MITEL NETWORKS

3300 Integrated Communications Platform

TECHNICIAN'S HANDBOOK

Release 3.3



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Mitel Networks 3300 Integrated Communications Platform Technician's Handbook

Release 3.3 51006266, Revision A April 2003

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Technician's Handbook

Chapter 1 Introduction

Technician's Handbook

About This Handbook

Purpose

The 3300 ICP Technician's Handbook provides instructions on installing, upgrading, maintaining and troubleshooting the Mitel Networks[™] 3300 Integrated Communications Platform (ICP).

Audience

This handbook is aimed for certified 3300 ICP technicians.

Contents

This handbook is organized as follows:

- Chapter 1: Introduction
- Chapter 2: Installation (page 11)
- Chapter 3: Upgrade and FRUs (page 83)
- Chapter 4: Programming (page 129)
- Chapter 5: Troubleshooting (page 137)
- Chapter 6: Maintenance (page 193)
- Appendix A: Typical Network Configurations (page 215)
- Appendix B: System Capacity (page 227)
- Appendix C: Installation Planner (page 233)
- Appendix D: Hardware Reference (page 237)
- Appendix E: Status LEDs (page 253)
- Appendix F: FRU Part Numbers (page 271)
- Appendix G: Handling Fiber Optic Cables (page 283)

Symbols Used in this Handbook



Note: Used to provide additional information you should know about a topic.

P

Tip: Used to give advice on a topic.



Time: Used to indicate the time it takes to complete a procedure.

Important Safety Instructions

CAUTION: Failure to follow all instructions may result in improper equipment operation and/or risk of electrical shock. See the 3300 Safety Instructions on Mitel Online for complete safety information.



Note: The ground symbol within a circle identifies the terminal to be connected to an external protective conductor. Connect this terminal to earth ground before you make any other connections to the equipment.

About the 3300 ICP

The Mitel Networks[™] 3300 Integrated Communications Platform (ICP) is a Voice over IP (VoIP) solution that delivers the superior voice capabilities and the features that enterprises have come to expect from a communications system.

Figure 1 below shows an example of a 3300 ICP system made up of a Controller, an Analog Services Unit (ASU) and Universal Network Services Unit (NSU).



Figure 1. Example of a 3300 ICP System

For additional information, see the following chapters:

- Appendix B: System Capacity (page 227)
- Appendix D: Hardware Reference (page 237)

Network Configurations

The most common configurations of the 3300 ICP in a network are:

- One DHCP per VLAN
- One DHCP for two VLANs
- One router interface to multiple VLANs (router on a stick)

For an overview of each configuration, see Appendix A: Typical Network Configurations (page 215).

Software Tools

The system has a number of programming tools that have been designed for different levels of user:

- The System Administration Tool (also known as **ESM**) provides a Web-based interface that trained technicians use to program the system.
- The Group Administration Tool provides a Web-based interface that enables administrators and receptionists to make changes to user information.
- The **Desktop Tool** provides a Web-based interface that enables IP telephone users to program their telephone feature keys on their phone.
- The Configuration Tool enables the installer to get a new system up and running at the installation site. It also enables databases from legacy SX-2000 Light, SX-2000 MicroLight systems, 3200 ICP systems, and 3800 WAG systems to migrate to the 3300 ICP through a database conversion and restoration utility.
- The ISDN Maintenance and Administration Tool (IMAT) provides the programming interface for PRI and R2 protocols.

Additional Documentation

About the 3300 ICP Documentation

The 3300 ICP documentation set includes the following components:

- Printed documents.
- PDF Documents on Mitel Online (including copies of the printed documents).
- Customizable Manual Maker guides on Mitel Online.
- Online Help.

In addition, you can get the following technical documents from Mitel Online:

- Field Change Instructions (FCI): describes software changes, bug fixes, outstanding issues and hardware compatibility considerations for each software release. The FCI is also included on the 3300 ICP software CD-ROM.
- Technical Service Bulletins (TSBs) and Technical Information Bulletins (TIBs): issued by Mitel Technical Support to address frequently asked questions regarding hardware and software problems.

Getting 3300 ICP Documentation

Access Online Help

 In the software application (System Administration Tool, IMAT, etc.), click the Help link or button to access the tool's Online Help.

Access Mitel Online



- **Note:** You must be a registered user to access Mitel Online.
- 1. From a web browser, go to **www.mitel.com**.
- 2. In the **Global Online Services** pull-down menu (near top center of screen), select **Mitel Online (Global)**.
- 3. Enter your Mitel Online username and password, and click **Login**.

Get 3300 ICP documentation on Mitel Online

- 1. Access Mitel Online.
- 2. Move your cursor on **Downloads** (left side of screen), and select **Product Documentation**.
- 3. To view a document: click on the name of the desired document.
- 4. To download a document:
 - Right-click the name of the desired document, and select **Save Target As...** OR
 - When viewing a PDF document, click on the disk icon.

Get User and Installation Guides on Mitel Online

- 1. Access Mitel Online.
- 2. Move your cursor on **Downloads** (left side of screen), and select **Product Documentation**.
- 3. Click on **Installation Guides** (for Installation Guides) or **User Guides** (for other documents).
- 4. To view a document: click on the name of the desired document.
- 5. To download a document:
 - Right-click the name of the desired document, and select **Save Target As...** OR
 - When viewing a PDF document, click on the disk icon.

Create telephone User Guides with Manual Maker

- 1. Access Mitel Online.
- 2. Move your cursor on **Downloads** (left side of screen), and select **Product Documentation**.
- 3. Click on Manual Maker.
- 4. Click the **Help** button for instructions on creating User Guides with Manual Maker.

Contacting Mitel

Sending Us Feedback

If you have suggestions on how to improve this documentation, please contact us at **techpubs@mitel.com**.

Contacting Mitel Networks

Contact Mitel Networks Order Desk

You can reach the Order Desk at 1-800-796-4835.

Contact Mitel Networks Repair Department

You must get a Return of Merchandise Authorization (RMA) form from the Repairs Department before sending equipment back to Mitel Network.

You can reach the Repairs Department at 1-888-222-6483.

Contact Technical Support

Please contact Mitel Technical Support if you require technical assistance.

IMPORTANT:

Before calling Mitel Technical Support, please go through the applicable section(s) of the Troubleshooting chapter (page 137).

If you cannot find the source of the problem in the Troubleshooting chapter, please collect the required information listed in the applicable section(s) of the Troubleshooting chapter **before** calling Mitel Technical Support.

You can reach Technical Support at 1-800-561-0860.

Chapter 2 Installation

Technician's Handbook

About This Chapter

This chapter contains instructions on installing a 3300 ICP. For information on upgrading and replacing the 3300 ICP equipment, see Chapter 3 on page 83.



Note: Before installing a 3300 ICP, **always** read the Field Change Instructions (FCI) for the software you are installing. The FCI describes software changes, bug fixes, outstanding issues and hardware compatibility issues for the system (see "Getting 3300 ICP Documentation" on page 8).

Installation Overview

This section contains a brief overview of the steps required to install and configure (program) a 3300 ICP system. Install the system in the order shown (bullets indicate steps that may or may not be needed, depending on the configuration of the system).

- 1. Installing the Controller (page 14):
 - a. Installing the Controller Hardware (page 15).
 - b. Connecting the Controller to the Network (page 23).
- 2. Installing Service Units (page 29):
 - Installing 3300 Network Service Units (page 29)
 - Installing 3300 Analog Service Units (page 44)
 - Installing Peripheral Units (page 48)
 - Installing SUPERSET HUBs (page 60)
 - Installing Digital Service Units (page 63)
- 3. Installing Phones and Peripherals (page 29)
- 4. Programming Voice Mail (page 80)
- 5. Saving the Settings (page 29)

Installing the Controller

This section contains detailed instructions on installing and configuring the 3300 ICP Controller.

Overview

Installing the Controller Hardware (page 15):

- 1. Install the Controller Hard Drive (page 17).
- 2. Install the System ID Module (page 18).
- 3. Install the DSP Module(s), if required (page 19).
- 4. Connect the Maintenance PC to the Controller (page 20).
- 5. Turn on the Controller (page 20).
- 6. Verify the Connections (page 21).
- 7. Program the License and Option Keys (page 21).

Connecting the Controller to the Network (page 23):

- 1. Set the Controller RTC IP address (below).
- 2. Program the Controller DHCP settings. (page 25)
- 3. Verify the Operation of the Controller (page 27).
- 4. Configure the Layer 2 switch (page 28).

The Maintenance PC

The Maintenance PC is used to program and troubleshoot the 3300 Controller and Service Units, as well as the phones and peripherals connected to the 3300 ICP. You can use a desktop computer or a laptop as Maintenance PC.

The Maintenance PC must meet the following requirements:

- Windows 95, 98, NT or 2000 Professional
- Internet Explorer 5.5 with Service Pack 2 or later, and 128-but encryption
- a VT-100 emulator program
- a Network Interface Card (NIC)
- an FTP server (such as Microsoft IIS)
- 500 MB of free disk space

Installing the Controller Hardware

About the 3300 Controller

For any additional details and information on the Controller, see Appendix D: Hardware Reference (page 237).

Controller Slots Location

ply		SysID		
Power Supply	Slot 1	Slot 2 (Compression DSP)	Slot 3 (Telecom/ Compression DSP)	Slot 4 (Telecom DSP)

Figure 2. Slots Location for 100-User System

Power Supply	Slot 8 (Telecom DSP)		Slot 7 (Telecom DSP)	Slot 6 (Echo Canceller)	Slot 5 (Echo Canceller)
	SysID				
	Slot 1 (FIM)		Slot 2 (FIM)	Slot 3 (Compression DSP)	Slot 4 (Compression DSP)

Figure 3. Slots Location for 250- and 700-User Systems

Controller Part Numbers

Table 1 below shows the part numbers for the various versions of Controllers you may encounter:

Table 1. 3300 Controller Versions

Speed	100-User	250-User	700-User
133 MHz	n/a	50001262	50001263
300 MHz	50002211	50002970	50002971



Note: The 133 MHz Controller part numbers shown are for North America only.

Note: New Controllers are always 300 MHz units.



Install the Controller Hard Drive

Figure 4. Installing the Controller Hard Drive

- 1. Remove the Controller from its packaging.
- 2. Remove the Hard Drive from its packaging.
- 3. Locate the Hard Drive ribbon cable and power cable in the Controller hard drive enclosure (see Figure 4 above).
- 4. Connect the cables in step 3 to the corresponding connectors on the Hard Drive.
- 5. Insert the Hard Drive as shown in Figure 4 above.
- 6. Secure the Hard Drive plate to the Controller using the screws provided with the Hard Drive.

Next: Go to "Install the System ID Module" below.

Install the System ID Module

- 1. Remove the System ID Module from its packaging.
- Remove the bottom cover of the Controller (see "Removing/Installing the Controller Cover" on page 110).
- 3. Remove the protective cover from the System ID Module's connector.
- 4. Slide the System ID Module between the slots indicated below, and insert the module connector in its mate on the Controller.
 - 100-User Controller: slots 1 and 2 (see Figure 2 on page 15).
 - 250- and 700-User Controllers: slots 1 and 8 (see Figure 3 on page 16).
- 5. Secure the System ID Module using the screw provided with the module.
- If you are not installing DSP Compression Modules, put the Controller's bottom cover back on (see "Removing/Installing the Controller Cover" on page 110).

Next:

- If you are installing a DSP Compression Module, go to "Install the DSP Module(s)" below.
- If you are not installing DSP Compression Modules, go to "Connect the Maintenance PC to the Controller" on page 20.

Install the DSP Module(s)

Perform this step if the system needs compression channels and/or 30 voice mail ports (see Appendix F on page 271 for the part numbers of the DSP Modules):

- For 30 voice mail ports, add one (1) DSP Module (does not apply to 700-user Controller).
- For 32 channels compression, install one (1) DSP Module.
- For 64 channels compression, install two (2) DSP Modules (does not apply to the 100-user Controller).



Note: Make sure you have the appropriate compression license before installing DSP Modules for compression.

Repeat the steps below for each DSP Module you install:

- 1. Remove the DSP Module from its packaging.
- 2. Remove the blank module cover at the front of the Controller, and insert the DSP Module in the appropriate slot (see Table 2 below, Figure 2 on page 15 and Figure 3 on page 16).

Table 2. Installing DSP Modules

Feature		100-User System	250-User System	700-User System
30 VM ports		Slot 3	Slot 7	n/a
32 Comp.	20 VM Ports	Slot 3	Slot 3	Slot 3
Channels	30 VM Ports	Slot 2	5101.5	5101 5
64 Compr. Channels		n/a	Slots 3 & 4	Slots 3 & 4

- 3. Secure the DSP Module to the Controller using the screws provided with the module.
- 4. Put the Controller's top cover back on, and secure it with its screws (see "Removing/Installing the Controller Cover" on page 110 for more information).

Next: Go to "Connect the Maintenance PC to the Controller" below.

Connect the Maintenance PC to the Controller

- Connect an RS-232 straight DTE serial cable between the Controller's Maintenance port and the PC's serial port.
- 2. Program the PC's serial port (from the communication program) with the following settings:

Table 3. PC-to-Controller Serial Settings

Baud Rate	9600	Stop Bits	1
Data bits	8	Flow Control	None
Parity	None		

- 3. Connect a straight-through Ethernet cable (RJ-45 connectors) between the Controller's leftmost Ethernet Port and the PC's Network Interface Card (NIC).
- 4. Program the PC's Network Interface Card (NIC) with the following settings:

Table 4. PC-to-Controller Ethernet Settings

PC IP Address	192.168.1.n (where n is a value between 30 and 254)
PC Subnet Mask	255.255.255.0

Next: Go to "Turn on the Controller" below.

Turn on the Controller

- 1. Connect the female end of the power cable to the Controller, and secure it with the latch.
- 2. Connect the other end of the power cable to a protected outlet. The Controller turns on.



Note: The Controller can take up to 10-15 minutes to start-up.

Next: Go to "Verify the Connections" below.

Verify the Connections

Perform the steps below to verify the connections between the Maintenance PC and the Controller.

- 1. To verify the serial connection:
 - a. In the VT-100 emulator, press RETURN.
 - b. If the serial connection is installed and programmed properly, a right-pointing arrow (→) is displayed when you press ENTER.
- 2. To verify the Ethernet connection:
 - a. From the PC, PING the Controller's RTC IP address (default is 192.168.1.2).
 - b. If the Ethernet connection is installed and programmed correctly, the Controller replies to the PING.

Next: Go to "Program the License and Option Keys" below.

Program the License and Option Keys

Mitel Networks® 3300 Integrated Communi File Edit View Favorites Iools Help	cations Platform (ICP) - Microsoft Internet Explorer		
Alarm Status: 😣 Critical 2003-Mar-31 19:			
÷	05:02	Data Refresh	Help Exit
System Message:			
Selection: System Configuration			Change
System Configuration			
🖹 🛄 System Capacity	License and Option Selection		
E System Capacity Display	Purchased options		
🕆 🧰 Units/Modules	IP User Licenses: ACD Agent Licenses:	700 350	
Trunks	IP Device Licenses:	700	
Devices	Mailbox Licenses:	750	
🖲 🧰 Music On Hold	Digital Link Licenses: Compression Licenses:	8 24	
🖲 🗀 Loudspeaker Paging	XNET Networking:	24 Yes	
🖲 🧰 Telephone Paging	IP Networking:	Yes	
🗄 🧰 System Output Ports	System Id:	17591	
	Password:		
	Configuration options		
	Country:	North America	
	Networking Option: Mitai/Tapi Computer Integration:	Yes Yes	
	Extended Agent Group:	No	

Figure 5. Programming the License/Option Keys

- 1. From the Maintenance PC, start Internet Explorer.
- 2. Open the System Administration Tool:
 - a. Enter the Controller's IP address in the Address field of Internet Explorer, and press ENTER (default IP address is 192.168.1.2).
 - b. Enter the ESM login username and password, and click the **OK** button.



Note: The default login username and password are **system** and **password**, respectively. To prevent security problems, change these as soon as possible (System Access Authorization form in ESM).

- c. Click the **System Administration Tool** button. The System Administration Tool opens.
- In the Selection: drop-down menu on the left (when it says [Click Here to Start]), select System Configuration.
- 4. Click on the **System Capacity** folder, then on the **License and Option Selection** form.
- 5. Click the **Change** button, and fill-in the fields as required (see your Mitel Options sheet). For more information, click the **Help** button to access the System Administration Tool's Online Help.



Note: In the Configuration Options section, we recommend that you enable Networking Option and Mitai/Tapi Computer Integration.

6. Enter the Mitel Options Password (MOP) in the **Password** field, then click the **Save** button.



Time: The Save procedure takes a minute or so.

7. Reboot the Controller (press the **Reset** button on the Controller).

Next: Go to "Connecting the Controller to the Network" below.

Connecting the Controller to the Network

This section assumes that the network is already set up, and that there is a serial connection between the Maintenance PC and the Controller (see "Connect the Maintenance PC to the Controller" on page 20).

Overview

- 1. Set the Controller RTC IP address (page 23).
- 2. Program the Controller DHCP settings. (page 25)
- 3. Verify the Operation of the Controller (page 27).
- 4. Configure the Layer 2 switch (page 28).

Set the Controller RTC IP address

- 1. Start the communication program on the PC.
- 2. Press the **Reset** button on the Controller (use a small non-metallic pointed object).
- 3. When the communication program displays **Press any key to stop auto-boot**, press a key.
- 4. When **[VxWorks Boot]:** is displayed, type **c** and press ENTER.
- Go through the VxWorks settings (see Table 5 below). For each setting shown in **bold**, enter a value, then press ENTER. For all other settings, press ENTER to accept the default value.



Note: The Maintenance PC must be on the same subnet as the Controller.



Note: Do not pad zeroes in the IP addresses.

Prompt	Value	Note	
boot device	ata=0, 0	Boot device is Disk.	
processor number	0	Not used.	
host name	bootHost		
file name	/sysro/Rtc8260	Boot location and file name.	
inet on ethernet (e)		IP address and subnet mask (hex) for Controller RTC (for example, 134.199.63.11:ffffff00). Obtain it from your IT administrator.	
inet on backplane (b)			
host inet (h)		IP address of PC. Used for software upgrades.	
gateway inet (g)		IP address of the end user's default gateway for the 3300 ICP (must be outside the DHCP range).	
user (u)	ftp		
ftp password (ftp)	ftp		
flags (f)	0x0	Fixed IP address (0x40 used on E2T for DHCP).	
target name (n)			
startup script (s)			
other (o)	motfcc	Other device, E2T using Network boot from.	

Table 5. VxWorks Settings

6. Press the **Reset** button on the Controller.The Controller restarts.



Note: The Controller can take up to 10–15 minutes to restart.

7. Remove the serial connection between the Controller and the PC.

Next: Go to "Program the Controller DHCP settings." below.

Program the Controller DHCP settings.

- 1. On the PC, go to ESM and open the System Administration Tool.
- 2. In the **System Administration** section, open the **DHCP** folder.
- 3. In the **DHCP Subnet** form, enter the subnet name, IP address and bit mask.
- 4. In the **DHCP Static IP** form, program a static IP address for the E2T using the information in Table 6 below (skip this step for the 100-user Controller).

Option ID	Value	Notes/Example
Name	Name of E2T	
Subnet	Subnet of E2T	Select subnet.
IP Address	IP address of E2T	162.168.1.5
Protocol	"BOOT or DHCP"	
Hardware Addre	SS:	
Туре	MAC Address	
Other - Type	n/a	
Address	MAC address of Controller (found on back)	00:12:3a:4b: c5:67
Other - Address Length	n/a	
Client ID	n/a	

Table 6. E2T Static IP Address Programming

5. In the **DHCP IP Address Range** form, program the scope using the information in Table 7 below.



Note: The following IP addresses are reserved for the ASUs:

192.168.10.1 to 192.168.10.3 192.168.11.1 to 192.168.11.3 192.168.12.1 to 192.168.12.3 192.168.13.1 to 192.168.13.3

Table 7. IP Address Range (Scope) Programming

Option ID	Value	Notes/Example
Name of the range		
Subnet		Select subnet.
IP Range Start ^a	Start of scope	192.168.1.15
IP Range End ^a	End of scope	192.168.1.25
Protocol	"BOOT or DHCP"	
Client's class ID must match name	Clear checkbox.	
Lease Time	2 Weeks	

a. Cannot be modified once form is saved.

 In the DHCP Options form, program the options listed in Table 8 below for the scope you just programmed.

Table 8. Mitel DHCP Options

Option ID	Value	Notes/Example
128	Usually the Controller IP Address	168.192.1.2
129	Usually the Controller RTC IP Address	168.192.1.3
130	MITEL IP PHONE	
132	VLAN ID (optional)	2
133	Priority (optional)	6

7. In the **DHCP Server** form, enable the Controller's internal DHCP server.

Next: Go to "Verify the Operation of the Controller" below.

Verify the Operation of the Controller

This procedure verifies that the Controller is operating correctly before connecting it to the network.

- 1. On the PC, go to ESM and open the System Administration Tool.
- In the Maintenance and Diagnostics section, open the System Hardware Profile folder, and verify the information in the forms is correct, including the IP address of the E2T.
- 3. In the **Maintenance and Diagnostics** section, open the **Alarm Details** form.
- Verify that the following alarms do not appear (if you get an alarm, go to "Troubleshooting Alarms" on page 159):
 - E2T Com
 - DSP

The following steps are optional:

- Connect two IP Phones directly to one of the Controller's Ethernet ports (for a 100-user Controller, you must use a Layer 2 switch for these steps).
- Program the IP Phones (see the System Administration Tool Online Help for details).
- Make a call from one phone to the other, and verify that the alarms in Step 4 above do not appear in the Alarm Details form.
- 8. Remove the IP Phones from the Controller.

Next: Go to "Configure the Layer 2 switch" below.

Configure the Layer 2 switch

The 3300 ICP requires a Layer 2 switch between its Controller and the network.

1. Connect an Ethernet cable between the Layer 2 switch on your network and the leftmost available Ethernet port on the 3300 Controller.

If you are installing a 100-user system, move the PC Ethernet connection from the Controller to one of the Layer 2 switch input ports, and connect the Layer 2 switch to the leftmost Ethernet port of the Controller.



Note: You can do the same for a 250- and a 700-user system, if desired.

2. Program the Layer 2 switch with the appropriate settings (see Appendix A on page 215 for examples).



Note: Typically, access ports are used to connect the Layer 2 switch to the Controller, and trunk ports to connect the Layer 2 switch to the IP Phones.

See your IT administrator for information on setting up and programming a DHCP server. We recommend that you only use the Controller's internal DHCP server to provide a static IP address to the E2T, and an external DHCP server for all other equipment.



Note: See TSB #58004933 for information on programming 3300 DHCP settings on a Windows 2000 DHCP server.

 If you are not using the Controller's DHCP server, disable the Controller's DHCP server in the DHCP Server form (System Administration section, DHCP folder). OR

Next: Go to "Installing Service Units" below.

Installing Service Units

This section contains detailed information on installing Service Units and other adjunct equipment of the 3300 ICP.

Overview

Install the Service Units required for your system. See the appropriate sections for details.

- Installing 3300 Network Service Units (page 29)
- Installing 3300 Analog Service Units (page 44)
- Installing Peripheral Units (page 48)
- Installing SUPERSET HUBs (page 60)
- Installing Digital Service Units (page 63)

Next: Go to ""Installing Phones and Peripherals" on page 80".

Installing 3300 Network Service Units

You can install any of the following Network Service Units (NSUs):

- NSU (MSDN, PRI/QSIG, T1D4)
- R2 NSU
- BRI NSU

You can double the number of NSUs in a system by chaining secondary NSUs to the (primary) NSUs connected to the Controller (one secondary NSU per primary NSU). BRI NSUs cannot be chained.

Some NSUs required the ISDN Maintenance and Administration Tool (IMAT). When directed, see "IMAT" on page 35 for details.

Install an NSU

The steps below apply to all NSUs, except the BRI NSU. See "Install a BRI NSU" on page 34 for information on installing a BRI NSU.

- 1. Mount and secure the NSU in the desired location.
- Set the L0/L1 port DIP switches to the appropriate termination mode and impedance (see Table 9 and Table 10 on page 32). The default is network termination mode. See Appendix D on page 237 for the location of these switches.
- 3. Set the Message Link DIP switch to the appropriate position. See Appendix D on page 237 for the location of the Message Link switch.
 - For a primary NSU (connected directly to the Controller), set the switch to 1 (up).
 - For a secondary NSU (connected to another NSU), set the switch to 2 (down).
- 4. Connect a fiber optic cable between the NSU FIM and the Controller FIM.

If you are installing a Secondary NSU, connect a crossover CAT5 cable between CIM 1 of the secondary NSU and CIM 2 of the primary NSU (see Table 11 on page 33 for CIM pinout).

- Connect the NSU L0 and/or L1 port to the remote system (the PSTN or another system). See Table 10 on page 32 for the pinout.
- 6. For the PRI/QSIG R2 NSUs:
 - a. Connect the Maintenance PC to the NSU (for Windows 95/98, see page 36; For Windows 2000, see page 40).
 - b. Install IMAT on the Maintenance PC (see "To Install IMAT" on page 36).

7. Connect power to the NSU.



Note: The unit will be in an abnormal operation mode until all the programming is complete.

- 8. Using ESM, program the NSU settings on the Controller:
 - a. Program the Network Services Unit Configuration form (System Configuration section, Units/Modules folder). See the Online Help for more information.



Note: See Appendix D on page 237 for the location of the Controller Modules, ports and cabinets.

- b. Program the following forms in the Digital Trunk folder (System Configuration section, Trunks folder). See Table 12 on page 33 and the Online Help for more information.
 - Link Descriptor Assignment
 - Digital Link Assignment
 - MSDN-DPNSS-DASSII Trunk Circuit
 Descriptor Assignment
- For the PRI/QSIG R2 NSUs, program the NSU using IMAT (see "To Start IMAT" on page 43). See the IMAT Online Help for more information.

Next: Install any other required Service Unit (see "Overview" on page 29). If all the Service Units are installed, go to "Installing Phones and Peripherals" on page 80.

DIP Switch	Function	Settings	Notes
1	Tx Ground	Down: Ground Up: Floating	Set to up.
2	Rx Ground	Down: Ground Up: Floating	Set to up.
3	E1 Twisted Pair cable selector (RJ-45, PRI)	Down: Enabled Up: Disabled	120 ohm impedance
4	T1 cable selector (T1/D4)	Down: Enabled Up: Disabled	100 ohm impedance
5	E1, co-ax cable selector (R2)	Down: Enabled Up: Disabled	75 ohm impedance
6	Line/Network Termination selector	Down: Line Up: Network	

Table 9. NSU L0/L1 DIP Switch Settings

Table 10.NSU Pinouts for Line/NetworkTermination

Pin	Line Termination Mode	Network Termination Mode
1	Tx Ring	Rx Ring
2	Tx Tip	Rx Tip
3	Unused	Unused
4	Rx Ring	Tx Ring
5	Rx Tip	Tx Tip
6	Unused	Unused
7	Unused	Unused
8	Unused	Unused

	ASU)		
Pin	Signal	Pin	Signal
1	RX+	5	Not used
2	RX-	6	TX-
3	TX+	7	Not used
4	Not used	8	Not used

Table 11. CIM Connector Pinout (Controller, NSU & ASU)

Table 12.NSU Trunk Type ProgrammingInformation

NSU	Protocol	Link Descriptor (Integrated Access)	MSDN Trunk Circuit Descriptor Type
Universal	T1/E1 PRI/QSIG	ISDN Node	Universal T1
T1/E1			Universal E1
Universal T1	T1 E&M	T1D4	Universal T1
Universal	T1/E1 MSDN	DPNSS	Universal T1
T1/E1			Universal E1
R2	R2	ISDN Node	R2

Install a BRI NSU

The BRI NSU is connected to the Controller via a Universal NSU.

To install a BRI NSU

The BRI NSU connects to a Universal E1 MSDN NSU.



Note: Ensure the Universal E1 NSU is programmed before connecting the BRI NSU to it.

- 1. Mount the BRI NSU.
- Connect the BRI NSU L0/L1 ports to the Universal NSU L0/L1 ports (Table 9 and Table 10 on page 32).



Note: A Category 5 connection from the 3300 BRI NSU E1 port to a 3300 Universal NSU that is running E1 DPNSS. E1 connections as TX and RX pairs in RJ-45. Option to ground one side of TX and or RX (using DIP switch) to use with coax adapter.

- Connect the BRI NSU to the remote system (the PSTN or another system). See Table 14 on page 35 for the pinout.
- 4. Connect the BRI NSU to the Maintenance PC:
 - a. Connect the RS-232 port (RJ-45 connector) on the BRI NSU to a serial port on the Maintenance PC.
 - b. Set up the communications program on COM port
 1 or 2 with the following parameters:

Baud Rate	9600	Stop Bits	1
Data bits	8	Flow Control	None
Parity	None	Character Set	ASCII

Table 13. PC-to-BRI NSU Serial Settings

- 5. Power up the BRI NSU.
- On the Maintenance PC, program the BRI NSU using the VT-100 emulator. See TSB #58004741 for more information.

Next: Install any other required Service Unit (see "Overview" on page 29). If all the Service Units are installed, go to "Installing Phones and Peripherals" on page 80.

Pin	Signal	Pin	Signal	Pin	Signal
1	Т0	6	T6	11	T10
26	R0	31	R6	36	R10
2	T1	7	T7	12	T11
27	R1	32	R7	37	R11
3	T2	8	T8	13	T12
28	R2	33	R8	38	R12
4	T4	9	T8	14	T13
29	R4	34	R8	39	R13
5	T5	10	Т9	15	T14
30	R5	35	R9	40	R14

Table 14.	BRI Connector	Pinout (Am	phenol 25-p	oin)
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IMAT

The ISDN Maintenance and Administration Tool (IMAT) is a software tool used to program the PRI/QSIG variant Universal NSU and the R2 NSU. You can install IMAT on the Maintenance PC or on its own PC (IMAT PC).



Note: We strongly suggest that you use a non-networked computer (a Windows 95/98 networked computer may have difficulties communicating with Dial-up Networking).

IMAT Installation Overview

- 1. Install IMAT on the IMAT PC (page 36).
- 2. Connect the Maintenance PC to the NSU:
 - For Windows 95/98, see below.
 - For Windows 2000, see page 40.

For information on opening and using IMAT, see page 43.

To Install IMAT

- 1. Close all the applications running on the Maintenance PC.
- Insert the 3300 ICP software CD-ROM in the CD drive.
- 3. Open the **Tools** folder, then the **Disk 1** folder.
- 4. Double click the **Setup.exe** file. The installation program starts. Follow the prompts to install IMAT.

