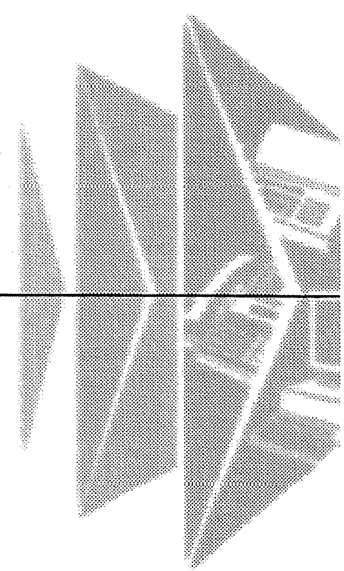
Issue 1 Release 2.0 January 1996

MITEL MAIL™

Voice Processing Solutions

Technical Reference Manual

MITEL®



Documentation Index

This index provides a list of technical practices for MITEL MAIL™ Release 2.0. The documentation set is contained in seven volumes as follows:

Vol. No.	Title	Part Number
Volume 1	**SYSTEM IMPLEMENTATION** System Implementation Guide	**9150-953-222-NA**
Volume 2	**REFERENCE AND CONFIGURATION** Reference and Configuration Manual	**9150-953-225-NA**
Volume 3	**FEATURES** FaxMemo Manual Receptionist II Manual Release Notes System Description	**9150-953-228-NA**
Volume 4	**INSTALLATION** Installation and Service Manual Notice to Installer - New System Notice to Installer - Software Update Prompt Installation Instructions Enhanced In-band Integration Manual E1/T1 Digital Trunk Connectivity Manual PMS Integration Manual TNPP Installation and Configuration PBX Integration	**9150-953-223-NA**
Volume 5	**TROUBLESHOOTING** Technical Reference Manual Diagnostics Manual Error Log Messages	**9150-953-227-NA**
Volume 6	**NETWORKING** MESA-Forms Manual MESA-Net Administrator's Manual MESA-Net Sprint Configuration Unified TCP/IP Manual	**9150-953-229-NA**
Volume 7	**OPTIONAL FEATURES** AMIS Analog Networking Guide Automatic Wakeup CallAgent Reference and Configuration Manual Cut-Through Paging User's Guide OneView Administrator's Guide	**9150-953-224-NA**

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6 Power Components

7 Operations, Administration, and Maintenance

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About This Manual

This manual contains technical reference information about hardware components for all servers. These servers include: Model 120, Model 70, and Model 640.

Who Should Read This Manual

This manual is intended for Centigram Certified Technicians (CCTs), responsible for installing and servicing the Centigram Series 6 voice mail servers.

Technicians must have experience with voice mail servers, PC hardware component installation, and an understanding of basic telecommunications principles. They must have completed the VoiceMemo Phase I and Phase II Installation and Maintenance courses.

If you do not meet these criteria, do not attempt to install or service Centigram Series 6 voice mail servers. Please contact your regional office or the Centigram Regional Operations Manager.

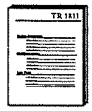
How to Use This Manual

Organization

This manual contains the following information:

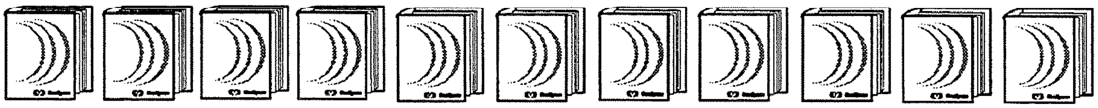
- Chapter 1: System Level References
- Chapter 2: System Connectivity Components
  - Section A: Telephony Components
  - Section B: Computer Interfaces
- Chapter 3: Special-Service Components
- Chapter 4: Base-System Components
- Chapter 5: Storage Components
- Chapter 6: Power Components
- Chapter 7: Operations, Administration, and Maintenance

Technical References



Use the technical references, in each chapter, to find detailed background information about the hardware components of all Series 6 servers. Use these references in conjunction with the Installation and *Service Manual* for your specific server.

Which Document Do I Use?



Topics listed below are described in the Centigram documents indicated. This table lists documents for the base hardware and software only, not optional features.

Topics	Notice to Installer	System Implementation Guide	Centigram Series 6* Installation and Service Manual	Centigram Series 6 Technical Reference Manual	VoiceMemo Reference and Configuration Manual	Centigram Series 6 Diagnostics Manual
Activating an inactive configuration					✓	
Administration by Phone					✓	
Billing					✓	
Call placement					✓	
Card configuration				✓		
Card replacement			✓			
Defining a line group					✓	
Diagnostics						✓
DID VoiceMemo application					✓	
Disk replacement			✓			
Distribution lists					✓	
Duplicating a configuration					✓	
Error Log messages						✓
Event Recorder messages			✓			✓
FCOSs and feature bits					✓	
Floppy backup and restore			✓			

Topics (continued)	Notice to Installer	System Implementation Guide	Centigram Series 6+ Installation and Service Manual	Centigram Series 6 Technical Reference Manual	VoiceMemo Reference and Configuration Manual	Centigram Series 6 Diagnostics Manual
FPSA					✓	
GCOSs and groups					✓	
Glossary					✓	
Greetings						
Hardware changes	✓		✓			
Hardware descriptions				✓		
Installation procedures	✓		✓			
LCOSs and limits					✓	
Mailboxes					✓	
Message delivery					✓	
Message waiting lights					✓	
Paging					✓	
Passcode - mailbox					✓	
Password - console			✓			
Phoneline exceptions				✓		
Power information		✓		✓		
Prompts			✓		✓	
RCOSs (NPA/NXX)					✓	
Release Notes	✓					
Repairing a Centigram Series 6 server			✓			
Replacing a Centigram Series 6 server			✓			
Reports					✓	
Resource Manager				✓		
Service procedures			✓			
Site preparation		✓				
System administration					✓	
System maintenance			✓			
System security					✓	

Topics	Notice to Installer	System Implementation Guide	Centigram Series 6* Installation and Service Manual	Centigram Series 6 Technical Reference Manual	VoiceMemo Reference and Configuration Manual	Centigram Series 6 Diagnostics Manual
System verify			✓			
Testing a configuration			✓		✓	
Troubleshooting						✓
Updating	✓		✓			
Upgrading	✓		✓			
Verifying configuration parameters					✓	
VoiceMemo application					✓	

*Includes: Model 70, Model 120, and Model 640 Installation and Service Manuals.

What If Information Is Missing?

If the information you need is not yet available in the documents listed above, go to these documents:

- *Release Notes for VoiceMemo Software Release 6.OA*
- Other existing documents, as applicable

How Do I Obtain the Documents I Need?

To obtain other Centigram documents, contact your local Centigram distributor.

Conventions Used in This Manual

The procedures in this manual use the following conventions to describe how you enter configuration information and how information is displayed on the Series 6 server console:

Press Enter — Press the Enter key. For example, "Press Enter if the current number is correct." On some keyboards, this key is labeled "Return" or has a return arrow (↵) on it.

Enter — Type the text shown, then press the Enter key. For example, "Enter the line number (1-24)" means type a number from 1 through 24, and then press the Enter key.

bold — Words or characters in bold type indicate either a value to be entered by you exactly as shown or, when used to indicate a variable entry, describe the type of value to be supplied by you. See example above.

What you select from a displayed menu

A displayed prompt for information

Select: (G) Current Group
Prompt: `Enter a group number =`
Response: Number of the line group (1-24) to be used for the application.

What you enter in response to the prompt

Note: Unless otherwise stated, press Enter after each response you enter.

Reader Advisories

Reader advisories used in this manual are shown below.

Note: Information especially useful in relation to this procedure.

CAUTION!

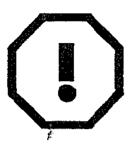
Information that helps you prevent equipment or software damage.

CAUTION!

Information that helps you avoid electrostatic discharge (ESD) damage to the equipment.

WARNING!

Information that helps you prevent an interruption to telecommunications traffic.



WARNING!

A hazard that can cause you personal injury.

DANGER!

Warns of a condition that could severely injure or kill you.

Before You Start

This manual assumes that you are familiar with using a console and keyboard. This section describes how to use the Centigram Series 6 server effectively.

Console Tips and Techniques

The tips and techniques offered in the following paragraphs can make configuration entry sessions at the Centigram Series 6 server maintenance console more productive.

Viewing Menus

- When you finish entering a value for a parameter, the server displays an abbreviated form of the current menu, called the "short menu." To view the complete current menu when a short menu is displayed, just press Enter.
- To return to the Main Menu from any VoiceMemo application configuration menu, press X (Exit), until the Main Menu appears.

Accepting Defaults

- To accept a default displayed in a *prompt,* just press Enter.
- To accept a default displayed in a *menu,* no action is necessary.

Avoiding Automatic Exit

CAUTION!

The Centigram Series 6 server "times out" after 15 minutes. This means that if you do not enter anything at the console for 15 minutes, the server automatically exits from the current program. When this happens, all work that has not been saved on the disk is lost.

To avoid being timed out and losing your work, follow these steps:

1. When you need time to think, write down the name of the current menu.
2. Exit to the (server) Main Menu.
3. When you want to continue your work, enter the appropriate menu options to regain your place.

If you find that the Centigram Series 6 server has timed out, follow the steps below. If your screen is blank, press any key to reactivate the screen and then continue with these steps.

1. Press any key to start the login sequence.
2. Enter your user ID and password (if requested).
3. Starting from the Main Menu, enter menu options to proceed to the menu from which the server timed out.
4. Reenter data as needed to regain lost work.

Quitting an Entry Session

At any point during entry of offline or online parameters, you can quit. Quitting discards all parameter entries you have made and leaves the VoiceMemo application configuration- the way it was before you started entering parameters.

To quit from the VoiceMemo Configuration Offline or Online menu:

Select: (Q) Quit -- Forget Changes
Prompt: Quit and forget changes? (y/n) =
Response: *Y* to return to the VoiceMemo Configuration Main Menu.

Shortcut Commands

You can use the Ctrl (Control) key or the / (slash) key while simultaneously pressing another key to execute shortcut commands at a Centigram Series 6 server maintenance console.

To do this...	Type...
Activate a timed-out console.	any key
From the offline or online menus, or FCOS, LCOS, GCOS menus, return to the VoiceMemo Configuration Menu and save any entries.	**/X**
From the offline or online menus, or FCOS, LCOS, GCOS menus, return to the VoiceMemo Configuration Menu without saving any entries.	**/Q Y**
Stop scrolling a displayed report.	**Ctrl-S**
Resume scrolling a displayed report.	Ctrl-Q
Return to the VoiceMemo application when a # or $ prompt is displayed.	Ctrl-D *or type exit*

Preparing for Hardware Installation

Before you begin to install any server hardware, read the following warnings.

WARNING!

An equipment grounding conductor that is not smaller in size than the ungrounded branch-circuit supply conductors must be installed as part of the circuit that supplies the product or system. Bare, covered, or insulated grounding conductors are acceptable. Individually covered or insulated equipment grounding conductors must have a continuous outer finish that is either green, or green with one or more yellow strips. The equipment grounding conductor is to be connected to ground at the service equipment.

WARNING!

The attachment plug receptacles in the vicinity of the product or system must be of a grounding type and the equipment grounding conductor serving these receptacles must be connected to earth ground at the service equipment.

DANGER!

Never install telephone wiring during a lighting storm.

Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

Use caution when installing or modifying telephone lines.

Protecting Your Equipment From Damage

CAUTION!

Many of the server components are easily damaged by electrostatic discharge (ESD) or rough handling: line cards, CPU cards, and hard disks are particularly susceptible to damage. Unless instructed otherwise, observe the precautions listed below and in individual sections during the handling of all components.

If you follow these simple instructions, you will reduce the risk of equipment trouble, down-time, and customer dissatisfaction:

- Wear a grounded wrist strap while handling components. Doing so protects the components from electrostatic discharges (ESD).
- Do an orderly shutdown of your server before turning its power off. Refer to CP 6268, "Shut Down a System," for instructions.
- Removing or installing a component while the server power is on can severely damage both the component and its associated circuitry.

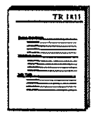
  Always:

  - Wait 60 seconds after your turn the server power off. The hard disk should stop spinning and be quiet.
  - If you need to set switches or jumpers on a circuit card, first place the card on an anti-static mat. If such mat is not readily available, use the card's anti-static bag as a temporary mat. If neither a mat nor a bag is available, do not work on the component until you have obtained one.
  - Store circuit cards and other components in anti-static bags and their original shipping boxes.

1 System Level References

- This chapter provides System *Level Technical References.*

Technical References



Use the technical references to find detailed background information about the hardware components of a Centigram Series 6 server. These are: the Model 640, the Model 120, and the Model 70.

How to Use This Chapter

Identify the *System-Level References* that you want to study. Go to the "List of Technical References" in this chapter and identify its technical reference number. The references are listed in numerical order in the "List of Technical References" table.

If you remove a technical reference from this binder, mark its original location, and replace it when you are finished with the document.

1 System Level References
List of Technical References

Tech. Ref. Number	Title	Document Rev.	Release Number
TR 1902	Model 120 Service Card Hardware Configuration	Doc. Rev. A	6.0A
TR 1920	Model 70 Service Card Hardware Configuration	Doc. Rev. A	6.0A
TR 1922	Model 640 Service Card Hardware Configuration	Doc. Rev. A	6.0A
TR 1935	Series 6 Server Service Card Software Configuration	Doc. Rev. A	6.0A

Model 120 Service Card Hardware Configuration Technical Reference

This document provides a brief description of the Centigram Series 6 Communication Server Model 120, service card configuration procedures, and hardware configuration rules and maps.

1 Server Overview

The Series 6 server platform is available in three packaging options: the rackmount server (Model 640), the desktop minitower (Model 70), and the tower (Model 120) servers. Each server uses a different CPU and supports a different number of ports and backplane slots.

This section provides a brief overview of the Model 120S and the Model 1201. Both Model 120 servers use the same software and are based on the same design, but have minor differences in the CPU, hard drives, and service card configurations.

Model 120S

The Model 120S server is a standard tower cabinet featuring a Pentium 100 MHz CPU, SCSI bus, 500-watt power supply, 10 available ISA card slots, 3.5-inch floppy disk drive, and a SCSI hard disk. This system can accommodate up to eight ISA-compatible telephony interface cards (analog or digital) with a maximum of 60 ports, and up to four SCSI disks of the same size for a maximum redundant speech storage capacity of 480 hours. The telephony interface cards and the fax card support a special Multi-Vendor Integration Protocol (MVIP) bus. The base system is shipped with a CPU card, SCSI interface card, SCSI hard disk, a modem, and a minimum of four ports on one line card.

Model 120I

The Model 1201 server is a standard tower cabinet featuring a 486-33 MHz CPU card, 500-watt power supply, 11 available ISA card slots, 3.5-inch floppy disk drive, and an IDE hard disk. This system can accommodate up to four ISA-compatible telephony interface cards (analog or digital) with a maximum of 32 ports, and two hard disks for a maximum redundant speech storage capacity of 55 hours. The telephony interface cards and the fax card support a special Multi-Vendor Integration Protocol (MVIP) bus. The base system is shipped with a CPU card, IDE hard disk, a modem, and a minimum of four ports on one line card.

Hard disks provide storage for the operating system, system software, mailbox and message statistics, and digitized speech. Centigram qualifies hard disks for the highest reliability through a rigorous burn-in and testing process. Hard disks must meet high mean-time-between-failure rates. To ensure availability, at least two sources are qualified for each hard-disk size. Centigram uses SCSI disks for its

Model 640 and Model 120S servers, and IDE disks for its Model 1201 and Model 70 servers.

All servers come with a floppy disk drive for use with 3.5-inch double-sided, double-density diskettes (1.44-MB formatted). The floppy disk drive is used to install, reconfigure, and update system software, to back up mailbox and account data files, and to enable loading optional features.

2 Server Architecture

The block diagram in Figure 1 shows the Model 120 basic architecture. This architecture has been partitioned into several functional areas: System Connectivity Components, Special Service Components, Base System Components, Storage Components, Power Components, and Operations, Administration and Maintenance. The basic features of these systems are described below:

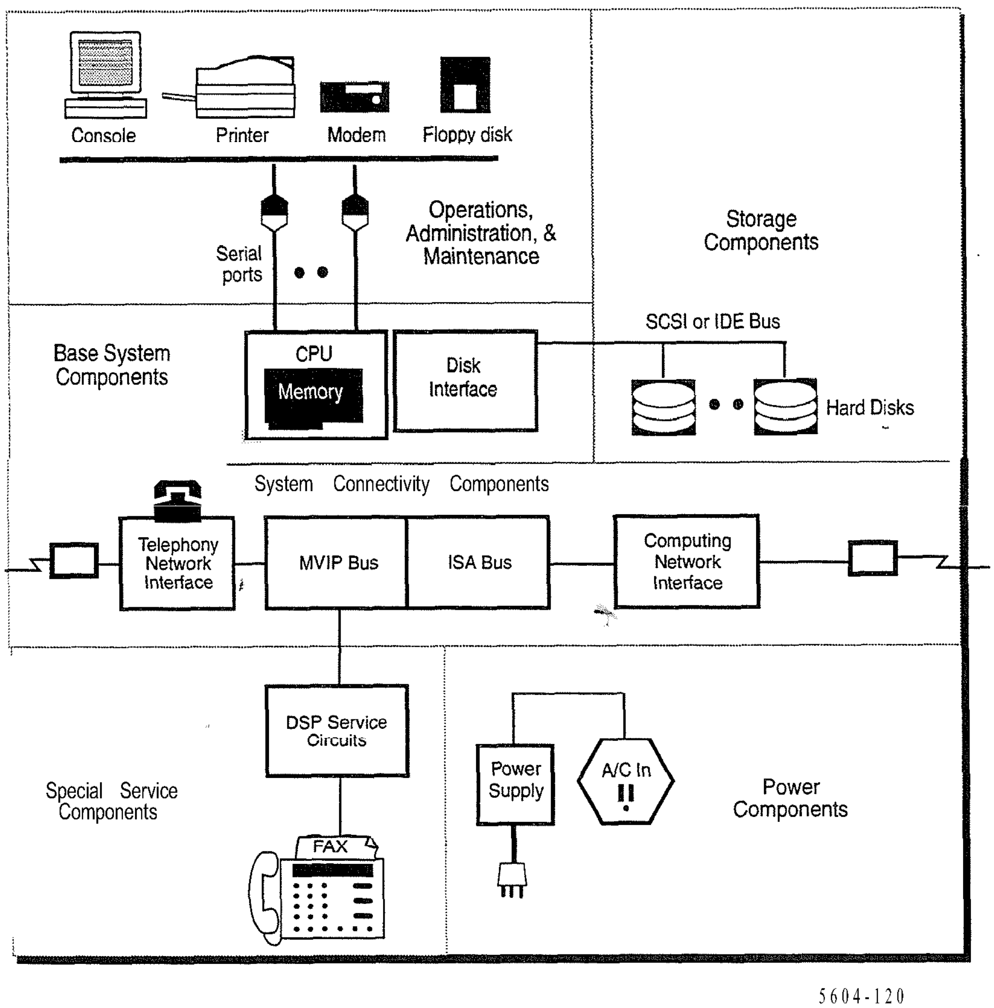


Figure 1 Model 120 Block Diagram

System Connectivity Components

These are the telephony and computer interface components that connect the system to the external world. They are located in ISA bus slots. Computer interfaces include a high speed serial card and an Ethernet card. Telephony interfaces include digital (T1 and El) and analog (Loopstart, DID, etc.) line cards as well as the SS7 card. The DSP cards, which are required to support the T1/E1 interfaces, are included here. The telephony interface cards are interconnected by the Multi-Vendor Integration Protocol (MVIP) bus.

Special Service Components

These consist of ISA fax cards. They are interconnected with the telephony interface cards by the MVIP bus to provide shared fax service.

Base System Components

These consist of the main CPU and disk storage interface. For the Model 1201, the CPU features an IDE interface. For the Model 120S, the CPU features a SCSI disk interface, which is provided by a plug-in card.

Storage Components

These consist of the attached hard drives where system software, mailboxes, user accounts, and user speech are stored. The Model 120S features up to four SCSI hard disks, and the Model 1201 features up to two IDE hard disks.

Power Components

These consist of the system power supply. Both the Model 120S and Model 1201 feature a 500-watt AC power supply.

Operations, Administration and Maintenance (OA&M)

This functional area consist of the system interfaces and features that provide support for the OA&M. They are the console serial ports on the CPU and the floppy drive interface.

3 Card Configuration

This section describes the physical hardware configuration procedures of the Model 120S and the Model 1201. Configuration and installation procedures for the Model 120 servers are similar, with the exception of the location and number of service cards accepted by each server.

Model 120S

The Model 120S features 10 available ISA card slots. (Standard system configuration requires a CPU card in slot 0 and a SCSI interface card in slot 1.) Slots 2 - 11 can be configured with other service cards according to specific user needs. The system backplane can accommodate up to 8 service cards. Both analog and digital service cards can be mixed in the same server. See Table 1 for a list of all service cards accepted by the Models 120S/120I. See Figures 2 and 3 for the Model 120S analog and digital configuration parameters.

Model 1201

The Model 1201 features 11 available ISA card slots. (Standard system configuration requires a CPU card in slot 0.) Slots 1 - 11 can be configured with other service cards according to specific user needs. The server backplane can accommodate up to 4 service cards. Both analog and digital service cards be mixed in the same server. See Table 1 for a list of all service cards accepted by the Models 120S/ 1201. See Figures 4 and 5 for the Model 1201 analog and digital configuration parameters.

Table 1 Model 120S/ 1201 Cards

Category/Name	Configure Hardware?	Consider Clock Term.?	Install MVIP Bus Cable?	Configure Res. Mgr?	Tech. Ref. Manual
Telephony Network Interfaces					Chap& 2A
LC4 (Four SIPs)	✓	✓	✓	✓	TR 1901
LC8 (Eight SIPs)	✓	✓	✓	✓	TR 1901
DSP8 (No SIPs)	✓		✓	✓	TR 1901
Power Config. Card (-48V)	✓				TR 1917
Dual T1	✓	✓	✓	✓	TR 1905
Dual El	✓	✓	✓	✓	TR 1906
DSP24	✓		✓	✓	TR 1903
DSP30	✓		✓	✓	TR 1903
SS7 (MTP Processing)	✓	✓	✓	✓	TR 1911
Computing Network Interfaces					Chapter 2B
Ethernet (16 bit Ethernet)					TR 1907
Serial-16/32	✓				TR 1908
Serial Smartcard	✓				TR 1909
Special Service Circuits					Chapter 3
FAX 2	✓	✓	✓	✓	TR 1904
FAX4	✓	✓	✓	✓	TR 1904
FAX8	✓	✓	✓	✓	TR 1904
Base System Components					Chapter 4
CPU - Pentium 100 MHz (120S)					TR 1912
CPU - 486/33 MHz (1201)					TR 1913
SCSI Interface Card (120S)	✓				TR 1916

Card Installation Guidelines

The Series 6 Servers use two types of cards: Bare-system *Cards* (examples: CPU cards and SCSI cards) and *Service Cards* (standard and special). LC8, El, and Ethernet are examples of standard service cards. Currently, the Fax card is the only one in the special service card category. Future product releases will introduce new special service cards. Install all cards in the server using the guidelines given below.

Before Installing the Card

1. Wear a grounded ESD wrist strap and attach it to a solid ground on the unit being serviced.

2. Refer to the Installation and Service manual and shut down the server, turn off the power supply, and wait *one* minute. The hard disk should stop spinning and be quiet.

Configuring the Hardware

3. Select the correct slot in the system backplane. Refer to the appropriate configuration map in this reference.

4. If the card is one of the cards listed below, set the card's address switches to match the card's configuration number required by the slot. Go to the Technical Reference for the card and determine which jumpers to set. The reference will also indicate what other jumpers or switches you need to set.

- Serial- 16/32
- Serial Smartcard
- Dual Tl, Dual El, SS7
- LC4, LC8, DSP8, DSP24/30
- FAX2, FAX4, FAX8

Terminating the Clock

CAUTION!

If you are adding a card, the existing termination may need to be moved from the existing card to the new one.

5. Only MVIP cards are involved in MVIP termination. A DSP24 or DSP30 card does not have any clock termination to set. The cards listed below are capable of terminating the MVIP clock signals
   - Dual T1, Dual El, SS7
   - LC4, LC8
   - FAX 2, FAX4, FAX8
6. Both ends of the MVIP bus must be terminated when four or more MVIP cards are installed. If a DSP24 or DSP30 card is an end card, the next closest card from that end must have its terminations set. (See list above.) When three or fewer MVIP cards are present, termination is helpful but not required. No more than two cards may have their terminations enabled at any given time. The MVIP bus must always use the shortest possible cable.
7. If you need to terminate a card's clock, go to the Technical Reference for the card and determine which jumpers to set.

Selecting a MVIP Bus Cable

8. Choose the minimum cable length to cover all MVIP cards from the cable choices given below. Note that the dash number of the cable signifies the number of MVIP connectors. For example, a "-07" cable has seven connectors.

Server Model Kit	MVIP Cables Included	Kit Part Numbers
Model 70 Kit	18 1 o-0590-04; -07	6800-70
Model 120 Kit	1810-0590-04, -07, -09, -11	6800-1201; 6800-120s
Model 640 Kit	1810-0590-04, -07, -09, -11, -13	6800-640

Installing the Card

9. Hold the new card by the top edge or upper corners and position over the empty card slot. Press the card firmly into the connector on the backplane.

10. Align the retaining bracket rounded notch with the slot frame hole.

11. Insert a 6-32 hex head Philips screw and secure the bracket.

12. Connect all required cables to the card.

Connecting the **MVIP** Bus Cable

13. When adding cards, try to use a cable from your bus cable kit that best matches your new configuration If after doing so, you still have a couple of leftover connectors, install the cable so there is one leftover connector at each end.

Booting Up the **Server**

14. Refer to your Installation and Service Manual for proper procedures and boot-up the server.

Adding the Card With Resource Manager

15. If your card is listed below, you need to add it with the Resource Manager Program. Go to TR 1935 and follow the instruction given there. If your card is not listed below, skip the following steps and refer to your *Series 6 Reference* and *Configuration Manual.* Do the offline configuration procedures listed in there.

- Dual T1, Dual El, SS7
- LC4, LC8, DSP8, DSP24/30
- FAX 2, FAX4, F A X 8

Configuring the Card **W**ith Resource **Manager**

16. After a card is added, follow the instructions in TR 1935 and configure it.

Assigning the Master Clock With Resource Manager

The MVIP bus requires a master clock *source* and a master clock reference to be selected. The Resource Manager software establishes a default Master Source and a Master Reference. If the slots maps are used, the default Master Source and Reference will always be correct when up to four MVIP cards (analog and/or digital) are present.

17. If you have a digital or mixed analog/digital configuration with five or more MVIP cards, select the T1 or E1 interface card closest to the center as the Master Clock Source, Digital trunk 0 on that card is your default Master Clock Reference.

    (Or...)

    If you have an analog only configuration with five or more MVIP cards, select the center most LC4 or LC8 as the Master Clock Source. The default Master Clock Reference is the oscillator on the selected card.

Note: Use the Resource Manager menus to make the selections, which may or may not be different from the default.

Configuration Rules and Maps

The information in Table 1 and configuration maps in Figures-2 - 5 show the assignments of service cards and their configurations to specific ISA bus slots on the Models 120S/ 1201 server hardware platforms. Supplementary configuration rules are provided for completeness and clarity. A service card configuration is a specific set of ISA bus resources allocated to this card. For example: Ethernet (3) configuration consists of IO Addresses 360H to 37FH, Interrupt 15, no Memory, and no DMA channels. Ethernet (1) is a different set of IO addresses and interrupt. The nomenclature specifies the configuration number in parentheses following the service card name. Ethernet (3) = configuration #3 of the Ethernet board. Some configurations are preprogrammed in the factory and are ordered specifically (such as the Ethernet cards) and some are configured by the installer. The documentation will reflect these differences.

The maps show a default map of service card assignments to slots with additional columns to the right indicating alternative assignments. If there are unfilled slots to the right of the default map, there are no alternative card assignments allowed. The intention of these maps is to provide a consistent set of manageable system configurations to satisfy the various engineering requirements of the product, specify the maximum product configurations for marketing, and provide reference configurations for manufacturing, TAC, and customers.

General Configuration Rules

When configuring a module, the order in which cards are assigned to slots will greatly simplify the process. As shown in the Order of Precedence, the first card to be assigned a slot is the Serial I/F (Serial-16/32 or Smartcard (3)). The last cards to be assigned slots are the FAX cards. (CPUs and the SCSI I/F card are all permanently assigned to their respective slots.) Within the Telephony I/Fs, Fractional Tls and their DSP8s are assigned first while the LC8s are assigned last.

Order of Precedence:

- Computer I/Fs
  - Serial
  - Ethernet
- Telephony I/Fs
  - Fractional Tl and DSP8s
  - Full T1/E1 and DSP24/30s
  - SS7 Integration
  - Power/Config Cards
  - LC8s
- Special Service Cards
  - FAX

Other Configuration Rules

These are additional configuration rules:

- **LC4/8** Mixing
  LC4s are LC8s with four Analog SIPs removed. They occupy the same slots for a given configuration number. Thus, an LC4 (3) would occupy the same slot as an LC8 (3). There would be a resource conflict if both existed within the same module. Any of the cards can be an LC4 or LC8 unless the total number of ports exceeds the limits of the particular platform. Notice that seven of the analog line cards on the Model 120 may be LC4 or LC8 while the eighth card may only be an LC4. When the available configuration numbers are all used up by a mixture of LC4s and LC8s and the platform is capable of supporting additional ports, the port capacity can only be increased by upgrading LC4s to LC8's by the addition of telephony SIPs or a card replacement.

- **T1/E1/Analog** Mixing
  T1 & El may not be mixed within the same unit. Either T1 or El may mix with analog within the same unit according to the appropriate figure.

- Number of FAX Ports
  The number of FAX ports may be equal to or less than the number of available telephony ports. They may not exceed the number of telephony ports.

- FAX 2/4/8 Port Mixing
  These cards can be mixed, but only in a strict sequence or else resource conflicts will occur. Of the allowed FAX configuration numbers , FAX2s must start at the lowest number until all are assigned followed by all of the FAX4s and then finally the FAX8s. If a FAX2 is added to an existing mixture, it must be inserted into the lowest group with all FAX4 s and FAX8s moved up. This situation is the same for FAX4s.

- MVIP Bus Cabling
  The assignment of Telephony and Special Service cards is intended to maintain a closely grouped set of MVIP cards and to minimize any gaps between cards. Always use the smallest possible MVIP bus cable. If there are unused connectors on the cable, they should be symmetrically distributed on either side of the group of MVIP cards. If the configuration is analog only with no FAX, an MVIP cable is not required but highly recommended. Digital, FAX, or mixed Analog/Digital all require the use of an MVIP cable.

- OneView Capacity
  The current rule is that a OneView session is equal to a VMEMO port. When counting port capacity for a module or a platform, Analog ports + digital ports + number of simultaneous OneView sessions must be less than or equal to the port capacity.

- Expansion of Initial Configuration
  When a card is added to an initial configuration, the new card configuration map must be recreated from the beginning.

Model 120S Analog Configuration Map
Max VM Ports: 60
Max Fax Ports: 32 (w/ 32 VM Ports)

Slot No.				
0	Pentium			
1	SCSI I/F Card			
2	LC4 (7)	Serial-16/Smartcard (3)/ Ethernet (1)	Serial-I 6/Smartcard (3)	FAX8 (3)
3	LC4/8 (6)	FAX8 (2)	Ethernet (1)	FAX8 (2)
4	LC4/8 (5)	FAX8 (1)	FAX8 (1)	FAX8 (1)
5	LC4/8 (4)	FAX8 (0)	FAX8 (0)	FAX8 (0)
6	LC4/8 (0)			
7	LC4/8 (1)			
8	LC4/8 (2)			
9	LC4/8 (3)			
10	Power/Config Board 1	FAX8 (5)	FAX8 (5)	
11	Power/Config Board 0			

Model 120S Analog (Loop Start Only) Configuration Map
Max VM Ports: 60
Max Fax Ports: 40 (w/ 40 VM Ports)

Slot No.				
0	Pentium			
1	SCSI I/F Card			
		Serial-I E6/Smartcard	Serial-16/Smartcard (3)	FAX8 (3)
3		FAX8 (2)	Ethernet (1)	FAX8 (2)
4	LC4 (7)	FAX8 (1)	FAX8 (1)	FAX8 (1)
5	LC4/8 (6)	FAX8 (0)	FAX8 (0)	FAX8 (0)
6	LC4/8 (0)			
7	LC4/8 (1)			
8	LC4/8 (2)			
9	LC4/8 (3)			
10	LC4/8 (4)	FAX8 (5)	FAX8 (5)	
11	LC4/8 (5)	FAX8 (6)	FAX8 (6)	FAX8 (6)

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Figure 2 **Model** 12**0S A**nalog Configuration **Maps**

Model 120S Digital Configuration Map
Max VM Ports: 60
Max Fax Ports: 56 (w/ 60 VM Ports - EI Only)

Slot No.								
0	Pentium							
1	SCSI I/F Card							
2						Serial-16/ Smartcard (3) Ethernet (1)	Serial-16/ Smartcard (3)	FAX8 (3)
3						FAX8 (2)	Ethernet (1)	FAX8 (2)
4			DSP8 (7)*			FAX8 (1)	FAX8 (1)	FAX8 (1)
5			DSP8 (6)*	DSP8 (6)*	LC4/8 (6)**	FAX8 (0)	FAX8 (0)	FAX8 (0)
6	DUAL T1/E1 (0)	DUAL T1/E1 (0)	DUAL T1 (0)	DUAL T1 (0)				
7	DSP24/ DSP30 (0)	DSP24/ DSP30 (0)	DSP8 (1)	DSP8 (1)				
8	DUAL T1/E1 (1)	DSP24/ DSP30 (1)	DSP8 (2)	DSP8 (2)	LC4/8 (2)**			
9	DSP24/ DSP30 (1)		DSP8 (3)	DSP8 (3)	LC4/8 (3)**	FAX8 (3)	FAX8 (3)	FAX8 (6)
10	ss7 (EI Only)		DUAL T1 (1)	DSP24 (1)/ DSP8 (4)*	LC4/8 (4)**	FAX8 (4)	FAX8 (4)	FAX8 (4)
11			DSP24 (1)/ DSP8 (5)*	DSP8 (5)*	Config Bd***	FAX8 (5)	FAX8 (5)	FAX8 (5)

* DSP8's installed only if DSP24 (1) not present.
** Total Ports (Analog plus Digital) not to exceed 60 per module. FAX ports not included. Fractional T1 counted only by number of enabled channels.
*** Config Board needed only if E&M, GS, or DID analog interfaces present. A single Config Board is only able to support up to 4 different LC4/8 boards containing these interfaces.

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Figure 3 **Model 120S Digital Configuration Maps**

Model 1201 Analog (Any Interface) Configuration Map
Max VM Ports: 32
Max Fax Ports: 32 (w/ 32 VM Ports)

Slot No.		
0	486 CPU	
1	Serial-I 6/Smartcard (3)	
2	Ethernet (1)	
3	FAX8 (2)	Ethernet (3) (No Smartcard (3))
4	FAX8 (1)	
5	FAX8 (0)	
6	LC4/8 (0)	
7	LC4/8 (1)	
8	LC4/8 (2)	
9	LC4/8 (3)	
10	FAX8 (3)	
11	Power/Config Board	

Model 1201 Analog (Loop Start Only)
Max VM Ports: 32
Max Fax Ports: 32 (w/ 32 VM Ports)

Slot No.		
0	486 CPU	
1	Serial-I 6/Smartcard (3)	
2	Ethernet (1)	
3	FAX8 (2)*	Ethernet (3) (No Smartcard (3))
4	FAX8 (1)	
5	FAX8 (0)	
6	LC4/8 (0)	
7	LC4/8 (1)	
8	LC4/8 (2)	
9	LC4/8 (3)	
10	FAX8 (2)*	
11	FAX8 (3)	

*Alternate locations. Four Fax cards maximum

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Figure 4 Model 120I Analog and Digital Configuration Maps

Model 1201 Digital Configuration Map
Max VM Ports: 32
Max Fax Ports: 32 (w/ 32 VM Ports)

Slot No						
0	486 CPU					
1	Serial-16/Smartcard (3)					
2	Ethernet (1)			FAX8 (3)	Ethernet (1)	Ethernet (1)
3				FAX8 (2)	FAX8 (2)	FAX8 (2)
4				FAX8 (7)	FAX8 (1)	FAX8 (1)
5				FAX8 (0)	FAX8 (0)	FAX8 (0)
6	DUAL T1/E1 (0)	DUAL T1 (0)				
7	DSP24/DSP30 (0)	DSP8 (1)				
8	SS7 (EI Only)	DSP8 (2)				
9		DSP8 (3)			FAX8 (3)	
10		DSP8 (4)	LC4/8 (4)*			
11			Power/Config Brd **			FAX8 (5)

* Total Ports (Analog plus Digital) not to exceed 32 per module. FAX ports not included. Fractional T1 counted only by number of enabled channels.
** Config Board needed only if E&M, GS, or DID analog interfaces present.

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Figure 5 Model 1201 Digital Configuration **Parameters**

This document provides a brief description of the Centigram Series 6 Communication Server Model 70, service card configuration procedures, and hardware configuration rules and maps.

1 Server Overview

Server Architecture

3 Card Configuration

1 Server Overview

The Series 6 server platform is available in three packaging options: the rackmount server (Model 640), the desktop minitower (Model 70), and the tower (Model 120) servers. Each server uses a different CPU and supports a different number of ports and backplane slots. This section provides a brief overview of the Model 70.

The Model 70 is based on a standard desktop PC featuring seven available ISA slots, a 200-watt AC power supply, a 486-33Mhz CPU, an IDE hard drive, a 3.5-inch floppy disk drive, and a modular design for quick and easy component maintenance. This server can accommodate up to seven analog or digital service cards with a maximum of 30 ports (24 ports analog/30 ports digital) and up to two IDE hard disks for a maximum redundant speech storage capacity of 55 hours. The telephony interface cards and the fax card support a special Multi-Vendor Integration Protocol (MVIP) bus. The base system also includes a modem and a minimum of four ports on one line card.

Hard disks provide storage for the operating system, system software, mailbox and message statistics, and digitized speech. Centigram uses SCSI disks for its Model 640 and Model 120S servers, and IDE disks for its Model 1201 and Model 70 servers.

All servers come with a floppy disk drive for use with 3.5-inch double-sided, double-density diskettes (1.44-MB formatted). The floppy disk drive is used to install, reconfigure, and update system software, to back up mailbox and account data files, and to enable loading optional features.

Server Architecture

The block diagram in Figure 1 shows the Model 70 basic architecture. This architecture has been partitioned into several functional areas: System Connectivity Components, Special Service Components, Base System Components, Storage Components, Power Components, and Operations, Administration and Maintenance. The basic features of these systems are described below:

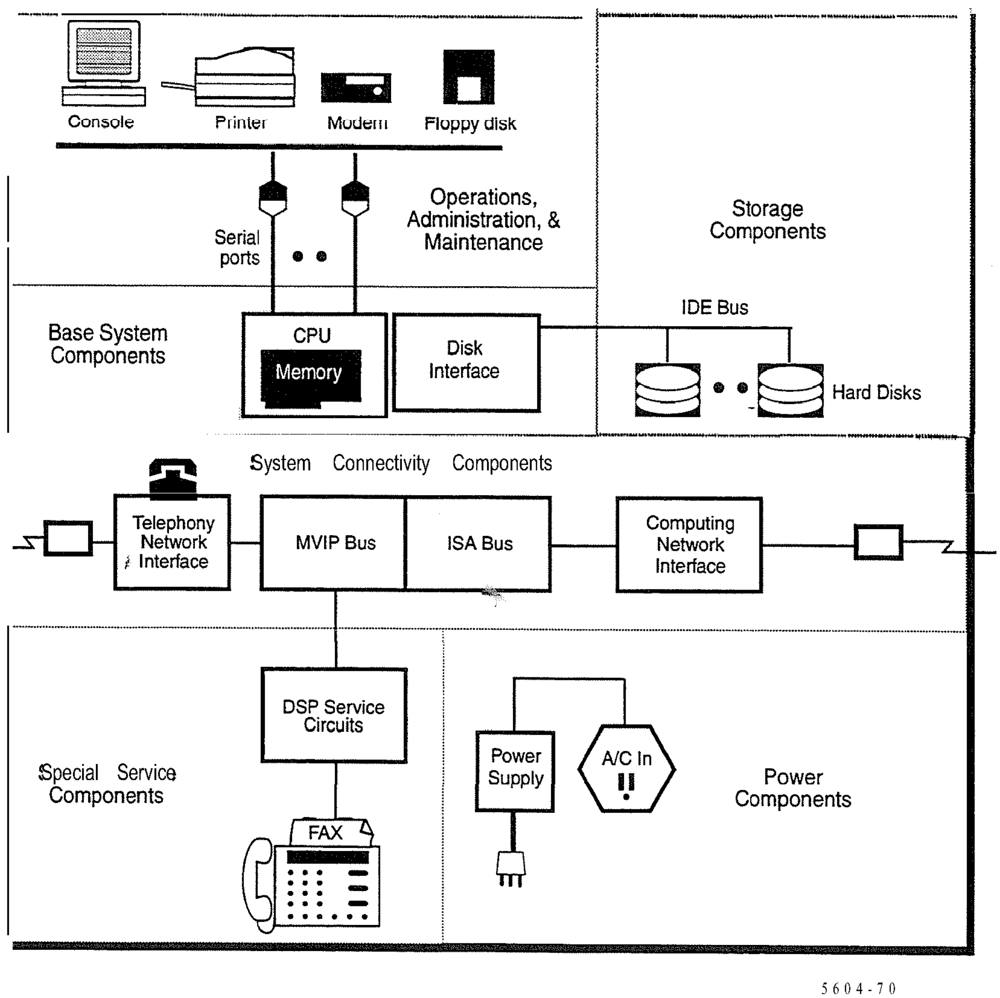

Figure 1 **Model** 70 **B**lock **Diagram**

System Connectivity Components

These are the telephony and computer interface components that connect the system to the external world. They are located in ISA bus slots. Computer interfaces include a high speed serial card and an Ethernet card. Telephony interfaces include digital (T1 and El) and analog (Loopstart, DID, etc.) line cards as well as the SS7 card. The DSP cards, which are required to support the T1/E1 interfaces, are included here. The telephony interface cards are interconnected by the Multi-Vendor Integration Protocol (MVIP) bus.

Special Service Components

These consist of ISA fax cards. They are interconnected with the telephony interface cards by the MVIP bus to provide shared fax service.

Base System Components

These consist of the main CPU and disk storage interface. The Model 70 CPU features an IDE interface.

Storage Components

These consist of the attached hard drives where system software, mailboxes, user accounts, and user speech are stored. The Model 70 features up to two IDE hard drives.

Power Components

These consist of the system power supply. The Model 70 features an 200-watt AC power supply.

Operations, Administration and Maintenance (OA&M)

These consist of the system interfaces and features that provide support for the OA&M. They are the console serial ports on the CPU and the floppy drive interface.

3 Card Configuration

The Model 70 features seven available ISA card slots. Slots O-6 can be configured with other service cards according to specific user needs. The system backplane can accommodate up to seven service cards in any combination that total between 4 and 24 ports (30 ports if El is used). Both analog and digital service cards can be mixed in the same server. See Table 1 for a list of all service cards accepted by the Model 70. See Figure 2 for the Model 70 analog and digital configuration parameters.

Table 1. Model 70 Cards

Category/Name	Configure Hardware?	Consider Clock Term.?	Install MVIP Bus Cable?	Configure Res. Mgr?	Tech. Ref. Manual
Telephony Network Interfaces					Chapter 2A
LC4 (Four SIPs)	✓	✓	✓	✓	TR 1901
LC8 (Eight SIPs)	✓	✓	✓	✓	TR 1901
DSP8 (No SIPs)	✓		✓	✓	TR 1901
Power Config. Card (-48V)	✓				TR 1917
Dual T1	✓	✓	✓	✓	TR 1905
Dual El	✓	✓	✓	✓	TR 1906
DSP24	✓		✓	✓	TR 1903
DSP30	✓		✓	✓	TR 1903
SS7 (MTP Processing)	✓	✓	✓	✓	TR 1911
Computing Network Interfaces					Chapter 2B
Ethernet (16 bit Ethernet)					TR 190i
Serial-16/32	✓				TR 1908
Serial Smartcard	✓				TR 1909

Table 1 **Model** 70 Cards (continued)

Category/Name	Configure Hardware?	Consider Clock Term.?	Install MVIP Bus Cable?	Configure Res. Mgr?	Tech. Ref. Manual
Special Service Circuits					Chapter 3
FAX 2	✓	✓	✓	✓	TR 1904
FAX 4	✓	✓	✓	✓	TR 1904
FAX 8	✓	✓	✓	✓	TR 1904
Base System Components					Chapter 4
Motherboard - 486/33Mhz	✓				TR 1934

Card Installation Guidelines

The Series 6 Servers use two types of cards: *Base-system Cards* (examples: CPU cards and SCSI cards) and Service Cards (standard and special). LC8, E1, and Ethernet are examples of standard service cards. Currently, the Fax card is the only one in the special service card category. Future product releases will introduce new special service cards. Install all cards in the server using the guidelines given below.

Before Installing the Card

1. Wear a grounded ESD wrist strap and attach it to a solid ground on the unit being serviced.

2. Refer to the Installation and Service manual and shut down the server, turn off the power supply, and wait one minute. The hard disk should stop spinning and be quiet.

Configuring the Hardware

3. Select the correct slot in the system backplane. Refer to the appropriate configuration map in this reference.
4. If the card is one of the cards listed below, set the cards address switches to match the card's configuration number required by the slot. Go to the Technical Reference for the card and determine which jumpers to set. The reference will also indicate what other jumpers or switches you need to set.
   - Serial- 16/32
   - Serial Smartcard
   - Dual T1, Dual El, SS7
   - LC4, LC8, DSP8, DSP24/30
   - FAX2, FAX4, FAX8

Terminating the Clock

CAUTION!

If you are adding a card, the existing termination may need to be moved from the existing card to the new one.

5. Only MVIP cards are involved in MVIP termination. A DSP24 or DSP30 card does not have any clock termination to set. The cards listed below are capable of terminating the MVIP clock signals
   - Dual T1, Dual El, SS7
   - LC4, LC8
   - FAX 2, FAX4, FAX 8
6. Both ends of the MVIP bus must be terminated when four or more MVIP cards are installed. If a DSP24 or DSP30 card is an end card, the next closest card from that end must have its terminations set. (See list above.) When three or fewer MVIP cards are present, termination is helpful but not required. No more than two cards may have their terminations enabled at any given time. The MVIP bus must always use the shortest possible cable.
7. If you need to terminate a card's clock, go to the Technical Reference for the card and determine which jumpers to set.

Selecting a **MVIP** Bus Cable

8. Choose the minimum cable length to cover all MVIP cards from the cable choices given below. Note that the dash number of the cable signifies the number of MVIP connectors. For example, a "-07" cable has seven connectors.

Server Model Kit	MVIP Cables Included	Kit Part Numbers
Model 70 Kit	1810-0590-04; -07	6800-70
Model 120 Kit	1810-0590-04, -07, -09, -11	6800-120I; 6800-120s
Model 640 Kit	1810-0590-04, -07, -09, -11, -13	6800-640

installing the Card

9. Hold the new card by the top edge or upper corners and position over the empty card slot. Press the card firmly into the connector on the backplane.

10. Align the retaining bracket rounded notch with the slot frame hole.

11. Insert a 6-32 hex head Philips screw and secure the bracket.

12. Connect all required cables to the card.

Connecting the MVIP Bus Cable

13. When adding cards, try to use a cable from your bus cable kit that best matches your new configuration If after doing so, you still have a couple of leftover connectors, install the cable so there is one leftover connector at each end.

Booting Up the Server

14. Refer to your Installation and Service Manual for proper procedures and boot-up the server.

Adding the Card With Resource Manager

15. If your card is listed below, you need to add it with the Resource Manager Program. Go to TR 1935 and follow the instruction given there. If your card is not listed below, skip the following steps and refer to your *Series 6 Reference and Configuration Manual.* Do the off-line configuration procedures listed in there.

- Dual T1, Dual El, SS7
- LC4, LC8, DSP8, DSP24/30
- FAX2, FAX4, FAX8

Configuring the Card With Resource Manager

16. After a card is added, follow the instructions in TR 1935 and configure it.

Assigning the Master Clock With Resource Manager

The MVIP bus requires a master clock *source* and a master clock *reference to* be selected. The Resource Manager software establishes a default Master Source and a Master Reference. If the slots maps are used, the default Master Source and Reference will always be correct when up to four MVIP cards (analog and/or digital) are present.

