conference Record form.

3. From the *Conference Name* field, enter the name of the customer/company installing the MCU.

4. Create a three-party dedicated conference by specifying **dedicated** in the *Class* field and assigning three Meet-Me numbers. Complete the other fields as appropriate.

5. When the form is completed, verify the screen displays: *command successfully completed* followed by *command:*

## Conference Record Form

The following list shows the fields on the Conference Record form (for the EX model) and their related values.

```
add conference 123                                       page   1 of 3
                          CONFERENCE RECORD

   Conference ID: 123                     Status: _____
 Conference Name: _____  Conference Mode: _____
      Billing ID: _____        Control Ext: __ Scan Int: __
        Password: _____        Cascade Mode: _____
           Scope: _____          Audio Mode: _____
           Class: _____           Bandwidth: ___
      Start Time: _____        No. of Channels: _
       Stop Time: _____        Entry/Exit Tones? _
                                   Warning Tone? _
                               Rate Adaptation? _
```

**Figure 6-1. Conference Record Form (Page 1)**

```
add conference 123                               Page   2 of  3
                          CONFERENCE RECORD
CONFEREES
          MCU
   Type   Ext   Meet-Me Number  Dial-Out Number 1  Dial-Out Number 2

 1: ____ _____                 _____   _____
 2: ____ _____                 _____   _____
 3: ____ _____                 _____   _____
 4: ____ _____                 _____   _____
 5: ____ _____                 _____   _____
 6: ____ _____                 _____   _____
 7: ____ _____                 _____   _____
 8: ____ _____                 _____   _____
 9: ____ _____                 _____   _____
10: ____ _____                 _____   _____
11: ____ _____                 _____   _____
12: ____ _____                 _____   _____
13: ____ _____                 _____   _____
14: ____ _____                 _____   _____
15: ____ _____                 _____   _____
```

**Figure 6-2. Conference Record Form (Page 2)**

**Conference Record Form, Page 1 of 1**

■ *Conference ID*

This display-only field assigns a unique number to identify the conference.

■ *Conference Name*

A name (up to 20 alphanumeric characters) chosen by the conference convener that identifies the purpose of the video conference.

■ *Billing ID*

A billing number (up to 15 digits) that the convener can optionally provide for tracking time and costs of the conference.

■ *Password*

Entered by the convener. Applies only to audio endpoints.

■ *Scope*

Visible only if a password is entered. If so, this field displays "audio."

■ *Class*

There are three conference classes: **reserved**, **dedicated**, and **file**. A **reserved** conference is a conference that is scheduled to begin within 24-hours of the current time. A **dedicated** conference is a conference that is always available and can be joined at anytime. A **file** conference is a conference that is filed as a record for future use. The default is **reserved**.

■ *Start Time*

If **reserved** or **file** is selected in the *Class* field, this field appears so you can enter the time the conference begins. The time is entered in *hhmm* format where *hh* is the hour (00 to 23) and *mm* is the minutes (00 to 59). This field is optional for file conferences.

■ *Stop Time*

If **reserved** or **file** is selected in the *Class* field, this field appears so you can enter the time the conference ends. The time is entered in *hhmm* format where *hh* is the hour (00 to 23) and *mm* is the minutes (00 to 59). This field is optional for file conferences.

■ *Status*

This display-only field reports the current status of a conference as it relates to the *Class* of the conference. A reserved conference can be **active, in-use**, **inactive**, or **complete**. **Active** means the conference is available to receive calls. **In-use** means the conference is in-progress and one or more conferees has joined in. **Inactive** means the conference is not available to receive calls (for a reserved conference, the *Start Time* has not been reached). **Complete** means a conference has ended (the *Stop Time*

has been reached). A dedicated conference is always **active** (available to receive calls). A file conference is always **inactive** (not available to receive calls).

■   *Conference Mode*

Depending on your MCU model, this field offers up to three conference modes. **Voice-activated** allows conferees to view the current speaker. The video source changes when another speaker begins talking. **Chair person control** allows the chair person to determine which video sending endpoint is broadcast to all the other conferees. **Presentation** mode allows one location to be viewed constantly by all conferees. If a conferee asks a question or makes a comment, the other conferees hear the speaker but continue to view the presenter. **Broadcastw/scn** mode allows one location to be viewed and heard constantly by all conferees. The broadcaster receives video (not audio) from all conferees on a rotating basis. **Voice-activated** is the default.