To Connect a Windows 95/98 Maintenance PC to an NSU



Note: You can also connect the Maintenance PC to the NSU via a modem (remote connection). For more information, see the IMAT Online Help.

Install a Direct Connection Device Driver on Windows 95/98

By default, Windows does not support a direct cable connection. You must add a device driver. Windows takes the information from a Mitel file and creates the driver called NT Direct Connection.

- 1. Click the Start button, select Settings, then Control Panel.
- 2. Double-click the **Modems** icon:
- 3. In the Modem Properties window, click Add.
- 4. In the Install New Modem screen, click Other.
- 5. Select **Don't detect my modem, I will select from a list**, then click **Next**.
- 6. Click Have Disk.
- 7. Type c:\Program Files\Mitel\Imat in the Copy manufacturer's files from field, then click OK.
- 8. In the Install from Disk window, click **OK**.

- 9. Click Next to select the NT Direct Connection.
- 10. Select COM 1 or COM 2, and then click Next.
- 11. Click Finish.
- 12. In the Modem Properties window, select **NT Direct Connection**, then click **Properties**.
- 13. Set the following parameters:

Windows 95/98		
Setting Name	Value	
Maximum speed	38 400	
Only connect at this speed	Select	
Data bits	8	
Parity	None	
Stop bits	1	
Mode	Auto Answer (in Advanced Settings).	
Error control	Clear if you have a direct connect cable.	
Flow Control	Clear if you have a direct connect cable.	

Table 15.Direct Connection Driver Settings for
Windows 95/98

14. Click **OK** and close the Control Panel window.

Connect the Maintenance PC to an NSU

15. Connect an RS-232 straight DTE serial cable between the NSU's serial port and the PC's serial port.



Note: If you are connecting through a modem, use a null modem adapter on the NSU side.

Create a Dial-Up Network Connection on Windows 95/98

Typically, you will want to follow this procedure twice to create two Dial-up Networking connections, one for on-site direct access, and one for remote modem access.

- 16. Click the **Start** button, select **Programs**, **Accessories**, then **Dial-Up Connections**.
- 17. Double-click Make New Connection.
- Enter an appropriate name for the connection (for example, Direct for direct connections, Remote or a customer's name for remote connections) and click Next.



Note: If you are creating a direct connection, make sure NT Direct Connection is listed in the drop-down list in the Make a New Connection window.

19. Enter an Area Code and Telephone Number and select a Country Code from the drop-down list. Click Next.



Note: Even though it is not needed for a direct connection, Windows requires that you enter this information.

- 20. Click Finish.
- 21. Right-click your new connection icon and click **Properties**.
- 22. Click **Configure**. Ensure the fields are set as follows:
 - Data bits: 8
 - Parity: none

For a direct connection:

- Maximum speed: 38400
- Check: only connect at this speed
- Select wait for dial tone before dialing
- Select cancel the call time at 60 seconds.

Click Advanced and turn off error control and flow control

For a remote connection:

- Stop bits: 1
- Click Advanced and turn on error control and select Compress data.
- Turn on flow control and select Hardware.

23. Click OK.

- Select Server Types tab and make sure that PPP: Windows, WindowsNT3.5, Internet or PPP:Internet appears in the Type of Dial-Up Server field.
- 25. In the Advanced Options field, select Log onto Network and Enable software compression.
- 26. Make sure that only **TCP/IP** is selected in the **Allowed network protocols** field.
- 27. Select the Scripting tab and enter:
 - for a 3300 Universal NSU: c:\program files\mitel\ Imat\pridun.scp.
 - for an R2 NSU: c:\program files\mitel\Imat \r2dun.scp.

28. Click **OK**.

To Connect a Windows 2000 Maintenance PC to an NSU



Note: You can also connect the Maintenance PC to the NSU via a modem (remote connection). For more information, see the IMAT Online Help.

Install a Direct Connection Device Driver on Windows 2000

By default, Windows does not support a direct cable connection. You must add a device driver. Windows takes the information from a Mitel file and creates the driver called NT Direct Connection.

- 1. Click the **Start** button, select **Settings**, then **Control Panel**.
- 2. Double-click the Phone and Modem Options icon.
- 3. Select the Modem tab. Click Add.
- 4. Click Other on the Install New Modem screen.
- 5. Select **Don't detect my modem**, I will select it from a list, then click Next.
- 6. In the Modems field, select **Communications cable between two computers**, then click **Next**.
- 7. Select COM 1 or COM 2, then click Next.
- 8. Click Finish.
- 9. The COM Port will be displayed in the Phone and Modem Options window, Modems tab. Select the COM Port and then click **Properties**.
- 10. From the **Maximum Port Speed** drop-down menu, select 38400.
- 11. In the Communications cable between two computers, select the **Advanced** tab, and then click **Change Default Preferences**.

- 12. From the **Port speed** drop-down list select **38400**, and then from the **Flow control** list select **None**.
- 13. Select the **Advanced** tab. From the drop-down menus, set the fields as follows:
 - Data bits: 8
 - Parity: none
 - Stop bits: 1
- 14. Click **OK** and close the Control Panel window.

Connect the Maintenance PC to an NSU

15. Connect an RS-232 straight DTE serial cable between the NSU's serial port and the PC's serial port.



Note: If you are connecting through a modem, use a null modem adapter on the NSU side.

Create a Dial-Up Network Connection on Windows 2000

Typically, you will want to follow this procedure twice to create two Dial-up Networking connections, one for on-site direct access, and one for remote modem access.

- 16. Click the Start button, select Programs, Accessories, Communications, then Dial-Up Connections.
- 17. Double click Make New Connection, and then click Next.
- 18. Select **Dial-up to the Internet**, and then click **Next**.
- 19. Select I want to set up my Internet connection manually, or I want to connect through a local area network (LAN). Click Next.
- 20. Select I connect through a phone line and a modem, and then click Next.

- 21. Use the COM Port that has been configured as a NULL Modem connection: 38400, 8, none, 1.
- 22. In the Choose Modem box, from the drop-down list select Communications cable between 2 computers. Click Next.
- 23. Clear the box Use area code and dialing rules, and then click **Advanced**.
- 24. For the Connection type, select **PPP (Point to Point Protocol)**.
- 25. For the Logon procedure, select **Use logon script**, and then click **Browse**. Select the appropriate script (see below), click **OK**, then **Next**.
 - for PRI/QSIG: c:\program files\mitel\lmat\ pridun.scp.
 - for R2: c:\program files\mitel\lmat\r2dun.scp.
- 26. In the Internet account logon information box, leave the username and password fields blank and then click **Next**.
- 27. Dialog boxes appear that warn you that you will not be able to connect to your Internet service provider without your user name and your password. Disregard these warnings and click **Yes** on these boxes to continue.
- 28. Enter the Connection name, and then click Next.
- 29. In the box to set up an Internet mail account, select No, and then click Next.
- 30. De-select the option to connect to the Internet immediately, then click **Finish**.
- 31. In the Network and Dial-up Connections window, right-click on the new DUN connection, point to **Properties**, then click **Configure**.
- 32. From the Maximum speed (bps) drop-down list, select **38400** for the baud rate.

33. Click **OK** until you exit the windows.

To Start IMAT

- 1. Start IMAT (ignore any message about username configuration error).
- 2. In the File menu, select Connect to Remote Site.
- 3. In the **Dial-Up Entry** box, select the connection name you entered when creating the dial-up network connection.
 - For Windows 95/98, see Step 18 on page 38.
 - For Windows 2000, see Step 28 on page 42.

Note: The R2 NSU does not require a password.

- Ensure that the correct option (PRI CARD, R2 CARD, etc.) is selected under Remote ISDN System.
- 5. Click Connect.
- 6. In the Connected to remote site window, click OK.

To close IMAT:

- a. Save any open databases.
- b. In the File menu, click Exit.

Installing 3300 Analog Service Units

Install an ASU

This procedure applies to both the ASU and the Universal ASU. You can connect up to four ASUs or Universal ASUs to the Controller.



Note: Ensure that there is a free CIM port on the Controller.



Note: The following IP addresses are reserved for the ASUs:

192.168.10.1 to 192.168.10.3 192.168.11.1 to 192.168.11.3 192.168.12.1 to 192.168.12.3 192.168.13.1 to 192.168.13.3

- 1. Mount the ASU.
- Connect a Cross-over Category 5 cable with RJ-45 connector to the CIM port on the ASU and a free CIM port on the Controller (see Table 11 on page 33).



Note: The 3300 Universal ASU can be located up to 30 meters (98.4 feet) away from the 3300 Controller. The interface employs a single standard 8-pin modular jack consisting of 2 balanced signal pairs and is located on the front of the unit.

- 3. Complete telephony cabling (see Table 16 on page 46).
- 4. For the Universal ASU, complete the Music on Hold and Paging cabling if required (see Table 17 and Table 18 on page 47).
- 5. Connect power to the ASU.

Once the CIM link synchronizes, the CIM LEDs turn on. The Controller detects the ASU, and the application software downloads and starts immediately.



Note: The unit will be in an abnormal operation mode until all the programming is complete.

- Using ESM, program the ASU settings on the Controller. See the System Administrator Tool Online Help for more information.
 - a. Program the Analog Services Unit Configuration form (System Configuration section, Units/Modules folder). See the Online Help for more information.



Note: See Appendix D on page 237 for the location of the Controller Modules, ports and cabinets.

- b. Program the applicable forms in the Analog Trunk folder (System Configuration section, Trunks folder). See the Online Help for more information.
- c. Universal ASU only: In the **Miscellaneous Assignment** form (**System Configuration** section, **Music on Hold** folder), program the virtual circuit for the Tip/Ring pair used for Music on Hold.
- d. Universal ASU only: In the Loudspeaker Paging Assignment form (System Configuration section, Loudspeaker Paging folder), program the zone and virtual circuit for the Tip/Ring pairs used for Paging.

Next: Install any other required Service Unit (see "Overview" on page 29). If all the Service Units are installed, go to "Installing Phones and Peripherals" on page 80.

Pin	Color Code	ASU	Universal ASU ^a
26/1	W/BL, BL/W	ONS Ring/Tip 1	ONS Ring/Tip 1
27/2	W/O, O/W	ONS Ring/Tip 2	ONS Ring/Tip 2
28/3	W/G, G/W	ONS Ring/Tip 3	ONS Ring/Tip 3
29/4	W/BR, BR/W	ONS Ring/Tip 4	ONS Ring/Tip 4
30/5	W/S, S/W	ONS Ring/Tip 5	ONS Ring/Tip 5
31/6	R/BL, BL/R	ONS Ring/Tip 6	ONS Ring/Tip 6
32/7	R/O, O/R	ONS Ring/Tip 7	ONS Ring/Tip 7
33/8	R/G, G/R	ONS Ring/Tip 8	ONS Ring/Tip 8
34/9	R/BR, BR/R	ONS Ring/Tip 9	ONS Ring/Tip 9
35/10	R/S, S/R	ONS Ring/Tip 10	ONS Ring/Tip 10
36/11	BK/BL, BL/BK	ONS Ring/Tip 11	ONS Ring/Tip 11
37/12	BK/O, O/BK	ONS Ring/Tip 12	ONS Ring/Tip 12
38/13	BK/G, G/BK	ONS Ring/Tip 13	ONS Ring/Tip 13
39/14	BK/BR, BR/BK	ONS Ring/Tip 14	ONS Ring/Tip 14
40/15	BK/S, S/BK	ONS Ring/Tip 15	ONS Ring/Tip 15
41/16	Y/BL, BL/Y	ONS Ring/Tip 16	ONS Ring/Tip 16
42/17	Y/O, O/Y	ONS Ring/Tip 17	LS Ring/Tip 1
43/18	Y/G, G/Y	ONS Ring/Tip 18	LS Ring/Tip 1-1
44/19	Y/BR, BR/Y	ONS Ring/Tip 19	LS Ring/Tip 2
45/20	Y/S, S/Y	ONS Ring/Tip 20	LS Ring/Tip 1-2
46/21	V/BL, BL/V	ONS Ring/Tip 21	LS Ring/Tip 3
47/22	V/O, O/V	ONS Ring/Tip 22	LS Ring/Tip 1-3
48/23	V/G, G/V	ONS Ring/Tip 23	LS Ring/Tip 4
49/24	V/BR, BR/V	ONS Ring/Tip 24	LS Ring/Tip 1-4
50/25	V/S, S/V	N/C	N/C

Table 16. ASU 25-Pair D-Type Connector Pinout

a. The LS Ring/TIP 1-n connectors are only used in specific countries. They are not used in North America.

Table 17. Universal ASU Music on Hold Connector Pinout

Pin	Signal	Virtual Circuit ^{a,b}
1/2	Tip/Ring 1	n 1 4 1
3/6	Tip/Ring 2	n 1 4 2
4/5	Tip/Ring 3	n 1 4 3
7/8	Tip/Ring 4	n 1 4 4

a. Cabinet Shelf Slot Circuit.

b. CIM 1: n = 2. CIM 2: n = 3.



Note: You only need one Tip/Ring pair to program Music on Hold. The Music on Hold port is an 8-pin connector on the back of the Universal ASU.

Table 18. Universal ASU Pager Connector Pinout

Pin	Signal	Zone	Virtual Circuit ^{a,b}
1/2	Tip/Ring 1	00	n 1 5 1
3/6	Tip/Ring 1-1	00	11151
4/5	Tip/Ring 2	01	n 1 5 2
7/8	Tip/Ring 1-2	01	11152

a. Cabinet Shelf Slot Circuit.

b. CIM 1: n = 2. CIM 2: n = 3.



Note: The Paging port is a standard 8-pin modular RJ-45 connector located on the rear panel of the Universal ASU.

Note: Each paging port has a tip/ring pair for audio (Tip/Ring n) and a second tip/ring pair (Tip/Ring 1-n) contact closures for zone control. The contact closes when paging on zones.

Installing Peripheral Units

Overview

- 1. Unpack, position, and ground the Peripheral Unit (page 48).
- 2. Connect the fiber cable to the node (page 49).
- 3. Install the power converter (page 50).
- 4. Install the Peripheral Interface cards (page 51).
- 5. Cable the node to the MDF (page 52).
- 6. Program the Peripheral Unit (page 59).



Note: For information about removing and replacing the front panel of the cabinet, see "Remove/Install the Front Panel" on page 117.

Next: Install any other required Service Unit (see "Overview" on page 29). If all the Service Units are installed, go to "Installing Phones and Peripherals" on page 80.

Unpack, position, and ground the Peripheral Unit



WARNING:Do not apply power to the Peripheral Unit until the ground cable is installed.

- 1. Remove the peripheral node from its packaging.
- 2. Check the contents against the packing list.
- Visually inspect the node and attached equipment for damage. Repack and return any damaged equipment.
- 4. Position the node.

 Connect an external ground to the ground terminal on the rear panel of the peripheral cabinet. Refer to the Safety Instructions for detailed grounding requirements.

Next: Go to "Connect the fiber cable to the node" below.

Connect the fiber cable to the node

The fiber optic cable connects the FIM in the Controller to the FIM in the Peripheral Unit.

- 1. Review the guidelines for handling fiber optic cable (see Appendix E on page 253).
- Route the fiber optic cable through the cable port at the rear of the peripheral cabinet into the cabinet. Extend the fiber cable approximately 30 cm (1 ft) beyond the front of the cabinet.
- Install a short piece of nylon spiral wrap over the cable at the point where the cable exits the rear of the cabinet.
- Close the sliding cable port door. Ensure that the door closes on the nylon spiral-wrapped section of fiber cable.
- Remove the plastic dust caps from the fiber optic cable and the connector ferrules on the FIM faceplate.
- Plug the fiber connectors into the connectors on the FIM faceplate. The fiber connectors have a small key that must be aligned with a slot on the FIM connectors. Lock each connector into position by pushing the metal collar forward and clipping it onto the FIM connector.

Next: Go to "Install the power converter" below.

Install the power converter



WARNING:Danger to personnel and/or equipment damage could result if the cabinet is not powered off during installation of the AC power converter.

 At the rear of the cabinet, remove the two screws that fasten the internal AC power cord access cover plate to the backplane, and remove the cover plate (see Figure 6 below).

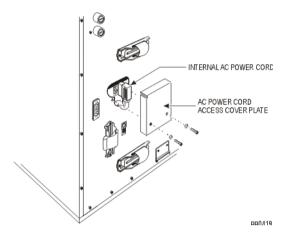


Figure 6. Peripheral Unit AC Power Cord Access

- 2. Ensure that the switch on the power converter faceplate is set to off (0).
- 3. Unpack and inspect the power converter.
 - Unpack the power converter and remove all packing materials.
 - Inspect the power converter to ensure that the unit is not dented or scratched, and that all fittings are secure.

- 4. Install the power converter:
 - Slide the power converter into position (slots 13-15).
 - Move the card latches to the vertical position to secure the power converter.
- Plug the internal AC power cord from the power distribution unit (PDU) into the power converter through the access cutout in the backplane.
- Replace the internal AC power cord access cover plate over the access cutout in the backplane, and replace the two screws.

Next: Go to "Install the Peripheral Interface cards" below.

Install the Peripheral Interface cards

CAUTION: To prevent static damage to electrical components, ensure that the system is grounded before you install the cards. Whenever you handle circuit cards, wear an anti-static strap.

- 1. Install the peripheral switch controller card in slot 16 (Appendix D on page 237 for slot locations).
- Set the E&M Trunk Card settings and the OPS Line Card Message Waiting Switches in the Peripheral Unit Specifications section.
- 3. Check the connector pins to be certain that they are straight.
- 4. Slide the card into the slot.
- 5. Push the upper and lower latches away from you until they are vertical and the card is locked in place.

Next: Go to "Cable the node to the MDF" below.

Cable the node to the MDF

Cable the lines and trunks from the Peripheral Unit to the Main Distribution Frame (MDF) by using the Peripheral Interface Cabling Tables (see "Peripheral Unit Cabling" on page 54).

Next: Power up the Peripheral Unit, then install any other required Service Unit (see "Overview" on page 29). If all the Service Units are installed, go to "Installing Phones and Peripherals" on page 80.

About Peripheral Interface Cabling

Peripherals equipment (stations, SUPERSET telephones, trunks, etc.) are connected to the relevant interface circuits of the system via a cross-connect field.

Peripheral Interface cards, situated in slots 1 through 12, are connected to the cross-connect field by a maximum of eight 25-pair cables (customer-supplied) per Peripheral Unit. Cables terminate at the node on 50-pin plugs, J1 through J8, with the number of cables being dependent on the quantity and type of interface cards installed in the node.

Plugs J1 through J8 are hardwired to backplane connectors in slots 1 through 12 to form four slot groups, each comprising three adjacent cards and each associated with a pair of plugs. Two adjacent slot groups are shown in Backplane Connector Arrangements. The circuits of interface cards contained in a slot group are evenly distributed to the relevant pair of plugs, such that, half the circuits of each card in a group are connected to the odd-numbered plug and half to the even-numbered plug. Peripheral Wiring (Backplane) details the hardwire connections between one slot group and the associated plugs. The wiring sequence is identical for the remaining three slot groups.

Cable jacks (P1 through P8), are customer-supplied and should be labeled at time of installation. P1 through P8 are secured to J1 through J8 with hook and loop type fasteners. Equipment that is external to the system (i.e., system to cross-connect field cables and cross-connect field hardware) is not supplied by MITEL. Therefore, the type of equipment used and the layout of the cross-connect field cables is at the discretion of the installation company. Installation information for such equipment must be obtained from the equipment manufacturer.

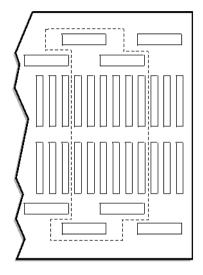
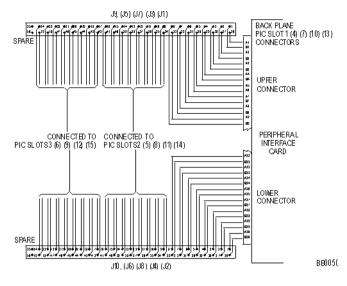


Figure 7. Peripheral Unit Backplane Connector Arrangements

BB0565





Peripheral Unit Cabling

Use the appropriate tables to cable the Peripheral Unit card connectors to the main distribution frame.



Note: When cabling the SX-2000[®] MICRO LIGHT node connectors, use the cabling tables that correspond to the Peripheral Interface card slot in the node.

Connectors for customer supplied 25-pair cables terminating on peripheral backplane (to MDF) and SFT unit (to MDF) use AMP Champ or equivalent cable connectors:

- 50-pin RS (receptacle screw lock)
- female
- screw lock
- 90 tapered slide-on hood.

Table 19 (page 56), Table 20 (page 57) and Table 21 (page 58) show the pinout signals of the interface cards as they appear on J1 through J8. The following abbreviations are used in the tables:

- ONS L C: ONS line card and ONS CLASS/CLIP line card
- OPS L C: OPS line card
- LS/GS Trunk: Loop Start/Ground Start Trunk card
- E&M Trunk: E&M trunk card
- DID/LT Trunk: direct inward dialing/loop tie trunk card
- DID/2 Trunk: direct inward dialing
- COV L C: SUPERSET 4 line card
- DNI L C: digital network interface line card.

Peripheral Backplane Plugs	Pin	Color Code	ONS L C	OPS L C	LS/GS Trunk	E&M Trunk	DID/LT Trunk	DID/2 Trunk	COV L C	DNI L C
	26	W/BL	1T	1T	1T	1T	1T	1T	1T	1T
	1	BL/W	1T	1R	1R	1R	1R	1R	1R	1R
	27	W/O	2T	1MWB	1T(MR)	1T1			2T	2T
	2	O/W	2R	1MWA	1R(MR)	1R1			2R	2R
	28	W/G	3T	2T	2T	1E	2T	2T	3T	3T
P1 (slot 1)	3	G/W	3R	2R	2R	1SG	2R	2R	3R	3R
	29	W/BR	4T	2MWB	2T(MR)	1M			4T	4T
P3 (slot 4)	4	BR/W	4R	2MWA	2R(MR)	1SB			4R	4R
P5 (slot 7)	30	W/S	5T	3T	3T	2T		3T	5T	5T
F 5 (SIUL 7)	5	S/W	5R	3R	3R	2R		3R	5R	5R
P7 (slot 10)	31	R/BL	6T	3MWB	3T(MR)	2T1			6T	6T
(0.01.10)	6	BL/R	6R	3MWA	3R(MR)	2R1			6R	6R
	32	R/O	7T	4T	4T	2E		4T		7T
	7	O/R	7R	4R	4R	2SG		4R		7R
	33	R/G	8T	4MWB	4T(MR)	2M				8T
	8	G/R	8R	4MWA	4R(MR)	2SB				8R
	26	W/BL	9T	5T	5T	3T	3T	5T	7T	9T
	1	BL/W	9R	5R	5R	3R	3R	5R	7R	9R
	27	W/O	10T	5MWB	5T(MR)	3T1			8T	10T
	2	O/W	10R	5MWA	5R(MR)	3R1			8R	10R
	28	W/G	11T	6T	6T	3E	4T	6T	9T	11T
P2 (slot 1)	3	G/W	11R	6R	6R	3SG	4R	6R	9R	11R
	29	W/BR	12T	6MWB	6T(MR)	3M			10T	12T
P4 (slot 4)	4	BR/W	12R	6MWA	6R(MR)	3SB			10R	12R
P6 (slot 7)	30	W/S	13T	7T	7T	4T		7T	11T	13T
10(30(7)	5	S/W	13R	7R	7R	43R		7R	11R	13R
P8 (slot 10)	31	R/BL	14T	7MWB	7T(MR)	4T1			12T	14T
	6	BL/R	14R	7MWA	7R(MR)	4R1			12R	14R
	32	R/O	15T	8T	8T	4E		8T		15T
	7	O/R	15R	8R	8R	4SG		8R		15R
	33	R/G	16T	8MWB	8T(MR)	4M				16T
	8	G/R	16R	8MWA	8R(MR)	4sb				16R

Table 19. Card Slots 1, 4, 7 and 10 Connections to
Cross-Connect Field

Peripheral Backplane Plugs	Pin	Color Code	ONS L C	OPS L C	LS/GS Trunk	E&M Trunk	DID/LT Trunk	DID/2 Trunk		DNI L C
	34	R/BR	1T	1T	1T	1T	1T	1T	1T	1T
	9	BR/R	1T	1R	1R	1R	1R	1R	1R	1R
	35	R/S	2T	1MWB	1T(MR)	1T1		1	2T	2T
	10	S/R	2R	1MWA	1R(MR)	1R1		1	2R	2R
	36	BK/BL	3T	2T	2T	1E	2T	2T	3T	3T
P1 (slot 2)	11	BL/BK	3R	2R	2R	1SG	2R	2R	3R	3R
	37	BK/O	4T	2MWB	2T(MR)	1M			4T	4T
P3 (slot 5)	12	O/BK	4R	2MWA	2R(MR)	1SB			4R	4R
P5 (slot 8)	38	BK/G	5T	3T	3T	2T		3T	5T	5T
F 5 (SIUL 0)	13	G/BK	5R	3R	3R	2R		3R	5R	5R
P7 (slot 11)	39	BK/BR	6T	3MWB	3T(MR)	2T1			6T	6T
(,	14	BR/BK	6R	3MWA	3R(MR)	2R1			6R	6R
	40	BK/S	7T	4T	4T	2E		4T		7T
	15	S/BK	7R	4R	4R	2SG		4R		7R
	41	Y/BL	8T	4MWB	4T(MR)	2M				8T
	16	BL/Y	8R	4MWA	4R(MR)	2SB				8R
	34	R/BR	9T	5T	5T	3T	3T	5T	7T	9T
	9	BR/R	9R	5R	5R	3R	3R	5R	7R	9R
	35	R/S	10T	5MWB	5T(MR)	3T1			8T	10T
	10	S/R	10R	5MWA	5R(MR)	3R1			8R	10R
	36	BK/BL	11T	6T	6T	3E	4T	6T	9T	11T
P2 (slot 2)	11	BL/BK	11R	6R	6R	3SG	4R	6R	9R	11R
	37	BK/O	12T	6MWB	6T(MR)	3M			10T	12T
P4 (slot 5)	12	O/BK	12R	6MWA	6R(MR)	3SB			10R	12R
P6 (slot 8)	38	BK/G	13T	7T	7T	4T		7T	11T	13T
1 0 (3101 0)	13	G/BK	13R	7R	7R	43R		7R	11R	13R
P8 (slot 11)	39	BK/BR	14T	7MWB	7T(MR)	4T1			12T	14T
- (14	BR/BK	14R	7MWA	7R(MR)	4R1			12R	14R
	40	BK/S	15T	8T	8T	4E		8T		15T
	15	S/BK	15R	8R	8R	4SG		8R		15R
	41	Y/BL	16T	8MWB	8T(MR)	4M				16T
	16	BL/Y	16R	8MWA	8R(MR)	4sb				16R

Table 20. Card Slots 2, 5, 8 and 11 Connections to Cross-Connect Field

Peripheral Backplane Plugs	Pin	Color Code	ONS L C	OPS L C	LS/GS Trunk	E&M Trunk	DID/LT Trunk	DID/2 Trunk	COV L C	DNI L C
	42	Y/O	1T	1T	1T	1T	1T	1T	1T	1T
	17	0/Y	1T	1R	1R	1R	1R	1R	1R	1R
	43	Y/G	2T	1MWB	1T(MR)	1T1			2T	2T
	18	G/Y	2R	1MWA	1R(MR)	1R1			2R	2R
	44	Y/BR	3T	2T	2T	1E	2T	2T	3T	3T
	19	BR/Y	3R	2R	2R	1SG	2R	2R	3R	3R
P1 (slot 3)	45	Y/S	4T	2MWB	2T(MR)	1M			4T	4T
	20	S/Y	4R	2MWA	2R(MR)	1SB			4R	4R
P3 (slot 6)	46	V/BL	5T	3T	3T	2T		3T	5T	5T
P5 (slot 9)	21	BL/V	5R	3R	3R	2R		3R	5R	5R
F 5 (SIUL 9)	47	V/O	6T	3MWB	3T(MR)	2T1			6T	6T
P7 (slot 12)	22	O/V	6R	3MWA	3R(MR)	2R1			6R	6R
(0.00	48	V/G	7T	4T	4T	2E		4T		7T
	23	G/V	7R	4R	4R	2SG		4R		7R
	49	V/BR	8T	4MWB	4T(MR)	2M				8T
	24	BR/V	8R	4MWA	4R(MR)	2SB				8R
	50	_	_	_	_	Spare	—	—	-	—
	25		_	—	_	Spare	—		_	—
	42	Y/O	9T	5T	5T	3T	3T	5T	7T	9T
	17	0/Y	9R	5R	5R	3R	3R	5R	7R	9R
	43	Y/G	10T	5MWB	5T(MR)	3T1			8T	10T
	18	G/Y	10R	5MWA	5R(MR)	3R1			8R	10R
	44	Y/BR	11T	6T	6T	3E	4T	6T	9T	11T
	19	BR/Y	11R	6R	6R	3SG	4R	6R	9R	11R
P2 (slot 3)	45	Y/S	12T	6MWB	6T(MR)	3M			10T	12T
	20	S/Y	12R	6MWA	6R(MR)	3SB			10R	12R
P4 (slot 6)	46	V/BL	13T	7T	7T	4T		7T	11T	13T
P6 (slot 9)	21	BL/V	13R	7R	7R	43R		7R	11R	13R
F0 (SIUL 9)	47	V/O	14T	7MWB	7T(MR)	4T1			12T	14T
P8 (slot 12)	22	O/V	14R	7MWA	7R(MR)	4R1			12R	14R
(48	V/G	15T	8T	8T	4E		8T		15T
	23	G/V	15R	8R	8R	4SG		8R		15R
	49	V/BR	16T	8MWB	8T(MR)	4M				16T
	24	BR/V	16R	8MWA	8R(MR)	4sb				16R
	50	—	_	—	—	Spare	—	—	—	—
	25	—	—	—	—	Spare	—	—	—	—

Table 21. Card Slots 3, 6, 9 and 12 Connections to
Cross-Connect Field

Program the Peripheral Unit

1. Power up the Peripheral Unit.



Note: The unit will be in an abnormal operation mode until all the programming is complete.

- 2. Using ESM, program the Peripheral Unit settings on the Controller.
 - a. Program the forms in the Peripheral/DSU Unit folder (System Configuration section, Units/Modules folder). See Table 22 below and the Online Help for more information.



Note: See Appendix D on page 237 for the location of the Controller Modules, ports and cabinets.

Table 22. Peripheral Unit Programming Settings

Cabinet	n (starts at 6)
Shelf	1
Slot	17

b. If required, program the applicable forms in the Analog Trunks folder (System Configuration section, Trunks folder). See the Online Help for more information.