17. If you have a digital or mixed analog/digital configuration with five or more MVIP cards, select the T1 or El interface card closest to the center as the Master Clock Source. Digital trunk 0 on that card is your default Master Clock Reference.

    (Or...)

    If you have an analog only configuration with five or more MVIP cards, select the center most LC4 or LC8 as the Master Clock Source. The default Master Clock Reference is the oscillator on the selected card.

    Note: Use the Resource Manager menus to make the selections, which may or may not be different from the default.

Configuration Rules and Maps

The information in Table 1 and configuration maps in Figure 2 show the assignments of service boards and their configurations to specific AT bus slots on all the Series 6 server hardware platforms. Supplementary configuration rules are provided for completeness and clarity. A service board configuration is a specific set of AT Bus resources allocated to this card. For example: Ethernet (3) configuration consists of IO Addresses 360H to 37FH, Interrupt 15, no Memory, and no DMA channels. Ethernet (1) is a different set of IO addresses and interrupt. The nomenclature specifies the configuration number in parentheses following the service card name. Ethernet (3) = configuration #3 of the Ethernet board. Some configurations are preprogrammed in the factory and are ordered specifically (such as the Ethernet cards), and some are configured by the installer. The documentation will reflect these differences.

The maps show a default map of service card assignments to slots with additional columns to the right indicating alternative assignments. If there are unfilled slots to the right of the default map, there are no alternative card assignments allowed. The intention of these maps is to provide a consistent set of manageable system configurations to satisfy the various engineering requirements of the product, specify the maximum product configurations for marketing, and provide reference configurations for manufacturing, TAC, and customers.

General Configuration Rules

When configuring a module, the order in which cards are assigned to slots will greatly simplify the process. As shown in the Order of Precedence, the first card to be assigned a slot is the Serial I/F (Serial-16/32 or Smartcard (3)). The last cards to be assigned slots are the FAX cards. (The CPU card is permanently assigned to its slot.) Within the Telephony I/Fs, Fractional Tls and their DSP8s are assigned first while the LC8's are assigned last.

Order of Precedence:

- Computer I/F's
  - Serial
  - Ethernet
- Telephony I/F's
  - Fractional T1 and DSP8's
  - Full T1/E1 and DSP24/30's
  - SS7 Integration
  - Power/Co&g Cards
  - LC8's
- Special Service Cards
  - FAX

Other Configuration Rules

These are additional configuration rules:

- LC4/8 Mixing
  LC4's are LC8s with four Analog SIPs removed. They occupy the same slots for a given configuration number. Thus, an LC4 (3) would occupy the same slot as an LC8 (3). There would be a resource conflict if both existed within the same unit. Any of the cards can be an LC4 or LC8 unless the total number of ports exceeds the limits of the particular platform. When the available configuration 'numbers are all used up by a mixture of LC4s and LC8s and the platform is capable of supporting additional ports, the port capacity can only be increased by upgrading LC4s to LC8s by the addition of telephony SIPs or a card replacement.

- T1/E1/Analog Mixing
  T1 and El cannot be mixed within the same module. T1 or El can mix with analog within the same module according to the appropriate figure.

- Number of FAX Ports
  The number of FAX ports may be equal to or less than the number of available telephony ports. They cannot exceed the number of telephony ports.

- FAX 2/4/8 Port Mixing
  These cards can be mixed, but only in a strict sequencing or else resource conflicts will occur. Of the allowed FAX configuration numbers (example: FAX8 (0) through FAX8 (5)), FAX2s must start at the lowest number until all are assigned followed by all of the FAX4s and then finally the FAX8s. If a FAX2 is added to an existing mixture, it must be inserted into the lowest group with all FAX4s and FAX8s moved up. This situation is the same for FAX4s.

- MVIP Bus Cabling
  The assignment of Telephony and Special Service cards is intended to maintain a closely grouped set of MVIP cards and to minimize any gaps between cards. Always use the smallest possible MVIP bus cable. If there are unused connectors on the cable, they should be symmetrically distributed on either side of the group of MVIP cards. If the configuration is analog only with no FAX, an MVIP cable is not required but *highly* recommended. Digital, FAX, or mixed Analog/Digital all require the use of an MVIP cable.

- OneView Capacity
  The current rule is that a OneView session is equal to a VMEMO port. When counting port capacity for a module or a platform, Analog ports + digital ports + number of simultaneous OneView sessions must be less than or equal to the port capacity.

- Expansion of Initial Configuration
  When a card is added to an initial configuration, the new card configuration map must be recreated from the beginning.

Model 701 Analog Configuration Map
Max VM Ports: 24
Max Fax Ports: 16 (w/ 24 VM Ports)

Slot No.		
0	Serial-I 6/Smartcard (3)	
1	Ethernet (1)	FAX8 (1)
2	FAX8 (0)	
3	LC4/8 (0)	
4	LC4/8 (1)	
5	LC4/8 (2)	
6	Power/Config Board	FAX8 (2)'

' Only two FAX cards may be installed due to power limitations.
FAX8 (2) may only be installed if the Power/Config board is not present. (Loop Start Only)

Model 701 Digital Configuration Map
Max VM Ports: 24 (30 El Only)
Max Fax Ports: 16 (w/ 24T1 or 30E1 VM Ports)

Slot No.			
0	Serial-I 6/Smartcard (3)		
1	Ethernet (1)		FAX8 (1)
2			FAX8 (2)
3	DUAL T1 (0)	DUAL T1 (0)	
4	DSP24 (0)	DSP8 (1)	
5		DSP8 (2)	
6		DSP8 (3)	FAX8 (2)

' Only two FAX cards may be installed due to power limitations.

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Figure 2 Model 70 Configuration Map

Model 640 Service Card Hardware Configuration Technical Reference

This document provides a brief description of the Centigram Series 6 Communication Server Model 640, service card configuration procedures, and hardware configuration rules and maps.

1 Server Overview

2 Server Architecture

3 Card Configuration

1 Server Overview

The Series 6 server platform is available in three packaging options: the rackmount server (Model 640), the desktop minitower (Model 70), and the tower (Model 120) servers. Each server uses a different CPU and supports a different number of ports and backplane slots.

The Model 640 provides optimal expansion capabilities, since the base system uses only a small portion of each assembly. The Model 640 can also be expanded simply by adding more modules for a maximum of four. The maximum capacity of the Model 640 is 240 ports, with 1440 hours redundant or 2880 hours non-redundant speech storage. Each Model 640 consists of the components described below.

CPU Assembly

A CPU assembly, consisting of a Pentium-100 plug-in board, a backplane with 13 available slots and an MCB II board which attaches to this backplane.

CPU Card

The CPU assembly uses a Pentium-based central processor board, with 32 to 64 MB of RAM. The board plugs into the Industry Standard Architecture (ISA) backplane. It provides two serial ports for maintenance purposes.

Plug-in Cards

The Model 640 uses cards which plug into the ISA backplane to provide for user services. There are 13 ISA-compatible available slots for each Model 640 module. The backplane accepts many ISA-compatible cards such as fax cards, line cards, DSP cards, communications cards, and T1/E1 interface cards.

There are two major classes of plug-in cards: Bare-system *Cards* (examples: CPU cards and SCSI cards) and Service *Cards* (standard and special). LC8, El, and Ethernet are examples of standard service cards. Currently, the Fax card is the only one in the special service card category. Future product releases will introduce new special service cards.

MCB II Board

The Model 640 uses the Module Control Board II to manage the base module's I/O resources. MCB II components include:

- Up to four Small Computer System Interface (SCSI) bus interface controllers.
- External alarm interface (relays, LEDs.
- Audible alarm system.
- Four asynchronous RS-232 ports. Any modem can be attached externally and connected to one of these serial ports.
- Non-Volatile RAM (NVRAM).
- Voltage, temperature, and fan rotation sensors, which are monitored by the CPU assembly's power supply to generate system alarms when the system malfunctions.
- A floppy controller and 1.44 Mb floppy interface.

Storage Assembly

A storage assembly, which can hold up to four hard disks and one floppy drive, provides a maximum of 480 hours redundant or 960 hours non-redundant storage capacity. The storage assembly contains its own power supply.

Hard disks provide storage for the operating system, system software, mailboxes and digitized speech. Centigram uses SCSI disks for its Model 640.

All servers come with a floppy disk drive for use with 3.5-inch double-sided, double-density diskettes (1.44-MB formatted). The floppy disk drive is used to install, reconfigure, and update system software, to back up mailbox and account data files, and to enable loading optional features.

Power Supply Assembly

The Model 640 configuration has separate power supplies for the CPU and storage subsystems. There are two options for both:

- A 50- to 60-Hz, 110-240 VAC input, 500W (maximum output), auto-selectable, quadruple-output (+5, +12, -12, and -48 VDC) switching power supply plus a disk storage power supply.
- -48 VDC input, 500W (maximum output), quadruple-output (+5, +12, -12, -48 VDC) switching power supply plus a disk storage power supply.

Auxiliary Equipment Subsystem

The auxiliary equipment subsystem can consist of external devices for the Model 640. Examples of these are:

- The CSO/IO Module for switching consoles and ESMDI serial integration links between redundant modules.
- External proprietary PBX call pickup integrations sets.
- Serial 16/32 interface, modules, modems, and printers.

2 Server Architecture

The block diagram in Figure 1 shows the Model 640 basic architecture. This architecture has been partitioned into several functional areas: System Connectivity Components, Special Service Components, Base System Components, Storage Components, Power Components, and Operations, Administration and Maintenance. The basic features of these systems are described below:

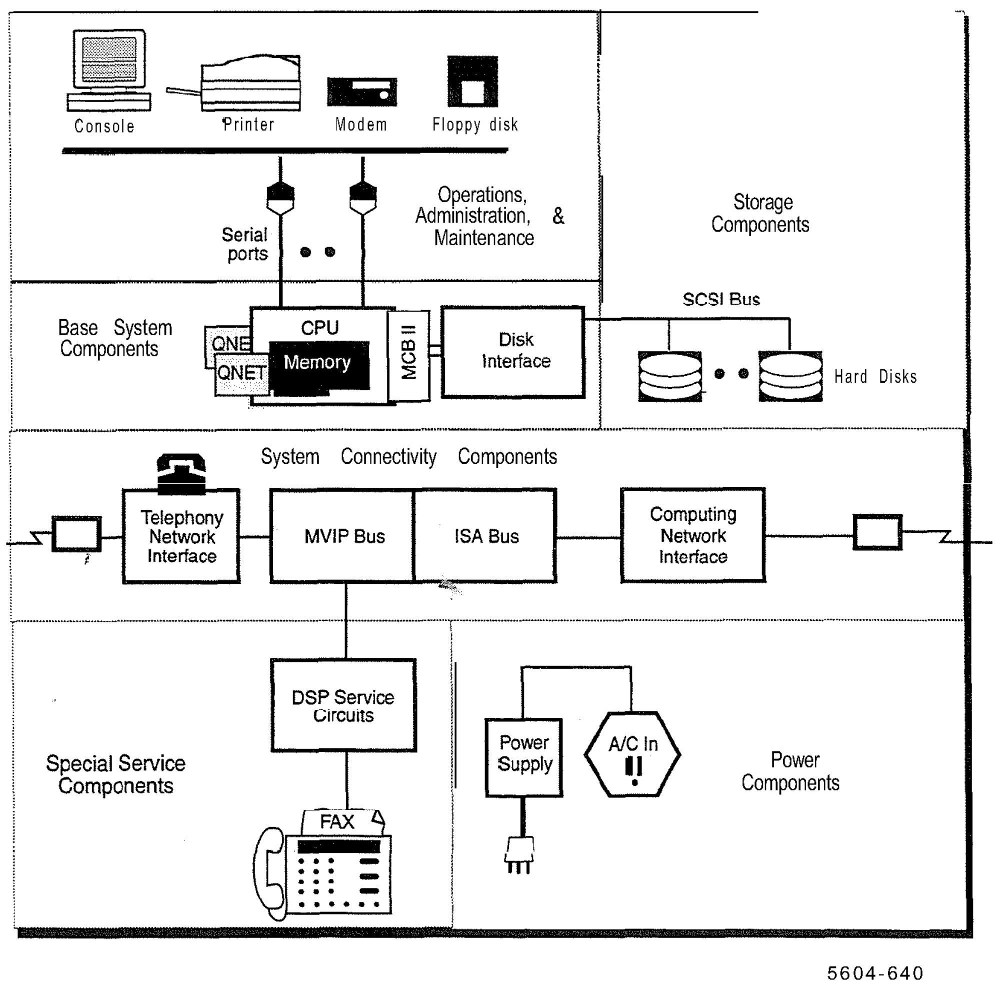


Figure 1 **Model 640** Block Diagram

System Connectivity Components

These are the telephony and computer interface components that connect the system to the external world. They are located in ISA bus slots. Computer interfaces include a high speed serial card and an Ethernet card. Telephony interfaces include digital (T1 and El) and analog (Loopstart, DID, etc.) line cards as well as the SS7 card. The DSP cards, which are required to support the T1/E1 interfaces, are included here. The telephony interface cards are interconnected by the Multi-Vendor Integration Protocol (MVIP) bus.

Special Service Components

These consist of ISA fax cards. They are interconnected with the telephony interface cards by the MVIP bus to provide shared fax service.

Base System Components

These consist of the main CPU, the QNet card, and the MCB II board, which includes multiple SCSI bus interfaces.

Storage Components

These consist of the attached hard drives where system software, mailboxes, user accounts, and user speech are stored. The Model 640 features a maximum of four SCSI hard disk per module or 12 hard disk in a four-module server (three storage assemblies maximum).

Power Components

These consist of the system power supply. The Model 640 features a 500-watt AC or DC power supply.

Operations, Administration and Maintenance (OA&M)

Thesesconsist of the system interfaces and features that provide support for 0 A & M. They are the console serial ports on the CPU and the floppy drive interface. On the Model 640, these also include temperature, fan, and voltage alarms; alarm relay contacts; etc.

3 Card Configuration

The Model 640 features 13 available ISA card slots for service cards. (Standard system configuration requires a CPU card in slot 0 and two MESA-Link (QNet) cards in slots 1 and 2.) Other slots can be configured with other cards according to specific user needs. Both analog and digital service cards can be mixed in the same server. See Table 1 for a list of all service cards accepted by the server. (See Figures 2 to 4 for the system analog and digital card configurations.)

Table 1 **Model 640 Cards**

Category/Name	Configure Hardware?	Consider Clock Term.?	Install MVIP Bus Cable?	Configure Res. Mgr?	Tech. Ref. Manual
Telephony Network Interfaces					Chapter 2A
LC4 (Four SIPs)	✓	✓	✓	✓	TR 1901
LC8 (Eight SIPs)	✓	✓	✓	✓	TR 1901
DSP8 (No SIPs)	✓		✓	✓	TR 1901
Power Config. Card (-48V)	✓				TR 1917
Dual T1	✓	✓	✓	✓	TR 1905
Dual El	✓	✓	✓	✓	TR 1906
DSP24	✓		✓	✓	TR 1903
DSP30	✓		✓	✓	TR 1903
SS7 (MTP Processing)	✓	✓	✓	✓	TR 1911
Computing Network Interfaces					Chapter 2B
Ethernet (16 bit Ethernet)					TR 1907
Serial-16/32	✓				TR 1908

Table 1 **Model** 640 Cards (continued)

Category/Name	Configure Hardware?	Consider Clock Term.?	Install MVIP Bus Cable?	Configure Res. Mgr?	Tech. Ref. Manual
Special Service Circuits					Chapter 3
FAX 2	✓	✓	✓	✓	TR 1904
FAX4	✓	✓	✓	✓	TR 1904
FAX8	✓	✓	✓	✓	TR 1904
Base System Components					Chapter 4
CPU - Pentium 100 MHz					TR 1912
MCB II (Backplane)					TR 1914
Mesalink (QNet)	✓				TR 1915

Card Installation Guidelines

The Series 6 Servers use two types of cards: *Base-system Cards* (examples: CPU cards and SCSI cards) and *Service* Cards (standard and special). LC8, El, and Ethernet are examples of standard service cards. Currently, the Fax card is the only one in the special service card category. Future product releases will introduce new special service cards. Install all cards in the server using the guidelines given below.

Before Installing the Card

1. Wear a grounded ESD wrist strap and attach it to a solid ground on the unit being serviced.

2. Refer to the Installation and Service manual and shut down the server, turn off the power supply, and wait one minute. The hard disk should stop spinning and be quiet.

Configuring the Hardware

3. Select the correct slot in the system backplane. Refer to the appropriate configuration map in this reference.

4. If the card is one of the cards listed below, set the card's address switches to match the card's configuration number required by the slot. Go to the Technical Reference for the card and determine which jumpers to set. The reference will also indicate what other jumpers or switches you need to set.

   - Serial- 16/32
   - Dual T1, Dual El, SS7
   - LC4, LC8, DSP8, DSP24/30
   - FAX 2, FAX4, FAX8

Terminating the Clock

CAUTION!

If you are adding a card, the existing termination may need to be moved from the existing card to the new one.

5. Only MVIP cards are involved in MVIP termination. A DSP24 or DSP30 card does not have any clock termination to set. The cards listed below are capable of terminating the MVIP clock signals

   - Dual T1, Dual El, SS7
   - LC4, LC8
   - FAX2, FAX4, FAX8

6. Both ends of the MVIP bus must be terminated when four or more MVIP cards are installed. If a DSP24 or DSP30 card is an end card, the next closest card from that end must have its terminations set. (See list above.) When three or fewer MVIP cards are present, termination is helpful but not required. No more than two cards may have their terminations enabled at any given time. The MVIP bus must always use the shortest possible cable.

7. If you need to terminate a card's clock, go to the Technical Reference for the card and determine which jumpers to set.

Selecting a MVIP Bus Cable

8. Choose the minimum cable length to cover all MVIP cards from the cable choices given below. Note that the dash number of the cable signifies the number of MVIP connectors. For example, a “-07” cable has seven connectors.

Server Model Kit	MVIP Cables Included	Kit Part Numbers
Model 70 Kit	1810-0590-04; -07	6800-70
Model 120 Kit	1810-0590-04, -07, -09, -11	6800-1201; 6800-120s
Model 640 Kit	1810-0590-04, -07, -09, -11, -13	6800-640

Installing the Card

9. Hold the new card by the top edge or upper corners, and position it over the empty card slot. Press the card firmly into the connector on the backplane.

10. Align the retaining bracket rounded notch with the slot frame hole.

11. Insert a 6-32 hex head Philips screw and secure the bracket.

12. Connect all required cables to the card.

Connecting the MVIP Bus Cable

13. When adding cards, try to use a cable from your bus cable kit that best matches your new configuration. If after doing so, you still have a couple of leftover connectors, install the cable so there is one leftover connector at each end.

Booting Up the Server

14. Refer to your Installation and Service Manual for proper procedures and boot-up the server.

Adding the Card With Resource Manager

15. If your card is listed below, you need to add it with the Resource Manager Program. Go to TR 1935 and follow the instruction given there. If your card is not listed below, skip the following steps and refer to your Series 6 *Reference and* Configuration *Manual.* Do the off-line configuration procedures listed in there.

- Dual T1, Dual El, SS7
- LC4, LC8, DSP8, DSP24/30
- FAX2, FAX4, FAX8

Configuring the Card With Resource Manager

16. After a card is added, follow the instructions in TR 1935 and configure it.

Assigning the Master Clock With Resource Manager

The MVIP bus requires a master clock *source* and a master clock *reference* to be selected. The Resource Manager software establishes a default Master Source and a Master Reference. If the slots maps are used, the default Master Source and Reference will always be correct when up to four MVIP cards (analog and/or digital) are present.

17. If you have a digital or mixed analog/digital configuration with five or more MVIP cards, select the T1 or El interface card closest to the center as the Master Clock Source. Digital trunk 0 on that card is your default Master Clock Reference.

(Or...)

If you have an analog only configuration with five or more MVIP cards, select the center most LC4 or LC8 as the Master Clock Source. The default Master Clock Reference is the oscillator on the selected card.

Note: Use the Resource Manager menus to make the selections, which may or may not be different from the default.

Configuration Rules and Maps

Configuration maps in Figures 2 and 3 show the assignments of cards and their configurations to specific ISA bus slots on the 640 server hardware platforms. Supplementary configuration rules are provided for completeness and clarity. A service board configuration is a specific set of ISA Bus resources allocated to this card. For example: Ethernet (3) configuration consists of IO Addresses 360H to 37FH, Interrupt 15, no Memory, and no DMA channels. Ethernet (1) is a different set of IO addresses and interrupt. The nomenclature specifies the configuration number in parentheses following the service card name. Ethernet (3) = configuration #3 of the Ethernet board. Some configurations are preprogrammed in the factory and are ordered specifically (such as the Ethernet cards), and some are configured by the installer. The documentation reflects these differences.

The maps show a default map of service card assignments to slots with additional columns to the right indicating alternative assignments. If there are unfilled slots to the right of the default map, there are no alternative card assignments allowed. The intention of these maps is to provide a consistent set of manageable system configurations to satisfy the various engineering requirements of the product, specify the maximum product configurations for marketing, and provide reference configurations for manufacturing, TAC, and customers.

General Configuration Rules

When configuring a module, the order in which cards are assigned to slots will greatly simplify the process. As shown in the Order of Precedence, the first card to be assigned a slot is the Serial I/F (Serial-16/32 or Smartcard (3)). The last cards to be assigned slots are the FAX cards. (CPU's, QNET's, and the SCSI I/F card are all permanently assigned to their respective slots.) Within the Telephony I/Fs, Fractional Tls and their DSP8s are assigned first while the LC8s are assigned last.

Order of Precedence:

- Computer I/Fs
  - Serial
  - Ethernet
- Telephony I/Fs
  - Fractional T1 and DSP8s
  - Full T1/E1 and DSP24/30s
  - SS7 Integration
  - Power/Co&g Cards
  - LC8s
- Special Service Cards
  - FAX

Other Configuration Rules

These are additional rules:

- LC4/8 Mixing
  LC4s are LC8s with four Analog SIPs removed. They occupy the same slots for a given configuration number. Thus, an LC4 (3) would occupy the same slot as an LC8 (3). There would be a resource conflict if both existed within the same module. Any of the cards can be an LC4 or LC8 unless the total number of ports exceeds the limits of the particular platform. Notice that seven of the analog line cards on the Model 640 may be LC4 or LC8 while the eighth card may only be an LC4. When the available configuration numbers are all used up by a mixture of LC4s and LC8s and the platform is capable of supporting additional ports, the port capacity can only be increased by upgrading LC4s to LC8s by the addition of telephony SIPs or a card replacement.

- T1/E1/Analog Mixing
  T1 & El may not be mixed within the same module. In a Model 640, however, they may exist in separate modules. T1 or El may mix with analog within the same module according to the appropriate figure.

- Number of FAX Ports
  The number of FAX ports may be less than or equal to the number of available telephony ports. They may not exceed the number of telephony ports.

- FAX 2/4/8 Port Mixing
  These cards can be mixed, but only in a strict sequence or else resource conflicts will occur. Of the allowed FAX configuration numbers (example: FAX8 (0) through FAX8 (5)), FAX2s must start at the lowest number until all are assigned followed by all of the FAX4s and then finally the FAX8s. If a FAX2 is added to an existing mixture, it must be inserted into the lowest group with all FAX4s and FAX8s moved up. This situation is the same for FAX4s.
  Example: 2 FAX2s, 2 FAX4s, and 2 FAX8s are being installed in the Model 640 Analog FAX only option (no Serial or Ethernets installed). FAX configurations 0 - 5 are available. The assignments would be:

  FAX8 (5)
  FAX8 (4)
  FAX4 (3)
  FAX4 (2)
  FAX2 (1)
  FAX2 (0)

  If another FAX2 is added, the assignments become:

  FAX8 (5)
  FAX4 (4)
  FAX4 (3)
  FAX2 (2)
  FAX2 (1)
  FAX2 (0)

Alternatively, if a FAX4 was added instead of a FAX2, the assignments would become:

FAX8 (5)
FAX4 (4)
FAX4 (3)
FAX4 (2)
FAX2 (1)
FAX2 (0)

In either case, it is also important to note that capacity was reduced because a FAX8 was lost due to limited available configurations.

The only exception to this rule is the explicitly shown FAX4 (10) configuration in the Model 640 Digital configuration. This does not conflict with any other FAX2 or FAX8 configuration.

- MVIP Bus Cabling
  The assignment of Telephony and Special Service cards is intended to maintain a closely grouped set of MVIP cards and to minimize any gaps between cards. Always use the smallest possible MVIP bus cable. If there are unused connectors on the cable, they should be symmetrically distributed on either side of the group of MVIP cards. If the configuration is analog only with no FAX, an MVIP cable is not required but highly recommended. Digital, FAX, or-mixed Analog/Digital all require the use of an MVIP cable.

- OneView Capacity
  The current rule is that a OneView session is equal to a VMEMO port. When counting port capacity for a module or a platform, Analog ports + digital ports + number of simultaneous OneView sessions must be less than or equal to the port capacity.

- Expansion of Initial Configuration
  When a card is added to an initial configuration, the new card configuration map must be recreated from the beginning.

Model 640 Analog Configuration Map
Max VM Ports: GO/Module
Max Fax Ports: 48/Module (w/ 56 VM Ports)

Slot No.						
0	Pentium					
1	QNET1					
2	QNET2					
3	Serial-16/Ethernet (3)	Serial-16	Ethernet (3)	Serial-I 6	Ethernet (1)	FAX8 (5)
4	Ethernet (1)	Ethernet (1)	Ethernet (1)	FAX8 (4)	FAX8 (4)	FAX8 (4)
5	Ethernet (3)	Ethernet (3)	FAX8 (3)	FAX8 (3)	FAX8 (3)	FAX8 (3)
6		FAX8 (2)	FAX8 (2)	FAX8 (2)	FAX8 (2)	FAX8 (2)
7		FAX8 (1)	FAX8 (1)	FAX8 (1)	FAX8 (1)	FAX8 (1)
8	LC4 (7)	FAX8 (0)	FAX8 (0)	FAX8 (0)	FAX8 (0)	FAX8 (0)
9	LC4/8 (0)					
10	LC4/8 (1)					
11	LC4/8 (2)					
12	LC4/8 (3)					
13	LC4/8 (4)					
14	LC4/8 (5)	FAX8 (5)				
15	LC4/8 (6)	FAX8 (6)	FAX8 (6)	FAX8 (6)	FAX8 (6)	
B	Power/Config Brd 1					
A	Power/Config Brd 0					

* Total Ports (Analog plus Digital) not to exceed 60 per module. FAX ports not included.

* Config Board needed only if E&M, GS, or DID analog interfaces present. A single Config Board is only able to support up to 4 different LC4/8 boards containing these interfaces.

x5221vm6

Figure 2 Model **640** Analog Configuration **Map**

Model 640 Digital Configuration Map
Max VM Ports: GO/Module
Max Fax Ports: GO/Module (w/ 60 VM Ports - El Only)

Slot No.							
0	Pentium						
1	QNET1						
2	QNET2						
3	Serial-16/Ethernet (3)			Serial-16	Serial-16	Ethernet (3)	FAX4 (10)
4	Ethernet (1)			Ethernet (1)	FAX8 (4)	Ethernet (1)	FAX8 (4)
5	Ethernet (3)			Ethernet (3)	FAX8 (3)	FAX8 (3)	FAX8 (3)
6				FAX8 (2)	FAX8 (2)	FAX8 (2)	FAX8 (2)
7				FAX8 (1)	FAX8 (1)	FAX8 (1)	FAX8 (1)
8				FAX8 (0)	FAX8 (0)	FAX8 (0)	FAX8 (0)
9	DUAL T1/E1 (0)	DUAL T1/E1 (0)					
10	DSP24/DSP30 (0)	DSP24/DSP30 (0)					
11	DUAL T1/E1 (1)	DSP24/DSP30 (1)	LC4/8 (2)*				
12	DSP24/DSP30 (1)		LC4/8 (3)*				
13	SS7 (El Only)		LC4/8 (4)*				
14			LC4/8 (5)*	FAX8 (5)	FAX8 (5)	FAX8 (5)	FAX8 (5)
15			LC4/8 (6)*	FAX8 (6)	FAX8 (6)	FAX8 (6)	FAX8 (6)
B	Open		Config Bd**				
A	Open		Config Bd**				

* Total Ports (Analog plus Digital) not to exceed 60 per module. FAX ports not included.
** Config Board needed only if E&M, GS, or DID analog interfaces present. A single Config Board is only able to support up to 4 different LC4/8 boards containing these interfaces.

x4083vm6

Figure 3 Model 640 Digital Configuration **Map**

Series 6 Server Service Card Sofiware Configuration Technical Reference

This technical reference describes the Resource Manager program, which is used to add, delete, and configure service cards in all Centigram Series 6 servers. Refer to your server's Hardware Configuration Technical Reference for other configuration procedures and hardware configuration rules and maps.

1 Configuration Overview

2 Configuration Procedure

1 Configuration Overview

The Series 6 Servers use two types of cards: *Base-system curds* (examples: CPU cards and SCSI cards) and two categories of Service *cards*: standard and special. LC8, El, and Ethernet are examples of standard service cards. Currently, the Fax card is the only card in the special service card category. Future product releases will introduce new special service cards. Table 1 compiles a complete list of service cards and indicates which ones need to be configured.

The VoiceMemo version 6.0 features new hardware with a MVIP (Multi-Vendor Integration Protocol) bus. MVIP hardware devices communicate with each other via the 40-pin MVIP bus ribbon cable across the tops of the MVIP cards. Some cards access only a subset of the MVIP time slots. This is handled automatically by the Resource Manager when the cards are configured through the menus.

The Resource Manager is a software utility that allows you to configure the telephony I/F hardware and special service card (FAX), manage the resource allocation in the hardware, and manage the MVII'? bus slot usage so that there is no conflict among different applications.

Upon startup, the Resource Manager reads the system configuration from the configuration files and updates its database. It then invokes the drivers of each of the hardware devices it finds in the configuration, initializes the devices, and downloads any programs needed in the hardware. For the cards equipped with MVIP switches, the Resource Manager also initializes the switches. Next, it configures the MVIP clock and busy-out trunks (line cards with Phoneline interface).

After the initialization sequence is complete, the Resource Manager is ready to serve any application that needs to allocate and use the hardware resources. It allows the application to allocate any free resources and make the connection between them. If the application dies, Resource Manager cleans up the resources allocated by this application from its allocation table.

The Resource Manager also provides some query information for the application, such as the lineport configuration, resource allocation, resource connectivity, and resource availability.

Table 1 Series 6 Servers Service **Cards**

Category/ Name	MVIP Supported?	Res. Mgr. Configuration Needed?
Telephony Network Interfaces		
LC4 (Four SIPs)	✓	✓
LC8 (Eight SIPs)	✓	✓
DSP8 (No SIPs)	✓	✓
Power Config. Card (-48V)		
Dual El	✓	✓
Dual T1	✓	✓
DSP24	✓	✓
DSP30	✓	✓
SS7 (MTP Processing)	✓	✓
Special Service Circuits		
FAX2	✓	✓
FAX4	✓	✓
FAX8	✓	✓
Computing Network Interfaces		
Ethernet		
Serial-16/32		
Smartcard		

Note: Base-system component cards are not listed.

Physical Resource Configuration Menu

The Resource Manager uses the Physical Resource Configuration Menu (Figure 1) to match the system software to the hardware configuration. This menu provides a series of options. When using the Physical Resource Configuration Menu, it is important to understand the following:

- Centigram Series 6 Servers are available in four models (640, 1201, 120S, 70). Model 640 provides 13 card slots for service cards and adapter cards. It also provides two additional slots labeled "A" and "B" for Power Configuration cards.
- Model 1201 provides 11 card slots, Model 120S provides 10 card slots, and Model 70 provides 7 card slots.
- The Menu displays slots 0 through 15 regardless of which model is configured.
- The Menu is only used to configure the software to accept service cards that use the MVIP bus.

2 Configuration Procedure

The Physical Resource Configuration Menu contains options required to configure hardware to the system software. This menu uses the Resource Manager. Input service card configuration into the Resource Manager according to the following guidelines.

- Access the Physical Resource Configuration Menu by selecting the following hierarchical menu selections:

  Main Menu ⇒ System Maintenance ⇒ Reconfiguration ⇒ Reconfiguring System ⇒ Hardware Configuration ⇒ Resource Configuration.

- The Physical Resource Configuration menu will appear

```
=============================
(M) set Module number
(A) Add resource card
(D) Delete resource card
(C) Configure resource card
(K) configure MVIP clocK
(S) Show resource database
(I) show IO address database
(T) show Trunk type database
(Q) Quit without saving
(X) eXit with configuration and report generated
Input your choice,? for help
(M/A/D/C/K/S/I/T/Q/X/?)
=============================
```

Figure 1 Physical Resource Configuration Menu

Configuration Commands

The examples in the following pages assume that you need to alter the hardware configuration of a Model 120S using an Analog Configuration Map (see TR 1902). The steps that we will follow are:

1. Set Module Number (not really needed in the Model 120)
2. Show the Resource Database to see what hardware is configured.
3. Move a fax card and add a line card.

Set Module Number (M)

To configure a module, Enter (M) to set Module number. The following screen will appear:

Current Module #: 1
Save Current Configuration? (Y/N) [N]
Input Module #:

If you answered "yes" to Save Current Configuration, the following screen will appear:

Generating configuration script . . . Done
Generating linecard configuration script . . . Done
Generating report files . . . Done

You have saved the current state of the configuration for the module that you selected. If you answer "no" and switch to another module, you will loose your work.

Enter the module number, which ranges from 1-4. This procedure is now complete. After this operation is finished, select another option or exit the Physical Resource Configuration menu.

Show Resource Database (S)

To see your resource database configuration, enter (S) Show resource. The following example screen shown below appears. This example is taken from a Model 120S analog configuration. Figure 2 shows a partial view of the configuration map. Notice that to add another line card, LC8 (4) in slot 5, FAX (0) must be removed from that slot, the card's address switches reset to the Fax (1) address, and the card re-installed in slot 4 as shown in Figure 2.

```
MVIP RESOURCE DATABASE
=========================

SLOT CARD RESOURCE
==== ---------------     --------------------------
0       Not       Configured
1       Not       Configured
2 Not Configured
3 Not Configured
4 Not Configured
5            FAX (2/4/8)    2(2) Fax; 2(2) Signal(NV);
6            LC8            S(8) Voice; 8(8) Signal; 8(8) Net-Dat; 8(8) Net-Sig;
7            LC8            8(8) Voice; 8(8) Signal; 8(8) Net-Dat; 8(8) Net-Sig;
8            LC8            8(8) Voice; 8(8) Signal; 8(8) Net-Dat; 8(8) Net-Sig;
9            LC8            8(8) Voice; 8(8) Signal; 8(8) Net-Dat; 8(8) Net-Sig;
10 Not Configured-
11 Not Configured
12 Not Configured
13 Not; Configured
14 Not Configured
1 5Not Configured
```

Clock source is default-set to LC8 at slot 7.
Clock reference is set to free running oscillator (Internal) of LC8 at slot 7.

4	LC4/8 (5)	FAX8 (1)
5	LC4/8 (4)	FAX8 (0)
6	LC4/8 (0)	
7	LC4/8 (1)	
8	LC4/8 (2)	
9	LC4/8 (3)	

Figure 2 TR 1902 Model 120 S Map - Partial View

Enter a 'q' to exit this screen. The Physical Resource Configuration menu will appear. This procedure is now complete. After this operation is finished, select another option or exit the Physical Resource Configuration menu.

Delete Resource Card (D)

To delete the Fax card in slot 5, enter (D) Delete resource card. The following menu will appear:

```
Occupied slots are:
Slot  Card
----  ----
5  FAX (2/4/8)
6  LC8
7  LC8
8  LC8
9  LC8
```

Enter the slot number of the card that you want to delete. You are prompted for a confirmation:

Delete [FAX] from slot 5? (Y/N) [N]

Enter "Y" and the following prompt appears:

Board [FAX] in slot 5 deleted from database.

This procedure is now complete. After this operation is finished, select another option or exit the Physical Resource Configuration menu.

Add Resource Card (A)

To add a service card, enter (A) Add resource card. The following menu will appear. Notice that the menu displays slots 0 through 15, regardless of which model is configured.

Available slots are: 0 1 2 3 4 5 10 11 12 13 14 15
Input your choice: <5>

Enter a slot number from the available slots shown. The following menu will appear:

Add Board to Database Menu

(A) DUAL El
(B) LC8
(C) DSP (24/30)
(D) FAX (2/4/8)
(E) MTP Processing (SS7)
(X) eXit
Input your choice, ? for help
(A/B/C/D/E/F/X/?):

Select "B" for a LC8 card. After you have selected a card option, the Physical Resource Configuration menu will appear. After the Physical Resource Configuration menu appears, select the card configuration procedure and refer to that particular section.

Note: When you select a Dual E1 (or T1), DSP (24/30), LC8, or FAX (2/4/8) card, the card needs to be configured.

At this point, you can repeat the above process and add FAX (1) into slot 4. In essence, you have:

1. Removed the FAX8 (0) card from its slot (slot 5).

2. Changed the FAX8 (0) card's jumpers to give it a new address (128 Hex.). The card has now a new configuration number and it is called FAX8 (1).

3. Added the FAX8 (1) card to a new slot (slot 4) to enable you to add a line card in slot 5. This line card will take a Hexadecimal address of 82C0 and it will be known as LC8 (4).

Configuration is now complete and no other steps are required. After this procedure is finished, exit the Physical Resource Configuration menu.

Configure Resource Card (C)

To configure a line card, enter (C) Configure Resource Card. The following example menu will appear:

Occupied slots are:

```
Slot  Card
====  ====
4  FAX  (2/4/8)
5  LC8
6  LC8
7  LC8
8  LC8
9  LC8
```

The above example has five line cards. Enter the slot number of the card that you want to configure. The following example menu will appear when you enter a card option. (This example assumes that slot # 5 was selected).

```
Configuration Menu for Board [LC8] in AT slot 5
=====================================================
(A) Change IO Port Address
(T) set Trunk signaling type
(F) reset to deFault
(S) Show board configuration
(W) shoW default configuration
(X) eXit
Input your choice, ? for help
(A/T/F/S/W/X/?):     <a>
```

This menu displays various line card configuration procedures that must be completed, depending on the type of line card selected. The next sections describe all procedures required for the following line cards:

- DSP (24/30)
- LC8
- FAX (2/4/8)
- Dual T1/E1

DSP (24/30) Cards

The only choice allowed for this type of card is (A) IO Port Address Change. The default setting is 0x2A0. The number in [brackets] is the card configuration number, which is used by the Configuration Maps given in TR 1902 (Model 120), TR 1920 (Model 70), and TR 1922 (Model 640). Enter (A) and the following menu will appear:

```
IO port address of Board is 0X2A0

Select IO Port Address Menu
===========================
(A) 0x02A0 [0]    (B) 0x22A0 [1]    (C) 0x42A0 [2]    (D) 0x62A0 [3]
(E) 0x82A0 [4]    (F) 0xA2A0 [5]    (G) 0xC2A0 [6]    (H) 0xE2A0 [7]
(X) eXit
Input your choice, ? for help
(A/B/C/D/E/F/G/H/?): <x>
```

If you need to assign a different I/O address, select one from the choices below that does not conflict with any other board in your server. (See Table 2.) Notice that the menu shows DSP24/30 addresses for card configuration numbers two through seven. These are reserved for future use.

Table **2** **DSP24/30 - I/O** Addresses and Switch (SW1) Settings

Card Config. Number	Base I/O address (Hex)l	Setting Sw1-1	Setting Sw1-2	Setting Sw1-3	Setting Sw1-4	Setting Sw1-5	Setting Sw1-6
DSP[O]	02A0	On	On	On	On	Off	On
DSP[1]	22A0	Off	On	On	On	Off	On

Configuration is now complete. After this procedure is finished, exit the Physical Resource Configuration menu.

LC8 Cards

Enter (A) IO Port Address Change. The following menu will appear. The number in [brackets] is the card configuration number, which is used by the Configuration Maps given in TR 1902 (Model 120), TR 1920 (Model 70), and TR 1922 (Model 640).

IO port address of Board is 0X2C0

Select IO Port Address Menu
============================
(A) 0x02C0 [0]   (B) 0x22C0 [1]   (C) 0x42C0 [2]   (D) 0x62C0 [3]
(E) 0x82C0 [4]   (F) 0xA2C0 [5]   (G) 0xC2C0 [6]   (H) 0xE2C0 [7]
(I) 0x02A0 [8]   (J) 0x22A0 [9]   (K) 0x42A0 [10]   (L) 0x62A0 [11]
(M) 0x82A0 [12]   (N) 0xA2A0 [13]   (O) 0xC2A0 [14]   (P) 0xE2A0 [15]
(X) eXit
Input your choice, ? for help
(A/B/C/D/E/F/G/H/I/J/K/L/M/N/O/P/X/?): <x>

If you need to assign a different I/O address, select one from the choices below that does not conflict with any other board in your server. (See Table 3.) Notice that the menu shows LC8 addresses for card configuration numbers eight through 15. These are reserved for future use.

Table 3 **LC8** Cards - I/O Addresses and Switch **(SW1)** Settings

Card Config. Number	Base I/O address (Hex)	Setting Sw1-1	Setting Sw1-2	Setting Sw1-3	Setting Sw1-4	Setting Sw1-5	Setting Sw1-6
LC8 [0]	02C0	On	On	On	On	On	On
LC8 [1]	22C0	Off	On	On	On	On	On
LC8 [2]	42C0	On	Off	On	On	On	On
LC8 [3]	62C0	Off	Off	On	On	On	On
LC8 [4]	82C0	On	On	Off	On	On	On
LC8 [5]	A2C0	Off	On	Off	On	On	On
LC8 [6]	C2C0	On	Off	Off	On	On	On
LC8 [7]	E2C0	Off	Off	Off	On	On	On

Enter (T) set Trunk signaling type. The following menu will appear and you will be prompted to enter a range of channels. For LC8, the valid input is O-7.

```
Current trunk types:
chnl: 00 01 02 03 04 05 06 07
type: LS LS LS LS LS LS LS LS
```

Input a range of channels (O-4 or 1,4,7, etc.). After channel numbers have been entered, the following menu will appear:

```
Select Trunk Type Menu
========================
(0) E&M
(1) E&M Type 1A
(2) Loopstart
(3) DID
(4) Groundstart
(D) Digital Support
(N) None
(X) exit
Input your choice, ? for help
(0/1/2/3/4/N/X/?) :
```

If you select (D) for Digital Support, it will set all 8 channels to that type even if you specify only some channels for configuration. The only way to change it is by deleting the card and adding the card again. If you select (N) for None, it will no signaling (no DSP on the trunk selected).

Configuration is now complete. After-this procedure is finished, exit the Physical Resource Configuration menu.

FAX (2/4/8) Cards

The only choice for this type of card is (A) IO Port Address change. Enter (A) if you need to assign a different I/O address. The default setting is 0x100. The following menu will appear. The number in [brackets] is the card configuration number, which is used by the Configuration Maps given in TR 1902 (Model 120), TR 1920 (Model 70), and TR 1922 (Model 640).

Note: The program displays three menus. One for each type of FAX card. Only the menu for the FAX4 card is shown here.

```
IO port address of Board is OX1 00   (FAX4)

Select IO Port Address Menu
===========================
(A) 0x100 [0]     (B) 0x118 [1]     (C) 0x130 [2]     (D) Ox148 [3]
(E) 0x160 [4]     (F) Ox178 [5]     (G) 0x190 [6]     (H) 0x1A8 [7]
(I) 0x1C0 [8]     (J) 0x1D8 [9]     (K) 0x220 [10]    (L) 0x250 [11]
(M) Ox268 [12]    (N) 0x280 [13]    (0) 0x2A0 [14]    (X) exit
Input your choice, ? for help
(A/B/C/D/E/F/G/H/I/J/K/L/M/N/O/X/?): <x>
```

To assign a different I/O address, select one from the choices below in Table 4 (FAX;?), Table 5 (FAX4), or Table 6 (FAX8). Configuration is now complete. After this procedure is finished, exit the Physical Resource Configuration menu.

Figure 3 shows SW1 set for a Hex address of 100 and configured as a *first* Fax card with the interrupt pull-up switch set to On. (See Caution below.)

Address=1 00 hex
(First Board)

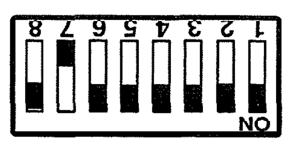


Figure 3 Fax **Card SW1**

CAUTION!

Position 1 of SW1 does not affect the base I/O address. It enables an interrupt pull-up resistor and it must be ON only on the first Fax card of each module. If you have additional Fax cards, set their SW1-1 switches to Off. Depending on the configuration map of your server, the first Fax card in your module is either FAX [0] or FAX [1]

Table 4 **I/O** Address Switch **Settings (FAX2)**

Card Number	Base Adds	8	7	6	5	4	3	2	1
FAX2 [0]	100	On	Off	On	On	On	On	On	*
FAX2 [1]	110	On	Off	On	On	On	Off	On	*
FAX2 [2]	120	On	Off	On	On	Off	On	On	Off
FAX2 [3]	130	On	Off	On	On	Off	Off	On	Off
FAX2 [4]	140	On	Off	On	Off	On	On	On	Off
FAX2 [5]	150	On	Off	On	Off	On	Off	On	Off
FAX2 [6]	160	On	Off	On	Off	Off	On	On	Off
FAX2 [7]	170	On	Off	On	Off	Off	Off	On	Off
FAX2 [8]	180	On	Off	Off	On	On	On	On	Off
FAX2 [9]	190	On	Off	Off	On	On	Off	On	Off
FAX2 [10]	1A0	On	Off	Off	On	Off	On	On	Off
FAX2 [11]	1B0	On	Off	Off	On	Off	Off	On	Off
FAX2 [12]	1C0	On	Off	Off	Off	On	On	On	Off
FAX2 [13]	1D0	On	Off	Off	Off	On	Off	On	Off
FAX2 [14]	1E0	On	Off	Off	Off	Off	On	On	Off

Table 5 I/O Address Switch Settings (FAX4)

Card Number	Base Adds	8	7	6	5	4	3	2	
FAX4 [0]	100	On	Off	On	On	On	On	On	*
FAX4 [1]	118	On	Off	On	On	On	Off	Off	*
FAX4 [2]	130	On	Off	On	On	Off	Off	On	Off
FAX4 [3]	148	On	Off	On	Off	On	On	Off	Off
FAX4 [4]	160	On	Off	On	Off	Off	On	On	Off
FAX4 [5]	178	On	Off	On	Off	Off	Off	Off	Off
FAX4 [6]	190	On	Off	Off	On	On	Off	On	Off
FAX4 [7]	1A8	On	Off	Off	On	Off	On	Off	Off
FAX4 [8]	1C0	On	Off	Off	Off	On	On	On	Off
FAX4 [9]	1D8	On	Off	Off	Off	On	Off	Off	Off
FAX4 [10]	220	Off	On	On	On	Off	On	On	Off
FAX4 [11]	250	Off	On	On	Off	On	Off	On	Off
FAX4 [12]	268	Off	On	On	Off	Off	On	Off	Off
FAX4 [13]	280	Off	On	Off	On	On	On	On	Off
FAX4 [14]	2A0	Off	On	Off	On	Off	On	On	Off

Table 6 I/O Address Switch Settings (FAX8)

Card Number	Base Adds	8	7	6	5	4	3	2	1
FAX8 [0]	100	On	Off	On	On	On	On	On	*
FAX8 [1]	128	On	Off	On	On	Off	On	Off	*
FAX8 [2]	150	On	Off	On	Off	On	Off	On	Off
FAX8 [3]	178	On	Off	On	off	off	Off	Off	Off
FAX8 [4]	1A0	On	off	off	On	Off	On	On	Off
FAX8 [5]	1C8	On	off	off	Off	On	On	Off	Off
FAX8 [6]	250	Off	On	On	Off	On	Off	On	Off
FAX8 [7]	278	Off	On	On	off	off	Off	Off	Off

Dual T1/E1 Cards

For this card, you can assign a different I/O address by entering (A), set a trunk type by entering (T), or assign a different framing/coding format by entering (C).

Configuration Menu for Board [DUAL T1] in AT slot 2
==
(C) Configure T 1 /El carrier
(A) change IO port Address
(T) set Trunk signaling type
(F) reset to default
(S) show board configuration
(W) show default configuration
(X) exit

If you enter (A) IO Port Address Change, the following menu will appear:

IO port address of Board 2 is OX300

Select IO Port Address Menu

(A) 0x300 [0] (B) 0x2300 [1] (C) 0x4300 [1] (X) eXit
Input your choice, ? for help
(A/B/C/X/?): <x>

To assign a different I/O address, select one from the choices below (Shaded address is reserved.)