■   *Control Ext.*

This field appears only when the *Conference Mode* is either **Presentation** or **Broadcastw/scn**. The control extension is the MCU-extension of the location that will be the presenter or the broadcaster.

■   *Scn Int*

This field appears only when the *conference mode* is broadcast with auto scan. It specifies the duration of the scan (in seconds) on each conferee location. The default is **15** seconds.

■   *Cascade Mode*

If the conference includes a CAS link, this mode must be either **primary** or **secondary.** On the other hand, if a cascaded endpoint cannot be administered, the mode must be **none.** Finally, if endpoints can be administered but the link is not enabled, the mode is **disabled**.

■   *Audio Mode*

This display-only field sets the audio mode to **auto** which allows the MCU to automatically choose the appropriate audio mode (G.711 or G.728) for the conference.

■   *Bandwidth*

This field is used to specify the bandwidth selected for the conference. If **56k** is selected, the conference will be a 2B-channel 56k conference (112k bandwidth). If **64k** is selected, the conference will be a 2B-channel 64k conference (**128k** bandwidth). If **384k** is selected, the conference will be a one channel **384k** (H0) conference. Other 1-channel bandwidths include **336k, 768k, 1472k,** and **1536k**. **56k** is the default.

- *No. of Channels*

  This display-only field specifies **2** channel 56K (112K) or 64K (128K) band-width or **1** channel H0 (384k) bandwidth. If the *Bandwidth* selected for the conference is 336k, 384k, 768k, 1472k, or 1536k, this field will display a **1** for one channel.

- *Entry/Exit Tones*

  This field appears if your MCU model has the Notification Tones feature. If it does appear, enter **yes** if you want conferees to hear an entry tone when-ever a conferee joins the conference and an exit tone whenever a conferee leaves the conference. Enter **no** if you do not want the entry or exit tones for this conference. Tones are enabled or disabled on a per conference basis. The default is **yes**.

- Warning Tone

  This field appears if your MCU model has the Notification Tones feature and if *Class* is **reserved** or **file.** If it does appear, enter **yes** if you want con-ferees to hear a tone when 10 minutes remain before the scheduled end of the conference. Enter **no** if you do not want the warning tone for this con-ference. This tone is enabled or disabled on a per conference basis. The default is **yes**.

- Rate Adaptation

  This field appears if the conference has a 64k bandwidth. It indicates whether or not a 56k/64k rate adaptation is allowed for the conference.

- *Type*

  This field indicates the type of conferee. Possible entries include **P64** (mul-timedia), **AUD** (audio-only), **CAS** (cascade link), **BOND** (bonding), or **BCAS** (cascade bonding). Up to 25 entries are allowed.

- *MCU-Ext*

  An MCU-extension is required for each conferee in a conference. Up to 25 entries are allowed.

- *Meet-Me Number*

  Whenever an MCU-extension has been entered in a previous conference record administration session, the MCU automatically displays the data entered on the MCU-Extension form for the associated Meet-Me Number field. The Meet-Me Number is usually the network number the conferee dials to join a conference or the location of the conferee.

- *Dial-out Number 1, Dial-out Number 2*

  Network numbers that the MCU dials. These numbers are assigned to the endpoints. Up to 48 entries are allowed.

# Glossary

## A

**active**
> A reserved conference status when the conference is scheduled to begin but no conferees have joined. A dedicated conference status is active at all times.

**Advanced mode**
> A feature of the MCU that offers presentation and broadcast with auto-scan conference modes.

**Application Compliant flag**
> A per-user flag in the Conference Record that indicates which endpoints use non-compliant applications.

**AT&T Conference Reservation System**
> A PC-based reservation system that manages the MCU reservation system, automates the scheduling tasks, performs conflict resolution, and ensures that participating video endpoints have the proper capabilities to join the conference.

**AT&T MultiPoint Control Unit**
> Equipment that provides high-quality multimedia conferencing with video endpoints that communicate via the ITU-T Px64 standards.

**AT&T Video Technical Center**
> A video technical support group that is available to help with questions about the AT&T MCU.

**Audio Add-On**
> Feature that allows the MCU to support up to six non-Px64 audio-only endpoints per non-cascaded conference and up to12 such endpoints per cascaded conference.