Next: Install any other required Service Unit (see "Overview" on page 29). If all the Service Units are installed, go to "Installing Phones and Peripherals" on page 80.

Installing SUPERSET HUBs

Overview

There are two basics steps in installing a SUPERSET HUB:

- Install the Peripheral Slot FIM Carrier (page 60)
- Install the SUPERSET Hub (page 61)



Note: When installing the SUPERSET HUB in an enclosed rack, you **must** provide adequate ventilation to ensure that the maximum ambient temperature inside the rack does not exceed 40°C (104°F).



Note: When mounting the HUB in a rack, ensure that there is no uneven mechanical loading. Uneven mechanical loading can cause hazardous conditions.



Note: When using the HUB in a rack, consider the connection of the equipment to the supply circuit, and the effect that overloading of circuits might have on over-current protection and supply wiring. Consider the HUB's ratings label.



Note: You can upgrade or replace the Fiber Interface Module in a SUPERSET HUB (see Chapter 3 on page 83).



WARNING: This product uses a Class 1 LED. Fiber optic sources emit infrared radiation. This radiation is invisible to the human eye, and can damage the retina. NEVER look directly into the end of a fiber optic cable that you suspect is energized by a fiber optic source.

CAUTION: When working with raw fiber optic cables, be aware of fiber ends and slivers which can puncture the skin and cause irritation.

Install the Peripheral Slot FIM Carrier

- 1. Attach an anti-static wrist strap.
- Remove the Peripheral Slot FIM Carrier from its packaging, and inspect it to ensure that it is not damaged.

- 3. Remove the Peripheral Cabinet front and rear panels.
- 4. Slide the Peripheral Slot FIM Carrier partway into the first available slot from the right.
- 5. Remove the black plastic dust caps from the fiber optic cable connectors and from the connector ferrules on the faceplate of the FIM.
- Connect the fiber optic cables to the connectors on the FIM via the fiber optic access port on the rear of the cabinet.



Note: The fiber optic cable connectors have a small key that you must align with a slot on the FIM connectors. Lock each connector into position by pushing its metal collar forward and clipping it onto the FIM connector.

- 7. Push the Peripheral Slot FIM Carrier fully into the slot and secure it with the card latch.
- 8. Remove the anti-static wrist strap.
- 9. Route the fiber optic cables from the Peripheral Cabinet to the SUPERSET HUB.
- 10. Replace the Peripheral Cabinet front and rear panels.

Next: Go to "Install the SUPERSET Hub" below.

Install the SUPERSET Hub

- 1. Attach the rubber feet to the base of the unit.
- If required, secure the mounting brackets to the SUPERSET HUB case by using the holes appropriate to the selected mounting position and install the unit in an equipment rack or mount the unit on a wall.
 - The side that contains the row of RJ-45 connectors faces the front when the unit is rack-mounted or the top when the unit is wall-mounted. If you are wall-mounting the unit, use wall anchors that are appropriate for the wall type.

- Use # 12 screws that are at least 0.8 cm (1.5 in.) long, and ensure that the screws are not fully tightened so that the unit may be easily removed (without the use of a tool) for servicing.
- 3. Ensure that the ventilation holes are not blocked.
- 4. Remove the black plastic dust caps from the fiber optic cables and from the connector ferrules on the unit.
- 5. Connect the fiber optic cables from the Peripheral Slot FIM Carrier in the Peripheral Cabinet to the connectors on the SUPERSET HUB unit.
- 6. Connect the RJ-45 connectors to the UTP distribution panel according to the building-wiring plan.
- 7. Connect the power cable to a convenient wall socket.
 - The wall socket is the main disconnect device and must, therefore, be installed near the unit and be easily accessible.



Note: The unit will be in an abnormal operation mode until all the programming is complete.

8. Program the SUPERSET HUB as a DNI Line Card in the slot where the Peripheral Slot FIM Carrier is inserted.

Next: Install any other required Service Unit (see "Overview" on page 29). If all the Service Units are installed, go to "Installing Phones and Peripherals" on page 80.

Installing Digital Service Units

Overview



WARNING: Do not apply power to the equipment at any time during equipment installation.

- 1. Unpack, position, and ground the DSU Node (page 63).
- 2. Connect the fiber cable to the DSU (page 64).
- 3. Install a DSU card (page 65).
- 4. Install the interface assembly on cards (page 66).
- 5. Program the DSU (page 79).

Next: Install any other required Service Unit (see "Overview" on page 29). If all the Service Units are installed, go to "Installing Phones and Peripherals" on page 80.

Unpack, position, and ground the DSU Node

CAUTION: Do not open or unpack any printed circuit board cartons at this time.

CAUTION: Ensure that you use the Cabinet Stacking Brackets if you want to stack cabinets on top of each other. Stacking cabinets without these brackets could result in damage to the equipment or injury.

- 1. Open the DSU node carton.
- 2. Remove the plastic bag from the top and sides of the cabinet. Lift the DSU node out of the carton.
- Check that the node and all attached equipment are undamaged. Repack and return any damaged equipment.
- 4. Place the node in its assigned position.

5. Remove the DSU node front panel.

Next: Go to "Connect the fiber cable to the DSU" below.

Connect the fiber cable to the DSU

The fiber optic cable connects the FIMs in the 3300 Controller to the FIMs in the DSU node.

- 1. Review the guidelines for handling fiber optic cable (see Appendix E on page 253).
- Route the fiber optic cable through the sliding cable port at the rear of the DSU cabinet into the cabinet. Extend the fiber cable approximately 30 cm (1 ft) beyond the front of the cabinet.
- Install a short piece of nylon spiral wrap over the cable at the point where the cable exits the rear of the cabinet.
- 4. Close the sliding cable port door. Ensure that the door closes on the nylon spiral-wrapped section of fiber cable.
- 5. Remove the plastic dust caps from the fiber optic cable and the connector ferrules on the FIM faceplate.
- Plug the fiber connectors into the connectors on the FIM faceplate. The fiber connectors have a small key that must be aligned with a slot on the FIM connectors. Lock each connector into position by pushing the metal collar forward and clipping it onto the FIM connector.

Next: Go to "Install a DSU card" below.

Install a DSU card

CAUTION: To prevent static damage to electrical components, ensure that the system is grounded before you install a card. Whenever you handle circuit cards, wear an anti-static strap.

- Before installing a BRI Card, see "Install the BRI Card" on page 67.
- Before installing a Formatter Card (CEPT, DS1), see "Install the Formatter Cards (CEPT, DS1)" on page 69.
- Before installing a PRI Card, see "Install the PRI" on page 73.
- Before installing a Peripheral Resource Card, see "Install the Peripheral Resource Card" on page 75.
- Before installing an R2 Card, see "Install the R2 Card" on page 76.

To install a DSU Card

- 1. Ensure that the FIMs are installed and cabled
- 2. Connect the power cord to the external ac power source.
- 3. Attach the anti-static strap to your wrist.
- 4. Unpack the card and inspect it to ensure that it is not damaged.
- Insert the card into the slot that corresponds to the appropriate interface assembly, and close the locking latches.

Next: Go to "Install the interface assembly on cards" below.

Install the interface assembly on cards

The Interface Assembly attaches to the following cards:

- BRI Interface Assembly card (see "Install the BRI Card" on page 67).
- DS1/T1 Formatter II cards (see "To Install the DS1 interface assembly and cabling" on page 70).
- CEPT Formatter II cards (see "To Install the CEPT interface assembly and cabling" on page 72).
- PRI card (see "Install the PRI" on page 73).
- R2 card (see "Install the R2 Card" on page 76).

To install an DSU Interface Assembly

- 1. Attach the anti-static strap to your wrist.
- 2. Unpack the Interface Assembly and inspect it to ensure that it is not damaged.
- 3. At the rear of the cabinet, locate the slot in the DSU cabinet that corresponds to the slot that you will use for the PRI, BRI, R2, CEPT, or DS1/T1 cards.
- 4. Remove the blanking plate from the selected slot.
- Using the screws that secured the blanking plate, mount the Interface Assembly extension bracket on the selected slot. The closed side of the extension bracket must be to the left when viewed from the rear of the cabinet.
- 6. Insert the Interface Assembly. Ensure the edge connector on the card aligns with the connector on the backplane of the system.
- 7. Secure the Interface Assembly to the extension bracket with the screws provided.

Next: Go to "Program the DSU" on page 79".

Install the BRI Card

Before you install the BRI card, ensure that:

- The configuration includes a CEPT Formatter card that has an unused hybrid circuit (one Rx/Tx pair) configured with DPNSS protocol
- The system has a free DSU slot for the BRI card
- The wiring from the Network Termination Terminal Equipment (NTTE), Network Termination 1 (NT1), or terminating equipment is Cat 5 UTP
- A computer is available for use as maintenance PC.

BRI Card Installation Overview

Install the BRI card as follows:

- 1. Using ESM, program the customer data in the 3300 ICP.
- 2. Install the BRI interface assembly (see "Install the interface assembly on cards" on page 66).
- 3. Install the BRI card ("Install a DSU card" on page 65).
- 4. Connect the terminal equipment (see below)

Next: Go back to "Install a DSU card" on page 65".

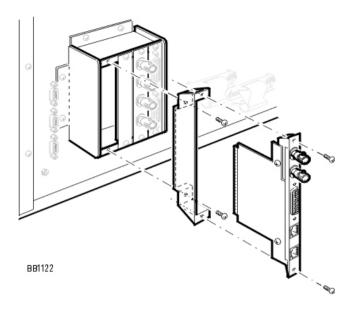


Figure 9. installing the BRI Interface Assembly

To connect the terminal equipment to the BRI card:

- Using a BNC to BNC cable, connect the Rx port on the BRI interface assembly to the Tx port on the CEPT interface assembly.
- Using a BNC to BNC cable, connect the Tx port on the BRI interface assembly to the Rx port on the CEPT interface assembly.
- Using the 44-pin D-type to Amphenol cable, connect the ISDN BRI port on the BRI interface assembly to the distribution frame, RJ45 patch panel, or network terminating rack. (See tables for the cable pinout; 6 circuit and 15 circuit)

Installation

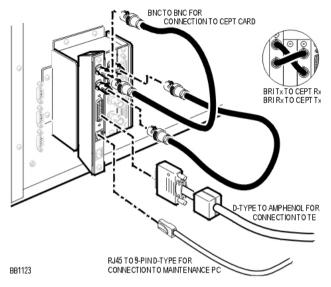


Figure 10. Connecting the Terminal Equipment to the BRI Card

Install the Formatter Cards (CEPT, DS1)

The CEPT DS1/T1 Formatter cards are installed in any empty DSU slot. The DSU cabinet supplies the power for the card and provides a message interface back to the control cabinet through the FIM interface and the fiber optic cable.

Formatter Cards Installation Overview

Install a Formatter card as follows:

- 1. Using ESM, program the Card Assignment with CEPT Formatter or DS1 Formatter cards.
- 2. Install the Formatter Card Interface Assembly:
 - DS1: see "To Install the DS1 interface assembly and cabling" below.
 - CEPT: see "To Install the CEPT interface assembly and cabling" on page 72.

- 3. Install the Formatter Card ("Install a DSU card" on page 65).
- 4. Test the Formatter Card (see "To Test a Formatter Card" on page 73).

Next: Go back to "Install a DSU card" on page 65".

To Install the DS1 interface assembly and cabling

If you install a DS1 Card, you must also install the appropriate DS1 Interface Assembly and connect the external cables.

The DS1 Interface Assembly provides two filtered DB-15 pin connectors for the external cables required by one DS1 Formatter Card. You can mount up to four DS1 Interface Assemblies in he DSU.

- 1. Attach the anti-static strap to your wrist.
- 2. Unpack the DS1 Interface Assembly. Inspect it to ensure that it is not damaged.
- 3. Locate the slot in the DSU that corresponds to the DSU slot that holds the DS1 Formatter card.
 - When you are facing the rear panel, the DSU slots, from right to left, correspond to DSU slots n/1/2 to n/1/5 (where n is the Controller cabinet number).
- 4. Remove the cover plate from the slot on the metal box by unscrewing the two screws that hold it in place.
- Insert the DS1 Interface Assembly into the empty slot in the DSU box, and plug it into the DIN connector in the back of the DSU box.
- 6. Align the screw holes on the DS1 Interface Assembly faceplate with the screw holes in the metal box, and fasten the faceplate to the box.



Note: The Interface Assembly faceplate may have an extension.

 Connect the 22 AWG (22 IWG) shielded twisted pair cables from the external network to the connectors (DB-15, RJ-45 or co-axial) on the DS1 Interface Assembly (see Table 23 and Table 24 below).

Pin	Color Code	Description
1/9	W/O, O/W	Tx Tip/Ring
2/4	W/G, G/W	Frame Ground
3/11	W/BL, BL/W	Rx Tip/Ring
Others		Unused

Table 23. DS1 DB-15 Connector Pinout

Table 24.DS1 Pinouts for Line/NetworkTermination

Pin	Line Termination Mode	Network Termination Mode
1	Tx Ring	Rx Ring
2	Tx Tip	Rx Tip
3	Unused	Unused
4	Rx Ring	Tx Ring
5	Rx Tip	Tx Tip
6	Unused	Unused
7	Unused	Unused
8	Unused	Unused

- 8. Remove the DS1 Formatter Card.
- 9. Set the DS1 Formatter card line equalizer switches (S1 and S2).
- 10. Re-install the DS1 Formatter card.
- 11. Remove the anti-static strap from your wrist.

Next: Go back to ""Install the interface assembly on cards" on page 66".

To Install the CEPT interface assembly and cabling

This procedure provides instructions on installing a CEPT Interface Assembly or a CEPT Interface Assembly II and Cables:

If you install a CEPT Formatter card, you must also install a CEPT Interface Assembly and connect the cables.

The CEPT Interface Assembly provides four filtered BNC connectors for the external cables required by one CEPT Formatter card. Each CEPT Interface Assembly plugs into a J3 DIN 3 X 32 connector. These connectors are located in a 9 cm x 12.5 cm (3.5 inch x 5 inch) metal box that projects from the backplane.

- 1. Attach the anti-static strap to your wrist.
- Unpack the CEPT Interface Assembly. Inspect it to ensure that it is not damaged.
- Set the CEPT Interface Assembly jumpers to the desired positions.
- 4. Locate the slot in the DSU box that corresponds to the DSU slot that holds the CEPT Formatter card.
 - When you are facing the rear panel, the DSU box slots, from right to left, correspond to DSU slots n/1/2 to n/1/5 (where n is the Controller cabinet number).
- Remove the cover plate from the slot on the metal box by unscrewing the two screws that hold it in place.
- Insert the CEPT Interface Assembly into the empty slot in the DSU box, and plug it into the DIN connector in the back of the DSU box.
- 7. Align the screw holes on the CEPT Interface Assembly faceplate with the screw holes in the metal box, and fasten the faceplate to the box.

- 8. Connect the cables from the external network to the BNC connectors on the CEPT Interface Assembly.
- 9. Remove the anti-static strap from your wrist.

Next: Go back to ""Install the interface assembly on cards" on page 66".

To Test a Formatter Card

If the installation is successful, the card will boot up.

- 1. Inspect the LEDs on the faceplate to verify that the card is functioning. See Faceplate LEDs.
- In the System Administration Tool, Maintenance and Diagnostics, use the STATE command to verify that the trunks associated with the corresponding channels are all in IDLE State.

Next: Go back to ""Install the interface assembly on cards" on page 66".

Install the PRI

The following section describes how to install the PRI card and PRI interface assembly. You will need to program the PRI card into the 3300 ICP database to allocate links and trunks.

The PRI card is installed in any empty DSU slot. The DSU cabinet supplies the power for the card and provides a message interface back to the control cabinet through the FIM interface and the fiber optic cable.

PRI Installation Overview

Install the PRI card in the following sequence:

- 1. In ESM, program the customer data in the 3300 ICP.
- Configure the card for Line Side or Trunk Side termination ("To configure the R2 card for Line Side or Trunk side termination:" on page 77).

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- 3. Install the interface assembly (see "Install the interface assembly on cards" on page 66).
- 4. Install the PRI card (see "Install a DSU card" on page 65).
- 5. Configure the IMAT database.
- 6. Connect the IMAT PC to the PRI card (see "IMAT" on page 35).
- 7. Save the IMAT database onto the PRI card.
- 8. Connect the PRI card to the ISDN network (see below).

Next: Go back to "Install a DSU card" on page 65".

To connect the PRI card to the network:

- 1. Unpack and inspect the ISDN PRI cables. Retain the original package.
- 2. Plug the ISDN PRI cable into the PRI port.
- 3. Plug the ISDN PRI cable into the network terminating equipment.



Note: A dual-port card needs two ISDN PRI cables if you are using both ports.

To Install for PRI QSIG

To install and configure the PRI Card in the DSU as a PRI/QSIG variant, see "Installing 3300 Network Service Units" on page 29, and follow the steps for installing as a PRI/QSIG variant.

These are the steps that are required for installation and programming:

- 1. Connect a computer to the PRI card.
- 2. Install a Direct Connection Device Driver on a computer.
- 3. Create a Dial-up Network connection on your computer.
- 4. Connect the computer to the PRI Card.
- 5. Use the IMAT Tool to complete required PRI configuration.
- 6. Connect the PRI Card to the ISDN network.

Install the Peripheral Resource Card

Each FIM in the DSU must have a Peripheral Resource Card (PRC) installed above it.

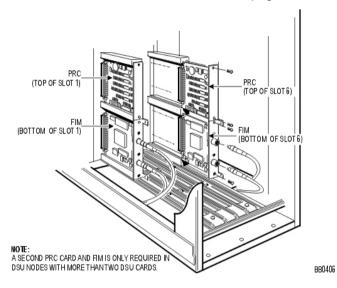


WARNING: Power must not be applied to the Peripheral Unit while you are installing the Peripheral Resource card.

To install a PRC in a DSU:

- 1. Unpack the PRC.
- 2. Slide the PRC into the top of slot 1 until it connects firmly with the backplane.
- 3. Fasten the PRC in place using the two screws provided, or use the latches on the card guides.

4. If a second PRC is required, install it in the same manner in the top of slot 6.



Next: Go back to "Install a DSU card" on page 65".

Figure 11. Installing a Peripheral Resource Card

Install the R2 Card

The R2 card is installed in any empty DSU slot. The DSU cabinet supplies the power for the card and provides a message interface back to the control cabinet through the FIM interface and the fiber optic cable.

The following section describes how to install the R2 card and R2 interface assembly. You will need to program the R2 card into the 3300 ICP database to allocate links and trunks.

R2 Card Installation Overview

Install the R2 card in the following sequence:

- 1. In ESM, program the customer data in the 3300 ICP.
- 2. Configure the card for Line Side or Trunk Side termination (see below).
- 3. Install the interface assembly (see "Install the interface assembly on cards" on page 66).
- 4. Install the R2 card ("Install a DSU card" on page 65).
- 5. Configure the IMAT database (see below).
- Connect the computer to the R2 card (see "IMAT" on page 35).
- 7. Save the IMAT database onto the R2 card.
- Connect the R2 Card to the PSTN network (see page 78 below).

Next: Go back to "Install a DSU card" on page 65".

To configure the R2 card for Line Side or Trunk side termination:

- 1. Attach the anti-static strap to your wrist.
- Unpack the R2 card and inspect it to ensure that it is not damaged.
- Ensure the jumper block covers the NT position for the Trunk Side termination and the LT position for Line Side termination.
- Set the termination impedance switch of the line to the up position for 120 ohms or down for 75 ohms.

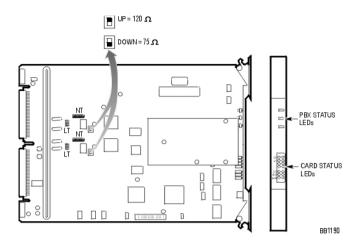


Figure 12. Setting R2 Card Termination Impedance

To connect the R2 card to the network:

- 1. Unpack and inspect the R2 coaxial cables.
- 2. Plug the R2 cable into the R2 port.
- 3. Plug the R2 cable into the network terminating equipment.



Note: A dual-port card needs two coaxial cables if you are using both ports.



Note: The R2 coaxial cables have both transmit (arrow pointing away from cable) and receive (arrow pointing towards cable) connectors. When you set the card for trunk side termination (jumper at NT position), connect the R2 coaxial cable transmit lead to the network receive connector, and the R2 coaxial receive lead to the network transmit connector. When you set the card for line side termination (jumper at LT position), connect the R2 coaxial cable transmit lead to the network transmit connector, and the R2 coaxial receive lead to the network receive connector.

Pin	Function
1, 2	ТХ
4, 5	RX

Table 25. R2 Card RJ-45 Connector Pinout

Program the DSU

1. Power up the DSU.



Note: The unit will be in an abnormal operation mode until all the programming is complete.

- 2. Using ESM, program the DSU settings on the Controller.
 - a. Program the forms in the Peripheral/DSU Unit folder (System Configuration section, Units/Modules folder). See Table 26 below and the Online Help for more information.



Note: See Appendix D on page 237 for the location of the Controller Modules, ports and cabinets.

Table 26. Peripheral Unit Programming Settings

Cabinet	n (starts at 6)
Shelf	1
Slot	17

b. If required, program the applicable forms in the Digital Trunks folder (System Configuration section, Trunks folder). See the Online Help for more information.

Next: Install any other required Service Unit (see "Overview" on page 29). If all the Service Units are installed, go to "Installing Phones and Peripherals" on page 80.

Installing Phones and Peripherals

This section contains information on installing telephone sets, consoles, and other peripherals.

The 3300 ICP supports a number of IP, DNI, analog and wireless phones, as well as conference units, programmable key modules and operator consoles.

Installing Phones

Refer each phone's Installation Guide (included in the phone's package) to install the phones.

Programming Phones

In ESM, enter the required programming and registering information in the applicable forms in the **Devices** folder (**System Configuration** section). See the Online Help for more information.

Next: When all the Phones and Peripherals are installed and programmed, go to "Programming Voice Mail" below.

Programming Voice Mail

In ESM, program the required voice mail settings in the **Voice Mail** folder (**System Administration** section). See the Online Help for more information.



Note: These settings will not take effect until you reboot the system in the next section.

Next: When all the voice mail settings are programmed, go to Saving the Settings below.

Saving the Settings

To save the 3300 settings

- 1. From EMS, set the current time and date using the **writedatetime** maintenance command. See the System Administration Tool Online Help for more information.
- From ESM, perform a DBMS save (DBMS Save maintenance command). See the System Administration Tool Online Help for more information.
- 3. Reboot the 3300 by pressing the **Reset** button on the front of the Controller.

The installation is now complete. Verify that the system is operating correctly by performing a Healthy Check (see "Healthy System Checklist" on page 195).

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Chapter 3 Upgrade and FRUs

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About This Chapter

This chapter contains instructions on upgrading a 3300 ICP system, and on replacing Field Replaceable Units.

For information on installing the 3300 ICP, see Chapter 2: "Installation" on page 11.



Note: Before installing a 3300 ICP, always read the Field Change Instructions (FCI) for the software you are installing. The FCI describes software changes, bug fixes, outstanding issues and hardware compatibility issues for the system (see "Getting 3300 ICP Documentation" on page 8).

CAUTION: To prevent ESD damage while handling modules on any unit, always attach the wrist strap from the cabinet being serviced, and immediately place any item removed from a cabinet into an anti-static bag.

This chapter is organized as follows:

Upgrading a 3300 ICP:

- Upgrading to a 300 MHz Controller (page 88)
- Upgrading to 30 Voice Mail Ports (page 89)
- Adding Compression Channels (page 91)
- Upgrading to a 700-User System (page 93)
- Upgrading 3300 ICP Software (page 95)

Replacing FRUs:

- Replacing Controller FRUs (page 109)
- Replacing Peripheral Unit FRUs (page 116)
- Replacing Digital Service Unit FRUs (page 123)

Upgrading a 3300 ICP

Before You Begin

Before starting an upgrade:

- Backup the 3300 ICP system.
- Ensure that the upgrade kit is complete.
- Check each module to ensure that no damage has occurred in transit.
- Make sure you have a Philips screwdriver.

Overview

Use Table 27 below to determine the upgrades options for your system.

Table 27. 3300 Upgrade Options

Upgrade Option	133 MHz Systems		300 MHz Systems ^a			
opgiado option	250-User	700-User	100-User	250-User	700-User	
Upgrading to a 300 MHz Controller (page 88)	\checkmark	\checkmark	_		—	
Upgrading to 30 Voice Mail Ports (page 89)	\checkmark	_			—	
Adding Compression Channels (page 91)	√b	√b	\checkmark	\checkmark	\checkmark	
Upgrading to a 700-User System (page 93)	\checkmark	—	_	\checkmark	—	
Upgrading 3300 ICP Software (page 95)	√c	\checkmark	\checkmark		\checkmark	

a. Requires 3300 ICP software version 3.2 or higher.

- b. Upgrading to 64 compression channels requires a 300 MHz Controller.
- c. If you are upgrading from version 3.0, you must first upgrade to version 3.2.

About the 3300 Controller

For any additional details and information on the Controller, see Appendix D: Hardware Reference (page 237).

Controller Slots Location

pply		SysID		
Power Sup	Slot 1	Slot 2 (Compression DSP)	Slot 3 (Telecom/ Compression DSP)	Slot 4 (Telecom DSP)

Figure 13. Slots Location for 100-User System

Supply	Slot 8 (Telecom DSP)	Slot 7 (Telecom DSP)	Slot 6 (Echo Canceller)	Slot 5 (Echo Canceller)	
er Si	SysID				
Power	Slot 1 (FIM)	Slot 2 (FIM)	Slot 3 (Compression DSP)	Slot 4 (Compression DSP)	

Figure 14. Slots Location for 250- and 700-User Systems

Controller Part Numbers

Table 28 below shows the part numbers for the various versions of Controllers you may encounter:

Table 28. 3300 Controller Versions

Speed	100-User	250-User	700-User
133 MHz	n/a	50001262	50001263
300 MHz	50002211	50002970	50002971



Note: The 133 MHz Controller part numbers shown are for North America only.

Note: New Controllers are always 300 MHz units.

Upgrading to a 300 MHz Controller

If you have a 133 MHz Controller, you can replace it by a 300 MHz Controller (installing 64 compression channels requires a 300 MHz Controller).



Note: See Table 28 above for a list of part numbers for the 133 and 300 MHZ Controllers.

To Upgrade to a 300 MHz Controller

- 1. Power down the old Controller.
- 2. Disconnect all cables from the old Controller.
- 3. Remove the hard drive from the old Controller (see "Replace the Hard Drive" on page 112).
- 4. Install the hard drive in the new Controller (see "Replace the Hard Drive" on page 112).
- Remove the bottom cover of the old Controller (see "Removing/Installing the Controller Cover" on page 110).
- Remove the cover of the new Controller (see "Removing/Installing the Controller Cover" on page 110).
- Remove the System ID Module from the old Controller (see "Replace the System ID Module" on page 113).
- Install the System ID Module in the new Controller (see "Replace the System ID Module" on page 113).
- 9. Reconnect the cables to the new Controller.
- 10. Power up the new Controller.

Upgrading to 30 Voice Mail Ports

You can increase your system capacity from 20 to 30 voice mail ports (100- or 250-user systems) by adding a DSP Module (21161-based) in the Controller.



Note: The 700-user Controller does not need an additional DSP Module to upgrade from 20 to 30 voice mail ports. See "Program the Additional Voice Mail Ports" below to upgrade the 700-user Controller to 30 voice mail ports.

There are two steps to upgrade from 20 to 30 voice mail ports:

- Program the additional voice mail ports in ESM.
- Install the DSP module (100- and 250-user Controllers only).

Before You Begin

The Controller must have the following modules already installed:

Table 29. Voice Mail Upgrade Preconditions

100-User System (300 MHz)	250-User System (133 and 300 MHz)
One RTC processor with embedded E2T.	One RTC.
	One E2T.
One 64-channel echo canceller (embedded).	One 64-channel echo canceller.
One dual FIM.	One dual FIM.
One DSP module for telecom support (21161-based).	One DSP module for telecom support (21061/21161-based).

Program the Additional Voice Mail Ports

- In ESM, change the number of voice mail ports in the Voice Mail Port Capacity form (System Administration section, Voice Mail folder, System Settings folder).
- In ESM, program the following for each new voice mail ports in the Voice Mail Port Assignment form (same location as above):
 - Extension number
 - Interconnect number
- For the 100- and 250-user Controllers, power off the Controller, and continue with "Add a DSP Module for 30 Voice Mail Ports" below.

For the 700-user Controller, reboot the Controller by pressing the **Reset** button.

Add a DSP Module for 30 Voice Mail Ports

- 1. Disconnect all cables from the Controller.
- Remove the Controller cover (see "Removing/Installing the Controller Cover" on page 110).
- Install the new DSP module (see "Install the DSP Module(s)" on page 19). See Table 30 below for installation location.

Table 30. Installing a DSP Module for VoiceMail Ports^a

100-User	250-User
System	System
Slot 3	Slot 7

a. See "About the 3300 Controller" on page 87 for the location of the slots.

- Replace the Controller cover (see "Removing/Installing the Controller Cover" on page 110).
- 5. Reconnect the cables to the Controller.
- 6. Power up the Controller.

Adding Compression Channels

You can add up to 64 compression channels to any system, by adding one or two DSP Modules (21161 based) in the Controller. One DSP Module provides support for 32 compression channels, and two DSP Modules provide support for 64 compression channels (the 100-user Controller supports a maximum of 32 compression channels).



Note: You must purchase compression licenses before adding a DSP Module(s) for compression.



Note: Upgrading to 64 compression channels requires a 300 MHz Controller (see "Upgrading to a 300 MHz Controller" on page 88).

Before You Begin

The system must have the following modules already installed:

Table 31. Compression Channels Upgrade Preconditions^a

100-User System	250-User System	700-User System
One RTC processor (embedded E2T).	One RTC (133 MHz min. for 32 channels, 300 MHz for 64 channels).	
(embedded E21).	One E2T.	
One 64-channel echo canceller (embedded).	One 64-channel echo canceller.	One 128-channel echo canceller.
One dual FIM.	One dual FIM.	Two dual FIMs.
One DSP module for telecom support (21161-based).	One DSP module for telecom support (21061/ 21161-based).	Two DSP modules for telecom support (21061/ 21161-based).

a. See "About the 3300 Controller" on page 87 for the location of the slots.

Add Compression DSP Module(s)

- 1. If you are adding 64 compression channels to a 133 MHz system, first upgrade to a 300 MHz Controller (see "Overview" on page 86).
- 2. Power down the Controller.
- 3. Disconnect all cables from the Controller.
- Remove the Controller cover (see "Removing/Installing the Controller Cover" on page 110).

 Install the new DSP module (see "Replace the MMC Module (DSP, Echo Canceller)" on page 115). See Table 32 below for installation location.