Base address	Card Config. Number	Switch S4 Segment sw1	Switch S4 Segment sw2	Switch S4 Segment sw3	Switch S4 Segment sw4
300	0	Off	Off	Off	Off
2300	1	Off	Off	On	Off
4300	2	Off	On	Off	Off

If you enter (T) set Trunk signaling type, the following menu will appear and you will be prompted to enter a range of channels. For El cards, the valid input is O-59. For T1 cards, the valid input is O-47.

Current trunk types:

chnl: 0001020304050607 08091011
type: LS LS LS LS LS LS LS LS LS LS LS LS

chnl: 12 13 14 15 16 17 18 19 20 2122 23
type: LS LS LS LS LS LS LS LS LS LS LS LS

chnl: 24 25 26 27 28 29 30 31 32 33 34 35
type: LS LS LS LS LS LS LS LS LS LS LS LS

chnl: 36 37 38 39 40 4142 43 44 45 46 47
type: LS LS LS LS LS LS LS LS LS LS LS LS

Input a range of channels (O-4 or 1,4,7, etc.). After channel numbers have been entered, the following menu will appear:

Select Trunk Type Menu
========================
(0) E&M
(1) Loopstart
(2) DID
(3) Groundstart
(4) Common Channel Signaling
(X) exit
Input your choice, ? for help
(0/1/2/3/4/X/?) :

If you enter (C) Configure E1/T1 carrier, the following menu will appear:

Configuration menu for T1/E1 Carrier at trunk 0
==
(T) set Trunk number
(F) configure Framing format
(C) configure Coding format
(D) Display current configuration
(X) eXit
Input your choice, ? for help
(T/F/C/D/X/?): <x>

If you enter (F) configure Framing format, the following menu will appear:

Configure Frame Format for Board [DUAL T1]
==
(A) D3/D4 framing

(B) ESF framing
(X) eXit
Input your choice, ? for help
(A/B/X/?): <x>

(OR) for Dual El configuration

Configure Frame Format for Board [DUAL El
==
(A) CEPT framing
(B) CRC framing
(X) eXit
Input your choice, ? for help
(A/B/x/?): <x>

If you enter (C) configure Coding format, the following menu will appear:

Configure Coding Format for Board [DUAL T1]
==
(A) AMI Coding
(B) AMI with ZCS coding
(C) B8ZS coding
(X) exit
Input your choice, ? for help
(A/B/C/X/?): <x>

(OR) for Dual El configuration

Configure Coding Format for Board [DUAL El]
==
(A) AM1 Coding
(B) HDB3 coding
(X) exit
Input your choice, ? for help
(A/B/C/D/X/?): <x>

Configuration is now complete. After this procedure is finished, exit the Physical Resource Configuration menu.

Configure MVIP ClocK (K)

To set a different clock reference or clock master, select (K) configure MVIP clock from Physical Resource Configuration menu. The following menu will appear:

```
MVIP Clock Configuration Menu
========================================
(C) configure Clock source
(R) configure clock Reference
(D) set to Default configuration
(S) Show current configuration
(F) show deFault configuration
(X) exit
Input your choice, ? for help
(R./M/D/S/F/XI?): <x>
```

When (R) is selected for clock reference, it will display the available choices. Enter the appropriate slot number. If you choose a digital card, it will display the following menu:

```
Digital Clock Reference Configuration Menu
=====================================

(A) Network interface On trunk 0
(B) Network interface On trunk 1
(C) Internal free running oscillator
(X) exit
```

If you choose an analog card, the configuration is complete.

When (C) is selected for the clock source, it will display the available slots. To choose, enter the appropriate slot number, and the procedure is complete.

Show IO Address Database (I)

To see the IO address database configuration, enter (I) show IO address database. A screen similar to the one below will appear. In the actual display, configuration numbers are not displayed. Also, the Fax card will show as "FAX2/4/8/."

SLOT	CARD	IO PORT ADDRESS
====	=======	=========================
0	Not Configured	
1	Not Configured	
2	Not Configured	
3	Not Configured	
4	FAX8 (1)	(Hex) 128
5	LC8 (4)	(Hex) 82C0
6	LC8 (0)	(Hex) 02C0
7	LC8 (1)	(Hex) 22C0
8	LC8 (2)	(Hex) 42C0
9	LC8 (3)	(Hex) 62C0
10	Not Configured	
11	Not Configured	
12	Not Configured	
13	Not Configured	
14	Not Configured	
15	Not Configured	

Digital clock reference is set to: network interface at AT slot 7, trunk 0

Show Trunk Type Database (T)

To see the trunk type database configuration, enter (T) show Trunk type database. The following example screen will appear:

```
Slot 4 [FAX (2/4/8)]
===================================
None


Slot 5 [LC8]
===================================
chnl: 0001 020304050607
type: LS LS LS LS LS LS LS LS


Slot 6 [LC8]
-----------------------------------
chnl: 00 01020304050607
type:   LSLS   LSLSLSLSLSLS


Slot 7 [LC8]
===================================
chnl: 00 0102030405 0607
type:  LS  LS  LSLSLSLSLSLS


Slot 8 [LC8]            4
===================================
chnl: 00 01020304050607
type: LS LS LS LS LS LS LS LS


Slot 9 [LC8]
===================================
chnl: 00 01020304050607
type: LS LS LS LS LS LS LS LS
```

Quit Without Saving (Q)

To exit the Physical Resource Configuration menu without saving any changes, enter (Q) Quit.

Exit with Configuration and Report Generated (X)

To save the current configuration and exit out of the Physical Resource Configuration menu, enter (X) eXit with configuration and report generated. A report is automatically generated as you exit.

After you exit out of Physical Resource Configuration menu, you must go to the Off-line Configuration Menu and update information.

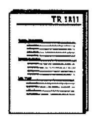
CAUTION!

When a card is added or deleted, the offline configuration must be invoked to keep its data in sync with the Physical Resource Configuration menu. The new offline configuration must then be activated.

2 System Connectivity

This chapter provides Technical References for System Connectivity components. These components are organized into two categories:

- Telephony Components
- Computer Interfaces



Technical References

Use the technical references to find detailed background information about the hardware components of a Centigram Series 6 server. These are: the Model 640, the Model 120, and the Model 70.

How to Use This Chapter

Identify the System Connectivity component that you want to study. Go to the "List of Technical References" in this chapter and identify its technical reference number. The references are listed in numerical order in the "List of Technical References" table.

If you remove a technical reference from this binder, mark its original location, and replace it when you are finished with the document.

2 System Connectivity Components
List of Technical References

Tech. Ref. Number	Title	Date	Release Number
	Telephony Components		
TR 1901	LC8/DSP8 Line Card	Doc. Rev. A	6.0A
TR 1903	DSP24/30 Line Card	Doc. Rev. A	6.0A
TR 1905	Dual T1 Card	Doc. Rev. A	6.0A
TR 1906	Dual El Card	Doc. Rev. A	6.0A
TR 1911	SS7 Signal Processor	Doc. Rev. A	6.0A
TR 1917	Power Configuration Card	Doc. Rev. A	6.0A
TR 1925	Phoneline Exceptions	Doc. Rev. A	6.0A
	Computer Interfaces		
TR 1907	Ethernet Card	Doc. Rev. A	6.0A
TR 1908	Serial 16/32 Card	Doc. Rev. A	6.0A
TR 1909	Serial Smartcard	Doc. Rev. A	6.0A

2A Telephony Components
List of Technical References

Tech. Ref. Number	Title	Date	Release Number
	Telephony Components		
TR 1901	LC8/DSP8 Line Card	Doc. Rev. A	6.0A
TR 1903	DSP24/30 Line Card	Doc. Rev. A	6.0A
TR 1905	Dual T1 Card	Doc. Rev. A	6.0A
TR 1906	Dual E1 Card	Doc. Rev. A	6.0A
TR 1911	SS7 Signal Processor	Doc. Rev. A	6.0A
TR 1917	Power Configuration Card	Doc. Rev. A	6.0A
TR 1925	Phoneline Exceptions	Doc. Rev. A	6.0A
	Computer Interfaces		
TR 1907	Ethernet Card	Doc. Rev. A	6.0A
TR 1908	Serial 16/32 Card	Doc. Rev. A	6.0A
TR 1909	Serial Smartcard	Doc. Rev. A	6.0A

2B Computer Interfaces
List of Technical References

Tech. Ref. Number	Title	Date	Release Number
	Telephony Components		
T R 1901	LC8/DSP8 Line Card	Doc. Rev. A	6.0A
T R 1903	DSP24/30 Line Card	Doc. Rev. A	6.0A
T R 1905	Dual T1 Card	Doc. Rev. A	6.0A
T R 1906	Dual El Card	Doc. Rev. A	6.0A
T R 1911	SS7 Signal Processor	Doc. Rev. A	6.0A
T R 1917	Power Configuration Card	Doc. Rev. A	6.0A
T R 1925	Phoneline Exceptions	Doc. Rev. A	6.0A
	Computer Interfaces		
TR 1907	Ethernet Card	Doc. Rev. A	6.0A
TR 1908	Serial 16/32 Card	Doc. Rev. A	6.0A
TR 1909	Serial Smartcard	Doc. Rev. A	6.0A

This technical reference provides information for the LC8/DSP8 Card used in the Centigram Series 6 Communications servers. It provides a brief description of the card, configuration data, and installation guidelines. These cards can be used in the Model 640, Model 120, and Model 70.

1 Introduction

2 Configuration Data

3 Installation Guidelines

1 Introduction

The LC8/DSP8 Card (Figure 1) includes up to eight telephone line interfaces (ports) and Digital Signal Processing (DSP) interfaces on one card. The interfaces are provided by hybrids (SIPs) on the card. If the card has no hybrids, the card is only used for DSP functions and it is called "DSP8." If the card has four hybrids, it provides four analog ports; if eight hybrids, it provides eight analog ports (one SIP per port and two ports per connector). These cards can be purchased with Loop Start, DID, E&M, or Ground Start optional interfaces. These optional interfaces are provided by the *type* of hybrids on the card. Interface hybrids cannot be mixed on the same card.

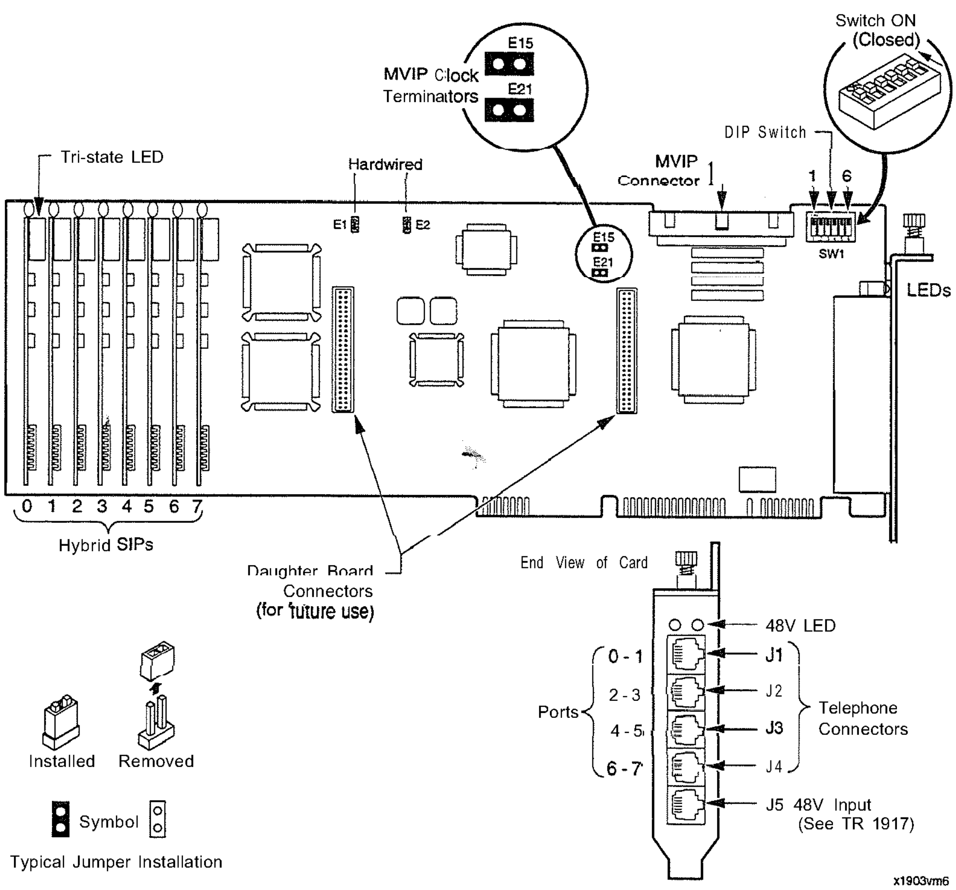


Figure 1 LC8/DSP8 Card

2 Configuration Data

In order for the LC8 card to properly work with the server, you must configure the card to comply with the data given in the following paragraphs.

1. The card should have the correct number and type of hybrids. Refer to Table 1 for the part numbers of hybrids. Only four digits appear on the hybrid (24xx), on the side facing the card guide, which is opposite the telephone line connector.

Table 1 Type of Hybrids

Part Number	Hybrid Type	How To Use J5
1495-2451-01	Ground Start	See TR 1917
1495-2465-o 1	DID/E & M	See TR 1917
1495-2493-01	Loop start	Not Used

2. You should determine which slots you can use for installing these cards. (Refer to *the Service Curd Hardware Configuration Technical Reference* for your specific server.)

3. You must set the correct I/O address for the card. The card's I/O address is set with switch S 1. Table 2 shows the switch settings for valid addresses.

Table 2 **LC8** Cards-I/O Addresses and Switch Settings

Card Config. Number	Base I/O address (Hex)l	Setting Sw1-1	Setting Swl-2	Setting Swl-3	Setting Swl-4	Setting Swl-5	Setting Swl-6
LC8[0]	02C0	On	On	On	On	On	On
LC8[1]	22co	Off	On	On	On	On	On
LC8[2]	42C0	On	Off	On	On	On	On
LC8[3]	62C0	Off	Off	On	On	On	On
LC8[4]	82C0	On	On	Off	On	On	On
LC8[5]	A2C0	Off	On	Off	On	On	On
LC8[6]	C2C0	On	Off	Off	On	On	On
LC8[7]	E2C0	Off	Off	Off	On	On	On

4. The MVIP bus clock might need to be terminated. Jumpers (El 5 & E21) are defined in Table 3, but you need to read the "Installation Guidelines" at the end of this section before setting the jumpers.

CAUTION!

If you are adding a card, the existing termination may need to be moved from the existing card to the new one.

Table 3 Card's Jumpers - Clack Termination

Jumpers	Installed or Removed?	Function Provided
El5 andE21	Installed	Places termination on MVII? Clock.
El5 andE21	Removed	Removes termination from MVIP Clock.

5. You need to configure the system Resource Manager. (Refer to the Service *Card Software Configuration Technical Reference.)*

6. If you are using DID, Ground Start, or E&M, you need to get additional information from the Power *Configuration Card Technical Reference* (TR 1917).

7. When connecting the LC8 cards to the patch panel, use straight-through, 8-pin non-keyed modular patch cables or an octopus cable. (See Figures 2 and 3.)

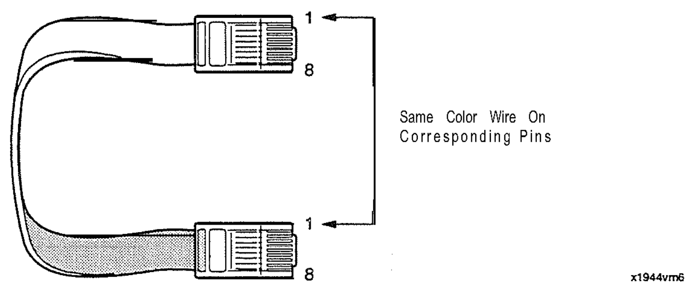
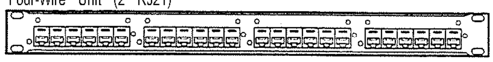
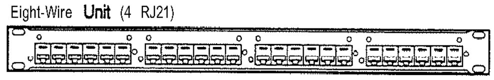
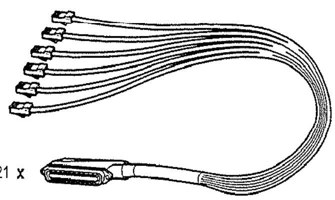
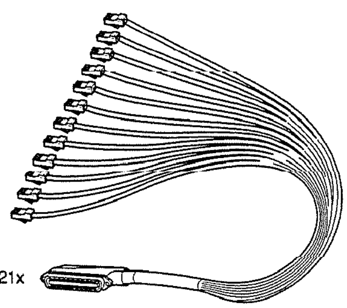
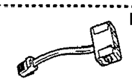


Figure 2 Straight-Through Modular Patch-Cable

Note: Octopus cables and patch panels are mutually exclusive. Straight-through modular cables, which are provided, have identical color codes from left to right on each modular connector when viewed with the connectors side by side as Figure 2 shows.

Figure 3 shows various connecting methods for Series 6 servers.

Figures 4 though 7 show connections from line cards to patch panels. In these figures, four RJ-21 connectors per patch panel are shown. They support E&M, Loop Start, Ground Start, and DID connections. Sometimes in the field, patch panel are installed upside down. This facilitates the routing of cables between the panels and the line cards.

	Primary Use: Model: 70	120	640	Number of RJ-61x	Wires Per RJ-61x	Ports & USC	
Patch Panels See Figures 4 through 7 for cabling diagrams							
Four-Wire Unit (2 RJ21) 			✔	24	4	48 (LS, GS, DID)	
Eight-Wire Unit (4 RJ21) 			✔	24	8	48 (E & M)	
Octopus Cables							
6 Connector  RJ-21 x	✔	✔	✔	6	8	12 (E & M)	
12 Connector  RJ-21x	✔	✔	✔	12	4	24 (LS, GS, DID)	
T-Adapter  RJ-11 RJ-61 See Figure 8 for Detail	✔	✔		1	8	2 (Any)	0

x1942vm6

Figure 3 Various Connecting Methods for Series 6 Servers

Note: There are two patch panels in the installation. For clarity, only one patch panel at a time is shown.

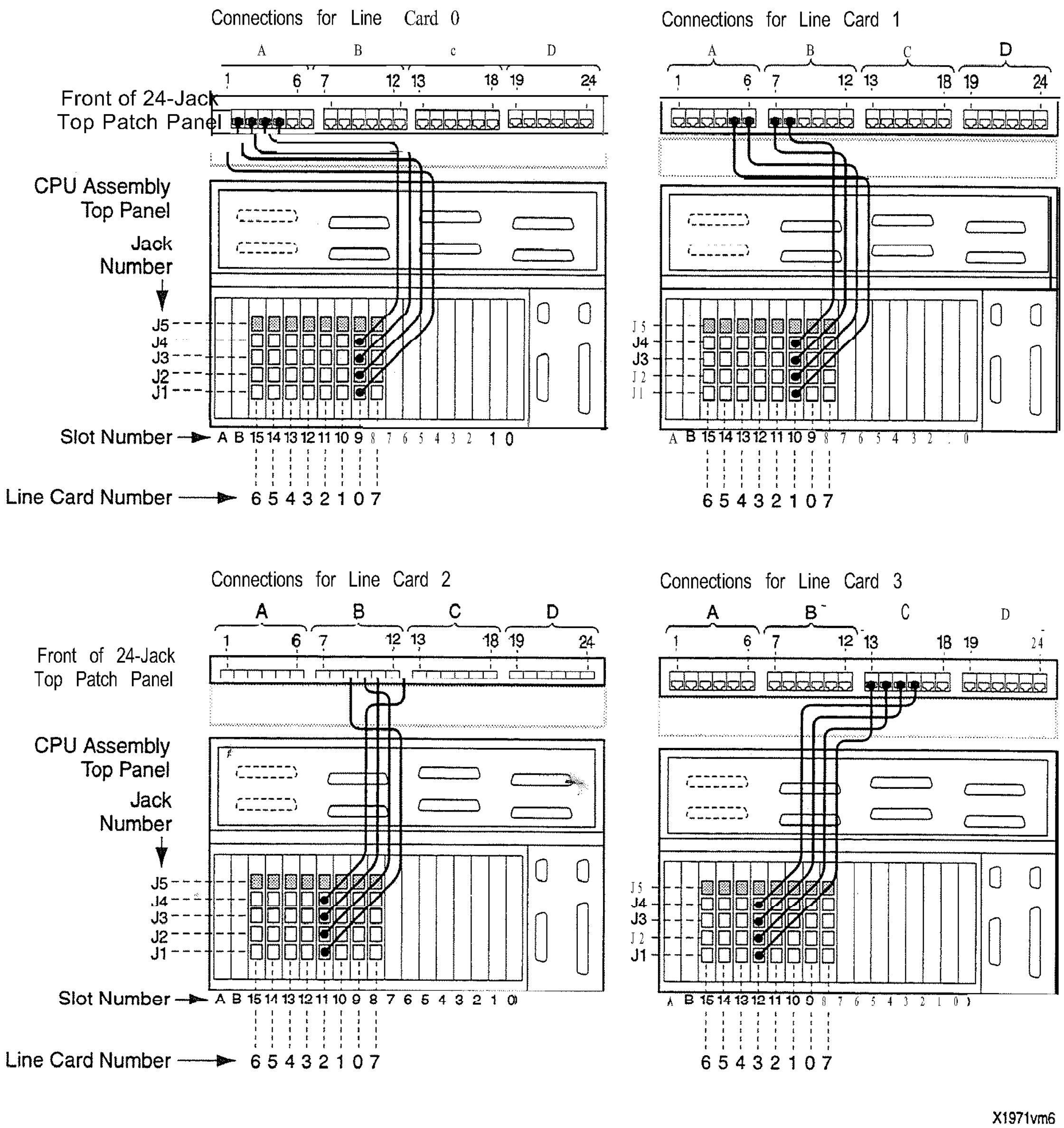


Figure 4 Right-Side Up Patch Panel-Line **Cards 0—3**

Note: There are two patch panels in the installation. For clarity, only one patch panel at a time is shown.

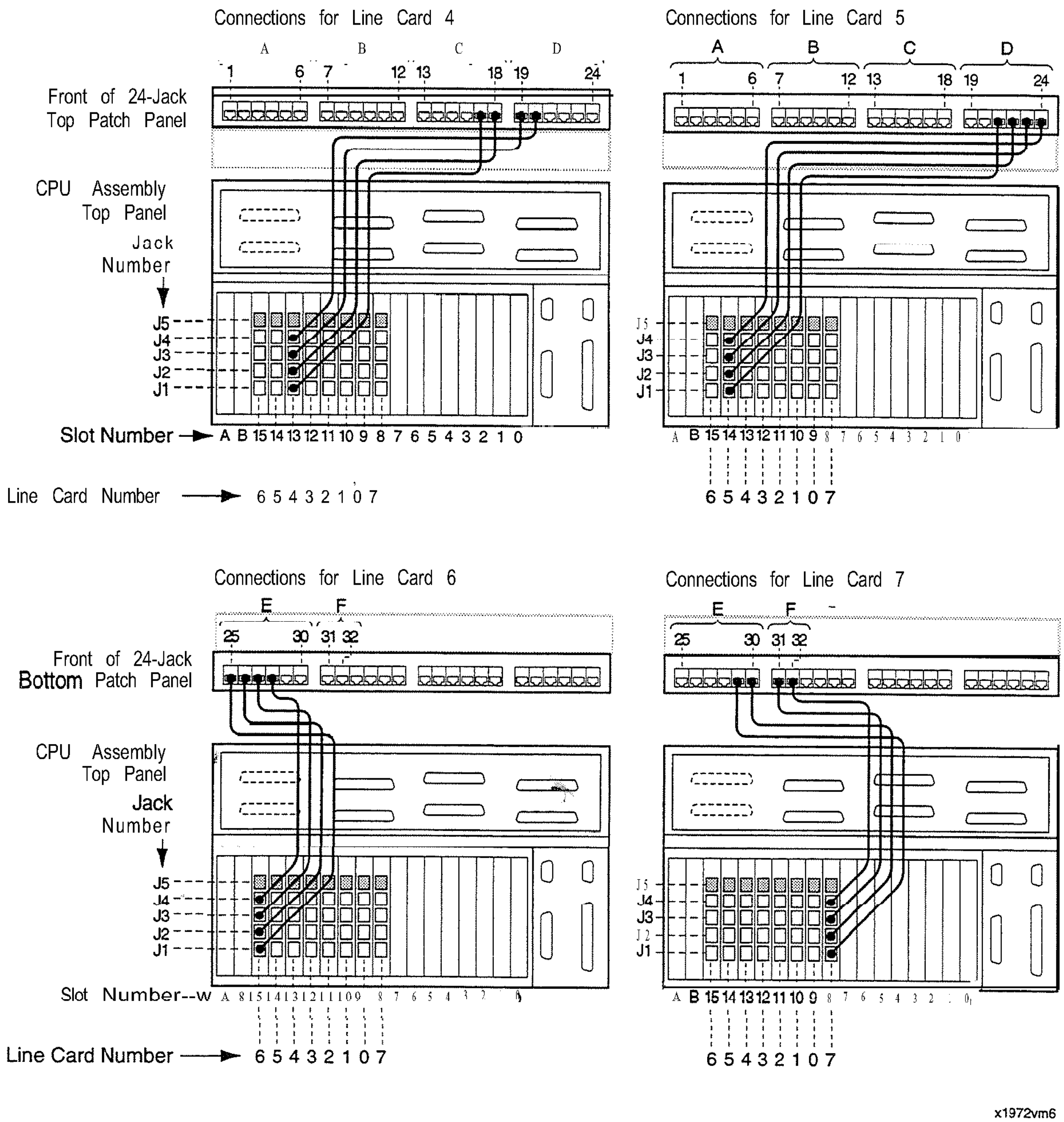


Figure 5 **Right-Side Up Patch** Panel-line **Cards 4—7**

Note: There are two patch panels in the installation. For clarity, only one patch panel at a time is shown.

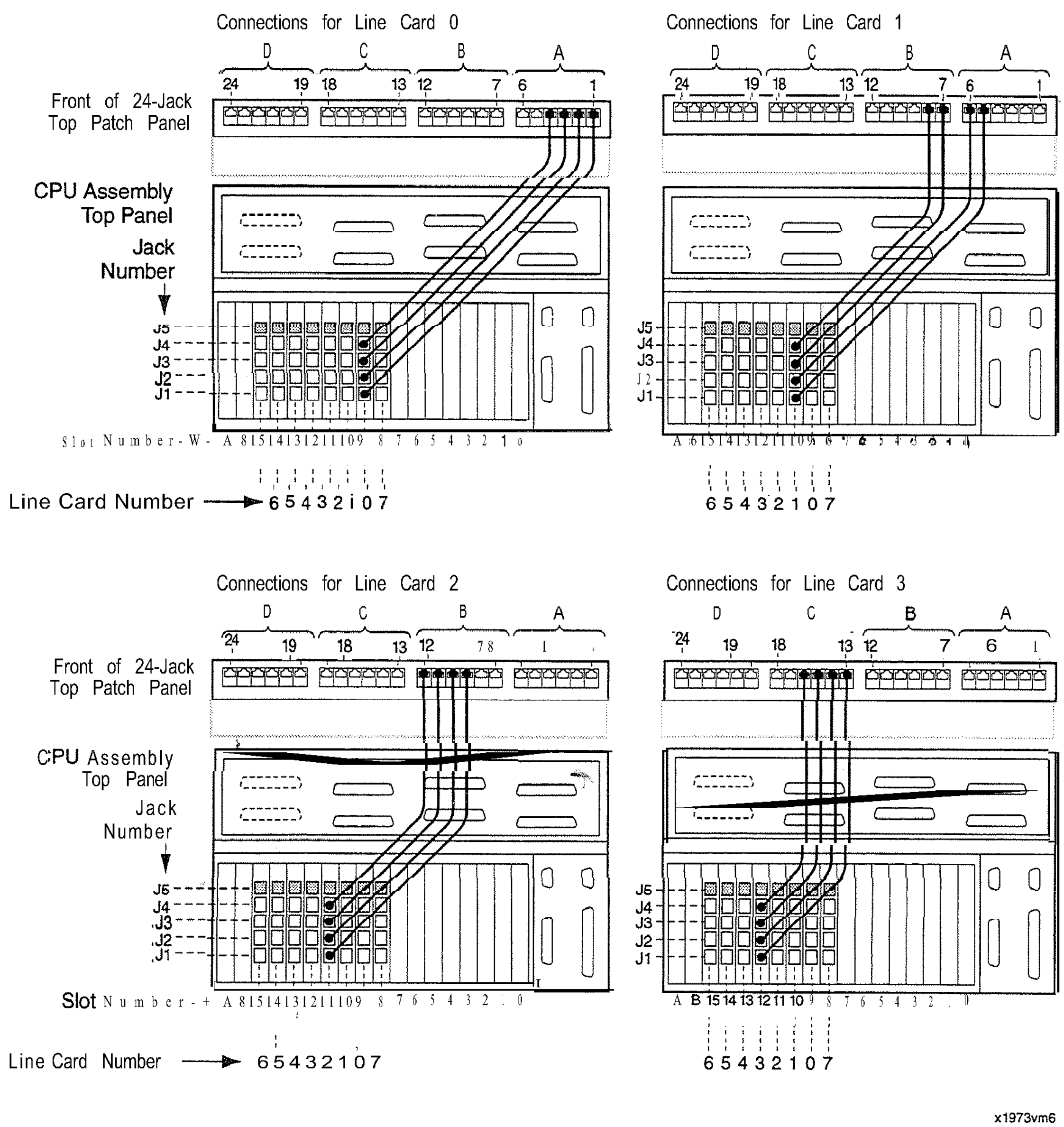


Figure 6 Upside Down Patch Panel—Line Cards 0—3

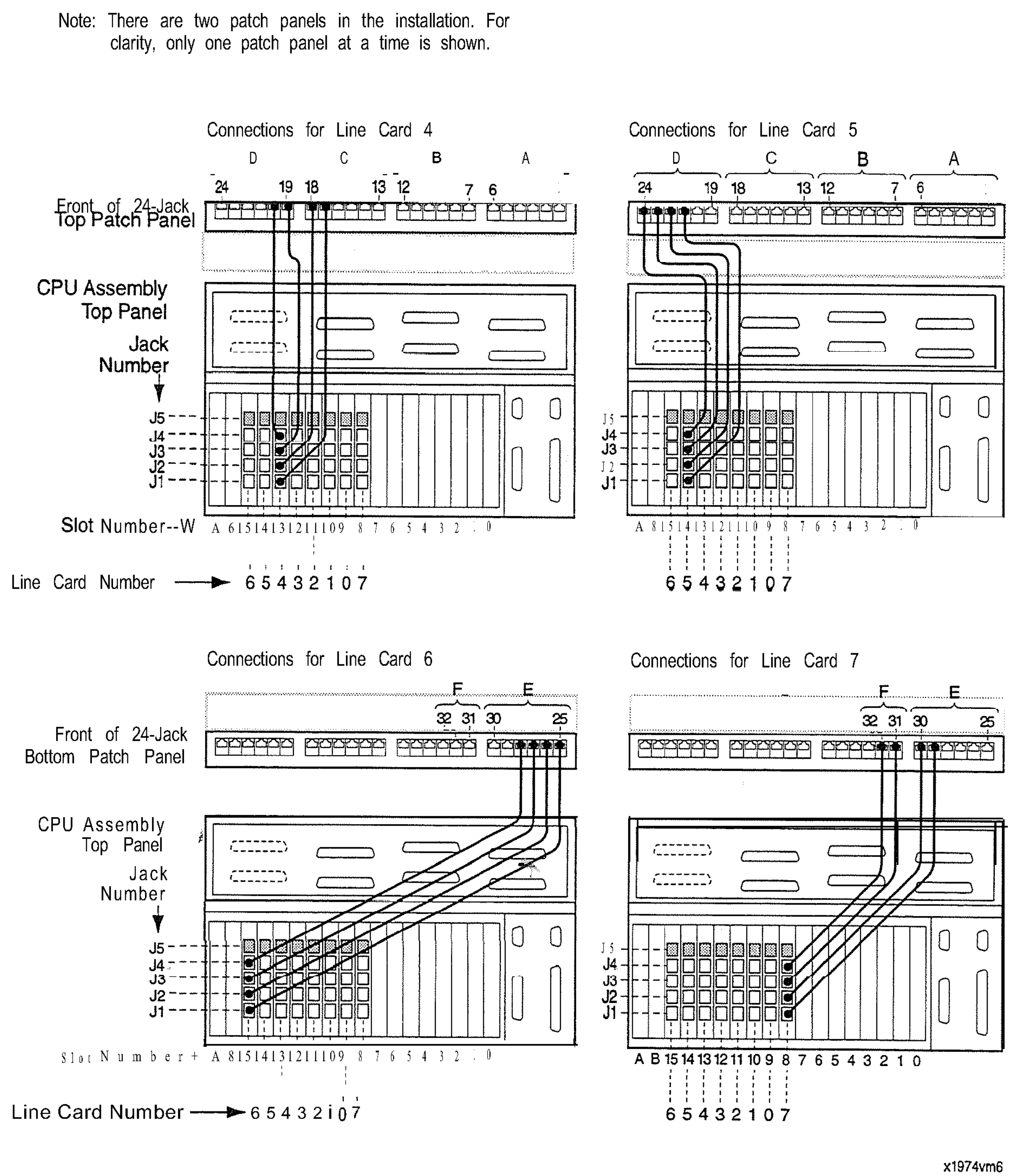


Figure 7 **Upside Down Patch Panel—Line Cards 4—7**

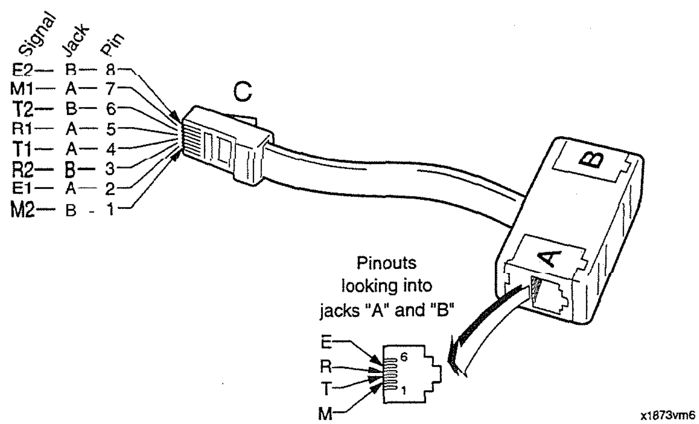
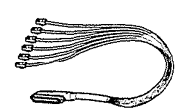
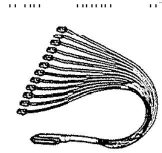
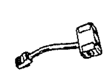


Figure 8 Detail of T-Adapter

Table 4 lists part numbers for the various connecting hardware.

Table 4 Connecting Hardware-Part **Numbers**

Description	Part Number	Icon
Patch Panel RJ21 (2) RJ61 (24)	2800-0006-09	
Patch Panel RJ21 (4) RJ61 (24)	2800-0006-04	
Octopus Cable RJ21 (1) RJ61 (6)	1911-0012-01	
Octopus Cable RJ21 (1) RJ61 (12)	1911-0013-01	
T-Adapter RJ61 (1) Male RJ 11 (2) Female	1990-0049-0 1	

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's *Installation and Service Manual.*

This card is preconfigured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to *the Service Card Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements
3. Refer to your server's *Installation and Service Manual* for correct instructions on how to remove and replace cards.

This document provides information for the DSP24/30 Card used in the Centigram Series 6 Communication servers. It provides a brief description of the card, configuration data, and installation guidelines. These cards can be used in the Model 640, Model 120, and Model 70..

1 Introduction

The DSP24/30 Card (Figure 1) is a standard PC AT card which performs digital signal processing on data from MVIP bus streams. The card supports standard voice processing functions for store and forward speech and telephony signaling on either 24 or 30 ports. This card is used in conjunction with the Dual T1 or the Dual El card.

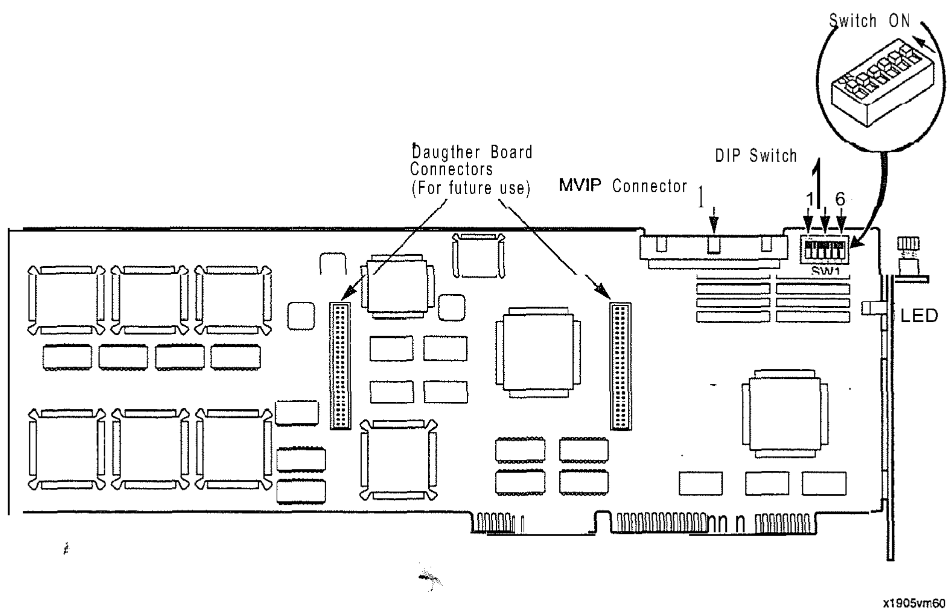


Figure 1 **DSP24/30 Card**

2 Configuration Data

In order for the DSP24/30 card to work with the server, you must configure the card to comply with the data given in the following paragraphs.

1. You should determine which slots you can use for installing these cards. (Refer to the *Service Curd Hardware Configuration Technical Reference* for your specific server for configuration maps.) The available slots will determine which address to set.

2. You must set the correct I/O address for the card. The card's I/O address is set with switch S 1. Table 2 shows the switch settings for *valid* addresses.

3. You need to configure the system Resource Manager. (Refer to the Service *Card Software Configuration* Technical *Reference.)*

4. When a DSP24/30 card is installed, an MVIP cable is required.

Table **2** **DSP24/30 · I/O** Addresses and Switch **Settings**

Card Config. Number	Base I/O address (Hex)l	Setting Sw1-1	Setting Sw1-2	Setting Sw1-3	Setting Sw1-4	Setting Sw1-5	Setting Sw1-6
DSP[O]	02A0	On	On	On	On	Off	On
DSP[1]	22A0	Off	On	On	On	Off	On

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's Installation *and Service* Manual.

This card is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to *the Service Card Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements.
3. Refer to your server's *Installation and Service Manual* for correct instructions on how to remove and replace cards.

Dual T1 Digital Trunk Interface Card Technical Reference

This document provides information for the Dual T1 Digital Trunk Interface card used in the Series 6 servers. It provides a brief description of the card, configuration data, and installation guidelines. The card can be used in the Model 70, Model 120, and Model 640 servers.

1 Introduction

2 Configuration Data

3 Installation Guidelines

1 Introduction

The Dual T1 Digital Trunk Interface card (P/N 2410-0193-01) provides access to two T1 digital trunks. One card can connect to one or two DSP24 digital line cards over the MVIP bus.

The card converts the incoming trunks from bipolar AM1 format to unipolar format, demultiplexes frames into individual channels, extracts a clock signal, and arranges the D3/D4 channels or ESF channels in the incoming data from serial bit streams into MVIP format for the DSP cards.

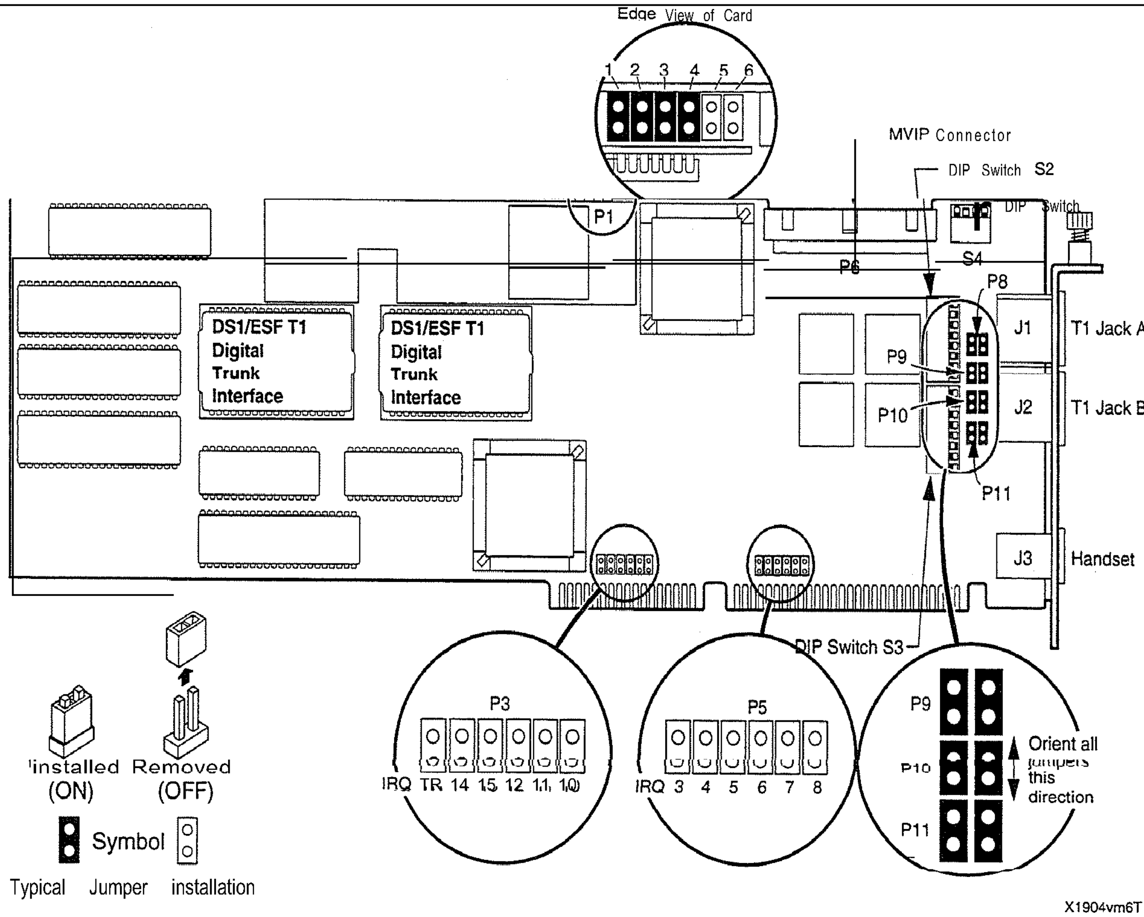
The trunk hybrids on the card derive a 8 kHz clock reference from one of the network RxD signals. The preferred network signal, trunk 0 or trunk 1, can be selected through the Resource Configuration Manager setup menus for T1 trunk connections.

The line driver of each trunk hybrid connects through an output transformer to a transmit equalization network. The transmit equalization hybrid conditions the TxD signals to optimize the signals for transmission over standard ABAM 1 00-Ohm twisted pair cable. Switches on the card allow various amounts of equalization to be selected to compensate for differing T1 span lengths.

Card Features

The Dual T1 Digital Trunk Interface card, shown in Figure 1, has these features:

- Two T1 (card type MB89110) primary-rate RJ-48C interfaces
- Multi-Vendor Integration Protocol (MVIP) Bus
- ESF or D3/D4 framing
- CAS extraction
- Channel loopbacks
- US Federal Communications Commission (FCC) approved
- Canadian Department of Communications (DOC) approved



(P/N 2410-0193-01)

Figure 1 Dual T1 Interface Card Layout

Note: The Series 6 digital trunk connectivity feature offers both T1 and El digital trunk interface cards. These cards are virtually identical. They can be distinguished by the legend on the two large DIP integrated circuits located on the left-center of the cards. The Dual T1 Digital Trunk Interface has the legend "DS 1 /ESF T1 Digital Trunk Interface." The Dual E 1 Digital Trunk Interface has the legend "CEPT El Digital Trunk Interface."

Regulatory Compliance Information

FCC

The Dual T1 Digital Trunk Interface card complies with Part 68 of the FCC Rules. The FCC Registration Number for this card is:

2AHCAN-65489-XD-N

The card is designed for connection to circuit termination panels (DSXs) equipped with RJ-48C jacks. The applicable FCC Facility Interface Codes (FIC) is 04DU9-BN and the Service Order Code (SOC) is 6.0N for all applicable connections. These connections can be 1 .544 Mbps rate T 1 signals without line power. Framing can be SF, SF and B8ZS, ANSI ESF, and ANSI ESF and B8ZS.

Canadian DOC

Canadian Department of Communications (DOC) approved.

The Dual T1 Digital Trunk Interface card meets the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," IECS-003 of the Department of Communications.

2 Configuration Data

The Dual T1 Digital Trunk Interface card contains the option switch settings and jumper settings shown in Figure 1. When replacing the Dual T1 Digital Trunk Interface card, ensure that the switch and jumper settings on the replacement card match those of the card being removed from the Series 6 server module.

MVIP Clock Termination P1

The MVIP (Multi-Vendor Integration Protocol) connector is a direct card-to-card bus used by the Dual T1, DSP, LC, and fax cards to communicate. The jumpers at connector P1 terminate the MVIP clock signals (Table 1) on the bus to prevent ringing. Install these jumpers whenever the Dual T1 Digital Trunk Interface card is at one end of the MVIP bus. If the card is not the last card on the MVIP bus, do not install these jumpers.

Table 1 **MVIP** Clock Termination Jumper Settings

Jumper P1 (MVIP Clock Termination)		
Position	Jumper	Status
1	ON	c 4
2	ON	FP
3	ON	C2
4	ON	C8
5	OFF	Not used
6	OFF	Not used

I/O Address Switch S4

The Dual T1 card is allocated AT bus base addresses 0300h (the default address) and 2300h. For convention set Dual T1 card #1 for 0300h and card #2, if present, for 2300h (Table 2). H owever, whenever replacing a card, always set the address of the replacement to match the settings of the card you are removing.

Table 2 Address Switch Settings

DIP Switch S4 (Card Number 0 Addr-0300h)		DIP Switch S4 (Card Number 1 Addr-2300h)	
Segment	Setting	Segment	Setting
SW1	0	SW1	0
SW2	0	SW2	0
SW3	0	SW3	1
SW4	0	SW4	0

0 = closed or on; 1 = open or off

Line Pairing Jumpers P8-P10

Jumpers P8 and I'9 establish line pairing for transmit and receive for trunk connection A and P10 and P1 1 establish line pairing for trunk B. Setting the jumpers vertically as listed in Table 3 selects the RJ-48C connector pins 1 and 2 for receive (input) and pins 4 and 5 for transmit (output). Use this configuration since the Series 6 server is on the "user" side of the network.

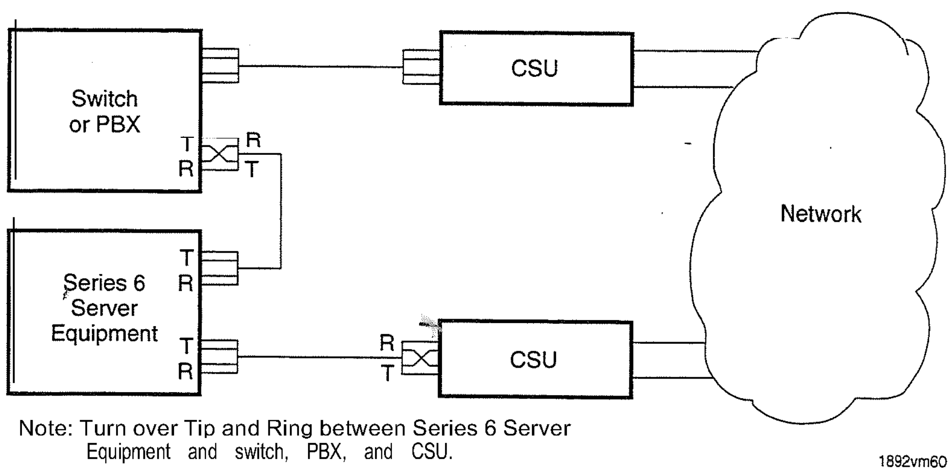
Table 3 line Pair Jumpers

Line Pair Jumpers (Transmit on pins 1 and 2, and Receive on pins 4 and 5 of the RJ48C connectors J1 and J2)			
T1 Trunk A		T1 Trunk B	
P8 Vertical	P9 Vertical	P10 Vertical	P11 Vertical

RJ-48C T1 Network Connectors

The T1 line connectors are ISDN standard 8-pin RJ-48C jacks. The connector closer to the "lip" on the end plate of the card is the trunk A interface (Figure 1) and the second connector is the trunk B interface. The "A" trunk interface on the card is the lower-ordered trunk connection, and "B" is the higher-ordered connection. Thus, for configuration purposes, the trunk "A" trunk interface becomes trunk "0" and the trunk "B" trunk interface becomes trunk "1." For Model 640 and Model 120S servers , if a second Dual T1 Digital Trunk Interface card is installed, its trunk "A" interface becomes trunk "2" and its trunk "B" trunk interface becomes trunk "3."