**Audio Add-On Echo Control**
> An echo canceler function implemented in the MCU to prevent echoes caused by Audio Add-On conferees who dial into a conference through an analog circuit. Echoes occur at the two- to four-wire conversion (hybrid) in the network or in PBXs and are caused by impedance mismatches at those points.

**audio port**
> The port used for an Audio Add-On party to join a conference. See also *port*.

**Automatic mode**
> A feature of the MCU that offers voice-activated conference mode.

## B

**B-channel**
> A bearer channel provided by the network from a video endpoint to the MCU.

**bandwidth**
> Specifies a transfer rate or range of frequencies for an amount of data moving from one point to another. Used in context for video bandwidth rates, the more free bandwidth for video, the better

the picture quality transmitted. The MCU port capacity provides for 112k/128k bandwidth (2B-channel 56k/64k), 1-channel multirate ISDN bandwidths of 128k, 192k, 256k, 320k, 384k, 768k, 1472k, 1536k, and 1920k, or BONDing bandwidths of 112/128k, 168/192k, 224/256k, 280/320k, and 336/384k.

**Bandwidth on Demand**

Feature that allows the AT&T MCU to establish conferences at bandwidths greater than 128k without the use of ISDN-PRI and Wideband H0 channels.

**Basic/Enhanced Service Flag**

A flag in the Conference Record that disables commands/caps that are known to cause problems (such as crashing) to specific endpoints.

**BRI/DCP Direct Connect Interface**

Feature that allows the user to connect BRI or DCP endpoints directly to the MCU without involving a public or private network, PBX, or MUX. The feature allows up to 12 BRI stations or up to four DCP group systems to connect directly to the MCU.

**BONDing**

See "bandwidth on demand."

**BONDing ports**

The ports in an MCU conference that use one of the following BONDed bandwidths:  112/128k, 168/192k, 224/256k, 280/320k, or 336/384k.

**broadcaster**

A video endpoint is considered the broadcaster when it sends the same video, audio and data signal to two or more locations.

**Broadcast/scan**

A conference mode where one video endpoint's video, audio and data are broadcast to all other conferees. The broadcaster views the other locations one after another for a fixed duration of time. The broadcaster is constantly viewed by all other locations.

**Browse**

A Universal Conference Control subfeature that allows the broadcaster to scan endpoints in the conference without specifying an endpoint number for each scanned endpoint. With this feature, only the broadcaster sees a change in video caused by the scan.

# C

**cascading**

Connecting two or more AT&T MCUs via a Px64 communications link. This feature allows endpoints connected on different MCUs to participate in the same conference.

**Chair control mode**

A conference mode where one site controls which endpoints are added and/or dropped during a conference.

**CIF**

Common Intermediate Format  (also known as FCIF or Full CIF).  An industry-standard means for encoding video signals for high-quality pictures. QCIF MPI specifies a picture interval numbers.

**class**

A Conference Record has one of three classes: reserved, dedicated, or file.

**complete**

A reserved conference has a status of complete when the stop time has passed and the last conferee has dropped from the conference.

**conferee**

A video endpoint participating in a multipoint video conference.

**Conference Appointment Form**

A form that is used to record all the information necessary to schedule and reserve a multipoint video conference.

**Conference Redial flag**

A flag in the Conference Record that allows an endpoint to be "redialed" during a conference (therefore, this flag is in effect for Dial-Out calls).

**convener**

The person who schedules a conference and is responsible for distributing the Meet-Me numbers.

**CRS**

*See* AT&T Conference Reservation System.

# D

**dedicated**

A conference class that reserves a specified number of MCU ports for a multipoint video conference at any time.

**Dedicated Access**

A feature that enables endpoints to participate in multipoint audio and video conferences via non-signaled T1 facilities. For this feature, the MCU connects to a Multiplexer (MUX), a Digital Access Crosspoint System (DACS), or to H.320 endpoints via DS1 facilities. A maximum of 20 DS1 connections to the MCU are supported.

**Dial-out**

A feature that allows Px64 calls to originate (dial out) from the MCU in addition to receiving dial-in calls. Therefore, conference participants can join conferences by receiving calls from the MCU.

**Dynamic Conference Resizing**

A feature that allows the user to add and remove conference participants before the conference starts as well as during the conference.

# E

**encoding**

Changing video and/or audio signals into digital form for more efficient and accurate transmission (movement) from one entity to another.