Table 32. Installing Compression DSP Module(s)

100-User System with		250- and 700-User Systems	
20 VM ports	30 VM Ports	32 channels	64 channels
Slot 3	Slot 2	Slot 3	Slots 3 & 4

- Replace the Controller cover (see "Removing/Installing the Controller Cover" on page 110).
- 7. Reconnect the cables to the Controller.
- 8. Power up the Controller.

Upgrading to a 700-User System

You can increase the user capacity of a 250-user system to that of a 700-user system by adding the following modules:

- One Telecom DSP Module (21061/21161 based).
- One Dual FIM Module.
- One 64 Channel Echo Canceller.



Note: A second 64-channel Echo Canceller can be added, or the existing 64-channel Echo Canceller can be replaced by a 128-channel Echo Canceller.



Note: To add compression channels to the upgraded system, see "Adding Compression Channels" on page 91.

Before You Begin

The system must have the following modules already installed:

Table 33. 250- to 700-User Upgrade Preconditions

250-User System
One RTC.
One E2T.
One 64-channel echo canceller.
One dual FIM.
One DSP module for telecom support (21061/21161-based).

Add User Capacity

- 1. Power down the Controller.
- 2. Disconnect all cables from the Controller.
- Remove the Controller cover (see "Removing/Installing the Controller Cover" on page 110).
- 4. Install the new Dual FIM Module (see "Replace the Dual FIM Module" on page 114).

Table 34.Upgrading a 250-User System to
700 Users

DSP Module	Dual FIM	Echo Canceller
Slot 7	Slot 2	Slot 6

- 5. Install the new 21161 DSP Module (see "Replace the MMC Module (DSP, Echo Canceller)" on page 115).
- Install the 64 Echo Canceller Module (see "Replace the MMC Module (DSP, Echo Canceller)" on page 115).

- Replace the Controller cover (see "Removing/Installing the Controller Cover" on page 110).
- 8. Reconnect the cables to the Controller.
- 9. Power up the Controller.

Upgrading 3300 ICP Software

This procedure installs new software on your 3300 Controller to upgrade from a previous version to 3300 ICP version 3.3 software.



Note: If you currently have version 3.0 installed, you must first upgrade it to version 3.2 before upgrading to version 3.3.

A similar Software Install Procedure can be used to rebuild or replace a corrupted database. For this procedure, see "Software Install Procedure" on page 154.

Mitel Options Password

- If you have purchased new options, you need a new Mitel Options Password.
- If you have not purchased new options, you do not need a new Mitel Options Password, unless you are upgrading from Release 3.0.

You must access your Mitel Options Password through Mitel Online (www.mitel.com). This password is required during the upgrade procedure, so you MUST keep a proper record of it. A new password is issued to you if you are purchasing new options. Call Mitel Customer Service during normal business hours prior to attempting the software upgrade to confirm a previous password or to purchase new options and receive a new password.

Java Plug-In

Java Plug-in 1.3.1 comes with the 3300 ICP software. During ESM backup/restore procedures on this software version, the software detects whether the proper version of Java Plug-in (1.3.1) has been installed. If not, it will prompt you to install the correct version with the installation wizard.

Tip: We recommend that you avoid running multiple versions of Java Plug-in. If you are running the incorrect version for the upgrade, you should uninstall it from every PC that is used as an administrator for the 3300 Integrated Communications Platform (ICP) and allow the software to install the correct version during the next backup/restore on each one.

Database backup

During the upgrade procedure, you are instructed to perform a backup of your database. Note that during the first minute of ESM backup, the voice mail system is inaccessible and in Ring-No Answer state. If users are still accessing voice mail when you start the ESM backup, voice mail will remain in Ring-No Answer state until all voice mail users are disconnected from the system. Thus, we strongly recommend that you ensure no one is accessing voice mail before you begin your ESM backup.

To check if voice mail is currently in use, issue the **stat 1 4 27** and **stat 1 4 28** ESM maintenance commands.



Note: We strongly recommend that you ensure the ESM backup file contains voice mail messages before running the upgrade procedure (see Step 13 in "Backing up the database" in the following upgrade procedure).



Note: It is very important to maintain current database backups; backups should be done on a regular basis.

Before you begin

The Installer PC requires the following software and hardware:



Note: You can use the Maintenance PC to install the software, as long as it meets the requirements below.

- Windows NT 4.0 or Windows 2000 operating system
- I.E. browser 5.5 SP2 or later, with 128-bit encryption
- At least 525 MB free hard-drive space
- FTP server (installed with IIS or PWS, for example)
- Ethernet card and a connection to the Mitel Networks 3300 ICP
- RJ45 Ethernet cable
- VT-100 emulator communications program (such as HyperTerminal)
- · Serial connection to the 3300 ICP maintenance port
- Java Plug-in 1.3.1



Note: Windows 95/98 with PWS does NOT include an FTP server application and will not work for the upgrade process unless a third-party FTP server application is used.

You also need

- The IP address of the 3300 ICP
- The customer's 3300 ICP username and password
- The 3300 ICP software CD
- Your 3300 ICP Mitel Options Password



Note: We recommend you delete all voice mails messages in the database. This will greatly reduce its size.

Tip: You can change the following four fields in the License and Option Selection form without a new Mitel Options Password (these fields is a new option for Extended Agent Group):

- Country
- Networking Option
- MiTAI/Tapi Computer Integration
- Extended Agent Group



Time: The complete upgrade/install procedure takes approximately 2 hours and 20 minutes for an average-sized database (50-100 MB) and up to 8 hours for a large database (600 MB).

Upgrade Procedure Overview

The software upgrade procedure consists of the following nine sub-procedures, all of which **must be completed in order**:

- 1. Steps 1-2: Establishing a connection to the 3300 Controller (page 99).
- 2. Steps 3-13: Backing up the database (page 100).
- 3. Steps 14-22: Installing software (upgrading) (page 102).
- 4. Steps 23-28: Rebooting (page 103).
- Steps 29-31: Setting your purchased Mitel options (page 105).
- 6. Steps 32-42: Restoring the database (page 106).
- 7. Step 43-45: Peforming the final reboot
- 8. Steps 46-49: Performing maintenance checks (page 107).
- Steps 50-52: Upgrading IP sets and forcing lease renewals (page 108)

Upgrade the 3300 Software



Note: Ensure that no one else makes changes to the database once you've backed up the database. Any changes not included in your backup/restore will be lost when the system is restored.



Note: If a Security Information Warning pop-up window appears during this procedure, click **Yes** to continue.

Establishing a connection to the 3300 Controller

 Using an RJ45 Ethernet cable, connect your laptop/PC directly to one of the 3300 ICP Ethernet ports, or through the Layer-2 switch (required for the 100-user system).



Tip: Your laptop/PC must be on the same subnet as the RTC IP address; otherwise, a router will be required on your network, and the gateway IP address of that router must be applied to the RTC setup as well as to your laptop/PC. Also make sure that your PC's IP address does not conflict with any other IP addresses.



Tip: Check the FTP site properties and ensure that the FTP username has the proper permissions. If you use another username, make sure that it permits you to access the FTP server in the IIS/PWS-FTP site and also that it is programmed on the RTC (see "Troubleshooting Software Installation and Upgrade" on page 147 for more information).

2. From the Installer PC, ping the 3300 ICP to verify that you have established a connection.

Backing up the database

Back up the 3300 ICP database (including voice mail) to your laptop/PC, using the following procedure:

- 3. Open the System Administration Tool:
 - a. Open Internet Explorer.
 - b. Enter the Controller's IP address in the **Address** field of Internet Explorer, and press ENTER.



Note: The Installer PC must be in the same subnet as the RTC IP (for example, 192.168.1.x).

- c. Enter the ESM login username and password, and click the OK button.
- d. Click the **System Administration Tool** button. The System Adminstration Tool opens.
- Click in the Selection: drop-down menu (where it says [Click here to start]), and select Maintenance and Diagnostics
- 5. Click on the **Back-up** form.
- Read the section, "Trusting the FTP Backup and Restore Applet," and then follow the instructions to copy the **identitydb.obj** file to your PC (if required). Save the file in:
 - For Windows NT: WINNT/Profile/<username>
 - For Windows 2000: Documentation and settings/<username>
- In the section, "Performing the backup", enter the path on your local drive to store the backup (for example, C:\3300_ICP\backup).
- 8. Enter a name for your backup file.

9. Click **Yes** to include the voice mail messages in your backup.



Note: The upgrade will erase the voice mail messages in your system, so you need to back them up **now**. Note that including voice mail messages can significantly increase the backup time.

10. Click **Start Backup**. The system displays progress and, eventually, a back-up complete message.



Note: During a system backup, the 5140 IP Appliance will be unable to access the following applications through the command keys: Online Services, Personal Directory, Bookmarks, and Speed Dials.



Time: The system takes approximately 30 to 90 minutes to back up an average-sized database, and approximately 4 hours to back up a large voice mail database.

- 11. Click OK.
- 12. Verify the presence of the backup file on the local drive.
- 13. Use the following procedure to ensure that your ESM backup file contains your voice mail messages before proceeding with the software installation:
 - Change the backup file name to .tar file (for example, May10 to May10.tar)
 - · Use WinZip to open your renamed .tar file
 - Look for files with the name of 002Vxxxxxx.vox (where xxxxxx is a variable, system-generated, alphanumeric string), which are played and unplayed messages, and 003msgxxxx.vox (where xxxx is the extension number), which contain the status of messages belonging to that extension.

Installing software (upgrading)

- 14. Insert the Mitel Networks 3300 ICP software CD into the CD drive of the installer's PC.
- 15. Run the "Setup.exe" program from the CD. You see the Installation Wizard Welcome page.
- 16. Click Next to continue.
- 17. Read the License Agreement page, and click **Yes** if you wish to continue.
- 18. Ensure that **New Installation** is selected, and click **Next**.
- Choose a location in your local FTP server for the InstallSetup program to install files (normally this is C:\inetpub\ftproot, which is the default FTP home directory for an anonymous user) by completing either of the following steps:
 - Click Browse to find the location, and then click Next to continue. You see a read-only list of the configurations you have made, OR
 - Click **Next** to accept the location displayed and continue. You see a read-only list of the configurations you have made.



Note: If you do not get this list, your FTP server is not installed properly. Re-install your FTP server.



Note: If you do not have an FTP server, install the files in c:\MN3300.

20. Click Next.



Time: The system takes approximately 10 minutes to copy the files to the specified location.

21. Ensure that the **Read manual instructions to complete the installation** check box is selected, and click **Finish**. The **SWinstallGuide.txt** README file opens. 22. From the **SWinstallGuide.txt** file, record the parameters you need to complete Step 27 (or keep the file open until then).

Rebooting

- 23. Launch your VT-100 emulator communications program.
- 24. Type **reboot**, and press ENTER. The Controller reboots.



Tip: You can also reboot by pressing the **Reset** button on the front panel of the 3300 Controller.

25. In the communication program, press a key at the **Press any key to stop auto-boot** prompt. Note that you have 10 seconds to complete this step. If 10 seconds elapse before you press a key, the system will auto-boot.



Tip: If you miss the 10-second timeout, manually reset the controller by pressing the **Reset** button. The RTC opens, and you once again have 10 seconds to complete step 29.

- 26. At [VXWorks Boot] type c, and press ENTER.
- 27. Go through the VxWorks settings (see Table 35 below). For each setting shown in **bold**, enter the value from the **SWinstallGuide.txt** file (see Step 22 above), then press ENTER. For all other settings, press ENTER to accept the default value.



Note: The parameters are case-sensitive.

Prompt	Value	Note
boot device	motfcc	Boot device is Network.
processor number	0	Not used.
host name	bootHost	
file name	Boot_Install	Boot location and file name.
inet on ethernet (e)		IP address and subnet mask (hex) for Controller RTC (for example, 134.199.63.11:ffffff00). Obtain it from your IT administrator.
inet on backplane (b)		
host inet (h)		IP address of Installer PC. Used for software upgrades.
gateway inet (g)		IP address of the end user's default gateway for the 3300 ICP (must be outside the DHCP range).
user (u)	ftp	
ftp password (ftp)	ftp	
flags (f)	0x0	Fixed IP address (0x40 used on E2T for DHCP).
target name (n)		
startup script (s)		
other (o)	motfcc	Other device, E2T using Network boot from.

Table 35. VxWorks Settings

28. At [VXWorks Boot], type @, or press the **Reset** button on the controller.



Time: The system takes approximately 30 minutes to re-format the hard drive and install the software.



Note: If you get an error message see "Troubleshooting Software Installation and Upgrade" on page 147.

Setting your purchased Mitel options

29. Start Internet Explorer, and go to the IP address of the 3300 Controller (for example, http://<RTC IP address>). You see the 3300 ICP ESM login page.



Note: Your laptop/PC must have the same subnet address as the RTC IP (for example, 192.168.1.x, where x is a variable) to launch ESM.

30. Log in to the 3300 ICP ESM using the default username (system) and password (password). You see the 3300 ICP ESM main tools menu.



Tip: If your login fails, it may be because the system is not finished loading. Once you see **Channel 19 initialized** in the RTC (**Channel 29 initialized** if you have 30 voice mail ports), you should be able to log in.

31. Set the options in the License and Option Selection form according to your purchased Mitel options.



Note: Since the installation of new software erases all of your system settings, you must complete this form even if you have not purchased any new options.

To set the options:

- At the main tools menu, click **System Administration Tool**.
- Click in the Selection: drop-down menu, where it says [Click here to start].
- Click System Configuration, click System Capacity, and then click License and Option Selection. You see the License and Option Selection view.
- Click **Change** in the top right corner. You see a pop-up window.
- Click OK to proceed to change your options. (Clicking Cancel will return you to the License and Option Selection view.)

 Enter the purchased system options. Note that you can change the Country, Networking Option, MiTAI/Tapi Computer Integration, and Extended Agent Group fields without a new Mitel Options Password (enable these options as needed).



 Note: In the Configuration Options section, we recommend that you enable Networking Option and Mitai/Tapi Computer Integration.

• Enter your Mitel Options Password, and click **Save**. A pop-up window instructs you, "If you have a database to restore, do that now. If there is no database to restore, reboot now." Click **OK** to close the window, and continue below.



Timer: The system can take up to 3 minutes to save your changes.

Restoring the database

- 32. In the Selection: drop-down menu, click Maintenance and Diagnostics and then click Restore.
- 33. Type the location of the database that is being restored, or use the browse facility.
- 34. Click **Start Restore**. A window warns you that you must manually reboot after a restore and that a restore replaces the current database.
- Click OK. The system will show an "in progress" message and then a "complete" message.
- 36. Click OK.
- 37. Click the Exit button until you are logged out of ESM.
- 38. **Manually** reset the system by pressing the **Reset** button on the 3300 Controller.



Note: The system does not allow you to log in during the restore and reset period. Once the system has completed the restore and reset, you should see "deleting/ipservicesdb.tar" in the RTC. This is a good indication that you can log back in to the 3300 ESM.



Time: The system takes approximately 20 minutes to restore an average-sized database, during which time the files are copied to the 3300 Controller. Once the files have been copied, you must reset the controller. Note that the system can take up to an additional 1 hour to reset.

- 39. When the system has finished resetting, log back in to ESM (using the customer's username and password).
- 40. Click System Administration Tool, click Maintenance and Diagnostics, click Maintenance Commands, then click All.
- 41. Issue the **dbms stat** command to check if the DBMS flag (DBMS_INITIALIZED) is ON.
- 42. Issue the **Type*.dr.logfile_1** command to display the log file created during the Data Restore. Wait until the checks are complete

Peforming the final reboot

- 43. Verify that none of the NSUs are loading. If they are, wait until they have finished loading (L0/L1 LEDs are not marching).
- 44. If you have upgraded from 20 to 30 voice mail ports, program the new voice mail ports.
- 45. Manually reset the controller again to ensure that all the components are properly initialized.

Performing maintenance checks

Do not reset any system components (Controller, NSU, ASU, DSU, Peripheral Unit, and so on) while executing the following checks.

46. When the system has finished resetting, log back in to ESM (using the customer's username and password).

- 47. Click System Administration Tool, click Maintenance and Diagnostics, click Maintenance Commands, then click All.
- 48. Issue the **Type*.dr.logfile_1** command to display the log file created during the Data Restore.
- 49. Issue the **mess sub** command to check the programmed NSU links; they should be OPEN. If any programmed links are in SCAN, check the LINK STATUS LEDs; if the AMBER LEDs are chasing, this means that the NSUs are writing to the RAM DISK.

Upgrading IP sets and forcing lease renewals

- 50. Log back in to ESM and issue the LOAD IPDevice 1 to X (where X represents the last IP device number) to upgrade the IP phones.
- 51. If you have an IP console, you must:
 - Cycle the power on the IP TKB (key pad).
 - Upgrade the IP Console software (if required).
- 52. If the system has a Peripheral Unit with DNI Line cards, we recommend that you issue the **Load x x x** command to load the DNI cards and ensure that the latest DNI line load is loaded.

Replacing FRUs

Overview

This section contains detailed information on replacing the 3300 ICP Field Replaceable Units (FRUs). See Appendix F on page 271 for a list of FRU part numbers.

The section is organized as follows:

- Replacing Controller FRUs (below)
- Replacing Peripheral Unit FRUs (page 116)
- Replacing Digital Service Unit FRUs (page 123)

Replacing Controller FRUs

Overview

The Controller has the following Field Replaceable Units (FRUs):

- Hard Drive (page 112)
- System ID Module (page 113)
- Dual FIM Module (page 114)
- MMC Module (DSP, Echo Canceller) (page 115)

To remove the Controller cover, follow the procedure below.

Removing/Installing the Controller Cover



Note: Ensure that you have read the Safety Instructions before carrying out these procedures ("Important Safety Instructions" on page 4).

CAUTION: To prevent ESD damage while handling modules on any unit, always attach the wrist strap from the cabinet being serviced, and immediately place any item removed from a cabinet into an anti-static bag.

To remove the 3300 ICP Controller cover:

- 1. Turn off the power to the unit.
- 2. Disconnect all cables.
- 3. Remove the 3300 Controller from the rack and place it on a suitable work area.
- 4. Remove the front face-plate (this will clip off).
- 5. Turn the 3300 Controller over gently, keeping the front panel facing forward.
- 6. Remove the two screws from the underside of the 3300 Controller.
- 7. Turn the 3300 Controller the right side up and rotate until the back of the unit is facing forward.
- 8. Remove the two screws from the back panel.
- 9. Slide the cover forward until it catches, then tilt the cover upward to remove it.
- 10. Turn the 3300 Controller until the front panel is toward you.

To Install the 3300 ICP Controller Cover

- 1. Turn the 3300 Controller until the back panel is facing forward.
- 2. Lift the lock for the AC power cord and place the shell at an angle to hook onto the back of the unit.
- 3. Straighten and slide the cover forward as far as it will go.
- 4. Secure the shell by inserting and snugly securing the two screws on the back panel.
- 5. Rotate the 3300 Controller until the front panel is facing forward.
- 6. Turn the 3300 Controller gently upside down.
- 7. Secure the screws on the bottom front of the unit.
- 8. Turn the 3300 Controller right side up.
- 9. Clip on the front face-plate taking care not to damage the protruding FIM connectors.
- 10. Reinstall the 3300 Controller into the rack (if applicable).
- 11. Reconnect all cables.
- 12. Power on the unit.

Replace the Hard Drive



Note: Ensure that you have read the Safety Instructions before carrying out these procedures.



Note: Use this procedure only to replace a Hard Drive in a system that's already installed. To install a Hard Drive in a new system, see "Install the Controller Hard Drive" on page 17.

CAUTION: To prevent ESD damage while handling modules on any unit, always attach the wrist strap from the cabinet being serviced, and immediately place any item removed from a cabinet into an anti-static bag.

To replace the Hard Drive:

- 1. If possible, backup your database (if you can't backup your databse, locate the latest backup you have made).
- 2. Turn off the power to the unit.
- 3. Disconnect all cables.
- 4. Place the 3300 Controller on the work area with the bottom of the unit facing up.
- Remove the old Hard Drive backing plate from the Controller by removing the six (6) smaller border screws (the four larger screws secure the hard drive to the backing plate). Keep the screws.
- 6. Unplug the ribbon cable and the power cable from the old Hard Drive.
- 7. Connect the ribbon cable and power cable to the new Hard Drive.
- 8. Insert the Hard Drive as shown in Figure 15 below.
- 9. Secure the Hard Drive backing plate to the Controller cover using the screws from Step 5.
- 10. Remount the Controller.

- 11. Restore the connections to the Maintenance PC.
- 12. Return power to the Controller but do not connect to the network.
- 13. Install the software in the Hard Drive: see "Upgrading 3300 ICP Software" on page 95 (skip "Backing up the database" on page 100).
- 14. Reconnect the Controller to the network.





Replace the System ID Module

Note: Ensure that you have read the Safety Instructions before carrying out these procedures.

CAUTION: To prevent ESD damage while handling modules on any unit, always attach the wrist strap from the cabinet being serviced, and immediately place any item removed from a cabinet into an anti-static bag.

To replace the System ID Module:

- 1. Turn off the power to the Controller.
- 2. Disconnect all cables.

- Remove the Controller cover (see "Removing/Installing the Controller Cover" on page 110).
- 4. Remove the old System ID Module from the board:
 - 100-user system: the module is located behind slot 2.
 - 250- and 700-user systems: the module is located between Slot 1 (Dual FIM) and Slot 8 (DSP).
- 5. Remove the protective cover from the new System ID Module's connector.
- 6. Install the new System ID Module.
- 7. Secure the new System ID Module using the screw provided with the module.
- Replace the Controller cover (see "Removing/Installing the Controller Cover" on page 110).
- 9. Reconnect all the cables to the Controller.
- 10. Power up the Controller.

Replace the Dual FIM Module



Note: Ensure that you have read the Safety Instructions before carrying out these procedures.

CAUTION: To prevent ESD damage while handling modules on any unit, always attach the wrist strap from the cabinet being serviced, and immediately place any item removed from a cabinet into an anti-static bag.

To replace a Dual FIM Module:

- 1. Turn off the power to the Controller.
- 2. Disconnect all cables.

- 3. Remove the cover (see "Removing/Installing the Controller Cover" on page 110).
- 4. Remove the two Philips screws from the faceplate in slot MMC 2.
- 5. Remove the faceplate.
- 6. Remove the screws and lock washers from the old Dual FIM Module.
- 7. Pull up on the old Dual FIM Module to remove it.
- Remove the new Dual FIM Module from the packaging, line up the connectors and firmly seat it onto the board.
- 9. Secure the new Dual FIM Module onto the board using the screws and lock washers provided.
- 10. Replace the cover(see "Removing/Installing the Controller Cover" on page 110).

Replace the MMC Module (DSP, Echo Canceller)

Note: Ensure that you have read the Safety Instructions before carrying out these procedures.

CAUTION: To prevent ESD damage while handling modules on any unit, always attach the wrist strap from the cabinet being serviced, and immediately place any item removed from a cabinet into an anti-static bag.

To replace an MMC Module:

- 1. Turn off the power to the Controller.
- 2. Disconnect all cables.
- 3. Remove the cover (see "Removing/Installing the Controller Cover" on page 110).
- 4. Remove the screws ad lock washers from the module.

- 5. Pull up on the old MMC Module to remove it.
- 6. Line up the connectors of the new MMC Module, and firmly seat it onto the board.
- 7. Secure the new module onto the board using the screws and lock washers provided.
- 8. Replace the cover (see "Removing/Installing the Controller Cover" on page 110).

Replacing Peripheral Unit FRUs

Overview

The Peripheral Unit has the following Field Replaceable Units (FRUs):

- Circuit Card (page 117)
- Power Converter (page 118)
- Power Distribution Unit (page 120)
- Cooling Fan (page 121)
- FIM (page 122)
- Switch Controller Card (page 123)

To remove the Peripheral Unit Front Panel cover, follow the procedure below.

Remove/Install the Front Panel



Note: This procedure also applies to a Digital Service Unit (DSU).

To remove the front panel from a Peripheral Unit or DSU:

- 1. Insert a screwdriver in the slot on the right side of the front grill and pry it open.
- 2. Loosen the two screws on the front cover and lift the cover up and away from the cabinet.

To replace a front panel on a Peripheral Unit or DSU:

- 1. Align the front panel screws with the holes in the cabinet and tighten the two screws.
- 2. Insert the left front grill into the slot and snap it closed.

Replace the Circuit Card

Note: This procedure also applies to a Digital Service Unit (DSU).

CAUTION: To prevent ESD damage while handling modules on any unit, always attach the wrist strap from the cabinet being serviced, and immediately place any item removed from a cabinet into an anti-static bag.

To remove a Peripheral Unit or DSU circuit card:

- 1. Enter BUSY <PLID of faulty card>, and select the COURTESY DOWN option.
- 2. To confirm that all circuits are in the busy state, enter STATE <PLID of faulty card>.
- 3. Pull the upper and lower latches outward until they are both in the horizontal release position.
- 4. Draw the card toward you.

5. Immediately place the card in an anti-static bag.

To install a Peripheral Unit or DSU circuit card:

- For cards that have switches, refer to the card's hardware description for information about switch settings.
- 2. Check the connector pins to be certain that they are straight.
- 3. Slide the card into the slot.
- 4. Push the upper and lower latches away from you until they are vertical and the card is locked in place.
- 5. To return the circuits to service, enter RTS <PLID>.

Replace the Peripheral Unit Power Converter

- 1. Remove the front panels.
- 2. Power down the node.
- 3. Disconnect the internal AC power cord.
 - Unscrew and remove the cover plate over the internal AC power cord access on the rear of the node (see the figure below).
 - Unplug the internal AC power cord from the rear of the AC power converter (accessed through cutout in the backplane).

- 4. Remove the converter.
 - Move the card latches on the converter to the horizontal position.
 - · Carefully withdraw the converter unit from the shelf.
- 5. Unpack and inspect the converter.
 - Unpack the converter and remove all packing materials.
 - Inspect the converter to ensure that the unit is not dented or scratched, and that all fittings are secure.
- 6. Install a new converter.
 - Slide the replacement converter into position (slots 13 15).
 - Move the card latches to the vertical position to secure the converter.
 - Plug the internal ac power cord from the PDU into the ac power converter, through the cutout in the backplane.
 - Replace the cover plate over the access cutout in the backplane, and fasten in place with the screws removed in step 3.
- 7. Power up the node.
- 8. Replace the front panels.

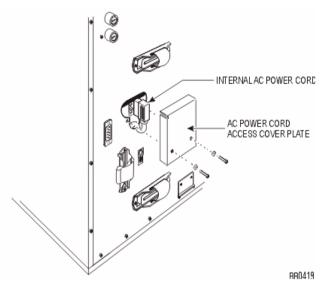


Figure 16. Peripheral Node Power Converter Connections

Replace the Peripheral Unit Power Distribution Unit (PDU)

- 1. Power down the node.
- 2. Remove the front panels.
- 3. Remove the PDU.
 - a. Unplug the external power cord from the PDU.
 - b. Remove the PDU internal power cover plate.
 - c. Unplug the PDU internal power cord from the power converter.
 - d. Remove the outer screws on the PDU faceplate.
 - e. Pull the PDU out until you can access the fan power connector at the rear of the PDU.
 - f. Disconnect the fan power connector and remove the PDU.

- 4. Install a new PDU.
 - a. Unpack and inspect the new PDU for damage.
 - b. Set the power switch on the new PDU to off (O).
 - c. Connect the fan power connector at the rear of the PDU.
 - d. Insert the PDU and replace the outer screws on the PDU faceplate.
 - e. Plug the PDU internal power cord into the power converter.
 - f. Replace the internal power access cover plate.
 - g. Plug the external power cord into the PDU.
- 5. Power up the node.
- 6. Replace the front panels.

Replace the Peripheral Unit Cooling Fan

- 1. Power down the unit.
- 2. Remove the front panels.
- 3. Disconnect the fan assembly.
- 4. Remove the old fan.
- 5. Insert the new fan.
- 6. Replace the fan assembly.
- 7. Replace the front panels and power up the unit.

Replace the Peripheral Unit FIM



WARNING: Power must not be applied to the Peripheral Unit while the Fiber Interface Module is removed or replaced.

- 1. Power down the node.
- 2. Remove the front panels.
- 3. Attach the anti-static strap to your wrist.
- 4. If you need more room, remove the power converter and the PSC.
- 5. Disconnect the fiber cables from the old FIM:
 - Place dust caps on the fiber cable connectors and on the FIM connectors.
 - Remove the cable by sliding it through the cable port at the rear of the cabinet.
- 6. Pull the old FIM out gently from slot 17, unplugging it from the backplane.
- 7. Unpack the new FIM, and inspect it to ensure that it is not damaged.
- 8. Slide the new FIM into the bottom of slot 17 until it connects with the backplane firmly.
- 9. Fasten the new FIM in place with the two screws provided or the latch on the card guides.
- 10. Attach the new FIM cable by following the steps in Connect the Fiber Optic Cable.
- 11. If the PSC and power converter were removed, replace them at this time.
- 12. Power up the node.
- 13. Replace the front panels.

Replace the Peripheral Unit Switch Controller Card

CAUTION: To prevent ESD damage while handling modules on any unit, always attach the wrist strap from the cabinet being serviced, and immediately place any item removed from a cabinet into an anti-static bag.

- 1. Power down the Peripheral Unit.
- 2. Replace the faulty peripheral switch controller card with the new peripheral switch controller card.
- 3. Power up the Peripheral Unit.

Replacing Digital Service Unit FRUs

Overview

The DSU has the following Field Replaceable Units (FRUs):

- Circuit Card (see "Replace the Circuit Card" on page 117)
- BRI Card (page 124)
- Formatter Cards (CEPT, DS1) (page 125)
- PRI (page 125)
- Peripheral Resource Card (page 126)
- FIM (page 126)
- R2 Card (page 128)

To remove the DSU Front Panel cover, see "Remove/Install the Front Panel" on page 117.

Replace the Front Panel

See "Remove/Install the Front Panel" on page 117.

Replace the Circuit Card

See "Replace the Circuit Card" on page 117.

Replace a BRI card

- 1. Remove the cables to the old BRI card.
- 2. Attach the anti-static strap to your wrist.
- 3. Open the latches of the old BRI card, and remove the old BRI card from its slot.
- 4. Unpack the new BRI card and inspect it to ensure that it is not damaged.
- 5. Insert the new BRI card in its slot (the slot that corresponds to the BRI interface assembly), and close the locking latches.
- 6. Reconnect the cables to the new BRI card.