When fabricating interface cables, the Series 6 server transmit connections go to the receive connections on the switch, PBX, and CSU equipment (Figure 2). Similarly, the switch, PBX, and CSU equipment transmit connections go to the Series 6 server receive connections. Table 4 lists the connector pin assignments. Centigram provides a 3-foot (0.9m) cable terminated at both ends in RJ-48C connectors (P/N 191 1-0014-01). This cable can be used to connect to a local DSX patch panel.



(P/N 1911-0014-01)

Figure 2 Tip and Ring Turnover between Series 6 Server Equipment and Switch / PBX and CSU

Table 4 Network Connector Pin Assignments

	Function	
Pin	PBX / Switch / Network	Series 6 server
1	TxD	RxD
2	TxD	RxD
3	Not Used	Not Used
4	RXD	TxD
5	RXD	TxD
6	Not Used	Not Used
7	Not Used	Not Used
8	Not Used	Not Used

line Equalization Switches S2 and S3

The transmit hybrids on the card for T1 trunks pre-condition the outputs signals for transmission over 100-Ohm twisted pair copper cable. Eight-pole switches S2 and S3 select various levels of attenuation for differing T1 span lengths. Switch S2 sets the equalization for T1 trunk port A, and S3 sets the equalization for T1 trunk B. The output pulse from the T1 equalization hybrid meets DSX-1 requirements (ANSI T1.102 — 1987, Section 2) for a specific length of cable. When using standard 22 AWG ABAM cable, you can use the settings listed in Table 5.

Table 5 Switch Settings for Standard Cable lengths

Sections for Switch S2 or S3	0–150 ft.	150-450 ft.	450-655 ft.
SW1	On		
SW2		On	
SW3			On
SW4		On	
SW5		—	On
SW6		On	—
SW7			
SW8			On

IRQ Jumpers and Handset Connector

The interrupt request jumpers at P3 and P5 and the handset connectors are not used. As shown on Figure 1, these jumpers are not installed.

Pre-Installation Considerations

By convention, the Dual T1 Digital Trunk Interface card installs in these slots in the Model 70, Model 120, and Model 640 platforms:

Card Number	Model 70 Slot Number	Model 1201 Slot Number	Model 120S Slot Number	Model 640 Slot Number
0	3	6	6	9
1	—	—	8	11

The nature of the system AT bus does not require cards to be installed in particular slots. However, the MVIP bus clock signals must be terminated to ensure reliable data transfer across the bus. The above conventional slot assignments for the Dual T1 Digital Trunk Interface card ensures that the MVII? bus clock signal is properly terminated. This installation arrangement also ensures a standard system configuration to simplify communications with Centigram TAC and field service. A typical digital trunk connectivity configuration has a card equipped with MVIP clock termination jumpers installed at each end of the MVIP bus (Figure 3).

Note: The last cards on the ends of the MVIP bus cable must have their MVIP clock termination jumpers installed.

Digital trunk PCM channels correlate directly to analog ports. Line groups are configured for a system connected through digital trunks in the same manner as for analog trunks. The DSP24 line card ports are assigned by the slot number of the related trunk interface card, trunk number, and PCM channels. These assignments are done in triplet using the form xx:yy:zz, where **xx** is the VoiceMemo module number, **yy** is the slot number trunk card, and **zz** is the channel (port) number. Port numbers begin with 0 on trunk "A" of the lower order trunk interface card and continue in sequence from one trunk to another. For example, trunk "A" on the first trunk interface card is configured as trunk number 0. Given that all PCM channels are used, these channels will number from O-23. The channels on trunk "B" (trunk number 1) continue numbering with 24 through-47, and so forth.

Tip: To ensure fault tolerance, use several digital trunks to share the load of traffic-bearing channels. If available, reserve several channels in each trunk as spares.

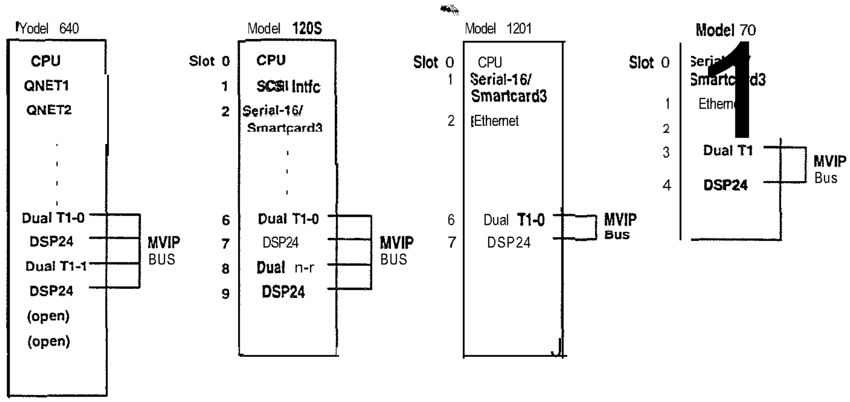


Figure 3 **Typical** System **Configurations With Digital Connectivity**

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's *Installation and Service Manual.*

This card is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to the Service *Card Hardware Configuration Technical Reference* for your specific server. That section provides:
    - An overview of your server
    - A description of your server's architecture
    - Card configuration and installation guidelines
    - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
    - Jumper and switch setting information specific to your card
    - If applicable, interface requirements
3. Refer to your server's *Installation and Service Manual* for correct instructions on how to remove and replace cards.

Dual El Digital Trunk Interface Card
Technical Reference

This document provides information for the Dual El Digital Trunk Interface card used in the Centigram Series 6 Communications servers. It provides a brief description of the card, configuration data, and installation guidelines. The card can be used in the Model 70, Model 120, and Model 640 systems.

1 Introduction

2 Configuration Data

3 Installation Guidelines

1 Introduction

The Dual El Digital Trunk Interface card (P/N 2410-O 171-03 and -04) provides access to two El digital trunks. One card can connect to one or two DSP30 digital line cards over the MVIP bus. VoiceMemo release 6.0A supports only System Signaling 7 for CCITT El digital trunk connectivity. To support this signaling, the SS7 Integration and the SS7 Signaling Processor must be installed with the Dual El Digital Trunk Interface card to process the signaling information carried in El PCM time slot 16. (Refer to TR1911 and to the *SS7 Integration Manual* for additional information.)

The Dual El Digital Trunk Interface card converts the incoming trunks from bipolar format to unipolar format, demultiplexes frames into individual channels, extracts a clock signal, and arranges the 32 channels in the incoming serial bit streams into parallel bytes for the signal processing card. Conversely, the card converts the parallel data from the signal processing card to serial data and converts the bit stream to bipolar format for the digital trunks.

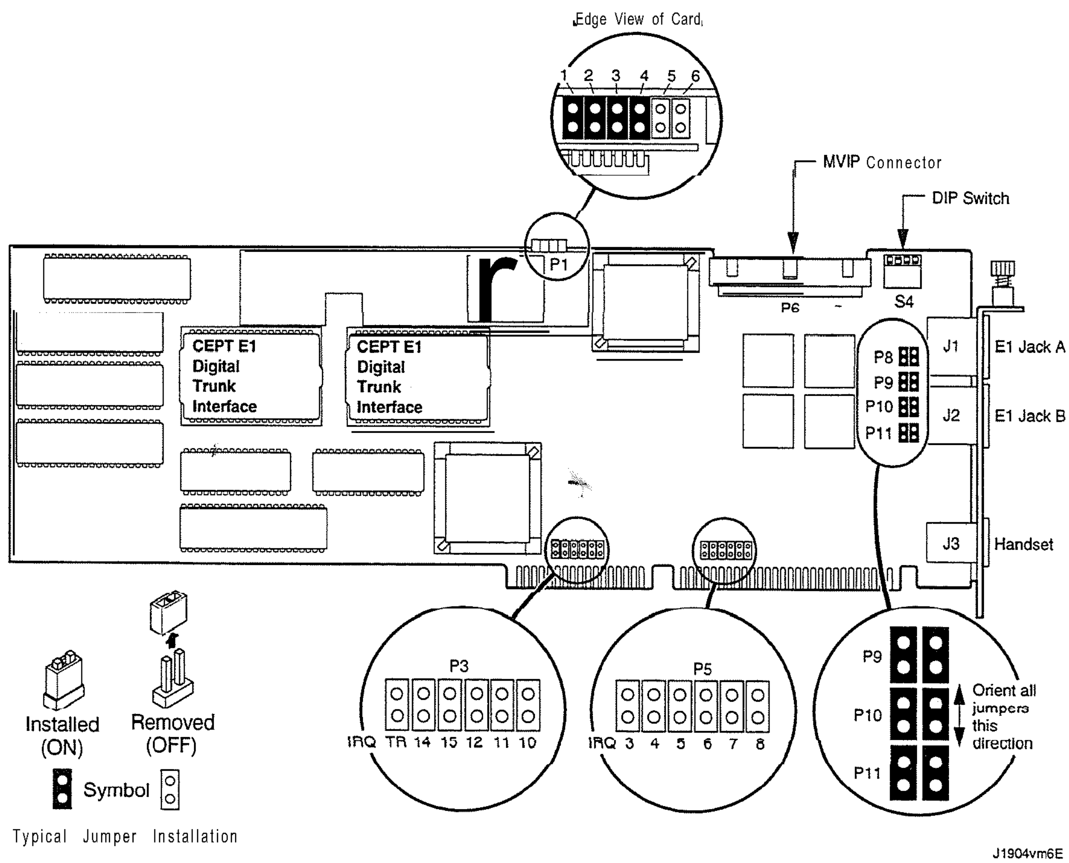
The trunk hybrids on the card extract a 8 kHz clock reference from one of the network RxD signals. The preferred network signal, trunk 0 or trunk 1, can be selected through the Resource Configuration Manager setup menus for El trunk connections.

The line driver of each trunk hybrid connects through an output transformer to a transmit equalization network. The transmit equalization hybrid conditions the TxD'signals to optimize the signals for transmission over standard ABAM 100-Ohm twisted pair cable. Switches on the card allow various amounts of equalization to be selected to compensate for differing El cable lengths.

Card Features

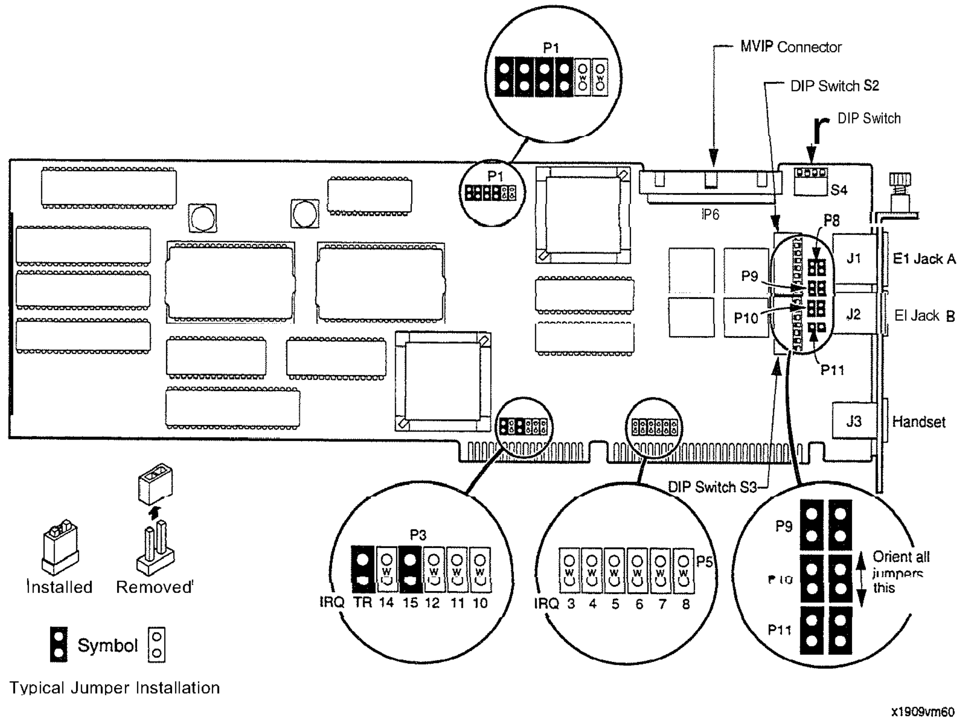
The Dual El Digital Trunk Interface card, shown in Figures 1 and 2, has these features:

- Two El (MB89 120) 1 00Ω RJ48C interfaces
- Balanced or unbalanced trunk interface configurations
- Multi-Vendor Integration Protocol (MVIP) bus
- CCS extraction
- Channel loopback toward facility
- CEPT or CRC framing
- US Federal Communications Commission (FCC) approved
- Canadian Department of Communications (DOC) approved
- British Approval Board for Telecommunications (BABT) approved



P/N 2410–0171–03

Figure 1 **Dual E1 Interface** Card (Unbalanced Trunk) layout



P/N 2410-0171-04

Figure 2 Dual El Interface Card (Balanced Trunk) layout

Note: The Series 6 server digital trunk connectivity feature offers both T1 and El Digital Trunk Interface cards. These cards are virtually identical. They can be distinguished by the legend on the two large DIP integrated circuits'located on the left-center of the cards. The Dual El Digital Trunk Interface has the legend "DS 1/ESF T1 Digital Trunk Interface." The Dual El Digital Trunk Interface has the legend "CEPT El Digital Trunk Interface."

Regulatory Compliance Information

The model MB89 120-UK variation to the Dual El Digital Trunk Interface card conforms to these BABT standards:

- OTR001 port type 2DS
- BS6301
- BS6328
- BABT License Certificate No. NS/ 14 12/I/N/603064

2 Configuration Data

The dual interface card contains the option switch settings and jumper settings shown in Figures 1 and 2. When replacing the Dual El Digital Trunk Interface card, ensure that the switch and jumper settings on the replacement card match those of the card being removed from the Series 6 server module.

MVIP Clock Termination Connector P1

The MVIP (Multi-Vendor Integration Protocol) connector is a direct card-to-card bus used by the Dual El, DSP, SS7 Signal Processing card, LC, and fax cards to communicate. The jumpers at connector P1 terminate the MVIP clock (Table 1) on the bus to prevent ringing. Install these jumpers whenever the Dual El Digital Trunk Interface card is at one end of the MVIP bus. If the card 'is not the last card on the MVIP bus, do not install these jumpers.

Table 1 **MVIP** Clock Termination Jumper Settings

Jumper P1 (MVIP Clock Termination)		
Position	Jumper	Status
1	ON	c4
2	ON	FP
3	ON	C2
4	ON	C8
5	OFF	Not used
6	OFF	Not used

I/O Address Switch S4

The Dual El card is allocated AT bus base addresses 0300h (the default address) and 2300h. By convention set Dual El card #0 for 0300h and card #1, if present, for 2300h (Table 2). However, whenever replacing a card, always set the address of the replacement to match the settings of the card you are removing.

Table 2 **Address Switch Settings**

DIP Switch S4 (Card Number 0 Addr-0300h)		DIP Switch S4 (Card Number 1 Addr-2300h)	
Segment	Setting	Segment	Setting
SW1	0	SW1	0
SW2	0	SW2	0
SW3	0	SW3	1
SW4	0	SW4	0

0 = closed or on; 1 = open or off

Line Pairing Jumpers P8-P10

Jumpers P8 and P9 establish line pairing for transmit and receive for trunk connection A, and P10 and P11 establish line pairing for trunk B. Setting the jumpers vertically (Table 3) selects the RJ-48C connector pins 1 and 2 for receive (input) and pins 4 and 5 for transmit (output). Use this configuration since the Series 6 server is on rhe "user" side of the network.

Table 3 line Pair Jumpers

Line Pair Jumpers (Transmit on pins 1 and 2, and Receive on pins 4 and 5 of the RJ48C connectors J1 and J2)			
T1 Trunk A		T1 Trunk B	
P8	P9	P10	P11
Vertical	Vertical	Vertical	Vertical

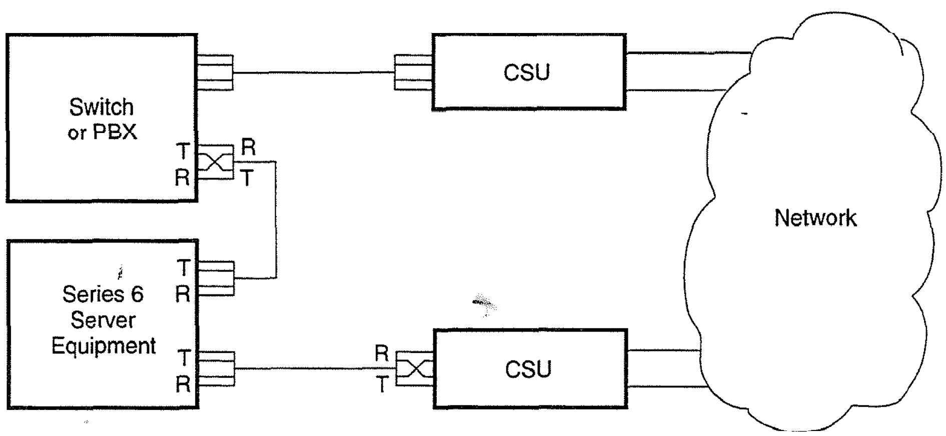
RJ-48C E1 Network Connectors

The El line connectors are ISDN standard 8-pin RJ-48C jacks.

Version -03 cards have interfaces for unbalanced trunks (carried over coaxial cable). These interfaces require the use of an RJ-48C-to-BNC "pigtail" adapter, or the equivalent. Centigram provides a 3-foot/0.9-meter RJ-48C-to-BNC plug adapter cable, P/N 1810-0565-01.

Version –04 cards have interfaces for balanced trunks (carried over twisted pair cable). Centigram provides a 3-foot/0.9-meter cable terminated at both ends in RJ-48C connectors, P/N 191 1-0014-01. This cable can be used to connect to a local digital patch panel.

The connector closer to the "lip" on the end plate of the card is the trunk A interface (Figures 1 and 2) and the second connector is the trunk B interface. When fabricating interface cables, the Series 6 server transmit connections go to the receive connections on the switch, PBX, and CSU equipment (Figure 3). Similarly, the switch, PBX, and CSU equipment transmit connections go to the Series 6 server receive connections. Table 4 lists the connector pin assignments.



Note: Turn over Tip and Ring between Series 6 Server Equipment and switch, PBX, and CSU.

1892vm60

Figure 3 Tip and Ring Reversal between Series 6 Server Equipment and Switch / PBX and CSU

Table **4** Network Connector Pin Assignments

	Function	
Pin	PBX / Switch / Network	Series 6 Server
1	TxD	RxD
2	TxD	RxD
3	Not Used	Not Used
4	RxD	TxD
5	RxD	TxD
6	Not Used	Not Used
7	Not Used	Not Used
8	Not Used	Not Used

Balanced Trunk line **Equalization S2 and S3**

The transmit hybrids on the -04 version card for balanced El trunks pre-condition (that is, equalize) the output signals for transmission over 120-Ohm twisted pair copper cable. The equalizer interface is designed for 0.6 mm (22 AWG) twisted pair cable. Eight-pole switches S2 for El trunk A (the upper connection) and S3 for El trunk B (the lower connection) select the amount of equalization impedance. (Line equalization is not required for unbalanced trunks.)

Table 5 lists switch settings for minimum to maximum equalization. Table 6 lists the switch settings you can expect for 0.6 mm cable with lengths of O-45 meters, 46-137 meters, and 137-200 meters. However, because of the various cable types used in CCITT applications, measure the ringing, reflections, and cross-talk . Then select the switch settings that will optimize the equalization of the cable. Figure 4 shows the equalization network equivalent circuit.

Note: The unbalanced trunk version (-03) of the El card has neither a line equalization circuit nor DIP switches for setting line equalization.

Table 5 Equalization Switch Settings for Balanced Trunks (-04 card versions only)

	None			→			→		→			Max
SW1	On	—		On	—	—	On	—	—	On	—	—
SW2	—	On	—	—	On	—	—	On	—	—	On	—
SW3	—	—	On	—	—	On	—	—	On	—	—	On
SW4	—	—	—	On	On	On	—	—	—	On	On	On
SW5	—	—		—	—	—	On	On	On	On	On	On
SW6	—	—	—	On	On	On	—	—	—	On	On	On
SW7	—	—	—	—	—	—	On	On	On	On	On	On

Table 6 Typical Equalization Switch Settings (-04 Card Versions Only)

Sections for Switch S2 or S3	0-46 m	46-137 m	137-200 m
SW1	On	—	—
SW2	—	On	—
SW3	—	—	On
SW4	—	On	—
SW5	—	—	On
SW6	—	On	—
SW7	—	—	—
SW8	—	—	On

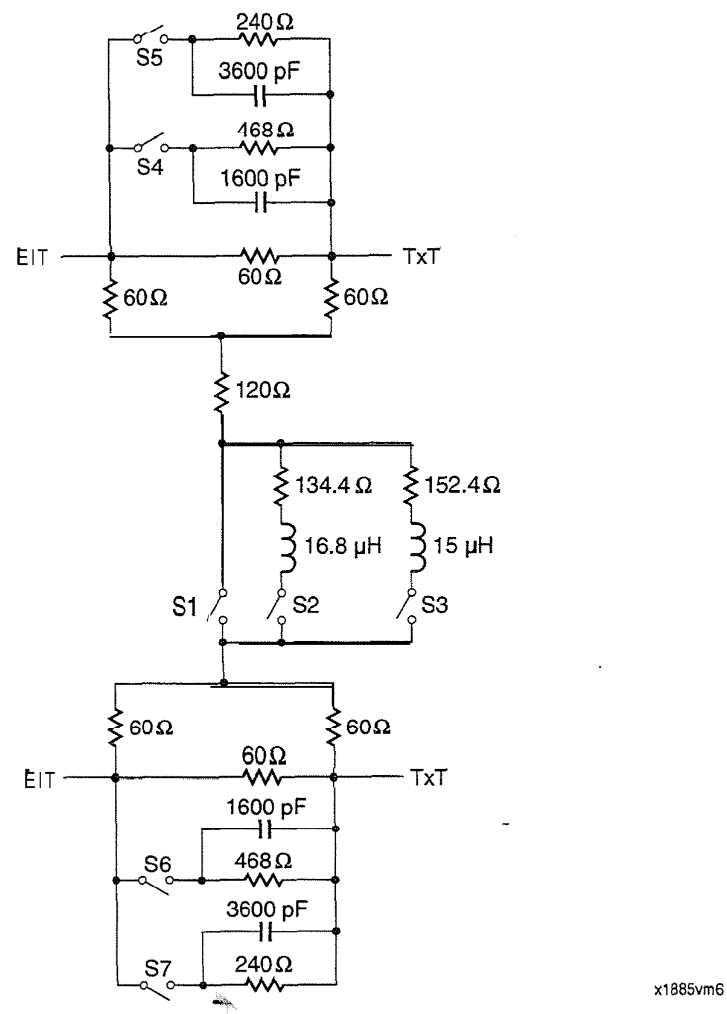


Figure 4 Dual El Digital Trunk Interface -04 Version **Card** Balanced Trunk Equalization Network Equivalent Circuit

IRQ Jumpers and Handset **Co**nneetor

The interrupt request jumpers at P3 and P5 and the handset connectors are not used. As shown on Figures l and 2, these jumpers are not installed.

Pre-Installation Considerations

By convention, the Dual El Digital Trunk Interface card installs in these slots in the Model 70, Model 120, and Model 640 servers:

Card Number	Model 70 Slot Number	Model 1201 Slot Number	Model 120S Slot Number	Model 640 Slot Number
0	3	6	6	9
1	—	—	8	11

The nature of the system AT bus does not require cards to be installed in particular slots. However, the MVIP bus clock signals must be terminated to ensure reliable data transfer across the bus. The above conventional slot assignments for the Dual El Digital Trunk Interface card ensures that the MVIP bus clock signal is properly terminated. This installation arrangement also ensures a standard system configuration to simplify communications with Centigram TAC and field service. A typical digital trunk connectivity configuration has a card equipped with MVIP clock termination jumpers installed at each end of the MVIP bus (Figure 5).

Note: The cards on the ends of the MVIP bus cable must have their MVIP clock termination jumpers installed.

Digital trunk PCM channels correlate directly to analog ports. Line groups are configured for a system connected through digital trunks in the same manner as for analog trunks. The DSP30 line card ports are assigned by the slot number of the related trunk interface card, trunk number, and PCM channels. These assignments are done in triplet using the form xx:yy:zz, where xx is the VoiceMemo module number, **yy** is the slot number trunk card, and **zz** is the channel (port) number. Port numbers begin with 0 on trunk "A" of the lower order trunk interface card and continue in sequence from one trunk to another. For example, trunk "A" on the first trunk interface card is configured as trunk number 0. Given that all PCM channels are used, these channels will number from O-29. The channels on trunk "B" (trunk number 1) continue numbering with 30 through 59, and so forth.

Tip: To ensure fault tolerance, use several digital trunks to share the load of traffic-bearing channels. If available, reserve several channels in each trunk as spares.

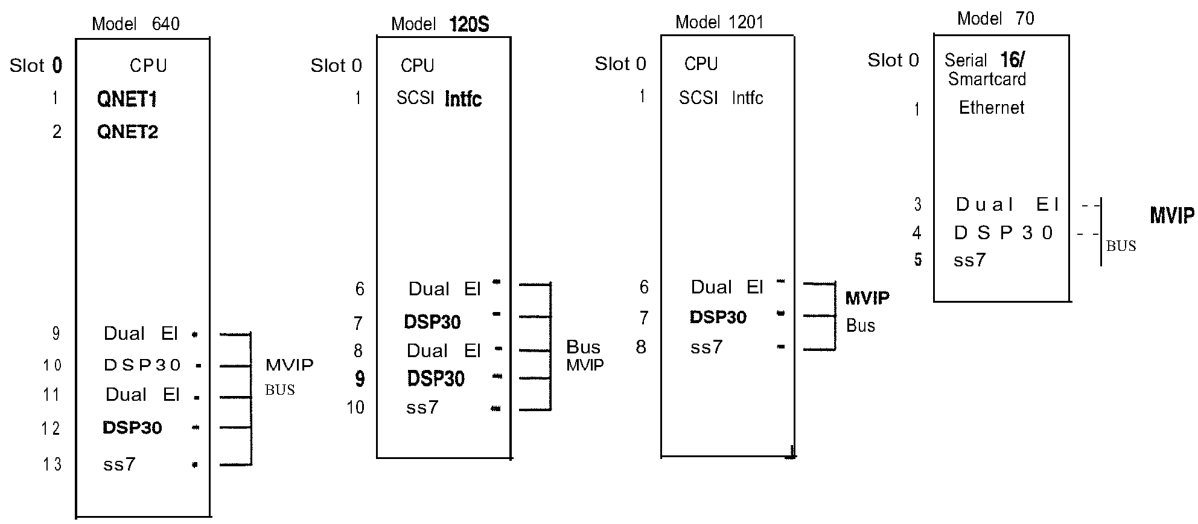


Figure 5 **Typical** System Configurations with **Digital** Connectivity

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's Installation *and Service Manual,*

This card is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to *the Service Card Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements
3. Refer to your server's *Installation and Service* Manual for correct instructions on how to remove and replace cards.

This technical reference provides information for the Ethernet Card used in the Centigram Series 6 Communication server Model 640, Model 120, and Model 70. It provides a brief description of the card, configuration data, installation guidelines, and troubleshooting hints.

1 Introduction

The Ethernet Card (Figure 1) is used with OneView and MESA-Net applications in the Model 640, Model 120, and Model 70.

When using multiple cards, you need to be aware of the Interrupt Request (IRQ) values and input/output (I/O) parameters required by each card However, if you follow the guidelines given in the *Service Card Hardware Configuration Technical Reference* for your specific server, you will minimize problems with conflicts.

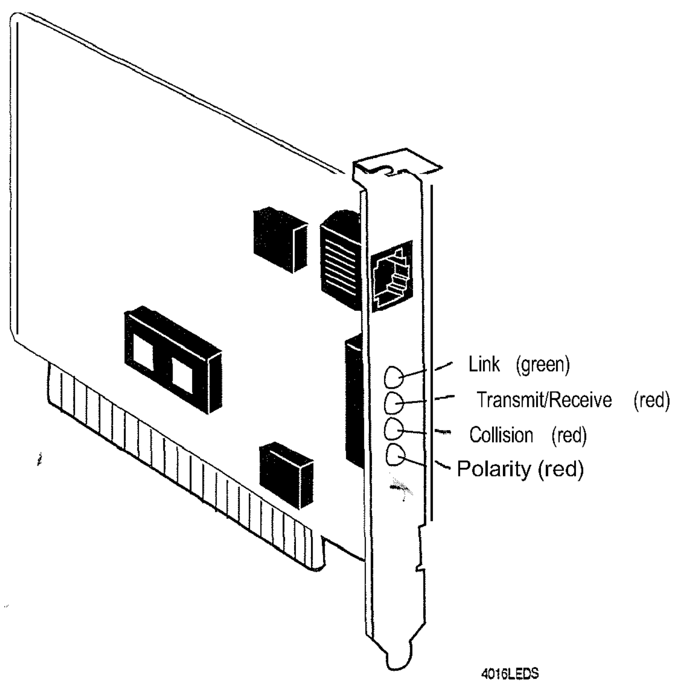


Figure 1 Ethernet Card

Ethernet Hardware

In order to connect your server to an Ethernet network, you need an Ethernet card. You need at least one Ethernet card per server, and you can install up to two cards per module. However, one card can support multiple applications (e.g., MESA-Net and OneView). Therefore, in most cases, only one card per module is needed.

There are three kinds of cabling that can be used in Ethernet networks, *thick, thin,* and *twisted pair.* The Ethernet card provided only supports 1 0BaseT, twisted pair. Twisted pair Ethernet uses unshielded twisted pair cable (AT&T D-inside wire or IBM Type 3), based on IEEE standard 802.3 10BaseT. The cable is two sets of twisted wire pairs, with a gauge of 22, 24, or 26. All three standards have a data rate of 10 megabits per second.

The Ethernet card provided with the Unified TCP/IP software option has a twisted-pair connector (an RJ-45 connector) for 10BaseT wiring. If you have thin or thick Ethernet cabling, you must purchase a transceiver to interface between your cabling and the Ethernet card's RJ45 connector. These transceivers are available through many vendors.

Hardware Limitations

The Ethernet (03) card cannot coexist with the following card because of interrupt conflicts:

- Serial Smartcard

Do not include an Ethernet card in the same module with the above card.

2 Configuration Data

The Ethernet cards are pre-programmed and pre-configured at the Centigram factory. The information in this section is provided to enable you to check the configuration of spare cards. There are two types of spares, the -01 and the -03; they are not interchangeable. Also, two cards of the same type cannot coexist in the same module. When adding a second card, make sure that it is of a different type.

Figure 2 shows the jumper configuration set at the Centigram factory.

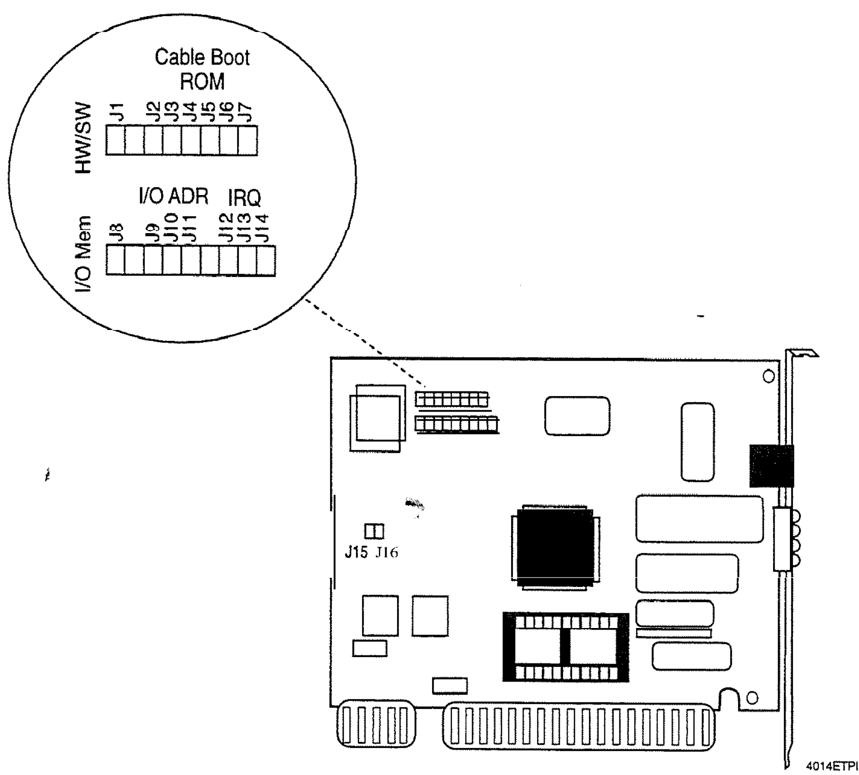


Figure 2 Ethernet Card Jumpers

Card Types

There are two Ethernet cards available: Ethernet (1) and Ethernet (3). Table 1 lists the IRQ values and I/O parameters required by both Ethernet cards. The number in parentheses is the card configuration number, which is identified in the *Service Card Hardware* Configuration Technical Reference.

Table 1 Ethernet Card—Configuration Parameters

Parameter	Ethernet (1) (2410-0208-01)	Ethernet (3) (2410-0208-03)
I/O Address	280h-29Fh	360h-37Fh
Interrupt	10	15
Memory	Not used	Not used
DMA	Not used	Not used
I/O Address Conflicts	FAX4 (13) FAX8 (7)	Parallel Port 1 (All CPUs)
Interrupt Conflicts	None	Smartcard (3)

Jumper Configuration

Table 2 lists the jumper configuration required by Ethernet cards.

Table 2 Ethernet Cards-Required Configuration

TYPE	LOCATION	JUMPER/NO JUMPER	SETTING
Hardware/Software	J 1	"SW" jumper	SW
Cable Type	J2, J3	J2 no jumper J3 no jumper	Unshielded twisted pair (UTP)
Boot PROM Address	J5, J6	J5 no jumper J6 jumper	DOOOH
Boot PROM Select	J7	J7 no jumper	Off
Mode Selection	J8	J8 no jumper	I/0
I/O Address	J9, J10, J11		
Ethernet (1)		J9 & J10 jumper	280
Ethernet (3)		J9, J10, & J11 jumper	360
IRQ	J12, J13, J14		
Ethernet (1)		J14 only	10
Ethernet (3)		J12, J13, &J14	15
8/16 bit selection	J15, J16	J15 jumper J 16 no jumper	16 bit

Network Connections

The Ethernet card has an RJ-45 port which allows connection to unshielded twisted-pair (10BaseT) Ethernet wiring (Figure 3). Insert the RJ-45 plug into the RJ-45 port on the Ethernet card. The other end of the wire should be connected to a pre-wired wall jack or a concentrator or hub on your network.

Verify the connection by powering on both the server and the concentrator or hub. Look for the green Link Integrity LED on the Ethernet card; it should be lit if the connection is good. The corresponding light on the concentrator should also be lit.

If the Polarity LED is lit, then the automatic polarity correction feature is working, and the signal polarity is reversed. (This means the wiring had inverse polarity to begin with.)

The Transmit/Receive LED is lit when the card is transmitting or receiving data across the network. The Collision Detection LED lights when collisions are detected on the network. Large numbers of collisions can indicate a network problem or excessive traffic.

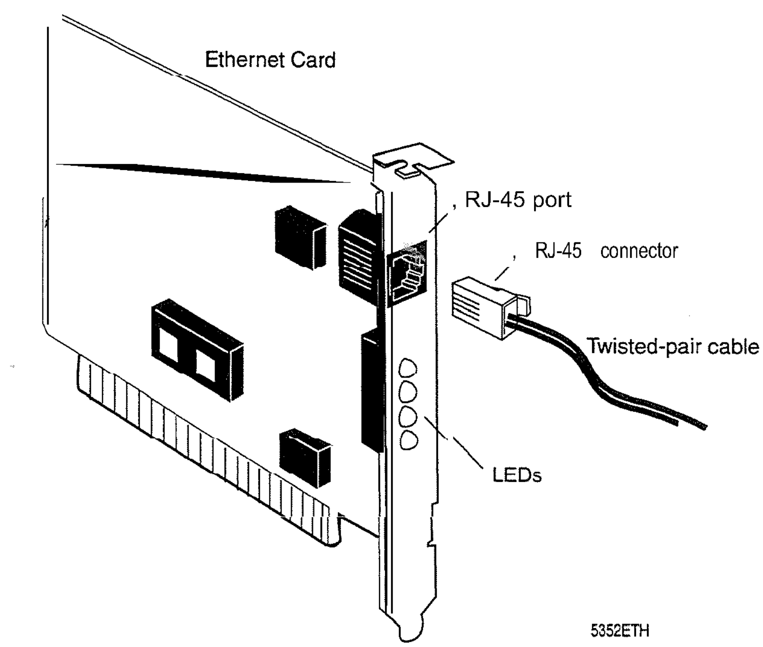


Figure 3 Ethernet Network Connections

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's Installation *and Service Manual.*

This card is pre-configured at the Centigram factory, and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to the *Service Card Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements
3. Refer *to* your server's *Installation and Service Manual* for correct instructions on how to remove and replace cards.

4 Troubleshooting Hints

If after the card is installed, it does not function properly, do the following before calling TAC:

- Ensure the card is firmly seated in its slot and that it is receiving power,
- Ask the LAN administrator verify that the circuit is active and the address is valid.
- Check the wiring connection to both the card and the wall jack or concentrator.
- Check that your card is configured for an RJ-45 connector.
- Ensure that the wiring is within the range allowed. Unshielded twisted-pair (UTP)cable must follow IEEE 802.3 10BaseT standards. The cable must be 105 ohm, AT&T D-inside wire (DWI & PDS) or IBM Type 3 twisted pair wire of 22, 24, or 26 gauge. The maximum length between a node (such as your server) and the concentrator is 100 meters, or 325 feet. Existing phone wiring is acceptable if it meets the above standards and has two pairs of wires as Table 3 shows.
- Check that the cable connecting the Ethernet card to a wall jack or concentrator is eight-conductor (4 pair) wire, of the same type used throughout the network. It should be wired as Table 4 shows.

Table 3 Acceptable Phone Wiring

RJ-45 Pin Number	Wire Number	Function
1	1 (pair A)	TX+
2	2 (pair A)	TX-
3	3 (pair B)	RX+
6	6 (pair B)	RX-

Table 4 Wall-Connecting Cable

RJ-45 Pin Number	Wire Number
1	1 (pair A)
2	2 (pair A)
3	3 (pair B)
6	6 (pair B)
4	4 (pair C)
5	5 (pair C)
7	7 (pair D)
8	8 (pair D)

- Check that the green Link LED is lit. If it is not lit, check cabling of other computers connected to the same concentrator. If none are lit, verify that the cables and hub are operational.

- Check the red Collision LED. If it is solid red or red most of the time, excessive collisions are occurring on the network. Solid red can also indicate an incorrect cable type configuration; check the jumper settings.

- Test the connection with ping. Refer to your TCP/IP or MESA-Net manual for details.

Serial 16/32 Card
Technical Reference

This technical reference provides information for the Serial 16/32 Card used in the Centigram Series 6 Communication server Model 640 and Model 120. It provides a brief description of the card, configuration data, and installation guidelines.

1 Introduction

The Serial 16/32 high-speed serial interface (Figure 1) provides a server with multiple simultaneous serial connections for uses such as PBX integrations, host computer communications, and MESA-Net networking. Each Serial 16/32 can support up to 32 asynchronous serial connections with speeds up to 38.4 kbps on each port.

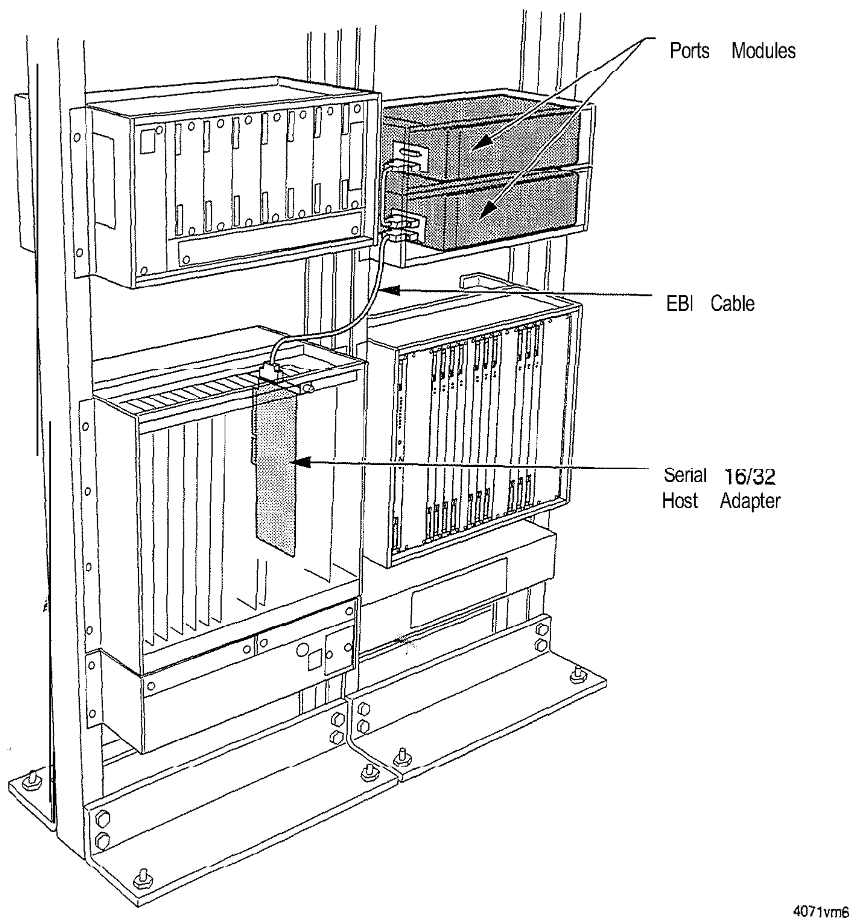


Figure 1 Serial 16/32 Components

The Serial 16/32 serial interface consists of a host adapter card (part number 24 1 O-O 179-02) that plugs into a backplane slot in the server and one or two S 16/32-CHANNEL 1 6/cm external ports module boxes (part number 2800-00 17-O 1). The Serial 16/32 host adapter card and the first S16/32-CHANNEL ports module are connected by a 12' External Bus Interface (EBI) cable (part number 18 10-0568-o 1). The optional second S 16/32-CHANNEL ports module is daisy-chained to the first S16/32-CHANNEL ports module with an 18" EBI cable (part number 1810-0567-01). Figure 1 shows the components in the Model 640.

At the heart of the Serial 16/32 host adapter is a 32-bit 20 MHz 305 1 RISC processor. The card has 256 K of dual-ported high-speed RAM used for program code and data buffering.

Each S 16/32-CHANNEL ports module has 16 DB-25P connectors at the physical interface. A basic setup requires only one S16/32-CHANNEL ports module, but two S16/32-CHANNEL ports modules can be daisy-chained together for a total of 32 ports. Full modem control, including both hardware and Xon/Xoff flow control, is supported on all ports.

2 Configuration Data

The Serial 16/32 host adapter has a single set of four DIP switches to set a starting address for the I/O port. For servers, all four switches must be in the ON position to provide a starting port address of 324h (see Figure 2).

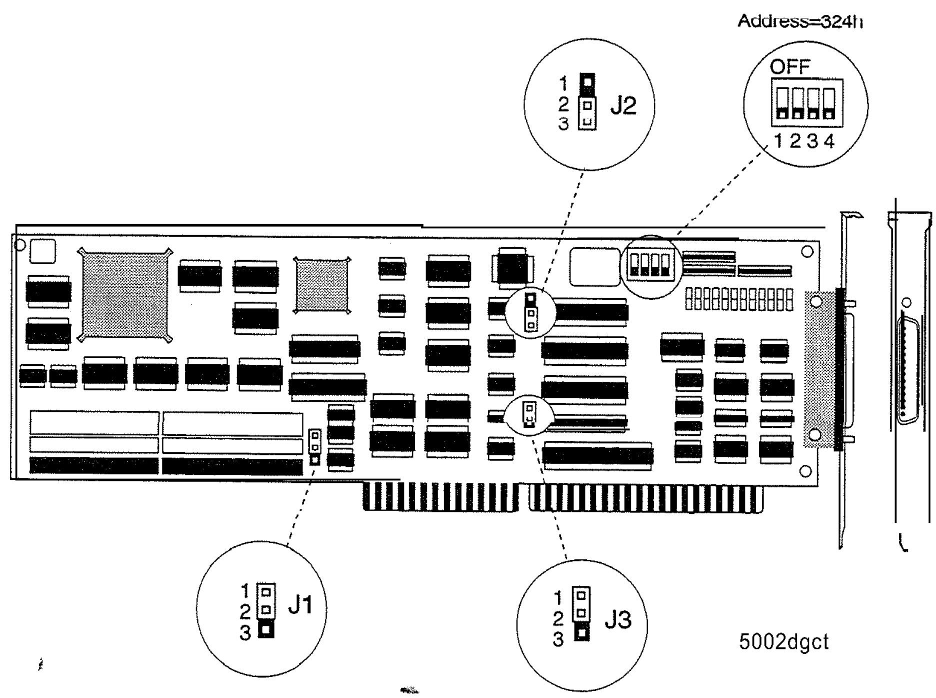


Figure 2 Serial **16/32 Card**

There are three jumpers on the Serial 16/32 card. These jumpers are set as the figure shows.

Serial Interface

The S16/32-CHANNEL ports sixteen asynchronous serial interface ports are provided via sixteen DTE-wired DB-25P connectors located on the rear of the unit. The pin assignments are shown in Table 1.

Table 1 **S16/32-CHANNEL DB-25 Pin Assignments**

Pin	RS-232 Signal	RS-232 Description	V.24 Signal	V.24 Description	Direction
1*	AA	Frame/Chassis Ground (FG)		Frame Ground	n/a
2	BA	Transmitted Data (TxD)	103	Transmitted Data	out
3	BB	Received Data (RxD)	104	Received Data	in
4	CA	Request To Send (RTS)	105	Request To Send	out
5	CB	Clear To Send (CTS)	106	Ready For Sending	in
6	c c	Data Set Ready (DSR)	107	Data Set Ready	in
7	AB	Signal Ground (SG)	102 102a 102b	Signal Ground DTE Com DCE Com	n/a
8	CF	Data Carrier Detect (DCD)	109	Data Channel Received/Line Signal Detector	in
20	DC	Data Terminal Ready (DTR)	108/2	Data Terminal Ready	out
22	CE	Ring Indicator (RI)	125	Calling Indicator	in

*Chassis ground is also available on the connector shell.

The Serial 16/32 serial interface is compatible with both EIA standard EIA-232D and CCITT Recommendation V.24 and V.28. For more information on these interfaces, see the applicable standards.

Cables

To ensure noise immunity, unbalanced serial connections need shielded, low-capacitance cables designed for serial data transmission. CCITT Recommendation V.28 and EIA specification RS-232 give technical data that must be considered for the unbalanced serial connections they specify. As a general rule, cables should not exceed 50 feet in length, assuming an average capacitance of 50 pF/ft.

In situations where low-capacitance cable is unavailable, or very long cable runs are required, use "short-haul" modems to increase the effective range of the interface. Short-haul modems are similar to standard modems, but connect directly to each other by way of a cable rather than through a telephone circuit.

Note: For best results, use externally-powered, short-haul modems.

Grounding

The shield should be grounded at both ends of the cable. Chassis Ground, available on pin 1 or the metal shell of the DB-25 connector, is ideal for this purpose.