**endpoint**

A video unit such as a camera, PC, video recorder, speakers, and other equipment used for transmitting multimedia (voice, audio, full-motion video, and graphics) during an MCU conference. The video capabilities of an endpoint can be linked to a specific site.

**entry tone**
A tone that alerts conferees already on a conference that another conferee has joined in the conference.

**exit tone**
A tone that alerts conferees on a conference that a conferee has left the conference.

# F

**far-end**
When troubleshooting problems on the MCU, the video endpoint is often referred to as being on the far-end of the connection.

**FCIF**
*See* CIF.

**file**
A conference class that saves a copy of a Conference Record for future use.

# G

**G.711 Audio**
*See* PCM.

**G.722 Audio**
An audio mode that enables the system to bridge G.722 (7kHz) audio. 7kHz is the audio bandwidth provided by G.722. This bandwidth allows for a more natural sounding voice conference. The MCU supports G.722-conferenced audio at 48k or 56k, as defined in ITUT-T Recommendation G.722.

**G.728 Audio**
*See* LD-CELP.

# H

**H0**
A one-channel 384k bandwidth call.

**H.320**
The multipoint conferencing standard adopted by the ITU-T (also known as Px64). This standard includes some of the other H-series standards governing the definition of multimedia equipment and equipment transmission (movement of data) capabilities and methods.

**H-series**
*See* H.320.

**handshake**
An expression relating to the establishment of communications between the MCU and a video endpoint.

# I

**Inactive**
A conference status when a conference is reserved but has not begun and when a conference has a class of file.

**In-use**
A conference status when a reserved conference has begun and at least one conferee has joined the conference.

**ITU-T**
An international group known as International Telecommunications Union-Telecommunications established in 1993 to develop standards to allow video endpoints to communicate with each other.

# L

**LD-CELP (G.728)**
A means of encoding audio so a smaller portion of bandwidth is allocated to audio. This results in greater bandwidth for video, thus improving picture quality.

**login**
A keyword assigned to a user to access the MCU.

**login password**
A codeword that can be customized by the user that corresponds with the user's login.

**Low-/High-Speed Interworking**
A feature that allows 56k or 64k endpoints to join higher-speed conferences as Audio Add-On endpoints via conventional dial-in Px64 ports. Multiple Px64 ports in a conference can implement this feature simultaneously.

# M

**Management Terminal**
A 715 BCT used primarily for administration and maintenance functions.

**Manufacturer and Product Information Exchange**
The MCU exchanges ns-caps with each endpoint that joins the conference. Besides information regarding capabilities, ns-cap messages contain manufacturer and product information for the MCU or endpoint. Such information received by the MCU from the endpoint is displayed on the Status Conference form.

**MCS/MLP**
A multipoint data conferencing feature based on the H.221 MLP feature that enables data collaboration capabilities within a conference.

**MCU**
*See* AT&T MultiPoint Control Unit.

**MCU-extension**
An extension on the MCU that corresponds to the number a conferee dials to join a multipoint video conference.

**MCU-Extensions and Numbers to Dial Form**
A list of all MCU-extensions, supported bandwidth, and corresponding Meet-Me numbers that conferees dial to join a conference.

**MCU-MT**
*See* Management Terminal.

**MCU-ST**
*See* Scheduling Terminal.

**Meet-Me number**
A number a conferee dials to join a multipoint video conference.

**Mixed conference mode**
Feature that allows the MCU to support both Meet-Me and Dial-Out endpoints in the same conference.

**multimedia**
The use of a variety of media, including audio, data, graphics, and full-motion video.

**multipoint video conferencing**
A technique of combining video, audio, and data from three or more video endpoints onto a single video conference call.

# N

**network service**
The telephone company that provides the trunks and Meet-Me numbers to access the MCU.

**network type**
Specifies whether a video endpoint is connected to a private network (behind a PBX) or a public network.

**notification tones**
The entry, exit, and warning tones available with some of the MCU models.

# P

**paper-based scheduling system**
A method of recording and tracking conference reservations to prevent overbooking of the MCU.

**Per-conference password**
Password for a conference that is provided by the customer at conference reservation time. Conferees are prompted for the password when they join the conference.

**PC-based scheduling**
A scheduling method that uses the AT&T Conference Reservation System to accept reservations and qualify video endpoints to participate in a multipoint video conference.