Replace a BRI Interface Assembly

- 1. Attach the anti-static strap to your wrist.
- Open the latches of the BRI card in the Interface Assembly, and remove the BRI card from the assembly. Store the BRI card in anti-static packaging for safekeeping.
- 3. Remove the screws securing the Interface Assembky to the extension bracket.
- 4. Remove the old Interface Assembly from its slot.
- 5. Unpack the new Interface Assembly, and inspect it to ensure that it is not damaged.
- 6. Insert the new Interface Assembly into the slot.
- 7. Secure the Interface Assembly to the extension bracket with the screws from Step 3.

8. Insert the BRI card in the Interface Assembly, and close the latches.

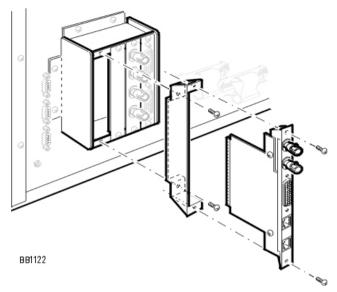


Figure 17. Installing the BRI Interface Assembly

Replace the Formatter Cards (CEPT, DS1)

- 1. Attach the anti-static strap to your wrist.
- 2. Open the old card's locking latches, and remove the old card from its slot.
- 3. Insert the new card into the slot, and close the locking latches.

Replace the PRI card

- 1. Remove the cables from the PRI card.
- 2. Attach the anti-static strap to your wrist.
- 3. Open the locking latches of the old PRI card, and remove the card from its slot.

- 4. Insert the new PRI card into the slot, and close the locking latches.
- 5. Reconnect the cables to the PRI.

Replace a Peripheral Resource Card

- 1. Remove the old Peripheral Resource Card from its slot (remove screws or open the card guide latches).
- 2. Unpack the new Peripheral Resource Card.
- 3. Slide the new Peripheral Resource Card in its slot, and secure it (use screws or close the card guide latches).

Replace the Fiber Interface Module

To replace a FIM in a DSU:

- 1. Power down the node.
- 2. Remove the front panels.
- 3. Attach an anti-static strap to your wrist.
- 4. If you need more room, remove adjoining DSU cards.
- 5. Disconnect the fiber cables from the FIM.
 - Mark the cable connectors so they are replaced correctly on the new FIM.
 - Remove the screws or release the latches on the FIM.
 - Pull the FIM out gently from slot 1 or 6, unplugging it from the backplane.
- 6. Install a new FIM.
 - Slide the new FIM into the bottom slot 1 or 6, seating it firmly.
 - Fasten the screws or release the latches on the FIM.

- Remove the plastic caps from the cable connectors on the FIM faceplate and connect the optical fiber cables to those connectors.
- 7. Replace the DSU cards.
- 8. Power up the node.
- 9. Replace the front panels.

To install a FIM in a DSU Node:



WARNING: Fiber optic sources emit infrared light invisible to the human eye that can damage the retina. Never look directly into a source or into the end of a fiber energized by a source. When working with raw fiber optic cable, be careful of fiber ends or slivers that can puncture the skin and cause irritation.

- 1. Attach the anti-static strap to your wrist.
- Unpack the FIM. Inspect the FIM to ensure that it is not damaged.
- 3. Remove the DSU node front door
 - Pry open the two latches on the right hand side of the black cover panel on the front door, and swing the cover panel off to the left.
 - Loosen the two screws under the black panel to release the front door.
 - Pull the top corners of the front door out and lift it off the lip at the bottom front of the node.
- 4. Remove the DSU cards from the cabinet. Insert each circuit card in a separate anti-static bag.
- Slide the FIM into the bottom slot 1 or slot 6 until it connects with the backplane firmly. Fasten the FIM in place with the two screws provided or use the latch on the card guides. See FIM and PRC Installation in the DSU Node.
- 6. Remove the anti-static strap from your wrist.

Replace the R2 Card

- 1. Remove the cables from the R2 card.
- 2. Attach the anti-static strap to your wrist.
- 3. Open the locking latches of the old R2 card, and remove the card from its slot.
- 4. Note the jumper blocks and impedance switches settings of the old R2 card.

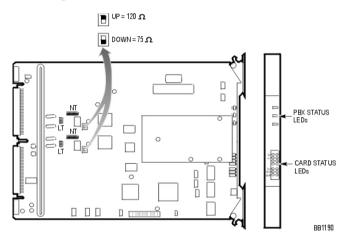


Figure 18. Setting R2 Card Termination Impedance

- 5. On the new R2 card, ensure that the jumper blocks and impedance switches settings match those of the old R2 card (see Step 4 above).
- 6. Insert the new R2 card into the slot, and close the locking latches.
- 7. Reconnect the cables to the new R2 card.

Chapter 4 Programming

Technician's Handbook

About This Chapter

This chapter provides general information on programming the 3300 ICP and its peripheral.

Programming the System

Overview of Programming

- 1. Use the 3300 Configuration Tool. Refer to the 3300 Configuration Tool online help for programming information.
- 2. Use the System Administration Tool. Refer to the System Administration Tool online help for programming information.
- 3. Use IMAT.
- 4. Register the IP telephones.

Program DHCP Options

The following options are required in the DHCP server programming:



Note: To program DHCP on a Windows 2000 server, see TSB #58004933.

- 3 (Router) Default Gateway IP Address
- 6 DNS Server IP Address
- 66 TFTP Server ASCII String format (typically the 3300 ICP Controller)
- 67 TFTP BootFile (ASCII String = /sysro/e2t8260)
- 128 TFTP Server IP address format (typically the 3300 ICP Controller)

- 129 RTC IP address format (typically the 3300 ICP Controller)
- 130 IP phone DHCP Server (ASCII String = MITEL IP PHONE)
- 132 VLAN ID for the voice LAN (Hex 32 bit word, optional)
- 133 Priority, values of 1-7 (Mitel recommends 6; optional).

Using IMAT

The IMAT software is used to program hardware and call characteristics for the NSUs that run PRI or R2 protocols. IMAT is also used to install software upgrades.

Maintenance activities include access to the following R2 maintenance information:

- A list of all software files and versions on the R2 NSU
- Log messages which contain a history of activities and the status of faults
- R2 database.

Use IMAT to backup the database from the R2 NSU, or to upgrade the R2 software on the R2 NSU. For more information, refer to "IMAT" on page 35 and to the IMAT Online Help.

Registering IP Telephones from the Station

This procedure registers the IP devices with the 3300 ICP database. The procedure will program the 3300 ICP database with the MAC address of the IP device.



Note: Use the System Administration Tool to program all other station features (for example, Class of Service, Interconnect Restriction, Set Key Assignments, and Class of Restriction).

Before you begin

- Ensure a Set Registration Access Code is assigned in the System Options Assignment form.
- Ensure the directory number and device type is programmed in the Single Line IP Set Configuration form or Multiline IP Set Configuration form.

Register IP Phones

- 1. Connect the IP telephone to an RJ-45 Ethernet port on the LAN.
- Press * during power-up (to clear any PIN number in memory).
- 3. Type the PIN number at the prompt on the IP device. Prompts are:



Note: The PIN number is the set registration code followed by the set's extension number.

- 5001, 5005 IP Phones: solid message light.
- 5005, 5010, 5020, 5205, 5215, 5220 IP Phones, and 5140, 5240 IP Appliances: display shows Enter the PIN number.
- 4. Complete one of the following:
 - 5001, 5005, 5201 and 5205 IP Phones: press Hold.
 - 5010, 5215, 5020 and 5220 IP Phones: press **SuperKey**.

• 5140 and 5240 IP Appliances: press **OK**. The set will complete initialization.



Note: Use the System Administration Tool to program all other station features (for example, Class of Service, Interconnect Restriction, Set Key Assignments, and Class of Restriction).

When using the 3300 ICP in a cluster, the actual registering sequence of the IP device is unchanged provided the following guidelines have been observed:

- The Cluster Element ID programmed in the Cluster Element Assignment form must match the ICP/PBX Number programmed in the ICP/PBX Assignment form.
- In a clustered environment, each member of the cluster must be able to see the directory numbers programmed on the other controllers. This information is programmed by using OPS manager.
- The Set Registration Access Codes and Set Replacement Access Codes must be the same for each controller in the cluster.
- Each IP Phone must be able to retrieve the IP address of one of the controllers in the cluster (see program DHCP server instructions).



Note: Mitel Networks OPS Manager is required to use 3300 ICP systems in a clustered environment.

Programming the E2T via a Debug Cable

Use the settings in Table 36 below to program the E2T using a debug (Tapi) cable.



Note: Use this table only if you already have a debug cable. The debug cable is not supplied with the 3300 ICP system.

Table 36. Debug Cable E2T VxWorks Settings

Prompt	Value	Note
boot device	motfcc	Boot device is Network.
processor number	0	Not used.
host name	bootHost	
file name	/sysro/E2T8260	Boot location and file name.
inet on ethernet (e)		IP address and subnet mask (hex) for Controller E2T (for example, 134.199.63.11:ffffff00). Obtain it from your IT administrator.
inet on backplane (b)		
host inet (h)		IP address of Controller RTC.
gateway inet (g)		IP address of the end user's default gateway for the 3300 ICP (must be outside the DHCP range).
user (u)	ftp	
ftp password (ftp)	0	
flags (f)	0x0	Fixed IP address.
target name (n)		
startup script (s)		
other (o)		

Technician's Handbook

Chapter 5 Troubleshooting

Technician's Handbook

About This Chapter

This chapter provides standard procedures to troubleshoot the most common possible problems you may encounter with your 3300 ICP equipment. We highly recommend that you go through this chapter before calling Mitel Networks Technical Support.



Note: The maintenance and troubleshooting of your LAN/WAN network maintenance is the responsibility of your network provider. Mitel Networks Product Support can help you isolate minor network problems; for more complex network problems, Mitel Networks Product Support will escalate to Professional Services to assist you (this is a billable service).

This chapter is organized as follows:

- Start Here (page 143)
- Before You Contact Technical Support (page 142)
- Generic Troubleshooting Steps (page 144)
- Troubleshooting Software (page 147)
- Troubleshooting Hardware (page 159)
- Troubleshooting Network (page 169)
- Troubleshooting Phones and Peripherals (page 182)

Tools

Table 37 below lists the tools available to help you troubleshoot a 3300 ICP system.

Tool Name	Location	Function	Applies to
Alarms Detail Form	ESM (Maintenance and Diagnostics).	Provides the definition and location of the alarms.	3300 ICP system.
ESM Logs	ESM (Maintenance and Diagnostics).	Provides a history of the software logs.	3300 ICP software.
IMAT	Maintenance PC.	Used to load a database on the NSU PRI.	PRI/QSIG and R2 NSUs.
Java Console	Console PC	Troubleshoot 5550 IP Console. ^a	5550 IP Console.
LEDs	Front of each unit.	Provide overall status of unit.	3300 ICP hardware.
NSU Shell	NSU Maintenance Port.	Lists NSU error messages.	All NSUs.
Phone Debug Option	IP Phones with display.	Used to: - Monitor the phone settings (press UP/Down arrows together and type debug). - Program a static IP address (see TSB #58004933) - Hard code he connection speed and duplex mode (reboot while pressing 9)	IP Phone with display.

Table 37. Troubleshooting Tools

Tool Name	Location	Function	Applies to
Pstswlogs logviewer	FTP Logs on Controller (ftp from Maintenance PC)	Provide a history of software logs.	3300 ICP software.
RTC Shell	Controller Maintenance Port	Shows any error messages during the installation of the 3300 ICP. Monitors the bootup sequence of the system.	3300 ICP software.
SMDR	Controller (telnet from Maintenance PC).	Provide the call paths (call logs).	3300 ICP system.

Table 37. Troubleshooting Tools (continued)

a. To turn on the Java console: on the IP Console PC, select Start/Settings/Control Panel, and launch Java Plug.

Before You Contact Technical Support

If you cannot find the source of the problem in this chapter, please collect the required information listed in the applicable section(s) **before** calling Mitel Technical Support.

You will also need the additional information below before calling Tech Support:

- Serial number(s) of your equipment and software.
- The nature of the problem.
- What you were doing when the problem occurred.
- Troubleshooting steps taken.
- Troubleshooting results.
- Your network diagram.
- The DHCP configuration and settings.
- The Layer 2 switch configuration and settings.
- Whether the problem is between IP and IP, IP and remote IP, remote IP and TDM, etc.
- Alarm log details.
- NSU Maintenance log details (if applicable).

Start Here

If the problem is in one of the areas listed below, see the referenced troubleshooting section:

Troubleshooting Software

- Troubleshooting Software Installation and Upgrade (page 147)
- Troubleshooting Software Backup and Restore (page 151)

Troubleshooting Hardware

- Troubleshooting NSUs (page 161)
- Troubleshooting ASUs (page 163)
- Troubleshooting Peripheral Units (page 164)
- Troubleshooting Digital Service Units (page 165)

Troubleshooting Network

- Troubleshooting IP Trunking (page 169)
- Troubleshooting IP Phone Registration Problems (page 171)

Troubleshooting Phones and Peripherals

- Troubleshooting Phone Connection Problems (page 182)
- Troubleshooting Phone Audio Quality (page 185)
- Troubleshooting IP Console Problems (page 190)

For any other types of problems, see the "Generic Troubleshooting Steps" section below. If you cannot find a solution to your problem in this chapter, see "Before You Contact Technical Support" on page 142.

Generic Troubleshooting Steps

Follow the steps below if you can't find the problem when using the troubleshooting tables in this chapter.

If you still can't find the problem, call Mitel Networks Technical Support (see "Contacting Mitel" on page 10).

Generic Troubleshooting Steps

- 1. Verify the status of the LEDs (see Appendix E on page 253 for more information).
- In ESM, review the Alarm Details form (System Administration Tool/ Maintenance and Diagnostics).

Identify and fix each alarm.

- For IP Phone and physical network connectivity problems:
 - a. Verify that the device has power.
 - b. Verify the status of the port link integrity LEDs at each end of the cable.
 - c. Verify that each device transmits a link integrity pulse (LINK LED on).
 - If the link is down, try with another port. Verify that proper cabling is installed between the end devices.
 - e. Verify that a crossover cable was not installed instead of a straight-though cable, and vice-versa.
- 4. For network media problems:
 - a. If there is excessive noise, check for cabling problems.
 - b. If there are excessive collisions check for duplex mismatch problems.
 - c. For CRC: check if there is a faulty NIC card or flow-control.

- d. If there are excessive runt frames, check for bad cables, duplex mismatches or bad PC NIC.
- 5. For network connectivity problems, identify the path between two end devices by doing the following PING test (in order):
 - a. Local.
 - b. Local gateway.
 - c. Remote gateway.
 - d. Remote IP.

Troubleshooting Software

Troubleshooting ESM

To troubleshoot ESM Problems

- 1. Go through Table 38 below.
- 2. If you cannot solve the problem using Table 38, go through the steps in "Generic Troubleshooting Steps" on page 144.
- If you still can't find the problem, call Mitel Networks Technical Support (see "Before You Contact Technical Support" on page 142).

Table 38. Troubleshoot ESM

Symptom	Probable Causes	Corrective Action
ESM Tool does not launch	in Internet Explorer.	Enable cookies (see Internet Explorer Online Help for more information).

Troubleshooting Software Installation and Upgrade

To troubleshoot Software Installation/Upgrade Problems

- 1. Record the error message(s) in the RTC shell, then go through Table 39 below.
- 2. If you cannot solve the problem using Table 39, go through the steps in "Generic Troubleshooting Steps" on page 144.
- 3. If you still can't find the problem, call Mitel Networks Technical Support (see "Before You Contact Technical Support" on page 142).

IMPORTANT: Make sure you have the following information on hand before calling:

- The Controller's VxWorks parameters (bootdevice, host file, inet on ethernet, host IP address).
- The FTP site properties (home directory, IP address of FTP site, user defined in user domain).
- The error message(s) in the RTC shell

Error message on RTC shells	Probable Causes	Corrective Action
Fail to load file Fail to log in	IIS/PWS/FTP server is not running or not installed.	Go to your FTP site properties and re-start FTP services (see Appendix A on page 215 for information on Windows 2000 FTP site properties). <i>OR</i> Re-install your FTP server.
Fail to load file Fail to log in	The installation files are not in the home directories of the FTP server.	 Check and identify the home directory of your FTP site properties (Default is c:/inetpub/ftproot), and ensure that boot_install, sysro.tar,.etc are in this directory. If the files are not
		2. If the files are not there, run the setup.exe again to ensure that all these files are copied to this home directory (not the 3300 directory).

Table 39. Troubleshoot Software Installation and Upgrade

Error message on RTC shells	Probable Causes	Corrective Action
Fail to log in	FTP user (3300) cannot log in FTP server (by default, the FTP user defined in Vxworks is ftp and the password is ftp).	 Check the "security tab' of your FTP site and ensure that your FTP site allows "anonymous" connection. Verify if there is an FTP username defined in your FTP server's user domain. If there is, ensure that the username and password are correct, OR delete the user from user domain in order to allow "anonymous" login.
		3. Confirm FTP user name and password in Vxworks are ftp and ftp . You may change these to match those defined on your server's user domain (or vice versa).
		Tips: You may ftp from other computer into the FTP server and log in as user defined in Vxworks. This will confirm if ftp user can access FTP server

Table 39. Troubleshoot Software Installation and Upgrade

Error message on RTC shells	Probable Causes	Corrective Action
Fail to load file Fail to log in	No network connectivity between your FTP server and the 3300	 Ensure that your FTP server and the 3300 Controller are on the same subnet. If they are not, verify if the gateway IP addresses are defined, and ensure that the router is able to route between two subnets. If you have changed the IP address on the FTP server recently, make sure that you go to "FTP site properties" and select the corresponding IP address on the FTP site tab. Typically, this is set to "unassigned". Note: For Windows 2000, you may need to change the IP
		 address of the PC. 4. Verify that the Host IP address in Vxworks is pointing to your FTP server, and bootdevice is set to motfcc. Tips: To avoid troubleshooting router related issue, you should connect your FTP server directly to the Controller (FTP server and Controller on the same subnet).

Table 39. Troubleshoot Software Installation and Upgrade

Error message on RTC shells	Probable Causes	Corrective Action
Fail to load file Fail to log in	The Firewall application on the FTP server is running.	Disable the Firewall application.

Table 39. Troubleshoot Software Installation and Upgrade

Troubleshooting Software Backup and Restore

To troubleshoot Software Backup/Restore Problems

- 1. Go through Table 40 below.
- 2. If you cannot solve the problem using Table 40, go through the steps in "Generic Troubleshooting Steps" on page 144.
- If you still can't find the problem, call Mitel Networks Technical Support (see "Before You Contact Technical Support" on page 142).

IMPORTANT: Make sure you have the following information on hand before calling:

- Java plug-in version
- Maintenance PC username
- Maintenance PC IP address
- location of identitydb.obj file on the Maintenance PC.

Symptom	Probable Causes	Corrective Action
Backup/restore failure (only fail to FTP files between PC). Note: If Java Plug-in console view is enabled, you should see the security warning.	Java version is not correct. <i>OR</i> Higher version of Java is installed.	 Verify which version of Java is installed (must be 1.3.1). If another version is installed, remove it, re-install the correct version, and reboot the PC.
Backup/restore failure (only fail to FTP files between PC).	Backup/restore applet is not trusted (identity.obj not on PC).	 Go to the Backup or Restore form in ESM (Maintenance and Diagnostics). Click the link to download the identity.obj file to the Maintenance PC. Save the file in: For Windows NT: WINNT/Profile/ <username>. For Windows 2000: Documents and Settings/<username></username></username>
Backup/restore failure (only fail to FTP files between PC).	Backup/restore applet is not trusted (identity.obj not in right directory.	Verify the file is in the correct <username> profile (the profile used to log on the PC).</username>

Table 40.Troubleshoot Software Backup and
Restore

Symptom	Probable Causes	Corrective Action
Backup/restore failure (only fail to FTP files between PC).	Backup/restore applet is not trusted (identity.obj has wrong extension).	Verify that the extension of the file is .obj (not .obj.obj, or .obj.txt, or anything else).
		Tip: Disable the Hide file extensions for known file types option to see the complete extension of the file. In the folder window, select:
		For Windows NT: View/Options/View.
		<u>For Windows 2000</u> : Tools/Folder Options/View.

Table 40.Troubleshoot Software Backup and
Restore (continued)

Restoring Software

Restore Database Procedure

CAUTION: After restoring a database, you must reboot the system. Service will be LOST while the system reboots.

To restore a previously saved database:

- In the Selection: drop-down menu, click Maintenance and Diagnostics and then click Restore.
- 2. Type the location of the database that is being restored, or use the browse facility.

- 3. Click **Start Restore**. A window warns you that you must manually reboot after a restore and that a restore replaces the current database.
- 4. Click **OK**. The system will show an "in progress" message and then a "complete" message.
- 5. Click OK.
- 6. Click the Exit button until you are logged out of ESM.
- 7. **Manually** reset the system by pressing the **Reset** button on the 3300 Controller.

Software Install Procedure

This procedure is for installing 3300 Integrated Communications Platform (ICP) software on your 3300 Controller hard drive to rebuild a database.

The Mitel Networks 3300 Controller comes pre-loaded with system software. You do not need to install this software from scratch, unless you need to rebuild a corrupted database.



Note: For the procedure on upgrading software, see "Upgrading 3300 ICP Software" on page 95.



WARNING: The software installation procedure will format the 3300 Controller hard drive and install new software.

WARNING: This procedure will erase all system settings including Voice Mail messages. If you do not have a database backup to restore, you will have to reprogram the system.

Before you begin

The installer's PC requires the following software and hardware:

- Windows NT 4.0 or Windows 2000 operating system
- I.E. browser 5.5 or later, with 128-bit encryption

- FTP server running (installed with IIS or PWS, with a minimum of 250 MB free hard-drive space)
- Ethernet card and a connection to the Mitel Networks 3300 ICP
- RJ45 Ethernet cable
- Communications program such as VT100 or HyperTerminal
- · Serial connection to the 3300 ICP maintenance port
- Java Plug-in 1.3.1

You also need

- A backup of the customer's 3300 ICP database (if available)
- · The customer's 3300 ICP username and password
- The IP address of the 3300 ICP
- The 3300 ICP software CD
- Your 3300 ICP Mitel Options Password

Rebuild Procedure

- Using an RJ45 Ethernet cable, connect your laptop/PC directly to one of the 3300 ICP Ethernet ports.
- 2. From your laptop/PC, ping the 3300 ICP to verify that you have established a connection.
- 3. Back up the 3300 ICP database (including voice mail) to your PC.
- 4. Insert the Mitel Networks 3300 ICP software CD into the CD drive of the installer's PC.

- Run the "Setup.exe" program from the CD. The Installation Wizard starts, and you see the Welcome page.
- 6. Click Next to continue.
- Read the Licence Agreement page, and click Yes if you wish to continue.
- 8. Ensure that **New Installation** is selected, and click **Next**.
- Choose a location in your local FTP server for the InstallSetup program to install files (normally this is C:\inetpub\ftproot. installSetup program provides aprogress indicator and a log file.
- 10. Click Finish when prompted. You are presented with a text file providing instructions.
- 11. Launch your communications program that connects to the 3300 ICP serial port.
- Type reboot, and press ENTER. The 3300 Controller reboots, and a Hyperterminal window (RTC) opens on the installer's laptop/PC. You can also reboot by pressing the **Reset** button on the front panel of the 3300 Controller.
- Press a key at the Press any key to stop auto-boot prompt. Note that you have 10 seconds to complete this step. If 10 seconds elapse before you press a key, the system will auto-boot.
 - **Tip:** If you miss the 10-second timeout, manually reset the controller by pressing the **Reset** button. The RTC re-opens, and you once again have 10 seconds to complete step 13.
- 14. At [VXWorks Boot] type **c**, and press ENTER.

- 15. Change the following parameters as indicated:
 - Boot device : motfcc
 - File name : Boot_Install
 - Host inet : <the IP address of the FTP server PC host (your PC)>
 - User (u) : <user name for FTP server in PC host>
 - Ftp password (pw) (blank = use rsh) : <password for FTP server in PC host>
 - Flags (f) : 0x0 (for RTC only)

16. Press the **Reset** button on the controller.



Time: The system takes approximately 45 minutes to re-format the hard drive and install the software.

17. Log in to the 3300 ICP ESM using the default username (**system**) and password (**password**). You see the 3300 ICP ESM main tools menu.



Tip: If your login fails, it may be because the system is not finished loading. Once you see **Channel 19** initialized in the RTC (**Channel 29** initialized if you

have 30 voice mail ports), you should be able to log in.

- Set the options in the License and Option Selection form according to your purchased Mitel options. To set the options
 - At the main tools menu, click **System Administration Tool**.
 - Click in the **Selection**: drop-down menu, where it says [Click here to start].
 - Click System Configuration, click System Capacity, and then click License and Option Selection. You see the License and Option Selection view.
 - Click Change in the top right corner. You see a pop-up window.

- Click OK to proceed to change your options. (Clicking Cancel will return you to the License and Option Selection view.)
- Enter the purchased system options. Note that you can change the **Country**, **Networking Option**, **Mitai/Tapi Computer Integration**, and **Extended Agent Group** fields without a new Mitel Options Password.
- Enter your Mitel Options Password, and click Save.



Time: The system can take up to 3 minutes to save your changes.

- 19. Reboot.
- 20. A pop-up window instructs you, "If you have a database to restore, do that now. If there is no database to restore, reboot now." Click **OK**.
- 21. Complete one of the following steps:
 - If you have a database from a previous backup to restore, restore the backup data to the system (see "Restore Database Procedure" on page 153).



Note: The last step of the restore procedure instructs you to manually reset the system. It is very important to reset the system in order to complete the restore procedure; do not skip this step.

OR

• Program the system, using the **System Administration Tool**. When you finish programming, make sure that you perform a DBMS Save and then back up the 3300 ICP database to your laptop/PC (see "Backing up the database" on page 100).

Troubleshooting Hardware

Troubleshooting Alarms

To troubleshoot Alarms

- 1. Go through Table 41 below.
- 2. If you cannot solve the problem using Table 41, go through the steps in "Generic Troubleshooting Steps" on page 144.

If you still can't find the problem, call Mitel Networks Technical Support (see "Before You Contact Technical Support" on page 142).

Alarm	Probable Cause	Corrective Action
E2T ICP Com	E2T card has no IP address.	If you are using the Controller's internal DHCP server for the E2T: ensure you assigned a static IP address to the E2T using the correct MAC address (see Step 4 in "Program the Controller DHCP settings." on page 25). If you are using an external DHCP for the system: ensure that Options 66 and 67 are programmed correctly (see Appendix A on page 215).

Table 41. Troubleshoot Alarms

Alarm	Probable Cause	Corrective Action
E2T ICP Com	DHCP is corrupted.	Rebuild the DHCP scope.
E2T ICP Com	Incorrectly programmed E2T IP address or setup via a debug cable.	Verify that E2T VxWorks parameters are correct (see "Programming the E2T via a Debug Cable" on page 135).
DSP	Programmed 30 voice mail ports, but required DSP Module not installed (does not apply to 700-user Controller).	Install required DSP Module (see "Add a DSP Module for 30 Voice Mail Ports" on page 90).
DSP	Programmed compression channels, but required DSP Module(s) not installed.	Install required DSP Module(s) ("Adding Compression Channels" on page 91).
DSP	DSP Module(s) for compression installed, but license not enabled.	Enable compression license in ESM (System Configuration /System Capacity/ License and Option Selection).

Table 41. Troubleshoot Alarms

Troubleshooting NSUs

To troubleshoot NSU-Related Problems

- 1. Verify the status of the L0/L1 LED.
- 2. Record the error message(s) from the NSU Maintenance port, then go through Table 42 below.
- 3. If you cannot solve the problem using Table 42, go through the steps in "Generic Troubleshooting Steps" on page 144.
- If you still can't find the problem, call Mitel Networks Technical Support (see "Before You Contact Technical Support" on page 142).

IMPORTANT: Make sure you have the following information on hand before calling:

- Error message from NSU Maintenance port.
- Boot up sequence from NSU Maintenance port.
- Symptom appears in Troubleshooting table?
- PRI: can access IMAT database?

Table 42. Troubleshoot the NSU

Symptoms	Probable Cause	Corrective Action
NSU fails to come up after upgrade or new installation (Both the red and amber LEDs— just the amber LED—are marching between L0/L1).	Automatic NSU upgrade is in progress	Wait 15–20 minutes for the NSU upgrade to complete. CAUTION: Do not power down when the amber LED is marching between L0/L1. Powering down NSU will potentially corrupt NSU software.

Symptoms	Probable Cause	Corrective Action
The LEDs are marching (red/amber for 15 minutes, then amber for a few minutes), and cycle persistently through the same pattern.	Corrupted NSU software.	Refer to TSB #58004932 for information on reflashing the NSU.
NSU fails to boot, with an error message. Boot line timeout.	No fiber connection between Controller and NSU.	Fix the fiber connection, and ensure that the LEDs of both FIMs are solid green.
NSU fails to boot, with an error message. Boot line timeout.	Universal NSU programming is not complete.	 Ensure that the NSU is programmed as a Universal NSU T1 or E1 (not T1 or CEPT). Program the proper link descriptor with the proper integrated access, and assign to the corresponding NSU unit (for example: ISDN node for PRI protocol, T1D4 for T1D4, DPNSS for MSDN). Program at least one trunk.
NSU keeps resetting with no IMAT db error message.	No IMAT database is saved to the NSU (PRI).	Use IMAT and save the corresponding database to NSU (PRI).

Table 42. Troubleshoot the NSU

Symptoms	Probable Cause	Corrective Action
NSU is up, but L0 or	No physical	1. Verify and fix wiring.
L1 LED is solid red.	connection to far end.	2. Check DIP Switch 6. If it is UP, set it to DOWN to see if this makes any difference (see Table 9 on page 32).
NSU is up, but L0/L1 LED is flashing green.	Layer 2 is not up. Layer 2 protocol mismatch.	Check your IMAT database and confirm with your Telco to see which protocol you should use.
Distorted voice or loud noise on NSU.	Voice Encoding is not set properly.	Change Voice encoding in the link descriptor to invert for T1 , and ADI invert for CEPT .

Table 42. Troubleshoot the NSU

Troubleshooting ASUs

- Verify the status of the LEDs (see Appendix E on page 253).
- Verify that the IP addresses reserved for the ASUs are not used elsewhere on the system (see "Installing 3300 Analog Service Units" on page 44).

Troubleshooting Peripheral Units

Troubleshoot the DNI Line Card

To Troubleshoot a DNI Line Card interfaced with SUPERSET Phones

Verify the following:

- Telephone and main distribution frame connections
- Main distribution frame and system connections
- Programming in the following System Administration Tool forms:
 - Class of Service Options Assignment
 - Multiline DNI Set Configuration or Single Line DNI Set Configuration Form
 - Multiline Set Key Assignment
 - Station Service Assignment
 - Class of Restriction Group Assignment
 - Interconnect Restriction Table
- Telephones
- DNI Line Card (requires a reset)
- DNI port
- Backplane cable connections
- Peripheral switch or circuit switch (see Supplementary Peripheral Equipment Procedures)
- DTMF receivers (not enough for peak traffic load).