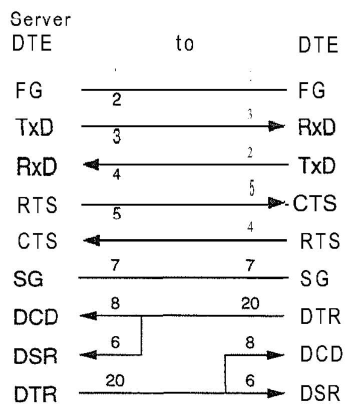
Environment

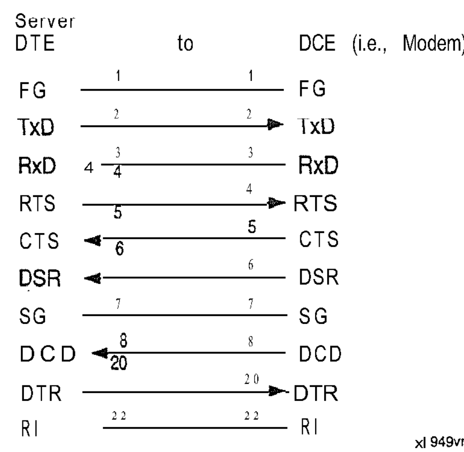
While good shielding provides reasonable protection against "noise" (Electromagnetic Interference, or EMI), route cables away from noise sources wherever possible. Avoid laying cables in close proximity to transformers, generators, motors, fluorescent lights, or other noise sources.

Cable Configurations

Some common cable configurations for use with the Serial 16/32 are shown below (the Serial 16/32 pinouts are listed on the left).

Full Null Modem

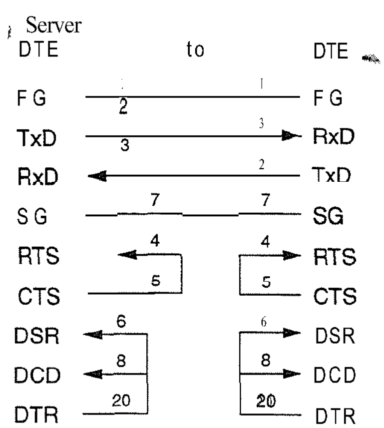




xl 949vm6

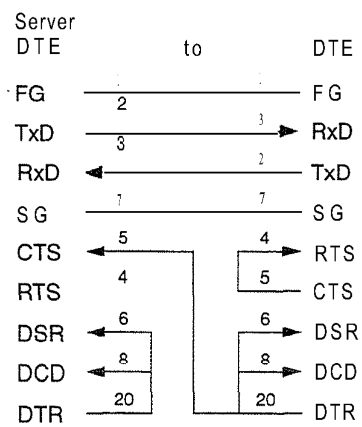
Three-Wire Null Modem

Note: Use for terminals or where XON/XOFF is implemented.



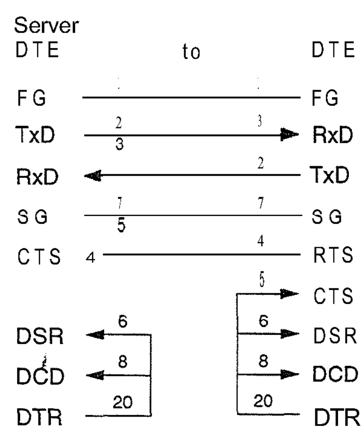
x1950vm6

Four-Wire Null Modem With DTR Handshaking



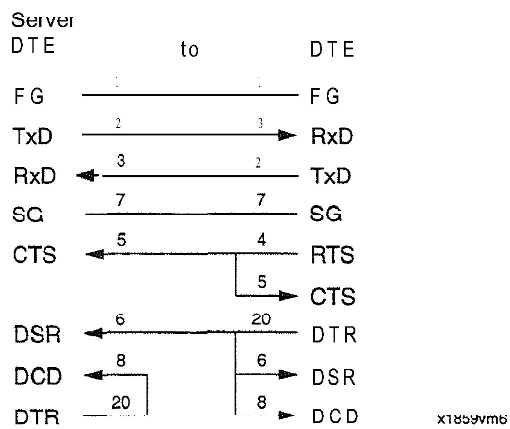
x1857vm6

Four-Wire Null Modem With RTS Handshaking

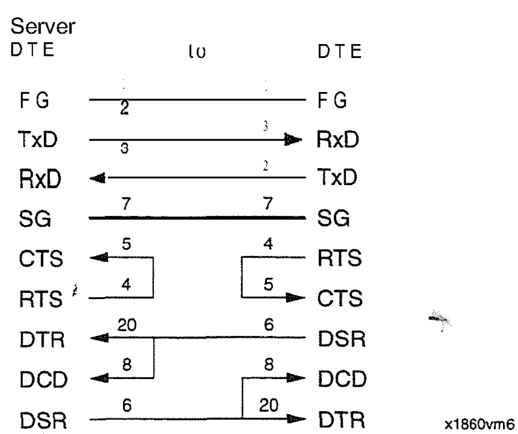


x1858vm6

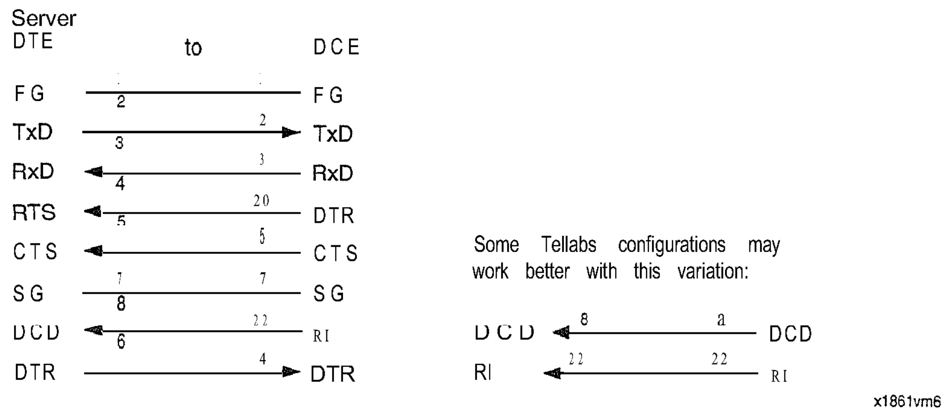
Five-Wire Null Modem With RTS Handshaking



Symmetrical Wiring for DTE to DTE



Serial 16/32 to Tellabs 340



3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's Installation *and Service Manual.*

This card is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to *the Service Card Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements
3. Refer to your server's *Installation and Service Manual* for correct instructions on how to remove and replace cards.

This technical reference provides information for the Serial Smartcard used in the Centigram Series 6 Communication server Model 120 and Model 70. It provides a brief description of the card, configuration data, and installation guidelines.

1 Introduction

2 Configuration Data

3 Installation Guidelines

1 Introduction

The Smartcard serial interface provides a server with multiple simultaneous serial connections for uses such as PBX integrations, host computer communications, and MESA-Net networking. The Smartcard comes in three configurations: eight ports, four ports, and two ports. In all configurations, the card is compatible with both EIA RS-232-C and CCITT V.24 and V.28 asynchronous communications standard, and can support bit rates up to 38.4 Kbps. A Model 70/120 server can support one Smartcard in any configuration. Model 640 dues not support the Smartcard.

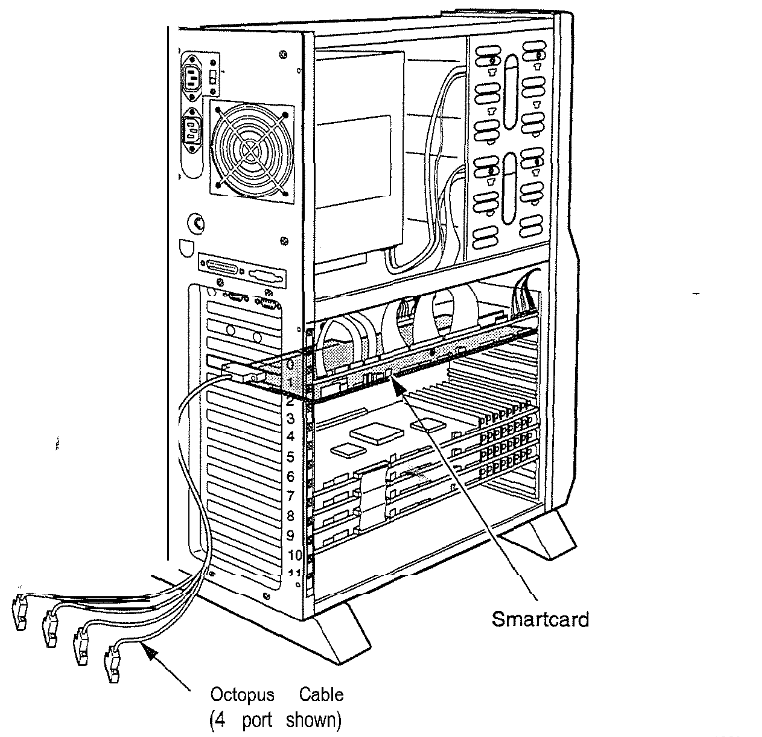


Figure 1 Smartcard Components

All Smartcard serial interfaces consist of a circuit card that plugs into a backplane slot in the server and one or two cables (sometimes called “octopus cables”) that provide DB-25P connectors for connection to external devices, as shown in Figure 1. Table 1 lists the part numbers for ail Smartcards and the accompanying cables.

Table 1 Smartcard Part Numbers

Smartcard	Part Number	Cable
2 Port	2490-0095-02	1810-061 1-01
4 Port	2490-0006-02	1820-00 1 0-00
8 Port	2490-0007-02	1820-0011-00

2 Configuration Data

Release 6.0 supports one Smarcard on Model 120 and Model 70, but not on Model 640. For servers, both the software interrupt (J1 and J2) and the I/O port address (SW1) must be set; the base address (SW2) remains the same. The configuration parameters of the Smartcard (3) are as follows:

I/O Address	320 -323h
Base Address:	DO000 - DFFFFh
Interrupt:	IRQ 15

All Smartcard cards have jumpers and switches for setting a software interrupt, an I/O port address, and a starting base address (see Figure 2 for details). Table 2 gives the switch settings for Smartcard (3).

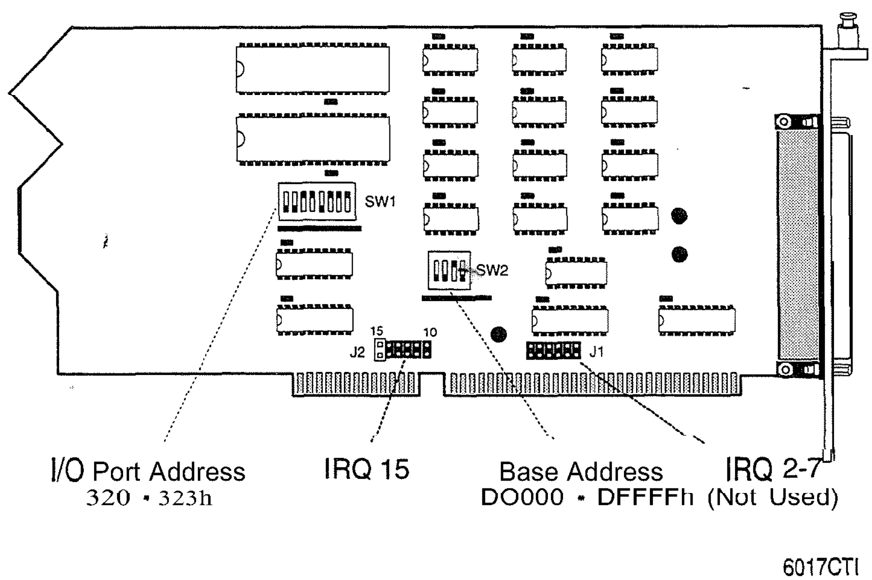


Figure 2 Smartcard (3) Configuration Settings

Table 2 Smartcard (3) Jumper and Switch Settings

Server Model	Backplane Slot	J1 Setting	J2 Setting	SW1								SW2			
				1	2	3	4	5	6	7	8	1	2	3	4
70	See TR 1920	none	15	off	off	on	on	off	on	on	on	off	off	on	off
120	See TR 1902	none	15	off	off	on	on	off	on	on	on	off	off	on	off

Serial Interface

The Smartcards' asynchronous serial ports are provided via cables terminated in DTE-wired DB-25P connectors that carry seven signals. The pin assignments are shown in Table 3.

Table 3 Smartcard **DB-25 Pin Assignments**

Pin	RS-232 Signal	RS-232 Description	V.24 Signal	V.24 Description	Direction
2	BA	Transmitted Data (TxD)	103	Transmitted Data	out
3	BB	Received Data (RxD)	104	Received Data	in
4	CA	Request To Send (RTS)	105	Request To Send	out
5	CB	Clear To Send (CTS)	106	Ready For Sending	in
7	AB	Signal Ground (SG)	102 102a 102b	Signal Ground DTE Corn DCE Corn	n/a
8	CF	Data Carrier Detect (DCD)	109	Data Channel Received/Line Signal Detector	in
20	DC	Data Terminal Ready (DTR)	108/2	Data Terminal Ready	out

The Smartcard serial interface is compatible with both EIA standard EIA-232-C and CCITT Recommendation V.24 and V.28. For more information on these interfaces, see the applicable standards.

Cables

To ensure noise immunity, unbalanced serial connections need shielded, low-capacitance cables designed for serial data transmission. CCITT Recommendation V.28 and EIA specification RS-232 give technical data that must be considered for the unbalanced serial connections they specify. As a general rule, cables should not exceed 50 feet in length, assuming an average capacitance of 50 pF/ft.

In situations where low-capacitance cable is unavailable, or very long cable runs are required, use "short-haul" modems to increase the effective range of the interface. Short-haul modems are similar to standard modems, but connect directly to each other by way of a cable rather than through a telephone circuit.

Note: For best results, use externally-powered, short-haul modems.

Grounding

Pin 7 on all Smartcard cables provides Signal Ground. Pin 1 is not used; there is no frame or chassis ground.

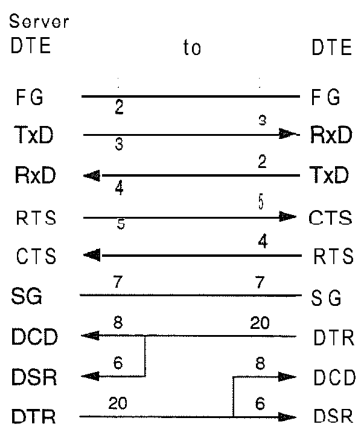
Environment

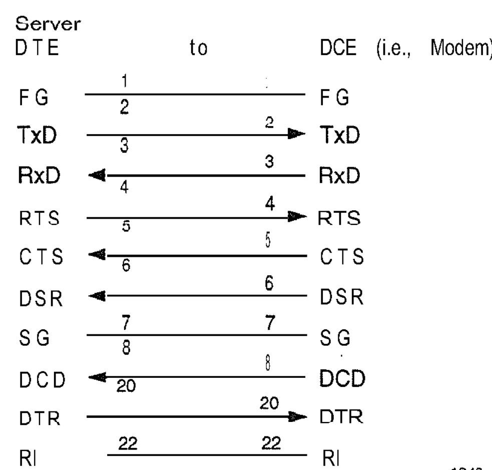
While good shielding provides reasonable protection against "noise" (Electromagnetic Interference, or EMI), route cables away from noise sources wherever possible. Avoid laying cables in close proximity to transformers, generators, motors, fluorescent lights, or other noise sources.

Cable Configurations

Some common cable configurations for use with the Smartcard are shown below (the Smartcard pinouts are listed on the left).

Full Null Modem

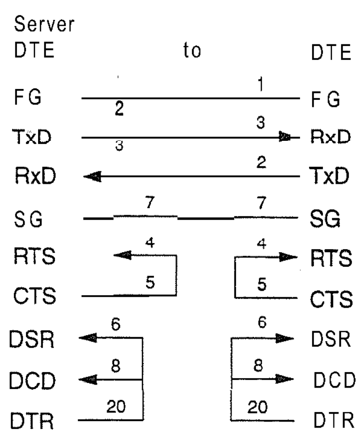




x1949vm6

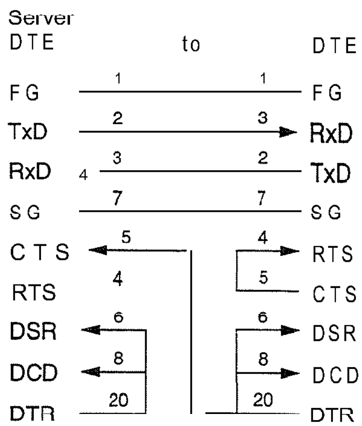
Three-Wire Null Modem

Note: Use for terminals or where XON/XOFF is implemented.



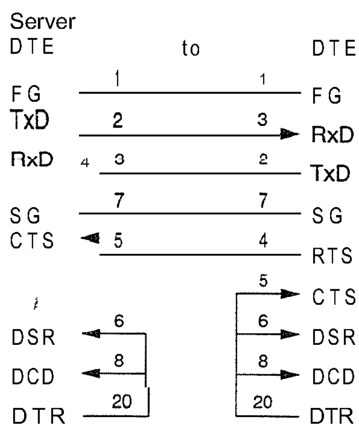
x1950vm6

Four-Wire Null Modem With DTR Handshaking



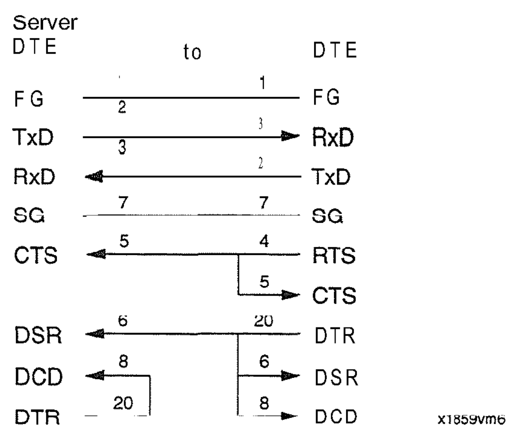
x1857vm6

Four-Wire **Null** Modem With RTS **Handshaking**

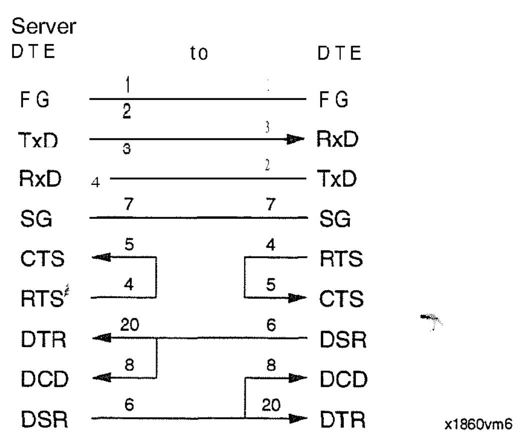


x1858vm6

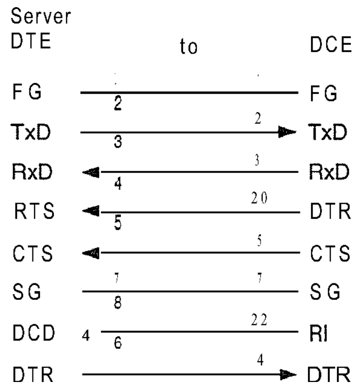
Five-Wire Null Modem With RTS Handshaking



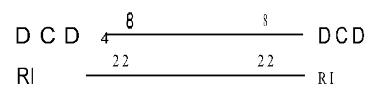
Symmetrical Wiring for DTE to DTE



Smartcard to Tellabs 340



Some Tellabs configurations may work better with this variation:



x1861vm6

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's *Installation and Service Manual.*

This card is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to the *Service Card Hardware Configuration Technical Reference* for your specific server. That section provides:
    - An overview of your server
    - A description of your server's architecture
    - Card configuration and installation guidelines
    - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
    - Jumper and switch setting information specific to your card
    - If applicable, interface requirements
3. Refer to your server's *Installation and Service Manual* for correct instructions on how to remove and replace cards.

SS7 Signal Processing Card Technical Reference

This document provides information for the SS7 Signal Processing card used in the Series 6 Communications servers. It provides a brief description of the card, configuration data, and installation guidelines. The card can be used in the Model 70, Model 120, and Model 640 servers.

1 Introduction

2 Configuration Data

3 Installation Guidelines

1 Introduction

The Signaling System 7 Signal Processing card (P/N 2410–0195–04), shown in Figure 1, provides message transfer capabilities for two SS7 links. In the 6.0A release of the VoiceMemo application, the SS7 card is used in conjunction with the Dual El Digital Trunk Interface card and the DSP 30 cards to provide connectivity to CCITT El digital trunk.

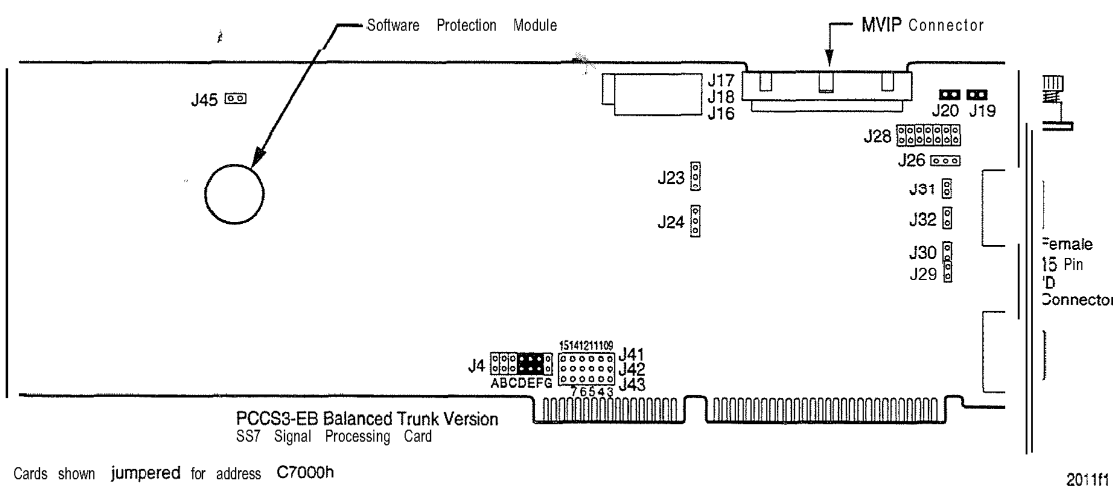
Though the card is equipped with a CEPT interface (an RJ-14), this interface is not used in Series 6 servers.

CAUTION!

The SS7 Signal Processing card can be permanently damaged by electrostatic discharge. Always wear a wrist grounding strap properly connected to frame ground whenever handling the card. Lay the card on an anti-static surface whenever moving jumpers.

CAUTION!

Do not change any jumpers on the SS7 Signal Processing card other than described below without being advised by Centigram TAC.



P/N 2410—0195—04

Figure 1 **SS7 Signal Processing Card**

2 Configuration Data

The SS7 Signal Processing card has the option jumper settings shown in Figure 1. When replacing this card, set the jumpers on the replacement card to match those of the card being removed from the Series 6 server module.

Address Jumpers

One SS7 Signal Processing card can be installed in each Model 640 Series 6 server module. The card occupies CPU memory address space rather than residing at an I/O address. The base address begins at C7000h. Only the board Base address jumper J4 sets the address (Table 1).

Table 1 Board Base Address - Jumper **J4**

Card Number	Address	A	B	C	D	E	F	G
Line Group l-Card 1	C7000	Off	Off	off	on	on	on	off

MVIP Termination Jumpers J19 and J20

Connectors J19 and J20, when jumpers are in place, terminate the MVIP clock. The MVIP (Multi-Vendor Integration Protocol) connector is a direct card-to-card bus used by the Dual El, SS7 Signal Processor, DSP30, LC8, and fax cards to communicate. MVIP clock signals C2 and C4 must be terminated on the SS7 Signal Processor card if it is the last card on the MVIP bus. If the card is not the last on the MVIP bus, do not terminate the MVIP clock signals.

Jumpers J17 and J18 cross-connect the MVIP bus DSo and DSi data streams to the MVIP header on the card. These are factory configured to connect DSo0–DSo3 to IO-13 and to connect DSi0–DSi3 to 00-03. Do not change the position of these jumpers.

Unused Jumpers

Jumper J23, J24, J26, J28—J32, J41—43, and J45 are unused and should not have jumper links installed.

Network Interfaces

The SS7 Signal Processing card is designed as a combined protocol conversion and trunk interface card. Because the Model 70, Model 120, and Model 640 servers use dedicated Dual El Digital Trunk Interface cards, the network interfaces on the SS7 Signal Processing card are unused.

Equalization Switch Settings

The Model PCCS3-EB SS7 card has DIP switches for setting trunk line equalization. Because the network interfaces on the SS7 Signal Processing card are unused, the jumpers on this card are likewise unused.

Pre-Installation Considerations

By convention, the SS7 Signal Processing card installs in these slots in the Model 70, Model 120, and Model 640 platforms:

Model 70 Slot Number	Model 120I Slot Number	Model 120S Slot Number	Model 640 Slot Number
5	8	10	13

The nature of the system AT bus does not require cards to be installed in particular slots; however, by convention, the SS7 Signal Processing card has a specific slot assignment in each Series 6 server platform. This slot assignment ensures a consistent arrangement of adapter cards installed in the Series 6 server. This installation arrangement also ensures a standard system configuration to simplify communications with Centigram TAC and field service. A typical digital trunk connectivity configuration has a card equipped with MVIP clock termination jumpers installed at each end of the MVIP bus (Figure 2). In the case of an SS7 integration, the SS7 Signal Processing card is at one end of the bus.

Note: The last card on the MVIP bus cable must have its MVIP clock termination jumpers installed.

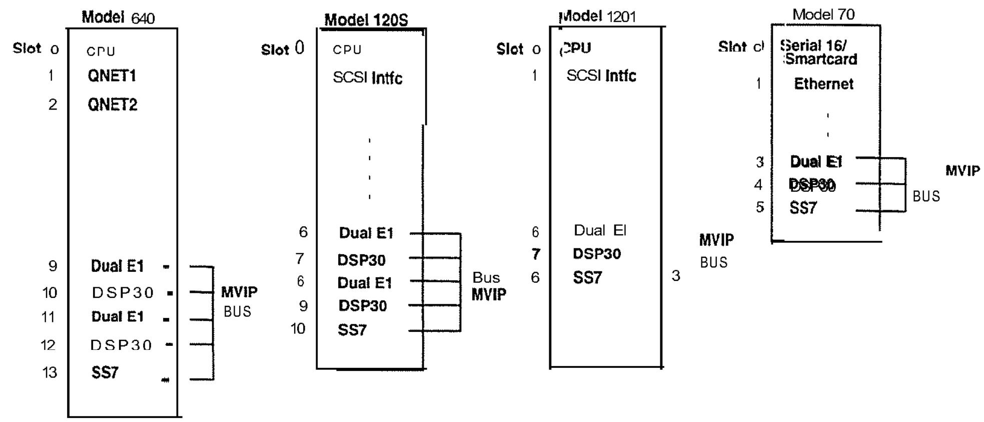


Figure 2 Typical Configurations With Digital Connectivity

Spare Cards Protection Module

The SS7 Signal Processing Card with software Version 4.00 and later will not work in your system without a software protection module (Figure 1). The module (which looks like a battery), is matched to the software in your system. The software module is factory-installed and must stay with the working card in your server.

Spare cards do not have protection modules. When you replace an SS7 Signal Processing Card with a spare, reuse the module from the working card and return the replaced module without the software protection module.

The software protection module is secured by a clip on the card. Simply slip the software protection module from the clip on the card you are replacing and put it into the clip on the spare card.

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's Installation and Service *Manual.*

This card is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to *the Service Card Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements
3. Refer to your server's *Installation and Service Manual* for correct instructions on how to remove and replace cards.

This technical reference provides information for the Power Configuration Card used in the Centigram Series 6 Communications server Model 640, Model 120, and Model 70. It provides a brief description of the card and field service procedures.

1 Introduction

2 Configuration Data

3 Installation Guidelines

1 Introduction

The Power Configuration (Figure 1) provides these two essential functions for the LC8 card:

- DC voltage (-48 volts) for LC8s supplied with DID, E&M, and Ground start SIPS
- Configuration to select DID, E&M, and Ground Start

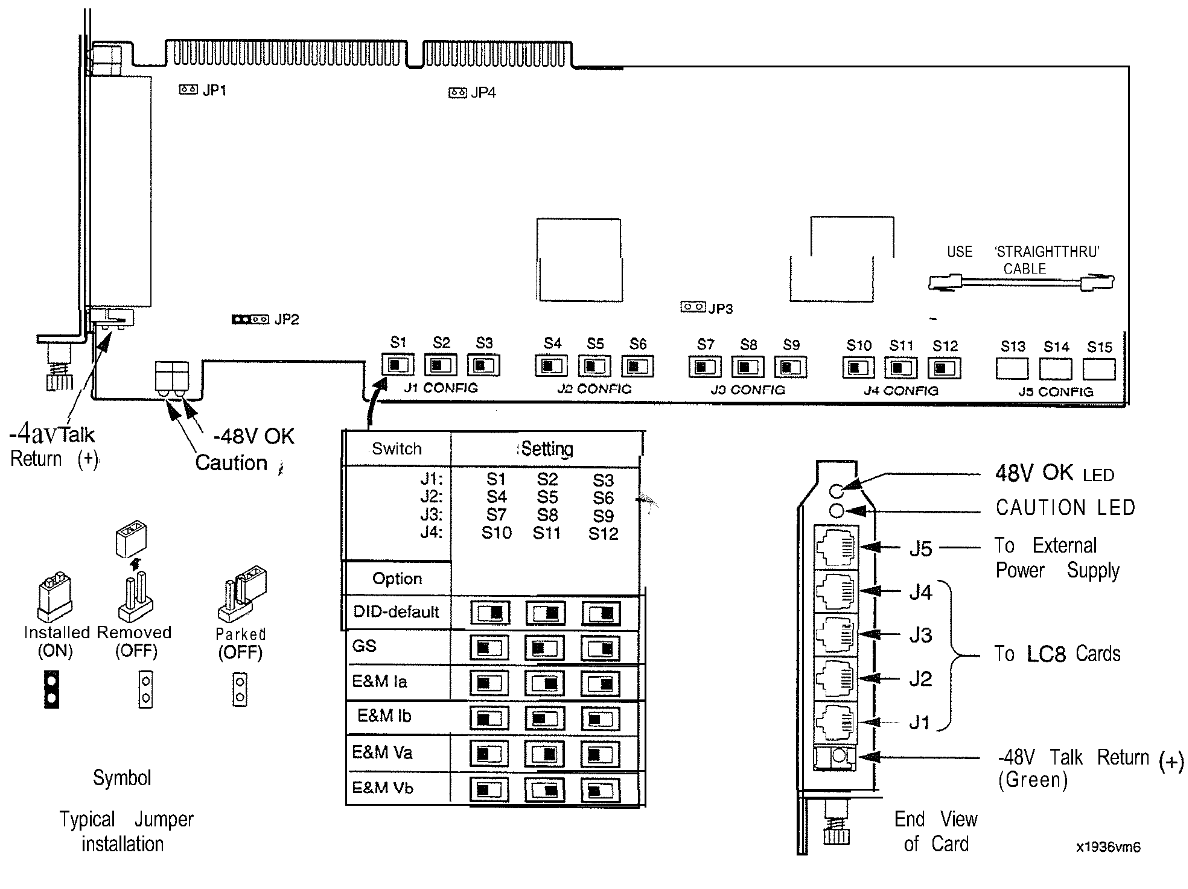


Figure 1 Power **Configuration Card**

2 Configuration Data

CAUTION!

To keep signal noise to a minimum, install the card's bracket tightly.

The Power Configuration card is required only with LC8/LC4 cards, which are using DID, E&M, or Ground Start configurations. The Power Configuration card supplies the required -48V to the line cards. One card configures up to four line cards.

There must be a -4SV talk return path for all Ground Start and E&M trunks. This is accomplished by connecting the PBX's -48V talk return or appropriate telephone line ground reference as indicated in the PBX's installation instructions, .to the -48V talk return on the Centigram server.

On all servers, 48V talk return is connected as follows:

- Model 70/120: Connect -48V talk return (green terminal on card's bracket) for each Power Configuration card to the equivalent point on the switching system. Use 16-1 8 AWG insulated wire.
- Model 640: Connect -48V talk return ('TR' terminal on the rear of the power supply) on each module with E&M and/or Ground Start to the equivalent terminal or ground window bar for the switching system. Use 16-1 8 AWG insulated wire. See Tech. Ref. 1900.

Note: The above connections are required for ground start and E & M lines, but are optional for DID lines.

By using the -48V talk return exclusively, Ground Start, E&M and DID signals are prevented from using the chassis or frame grounds. Chassis and frame grounds may be noisy and may also contain problems associated with ground loops, so connection of the -48V talk return to chassis or frames is not recommended.

You can set JP2 on the Power Configuration card On to connect the -48V talk return to its own chassis or logic ground points. Usually JP2 is left parked, so there is no connection from the -48V talk return to chassis or logic ground.

The -48V talk return voltage must not be allowed to "float" above the Centigram system's chassis or logic ground by more than 5 volts (measure the AC and DC voltages between the -48V talk return and chassis ground and between the -48V talk return and logic ground). If it does, then the equipment grounding must be assessed and fixed. If the problem cannot be fixed, a compromise measure is to set JP2 to On so -48V talk return is connected to Chassis Ground or Logic Ground.

Note: Using a jumper across pins 1 and 2 of JP2 without connecting TERM 1 (or TR) as described above is not recommended.

Jumper Settings

The card should have the jumper configuration given in Table 1.

Table 1 Jumper Settings

Jumper Name	Jumper Function	Default
JP1	Logic Gnd./Chassis Gnd	No Jumper
JP2	Logic Gnd/-48 talk return/Chassis Gnd	Park (one pin only)
JP4	-48V from B5	No Jumper

LED's

The Power Configuration card has two LED indicators; one red, one green. Table 2 shows their function. The LED functions only apply to the Model 120 and Model 70 servers.

Table 2 **Card's** LED's

Red LED	Green LED	Meaning	Action Required
OFF	OFF	Card is not receiving -48V power.	If appropriate, turn power on.
ON	OFF	CAUTION: -48V power is present on Power Configuration card but not on LC8 cards	Turn off external power supply if servicing hardware. (Model 70/120)
OFF	ON	Card is receiving -48V power. Normal operating state.	None
ON	ON	Fault.	Re-check wiring and if necessary, replace card.

Switch Settings

CAUTION!

Never change switches with the power on.

There are four switch groups with three switches each (Sl-S3, S4-S6, S7-S9, S10-S12). They control the settings of LC8 cards connected to connectors J 1 through J4. (See Figure 2.) Each switch group can be set independently to any valid setting. For example, Sl-S3 can be set to DID, while S4-S6 can be set to E&M. Before changing switch settings, ensure that the LC8 card has the correct hybrids to support the new switch settings. (See TR 1901.)

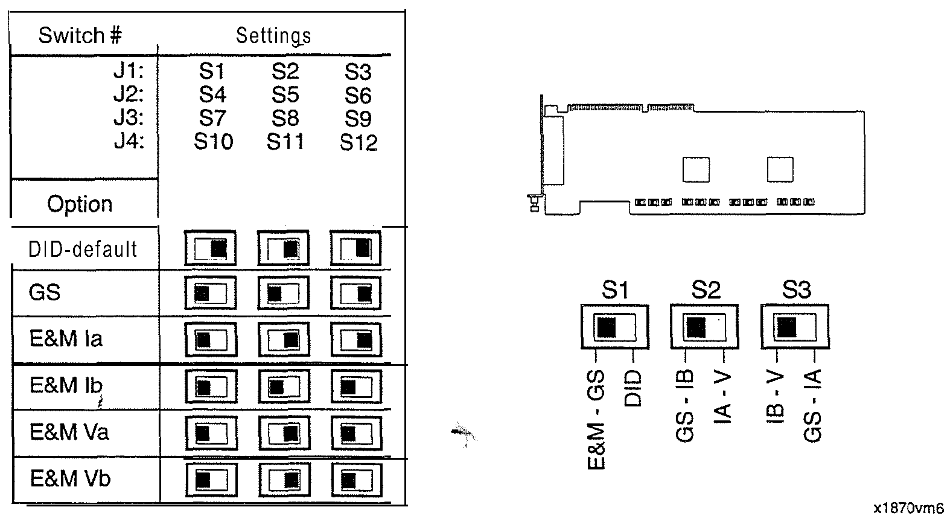


Figure 2 Configuration Switches **Detail**

Power Configuration Card Connections

CAUTION!

Never use a reverse modular cord to connect LC8 cards to the Power Configuration card or a patch panel.

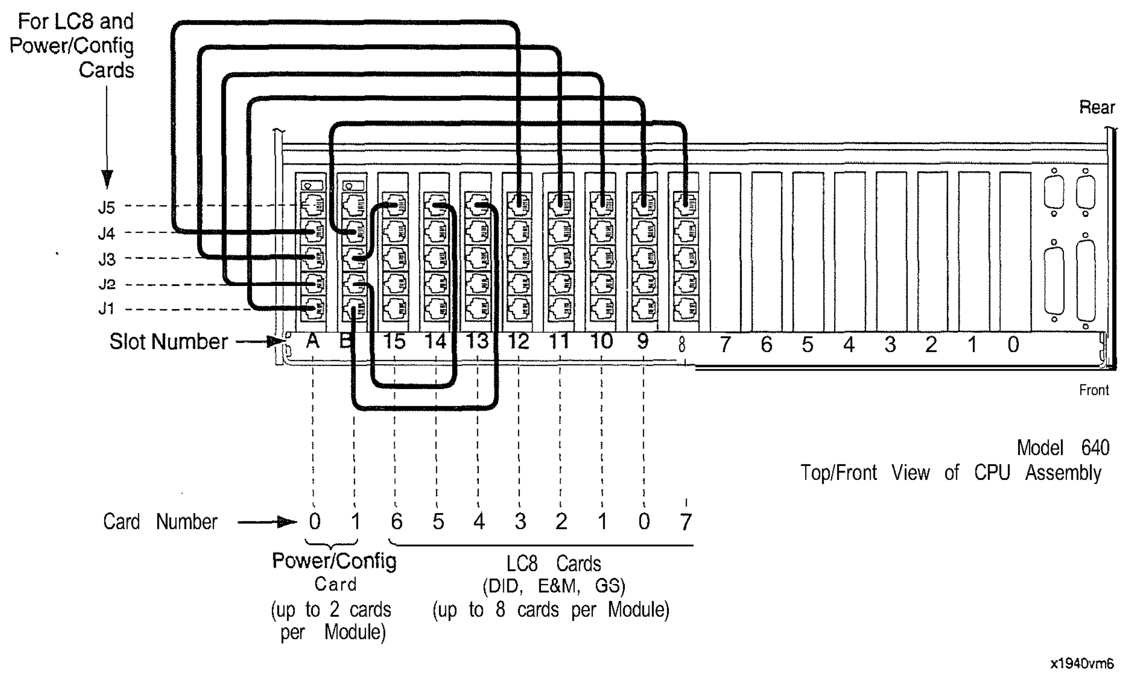
Connections between LC8 cards and the Power Configuration card are made via connectors
J1 through J4. These are explained in Table 3 for all servers.

Table 3 Power Configuration **Card--Cable Connections**

Config. Card	From Config. Card (J1--J5) (All Models)	To LC8 Card (J5) (Model 640)	To LC8 Card (J5) (Model 120/70)
Number 0	J1	LC8-0 (J5)	LC8-0 (J5)
	J2	LC8-1 (J5)	LC8-1 (J5)
	J3	LC8-2 (J5)	LC8-2 (J5)
	J4	LC8-3 (J5)	LC8-3 (J5)
	J5	Not Used	External -48 V Power Supply
Number 1	J1	LC8-4 (J5)	LC8-4 (J5)
	J2	LC8-5 (J5)	LC8-5 (J5)
	J3	LC8-6 (J5)	LC8-6 (J5)
	J4	LC8-7 (J5)	LC8-7 (J5)
	J5	Not Used	External -48 V Power Supply

Connections in Model 640 Systems

Figure 3 shows the connections between a Power Configuration card and LC8 cards in a Model 640.



Fig&e 3 Card Connections--Model 640

Connections in Model 120 Systems

Figure 4 shows the connections between a Power Configuration card and LC8 cards in a Model 120S. The Model 1201 is similar except it may have four line cards and one Power Configuration card.

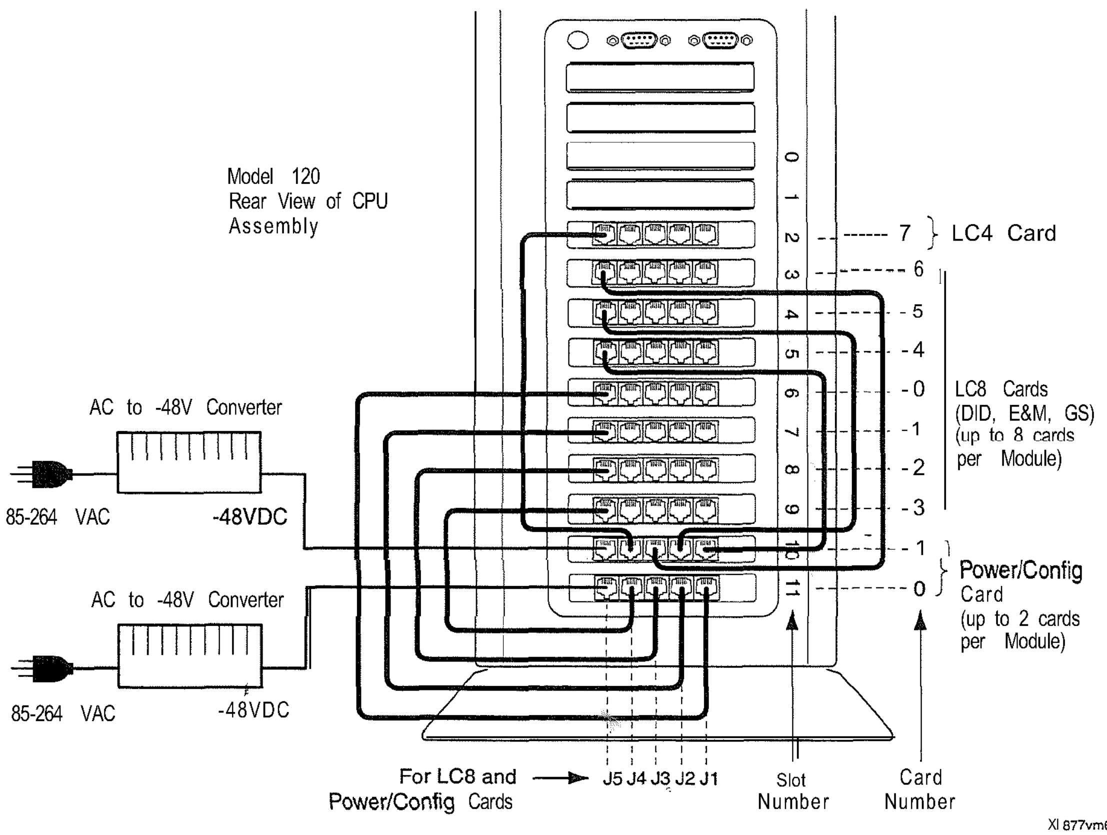


Figure 4 Card Connections--Model 120S

Connections in **Model 70** Systems

Figure 5 shows the connections between a Power Configuration card and LC8 cards in a Model 70.

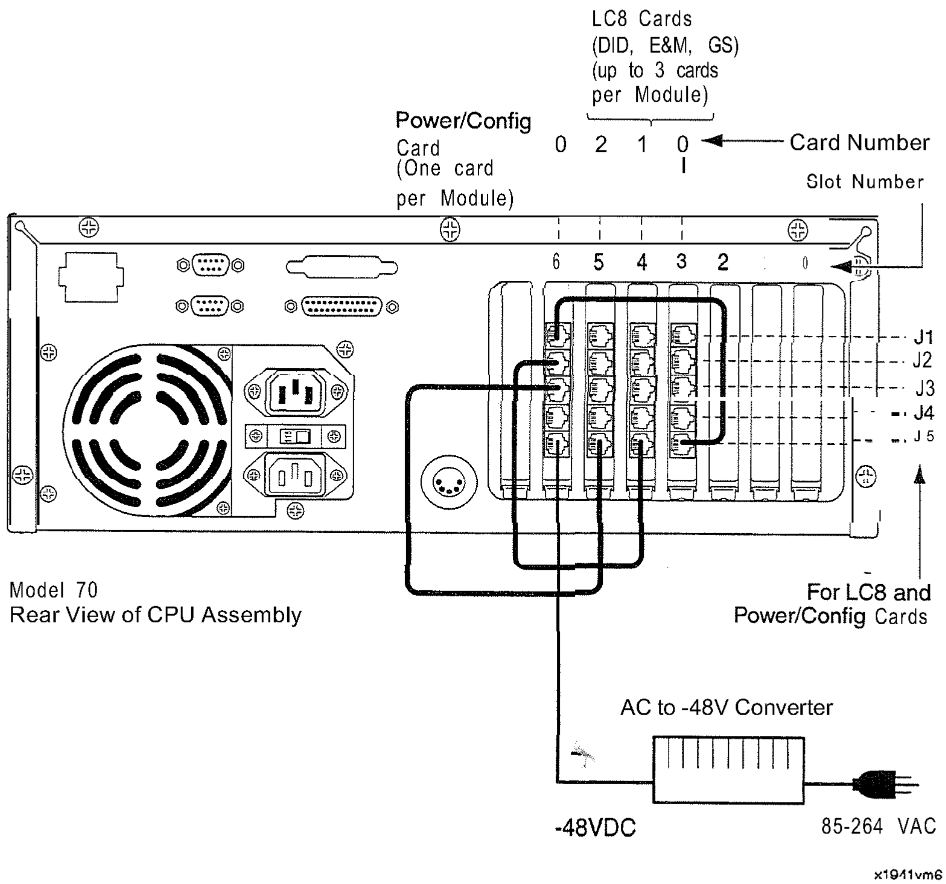


Figure 5 Curd **Connections--Model 70**

Modular Cables

CAUTION!

Never unplug or plug in any cables from a Power Configuration card when power is on.

When connecting LC8 cards to the Power Configuration card, always use "straight-through" modular cords. Straight-through modular cords can be identified by examining the end connectors. (See Figure 6.)

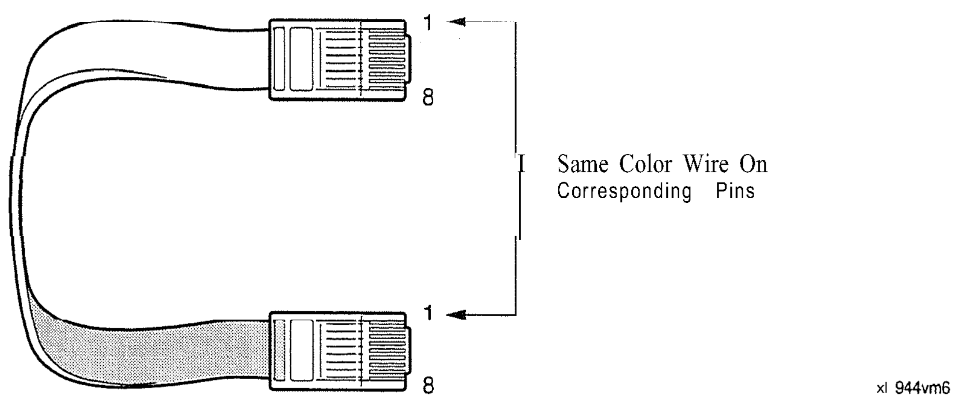


Figure 6 Straight-Through Modular Patch Cable

In this type of cable, corresponding pins on each connector should have the same color. For example, pin number 1, on both ends, has a blue conductor; pin number 2, on both ends, has an orange conductor, and so on.

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's *Installation and Service* Manual.

This card is preconfigured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to *the Service Card Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements
3. Refer to your server's Installation and Service Manual for correct instructions on how to remove and replace cards.

Phoneline Exceptions Technical Reference

This technical reference explains what Phoneline Exceptions are and how to configure them to control a particular line, a range of lines, or all of the lines installed in Centigram Series 6 Communication servers using the VoiceMemo application.