**PCM (G.711)**
Pulse Code Modulation. A means of encoding audio by assigning less bandwidth to video.

**point-to-point**
A conference involving only two sites whose video endpoints are not connected through the MCU.

**port**
A logical entity where the video call terminates on the MCU. It provides a specific bandwidth (data rate) capacity, such as 56k, 64k, etc.

**Port and Extension Usage Chart**
A chart that is used to record the number of MCU ports and MCU-extensions reserved for a particular day.

**Presentation**
A conference mode where a video endpoint's video is constantly broadcast to the other locations. However, the audio portion of the conference switches according to whom is speaking. Any conferee can be a speaker. The video endpoint that is the presenter views endpoints determined by voice-activated switching.

**protocol**
A set of international industry-standard rules governing the exchange of data between two entities.

**Px64**
Also known as H-series. The standards adopted by the ITU-T committee that allow video endpoints that comply with the standards to communicate with each other.

# Q

**QCIF**
Quarter Common Intermediate Format. An industry-standard means of encoding video signals to produce medium-quality pictures by encoding only a quarter of the video resolution of CIF.

# R

**Rate Adaptation**
Feature that allows the AT&T MCU to interwork endpoints operating with 2B-channels that are on both 56k and 64k networks.

**Real-Time Conference Status**
Feature that allows the real-time status of a conference and its associated conferees to be displayed on the MCU-MT. The **monitor conference** command is used for this purpose. Once the command is issued, the display is automatically updated approximately once every 30 seconds. Accordingly, this feature is intended for troubleshooting purposes.

**recurring meeting**
A meeting that occurs more than once in a definite pattern, such as every Thursday.

**reserved**
A conference class that indicates a conference will begin and end within the next 24 hours.

**reservations agent**
The person responsible for accepting multipoint conference reservations, making reservations on the MCU-ST, or CRS and resolving minor problems.

**Rollcall**
A Universal Conference Control subfeature that allows the broadcaster to scan endpoints in the conference without specifying an endpoint number for each scanned endpoint. With this feature, all endpoints in the conference see a change in video caused by the scan.

**rotation scan time**
The number of seconds that a broadcaster views each location before viewing the next location in the rotation.

# S

**scan time**
*See* rotation scan time.

**scheduling terminal**
Also known as the MCU-ST. A 715 Business Communications Terminal (BCT) used for reserving conferences on the MCU and for checking the status of conferences and availability of MCU ports.

**site profile**
A list of video endpoints that may participate in multipoint video conferences and their location, time zone, bandwidth, and network type.

**status**
The current state of a conference. A reserved conference status can be active, in-use, or complete. A file conference status is always inactive. A dedicated conference status is always active.

**system administrator**
The on-site telecommunications manager who administers the MCU trunks, maintenance alarm terminals, dial plan, passwords, MCU-extensions and numbers, and system time. The system administrator can request system reports to check on MCU performance and also has access to all conference-related forms.

# T

**Terminal Names**
A feature that enables the MCU to poll and ascertain "naming/identification" parameters from endpoints and to pass the information on to other endpoints. Therefore, conference participants whose endpoints display this information can identify other conference participants.

**tones**
*See* Notification Tones.

# U

**Universal Conference Control**
Customer option that enables an endpoint to manage a H.320 conference out-of-band. UCC is intended to provide a number of powerful services similar to, and in lieu of, H.243 Chair Control. The controlling terminal for UCC is a regular touchtone telephone, such as that used by an Audio Add-On party. The terminal does not receive audio, video, or data from the conference it is managing, and it does not transmit this media to the H.320 conference multiplex.

# V

**video endpoint**
A video codec, with camera, speakers, screen, and other equipment required for multimedia conferencing.

**Video-Switching Mode and Broadcaster Notification**
A feature used by the MCU to announce to all the conference endpoints the current video-switching mode and broadcaster. The feature is also used whenever the endpoint initiates a See-Me (User-Activated Presentation) request that cannot be honored.

**VTC**
*See* AT&T Video Technical Center.

**Voice-activated**
A conference mode where the video image of the person speaking is seen by all other conferees. The speaker sees the video image of the previous speaker. When a new speaker begins talking, the video switches to the new speaker.

# W

**warning tone**
A tone that sounds when only 10 minutes remain in a conference.

# Index