Troubleshooting Digital Service Units

Troubleshoot Alarms and Call Logs

To query alarms or call logs

- 1. Log on to the 3300 BRI NSU.
- 2. Enter the Configuration menu item number.
- 3. Enter the Debug menu item number.
- 4. Enter the Alarms and Call Log menu item number.
- 5. Do one of the following:
 - To query the alarms, enter the Query Alarms menu item number.
 - To query the call logs, enter the Query Call Logs menu item number.

To clear and reset the call log

- 1. Log on to the BRI card.
- 2. Enter the Configuration menu item number.
- 3. Enter the Debug menu item number.
- 4. Enter the Alarms and Call Log menu item number.
- Enter the Restart Call Log menu item number. The following message appears: ARE YOU SURE? (Y or N) [N]>
- 6. Enter y.

To query the status of the BRI channels

- 1. Log on to the BRI card.
- 2. Enter the Configuration menu item number.
- 3. Enter the Debug menu item number.

- 4. Enter the Alarms and Call Log menu item number.
- 5. To query the BRI status, enter 5.

To query BRI or PRI port statistics or the management link status

- 1. Log on to the BRI card.
- 2. Enter the Configuration menu item number.
- 3. Enter the Debug menu item number.
- 4. Enter the Alarms and Call Log menu item number.
- 5. Do one of the following:
 - To query the BRI port statistics, enter 7, and then enter <port number>.
 - To query the PRI port statistics, enter 8.
 - To query the management link status, enter 9.

Troubleshoot the DS1 Formatter Card

This card provides an interface between the PBX and external digital facilities (using T1/D4, MSDN/DPNSS, or APNSS signaling). Each card contains 2 interfaces. Each interface controls a 24-channel serial link. For further information, see MSDN/DPNSS Voice 1.

If you suspect a problem with the card, check for problems with the following components:

- External equipment or far end.
- External equipment and DS1 interface assembly connections.
- DS1 interface assembly and backplane connections.
- Programming in the following forms:
 - MSDN/DPNSS/DASS2 Trunk Circuit Descriptor Assignment.
 - Network Synchronization.

- Digital Trunk Assignment.
- DS1 Trunk Circuit Descriptor
- Digital CO Trunk Circuit Descriptor Assignment.
- Digital DID Trunk Circuit Descriptor Assignment.
- Digital E&M Trunk Circuit Descriptor Assignment.
- Digital Link Assignment.
- Link Descriptor Assignment.
- Backplane cable connections (or bent pins on backplane and inside shelf).
- DS1 card switch settings.
- DS1 software (reload by using the LOAD command).
- DS1 card.
- DS1 interface assembly.
- Peripheral switch or circuit switch.

Tips:



 Maintenance will take a link out of service if it demonstrates poor performance over a 24-hour period. To obtain an indication of a link's performance over a 24 hour period, use the command: "DTSTATS READ x x x x LAST 24" (where x x x x is the cabinet, slot, shelf, link of the card).



 For the STATE command: if state is "suspect", suspect faulty card or problem with 12-volt power. If state is "not seizable", suspect 24 hour limit exceeded, relay stuck closed (test using the TEST HYBRID command), or faulty programming. The card will also appear "not seizable" for a short period after being installed. For the DTSTATS command: if "sync is absent", suspect faulty cabling, problem at the far end, or directed testing being performed at the far end. Otherwise, no sync coupled with directed hybrid test passing indicates cabling problem.

• When the card is reloaded or removed, all calls using any channel on the card will be dropped.

 If one channel on one card is faulty, and does not affect traffic, it is not necessary to replace the card. The channel may be busied out using the BUSY command.

 For the DTSTATS command: if "sync is absent", suspect faulty cabling, problem at the far end, or directed testing being performed at the far end. Otherwise, no sync coupled with directed hybrid test passing indicates cabling problem.

• When the card is reloaded or removed, all calls using any channel on the card will be dropped.

 If one channel on one card is faulty, and does not affect traffic, it is not necessary to replace the card. The channel may be busied out using the BUSY command.

Troubleshooting Network

Troubleshooting IP Trunking

Use this section to troubleshoot when an IP trunk does not recover.

To troubleshoot IP Trunking Problems

1. Go through Table 43 below.



 Note: To rule out DHCP problems, and isolate network-related issues, we recommend that you program the IP Phone with a static IP Address (see TSB # 58004933).

- 2. If you cannot solve the problem using Table 43, go through the steps in "Generic Troubleshooting Steps" on page 144.
- If you still can't find the problem, call Mitel Networks Technical Support (see "Before You Contact Technical Support" on page 142).

IMPORTANT: Make sure you have the following information on hand before calling:

- network diagram
- routeShow result
- · PING test result between Controller and IP Phone
- · rmess verify result
- State xnet all

Symptoms	Probable cause	Corrective Action
IP trunk does not recover after router crash	ICMP redirect is enabled.	1. On the RTC shell, use routeShow to identify the addition RouteHost entries, then use routeDelete to remove the entry.
		2. For a permanent solution:
		a) Make sure that the route has a "permanent" static route to the remote IP trunk network.
		b) Turn IP redirect off.
		c) Turn on the routing protocol between local router and ISP router.

Table 43. Troubleshooting IP Trunks

Troubleshooting IP Phone Registration Problems

To troubleshoot IP Phone Registration Problems

1. Record the error message on the IP Phone display, then go through Table 44 below.



Note: To rule out DHCP problems, and isolate network-related issues, we recommend that you program the IP Phone with a static IP Address (see TSB # 58004933).

- 2. If you cannot solve the problem using Table 44, go through the steps in "Generic Troubleshooting Steps" on page 144.
- If you still can't find the problem, call Mitel Networks Technical Support (see "Before You Contact Technical Support" on page 142).

IMPORTANT: Make sure you have the following information on hand before calling:

- · Is problem with local or remote subnet?
- DHCP server(s) settings
- · Layer 2 switch configuration and settings
- Router configuration and settings
- Network Diagram
- IP addressing scheme
- VLAN configuration and settings

Error Message on IP Phone Display	Probable Causes	Corrective Action
Invalid Vlan ID	DHCP Option 132 and/or 133 not set correctly.	1. Identify the location of DHCP and which DHCP server is assigned IP address for the corresponding subnet (see Appendix A on page 215 for examples>.
		2. For an external Microsoft DHCP (NT server, etc.), make sure that the option type is set to LONG.
		Note: For Windows 2000, refer to TSB #58001604.
		3. For a Cisco Router DHCP, make sure that the option type is set to hex, and padded with 0s (for example, 0x000002 for VLAN 2).
		4. For the Controller internal DHCP, set the option type to numeric.
Duplicated IP	Existing data device owns the IP address.	1. Check the IP address on the phone display.
		2. Disconnect the IP Phone.
		3. From a PC on the same subnet, ping the suspected IP Phone to see if there is a response. If there is, identify the data device, and resolve the conflict.

Error Message on IP Phone Display	Probable Causes	Corrective Action
Duplicated IP	Corrupted DHCP server	1. On the suspected DHCP server, disable then recreate the scope.
		2. If this is a Microsoft DHCP, reboot the server.
DHCP discovery	DHCP Option 130 (MITEL IP PHONE) is not programmed.	Identify the location of DHCP and set to Option 130 as String type with value of "MITEL IP PHONE".
DHCP discovery	DHCP server does not have enough IP addresses.	Create a larger scope with more IP addresses on the DHCP server.
DHCP discovery	DHCP server is acting up and cannot assign	1. For a Microsoft DHCP server, reboot the server.
	IP addresses for the corresponding subnet, even though there are enough IP addresses.	2. For the Controller internal DHCP, disable DHCP and rebuilt the scope.
DHCP discovery	L2 switch port is shut down or not configured properly.	1. Check the L2 switch, and ensure that the port is not shut down.
		2. Ensure that this port can access the DHCP server subnet (that is, access the port for the same VLAN, etc.).

Error Message on IP Phone Display	Probable Causes	Corrective Action
DHCP Discovery (VLAN) (after releasing the first IP from the native DHCP server)	DHCP Option 130 (MITEL IP PHONE) is not programmed up on the second scope of the DHCP server (or on the second DHCP server). <i>OR</i> VLAN ID is not assigned properly	 Identify if there is one DHCP server for both VLANs, or if there is one DHCP per VLAN (see Appendix A on page 215 for more information). For one DHCP server for both VLANs, ensure that options 130 is programmed in the scope of Voice LAN as String type with value of "MITEL IP PHONE".
		3. For one DHCP per VLAN, ensure that option 130 is defined in both DHCP servers properly.
		4. Verify that option 132 is set to assign to the proper VLAN ID.
DHCP Discovery (VLAN) (after releasing the first IP from the native DHCP server)	For a one DHCP for two VLANs network configuration: IP helper address on the router interface is not set up correctly.	 On the router interface (in which DHCP is not residing), enter the IP helper address and specify the IP address of the DHCP server on the other side of the subnet (that is, always set up IP helper address on the DHCP client side). Ensure the second
		scope is created for the corresponding VLAN (see Appendix A on page 215 for more info).

Error Message on IP Phone Display	Probable Causes	Corrective Action
DHCP Discovery (VLAN) (after releasing the first IP from the native DHCP server)	The DHCP server is acting up and cannot assign IP addresses for the corresponding subnet even though there are enough IP addresses.	 For a Microsoft DHCP server, reboot the server. For the Controller internal DHCP, disable DHCP and rebuild the scope.
DHCP Discovery (VLAN) (after releasing the first IP from the native DHCP server)	The L2 switch port for the phone interface is shut down or not configured properly.	 Check the L2 switch and ensure that the port is not shut down. For a Cisco L2 switch , ensure that this is a trunk port with Dot1q encapsulation, and that this trunk port allows both native and Voice LAN to pass through. For an HP L2 switch, ensure that Native Lan is untagged, and that Voice LAN is tagged.
DHCP Discovery (VLAN) (after releasing the first IP from the native DHCP server)	The L2 switch port for the router interface is shut down or not configured properly.	 Identify if there are two physical interfaces to the router (one per VLAN), or a router on a stick configuration (one physical with virtual sub- interfaces). Ensure that the port(s) on both sides (L2 switch and router) are not shut down.

Error Message on IP Phone Display	Probable Causes	Corrective Action
		3. If there is a physical interface on the router for each VLAN, make sure that the L2 switch is set to access port for the corresponding VLAN/ subnet correctly (see Appendix A on page 215 for more information); <i>OR</i>
		4. If there is one physical interface on the router for multiple VLANs, ensure that this is a trunk port on the L2 switch, and ensure that this trunk port allows both native and voice lan to pass through. On the router subinterface, ensure that proper the VLAN is associated to the remote subinterface (see Appendix A on page 215).
DHCP Discovery (VLAN) (after releasing the first IP from the native DHCP server)	The DHCP server does not have enough IP addresses.	Create a larger scope with more IP addresses on the DHCP server.

Error Message on IP Phone Display	Probable Causes	Corrective Action
TFTP load failure	Option 128 is not set up to point to the right TFTP server (Controller).	Check the DHCP server, and confirm that option 128 is pointing to the right TFTP server (usually, the Controller RTC IP address).
TFTP load failure	No network connectivity between the Controller and the phone.	 Confirm that the Controller is connected to the network . For a Cisco L2 switch: verify that the L2 switch is
		access port (Voice LAN). 3. For an HP L2 switch: verify that the L2 switch is untagged (Voice LAN).
		4. If the router is involved, make sure that router's MTU is set to 600 or more.
TFTP load failure	Firmware on Controller is missing or corrupted .	1. Verify that the firmware (ipp510bootenc.bin, etc.) is in the sysro/tftp directory (particularly if the user has manually copied the firmware).

Error Message on IP Phone Display	Probable Causes	Corrective Action
		2. Confirm if TFTP on the Controller is corrupted (this can be verified by connecting the IP Phone directly on the Controller, or by observing the behavior of other IP Phones).
		Tips: If you have Option 132/133 programmed on the Controller's internal DHCP server, disable them before trying Step 2.
Waiting for link	Option 129 is not programmed correctly.	Check Option 129 on DHCP to confirm that the IP address is programmed correctly (RTC IP Address of Controller).
Waiting for link	The Layer 2 switch port may be running spanning tree.	Turn port fast on or disable Spanning tree (whichever is possible).
Waiting for link	The application server is broadcasting or multicasting on IP Phone port or on PC behind the IP Phone.	Turn off multicasting.

Error Message on IP Phone Display	Probable Causes	Corrective Action
Waiting for link	The PC behind the IP Phone is changing speed 100/10.	Depending on the NIC, you may need to hardcode to 100 MB instead of auto negotiation.
Waiting for link OR Lost link to Server	IP phone fails to receive Keepalive message in 30 seconds.	Verify if the network or the Controller is down.
Waiting for link OR Lost link to Server	There is electrical interference.	Verify the power source, and change the location of the power source.
TFTP Fail (Remote IP phone (statically programmed IP address) cannot access MN3300 across WAN).	The Layer 2 switch port for the phone interface is shut down or not configured properly.	 Check The Layer 2 switch and ensure that the port is not shut down (see Appendix A on page 215 for more information). For a Cisco Layer 2 switch: verify that this is a trunk port with Dot1q encapsulation, and ensure this trunk port allows both native and voice lan to pass through.
		3. For an HP Layer 2 switch: verify that Native Lan is untagged and Voice Lan is tagged.

Error Message on IP Phone Display	Probable Causes	Corrective Action
TFTP Fail (Remote IP phone (statically programmed IP address) cannot access MN3300 across WAN).	The Layer 2 switch port for router interface is shut down or not configured properly.	 Verify if there are two physical interfaces to the router (one per VLAN), or it is a router on a stick configuration (one physical with virtual sub- interfaces; see Appendix A on page 215 for mroe information). Ensure the port(s) on
		both sides (Layer 2 switch and router) are not shut down.
		3. If there is physical interface on the router for each VLAN, make sure that the Layer 2 switch is set to access port for the corresponding VLAN/subnet correctly; <i>OR</i>

Error Message on IP Phone Display	Probable Causes	Corrective Action
		4. If there is one physical interface on the router for multiple VLANs, verify that this is a trunk port on Layer 2 switch, and ensure this trunk port allows both native and voice lan to pass through.
		5. On the router's subinterface, verify that the proper VLAN is associated to the subinterface (see Appendix A on page 215).
TFTP Fail (Remote IP phone (statically programmed IP address) cannot access MN3300 across WAN).	Typo in IP address, VLAN ID, gateway.	 Delete and reprogram the static IP address. If there is no VLAN or prority, don't put 0 and leave them as blank. Verify that the gateway IP address is correct.

Troubleshooting Phones and Peripherals

Troubleshooting Phone Connection Problems

To troubleshoot Phone Connection Problems

1. Go through Table 45 below.



Note: To rule out DHCP problems, and isolate network-related issues, we recommend that you program the IP Phone with a static IP Address (see TSB # 58004933).

- If you cannot solve the problem using Table 45, go through the steps in "Generic Troubleshooting Steps" on page 144.
- If you still can't find the problem, call Mitel Networks Technical Support (see "Before You Contact Technical Support" on page 142).

Table 45. Troubleshoot Phone Connection Problems Problems

Symptoms	Probable Causes	Corrective Action
Can't make calls externally (display phone may show call barred).	COR restricted.	1. Identify the numbers dialed by the user, then check the route used in ARS.
		2. Remove the COR number from COR group table in COR assignment used in the route, <i>OR</i>
		Change the COR group number in the route assigment form.

Symptoms	Probable Causes	Corrective Action
Can't make calls externally (display phone may show call barred).	COS restricted for PRI or QSIG trunk.	Enable Public network access via DPNSS in the set's COS.
Cannot make call over analog loop trunk (intermittent problem).	PBX is sending the dialing digits too fast for Telco's receiver on the LOOP trunk.	Insert a tone plan in the digit modification assignment for the route used by analog loop trunk (tone plan is used to insert one or two seconds delay without any tone detection).
No dial tone on set.	Set is not programmed.	In ESM, program the extension accordingly.
No dial tone on set.	Wrong wiring	Check the wiring between the phone jack and the ASU, Peripheral Unit, MDF, etc.
No dial tone on set.	Faulty handset wire.	 Replace the handset cord. Replace the handset. Repalce the set.
No dial tone on set.	Circuit is manbusy.	 Enter the Mainteance command STATE <plid of the circuit> (Maintenance and Diagnostic/Maintenanc e Command).</plid Enter the Maintenance command RTS <plid>.</plid>

Table 45.Troubleshoot Phone Connection
Problems (continued)

Symptoms	Probable Causes	Corrective Action
No dial tone on set.	Circuit is locked out.	Verify the wiring between the phone and the patch panel.
If NONE of the sets are responding.	Problem with Controller.	Perform a Healthy System Checklist of the Controller (see page 195).
Sets cannot receive DID calls.	Non-DID is enabled in Station Service Assignment form.	Disable non-DID in the set's COS.
Sets take 10-12 seconds to receive incoming calls.	ANI/DNIS number delivery trunk option is enabled in T1 trunk's COS.	Disable the ANI/DNIS number delievery in the trunk's COS. Tip: You can assigned an unused COS to verify if this is the problem.
Sets take 10-12 seconds to receive incoming calls.	Dialing digit conflict.	Check the following forms for any potential dialing conflict: - Station service Assignmemt - Miscellaneous Assignment - Feature Access Code - Agent ID Assignment - System Option Assignment

Table 45.Troubleshoot Phone Connection
Problems (continued)

Symptoms	Probable Causes	Corrective Action
IP to IP calls OK, but not IP to TDM calls (rings once, then call	E2T not loaded.	1. Verify that the E2T IP address is programmed correctly.
drops).		2. Verify that the E2T IP address is not used elsewhere on the network.
		3. If the E2T IP address was hardcoded with a debug table, verify its settings (see Table 36 on page 135).

Table 45. Troubleshoot Phone Connection Problems (continued)

Troubleshooting Phone Audio Quality

To Troubleshoot Phone Audio Quality Problems

1. Go through Table 46 below.



Note: To rule out DHCP problems, and isolate network-related issues, we recommend that you prgram the IP Phone with a static IP Address (see TSB # 58004933).

2. If you cannot solve the problem using Table 46, go through the steps in "Generic Troubleshooting Steps" on page 144.

 If you still can't find the problem, call Mitel Networks Technical Support (see "Before You Contact Technical Support" on page 142).

IMPORTANT: Make sure you have the following information on hand before calling:

- Setup scenario
- Is there a common dnominator (router, only one side of subnet, etc.)
- Other call scenarios (Ip to IP, IP to TDM, etc.)
- · Layer 2 switch configuration and settings
- Router configuration and settings
- Network diagram
- · IP addressing scheme
- VLAN configuration and settings
- Layer 2 switch port statistics for FCS, collision and duplex mismatch

Table 46. Troubleshoot Audio Quality Problems

Symptoms	Probable cause	Corrective Action
One way audio between Remote IP to TDM (VM)	No gateway IP address programmed on E2T.	1. If E2T gets IP address from DHCP server, make sure that Option 03 (Router) is assigned to the scope with the proper IP address for the subnet.
		2. If E2T is hardcoded with a static P address, make sure that the gateway IP address is programmed properly in VxWorks.

Symptoms	Probable cause	Corrective Action
Distorted audio only on NSU	Voice encoding is not inverted.	1. For T1, enable invert for Voice encoding in link descriptor.
		2. For CEPT or API, enable ADI invert for voice encoding.
Broken Audio, intermittent	Handsfree on the far end.	Ensure that neither device is using Handsfree. Some handsfree phones only operate at half duplex.
Broken Audio, intermittent	Packet loss, jitter via network.	1. Identify the speech path between the two end points, including router, switch WAN in the audio stream.
		2. The network administrator needs to apply QOS/TOS to minimize jitter over slow speed interface (T1, Frame Relay, etc.), and give voice traffic priority over data.
Broken Audio, intermittent	Limited bandwidth and too many calls across router, or combination data and voice.	 Limit the number of calls to remote subnets. The network administrator needs to apply QOS/TOS to give
		voice traffic priority over data.

Table 46. Troubleshoot Audio Quality Problems

Symptoms	Probable cause	Corrective Action
Broken Audio, intermittent	Physical port error (CRC, faulty cable, duplex mismatch, HUB).	1. Identify the speech path between the two end points, including router, switch WAN in the audio stream.
		2. Verify that there is no duplex mismatch in each port settings and/or faulty cable, or faulty port.
		3. Make sure that the IP Phone is not plugged into a HUB.
Broken Audio, intermittent	Compression zone enabled.	Compression will save bandwidth but may cause noticeable clipping. If not sure, disable compression to see if it makes a difference.
Broken Audio, intermittent	Router's CPU is exhausted or congested.	Router may be running excessive filtering. The network administrator may need to monitor the performance of the router.
Echo	Handsfree mode is used .	Check if far end is using handsfree. Switch to Handset mode to see if this corrects it, or lower the handsfree's volume.

Table 46. Troubleshoot Audio Quality Problems

Symptoms	Probable cause	Corrective Action
Echo	Echo Canceller is beyond specifications.	1. Identify the path between the two end points, and verify if Trunk is always involved.
		2. Check with Telco to see if the trunk is within specs. On a typical T1, the input signal should be -15 dbB. If it is too high(-5 dB for example),echo may result. If this is the case, keep an echo log to
Echo	Network jitter issue.	isolate the problem. If the problem only occurs between IP devices, check network jitter issue above.
Echo between IP Phones	Layer 2 switch setting problem.	 Check the L2 switch for duplex mismatch and spanning tree. Turn off is possible.

Table 46. Troubleshoot Audio Quality Problems

Troubleshooting IP Console Problems

To troubleshoot 5550 IP Console Problems

1. Go through Table 47 below.



- Note: To rule out DHCP problems, and isolate network-related issues, we recommend that you program the IP Phone with a static IP Address (see TSB # 58004933).
- If you cannot solve the problem using Table 47, go through the steps in "Generic Troubleshooting Steps" on page 144.
- If you still can't find the problem, call Mitel Networks Technical Support (see "Before You Contact Technical Support" on page 142).

Symptoms	Probable cause	Corrective Action
IP console fails to register (red LED is lit on TKB).	TKB (keyboard) does not have a reserved IP address. <i>OR</i> TKB does not have the right IP addres. <i>OR</i> TKB is not communicating to the right Controller.	 Check DHCP lease to confirm if an expected IP address is assigned to TKB. If not assigned properly, ensure that you enter the MAC address of TKB properly in the Multiline Set Assignment form in ESM. Recyle the power of TKB to ensure that TKB is reloaded properly

Table 47. Troubleshoot IP Console Problems

Symptoms	Probable cause	Corrective Action
IP console fails to register (red LED is lit on TKB).	Console PC does not have the proper IP address.	If IP address of PC is on different subnet than TKB, make sure that the router between these two subnets is functional.
IP console fails to register (red LED is lit on TKB).	PC NIC has 802.1Q enabled on Data side while L2 switch is not configured to accept tagged frame on Native VLAN.	Disable 802.1Q on PC NIC Note: Only use 802.1Q on PC if PC and TKB are on the same vlan (e.g 2) which L2 switch accepts tagged frame on the specified VLAN.
IP Console fails to launch/	IP Console has been registered and IP console is reinstalled.	Delete the MAC address from IP console form and then re-register using the IP Console Configuration Wizard (Start/MN5550 IP console/Tools). Note: Do not re-run the IP Console software installation unless you need to (new installation, repair corrupted software, etc.). You should always use the Configuration Wizard to register to a different Controller.

Table 47. Troubleshoot IP Console Problems

Technician's Handbook

Chapter 6 Maintenance

Technician's Handbook

About This Chapter

This chapter contains maintenance information for the 3300 ICP. It is organized as follows:

- Healthy System Checklist (below)
- Checking the System (page 196)
- System Security Checklist (page 197)
- System Hardware Profile (page 197)
- Backing Up System Information (page 198)
- Viewing Logs (page 199)
- Checking Controller Hardware Profile (page 199)
- Maintenance Commands (page 200)

Healthy System Checklist

Ensure that the system is running properly by checking that there are:

- No alarms present
- DBMS Status initialized flag is on
- DBMS check is scheduled
- Programmed Reboot is scheduled
- No error logs
- Database is backed up

Checking the System

To check the system

- 1. Click Maintenance and Diagnostics.
- 2. Click Maintenance Commands.
- 3. Click All.
- 4. Enter the following commands:
 - SH ST AL Checks for system alarms. There should be no alarms. DBMS STAT - Checks the status of the initialized flag. If the flag is off enter DBMS Save command.
 - **PROGRAMMED REBOOT DISPLAY** Displays the scheduled system reset.
 - **ME S** Checks the status of all communication links. All communication links should be open.
 - **PCM TO** Checks for Circuit Switch Faults. There should be no faults.
- 5. Click Logs.
- 6. Click Maintenance Logs.
- 7. Click **Error** Checks for error logs or click **ALL** to see all maintenance logs.
- 8. Check that you have recent back-ups of the database and hard drive.



Note: It is recommended back-ups are made at least once a week and where possible, copies of the last 3 back-ups should be available.

System Security Checklist

Complete the following to ensure the system is secure:

- No SECURITY alarms are present
- Passwords and usernames have been changed from defaults
- · Passwords and usernames are recorded and secure
- Account codes programmed
- SMDR records checked for irregularities
- Trunk Class of Restrictions programmed correctly
- Voice mail system is secure
- Auto attendant is secure
- DISA is secure
- End user call forwarding feature is secure.

System Hardware Profile

To check the hardware that is installed in the controller:

- 1. Click System Hardware Profile from the Maintenance and Diagnostics menu.
- 2. Select one of the following:
 - Compute Cards for information on the E2T or RTC cards
 - Modules for information on the MMC cards (Dual FIMs, Echo Cancellers, DSPs, etc.)

Backing Up System Information

The system back up includes call control data: 3300 ICP databases, internal DHCP server configuration, and voice mail (with or without messages).

To back-up the system

- 1. Click Maintenance and Diagnostics.
- 2. Click Back-up.
- 3. Copy the identitydb.obj file to your PC (if required). Follow the instructions displayed on the screen.
- 4. Enter the path on your local drive to store the backup (e.g. C:\3300_ICP\backup).
- 5. Enter a name for your backup file.
- Click Yes to include the voice mail messages in your backup. Note: Including voice mail messages can increase the backup time significantly.
- 7. Click **Start Backup**. System will display progress and then a back-up complete message.
- 8. Click OK.
- 9. Verify the presence of the backup on the local drive.



Note: During a system backup, the 5140 IP Appliance will be unable to access an application through the command keys (Online Services, Personal Directory, Bookmarks, or Speed Dials).

Viewing Logs

To view maintenance or software logs

- 1. Click Maintenance & Diagnostics.
- 2. Click Logs.
- 3. Select the desired log category (Maintenance or Software).
 - To view all logs in the category click All Maintenance Logs (or All Software Logs)
 - To view error Logs click error
 - To view warning logs click warning
 - To view information click Info
- Highlight the desired log by moving your cursor over it and click once.
 - The details of the log will be displayed in the lower half of the screen.

Checking Controller Hardware Profile

Use this procedure to verify the hardware installed in the Controller:

- 1. In the ESM, go to the **Maintenance and Diagnostics** section, then the **System Hardware Profile** folder.
- 2. To view details on the installed modules, click the **System Hardware Modules** form.

To view details on the RTC and E2T, click on the **System Hardware Compute Cards** form.



Note: Verify that the IP address of the E2T is the correct one.



Note: Slot 1 is always the RTC. For a 100-user Controller, this form displays the details on the RTC only.

Maintenance Commands

BACKGROUND

To enable or disable a specified background diagnostic or to determine whether a specified background diagnostic is enabled or disabled.

BACKGROUND ON

BACKGROUND OFF

BACKGROUND STATUS

BACKGROUND STATUS CEPT

BACKGROUND STATUS DS1

BACKGROUND STATUS R2

BACKGROUND STATUS UNIVERSAL E1

BACKGROUND STATUS UNIVERSAL T1

BLF REFRESH

Aids maintenance personnel in refreshing remote busy lamps after work on inter-system trunks.

BLF REFRESH CEID <CEID INDEX>

BLF REFRESH CEID ALL

BUSY

Busies the designated card, circuit, or channel.

BUSY <unit> <shelf> <slot>

BUSY <unit> <shelf> <slot> <circuit>

BUSY <unit> <shelf> <slot> <circuit> <channel>

BUSY EXTENSION < extension number>

BUSY TRUNK GROUP <group number>

СВМ

Allows Call Back Messaging logs to be enabled or disabled.

CBM DISABLE LOG

CBM ENABLE LOG

CCS

Allows the diagnosis of problems occurring only over a DPNSS Link.

CCS RESET DASS2

CCS RESET DPNSS ROUTE_OPT_STATISTICS

CCS SHOW DPNSS FEATURE

CCS SHOW DASS2 FEATURE_STATUS

CCS SHOW DPNSS ROUTE SUMMARY

CCS SHOW DPNSS ROUTE DETAILED

CCS SHOW DASS2 ROUTE_OPT_STATISTICS

CCS TRACE ENABLE

CCS TRACE DISABLE

CCS TRACE SHOW OUTPUT

CCS TRACE SHOW CONTEXT

CCS TRACE SET CONTEXT <location ID>

CCS TRACE SET CONTEXT VIRTUAL <location ID>

CCS TRACE SET CONTEXT XNET

CCS TRACE CLEAR CONTEXT

CCS TRACE ENABLE CONTINUOUS

CONGESTION

Obtains an immediate printout of the Traffic Congestion Report, listing system resource shortages.

CONGESTION

DBMS

DBMS CHECK

To perform a variety of checking functions on the database.

DBMS CHECK ON

DBMS CHECK OFF

DBMS CHECK BRIEF

DBMS CHECK FULL

DBMS CHECK KILL

DBMS CHECK TIME <hour>

DBMS CLIENT

Enables the System Administrator to view who or what applications are accessing the database.

DBMS CLIENT

DBMS FLAG OFF

To discard a saved database and load a blank database.

DBMS FLAG OFF

DBMS SAVE

Saves database information to the hard disk and turns the DBMS flag on.

DBMS SAVE

DBMS STATUS

To provide general information about the state of the database.

DBMS STATUS

DIGITAL TRUNK STATISTICS

Allows maintenance personnel to obtain or erase statistics on any of the Channel Associated Signaling (CAS) or Common Channel Signalling (CCS) digital links connected to a system.

DTSTAT CLEAR <unit> <shelf> <slot> <hybrid>

DTSTAT READ <unit> <shelf> <slot> <hybrid>

DTSTAT READ <unit> <shelf> <slot> <hybrid> LAST <number of hours>

DISABLE SEIZE TEST

Disables seize testing of all out-of-service trunks.