1 Introduction

2 The Phoneline Exceptions Program

3 List of Phoneline Exceptions

4 Greet Command

1 Introduction

Telephony parameters are set values that determine the characteristics of the telephony interface between the Series 6 server and the PBX or Central Office switch. The default values for each parameter were chosen to conform to the valid ranges for most PBXs. Certain PBX installations require minor changes to one or more parameters to achieve optimal PBX interface with VoiceMemo. When changes are made to default telephony parameters, the system is said to have phoneline exceptions. Different types of phoneline exceptions are described below:

- Timeout parameters - Line exception timeout parameters help control port usage by minimizing the amount of time between call processing events. Each of these line exceptions is set to a value that ensures successful completion of the first event, without allowing excess time to elapse before the next event begins.
- Incoming signal detection - Line card ports use these line exceptions to monitor the telephony interface and detect incoming signals.
- Output signaling adjustments - These line exceptions control the signaling and tones needed to dial out for pagers, message delivery, and off-systems messaging applications.
- DTMF detection - The Series 6 server receives events in-the form of DTMF tones. Some aspects of DTMF detection can be customized for individual line card ports.
- Greet command parameters - The greet command, used for call progress and line signal monitoring, is a general purpose software routine resident on the line card. It detects speech, recorded announcements, dead lines, and call-progress tones such as ringback, busy, and reorder. When the Series 6 server application software instructs a line-card port to "wait for a greeting," the greet command uses digital signal processors to detect tones and speech.
- Speech and silence detection during recording - These parameters work together to detect speech pauses. They stop the system recording when a pause has occurred and restart the recording process once speech has resumed. This function can be enabled or disabled.

Since adjustment of telephony parameters can cause undesirable effects in other, seemingly unrelated areas, make sure the modifications are necessary before you make them. If you are unsure of the valid ranges for your PBX, contact the PBX vendor. Parameters that can be adjusted are listed and described in this chapter.

2 The Phoneline Exceptions Program

VoiceMemo calls any telephony parameters that are not set to their default values "phoneline exceptions." You can configure phoneline exceptions to affect a particular line, a range of lines, or all of the lines installed in the Series 6 server.

The defaults provided with your Series 6 server conform to North American Signaling Standards and under most conditions should provide adequate service. Before using a phoneline exception, troubleshoot to determine what the specific problem is, interpret any compatibility issues, and then determine if a phoneline exception can help resolve that problem. After making a change, test, and retest all lines affected by the change.

The phoneline exceptions listed here include all available to date. Not all phoneline exceptions are available in all releases and revisions of software. To determine which phoneline exceptions are available on your system, access the phoneline exception menu and run a default phoneline exception report.

Phoneline exceptions are available on a per port basis. Make sure any changes made to a range of lines do not seriously affect the performance of other line groups on your system.

When you change telephony parameters, keep in mind these points:

- You enter the phoneline exception number (referred to as a command number), not the line exception name, when you modify these parameters.
- You modify these parameters on a line-by-line, or a group of lines, basis.
- When you specify the lines to modify, you "translate" line card port numbers to phone line numbers.

The phoneline exceptions program, which is reached online from the System Maintenance Menu, allows the technician to generate a report of phoneline parameters that are not set to their default values, to change current phoneline parameters, to reset parameters for a particular line to their default values, and to obtain a report of all telephony parameters and their default values. Centigram recommends that before you make any changes to the phoneline exceptions, you print the phoneline exceptions report for reference purposes.

3 List of Phoneline Exceptions

This section lists and describes the phoneline exceptions that are available on the Series 6 servers.

Phoneline Exception 1 Start Record No Speech Time

What to Enter: Number of seconds, between 0 and 255.

Default: 5 seconds

How it Works: This sets the length of time between the end of the record beep and the playing of the prompt "nothing recorded" when no speech is detected. The effect of this line exception can be seen by logging into a mailbox, pressing M to make a new message, entering the mailbox number for the message, and then noting the time between end of the record beep and the prompt "nothing recorded." This time period is equal to the value of phoneline exception 1.

Tips & Techniques: Too short a value causes interruptions when the caller pauses between words or sentences. Too long a value causes ports to be tied up waiting for more speech, even if the caller has disconnected.

Phoneline Exception 2 Stop Record Timeout

What to Enter: Number of seconds, between 0 and 255.

Default: 3 seconds

How it Works: This sets the length of time between end of speech when recording a message and the playing of the prompt "End of message." You can see the effect of this phoneline exception by setting the phoneline exception to some value, logging into a mailbox, pressing M to make a message, entering a mailbox number for the message, recording a message, and then noting the length of time between the end of the message (speech) and the prompt "message complete." That time period is equal to the value of phoneline exception 2.

Tips & Techniques: Too short a value causes interruprions when the caller pauses between words or sentences. Too long a value causes ports to be tied up waiting for more speech, even if the caller has disconnected.

Phoneline Exception 3 Dial Tone Detect Time

What to Enter: Number of seconds, between 0 and 255.

Default: 5 seconds

How it Works: This is the number of seconds of continuous energy required to detect dial tone.

Tips & Techniques: If value is too low, a false dial tone detection is possible. Be aware that low monotone voices can cause unexplained disconnects. Too large a value and any process requiring dial tone detection (such as paging, message delivery, auto-wakeup, etc.) requires an excessive length of time to detect dial tone. The Series 6 server disconnects if dial tone is detected during any process where it is not expected (disconnect supervision). Set to 0 (zero) to disable dial tone detection, typical on DID or tie lines which do not have dial tones.

Interactions & Limitations: Phoneline exceptions 3, 22, and 136 all have control over dial tone detection. Phoneline exception 3 is the number of seconds of continuous energy detected. Phoneline exception 22 is added to phoneline exception 3 to give you total the time before the port times out. Phoneline exception 136 is the power required to validate the dial tone.

See Also: Phoneline exception 22 and 136 for more information about dial tone detection.

Phoneline Exception 4 Pause Compression Enable

What to Enter: 0 to disable, 1 to enable.

Default: Enabled

How it Works: This allows you to enable or disable silence elimination. When enabled, the time between speech is not recorded if the silence is more than half a second.

Interactions & Limitations: Note that disabling phoneline exception 4 can cause a significant amount of your hard disk to be used to record silence.

Phoneline Exception 5 Delay Following Command

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 0

How it Works: Allows configuration of a delay before the execution of the next single command. Centigram does not recommend changing this exception.

Phoneline Exception 6 DTMF Detect Enable

What to Enter: 0 to disable, 1 to enable.

Default: Enabled

How it Works: This disables DTMF detection on a port. If you disable phoneline exception 6 on a port, that port no longer recognizes any DTMF tones.

Tips & Techniques: This can be used in an Audio Text application where no user input is allowed for security purposes.

Phoneline Exception 8 Dead Line Timeout

what to Enter: Number of seconds, between 0 and 255.

Default: 50 seconds

How it Works: This is the number of seconds to wait for the presence of ringing, busy or speech during a greet command. An event is sent when a line is totally silent after executing a greet command to determine that the line is dead.

Tips & Techniques: Lower this value if the PBX does not give disconnect supervision.

See Also: FCOS bit 17 for quicker disconnect.

Phoneline Exception 9 Ringing Timeout

What to Enter: Number of seconds, between 0 and 255.

Default: 15 seconds

How it Works: This specifies the time that must elapse, after ringing has started, before the Series 6 server considers the call "Ring No Answer." You can change this pararneter if these two conditions are present:

- Receptionist II is installed.
- An outside caller is automatically forwarded to the Series 6 server after a certain number of rings.

Tips & Techniques: The value should be at least two seconds less than the value of call forward busy and no answer on your integrated PBX. This timer also affects the length of time a pager outdial rings a phone for message delivery and auto wakeup.

Phoneline Exception 10 Silence Timeout

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 75 hundredths of a second

How it Works: This is the number of hundredths of a second of silence after a ringing event terminates that a greet command is executed. This field should not require changing. The greet command supervises a line for call progression. The greet command also detects:

- Dial tone
- Reorder tone 480 Hz-180 ms to 320 ms separated by silence
- Busy tone 480 Hz-330 ms to 850 ms separated by silence
- Ring back tone 480 Hz-750 ms to 2000 ms separated by 2000 ms to 4200 ms silence
- Silence
- DTMF tones
- Speech energy

See Also: Phoneline exceptions 146, 170, and 182 for further explanation of the greet command. See the section on Greet Commands for more information on setting this field.

Phoneline Exception 11 Speak Timeout

What to Enter: Number of seconds, between 0 and 255.

Default: 3 seconds

How it Works: This is the number of seconds for the called party to stop speaking during a greet command. This field should not require any changing.

Tips & Techniques: Too many speech and modem carrier tones cause the greeting to fail and the system to treat the call as a failure.

See Also: Phoneline exceptions 10, 146, 170 and 182 for further explanation of the greet command. See the Greet Command section for more information.

Phoneline Exception 12 MF Detect Enable

What to Enter: 0 to disable, 1 to enable.

Default: Disabled

How it Works: If enabled, MF tones (North American Stand&d) are detected.

Other Requirements An MF line card is required to detect MF tones.

Interactions & Limitations Do not change this field. The application automatically enables and disables MF detect before and after call setup. MF detect is disabled during voice mail activity. It is used only for call setup.

See Also: Phoneline exception 3 1.

Phoneline Exception 13 Enable AGC

What to Enter: 0 to disable, 1 to enable.

Default: Enabled

How it Works: The automatic gain control (AGC) adjusts weak and strong signals so that the output level is always constant. Some lines are of such poor quality that the AGC cannot make an acceptable adjustment. Disable for ports that record TDD modulated carrier.

Phoneline Exception 14 Pulse Per Second

What to Enter: The following are the possible settings:

0=10 pps, 60-40 duty cycle

1 = 10 pps, 66-34 duty cycle

2=20 pps, 66-34 duty cycle

Default: 0 (10 pps, 60-40 duty cycle)

How it Works: This defines the pulse per second rate for dial pulse output. You adjust the parameter when the receiving equipment does not conform to North American Signaling Standards.

Phoneline Exception 22 Start Dial Tone Timeout

What to Enter: Number of seconds, between 0 and 255.

Default: 8 seconds

How it Works: This is the number of seconds added to phoneline exception 3 before a port times out when dial tone is not present.

Interactions & Limitations Phoneline exceptions 3, 22 and 136 all have control over dial tone detection. Phoneline exception 22 is added to phoneline exception 3 to give you total time before the port times out. Phoneline exception 136 sets the power required to validate dial tone.

See Also: Phoneline exception 3 and 136 for more information about dial tone detection.

Phoneline Exception 23 Flash Hook Time

What to Enter: Number in hundredths of a second, between 0 and 255.

Default: 50 hundredths of a second

How it Works: This is the number of hundredths of a second that the Series 6 server remains on-hook during flash. When making changes to this field, start by adjusting it to the halfway point of the PBX min/max flash detect time (the default average on most telephone equipment is 60 to 65 hundredths of a second).

Tips & Techniques: Intermittent or complete transfer failures can occur if flash hook time is too short. If the calling party is complaining about hearing DTMF tones during transfer, this value is too low. If the value is too high, the PBX interprets it as a disconnect and drops the call.

Interactions & Limitations For systems running Centrex Integrations, to allow operator transfers from the Series 6 server or if the Receptionist II feature is installed on the system, phoneline exception 23 should be set to 100 hundredths of a second (entered as 100).

Phoneline Exception 24 Wink Start

What to Enter: 0 to disable, 1 to enable.

Default: Disabled

How it Works: The wink duration is fixed at 200 milliseconds. It is an off-hook condition sent by the line card after an incoming call is verified. It works for DID and E & M connections only.

Tips & Techniques: If you are installing a line with no dial tone to a pager outdial group, you might need to enable wink start. Wink start is a type of out signaling capability. In DID applications, wink start is usually required by the Central Office. Certain PBXs also require wink start signaling on E & M tie trunk connections.

Phoneline Exception 25 Enable DTMF Column 3

What to Enter: 0 to disable, 1 to enable.

Default: Disabled

How it Works: Enables the detection of fourth column DTMF tones (A, B, C, D). The A, B, C, and D keys are called column 3 DTMF tones using 0 as column 1, 1 as column 2, 2 as column 3, and 3 as column 4.

Column	0	1	2	3
Row 1	1	2	3	A
2	4	5	6	B
3	7	8	9	c
4	*	0	#	D

Tips & Techniques: Be aware that enabling this could cause disconnects due to a person's voice being falsely accepted as DTMF tones.

Phoneline Exception 30 Precise Sleep Timer

What to Enter: Number in hundredths of a second, between 0 and 255.

Default: 8 hundredths of a second

How it Works: A timeout event is sent when this timer has expired. This timer overrides any previous timer command.

Tips & Techniques: This timer is fully independent of any other line card function and is only used by the module/application software.

Phoneline Exception 31 MF Receive Debounce Time

What to Enter: Number of 0.002 second units, between 0 and 255.

Default: 48 milliseconds (entered as 24)

How it Works: Allows the configuration of the length of time a MF tone must be depressed before it is recognized as a valid digit.

Other Requirements An MF line card is required to detect MF tones.

Interactions & Limitations Any value lower than 15 is not valid, because the MF detector chip only provides a minimum of 30 milliseconds debounce time.

Phoneline Exception 32 DTMF Receive Debounce Time

What to Enter: Number of 0.002 second units, between 18 and 255.

Default: 48 milliseconds (entered as 24)

How it Works: Allows configuration of the length of time a DTMF key must be depressed before it is recognized as a valid VoiceMemo command. The effect of this phoneline exception can be seen by pressing DTMF keys and noting how long they must be depressed for the system to respond. For example, if the value of phoneline exception 32 is set to 120 (240 ms), DTMF keys must be depressed 240 ms before the system responds.

Tips & Techniques: This value should be lowered if the system is missing the first digit of mailboxes on DID or speed dialers. This phoneline exception is active at all times, except when playing or recording a message.

Interactions & Limitations Settings of 18 or lower are fixed at 36 milliseconds.

Phoneline Exception 33 Record DTMF Receive Debounce Time

What to Enter: Number of 0.002 second units, between 0 and 255.

Default: 60 milliseconds (entered as 30)

How it Works: Allows configuration of the length of time a DTMF key must be depressed while recording a message or greeting for the system to recognize the DTMF key. The effect of this phoneline exception can be seen by logging into a mailbox and recording a message. While recording the message, press a DTMF key and note how long you must press the key before the system responds. For example, if the value of phoneline exception 33 is set to 120 (240 ms) DTMF keys must be pressed for at least 240 ms before the system responds.

Other Requirements Systems using the 0035, 0038, or 0046 line cards can reduce this parameter by 10% from the default value or current setting.

Tips & Techniques: Some electronic telephone sets only provide a short burst of tone to the voice mail port, regardless of how long a DTMF key is pressed. Check this at the voice mail port.

Interactions & Liiitations This phoneline exception is purposely set higher than phoneline exception 32 to prevent false DTMF detection on higher frequency voices while recording messages.

Phoneline Exception 34 Play DTMF Receive Debounce Time

What to Enter: Number of 0.002 second units, between 0 and 255.

Default: 60 milliseconds (entered as 30)

How it Works: Allows the configuration of the length of time a DTMF key must be depressed during playing of a message (and the prompt "End of Message") or during review of a recorded message before the system recognizes the DTMF key. The effect of this phoneline exception can be seen by logging into a mailbox and playing a message. While the message is being played, press any DTMF key. The system does not respond unless the DTMF key is pressed for at least twice as long as the play DTMF receive debounce time.

Other Requirements Systems using the 0035, 0038 and 0046 line cards can reduce this parameter by 10% from the default value or the current settings. Shorter debounce times improve DTMF cut-through during playing of a message.

Tips & Techniques: Some electronic telephone sets only provide a short burst of tone to the voice mail port, regardless of how long a DTMF key is pressed. Check this at the voice mail port.

Interactions & Limitations This phoneline exception can be set higher than phoneline exception 32 to prevent false DTMF detection on higher frequency voices while recording messages. Normally it is set to the same time as phoneline exception 32.

Phoneline Exception 35 Sleep After Hang-Up

What to Enter: Number of seconds, between 0 and 255.

Default: 2 seconds

How it Works: Length of time after hanging up that a port ignores a ringing event.

Tips & Techniques: Raise the value if the system is answering with the caller's menu or the "I do not understand that command" prompt. Too high a value results in poor use of ports and a perception of Ring No Answer problems or general greetings when using integrations. If you have Release 5.0 Rev. E or earlier software and you set this value to 0, you disable the port.

See Also: Phoneline exception 140. This phoneline exception overrides phoneline exception 140 if phoneline exception 35 has a higher value.

Phoneline Exception 38 Centrex Time Out

What to Enter: Number of seconds, between 0 and 255.

Default: 7 seconds

How it Works: Length of time after seeing ringing or a data packet on a configured Centrex line that the system responds. If ringing occurs on a port configured for Centrex and there is no data packet associated with that port in the configured length of time for this phoneline exception, the system answers with a general greeting instead of the mailbox greeting. If the data packet occurs first, the system waits the configured length of time for ringing. If that does not occur, the system invalidates the first data packet and restarts the timer on the ringing event and waits the configured length of time again for data.

Other Requirements The Centrex Optional Feature software must be installed.

Tips & Techniques: DMS 100 sites require a minimum of 10 seconds.

Phoneline Exception 39 Pause Before Pick Up

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 0 (no pause)

How it Works: Length of time a line card delays before answering a ringing line.

Phoneline Exception 40 Application Probe

What to Enter: 0 to disable, 1 to enable.

Default: Disabled

How it Works: This enables a debug tool that is for use only by Centigram Engineering.

Phoneline Exception 41 Pause Before Dial Pick Up String

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 1 second (entered as 100)

How it Works: Used with pickup-type integrations. This enables configuration of the delay between going off-hook and dialing the pickup feature access code.

Phoneline Exception 42 Centrex Ring Timeout

What to Enter: Number of seconds, between 0 and 255.

Default: 7 seconds

How it Works: For the Centrex integration, if a data packet is received, but a corresponding ringing event is not detected during this window, a Centrex ring time out occurs, and an error message is logged into the system logfile. This can occur if a caller hears the call being forwarded and decides to hang up. The data packet has already been received at this point, but there is no ringing event to match the data packet.

Other Requirements The Centrex Optional Feature software must be installed.

Tips & Techniques: If this exception is set too low, it can result in general greeting; if it is set too high, it can result in the call being answered with the wrong mailbox greeting.

Phoneline Exception 43 Answer Supervision Time-Out

What to Enter: Number of seconds, between 0 and 255. 0 is for "wait forever."

Default: 20 seconds

How it Works: Amount of time the line card waits to receive a ringing event when an "L" is in the dial string.

Other Requirements "L" must be in the dial string.

Note: The numbering gap at this point is intentional.

Phoneline Exception 128 Minimum Busy Half Cycle (-Greet)

What to Enter: Number of half cycles, between 0 and 255.

Default: 25 half cycles (12.5 seconds)

How it Works: Minimum number of half cycles for busy or reorder detection. Not used when a greet or play command is active.

Tips & Techniques: Should not require changing.

Phoneline Exception 129 Minimum Busy Half Cycle Creel

What to Enter: Number of half cycles, between 0 and 255.

Default: 15 half cycles (7.5 seconds)

How it Works: Minimum number of half cycles for busy or reorder detection. Used only when greet command is active.

Tips & Techniques: Should not require changing.

Phoneline Exception 130 Tie Trunk Break Detect Time

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 12 hundredths of a second

How it Works: The number of hundredths of a second to detect a line break when a port is jumpered for E & M or DID (reverse battery) interface. Breaks less than this time are ignored. Breaks more than this time are considered a disconnect. For DID, it detects loop breaks; for E & M it detects M lead "off" breaks.

Phoneline Exception 131 Loop Break Detect Time

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 10 hundredths of a second

How it Works: Number of hundredths of a second necessary for the Series 6 server to detect line break, when the channel is jumpered for loop current. Breaks less than this time are ignored.

Tips & Techniques: If the PBX breaks the loop for a longer interval, VoiceMemo considers it a disconnect, and goes on-hook.

Interactions & Limitations Centrex usually presents line breaks that cause unexplained disconnects. This can be eliminated by adjusting this phoneline exception to a value between 25 to 40.

Phoneline Exception 132 M Lead Debounce Time

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 4 hundredths of a second

How it Works: M lead state changes must last longer than this time to be considered valid.

Phoneline Exception 133 Delay Before Wink

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 20 hundredths of a second

How it Works: After a valid incoming seizure, the port waits this length of time before sending the wink start signal. It is active only when either the line card is set to DID or E & M, or when wink start is enabled.

Phoneline Exception 134 In-Ring On Time High

What to Enter: Number of hundredths of a second, between 0 and 65535.

Default: 4 seconds (entered as 400)

How it Works: Incoming ringing burst must be shorter than this to be considered valid.

Tips & Techniques: If you want to detect distinctive ringing, set this value to 200. Incoming ringing is controlled by phoneline exceptions 134, 144, 148, 150, and 152.

See Also: Phoneline exceptions 144, 148, 150, and 152.

Phoneline Exception 136 Minimum Dial Tone Detect Power

What to Enter: A value between 0 and 65535.

Default: 750 (=-18 dBm)

How it Works: Minimum power required to validate dial tone. There are two other criteria for dial tone detection.

- Steadiness, which is not an adjustable parameter.
- Duration, which is phoneline exception 3.

Other Requirements Systems using the 0035, 0038 or 0045 line cards must increase this parameter by 60% from the default value.

Tips & Techniques: On DID circuits, a problem occurs where voltage noise can be falsely identified as dial tone. Because dial tone should never be identified on a DID circuit, setting this value high (3000-6099) can eliminate this problem. This problem can appear as a high number of "the number you have dialed is out of service" recordings from the Series 6 server. Watch for disconnects on low frequency monotone voices that indicate this value is too low.

See Also: Phoneline exceptions 3 and 22 for more information about dial tone detection.

Phoneline Exception 138 No Break Time After Flash

What to Enter: Number of hundredths of a second, between 0 and 65535.

Default: 10 hundredths of a second

How it Works: Length of time after a switch hook flash in which all line break events are ignored. This prevents a disconnect following the switch hook flash.

Tips & Techniques: The Centrex application usually requires this phoneline exception to be increased to a value of 25 to 40.

Phoneline Exception 140 No Break/Ring Time On Loop

What to Enter: Number of hundredths of a second, between 0 and 65535.

Default: 2 seconds (entered as 200)

How it Works: Length of time that line break and ringing events are ignored after a hang up or pulse-out command. Used only when the channel is jumpered for Loop Start. Detection of an incoming ring restarts this timer. Reduce if calls are presented less than 2 seconds after the end of the previous call.

Interactions & Limitations If phoneline exception 35 is present, that value overrides the hang up parameters of this phoneline exception.

See **Also:** Phoneline exception 35

Phoneline Exception 142 Inhibit Play Time

What to Enter: Number of hundredths of a second, between 0 and 65535.

Default: 50 hundredths of a second

How it Works: Length of time before a port (after answering) begins to play the first prompt.

Tips & Techniques: For integrations using DTMF signaling, this phoneline exception can be increased, if necessary depending on DTMF interval timing. If the beginning words of mailbox greetings are being cut off, this value should be increased.

Phoneline Exception 144 In-Ring Off Time

What to Enter: Number of hundredths of a second, between 0 and 65535.

Default: 1 second (entered as 100)

How it Works: Length of time that incoming ringing current must be off before a valid ringing event is returned.

Tips & Techniques: If you want distinctive ringing, set this value to 50. See phoneline exceptions 134 and 148 for other ringing information.

Interactions & Limitations Phoneline exceptions 134, 144, 148, 150, and 152 control incoming ringing detection.

See **Also:** Phoneline exceptions 134, 144, 148, 150, and 152.

Phoneline Exeeption 146 Speech Detect Minimum Time

What to Enter: Number of hundredths of a second, between 0 and 65535.

Default: 25 hundredths of a second

How it Works: Speech or energy must last longer than this length of time to be considered valid during the greet command. Speech or energy bursts less than this time are completely ignored by the greet command. Busy tones, reorder tone, and ring back tone less than this time are not validated.

Other Requirements Systems using the 0035, 0038 or 0046 line cards require that you change this parameter for pager applications where confirmation tone-on-time is less than 250 ms per cycle and the number of cycles is 5 or fewer cycles. The new values should be 15 for 200 ms on-time, or 20 for 250 ms on-time.

Scc **Also:** Scc phonclinc cxccptions 10, 11, 170, and 182 for morc information on the greet command. See the Greet Command section in this manual for further explanation.

Phoneline Exception 148 In-Ring On Time Low

What to Enter: Number of hundredths of a second, between 0 and 65535.

Default: 25 hundredths of a second

How it Works: Length of time an incoming ring burst must be before it is considered valid.

Tips & Techniques: If you want distinctive ringing, set this value to 50. Phoneline exceptions 134, 144, 148, 150, and 152 control incoming ringing detection.

See Also: Phoneline exceptions 134 and 144

Phoneline Exception 150 In-Ring Maximum Power

What to Enter: A value between 0 and 65535.

Default: 2560

How it Works: If incoming ringing power rises above this threshold incoming ringing is detected.

Tips & Techniques: When a port is not answering on the first ring or is an intermittent Ring No Answer, raising this value to 4000 and phoneline exception 152 to 3800 can successfully eliminate this problem, mostly on XT type line cards. This is also helpful on Centrex Installations.

See Also: Phoneline exception 152

Phoneline Exception 152 In-Ring Minimum Power

What to Enter: A value between 0 and 65535.

Default: 2304

How it Works: If incoming ringing power falls below this threshold, incoming ringing detection is cleared.

Tips & Techniques: When a port is not answering on the first ring or is an intermittent Ring No Answer, raising this value to 3800 and phoneline exception 150 to 4000 can successfully eliminate this problem, mostly on XT type line cards. This is also helpful on Centrex installations.

See **Also:** Phoneline exception 150

Phoneline Exception 154 Pulse-Out Interdigit Delay

What to Enter: Number of hundredths of a second, between 0 and 65535.

Default: 75 hundredths of a second

How it Works: Length of time between accepting a pulse output command and starting the pulse output of digits.

Phoneline Exception 156 Record Prompt (Beep) Duration

What to Enter: Number of hundredths of a second, between 0 and 65535.

Default: 10 hundredths of a second

How it Works: Length of time for the record prompt beep. Three phoneline exceptions control the record prompt beep. They are:

- Phoneline exception 1 %-controls length of beep
- Phoneline exception 158—controls frequency of beep
- Phoneline exception 178-controls output level or beep

See Also: Phoneline exceptions 158 and 178

Phoneline **Exception 158 Record Prompt Frequency**

What to Enter: Frequency in Hertz, between 300 and 2500.

Default: 1000 Hz

How it Works: The frequency in hertz of the record prompt beep. Three phoneline exceptions control the record prompt beep. They are:

- Phoneline exception 156—controls length of beep
- Phoneline exception 158—controls frequency of beep
- Phoneline exception 178—controls output level or beep

See Also: Phoneline exceptions 156 and 178

Phoneline **Exception 160 Silence Delay**

What to Enter: Number of frames, between 0 and 255.

Default: 5 frames

How it Works: This phoneline exception is used in pause compression and is the maximum number of frames for which one frame with any energy can inhibit silence detection in subsequent frames.

WARNING! -- Do NOT **change** this phoneline exception.

Centigram does not support changes to this phoneline exception.

Phoneline Exception 161 Minimum Miniframes Not Silent

What to Enter: Number of miniframes, between 0 and 255.

Default: 7 miniframes

How it Works: A certain number of miniframes must contain audio activity before an entire frame is considered to be active. This is the minimum number of miniframes used to restart recording. Only used to reactivate recording after silence has been detected.

WARNING! -- Do NOT change this phoneline exception.

Centigram does not support changes to this phoneline exception.

Phoneline Exception 162 Minimum Speech Frames

What to Enter: Number of miniframes, between 0 and 255.

Default: 3 miniframes

How it Works: The minimum number of consecutive frames of speech (using phoneline exception 163) required to reset the record timeout. Used to prevent recording from stopping after it has started.

WARNING! -- Do NOT change this phoneline exception.

Centigram does not support changes to this phoneline exception.

Phoneline **Exception 163 Minimum Miniframes Speech**

What to Enter: Number of miniframes, between 0 and 255.

Default: 5 miniframes

How it Works: Minimum number of miniframes containing speech required to determine that an entire frame contains speech. Used to prevent recording from stopping after it has started. Increase this value to 6, 7, or 8 to reduce messages that contain noise.

WARNING! -- Do NOT change this phoneline exception.

Centigram does not support changes to this phoneline exception.

Phoneline **Exception 164 DTMF Output Duration**

What to Enter: Number of hundredths of a second, between 0 and 65535.

Default: 12 hundredths of a second

How it Works: Time that each DTMF tone output lasts in duration.

Tips & Techniques: Too low a value causes the PBX or Central Office not to recognize the digits sent.

See Also: Phoneline exception 166

Phoneline Exception 166 DTMF Output Interdigit Delay

What to Enter: Number of hundredths of a second, between 0 and 65535.

Default: 12 hundredths of a second

How it Works: Duration of silence between DTMF tone output.

Tips & Techniques: Too low a value causes the PBX or Central Office not to recognize your digits sent.

See Also: Phoneline exception 164

Phoneline Exception 170 Speech Detect Minimum Power (Greet)

What to Enter: A value between 0 and 65535.

Default: 2048

How it Works: A speech or energy burst must have this minimum energy level to be considered as valid power. Speech or energy less than this value does not activate the busy, reorder, ring-back, or speech detectors.

Tips & Techniques: A word of caution: changing values too low can have serious negative! effects on any application using the greet command. Make changes in small increments and test thoroughly on all lines.

Interactions & Limitations Because of the line loss values associated with Centrex, this number can be reduced significantly (i.e,. 2800 to 3000), when Receptionist II is active. To test, initiate a call through a Receptionist II port. when the receiving party answers, they should answer "Hello" in a normal voice. The Series 6 server should immediately come back and say, "Hello, you have a call." If there is any delay, you must decrease this value.

See Also: See phoneline exceptions 10, 11, 146, and 182 for more information about the greet command. See the section on Greet Commands for more information on setting this field.

Phoneline Exception 172 Minimum Reorder Detection Time

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 18 hundredths of a second

How it Works: Minimum time (tone and silence) for reorder detection. Change only if erratic reorder detection is present.

Phoneline Exception 173 Maximum Reorder Detection Time

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 32 hundredths of a second

How it Works: Maximum time (tone and silence) for reorder detection. Change only if erratic reorder detection is present.

Phoneline Exception 174 Minimum Busy Detection Time

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 33 hundredths of a second

How it Works: Minimum time (tone and silence) for busy detection. Should not require changing.

Phoneline Exception 175 Maximum Busy Detection Time

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 85 hundredths of a second

How it Works: Maximum time (tone and silence) for busy detection. Should not require changing.

Phoneline Exception 176 DTMF Output level

What to Enter: Number corresponding the desired output level:

6 = full output level

5 = 5/6

4 = 2/3

3 = 1/2

2 = 1/3

1 = 1/6

0 = no output

Default: 6, full-scale (approximately -1 dBm)

How it Works: Amplitude of DTMF tone output.

Tips & Techniques: If you include a pound sign (#) in the Pre-company name dial string or the Ike-mailbox greeting dial string, you can lower this value. Otherwise, it should not require changing.

Phoneline Exception 178 Record Prompt (Beep) Output Level

What to Enter: Number corresponding the desired output level:

6 = full output level

5 = 5/6

4 = 2/3

3 = 1/2

2 = 1/3

1 = 1/6

0 = no output

Default: 3, half-scale (approximately - 10 dBm)

How it Works: Amplitude of the record prompt (beep).

Phoneline Exception 180 Play Delay After DTMF Detect

What to Enter: Number of hundred&s of a second, between 0 and 65536.

Default: 0

How it Works: Length of time that VoiceMemo waits after detecting DTMF, before playing speech (prompts or message). Use only when necessary.

Tips & Techniques: The play delay can be increased if users are consistently losing the first few seconds of their messages, or if they are not hearing the first part of each prompt after a DTMF key is pressed. Some telephone equipment mutes the talk path after pushing a DTMF key. This requires that you increase the value if you are clipping off the beginning word after pressing a DTMF key.

Interactions & Limitations Iwatsu Omega 4 telephone systems require up to 75 hundredths of a second to eliminate clipping of words.

Phoneline Exception 182 Ringback Tone Maximum Silence

What to Enter: Number of hundredths of a second, between 0 and 65535.

Default: 2.8 seconds (entered as 280)

How it Works: Maximum silence allowed between ring back tone cycles before a greet automatically terminates with a speak detect event.

Tips & Techniques: This number is added to the actual duration of the ringback tone to create the actual allowable silence duration. For example, a 1 second ring back tone and phoneline exception 182 set at 320 equals a 4.2 second silence before a greet automatically terminates with a speak detect event (connect).

Phoneline Exception 184 DTMF Low Tone Attenuation

What to Enter: A value between 0 and 65535.

Default: 26000 (The low tone is 2 dB less than the high tone.)

How it Works: Relative amplitude of MF/DTMF lower frequency tone if phoneline exception 198 is enabled.

See Also: Phoneiine exception 198

Phoneline Exception 186 Maximum Dial Tone Interruption

What to Enter: Number of hundredths of a second, between 0 and 255.

Default: 5 hundredths of a second

How it Works: Length of time that a signal can be fully absent during dial tone detection without loss of dial tone detection.

Tips & Techniques: Use this for noisy lines where dial tone detection is required.

Phoneline Exception 1 87 Precise Dial Tone Detect

What to Enter: 0 to disable, 1 to enable.

Default: Disabled

How it Works: With this phoneline exception enabled, dial tone is only detected if meets Precise Tone parameters, which include frequency, steadiness, hit time, power, and duration. Duration is fixed at 1 second.

Other Requirements Only active when using the G or E command in a dial string.

Tips & Techniques: If this phoneline exception is disabled, the time must steady as long as phoneline exception 3, Dial Tone Detect Time, is set for.

See Also: Phoneline exceptions 188, 190, 192, 194, and 196, which select alternate precise frequencies. Phoneline exceptions 136 and 186 can also apply.

Phoneline Exception 188 Narrow Band Filter Coeff #0

What to Enter: A value between 0 and 65535.

Default: 13979, for 480 Hz. See table.

Phoneline Exception	Frequency 480	425	375-475
188	13979	25188	39773
190	8805	9545	9681
192	-12685	-13481	-13323
194	8851	9260	9052
196	-3862	-3855	-3581

How it Works: Different values for phoneline exceptions 188 through 196 define the center frequency of the progress tone to be detected. North America uses 480 Hz. Europe and Asia can use 425 or 375-475.

Interactions & Limitations All phoneline exceptions 188 through 196 must be set together.

Phoneline Exception 190 Narrow Band Filter Coeff #1

What to Enter: A value between -32767 and 32767.

Default: 8805, for 480 Hz. See table.

Phoneline Exception	Frequency 480	425	375-475
188	13979	25188	39773
190	8805	9545	9681
192	-12685	-13481	-13323
194	8851	9260	9052
196	-3862	-3855	-3581

How it Works: Different values for phoneline exceptions 188 through 196 define the center frequency of the progress tone to be detected. North America uses 480 Hz. Europe and Asia can use 425 or 375-475.

Interactions & Limitations All phoneline exceptions 188 through 196 must be set together.

Phoneline **Exception 192 Narrow Band Filter Coeff #2**

What to Enter: A value between -32767 and 32767.

Default: -12685, for 480 Hz. See table.

Phoneline Exception	Frequency 480	425	375-475
188	13979	25188	39773
190	8805	9545	9681
192	-12685	-13481	-13323
194	8851	9260	9052
196	-3862	-3855	-3581

How it Works: Different values for phoneline exceptions 188 through 196 define the center frequency of the progress tone to be detected. North America uses 480 Hz. Europe and Asia can use 425 or 375-475.

Interactions & Limitations All phoneline exceptions 188 through 196 must be set together.

Phoneline Exception 194 Narrow Band Filter Coeff #3

What to Enter: A value between -32767 and 32767.

Default: 885 1, for 480 Hz. See table.

Phoneline Exception	Frequency 480	425	375-475
188	13979	25188	39773
190	8805	9545	9681
192	-12685	-13481	-13323
194	8851	9260	9052
196	-3862	-3855	-3581

How it Works: Different values for phoneline exceptions 188 through 19 6 define the center frequency of the progress tone to be detected. North America uses 480 Hz. Europe and Asia can use 425 or 375-475.

Interactions & Limitations All phoneline exceptions 188 through 196 must be set together.

Phoneline Exception 196 Narrow Band Filter Coeff #4

What to Enter: A value between -32767 and 32767.

Default: -3862, for 480 Hz. See table.

Phoneline Exception	Frequency 480	425	375-475
188	13979	25188	39773
190	8805	9545	9681
192	-12685	-13481	-13323
194	8851	9260	9052
196	-3862	-3855	-3581

How it Works: Different values for phoneline exceptions 188 through 196 define the center frequency of the progress tone to be detected. North America uses 480 Hz. Europe and Asia can use 425 or 375-475.

Interactions & Limitations All phoneline exceptions 188 through 196 must be set together.

Phoneline Exception 198 DTMF Twist Enabled

What to Enter: 0 to disable, 1 to enable.

Default: Disabled

How it Works: Turns on phoneline exception 186.

Other Requirements This phoneline exception is required in Europe.

See Also: Phoneline exception 184

Phoneline Exception 200 Background Power Low Limit

What to Enter: Number between 5 and 100.

Default: 10

How it Works: Background power noise levels below this limit are not recorded.

Tips & Techniques: If adjusted too high, low speech power can be clipped. Adjustment is not recommended.

Phoneline Exception 214 DTMF Detect Minimum Power Ratio

What to Enter: Number between 10 and 30.

Default: 16

How it Works: The ratio of noise power just before DTMF to power during DTMF must be above this value before DTMF evenrs are sent to the host while in record mode. This ratio adapts upward during recording if a high speech to noise ratio is measured. The phoneline exception value corresponds to internal power detectors, and this is not directly related to dBm.

Tips & Techniques: Adjust higher for fewer false detects. If adjusted too high, DTMF from mobile and speaker phones are not detected because of their high background noise power.

4 Greet Command

The greet command is a general purpose software routine resident on the line card that detects call progress tones on a telephone line. It can detect ring-back tone, busy tone, reorder tone, dead lines, speech, and recorded announcements. It can also be prematurely terminated if it receives a DTMF tone of a duration greater than 120 milliseconds (ms).

The greet command monitors the telephone line and determines the type of tone based on three measurements:

- The instantaneous total line energy
- The instantaneous total energy in the 480 hertz (Hz) (±10 Hz) range
- The cadence of energy that has occurred (timing)

North American precise tone plan uses 480 Hz in ring back, busy, and reorder tones. A 480 Hz filter in the greet command provides additional robustness to the decision process of greet.

Greet and Call Disposition

The three measurements described above are used to create four information points used to make the final decision of c&disposition. The information points are created for each energy burst seen on the telephone line. These bursts of energy may be switching noise, call progress tones or actual speech. The information points created are:

- The total energy in an utterance or energy burst (See Absolute Amplitude, below)
- The ratio of the minimum energy to maximum energy in the burst (See Absolute Steadiness, below)
- The duration of the burst (See Ratio and Duration, below)
- The ratio of 480 Hz energy to the total energy of the burst (See Ratio and Duration, below)

Absolute Amplitude: The greet command continuously collects energy from the telephone line. When it determines that an utterance or energy burst is occurring, it begins collecting information about the energy burst. When the burst is completed, the greet software generates the four information points to be used for the decision.

Energy bursts below an average level of -18 dBm (decibels referenced to 1 milliwatt) are always ignored. This prevents idle line transients and call switching noises from falsely triggering the greet command detecting speech. Some people, however, speak in very low volume, which can cause the greet command to not "hear" the called party answer. You can adjust phoneline exception 170 for these situations.

Absolute Steadiness: After the burst has been validated as having sufficient energy and duration, the ratio of minimum energy to maximum energy is examined. Call progress tones all have the characteristic of being "steady" energy. This means that ring-back tone, busy tone, or reorder tone all have relatively constant amplitude throughout the tone burst. Speech does not have this characteristic. Even the utterance "Hello" has wild deviations of minimum to maximum instantaneous energy. If the ratio of minimum energy to maximum energy is greater than 0.5, the greet command assumes the energy burst was a call progress tone, and not speech. If the ratio was less than 0.5, the greet command terminates and returns a speech detected event to the host software.

Ratio and Duration: If the burst was determined to be a call progress tone, the greet command next examines the ratio of 480 Hz energy to total energy. If this ratio is in the band of 0.25 to 0.75 (approximately half the energy was 480 Hz) the greet command determines that the energy burst was a precise tone plan call progress tone, and goes on to examine the duration of the tone. If the ratio of 480 Hz was less than 0.25 (no 480 Hz energy) or greater than 0.75 (all 480 Hz energy) the greet command determines if a previous burst was precise tone. If there was precise tone before, this indicates that this energy burst is speech or some other tone (such as paging terminal tone), and the greet command terminates with a speech-detected event. If there was not a precise tone detected before, it assumes that this burst was a non-precise call progress tone, such as used in old switching equipment. This tone also is then measured for duration.

At this point, the greet command has successfully filtered out all speech detection, and is only left with determining what type of precise tone is being received. This is done exclusively by cadence. Table 1 shows how the Greet Command uses certain values to identify different tones.

Table 1 Identification of Tones

To identify a	Greet looks for a tone that is greater than...	But less than...	And also...
Reorder Tone	The value of phoneline exception 172. Default value is 180 ms.	The value of the exception 173. Default value is 370 ms.	For the duration specified in phoneline exception 129. Default value is 15 half-cycles.
Busy Tone	The value of phoneline exception 174. Default value is 330 ms.	The value of phoneline exception 175. Default value is 850 ms.	For the duration specified in phoneline exception 129. Default value is 15 half-cycles.
Ring Back Tone	750 ms	2200 ms	Separated by 2000 to 4200 ms of silence.

If the energy burst is not a precise tone, the Greet Command must determine that the energy burst is a valid speech event. To do so, it applies the two tests described in Table 2.

Table 2 Energy Burst Determination

	If...	Then...	Else...
Test 1	The energy burst is greater than the value of phoneline exception 170 and smaller than the value of phoneline exception 11 and longer than the value of phoneline exception 146...	Apply test 2.	Do not connect the call.
Test 2	Silence after energy burst is greater than the value of phoneline exception 10...	Perform the next event.	Do not connect the call.

Greet and Phoneline Exceptions

Phoneline exceptions allow the busy tone and reorder tone parameters to be adjusted where the subtending switching equipment does not conform to these industry standard default values. Table 3 shows the North American Precise Tone Plan.

Table 3 North American Precise Tone Plan

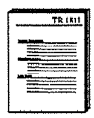
Tone Type	Frequency	Power	Duration
Dial Tone	350 + 440 Hz	-13 dBm*	STEADY
Ringback Tone	440 + 480 Hz	-18 dBm*	1 s on, 2 s on, 3 s off, 4 s off
Busy Tone	480 + 620 Hz	-25 dBm*	0.5 s on, 0.5 s off
Reorder Tone	480 + 620 Hz	-25 dBm*	0.25 s on, 0.25 s off

* Typical level at terminal equipment.

3 Special-Service Components

This chapter provides Technical References for *Special-Service* Components. At the time of publication, there is only one component that fits into this category.

Technical References



Use the technical references to find detailed background information about the hardware components of a Centigram Series 6 server. These are: the Model 640, the Model 120, and the Model 70.

How to Use This Chapter

Identify the *Special-Service Components* that you want to study. Go to the "List of Technical References" in this chapter and identify their technical reference number. The references are listed in numerical order in the "List of Technical References" table.

If you remove a technical reference from this binder, mark its original location, and replace it when you are finished with the document.

3 Special-Service Components
List of Technical References

Tech. Ref. Number	Title	Document Rev.	Release Number
TR 1904	Fax Card	Doc. Rev. A	6.0A

Fax Card Technical Reference

This technical reference provides information for the Fax card used in the Centigram Series 6 Communication server Model 640, Model 120, and Model 70. It provides a brief description of the card, configuration data, and installation guidelines.

1 Introduction

The digital fax cards used in Series 6 servers work with the VoiceMemo line cards to provide fax services during call sessions. The digital fax cards do not have direct telephone interfaces. They communicate over the MVIP bus with the line cards, which contain the telephone interface hardware and control the call sessions. Figure 1 illustrates these communication paths.

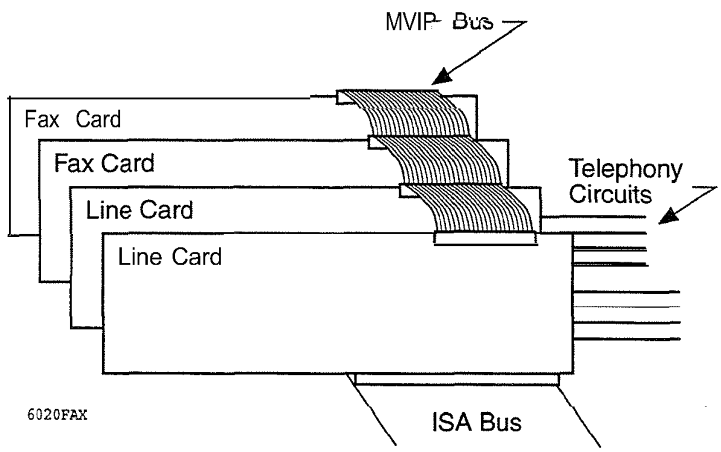


Figure 1 Fax Card to line Card Communication

Because digital fax cards are not physically attached to an individual line or line card, they can communicate over the MVIP bus with any line card. In this way, they can serve as a fax resource to any line card. Digital fax cards can be a dynamically allocated resource pool for several line card groups, or they can be dedicated to a single line group.

Hardware Overview

The digital fax cards in Series 6 servers have the following characteristics:

- Full-size AT cards that plug into slots in the system card cage
- Two-, four- or eight independent channels
- Full Group 3 fax send and receive functionality on each channel, with advanced data compression and error correction
- 14,400 bps transmit and receive speed depending on the capabilities of the far end
- LED status indicators
- Horizontal resolution is 203 dots per square inch (dpi) in both standard and fine modes
- Vertical resolution is 98 dpi in standard mode and 196 dpi in fine mode

System Interface

Each digital fax card has a 16-bit edge connector for connection to the system backplane and a top ribbon cable connector for connection to the MVIP bus. The backplane connector carries data between the fax card, CPU, and system hard disks. The MVIP bus carries information between the fax cards and line cards.

Incoming telephone lines (or digital telephony circuits) connect to VoiceMemo line cards. The line cards handle all line supervision and voice transmissions. When a line card detects an incoming fax tone or a caller presses a key to send/receive a fax, the line card requests a fax resource over the MVIP bus. Once a connection with a fax resource is established, the line card passes all fax-related information to the fax card for processing. Received faxes are transferred to the server's hard disk via the system backplane. The Series 6 server tags the stored fax with the called mailbox number for later retrieval by the mailbox owner.

2 Configuration Data

In order for the digital fax card to properly communicate with the servers, you must set jumpers for the card address and a priority interrupt level. You must also set a switch on each card to enable or disable MVIP clock termination.

8-Channel Digital Fax Card

The 8-channel digital fax card (FAX8) consists of two printed circuit cards in a sandwich assembly. The address and interrupt jumpers are on the base card, and the MVIP clock termination switches are on the daughter card, as shown in Figure 2.