DISABLE SEIZE TEST

ENABLE SEIZE TEST

Enables a seize test of all out of service trunks.

ENABLE SEIZE TEST

FIRMWARE

Gives details of the firmware that is running in a particular location on the system. To update the firmware on all devices on a PLID that support firmware download.

FIRMWARE PLID <unit> <shelf>

FIRMWARE PLID <unit> <shelf> <slot>

FIRMWARE PLID <unit> <shelf> <slot> <circuit>

FIRMWARE PLID <unit> <shelf> <slot> <circuit> <channel>

FIRMWARE KILL ALL

FIRMWARE KILL PLID <unit> <shelf>

FIRMWARE KILL PLID <unit> <shelf> <slot>

FIRMWARE KILL PLID <unit> <shelf> <slot> <circuit>

FIRMWARE KILL PLID <unit> <shelf> <slot> <circuit> <channel>

LANGUAGE DISPLAY

Displays the language of the sets on the system.

LANGUAGE DISPLAY SETS AUX1

LANGUAGE DISPLAY SETS AUX2

LANGUAGE DISPLAY SETS DEFAULT

LANGUAGE SELECT

To change the current language of the sets on the system to a specified language.

LANGUAGE SELECT <language> SETS AUX1 FROM <catalog>

LANGUAGE SELECT <language> SETS AUX2 FROM <catalog>

LANGUAGE SELECT < language > SETS DEFAULT FROM <catalog >

LOAD

Loads software into processors.

LOAD <unit/module>

LOAD IPDevice <1,2...700>

LOAD IPDevice <1> TO <700>

LOAD <unit> <shelf> <slot> <circuit>

LOAD <unit> <shelf> <slot> <circuit> <channel>

LOCATE

LOCATE AGENT

Determines where an ACD agent is logged in and the agent groups the agent is a member of.

LOCATE AGENT <agent identifier>

LOCATE ALL FREE

Identifies directory numbers or location IDs that have not been assigned.

LOCATE ALL FREE DN

LOCATE ALL FREE PLID <card type> <unit>

LOCATE ALL FREE PLID <card type> <unit> <shelf>

LOCATE ALL FREE PLID <card type> <unit> <shelf> <slot>

LOCATE ALL FREE PLID <card type> <plidmin> TO <plidmax>

LOCATE ALL FREE DN <dn number> TO <dn number>

LOCATE EXTENSION

Determines the physical location of a line for a given the extension number.

LOCATE EXTENSION < extension number>

LOCATE FEATURE

Provides a list of active features for a specified extension number or location ID.

LOCATE FEATURE EXTENSION <number>

LOCATE FEATURE HUNT_GROUP <number>

LOCATE FIRST

Locates the first location that has no device or number attached to it.

LOCATE FIRST FREE DN

LOCATE FIRST FREE DN <number> TO <number>

LOCATE FIRST FREE PLID <card type>

LOCATE FIRST FREE PLID <card type> <unit>

LOCATE FIRST FREE PLID <card type> <unit> <shelf>

LOCATE FIRST FREE PLID <card type> <unit> <shelf> <slot>

LOCATE GROUP_REPORTING

Provides information on the location of a report path.

LOCATE GROUP_REPORTING_NUM <number>

LOCATE NUMBER

Provides maintenance personnel with a quick reference as to where a number is being used.

LOCATE NUMBER <number>

LOCATE PATH

Provides information on the location of a path.

LOCATE PATH_REPORTING_NUM <number>

LOCATE PLID

Generates information about the circuit specified by the given Physical Location IDentifier (PLID).

LOCATE PLID <unit> <shelf> <slot>

LOCATE PLID <unit> <shelf> <slot> <circuit>

LOCATE REMOTE

Locates the Cluster Element ID and the routing digits of the extension number.

LOCATE REMOTE <number>

LOCATE TRUNK

Locates a trunk given the trunk number.

LOCATE TRUNK <trunk number>

MESSAGE

Displays status of message links between main control, and peripheral and digital trunk card processors. All links should be open.

MESSAGE REMOTE

MESSAGE SUBSYSTEM

NETSYNC

NETSYNC SETSOURCE

Allows maintenance personnel to select and lock the active clock source to a specific synchronizing source.

NETSYNC SETSOURCE <number>

NETSYNC SETSOURCE AUTO

NETSYNC SETSOURCE FREERUN

NETSYNC STATE

Allows maintenance personnel to obtain a report on the status of the synchronizing sources from both system clocks.

NETSYNC STATE <number>

NETSYNC SUMMARY

Allows maintenance personnel to obtain a report on the behavior of the synchronization source.

NETSYNC SUMMARY <number>

NETSYNC SUMMARY <number> LAST <number of hours>

РСМ

PCM STATUS

Displays the status of any receive or transmit link or path.

PCM STATUS TX <number>

PCM STATUS RX <number>

PCM TEST

Verifies the operation of PCM paths.

PCM TEST TX <number>

PCM TEST RX <number>

PCM TEST BOTH <number>

PCM TOTALS

Obtains a list of PCM fault totals.

PCM TOTALS

PENDING

Allows required changes to be made to the Telephone directory using OPS Manager.

PENDING CHANGES DELETE

PENDING CHANGES DISPLAY ALL

PENDING CHANGES DISPLAY COUNT

PENDING CHANGES DISPLAY NEW <number>

PENDING CHANGES GENERATE <string> BLANK

PENDING CHANGES GENERATE BLANK BLANK

PENDING CHANGES GENERATE BLANK <string>

PMS

Assists in debugging messages between the system and Performance management System.

PMS STATE

PMS TRACE DISABLE

PMS TRACE ENABLE

PROGRAMMED REBOOT

To enable or disable a programmed system reboot, schedule a system reboot, or display the programmed reboot settings and status.

PROGRAMMED REBOOT ON

PROGRAMMED REBOOT OFF

PROGRAMMED REBOOT DISPLAY

PROGRAMMED REBOOT MEMORY DAILY <hh:mm:ss>

PROGRAMMED REBOOT SCHEDULE <Day-of-week> <hh:mm:ss>

PROGRAMMED REBOOT SCHEDULE <DAILY> <hh:mm:ss>

PROGRAMMED REBOOT SCHEDULE <MONTHLY> <week # [1-4]> <day of the week> <hh:mm:ss>

PROGRAMMED REBOOT SCHEDULE <YEARLY> <month> <week # [1-4]> <day of the week> <hh:mm:ss>

PROGRAMMED REBOOT DEFAULT: MEMORY <DAILY> <2:15:00> and "OFF"

PROM

Provides information on the card type, revision number, revision strap, week and year of manufacture and the plant code of a specified card.

PROM <unit> <shelf> <slot>

READDATETIME

Displays the date and time on the system.

READDATETIME <year> <month> <date> <day of the week> <hours> <mins> <seconds>

REMOVE

Cancels the 'Courtesy Down' operation which has been requested during a busying operation, and is subsequently found to be unnecessary.

REMOVE COURTESY DOWN <unit> <shelf> <slot> <circuit>

REMOVE COURTESY DOWN EXTENSION <number>

RESOURCE

To display information about the resources used by the call process which owns a specified circuit.

RESOURCE <unit> <shelf> <slot> <circuit> <channel>

RESOURCE XNET <number>

REMOVE COURTESY DOWN

Cancels the 'Courtesy Down' operation which has been requested during a busying operation, and is subsequently found to be unnecessary.

RC <unit> <shelf> <slot>

RC <unit> <shelf> <slot> <circuit>

RC EXTENSION < extension number>

RESOURCE

To display information about the resources used by the call process which owns a specified circuit.

RESOURCE <unit> <shelf> <slot> <circuit> <channel>

RESOURCE XNET <number>

RMESSAGE

To verify remote message link establishment.

RMESS verify pbx <number> LAN

RMESS verify pbx <number> PPP

RTS

Returns to service a busied card, circuit or channel.

RTS <unit> <shelf> <slot>

RTS <unit> <shelf> <slot> <circuit>

RTS EXTENSION <number>

RTS MATE

RTS TRUNK GROUP <number>

SET THRESHOLDS

Allows maintenance personnel to define the threshold values at which a resource loss will trigger a minor, major, or critical alarm.

SET THRESHOLDS <alarm category> <number> <number>

SET THRESHOLDS <alarm category> <number> NIL NIL

SET THRESHOLDS <alarm category> <number> NIL <number>

SET THRESHOLDS <alarm category> <number> <number> <number>

SHOW

SHOW FAULTS

Provides a list of all the faults that are responsible for the alarm status as specified by one of the qualifiers.

SHOW FAULTS <category>

SHOW FAULTS ALARM

SHOW PRINT

Allows maintenance personnel to look at the print queue after requesting a print job.

SHOW PRINT

SHOW SEIZE

Displays the current status of seize testing for out of service trunks.

SHOW SEIZE TEST

SHOW STATUS

Provides all alarm information as specified by the qualifier.

SHOW STATUS <category>

SHOW STATUS ALARMS

STATE

Provides maintenance personnel with information concerning the current call-processing or maintenance state of a specified device or group of devices.

STATE <unit>

STATE <unit> <shelf>

STATE <unit> <shelf> <slot>

STATE <unit> <shelf> <slot> <circuit>

STATE EXTENSION <number>

STATE TRUNK GROUP NUMBER

STATE XNET PBX <number>

STATE XNET LINK <number>

SYSTEM TOTALS

To display the total number of programmed trunks, lines, stations and attendants, as well as a breakdown of the totals by device type.

SYSTEM TOTALS

TEST

Performs a single diagnostic test on the specified device or to repeatedly run directed diagnostic tests until a specific command is issued to cancel the test, or until a failure occurs.

TEST <unit>

TEST <unit> <shelf>

TEST <unit> <shelf> <slot>

TEST <unit> <shelf> <slot> <circuit>

TEST EXTENSION <number>

TEST TRUNK GROUP <number>

TRAFFIC

Allows traffic measurement on the system.

TRAFFIC DELETE <month> <day> <number>

TRAFFIC FILES

TRAFFIC PRINT

TRAFFIC STATUS

TRAFFIC STOP

TYPE

To display logs resulting from a database migration failure. Use this command to view logs after migrating an SX-2000 or 3200 ICP database when a "failure" dialog box appears.

TYPE *.DR.LOGFILE_1

WRITEDATETIME

Allows the date and time on the system to be changed.

<year><month><day> <day of the week> <hours> <mins> <seconds>

Appendix A Typical Network Configurations

Technician's Handbook

About This Appendix

This appendix contains the following:

- Network Configuration Examples (below)
- Windows 2000 FTP Server (page 225)

Network Configuration Examples

This section shows examples of the three most common network configurations for a 3300 ICP:

- One DHCP per VLAN (below)
- One DHCP for two VLANs
- One router interface to multiple VLANs (router on a stick)

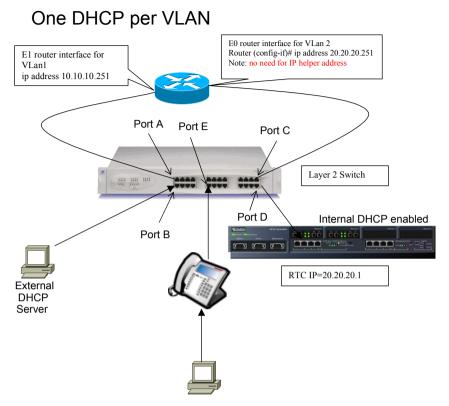


Figure 19. One DHCP per VLAN Example

DHCP Server Settings for One DHCP per VLAN Example

The following settings must be programed in the DHCP server:

- DHCP IP Address Range
- Subnet Mask
- Option 03 (Router)
- Option 128 (TFTP Server IP Address)
- Option 129 (RTC IP Address)
- Option 130 (IP Phone DHCP Server)

- Option 132 (VLAN ID)
- Option 133 (Priority)

Table 48 below show the DHCP settings programmed for this configuration.



Note: See TSB #58004933 for information on programming 3300 DHCP settings on a Windows 2000 DHCP server.

Table 48. DHCP Settings for One DHCP per VLAN Example

Setting	DHCP on VLAN 1 (IP: 10.10.10.2) Scope 1	Internal DHCP on Controller Scope 1
DHCP	10.10.10.10 to 10.10.10.100	20.20.20.10 to 20.20.20.100
Subnet	255.255.255.0	255.255.255.0
Opt. 03	10.10.10.251	10.10.10.251
Opt. 128	20.20.20.1	20.20.20.1
Opt. 129	20.20.20.1	20.20.20.1
Opt. 130	MITEL IP PHONE	MITEL IP PHONE
Opt. 132	2	—
Opt. 133	6	_

Layer 2 Switch Settings Example

Table 49 and Table 50 below are example of settings on a Cisco and an HP Layer 2 switch for this example. See Figure 19 for the port numbers.



Note: These settings also apply for the other network configuration examples.

Table 49. Cisco Layer 2 Switch Settings for Network Configuration Examples

Port	Use	Command
Α	Access	None (by default, all ports belong to
В	port for VLAN 1	VLAN 1)
С	Access	Router(config-if)#switchport mode
D	port for VLAN 2	access Router(config-if)#switchport access vlan 2
E	Trunk port with Dot1q for IP Phone	Router(config)#interface fast 0/5 Router(config-if)#switchport mode trunk Router(config-if)#switchport trunk encapsulation dot1q

Table 50.HP Layer 2 Switch Settings for Typical
Configurations

Port	Use	Command (on HP VLAN menu)
Α	Access port for	VLAN 1 = untagged
В	VLAN 1	VLAN 2 = NO
С	Access port for	VLAN 1 = NO
D	VLAN 2	VLAN 2 = untagged
Е	Trunk port	VLAN 1 = untagged
		VLAN 2 = tagged

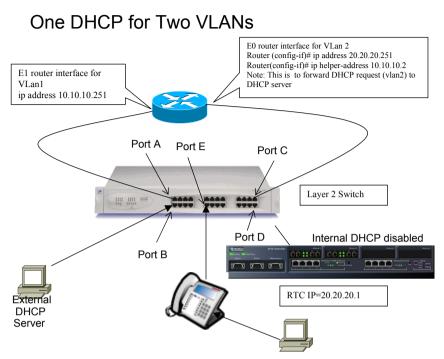


Figure 20. One DHCP for Two VLANs Example

DHCP Server Settings for One DHCP for Two VLANs Example

The following settings must be programed in the DHCP server:

- DHCP IP Address Range
- Subnet Mask
- Option 03 (Router)
- Option 128 (TFTP Server IP Address)
- Option 129 (RTC IP Address)
- Option 130 (IP Phone DHCP Server)
- Option 132 (VLAN ID)

• Option 133 (Priority)

Table 51 below show the DHCP settings programmed for this configuration.



Note: See TSB #58004933 for information on programming 3300 DHCP settings on a Windows 2000 DHCP server.

Table 51. DHCP Settings for One DHCP for TwoVLANs Example

	DHCP on VLAN 1 (IP: 10.10.10.2)		
Setting	Scope 1	Scope 2	
DHCP	10.10.10.10 to 10.10.10.100	20.20.20.10 to 20.20.20.100	
Subnet	255.255.255.0	255.255.255.0	
Opt. 03	10.10.10.251	20.20.20.251	
Opt. 128	20.20.20.1	10.113.1.1	
Opt. 129	20.20.20.1	10.113.1.1	
Opt. 130	MITEL IP PHONE	MITEL IP PHONE	
Opt. 132	2	2	
Opt. 133	6	6	

Layer 2 Switch Settings Example

See "Layer 2 Switch Settings Example" on page 220.

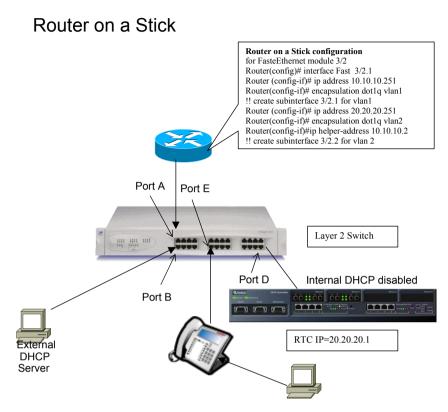


Figure 21. Router on a Stick Example

DHCP Server Settings for One DHCP for Two VLANs Example

The following settings must be programed in the DHCP server:

- DHCP IP Address Range
- Subnet Mask
- Option 03 (Router)
- Option 128 (TFTP Server IP Address)
- Option 129 (RTC IP Address)

- Option 130 (IP Phone DHCP Server)
- Option 132 (VLAN ID)
- Option 133 (Priority)

Table 52 below show the DHCP settings programmed for this configuration.



Note: See TSB #58004933 for information on programming 3300 DHCP settings on a Windows 2000 DHCP server.

Table 52.DHCP Settings for Router on a Stick
Example

	DHCP on VLAN 1 (IP: 10.10.10.2)		
Setting	Scope 1	Scope 2	
DHCP	10.10.10.10 to 10.10.10.100	20.20.20.10 to 20.20.20.100	
Subnet	255.255.255.0	255.255.255.0	
Opt. 03	10.10.10.251	20.20.20.251	
Opt. 128	20.20.20.1	10.113.1.1	
Opt. 129	20.20.20.1	10.113.1.1	
Opt. 130	MITEL IP PHONE	MITEL IP PHONE	
Opt. 132	2	2	
Opt. 133	6	6	

Layer 2 Switch Settings Example

See "Layer 2 Switch Settings Example" on page 220.

Windows 2000 FTP Server

Figure 22, Figure 23 and Figure 24 below show examples of the settings needed on a Windows 2000 FTP server.

To program these FTP settings

- 1. Open the Computer Management control panel (Start/Settings/Control Panels/Administrative Tools/Computer Management).
- 2. In Services and Applications, click on Internet Information.
- 3. Program the settings as shown below.

Default FTP Site Properties	x
FTP Site Security Accounts Messages Home Directory Directory Security	
Identification	L
Description: Default FTP Site	
IP Address: (All Unassigned)	
ICP Port: 21	
Connection	
C Unlimited	
Limited To: 10 connections	
Connection Timeout: 900 seconds	l
Enable Logging	
Active log format:	
W3C Extended Log File Format Properties	L
Current Sessions	
OK Cancel Apply Help	

Figure 22. Windows 2000 FTP - FTP Site Tab

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Default FTP Site Properties	? ×		
FTP Site Security Accounts Messages Home Directory Dir	ectory Security		
Allow Anonymous Connections			
Select the Windows User Account to use for anonymous access to this resource			
Username: MITELLAB3B\mnms	Browse		
Password: *******			
Allow only anonymous connections			
Allow IIS to control password			
FTP Site Operators			
Grant operator privileges to Windows User Accounts for this FTP site only.			
Operators: CAdministrators	A <u>d</u> d <u>H</u> emove		
OK Cancel	pply Help		

Figure 23. Windows 2000 FTP - Security Accounts Tab

Default FTP Site Properties	? ×
FTP Site Security Accounts Messages Home Directory Directory Security	
When connecting to this resource, the content should come from:	
Directory Listing Style C UNIX ◎ C MS-DDS ◎	
OK Cancel Apply He	lp



Technician's Handbook

Appendix B System Capacity

Technician's Handbook

System Capacity

The 100-user 3300 ICP will support one of the following maximum configurations:

- 100 IP telephones and 48 ONS telephones with no peripheral unit support.
- a combination of IP, ONS, and DNI telephones (for example, 75 IP telephones, 48 ONS telephones, and 25 DNI telephones on a peripheral unit).

The 250-user 3300 ICP will support one of the following maximum configurations:

- 250 IP telephones and 96 ONS telephones with no peripheral unit support.
- 250 IP telephones and a 192 port peripheral unit with a DTMF card installed.
- a combination of IP, ONS, and DNI telephones (for example, 100 IP telephones, 96 ONS telephones, and 100 DNI telephones on a peripheral unit).

A 700 User Controller will support one of the following maximum configurations:

- 700 IP telephones and 96 ONS telephones with no peripheral unit support.
- 700 IP telephones, 96 ONS telephones (connected via ASUs) and three 192 port peripheral units with a DTMF card installed.

The following table gives the maximum capacities available.



Note: The controller will not support all of these capacities at the same time. Refer to your Mitel Networks Sales Engineer for specific information on how to configure a 3300 ICP system

Parameter Name	700 User / 250 User Controllers	100 User Controller
Compression Channels (for TDM-IP)	64	32
DTMF Receivers	128	128
E2T Channels	128	64
Tone Detector Circuits*	32	32
Tone Generators	128	128
Voice Mail Ports	30	30
Dual FIMs	2	1
NSUs - without chaining	4	2
NSUs - with chaining	8	4
Peripheral Unit - direct connection	4	1
Peripheral Unit - with extended Peripheral Unit	8	Not Supported
ASUs	4	2
Trunks (analog and digital combined)*	628	628
BRI U Interfaces (with NSU)	60	30
IP trunks	200	50
ONS Lines*	700	700
DNI Channels*	2368	2368
Attendant Consoles*	24	16
IP Devices	700	100
DNI Devices*	756	756
		(Page 1 of 2)

Table 53. Maximum Hardware Capacity

Table 53. Maximum Hardware Capacity

Parameter Name	700 User / 250 User Controllers	100 User Controller
Programmable Key Modules*	75	75
* Many of the capacities in this table are not true hardware limitations, but are limits set by software on the number of hardware devices that can be programmed. Most systems will reach physical limitations before these large numbers of devices are reached.		
		(Page 2 of 2)

Parameter Name	Number
ACDII - Agent Groups	32 / 64
Agents per Group	150 / 500
ACDII - Agent IDs	1181
ACDII - Agent Paths	256
Attendant Console Groups	48
Attendant Console Calls Waiting	72
Broadcast Groups	1875
- Members per Broadcast Group	32
Busy Lamp Groups (Monitored Devices)	439
- Members per Busy Lamp Group	16
Call Reroute Always	176
Call Reroute 1st Alternates	336
Call Reroute 2nd Alternates	32
Class of Restriction (COR)	96
Class of Service (COS)	96
Conferences; maximum	8
Conferees in a conference; maximum	8
Default Account Codes	225
Departments (in Tel Dir)	2000
Digit Modification Tables	256
Digit Blocks	4055
Digital Links*	16
Group Page Groups	16
Hunt Groups	176
- Members per Hunt Group	64
Independent Account Codes	11000
	(Page 1 of 2)

Table 54. Maximum Software Feature Capacity

Parameter Name	Number
Locations (in Tel Dir)	250
Modem Groups	15
Modems per Modem Group	10
MSDN/DPNSS Cluster Elements	30
MSDN/DPNSS Remote Directory Numbers	18500
Networked ACD - Remote Agent Subgroups	32
Page Groups (Zones)	16
Personal Speed Call Users	500
(blocks of 10 speed calls per user)	
Pickup Groups	200
- Members per Pickup Group	75
Routes	200
Route Lists	128
Speed Call Digit String (avg. 12 digits)	1500
SUPERSET Callback Messages per System	500
System Account Codes	24
System Digit Strings	6814
System Speed Call	600
Telephone Directory Entries	19995
Trunk Groups	112
Trunks per Trunk Group	175
Trunk Service Numbers	150
Note: * This is a software capacity. The number available on the controller will limit this capac	er of dual FIMs ity.
	(Page 2 of 2)

Table 54. Maximum Software Feature Capacity

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Appendix C Installation Planner

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About This Appendix

This appendix provides a basic record for your planning information.

Installation Planner

The following required and default settings are necessary for an installation.

Table 55. System Administration Tool Settings

System Administration Tool			
Setting	Default	Personalized	
username	system		
password	password		

Table 56. Controller Configuration Settings

Controller Configuration (RTC)

Note: Do not change these settings unless you are specifically directed to make changes by a Field Change Instruction. Unauthorized changes may prevent the system from booting up.

	0 1		
	Default Settings	Settings to Change	
boot device	ata=0,0		
processor number	0		
host name			
file name	/sysro/RTC8260		
inet on ethernet (e)	192.168.1.2:ffffff00		IP address: sub- net mask (hex)
inet on backplane (b)			
host inet (h)			IP address: ftp server
gateway inet (g)			Default Gateway
user (u)	ftp		FTP user (installer's PC)

ftp password (pw)	ftp	FTP password (installer's PC)
flags (f)	0x0	
target name (tn)		
startup scripts (s)		
other (o)	motfcc	

Table 56. Controller Configuration Settings

Table 57. DHCP Configuration Settings

DHCP Configuration (for scope supporting IP Voice devices)				
IP Address Scope				
Start Address				
End Address				
Subnet Mask				
Lease Duration	Days:	Hours:	Minutes:	
Options (for all devices)	Identifier	Data Type	Value	
(Router) Default Gateway	003	IP Address		
Options (for WEB	devices)			
DNS Server	006	IP Address		
DNS Domain Name	015	ASCII String		
Options (for 3300	E2T)			
TFTP Server (host- name or IP)	066	ASCII String	(typically the IP address of the control- ler RTC)	
TFTP BootFile	067	ASCII String	/sysro/E2T8260	
Options (for IP Phones)				
Mitel IP Phone DHCP server	130	ASCII String	MITEL IP PHONE	
IP Phone TFTP Server	128	IP Address	(typically the IP address of the control- ler RTC)	

Table 57. DHCP Configuration Settings

MN3300 (RTC) IP Address	129	IP Address	
VLAN ID	132	Internal: Long External: Numeric	
VLAN Priority	133	Internal: Long External: Numeric	

Table 58. IP Phone Settings

IP Phone MAC Information	
IP Set Registration Code	(See System Option Assignment)
IP Set Replacement Code	

Table 59. Set Programming Settings

Set Programm	Set Programming Guide			
User Name	Location	Set Type	Number	MAC Address (optional)

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Appendix D Hardware Reference

Technician's Handbook

About This Appendix

This appendix provides reference information on the 3300 ICP and its hardware. The appendix is organized as follows:

- System Configurations (below)
- Hardware Equipment Details (page 241)

System Configurations

There are three (3) basic options for the 3300 ICP:

- 100-user system
- 250-user system
- 700-user system

Each of these options can be configured as follows:

- No compression
- · With compression:
 - 32 channels (all)
 - 64 channels (250- and 700-users options)
- 30 voice mail ports
 - with or without compression

The following top view diagram shows the MMC/A slot numbering convention. The diagram also indicates the type of MMC module that will be used in a particular slot. Slots 1 through 4 allow connectors to protrude through the front panel.

Slot 1	Slot 2	Slot 3	Slot 4
FIM	Empty	Empty	21161 DSP Telecom

IP0473

Figure 25. 100-User Controller Slot Numbering Convention

3300 ICP MMC SLOT NUMBERING CONVENTION

Rear Panel

Slot 8 For Telecom DSP	Slot 7 For Telecom DSP	Slot 6 For Telecom DSP or Echo Canceller	Slot 5 For Echo Canceller
Slot 1 For FIM	Slot 2 For FIM	Slot 3 For Compression DSP	Slot 4 For Compression DSP

Front Panel

IP0416

Figure 26. 250- and 700-User Controllers Slot Numbering Convention

Hardware Equipment Details

This section is organized as follows:

- Controller (below)
- Network Service Units (page 243)
- Analog Service Unit (page 244)
- Peripheral Unit (page 244)
- Digital Service Unit (page 251)

Controller

The Controller is the heart of the 3300 ICP. It provides the voice, signaling, central processing, and communications resources for the 3300 ICP system.

There are three basic configurations of the 3300 Controller, using two hardware platforms:

- 100-user Controller (also called 3300 Lite Controller)
- 250-user Controller
- 700-user Controller

Note: These names do not necessarily reflect the number of users licensed on a system.

Table 60 below shows the part numbers for the various versions of Controllers you may encounter:

Table 60. 3300 Controller Versions

Speed	100-User	250-User	700-User
133 MHz	n/a	50001262	50001263
300 MHz	50002211	50002970	50002971



Note: The 133 MHz Controller part numbers shown are for North America only.

Note: New Controllers are always 300 MHz units.

Controller Components

Figure 27 below shows the different components of a 250- and 700-User Controller.

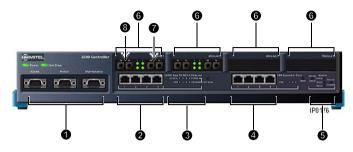


Figure 27. 250-/700-User Controller Components

Components

• Serial ports (from left to right: Alarm, Printer, Maintenance).

• Ethernet ports (The 100-user controller has 2 Ethernet port, but only the leftmost port can be used).

- Ethernet ports LEDs.
- O CIM expansion ports
- Alarm LEDs.
- **6** Modules 1 to 4 (from left to right).
- Port 1 of Module 1.
- O Port 2 of Module 1.

Controller Cabinets

The Controller cabinets are numbered as follows:

- Cabinet 1 (hardcoded): internal.
- Cabinets 2 to 5 (hardcoded): Ethernet ports.
- Cabinets 6 to 13 (6 to 9 for the 100-user Controller): module ports (module1 port 1, module 1 port 2, etc.).

Controller Alarm Port Pinout

Table 61. Controller Alarm Port Pinout

Pin	Signal	Pin	Signal
1	Critical alarm	6	Not used
2	Critical Alarm Return	7	Minor Alarm
3	Not used	8	Minor Alarm return
4	Major Alarm	9	Not used
5	Major Alarm Return		

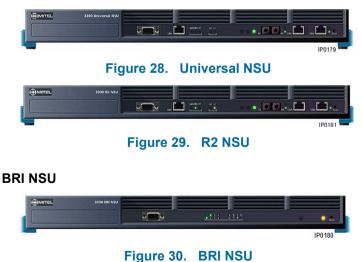
Network Service Units

The Network Services Unit provides connectivity to digital trunks for public or private networks.

There are three variants of 3300 NSUs:

- Universal NSU
- R2 NSU
- BRI NSU

Universal/R2 NSU



CEPT Port DIP Switch Settings

Table 62 below shows the settings for the CEPT port DIP switch. for the BRI NSU



Note: This is site-dependent. Tx is usually, grounded, but this depends if the remote Rx connection is grounded or not.

Table 62. CEPT Port DIP Switch Settings

Switch	Function	Settings	Notes
1	Tx Ground		Not required for RJ-45 connector.
2	Rx Ground		Not required for RJ-45 connector

Analog Service Unit

The Analog Services Unit (ASU) provides connectivity for analog trunks and telephones (POTS and On-Premise Station, ONS). There are two variants of 3300 ASUs:

- ASU
- Universal ASU



Figure 32. ASU

Peripheral Unit

Each Peripheral Unit contains peripheral interface cards providing ONS and/or DNI ports.

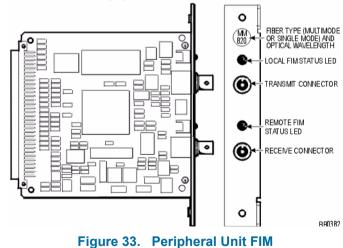
Each Peripheral Unit has one peripheral switch controller (PSC) card and one Fiber Interface Module (FIM). The PSC card provides control for all peripheral interface cards, and the FIM provides a fiber-optic connection to the 3300 controller.