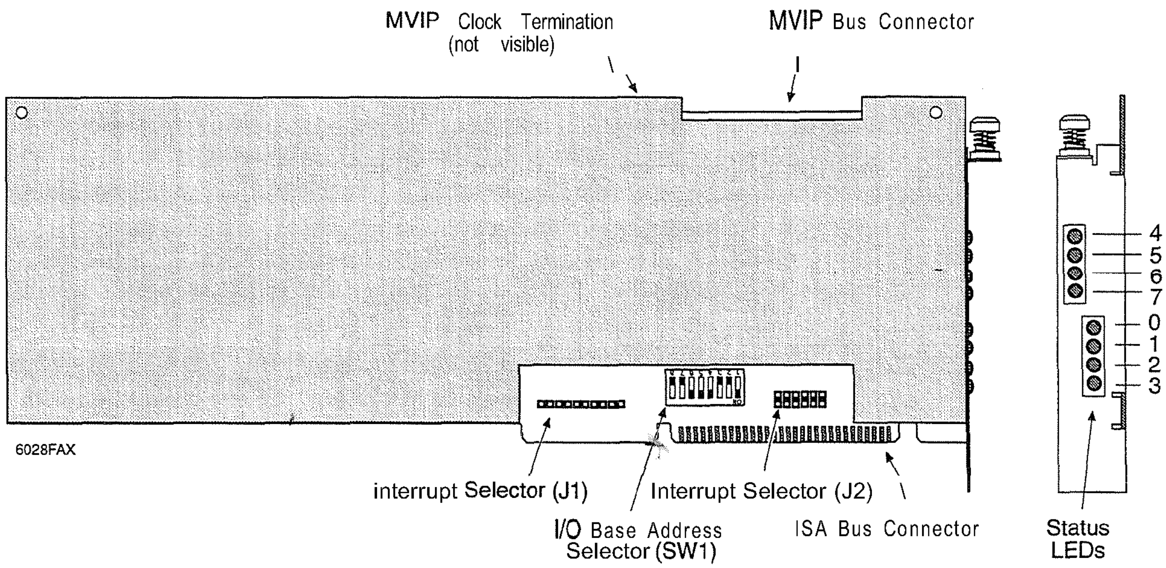
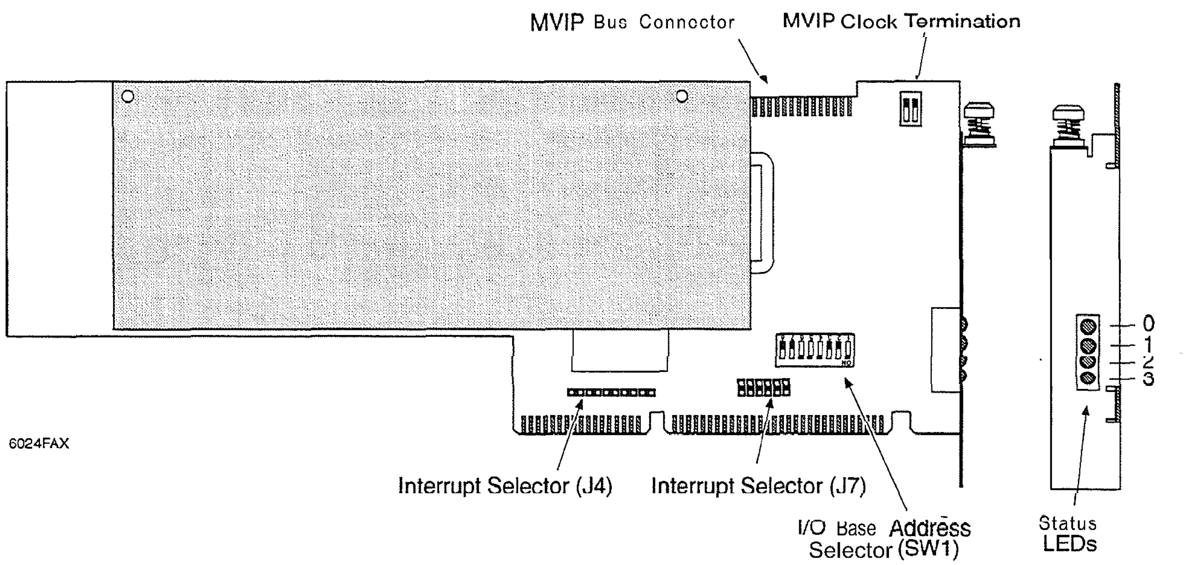


Figure 2 FAX8 Card Jumpers, Switches, and LEDs

The 8-channel card has eight red LEDs that are visible through the card bracket. Each LED is associated with one channel, as shown in the figure.

4-Channel Digital Fax Card

The 4-channel digital fax (FAX4) card consists of two printed circuit cards in a sandwich configuration. The address and interrupt jumpers are on the base card near the ISA bus connector, and the MVIP clock termination switches are near the top of the card next to the MVIP bus connector, as shown in Figure 3.



Figure, 3 FAX4 Card Jumpers, Switches, and **LEDs**

The 4-channel card has four red LEDs that are visible through the card bracket. Each LED is associated with one channel, as shown in the figure.

2-Channel Digital Fax Card

The 2-channel digital fax card (FAX2) is a single printed circuit card that plugs into the system backplane. The address and interrupt jumpers are on the base card near the ISA bus connector, and the MVIP clock termination switches are near the top of the card next to the MVIP bus connector, as shown in Figure 4.

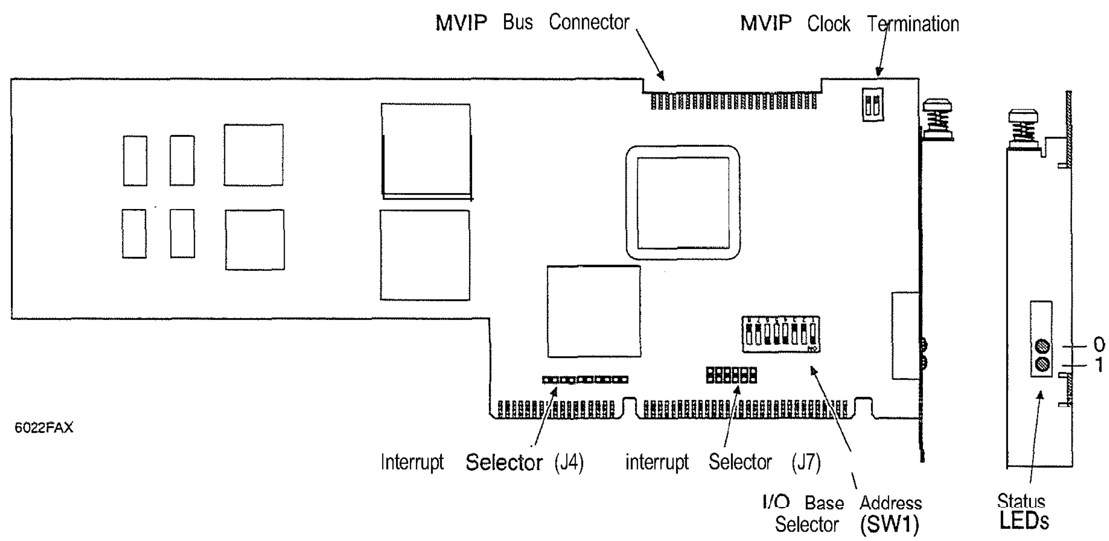


Figure 4 FAX2 Card Jumpers, Switches, and **LEDs**

The 2-channel card has two red LEDs that are visible through the card bracket. Each LED is associated with one channel, as shown in the figure.

Setting the Card Address

Each digital fax card in a server must have a unique address space that does nor overlap the address space of any other card in the module. Each type of fax card (2-, 4-, and 8-channel) requires a different amount of address space. Because a server can contain any combination of cards, you must pay careful attention to setting the card base address.

Table 1 shows the address space required by each fax card as it relates to the base addresses of other fax cards. The top row shows the possible base (starting) addresses for all of the digital fax cards. Each of the other rows shows the address space used by the different cards in different configurations. Note that a card's address space *starts* with the base address, but it may overlap other possible starting addresses and make them unavailable for other cards.

Table 1 Fax Card I/O Address Space

<table>
<tr><th>Base Address→
Fax Card↓</th><th>100</th><th>110</th><th>118</th><th>120</th><th>128</th><th>130</th><th>140</th><th>148</th><th>150</th><th>160</th><th>170</th><th>178</th><th>180</th><th>190</th></tr>
<tr><td>2-Channel</td><td>0</td><td colspan="2">1</td><td colspan="2">2</td><td>3</td><td colspan="2">4</td><td>5</td><td>6</td><td colspan="2">7</td><td>8</td><td>9</td></tr>
<tr><td>4-Channel</td><td colspan="2">0</td><td colspan="3">1</td><td colspan="2">2</td><td colspan="2">3</td><td colspan="2">4</td><td colspan="2">5</td><td>6→</td></tr>
<tr><td>8-Channel</td><td colspan="4">0</td><td colspan="4">1</td><td colspan="3">2</td><td colspan="3">3</td></tr>
</table>

<table>
<tr><th>Addr.→
Fax Card↓</th><th>1A0</th><th>1A8</th><th>1B0</th><th>1C0</th><th>1C8</th><th>1D0</th><th>1D8</th><th>1E0</th><th>220</th><th>250</th><th>268</th><th>278</th><th>280</th><th>2A0</th></tr>
<tr><td>2-Channel</td><td colspan="2">10</td><td>11</td><td colspan="2">12</td><td colspan="2">13</td><td>14</td><td colspan="6"></td></tr>
<tr><td>4-Channel</td><td>→6</td><td colspan="2">7</td><td colspan="3">8</td><td colspan="2">9</td><td>10</td><td>11</td><td colspan="2">12</td><td>13</td><td>14</td></tr>
<tr><td>8-Channel</td><td colspan="4">4</td><td colspan="4">5</td><td></td><td colspan="2">6</td><td colspan="3">7</td></tr>
</table>

When mixing fax port sizes, the rule is that the smallest size fax card must be installed first. If there are a 4-port and an 8-port fax card, the 4-port takes the first selection in its row. Then, the 8-port fax card takes the first non-conflicting configuration from its 8-channel row. See Table 2 for an example of a Model 640 server before and after reconfiguration.

In this example, the Model 640 server has one 8-channel card and one 4-channel card, the 4-channel card has a base address of 100 (hex). The 8-channel card cannot use the first possible address in the 8-channel row because it is in conflict with the address space used by the 4-channel card. The first base address available for the 8-channel card is 128.

If a 2-channel card is later added to the server, it must be the first card configured and it will take address 100. The 4-channel card is next and it takes address 118. The 8-channel is next and it takes address 150.

Table 2 Reconfiguration Example

Before Reconfiguration

Slot	Fax Card	Base Address
7	FAX8 [1]	128 Hex
8	FAX4 [0]	100 Hex

After Reconfiguration

Slot	‘Fax Card	Base Address
6	FAX8 [2]	150 Hex
7	FAX4 [1]	118 Hex
8	FAX2 [0]	100 Hex

Plan out your Fax cards and note what base address each card will have. Card numbers start with card number 0.

Switches 8 through 2 of SW1 set the base I/O address. Tables 3 through 5 show the switch settings for each of the Fax card types. Note that all base addresses are not valid for all card types. The first card in each module must have switch 1 set to on.

CAUTION!

Position 1 of SW1 does not affect the base I/O address. It enables an interrupt pull-up resistor and it must be ON only on the first Fax card of each module. If you have additional Fax cards, set their SW1-1 switches to Off. Depending on the configuration map of your server, the first Fax card in your module is either FAX [0] or FAX [1].

Table 3 I/O Address Switch Settings (FAX2)

Card Number	Base Adds	8	7	6	5	4	3	2	1
FAX2 [0]	100	On	Off	On	On	On	On	On	*
FAX2 [1]	110	On	Off	On	On	On	Off	On	*
FAX2 [2]	120	On	Off	On	On	Off	On	On	Off
FAX2 [3]	130	On	Off	On	On	Off	Off	On	Off
FAX2 [4]	140	On	Off	On	Off	On	On	On	Off
FAX2 [5]	150	On	Off	On	Off	On	Off	On	Off
FAX2 [6]	160	On	Off	On	Off	Off	On	On	Off
FAX2 [7]	170	On	Off	On	Off	Off	Off	On	Off
FAX2 [8]	180	On	Off	Off	On	On	On	On	Off
FAX2 [9]	190	On	Off	Off	On	On	Off	On	Off
FAX2 [10]	1A0	On	Off	Off	On	Off	On	On	Off
FAX2 [11]	1B0	On	Off	Off	On	Off	Off	On	Off
FAX2 [12]	1C0	On	Off	Off	Off	On	On	On	Off
FAX2 [13]	1D0	On	Off	Off	Off	On	Off	On	Off
FAX2 [14]	1E0	On	Off	Off	Off	Off	On	On	Off

Table 4 **I/O** Address Switch Settings (FAX4)

Card Number	Base Adds	8	7	6	5	4	3	2	1
FAX4[0]	100	On	Off	On	On	On	On	On	*
FAX4 [1]	118	On	Off	On	On	On	Off	Off	*
FAX4 [2]	130	On	Off	On	On	Off	Off	On	Off
FAX4 [3]	148	On	Off	On	Off	On	On	Off	Off
FAX4 [4]	160	On	Off	On	Off	Off	On	On	Off
FAX4 [5]	178	On	Off	On	Off	Off	Off	Off	Off
FAX4 [6]	190	On	Off	Off	On	On	Off	On	Off
FAX4 [7]	1A8	On	Off	Off	On	Off	On	Off	Off
FAX4 [8]	1C0	On	Off	Off	Off	On	On	On	Off
FAX4 [9]	1D8	On	Off	Off	Off	On	Off	Off	Off
FAX4 [10]	220	Off	On	On	On	Off	On	On	Off
FAX4 [11]	250	Off	On	On	Off	On	Off	On	Off
FAX4 [12]	268	Off	On	On	Off	Off	On	Off	Off
FAX4 [13]	280	Off	On	Off	On	On	On	On	Off
FAX4 [14]	2A0	Off	On	Off	On	Off	On	On	Off

Table **5** **I/O** Address Switch Settings **(FAX8)**

Card Number	Base Adds	8	7	6	5	4	3	2	1
FAX8 [0]	100	On	Off	On	On	On	On	On	*
FAX8 [1]	128	On	Off	On	On	Off	On	Off	*
FAX8 [2]	150	On	Off	On	Off	On	Off	On	Off
FAX8 [3]	178	On	Off	On	Off	Off	Off	Off	Off
FAX8 [4]	1A0	On	Off	Off	On	Off	On	On	Off
FAX8 [5]	1C8	On	Off	Off	Off	On	On	Off	Off
FAX8 [6]	250	Off	On	On	Off	On	Off	On	Off
FAX8 [7]	278	Off	On	On	Off	Off	Off	Off	Off

Figure 5 shows the switches of SW1 set for a base I/O address of 100 hex and configured as a *first* Fax card with the interrupt pull-up switch set to On. The switches are numbered 8 to 1, from left to right across the top of the SW1 casing.

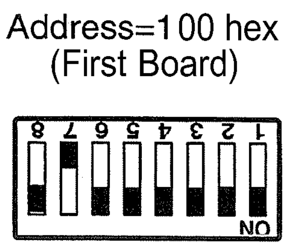


Figure 5 SW1 Set For Base I/O Address 100 Hex

Setting the Hardware Interrupt

All digital fax cards installed in a server share interrupt 12. Jumpers J1 and J2 on 8-channel fax cards and jumpers J4 and J7 on 2- and 4-channel fax cards selects the interrupt.

To set the interrupt, place a jumper on the pair of pins labeled-" 12" on the card. Make sure that no other jumpers are installed on the interrupt-selection jumper blocks. Figure 6 shows jumper J 1 set to interrupt 12 on an 8-channel fax card.

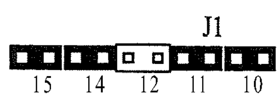


Figure 6 J1, on 8-channel fax card, set to interrupt 12

Setting the MVIP Clock Termination Switch

A two-position DIP switch controls termination for the MVIP clock signals. On the 8-channel daughter card, the switch is located on the card's top edge, near the MVIP connector. On 2- and 4-channel cards, the DIP switch is located on the base card's top right edge, near the bracket.

Set both DIP switches to ON on the digital fax card at the end of the MVIP bus. Set both DIP switches on all other digital fax cards to OFF.

Note: The connectors at both ends of the MVIP cable must be attached to circuit cards. Clock termination must be set on these and only these cards.

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's Installation *and Service Manual.*

This card is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to *the Service Card Hardware* Configuration *Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements
3. Refer to your server's *Installation and Service Manual* for correct instructions on how to remove and replace cards.

4 Base-System Components

This chapter provides Technical References for *Base-System Components.*

Technical References

Use the technical references to find detailed background information about the hardware components of a Centigram Series 6 server. These are: the Model 640, the Model 120, and the Model 70.

How to Use This Chapter

Identify the *Base-System Components* that you want to study. Go to the "List of Technical References" in this chapter and identify their technical reference number. The references are listed in numerical order in the "List of Technical References" table.

If you remove a technical reference from this binder, mark its original location, and replace it when you are finished with the document.

4 Base-System Components
List of Technical References

Tech. Ref. Number	Title	Document Rev.	Release Number
TR 1912	CPU (Pentium) Card	Doc. Rev. A	6.0A
TR 1913	CPU (486) Card	Doc. Rev. A	6.0A
TR 1914	MCB II Card	Doc. Rev. A	6.0A
TR 1915	QNet/MESA-Link Card	Doc. Rev. A	6.0A
TR 1916	SCSI Interface Card	Doc. Rev. A	6.0A
TR 1927	SCSI Bus Configurations	Doc. Rev. A	6.0A
TR 1934	CPU (486) Motherboard	Doc. Rev. A	6.0A

CPU (Pentium) Card
Technical Reference

This technical reference provides information for the Pentium central processing unit (CPU) card used in the Centigram Series 6 Communications server Model 640 and Model 120S. It provides a brief description of the card, configuration data, and installation guidelines.

1 Introduction

The central processing unit (CPU) card used in the Model 640 and the Model 120S (Figure 1) is a low-power single board AT compatible unit that offers high speed performance on a single full-size AT form factor card. This card supports an Intel Pentium microprocessor running at 100 MHz.

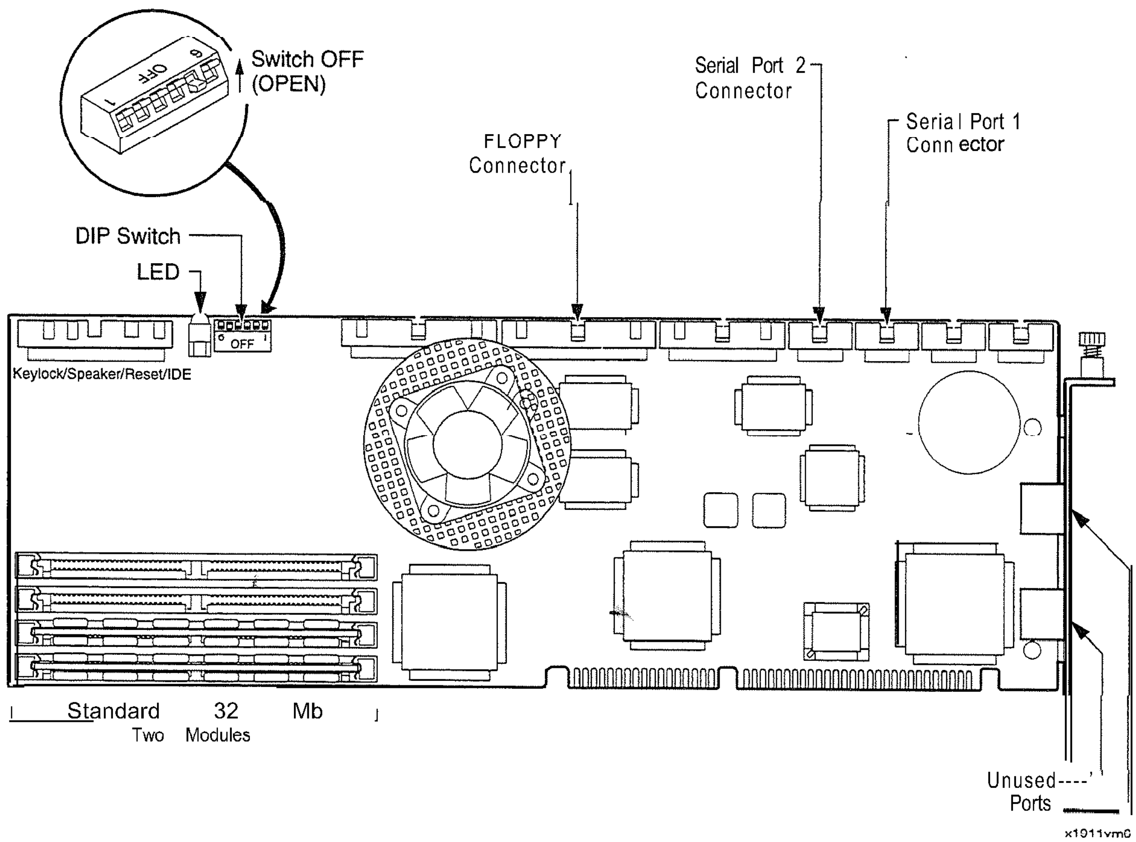


Figure 1 CPU (Pentium) Card

2 Configuration Data

In order for the Pentium CPU Card to properly work with the server, you must configure the card to comply with the data given in the following paragraphs.

DIP Switch Settings

The DIP switch shown in Figure 2 is a six-position switch that controls various internal functions of the CPU card. The six switches have two positions: OFF (open) or ON (closed). When position 5 of this switch is set to ON, the processor supplies a signal that enables watchdog timer interrupts. This, however, may have the effect of interfering with interrupts generated by the alarms subsystem of the Model 640. Therefore, when configuring the CPU card, do as follows:

- In the Model 640, set all six switches to OFF.
- In the Model 120S, set switch 5 to the On position; all other switches to OFF.

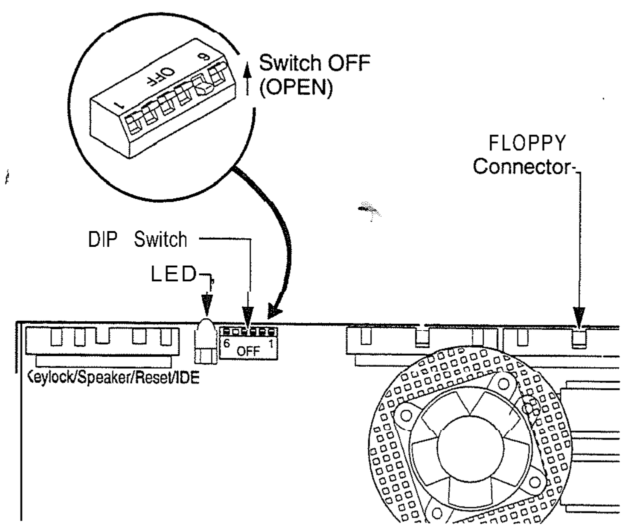


Figure 2 CPU Card's DIP Switches

Memory Configuration.

The Pentium CPU card's memory (Figure 3) is configured as follows:

- A minimum RAM memory default of 32 megabytes must be installed.
- An additional RAM memory option of 32 megabytes, for a total of 64 megabytes, might be installed.

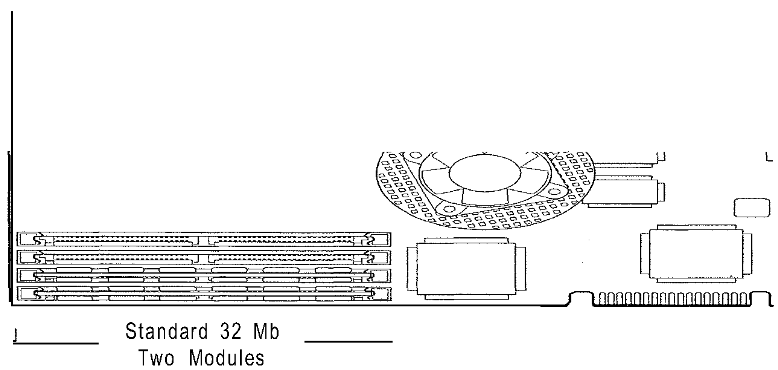


Figure 3 Location of Memory Modules

Cables and Connectors

CAUTION!

While installing the card and its cables, ensure that the Pentium CPU's fan is not blocked by these cables or other obstructions and it is free to spin.

The CPU Card users two different sets of connectors (Figure 4), depending on which server is used:

- In the Model 640, the "Reset/Speaker" cable connects between P3 on the backplane and the Speaker (P2) and Reset (P3) connectors on the CPU card. The Floppy cable connects to the backplane connector labeled "FLOPPY" and the two serial ports connect to the backplane connectors, which should be labeled "SER 1" and "SER 2." Serial Port 1 is the third outermost connector; Serial Port 2 the fourth.

- In the Model 120S, the 16-pin connector that comes from the front panel of the unit connects to the CPU card connector labeled "Keylock/Speaker/Reset/IDE." The floppy and serial port cables are labeled.

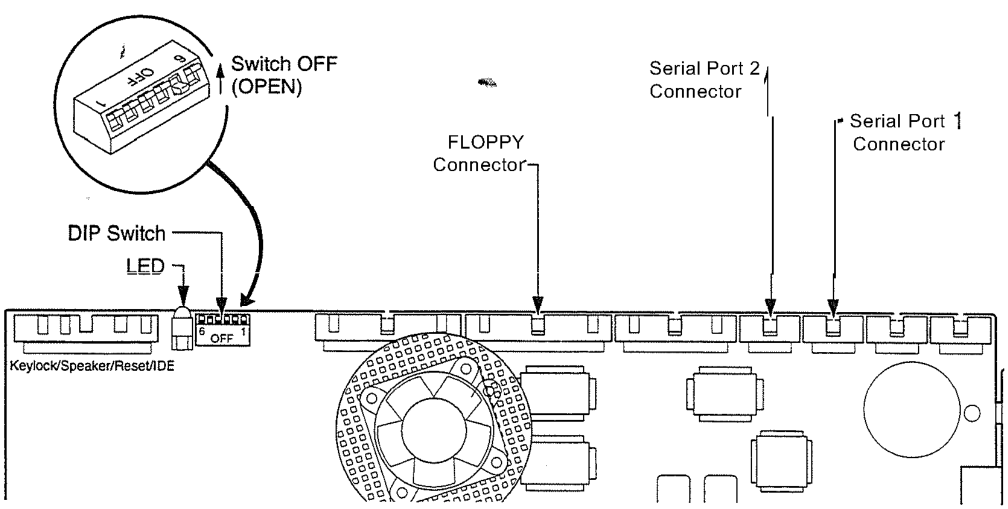


Figure 4 Location of Connectors

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's *Installation and Service Manual.*

This card is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to *the Service Card Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements
3. Refer to your server's *Installation and Service Manual* for correct instructions on how to remove and replace cards.

CPU (486) Card Technical Reference

This technical reference provides information for the CPU (486) Card used in the Centigram Series 6 server Model 1201. It provides a brief description of the card, configuration data, and installation guidelines.

1 Introduction

The central processing unit (CPU) card used in Model 1201 servers (Figure 1) is a low-power single board AT compatible unit that offers high speed performance on a single full-size AT form factor card. This card supports a 80486 microprocessor running at 33 MHz.

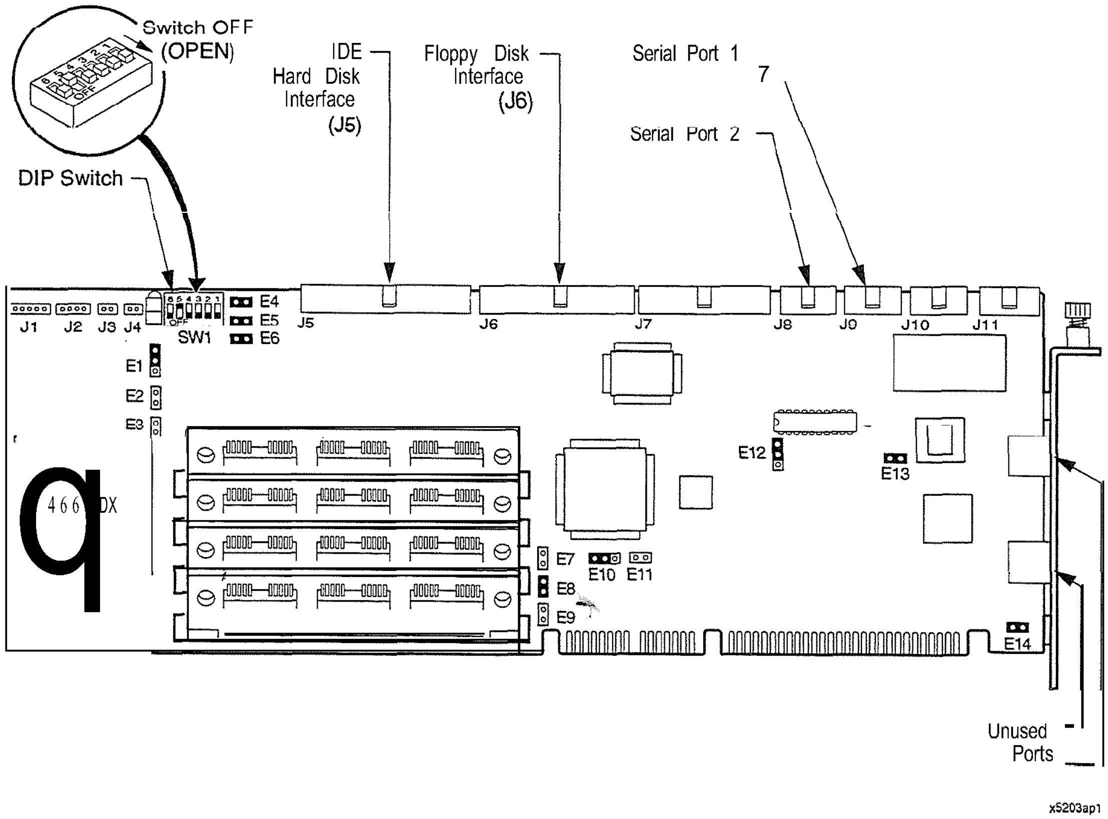
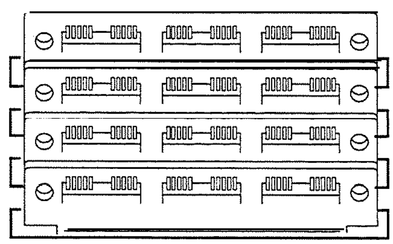


Figure 1 CPU (80486) Card

Onboard Memory

The CPU card uses low density SIMMs (Serial In-line Memory Modules) to allow user selection of on-board memory capacities between 16 and 24 megabytes.

SIMMs are small circuit cards that fit into the memory expansion slots of the CPU board. Typically, each SIMM supports either 4 or 16 megabytes each. Figure 2 shows a four-bank of memory with two banks filled with SIMMs.



1271cpu

Figure 2 **SIMMs** Installed

Input/Output Ports

Figure 3 shows the input/output (I/O) ports available on the 486 CPU card.

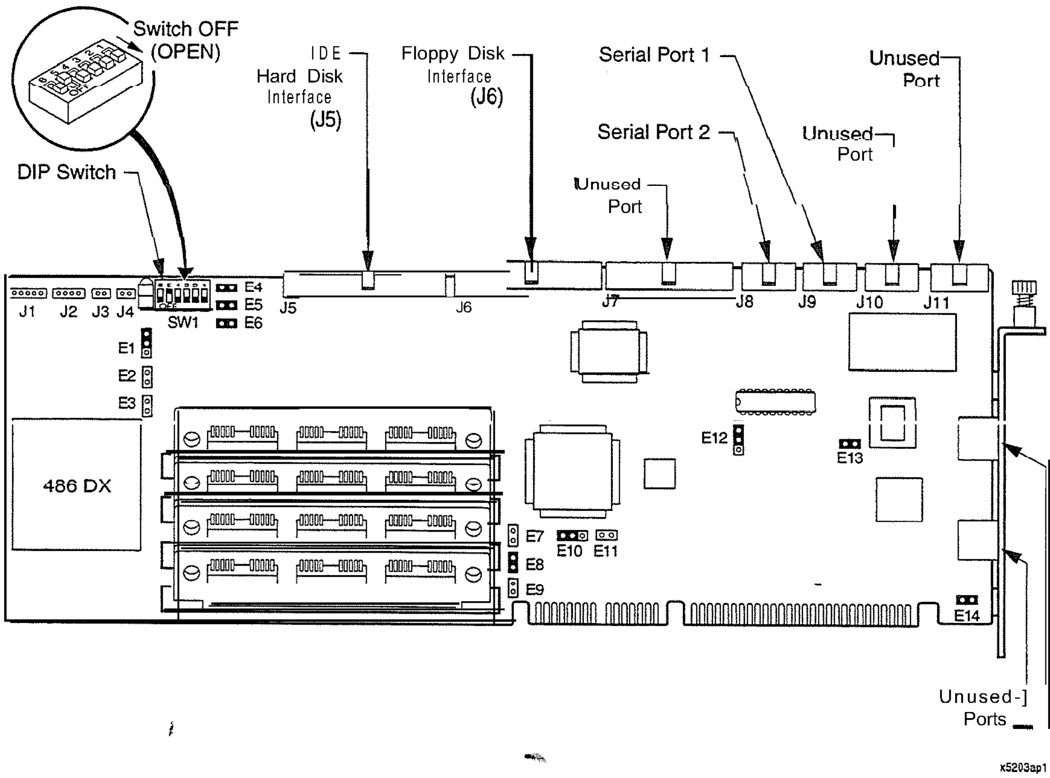


Figure 3 Input/Output Ports

The CPU card provides a hardware Reset port at J3. This input is designed for a switch closure input and it is debounced and buffered to make it ready for direct connection to a switch.

2 Configuration Data

The CPU cards are fully configured at the factory, and there is no need for re-configuration in the field. However, before installing a replacement card, you should ensure that the spare card has the same memory capacity installed.

The CPU card supports four banks of SIMM memory packages (Figure 4). Memory upgrades must be done following Table 1 and must be installed beginning with Bank 0. The are no jumpers that need to be set. However, SIMMs are static-sensitive and are easily damaged. You should refer to your *Installation and Service Manual* for correct upgrade instructions.

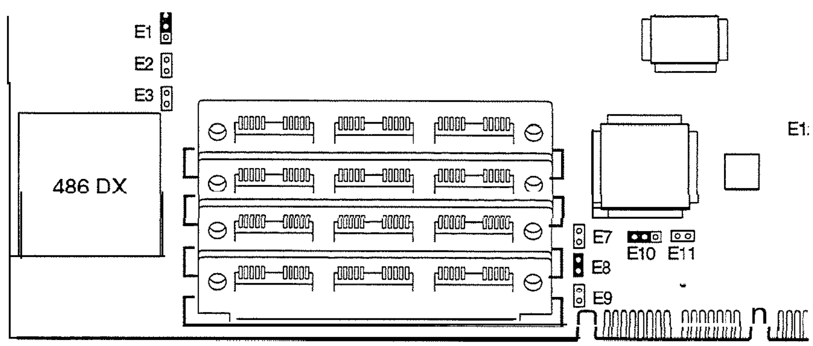


Figure 4 CPU Memory Banks

Table 1 Valid Memory Combinations

Memory Capacity	Bank 0	Bank 1	Bank 2	Bank 3
16 MB	16MB (4Mx36)	—		
24 MB	4 MB (1Mx36)	4 MB (1Mx36)	16MB (4Mx36)	

Ccables and Connectors

The CPU Card plugs into slot 0 on the Model 1201 system backplane. A series of ribbon cables connects the CPU card to the IDE hard disk (J5), floppy disk (J6), and two serial ports (J8/J9). If these connectors are not labeled, Serial Port 1 is the outermost connector and Serial Port 2 the innermost. A series of labeled wires also connects the CPU card to the keylock (J1), speaker (J2), reset (J3) and IDE (J4) connectors.

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's *Installation and Service* Manual.

This card is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to the *Service* Card *Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements
3. Refer to your server's Installation and Service Manual for correct instructions on how to remove and replace cards.

This technical reference provides information for the MCB II used in the Centigram Series 6 Communications server Model 640. It provides a brief description of the card, configuration data, and installation guidelines.

1 Introduction

2 Configuration Data

3 Installation Guidelines

1 Introduction

The Monitor Control Board II (MCB II) is a 16-bit ISA-compatible card that installs on the back of the Model 640 system backplane. See Figure 1 for a view of the card.

The MCB II provides four on-board connections for four plug-in SCSI daughter boards. Each SCSI daughter board can support up to eight devices (host, disk, or other SCSI compatible devices) to allow data transfers between the CPU, line cards, and hard disk drives.

The SCSI daughter board also allows future upgrades with minimal or no impact to the MCB II. In addition, the MCB II implements the third generation NCR53C720 SCRIPTS-based SCSI controller with bus mastering capability.

The MCB II provides on-board voltage, fan and temperature monitoring, and alarms for increased systems diagnostics capability. Serial ports are provided to allow various serial devices to be used (such as console port, printers, and modems). For system diagnostics, on-board, non-volatile RAM allows error messages or other system parameters to be stored even after the server has been powered down.

A front panel user interface provides four serial port connectors, reset switch, remote reset input, remote alarms, system alarms, and LEDs. The LEDs provide visual monitoring of system parameters such as power, SCSI bus and system activity, and error'reporting as CRItical, MAJor and MINor LED s. Refer to the Diagnostic Manual for more details about the alarms.

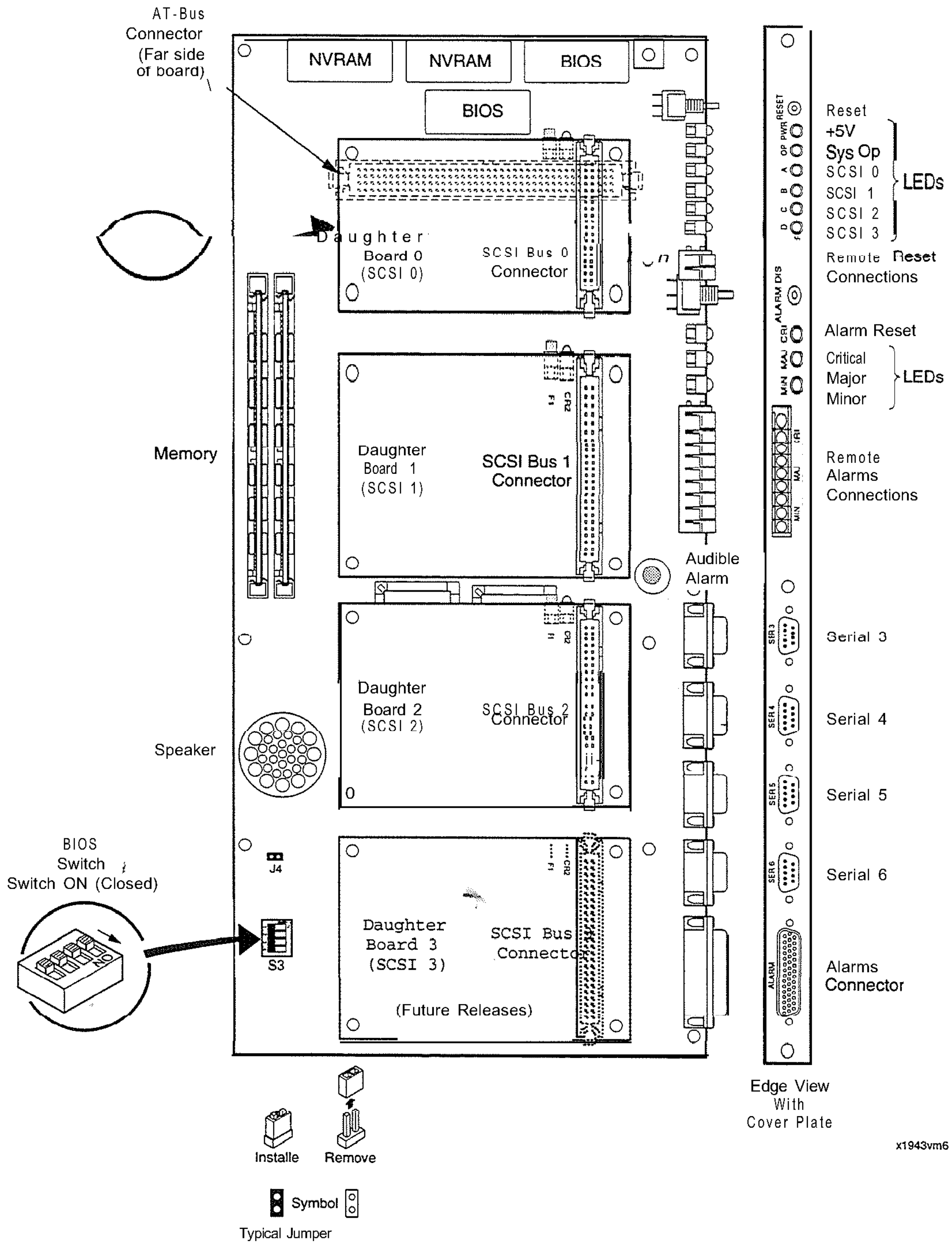


Figure 1 MCB II Card

The MCB II card incorporates the following features:

- 16-bit AT interface for greater bandwidth
- Four asynchronous serial ports
- Four Small Computer Systems Interfaces (SCSI).
- From four to eight megabytes of local DRAM with parity using 1M x 36 SIMMs memory modules.
- 128k x 8 Non-volatile memory store, expandable to 256k x 8
- Hardware systems monitoring (Audible alarms, error conditions, remote alarms, voltages and power, glitch detection, system fuses, fans, temperature)
- Reset logic
- PC Speaker interface
- SCSI BIOS with selectable base addresses
- Card ID Register

2 Configuration Data

The MCB II Card is fully configured at the factory and there is no need for re-configuration in the field. However, before installing a spare card, you should be familiar with the items discussed below.

LED Indications

LED indicators provide the status/error messages shown in Table 1.

Table 1 LED Indications

MCB II LED	Alarm Severity
Red	Critical
Yellow	Major
Green	Minor

Jumpers and Switches

All jumpers and switches are set according to specific system parameters. There is one j&per and one bank of four switches on the MCB II card. Functions and settings are as follows:

- Jumper J4 controls the PC-compatible speaker, and it is shipped in the "enabled" position (ON).

- The BIOS address switch (S3) is a four-position switch that controls the BIOS address and the alarm. Positions 1 through 3 define the BIOS address and must be set to OFF. Position 4 enables (OFF) or disables (ON) t h aud'bl e a arm during system power up. The default setting for this switch is in the Off position (Figure 1).

User Interface Connectors

After a card is installed and fully functioning, the following connectors provide user interface operations:

- Four 9-pin D-type female connectors provide DCE connections to serial ports
- One D-type, 44-pin, high-density connector for alarm
- Spring terminals provide connection to the Alarm Terminal and the Remote System Reset
- Alarm disable switch disables the alarm
- Manual reset switch resets the server

Model 640 Cable Connections

If you need to replace the MCB II, refer to Figure 2, which shows all MCB II connectors, and where they connect on the server. The figure also shows a detail of how one of the plug-in SCSI daughter boards installs on the main-board.

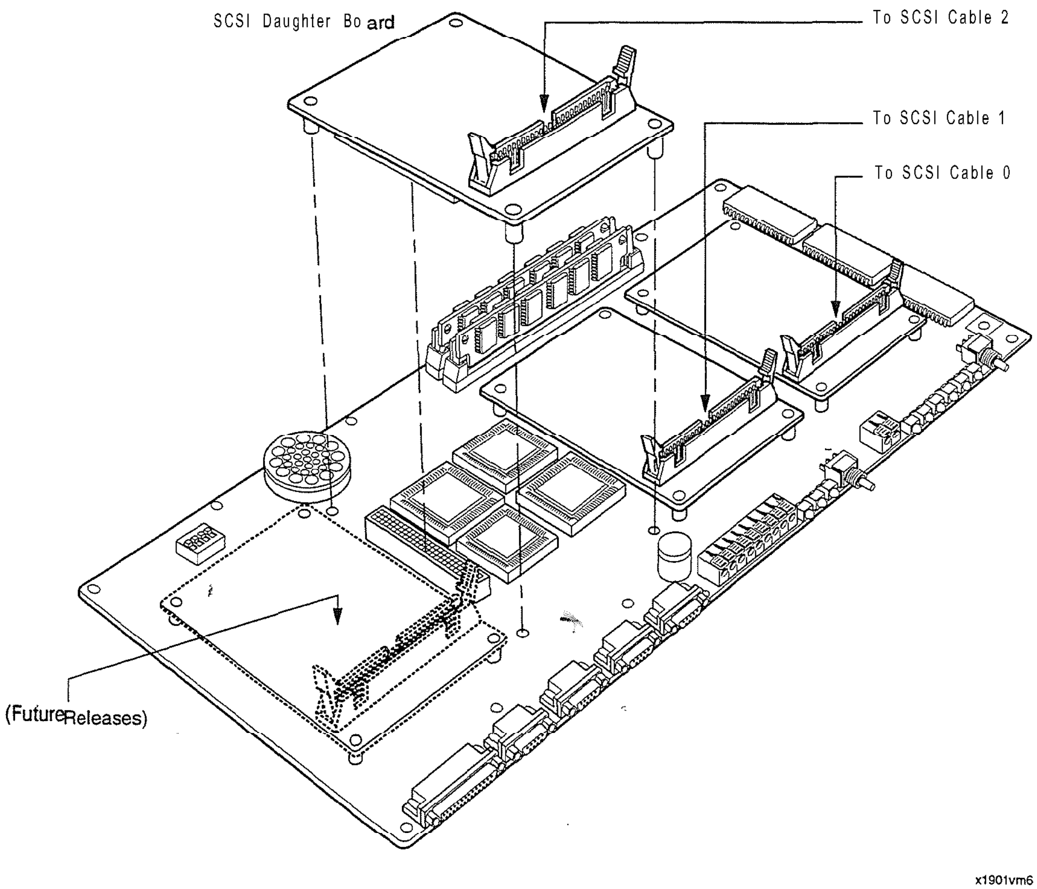


Figure 2 Model 640 Connections

SCSI Bus Fuses and LEDs

The SCSI daughter boards are not field replaceable. However, there is a fuse on each daughter board that protects the respective SCSI controller integrated circuit (IC). An LED on each daughter board indicates whether or not there is activity on the associated SCSI bus. If you experience problems and this LED is not lighted, you might want to check the fuse. The part number for the fuse is 2 1 SO-00 19-02. See Figure 3 for a detail of the daughter board.

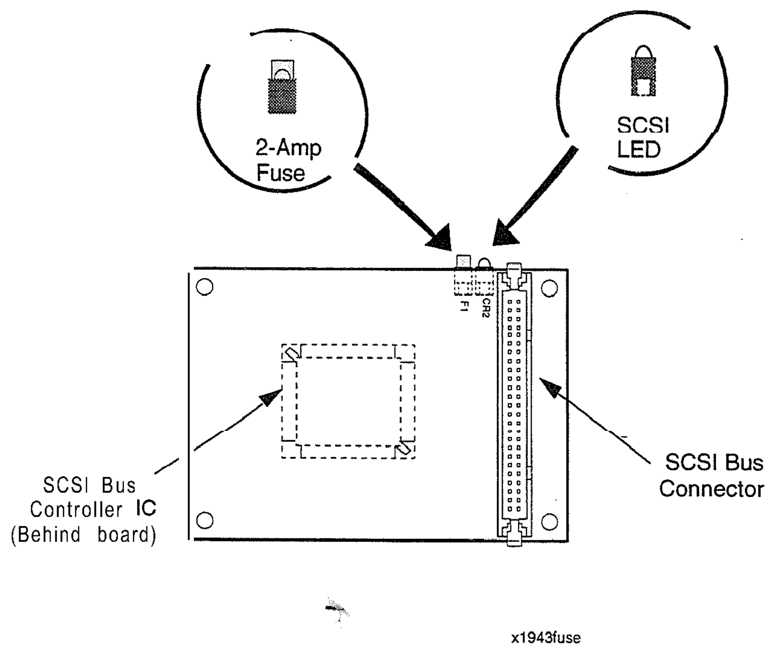


Figure 3 MCB II Daughter Board Detail

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's Installation and Service Manual.

This card is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to the *Service Card Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements
3. Refer to your server's Installation and Service Manual for correct instructions on how to remove and replace cards.

QNet/MESA-Link Card Technical Reference

This technical reference provides information for the QNet/MESA-Link Card(s) used in the Centigram Series 6 Communication servers to support the Redundant MESA-Link feature. It provides a brief description of the cards, configuration data, and installation guidelines. These cards are used in the Model 640.

1 Introduction

Redundant MESA-Link provides a fault tolerant QNet connection for VoiceMemo to increase operational reliability. This feature uses two QNet cards in each module. The first card is the prima y QNet card (Figure 1) and the second card is the *redundant* QNet card (Figure 2).

Figure 1 shows a QNet card with its address switch set for a "primary" BIOS address of CEOO. This card's BIOS is configured at the factory for IRQ7.