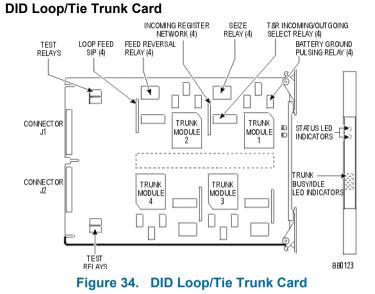
The following peripheral interface cards can be installed in Peripheral Units (some cards are only available in specific countries):

- DNI Line Card
- LS/GS Trunk Card
- ONS CLASS/CLIP Line Card
- ONS Line Card
- E&M Tie Trunk Card
- OPS Line Card
- DID/Loop Tie Trunk Card.

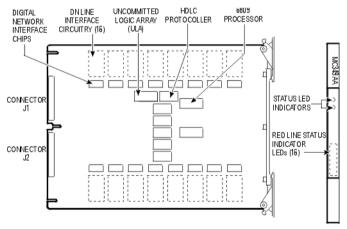
Fiber Interface Module

FIBER INTERFACE MODULE (FIM)



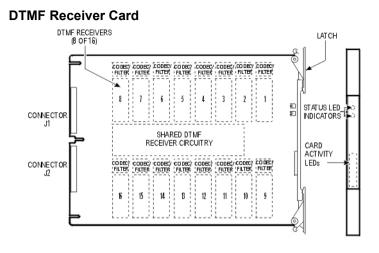


DNI Line Card



BB0120

Figure 35. DNI Line Card



BB0119

Figure 36. DTMF Receiver Card

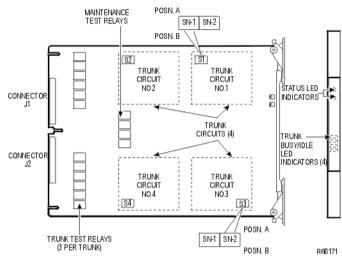
E&M Trunk Card

CONFIG URATION		ITCH ITION		TYPES OF INTER	FACE CIRCUITS
SERIAL NO.	(NC)TE) SN-2	CIRCUIT CONFIGURATION	SIG NAL CARRIER SET TYPES	COLLOCATED Trunk types
1	A	в	-48VWNXMM/C ∘SB ₁ISSG	TYPEI	NONE
			-48∨ E		
2	в	A	M M	TYPE II	TYPE II TYPE IV
3	в	В	-48∨E 6	TYPE V	TYPE I TYPE III TYPE V

NOTE: SWITCH SECTIONS ARE SN-1 AND SN-2, WHERE N IS THE PARTICULAR TRUCK CIRCUIT NUMBER ON THE CARD

Figure 37. E&M Trunk Card

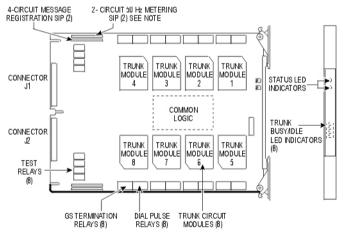
BB0149



SN-1 and SN-2 Cards

Figure 38. SN21 and SN-2 Cards

LG.GS Trunk Card



NOTE: 50 Hz METERING SIP INSTALLED ON MC340AB, MC340AD AND MC340AE CARDS ONLY. BB0117

Figure 39. LG/GS Trunk Card

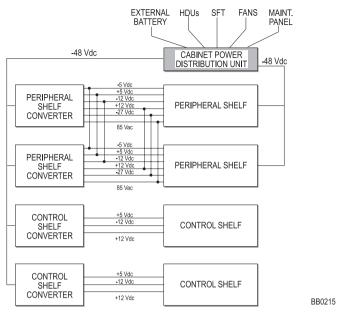
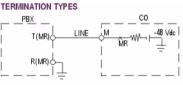
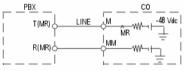


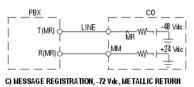
Figure 40. LG/GS Trunk Card Power Distribution



A) MESSAGE REGISTRATION, -48 Vdc, GROUND RETURN

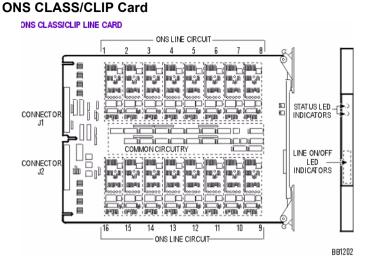


B) MESSAGE REGISTRATION, -48 Vdc, METALLIC RETURN



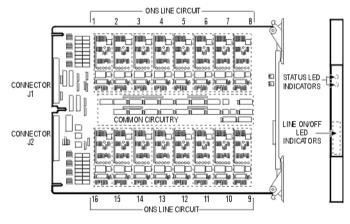
BB0266







ONS Line Card



BB0367



OPS Line Card

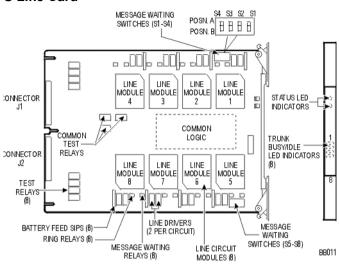


Figure 44. OPS Line Card

Digital Service Unit

The Digital Service Unit (DSU) provides digital trunk interfaces for public or private network access, and specialized digital functions (such as messaging and ISDN service).

The following cards can be installed in a DSU (some cards are only available in specific countries):

- DS1 Formatter
- CEPT Formatter
- E1/T1 Digital Trunk Formatter
- BRI Card (6 circuits)
- BRI Card (15 circuits)
- Euro PRI Card
- · NA PRI Card

R2 Card.

Conference Card

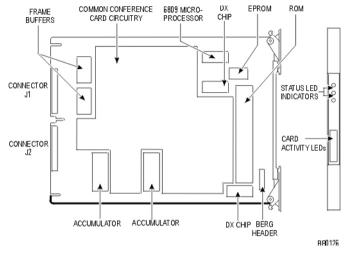


Figure 45. Conference Card

Appendix E Status LEDs

Technician's Handbook

About This Appendix

This appendix describes the following LEDs in the 3300 ICP system.

- Controller LEDs (below)
- Universal/R2 NSU LEDs (page 258)
- BRI NSU LEDs (page 263)
- ASU LEDs (page 264)
- Peripheral Unit LEDs (page 266)
- DSU LEDs (page 267)

For detail on the alarm, see the **Alarm Details** form on ESM (**Maintenance and Diagnostics** section).

Controller LEDs



Figure 46. Controller LEDs

- Power LED (below)
- Hard Drive LED (below)
- FIM LEDs (page 255)
- Ethernet LEDs (page 255)
- CIM LEDs (page 256)
- Alarm LEDs (page 257)

FIM LEDs

The top LED indicates the status of local FIM. The bottom LED indicates the status of the remote FIM.

The Controller FIM monitors the synchronization of the clock appearing on the fiber link from the Peripheral Unit or DSU.

The FIM in the Peripheral Unit or DSU monitors the synchronization of the clock appearing on the fiber link from the Controller (this synchronization state is encoded with other information and sent back to the Controller).

Table 63 below shows the meaning of the FIM LEDs.

Table 63. FIM LEDs

LED	Magning (Both LEDa)	
Status	Meaning (Both LEDs)	
ON	In frame synchronization.	
Flashing	Out of synchronization. OR	
	Tx and Rx cables reversed.	
OFF	Power off. OR	
	Held in reset.	

LAN Ethernet Ports LEDs

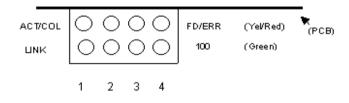


Figure 47. Controller LAN Ethernet Port LEDs

Table 64 below shows the meaning of the LAN Ethernet ports LEDs.

 Table 64.
 Controller Ethernet Ports LEDs

LED		Meaning	
Тор	Bottom	Normal Mode	Switch Pressed Mode
ON (Yellow)		Link activity.	Full duplex.
ON (Red)	_	Collision.	ERR.
_	ON (Green)	Link integrity.	100 Mbps.
_	OFF	No link integrity.	10 Mbps.

CIM LEDs

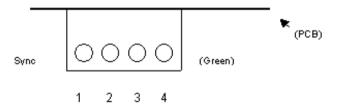


Figure 48. Controller CIM LEDs

Table 65 below shows the meaning of the CIM LEDs.

 Table 65.
 Controller CIM LEDs

LED	Meaning (All LEDs)	
Status	Meaning (All LEDS)	
ON	Communication link established and configured.	
Flashing	Link established but not configured.	
OFF	No power.	

Alarm LEDs

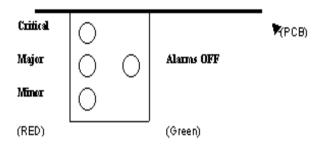


Figure 49. Alarm LEDs

Table 66 below shows the meaning of the Alarm LEDs in normal operation.

Table 66. Controller Alarm LEDs

LED		Meaning	
Status	Color	Meaning	
Critical L	.ED:		
ON	Red	Service is lost; immediate maintenance required (critical alarm invokes system fail transfer if enabled). <i>OR</i> Power on reset ongoing. <i>OR</i> INIT switch activated (resets all boards).	
OFF	—	No alarm.	
Major LE	D:		
ON	Red	Service has degraded beyond predetermined threshold. <i>OR</i> There is a critical. <i>OR</i> POR or INIT switch active.	
OFF	_	No alarm.	

Table 66. Controller Alarm LEDs (continued)

LED		Meaning	
Status	Color	Wearing	
Minor LE	D:		
ON	Red	Minor malfunction in system (minor alarm raised when system not fully operational). <i>OR</i> Critical Alarm on. <i>OR</i> POR or INIT switch active.	
OFF		No alarm.	
Alarms C	OFF LED:		
ON	Green	Alarm is on but silenced (Silence state is toggled by the Remove Alarms ON/OFF switch). <i>OR</i> PRO or INIT switch active.	
OFF		Alarm is audible. <i>OR</i> Controller is powering up.	

Network Services Unit LEDs

Universal/R2 NSU LEDs



Figure 50. Universal and R2 NSU LEDs

The Universal and R2 NSU LEDs are grouped as follows (see Figure 50 above):

- **1** LAN LEDs (below)
- **2** L0/L1 LEDs (page 260)
- O Card Status LEDs (page 261)
- **④** FIM LEDs (page 262)
- G CIM LEDs (page 262)

LAN LEDs

Table 67 below shows the meaning of the LAN LEDs.

Table 67. NSU LAN LEDs

LED		Meaning	
Status	Color Universal NSU		R2 NSU
LAN LED:			
Flashing LAN activity			
MS (Message Status):			
ON	Green	Message link open to the system.	

LED		Meaning	
Status	Color	Universal NSU	R2 NSU
OFF		Message link not open to the system. <i>OR</i> With L0/L1 LEDs marching: downloading.	Message link not open to the system.
ST (Status	s):		
ON		Card is booting. OR Card is not operating.	Card is booting.
Flashing		Operational (flashes in 0.5 seconds intervals).	
OFF	_	Not operational.	

Table 67. NSU LAN LEDs (continued)

L0/L1 LEDs

Table 68 below shows the meaning of the L0/L1 LEDs.

Table 68. N	SU L0/L	1 LEDs
-------------	---------	--------

LE	D	Mea	ning
Left	Right	Universal NSU	R2 NSU
_	ON (Red)	No Layer 1.	No physical layer present. <i>OR</i> Network/line jumper not set
ON (Green)		D-channel established (PRI). <i>OR</i> Layer 1 established (T1, E1, DPNSS).	correctly. AB signalling established.
Flashing (Green)	_		Layer 1 established.
Flashing (Green)	ON (Yellow)	Alarm indication from far end.	
OFF	ON (Yellow)	Blue alarm from card (this is normal during link startup; PRI NA or response to yellow).	Blue alarm from card (this is normal during link startup).
Flashing (Green)	—	Layer 1 established (PRI).	
Flashing (Green)	ON (Yellow)	Alarm indication	from far end.

Table 68. NSU L0/L1 LEDs (continued)

LED		Meaning	
Left	Right	Universal NSU	R2 NSU
Flashing (alternating yellow and green)		Downloading (15-20 minutes).	
Flashing (alternating yellow)		Decompressing (2-4 minutes).	and copying files
_	OFF	No error	
OFF	—	No Link.	

Card Status LEDs

Table 69 below shows the meaning of the Card Status (message link controlled) LEDs.

Table 69. NSU Card Status LEDs

LED			Meaning
Green	Yellow	Red	Meaning
ON	—		No error.
—	ON		Out of service.
_	—	ON	Error (not necessarily total failure).
ON	ON	_	Out of service (may occur at power up).
ON	—	ON	Fault detected.
—	ON	ON	Out of service (appears at power up).
ON	ON	ON	Appears at power up before the NSU is fully operational.
OFF	OFF	OFF	Fully operational.

NSU FIM LEDs

Table 70 below shows the meaning of the NSU FIM LEDs.



Note: When a remote MFC status LED is off, check the local FIM status LED. If it is ON, then the fiver optic cable may be faulty.

Table 70. NSU FIM LEDs

Top LED	Meaning for local, upper and
Status	remote, lower FIM
ON	In frame synchronization.
Flashing	Out of synchronization. <i>OR</i> Tx and Rx cables reversed.
	Tx and Rx cables reversed.
OFF	Power off. OR
	Held in reset.

NSU CIM LEDs

Table 71 below shows the meaning of the NSU CIM LEDs (CIM 1 is on the left, and CIM 2 is on the right).

Table 71. NSU CIM LEDs

LED	Meaning (all LEDs)
Status	
ON	Communication link synchronized with 3300 Controller.
Flashing	BSP running.
Marching	When top and bottom LEDs are alternating, NSU is powering up. Do NOT interrupt.
OFF	No power.

BRI NSU LEDs



Figure 51. BRI NSU LEDs

The BRI NSU LEDs are grouped as follows (see Figure 51 above):

- **OBRI** Circuit LEDs (below)
- **OCEPT LED** (page 260)

BRI Circuit LEDs

Each BRI Circuit LED shows the status of the corresponding BRI circuit. The BRI Circuit LEDs are also used during card initialization to indicate the progress of the self-test, and to indicate the download is in progress.

CEPT LED

Table 72 below shows the meaning of the CEPT LED.

Table 72. CEPT LED

LED	Meaning	
Status		
ON	Call in progress on DPNSS link.	
Flashing	1 sec. cycle: Layer 1 established. 4 sec. cycle: Layer 2 established.	
	4 sec. cycle: Layer 2 established.	
OFF	CEPT link not established.	

Analog Services Unit LEDs



Figure 53. ASU LEDs

The ASU LEDs are grouped as follows (see Figure 51 above):

- OCIM LED (below)
- **ONS** Circuit LEDs (page 260)
- OLS Circuit LEDs (page 260)

CIM LED

Table 73 below shows the meaning of the CIM LED.

Table 73.ASU CIM LED

LED	Magning		
Status	Meaning		
ON	Communication link synchronized with Controller.		
Flashing	BSP running.		
OFF	No power.		

ONS Circuit LEDs

Each ONS Circuit LED shows the status of the corresponding ONS circuit.

Table 74 below shows the meaning of the ONS Circuit LEDs.

Table 74. ASU ONS Circuit LEDs

LED	Meaning (All LEDs)	Circuit State	
Status		on cuit otate	
ON	_	Off hook.	
Flashing	SLOW: Circuit is manual busy.	ldle.	
	FAST: Circuit fault.	ldle.	
	IN A PATTERN: Loading software.	—	
OFF		ldle.	

LS Circuit LEDs

Each LS Circuit LED shows the status of the corresponding Universal ASU LS circuit.

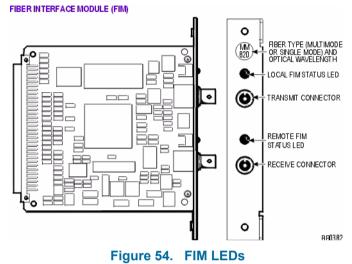
Table 75 below shows the meaning of the LS Circuit LEDs.

Table 75. Universal ASU LS Circuit LEDs

LED	Meaning (All LEDs)	Circuit State	
Status	Meaning (All LEDS)		
ON	—	Off hook.	
Flashing	SLOW: Circuit is manual busy.	ldle.	
	FAST: Circuit fault.	ldle.	
OFF	 	ldle.	

Peripheral Unit LEDs

Fiber Interface Module LEDs



See "CIM LEDs" on page 256 for more information on the FIM LEDs.

Digital Services Unit LEDs

DSU PRI Card LEDs

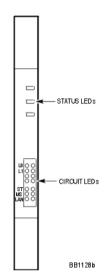


Figure 55. DSU PRI Card LEDs

Table 76 below shows the meaning of the PRI Card Circuit LEDs.

Table 76. DSU PRI Card Circuit LEDs

LED		Meaning (All LEDs)	
Status	Color	Meaning (All LEDS)	
MS (Messa	age Syste	m):	
ON	Green	Message link open to the system/	
OFF		Message link not open to the system.	
ST (Status	ST (Status):		
ON		Card is booting.	
Flashing		Operational.	
OFF		Not operational.	
L0/L1 LEDs:			

LED		Meaning (All LEDs)	
Status	Color	Meaning (All LEDS)	
Left	Right		
—	ON (Red)	Error.	
—	OFF	No error.	
ON (Green)	_	D-channel established.	
Flashing (Green)	_	Layer 1 established.	
OFF	—	No link.	
Flashing (Green)	ON (Yellow)	Alarm indication from far end.	
OFF	ON (Yellow)	Blue alarm from card (normal during link startup).	

Table 76. DSU PRI Card Circuit LEDs (continued)

R2 Card LEDs

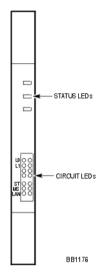


Figure 56. R2 Card LEDs

Table 77 below shows the meaning of the PRI Card Circuit LEDs.

Table 77. DSU R2 Card Circuit LEDs

LED		Meaning (All LEDs)	
Status	Color	Meaning (All LEDS)	
MS (Messa	age Syste	m):	
ON	Green	Message link open to the system/	
OFF		Message link not open to the system.	
ST (Status	ST (Status):		
ON		Card is booting.	
Flashing		Operational.	
OFF		Not operational.	

LED		Meaning (All LEDs)	
Status	Color	Meaning (All LEDS)	
L0/L1 LED	s:		
Left	Right		
_	ON (Red)	Error (no physical layer is present or network/line side termination jumper is not set properly).	
—	OFF	No error.	
ON (Green)	—	AB signaling established.	
Flashing (Green)	—	Layer 1 established.	
OFF	—	No link.	
Flashing (Green)	ON (Yellow)	Alarm indication from far end.	
OFF	ON (Yellow)	Blue alarm from card (normal during link startup).	

Table 77. DSU R2 Card Circuit LEDs (continued)

Appendix F FRU Part Numbers

Technician's Handbook

FRU Part Numbers

Hardware FRU Part Numbers

Table 78.	Hardware	FRU	Part	Numbers
-----------	----------	-----	------	---------

Part Number	Description
50000363	Power Distribution Unit
50000730	CEPT Interface Assembly
50001245	3300 - 32 Channel Echo Canceller
50001246	3300 - 64 Channel Echo Canceller
50001247	3300 - 128 Channel Echo Canceller
50001248	3300 - Dual Fiber Interface Module
50001260	3300 - Hard Disk Replacement
50001261	3300 - 250 to 700 Controller Upgrade Kit (FIM and Echo Canceller; exchange DSP for the new DSP)
50001266	3300 Analog Services Unit 4/16 Combo (NA)
50001267	3300 Analog Services Unit 24 Port (NA)
50001268	3300 Analog Services Unit 4/16 Combo (UK)
50001269	3300 Analog Services Unit 24 Port (UK)
50001270	3300 Universal Network Services Unit (NA)
50001271	3300 Universal Network Services Unit (UK)
50001274	3300 BRI Network Services Unit (NA)

Part Number	Description
50001275	3300 BRI Network Services Unit (UK)
50001856	SX-2000 Triple FIM Carrier
50002046	3300 Analog Services Unit 24 Port (LA)
50002047	3300 Analog Services Unit 4/16 Combo (LA)
50001272	3300 R2 NSU (110 V)
50001273	3300 R2 NSU (240 V)
50002370	3300 Peripheral Expansion Node (dark grey, 120 V, NA)
50002371	3300 Peripheral Expansion Node (dark grey, 240 V, NA)
50002372	3300 Peripheral Expansion Node (dark grey, 120 V, UK)
50002373	3300 Peripheral Node (dark grey, 120 V, AC, NA)
50002374	3300 Peripheral Node (dark grey, 240 V, AC, NA)
50002375	3300 Peripheral Node (dark grey, 120 V, AC, UK)
50002376	3300 Peripheral Node Door (dark grey)
50002572	3300 Peripheral Cabinet FRU
50002580	3200 to 3300 Upgrade 250 Users UK (upgrade components to 3.2)
50002581	3200 to 3300 Upgrade 250 Users NA (upgrade components to 3.2)
50002582	3340 Branch Office Solutions (LA)
50002583	3340 Branch Office Solutions (UK)
50002584	3340 Branch Office Solutions (NA)

Part Number	Description
50002813	3300 Analog Services Unit 24 Port Euro
50002814	3300 Universal Analog Services Unit 4/16 Combo Euro
50002922	3300 Power Dongles (Cisco compliant) 10 PK
50002211	3300 Controller 100 User
50002970	3300 Controller 250 User
50002971	3300 Controller 700 User
50003345	3300 Configuration Tool 3.3 (CD-ROM & License)
50003347	3300 Configuration Tool 3.3 (CD-ROM)
50002976	Power Cord 3 Pack NA
50002977	Power Cord 3 Pack UK
50002952	Power Cord 3 Pack Euro
50002230	Power Cord 3 Pack Australia/New Zealand
50002978	3300 Controller (contains E2T and RTC only)
50002979	3300 Quad DSP MOD II
52000810	3300 Chassis Upgrade 64 Channels Compression 700 User (contains 50002971- 700 User Controller, 2 X DSPs, 40 Compression Licenses (use old SysID and Hard Drive))

Part Number	Description	
52000840	3300 Chassis Upgrade 64 Channels Compression 250 User (contains 50002970 - 250 User Controller, 2 X DSPs, 40 Compression Licenses (use old SysID and Hard Drive))	
9125-100-100-NA	EMI Filter Kit	
9125-100-106-NA	Cabinet Interconnect Cable, 4.5 m (15 ft)	
9180-305-000-NA	System Fail Transfer Unit (6 circuit)	
9189-000-400-NA	SUPERCONSOLE 1000 - Light Grey; Back lit	
9189-000-401-NA	SUPERCONSOLE 1000 - Dark Grey; Back lit	
9400-200-116-NA	Peripheral Node	
9400-200-117-NA	Peripheral Expansion Node II (AC)	
9400-200-118-NA	Peripheral Cabinet II (AC)	
9400-200-119-NA	Peripheral Interconnect Card	
9400-200-122-NA	DSU Node	
9400-200-125-NA	DSU Cabinet (AC)	
9400-200-144-NA	Cabinet Stacking Brackets	
9400-200-200-NA	Power Module Redundant (in Control Node)	
9400-200-301-NA	Peripheral/DSU Resource Card	
9400-200-303-NA	Peripheral Slot FIM Carrier Card	
9400-200-304-BA	SUPERSET Hub Unit	
9400-200-306-BA	SUPERSET Hub Package	
9400-200-310-NA	Doors for Control/Peripheral Nodes (Pkg. of 2)	
9400-300-202-BA	Fan (240 VAC)	

Part Number Description	
9400-300-204-NA	AC Power Supply
9400-300-301-NA	Fiber Interface Module (FIM)
9400-300-302-NA	Quad FIM Carrier
9400-300-308-NA	DSU Slot FIM Carrier
9400-300-310-NA	FIM Carrier Card
9401-000-024-NA	Music on Hold Paging Unit (DNIC)
MA218AA	DS1 Interface Assembly
MA225AA	PRI Interface Assembly
MA233AA	Dual 10Base-T Interface Assembly (for OPS Man)
MA501AA	BRI Interface Assembly
MC268AA	6 CCT BRI Card
MC268AB	15 CCT BRI card
MC269AA	PRI Card, E1 Dual Link
MC269CA	CEPT Interface Card
MC270AA	PRI Card, T1 Dual Link
MC270CA	T1 (DS1) Formatter card
MC271AA	E1 R2 Card
MC312AB	Peripheral Switch Control II card
MC320CL	ONS CLASS Line Card (UK) with positive disconnect
MC320CM	ONS CLASS BRI Line Card
MC320EA	ONS CLASS Line Card (16 circuits)
MC320FA	ONS CLASS Line Card with positive disconnect
MC321AC	OPS Line Card (8 circuits)
MC330AB	DNI Line Card (16 circuits)
MC340BA	LS/GS Trunk Card (8 circuits)

Part Number	Description
MC341CA	DID/Loop Tie Trunk Card (4 circuits)
MC342BB	E&M Tie Trunk Card (4 circuits)
MP914AA	AC Power Converter
MT914AD	Power Converter (for the MICRO LIGHT 220 V)
MW401AA	BRI Cable - MDF 25 pair cable, 3 m (10 ft)
MW401AB	BRI Cable - MDF 25 pair cable, 10 m (32.5 ft)
MW402AA	BRI CEPT Cables
MW403AA	BRI MMI Cable
MW404AA	R2 Card, RJ-45 to Coaxial Adapter cable (2X BNC)

Software Options FRU Part Numbers

Table 79. Software Options FRU Part Number
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Part Number	Description
50002690	3300 3.1 Base Software Replacement (Software CD-ROM)
50002953	3300 3.2 Base Software Replacement (Software CD-ROM)
50003343	3300 3.3 Base Software Upgrade (Software CD-ROM, IP Console Software, Hard Drive, Handbook)
50003346	3300 3.3 Base Software (CD-ROM, SysID, Hard Drive, Handbook)

Table 79. Software Options FRU Part Numbers

Part Number	Description	
50003348	3300 3.3 Base Software (CD-ROM and Handbook)	
50003344	3300 3.3 Base Software (CD-ROM)	
54000291	3300 User License (One User)	
54000294	3300 Device License (One Device)	
54000297	3300 Mail Box License (One Mail Box)	
54000300	3300 ACD Agent License (One Agent)	
54000303	3300 Digital Link License	
54000497	3300 XNET Networking License	
54000540	3300 IP Networking License	
54000582	3340 Branch Office Solution Upgrade (NA)	
54000581	3340 Branch Office Solution Upgrade (UK)	
54000580	3340 Branch Office Solution Upgrade (LA)	
54000650	3300 Compression License (8 Channels)	
9125-271-000-NA	R2 Application CD-ROM Software	
9125-070-002-NA	PRI T1 Card CD-ROM Software	
9125-070-011-NA	Euro ISDN PRI Card Release 6 Application Software	
9125-070-012-NA	ISDN PRI Card Release 6 Application Software	
9125-501-001-NA	ISDN Min/Max Software Option for the PRI Card	

Part Number	Description
9125-501-002-NA	ISDN Auto Min/Max Software Option for the PRI Card
9125-501-003-NA	ISDN NFAS Software Option for the PRI Card
9125-501-004-NA	ISDN D-Channel Back up software option - PRI Card
9125-501-005-NA	ISDN remote LAN Access software option - PRI Card

Table 79. Software Options FRU Part Numbers

Technician's Handbook

Appendix G Handling Fiber Optic Cables

Technician's Handbook

Handling Fiber Optic Cables

Fiber Interface Module (FIM)

Guidelines for Handling Fiber Optic Cable

- Never touch the tip of a fiber connector. Cleanliness of the connector ferrule (tip) is important for error free transmission.
- Always place the dust caps onto the connectors immediately after disconnecting.
- You can clean the ferrule tips on the connectors with ethyl alcohol.
- Fiber optic cables are often more easily installed and pulled than copper because of their lightweight and flexibility. However, take care not to exceed the minimum bend radius or maximum tensile strength.
- Procedures for the repairing, splicing, or assembling fiber optic cables are available from fiber component manufacturers (many offer training courses).



WARNING: Fiber optic sources emit infrared light that is invisible to the human eye. Never look directly into a source or into the end of a fiber energized by a source because it can damage the retina.

When working with raw fiber optic cable, be careful of the fiber ends or slivers that can puncture the skin or cause irritation.

Specifications

At each end of a fiber optic cable is a Fiber Interface Module (FIM). At the transmitting end, the FIM converts electrical signals into pulses of light to be transmitted over the cable. At the receiving end, the FIM converts the pulses of light back into electrical signals usable by the node.

The FIM connects the 3300 Controller to a peripheral unit, NSU or DSU. These FIMs cannot be installed in the Applications Gateway. Each FIM variant may be identified by its optical wavelength and fiber type (indicated on the FIM faceplate). The same FIM variant must be used at each end of a fiber optic cable. However, a node may be equipped with different FIM variants to suit the length of each cable run.

Fiber Interface Module Specifications (9400-300-301-NA)		
Approximate maximum fiber cable run length (See Note 1)	1 km (0.62 miles)	
Power consumption (Watts)	2.5	
Number of fiber links per FIM	1 Tx, 1 Rx	
Fiber connector type	ST (See Note 2)	
Electrical interface (See Note 3)	8 serial ST links	
Optical wavelength (nm)	820	
Optical budget (See Note 4)	6 db	
Date rate (Mbits/second)	16.384	
Bit rate after encoding (Mbaud)	20.48	
Fiber optic cable type	62.5/125 µm Multimode	

Fiber Interface Module Specifications (9400-300-301-NA)

Notes:

- 1. The run length is the one-way length of fiber optic cable between nodes.
- 2. ST is a registered trademark of AT&T.
- 3. Some channels of the electrical interface are not available.
- 4. The optical budget is the allowable loss through fiber optic cable, splices, and connectors. The optical budget applies to the run length.

Operation

The FIM has three functional sections: a transmitter, a receiver, and a control section.

The transmitter section accepts data from the node in which it is installed. The data is converted to byte-interleaved format, and a checksum is calculated. The checksum byte is combined with the data and the frame synchronization information. The frame is encoded as serial data and transmitted on the fiber.

The receiver section converts the incoming data to parallel format, extracts the frame synchronization information, and decodes the data. Control and status information is extracted and further decoded. The checksum is verified and an error counter updated. The status information and data are combined, frame-aligned, and re-formatted for output.

The control section generates control signals and the transmit clocks. This section also regenerates the telephony clocks for the peripheral nodes, and provides status information for the Main Controller.

Two LEDs indicate the detection of local and remote clocks.

Technician's Handbook

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