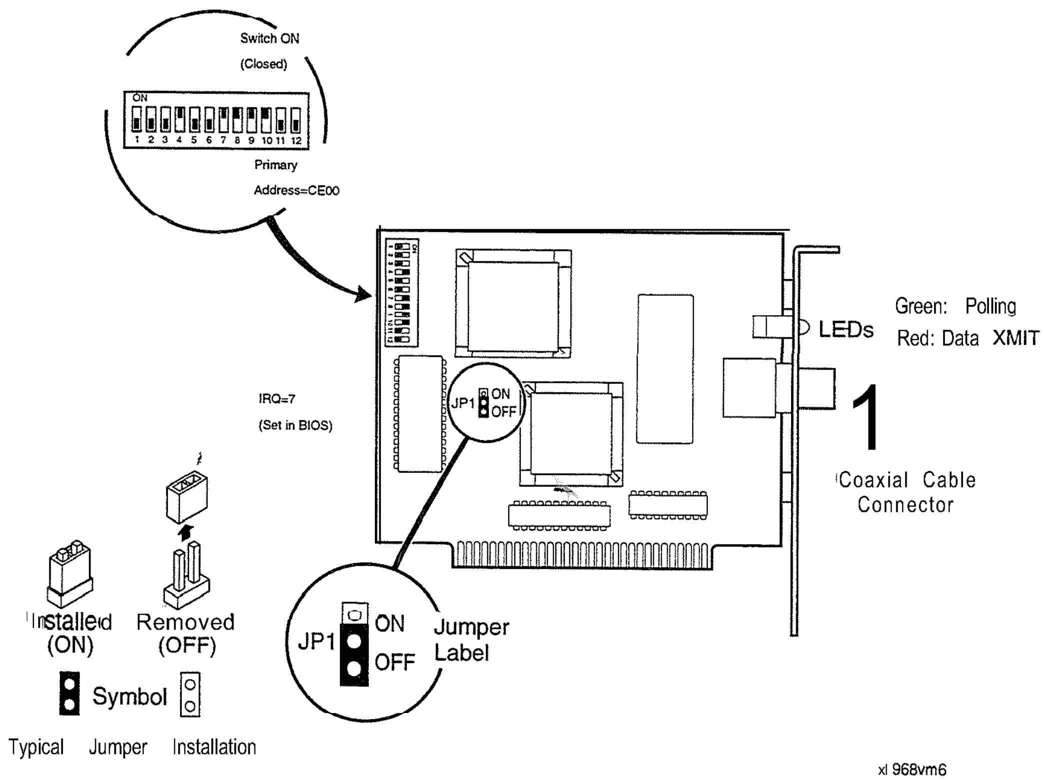


Figure 1 Primary **MESA-Link/QNet Card**

With Redundant MESA-Link, a single point of failure (i.e., fault in a MESA-Link cable or card) does not affect system operation. Essentially, the two network links are functionally equivalent. It is therefore technically possible to configure a system with only the redundant link.

The QNet card provides high speed communications among servers. This card uses the ARCNET protocol as its physical transport layer to connect two or more modules.

Figure 2 shows a QNet card with its address switch set for a "redundant" BIOS address of DEOO. This card's BIOS is configured at the factory for IRQ5.

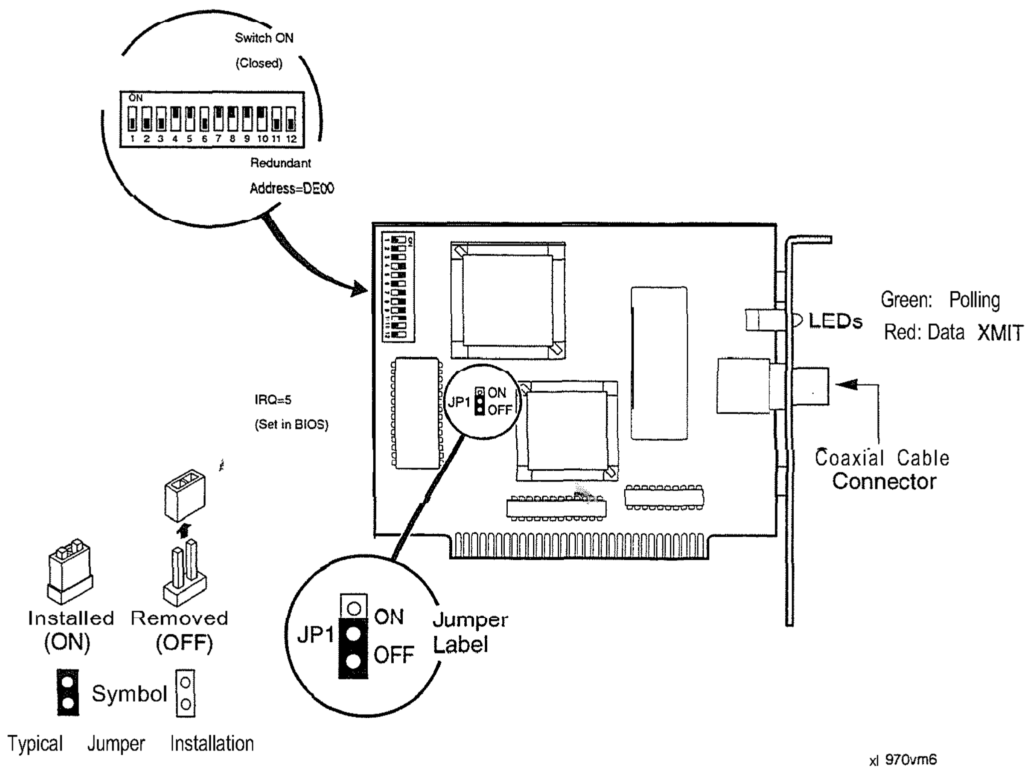


Figure 2 Redundant **MESA-Link/QNet** Card

2 Configuration Data

To setup Redundant MESA-Link, a redundant QNet card, in addition to the primary QNet card, is needed to plug into each module. The redundant QNet card's physical node ID is set to 32 plus its corresponding primary node ID. That is, node ID 33 is the redundant QNet card for module 1, node ID 34 is for module 2, node ID 35 is for module 3, and node ID 36 is for module 4.

When system POST (power-on-self-test) is executing, you will see node ID "32 + *n*" and node ID "*n* "on module *n* one after the other on the console.

Addresses and Interrupts

It is very important to set the redundant QNet memory address properly before plugging it into a module. All the primary QNet cards must be set to address CEO00 with IRQ 7 and all the redundant QNet cards must use DE000 with IRQ 5. Additionally, at least one of the QNet cards must have a Version 2.6 (or later) EPROM firmware installed; otherwise, the module will not boot up.

Redundant MESA-Link is only supported in servers running VoiceMemo Release 6.0 or later. The redundant QNet cards should be configured before being plugged into any module. A separate network link (cabling) is required to connect the redundant QNet cards together. Once the hardware is configured and installed, the server will automatically start the QNet software drivers appropriately during system boot-up.

Coaxial Cables

When connecting VoiceMemo modules, a low impedance (93 ohms) low capacitance coaxial cable (RG 62/U) must be used. When connecting more than four modules, an active hub is required. On all hubs, unused connectors must be capped.

CAUTION!

Do not use 50 ohm Ethernet cable (RG 8 or RG 58). Also, do not use 75 ohm T1 cable (RG 59 or RG 6/U)

Spares

QNet cards can be stocked as primary spares and redundant spares. It is not necessary to perform any software configuration. They are pre-set the Centigram factory. Then, when a card is needed, it can be programmed for a specific module in the field when instructed by Centigram Technical Assistance Center (TAC).

CAUTION!

If your QNet card fails and you need to install a new spare card, contact TAC for instructions on how to program the spare card. Do not change anything unless instructed by TAC.

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's *Installation and Service Manual*

This card is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to *the Service Curd Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements
3. Refer to your server's *Installation and Service Manual* for correct instructions on how to remove and replace cards.

This technical reference provides information for the SCSI interface card used in the Centigram Series 6 server Model 120S. It provides a brief description of the card, configuration data, and installation guidelines.

1 Introduction

2 Configuration Data

3 Installation Guidelines

1 Introduction

The SCSI interface card (Figure 1) is required in Model 120S. It is a single half-size AT form factor card that supports the SCSI hard drives.

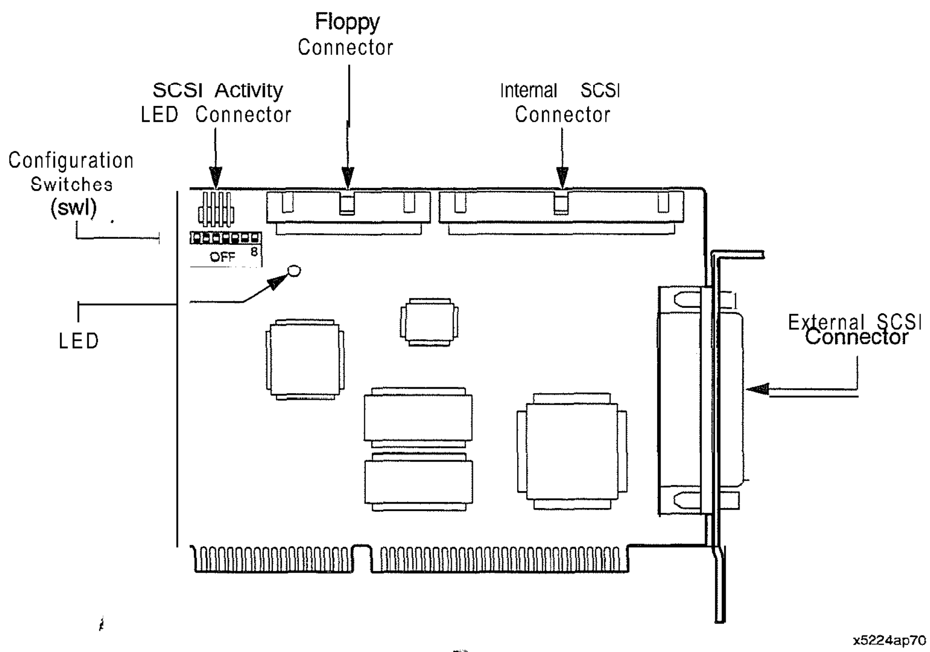


Figure 1 **SCSI** Interface **Card**

2 Configuration Data

The SCSI interface card is pre-configured at the Centigram factory and it is ready to install upon shipment. However, it is a good field practice to double check the card's configuration. Before you install a new card, be sure it is configured according to the specifications in Table 1.

Table 1 **SCSI Interface Card Configuration Settings**

DIP	Position	Function
1	Open	Termination: Software controlled
2	Open	
3	Open	Identify I/O port = 330H
4	Open	
5	Closed	Disable Floppy Circuit
6	Closed	
7	Open	BIOS Address C8000H
8	Closed	

The following interrupt settings require a special software program. For detailed instructions, contact TAC .

IRQ: 9
DMA Channel: 5
SCSI ID: 7

The SCSI interface card can connect to Model 120S only. It uses a 50-pin IDC-type internal SCSI connector cable.

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's *Installation and Service Manual.*

This card is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the card's configuration. Before you install a new card, you should follow these guidelines.

1. Refer to *the Service Card Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
   - Card configuration and installation guidelines
   - Card configuration rules and maps
2. Read the Configuration Data section above. That section provides:
   - Jumper and switch setting information specific to your card
   - If applicable, interface requirements
3. Refer to your server's Installation and Service Manual for correct instructions on how to remove and replace cards.

SCSI Bus Configurations
Technical Reference

This technical reference provides configuration and cabling information for the SCSI buses used in the Centigram Series 6 Communication server Model 640. This information is provided with figures that clearly show connections between modules as well as terminations.

Although the Floppy Disk drive is not part of the SCSI bus, a diagram showing the floppy cable connections between the Storage Assembly and the CPU Assembly is shown in this section.

Note: For systems with snap-down connectors, push the connector firmly onto the module assembly until a "click" is heard. For systems with screw down connectors, push the connector firmly onto the module assembly, then finger tighten the screws.

SCSI Bus Cabling

Floppy Disk Cabling

SCSI Bus Cabling

This section deals with the SCSI bus cabling for one, two, three, and four module servers.

One Module

Figure 1 shows the physical connections for the SCSI cables and terminators used with a Model 640 one-module server.

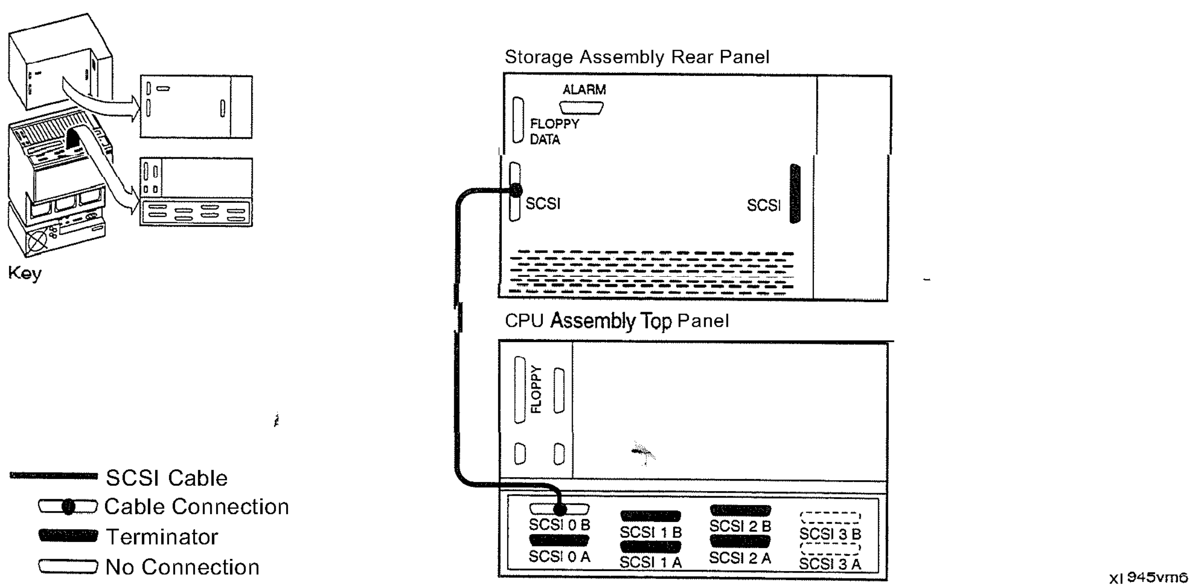


Figure 1 One Module SCSI Cables

Two Modules

Figure 2 shows the physical connections for the SCSI cables and terminators used with a Model 640 two-module server in a horizontal configuration.

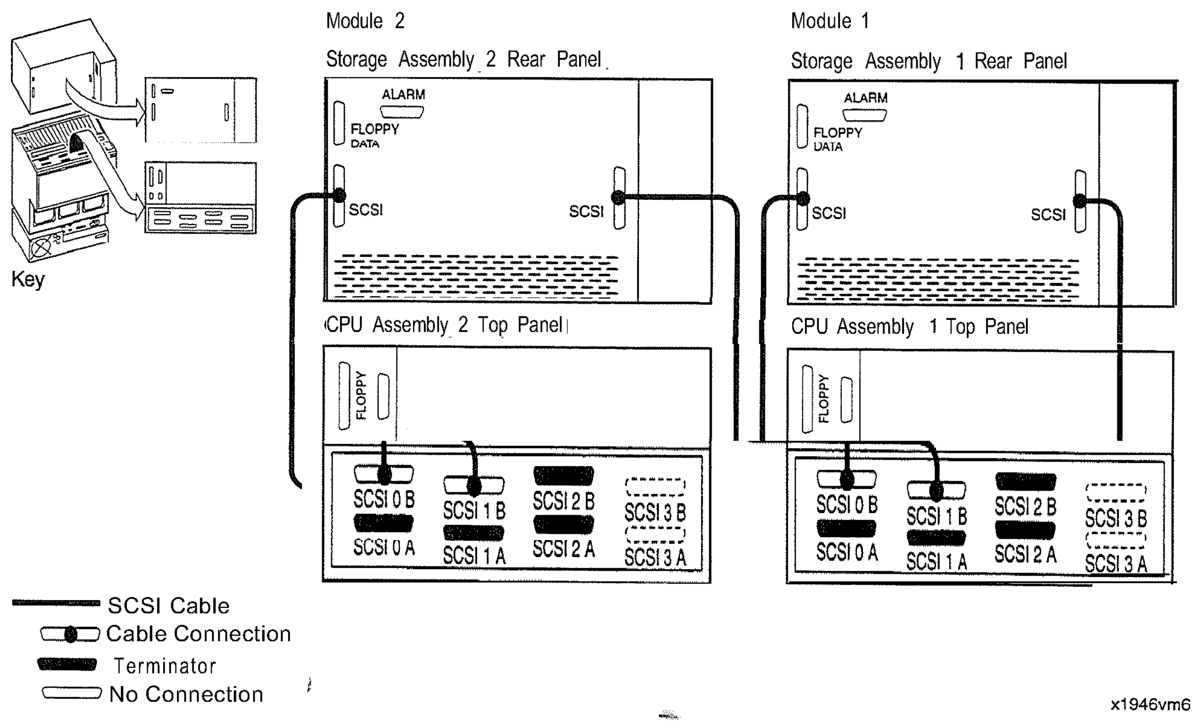


Figure 2 Two Modules SCSI Cables--Horizontal

Figure 3 shows the physical connections for the SCSI cables and terminators used with a Model 640 two-module server in a vertical configuration.

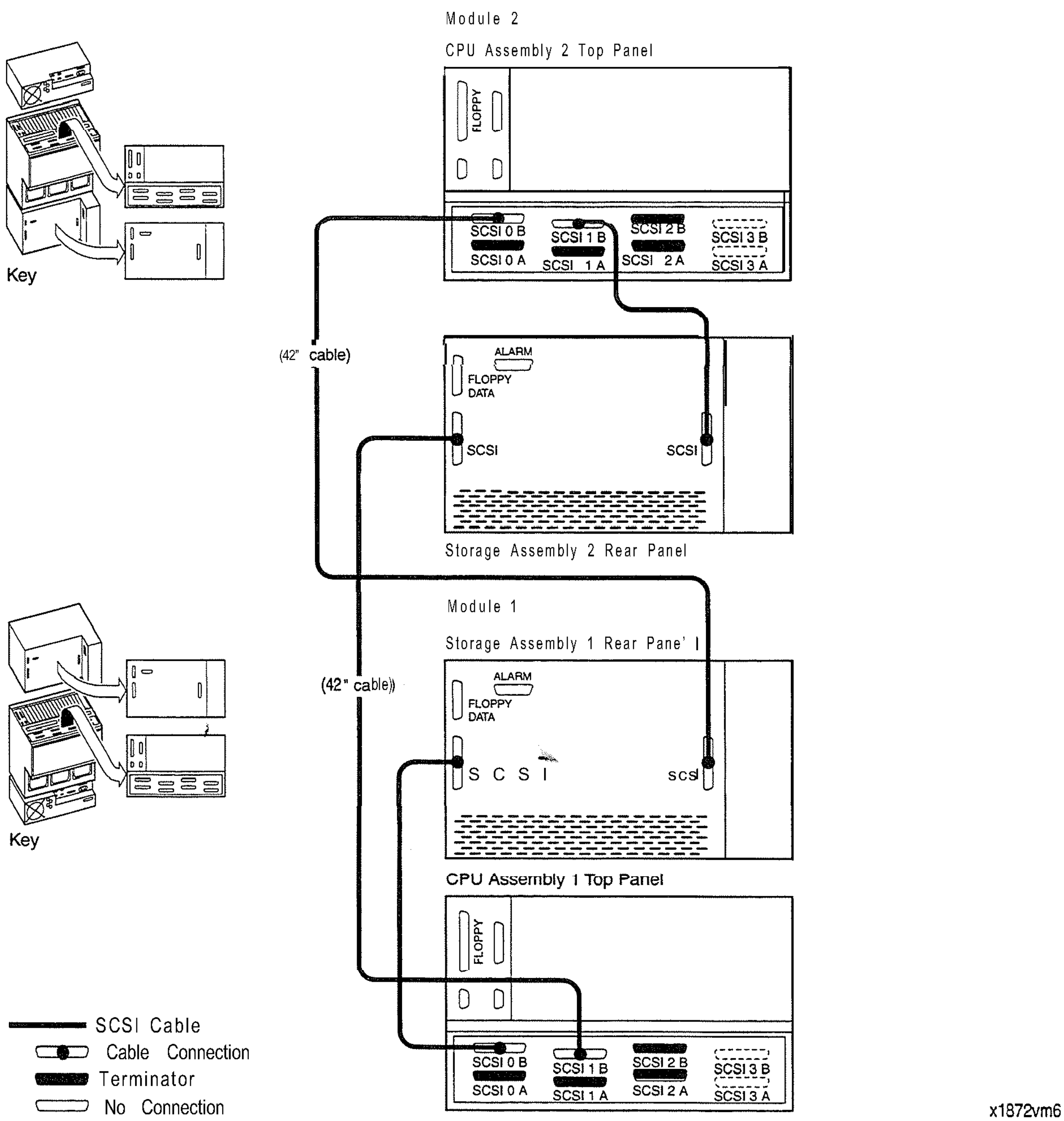


Figure 3 **Two Modules SCSI Cables--Vertical**

Three Modules

Figure 4 shows the physical connections for the SCSI cables and terminators used with a Model 640 three-module server in a horizontal configuration.

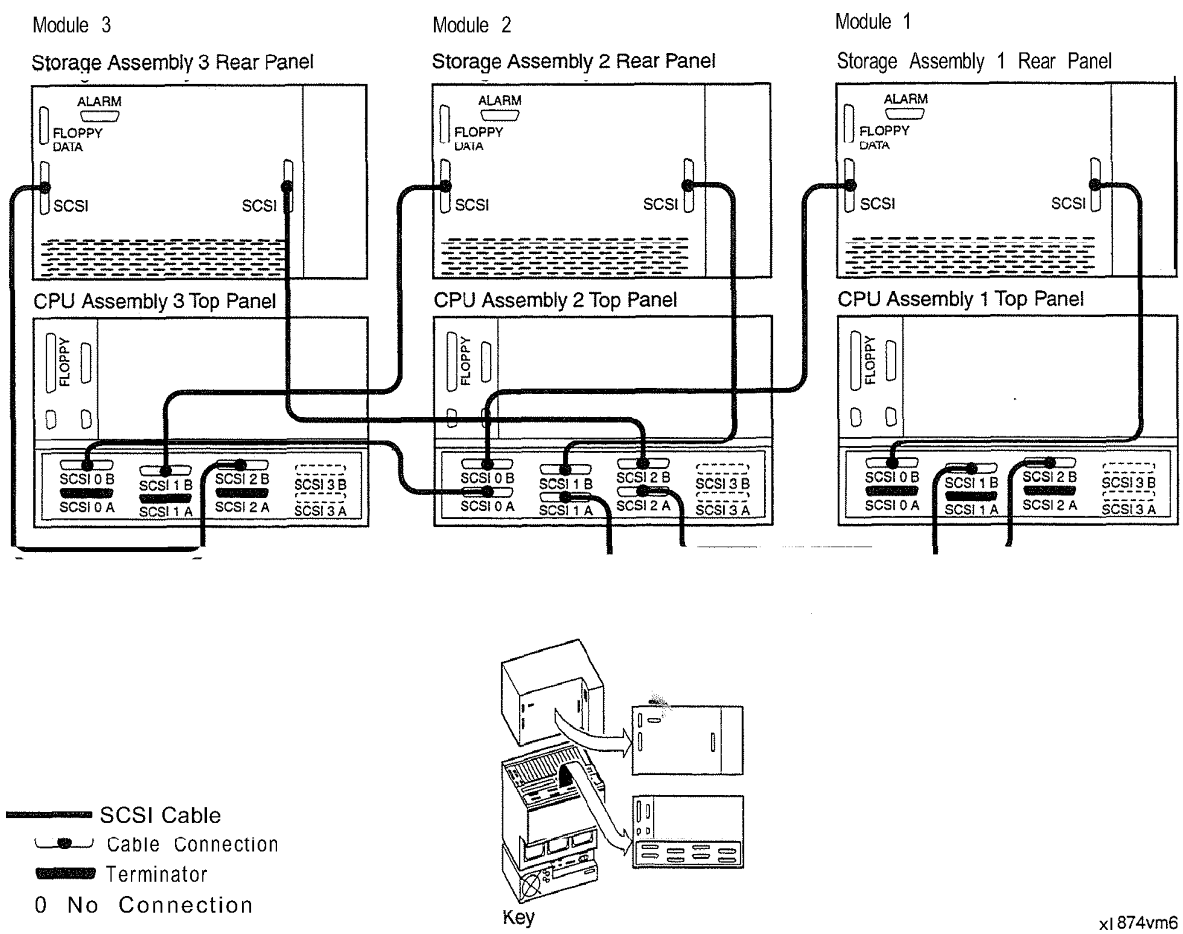


Figure 4 Three **Modules SCSI Cables--Horizontal**

Figure 5 shows the physical connections for the SCSI cables and terminators used with a Model 640 three-module server in a vertical configuration.

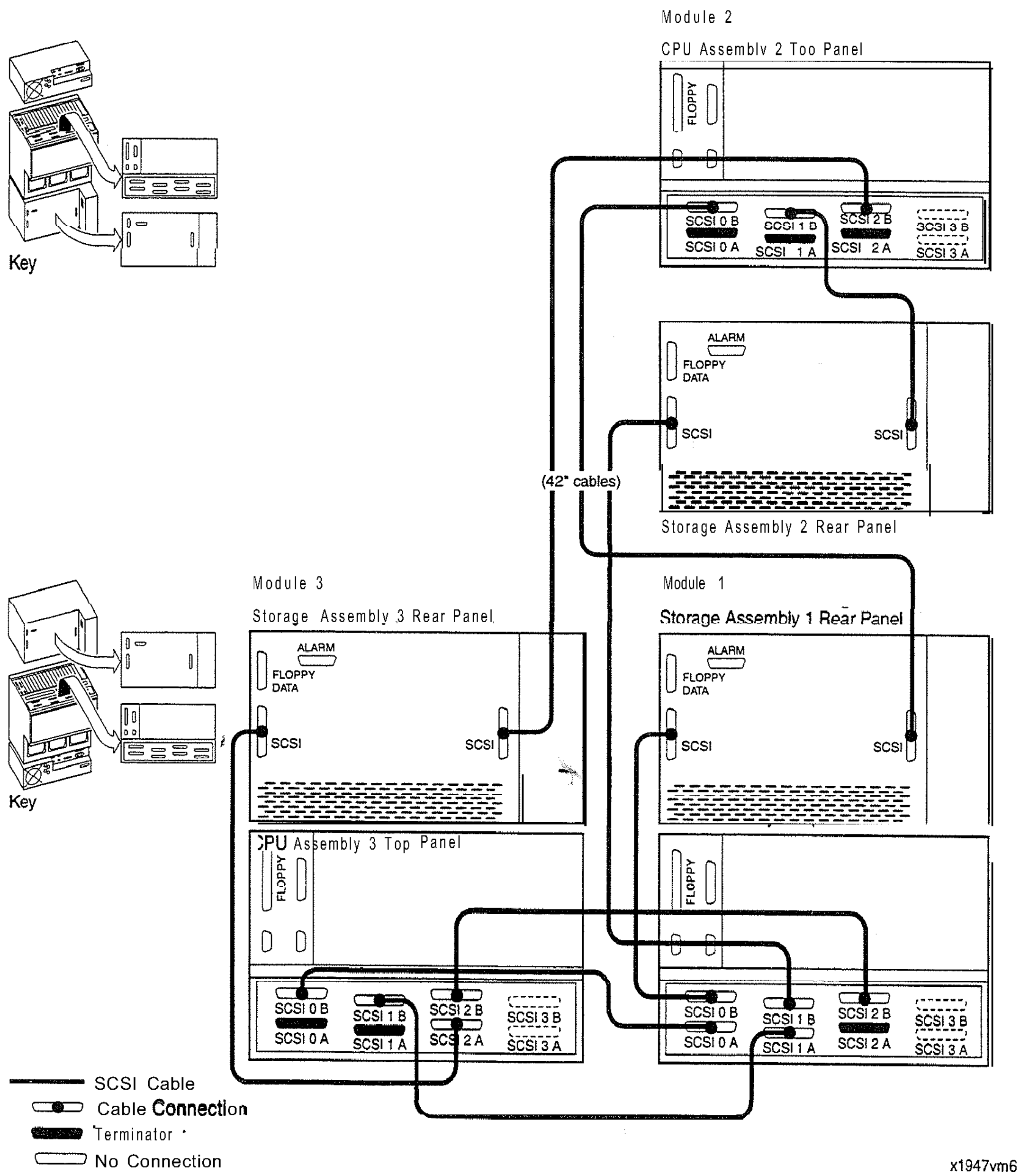
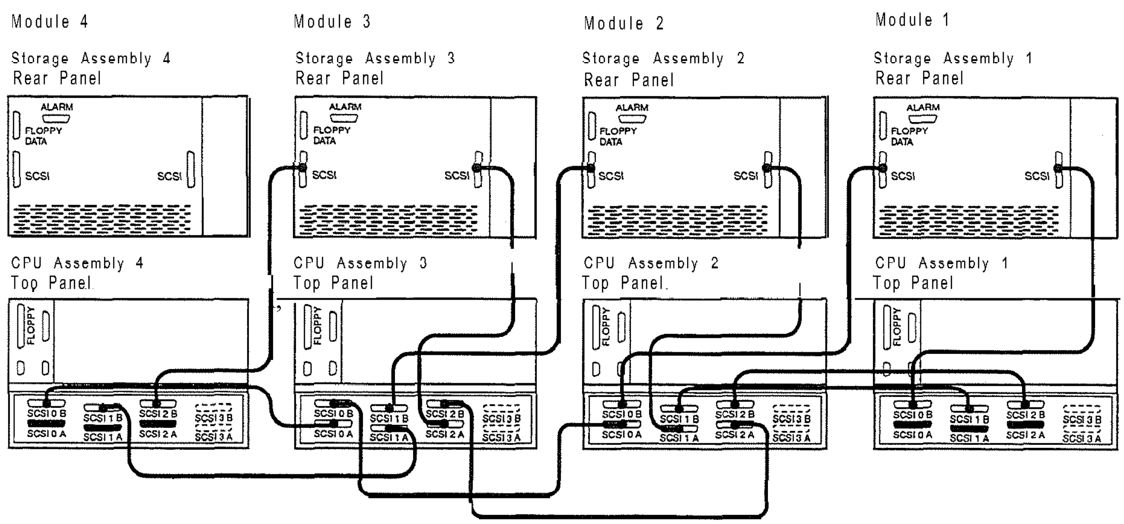


Figure 5 Three Modules SCSI Cables--Vertical

Four Modules

Figure 6 shows the physical connections for the SCSI cables and terminators used with a Model 640 four-module server in a horizontal configuration.



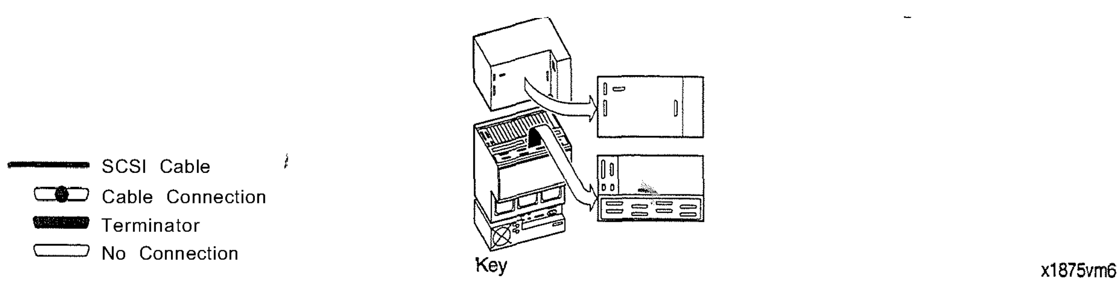


Figure 6 Four Modules SCSI Cables--Horizontal

Figure 7 shows the physical connections for the SCSI cables and terminators used with a Model 640 four-module server in a vertical configuration.

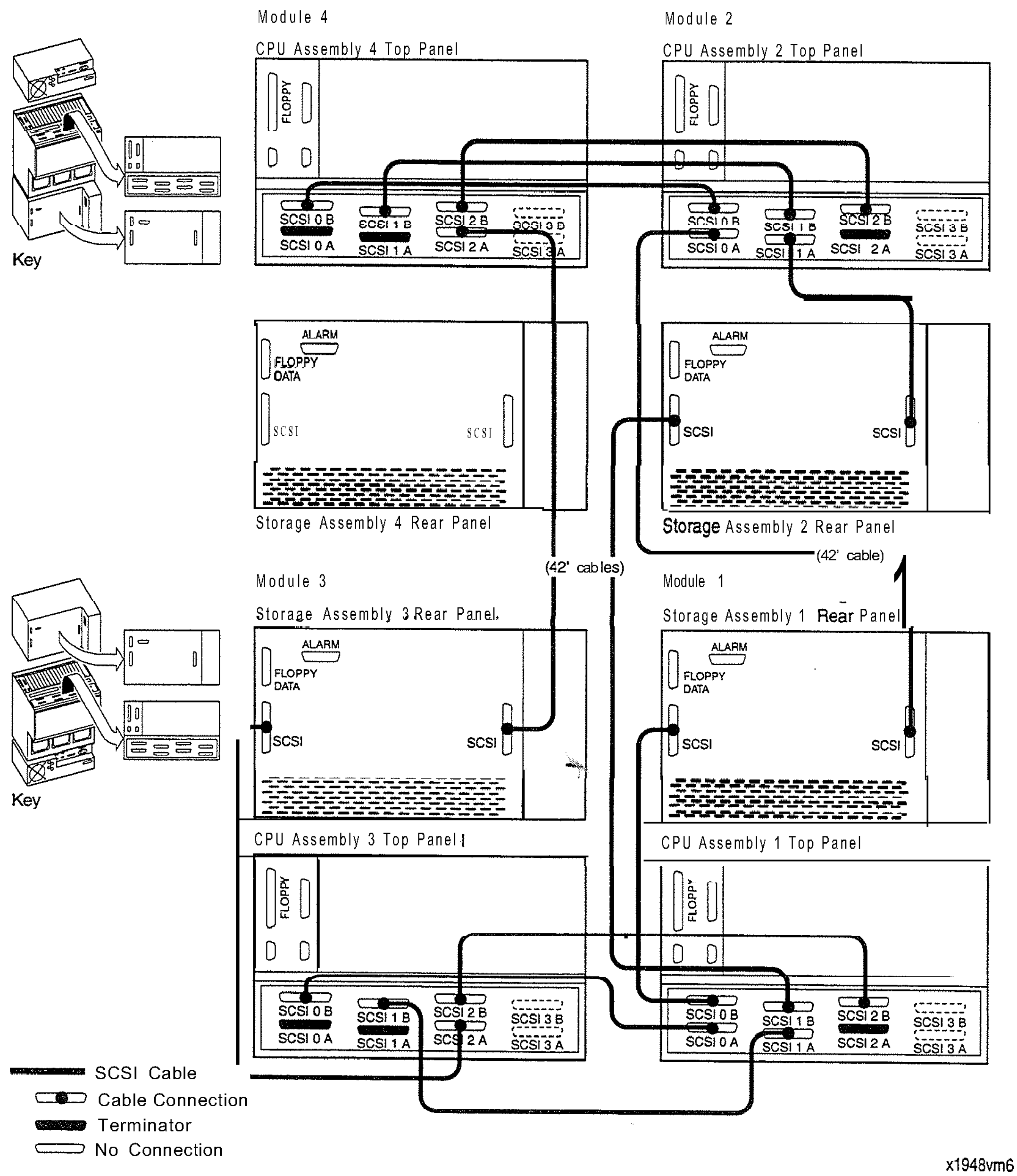


Figure 7 Four Modules SCSI Cables--Vertical

Floppy Disk Cabling

The floppy disk drive does not use the SCSI bus to communicate with the rest of the system. Instead, it is connected to the CPU assembly by a separate bus. There are two lengths of cable available, one longer than the other. Use the longer cable when cabling the vertical configurations of two and four modules.

Although the Floppy Disk drive is not part of the SCSI bus, a diagram showing the floppy cable connection between the Storage Assembly and the CPU Assembly is shown in Figure 8. Regardless of how many modules a Centigram server has, the floppy disk drive connection is always the same.

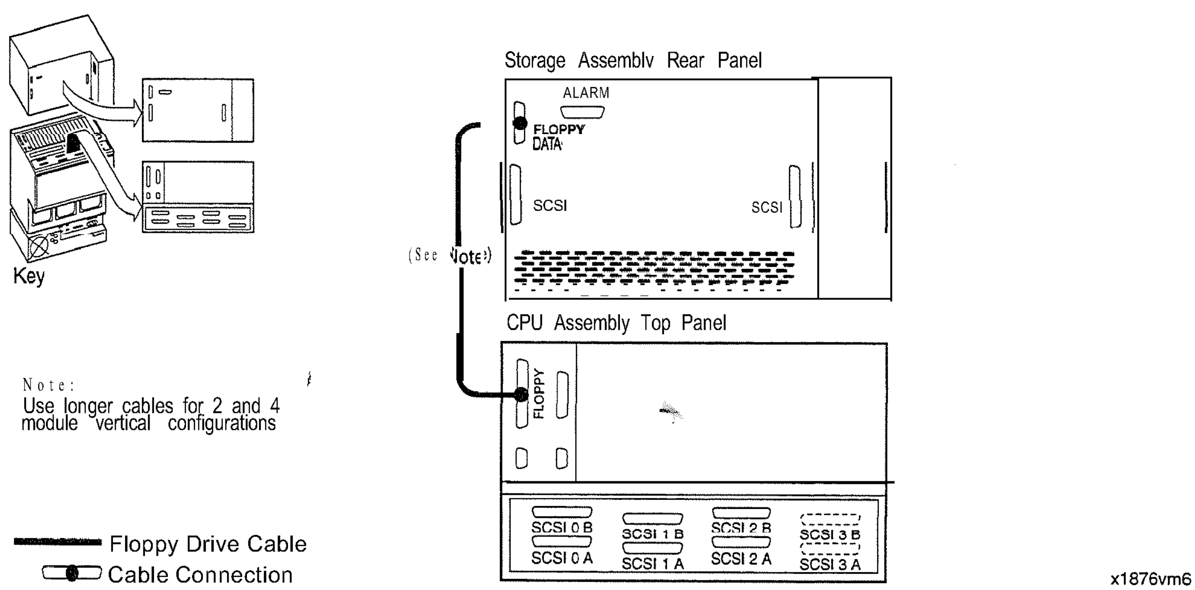


Figure 8 Floppy Disk Drive Cable Connection

CPU (486) Motherboard
Technical Reference

TR 1934

VoiceMemo Release 6.0A and later

This technical reference describes the Model 70 Motherboard. It provides a brief description of the motherboard and minor configuration data.

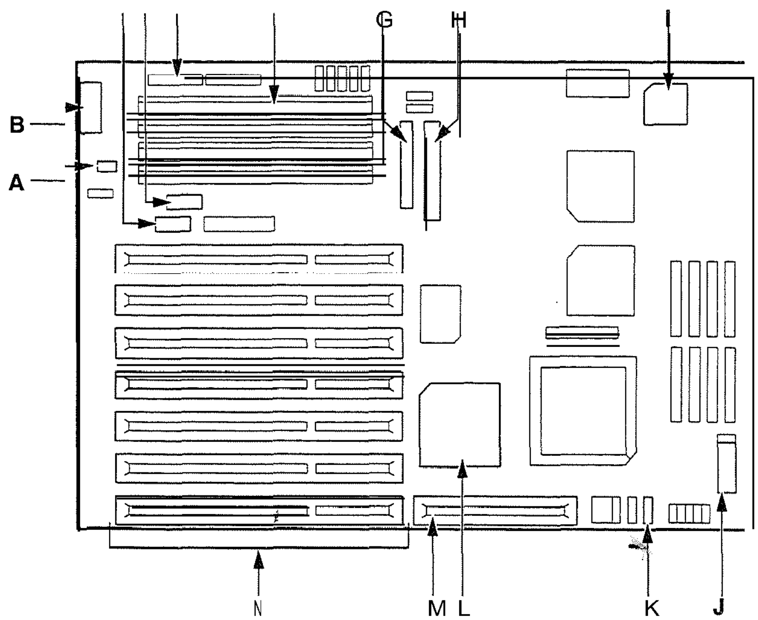
1 Introduction

2 Configuration Data

3 Installation Guidelines

1 Introduction

The Model 70 VoiceMemo system features a non-replaceable Intel motherboard (Figure 1) with a 486 microprocessor running at 33 MHz. All standard I/O features are integrated on the motherboard. These features include the floppy drive and IDE hard disk controllers and connectors, two DB9 RS-232 serial port connectors, a bi-directional parallel port, an integrated speaker, an AT style keyboard connector, and seven ISA bus slots.



A - Offboard battery connector
B - AT-style keyboard connector
C - Serial port 2 connector
D - Serial port 1 connector
E - Power supply connectors
F - System memory SIMM sockets (4)
G - Floppy drive connector
H - IDE hard disk drive connector
I - Keyboard controller
J - Front panel connectors
K - Front fan connector
L - Main CPU site
M - Add-in VESA local bus slot
N - Add-in board slots

x5230ap7

Figure 1 **Model 70 Motherboard**

CPU

The central processing unit (CPU) used on the Model 70 motherboard is an Intel 486 DX2 CPU running at 33 MHz. This CPU supports all 486 functionality and an on-chip 8 KB cache. The cache is 4-way set associative, uses a write-through policy, and can be disabled via the software. The CPU also contains an on-chip numeric coprocessor to increase the speed of floating point operations.

Onboard Memory

The motherboard uses SIMMs (Serial In-line Memory Modules) to allow user selection of on-board memory capacities between 16 megabytes and 24 megabytes.

2 Configuration Data

The motherboard is fully configured at the factory and there is no need for re-configuration or replacement in the field. However, SIMMs can be added to upgrade memory.

Memory Capacity

The motherboard supports four banks of SIMM memory packages. Memory upgrades must be done following Table 1 and must be installed beginning with Bank 0. The are no jumpers that need to be set. However, SIMMs are static-sensitive and are easily damaged. You should refer to your *Installation and Service Manual* for correct upgrade instructions.

Table 1 Valid Memory Combinations

Memory Capacity	Bank 0	Bank 1	Bank 2	Bank 3
16 MB	16 MB (4Mx36)	—	—	—
24 MB	4 MB (1Mx36)	4 MB (1Mx36)	16 MB (4Mx36)	—

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to upgrade this hardware component without first consulting your server's *Installation and Service Manual.*

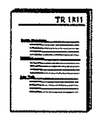
The motherboard is fully configured at the factory and there is no need for re-configuration or replacement in the field. However, SIMMs can be added to upgrade memory. Before you upgrade the memory, you should:

1. Refer to the *Service Card Hardware Configuration Technical Reference* for your specific server. That section provides:
   - An overview of your server
   - A description of your server's architecture
2. Read the Configuration Data section above. That section provides:
   - Memory capacities and valid memory configurations
3. Refer to your server's *Installation and Service Manual* for correct instructions on how to bring down the system.

5 Storage Components

- This chapter provides Technical References for Storage Components.

Technical References



Use the technical references to find detailed background information about the hardware components of a Centigram Series 6 server. These are: the Model 640, the Model 120, and the Model 70.

How to Use This Chanter

Identify the Storage *Components* that you want to study. Go to the "List of Technical References" in this chapter and identify their technical reference number. The references are listed in numerical order in the "List of Technical References" table.

If you remove a technical reference from this binder, mark its original location, and replace it when you are finished with the document.

List of Technical References

Tech. Ref. Number	Title	Document Rev.	Release Number
TR 1918	SCSI Hard Disk (Model 120S)	Doc. Rev. A	6.0A
TR 1919	Storage Assembly	Doc. Rev. A	6.0A
TR 1923	IDE Hard Disk (Models 120I/70)	Doc. Rev. A	6.0A
TR 1936	SCSI Hard Disk (Model 640)	Doc. Rev. A	6.0A

SCSI Hard Disk (Model 120S) Technical Reference

This technical reference provides information for the SCSI hard disks used in the Centigram Series 6 Communication server Model 120S. It provides basic configuration data and installation guidelines.

1 Introduction

2 Configuration Data

3 Installation Guidelines

1 Introduction

The Model 120S uses Winchester-technology hard disk drives to store the operating system, speech, names, greetings, prompts, messages, and application programs to allow VoiceMemo to perform its functions. Additionally, all drives are interfaced to the system bus using the Small Computer System Interface (SCSI).

2 Configuration Data

This section provides a summary of all new SCSI disks used with the Model 120S at the time of publication. If you need information about an older disk, please consult your original documentation first. If you still have questions, contact your distributor or Centigram Technical Assistance Center (TAC).

General Guidelines

- Identify the model number of your unit.
- Refer to the disk figure that matches your unit.
- Refer to the disk figure and associated table for disk's jumpers. You should not disturb any jumpers other than the SCSI ID jumpers.
- In Model 120S servers with one disk, the internal SCSI disk terminator is installed on the single disk. In Model 120S servers with multiple disks, the internal disk terminator is installed on the last disk on the SCSI cable.

Hard Disk Types

At the time of publication, the following disk models are available with the Model 120s.

Fujitsu M2684SAU (500 MB) SCSI Disk

This section describes the method of configuring the SCSI ID jumpers and the SCSI terminator, if necessary, on the Fujitsu M2684SAU 500 Megabyte Hard disk (Figure 1).

Below is the SCSI ID jumpering diagram for the Fujitsu model M2684SAU Drive. The SCSI terminator is enabled or disabled by respectively installing or removing the 14-pin dual in-line pack (DIP) resistor that is located by the SCSI connector.

Verify the proper Drive Manufacturer and Model Number, printed on the Hard disk, before starting this procedure. All work is to be performed with the unit powered off. Remember to wear a properly grounded wrist strap to avoid component damage. All ESD procedures must be followed when handling system assemblies.

CAUTION!

Set only the SCSI ID jumpers. Other default jumper and switch settings are provided for reference purposes only and should never be changed without specific instructions from Centigram Communications Corporation. Failure to comply with this warning could result in total, unrecoverable Hard disk Failure.

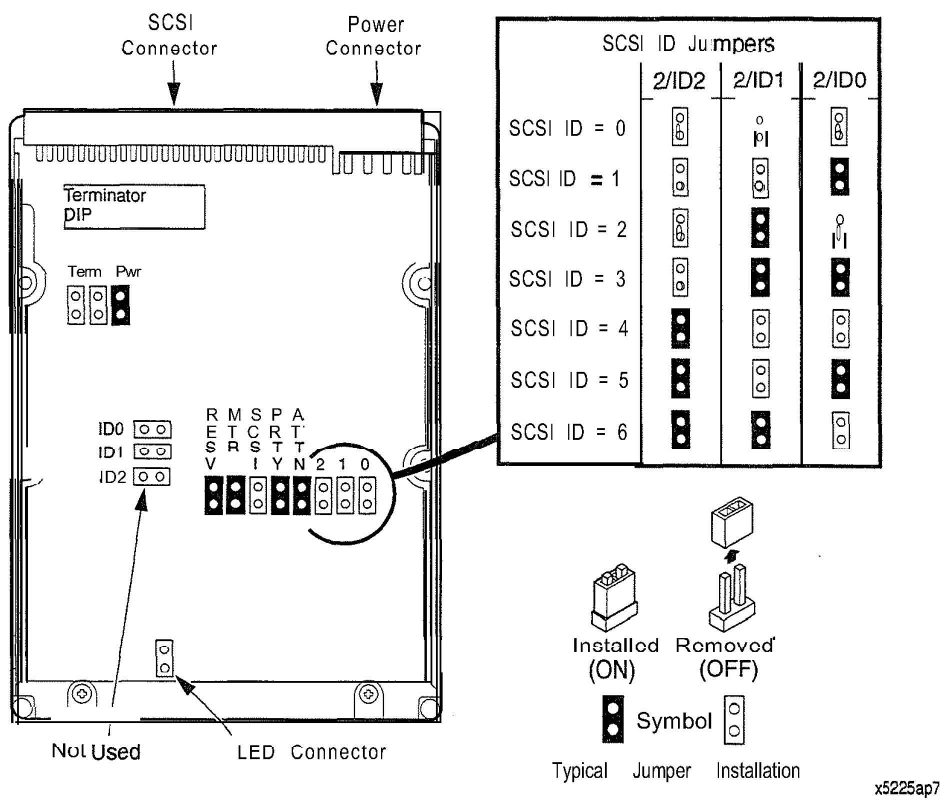


Figure 1 Fujitsu **M2684SAU (500** MB) **SCSI Disk**

Fujitsu M1606SAU (1 Gigabyte) SCSI Disk

This section describes the method of configuring the SCSI ID jumpers and the SCSI terminator, if necessary, on the Fujitsu M1606SAU 1.0 Gigabyte Hard disk.

Below is the SCSI ID jumpering diagram for the Fujitsu model M1606SAU Drive (Figure 2). The SCSI terminator is enabled or disabled by respectively installing or removing the 14 pin dual in-line pack (DIP) resistor that is located by the SCSI connector.

Please take the time to verify the proper Drive Manufacturer and Model Number, printed on the Hard disk before starting this procedure. All work is to be performed with the unit powered off. Remember to wear a properly grounded wrist strap to avoid component damage. All ESD procedures must be followed when handling system assemblies.

CAUTION!

This Section is to be used only for setting SCSI ID jumpers. Other default jumper and switch settings are provided for reference purposes only and should never be changed without specific instructions from Centigram Communications Corporation. Failure to comply with this warning could result in total, unrecoverable Hard disk Failure.

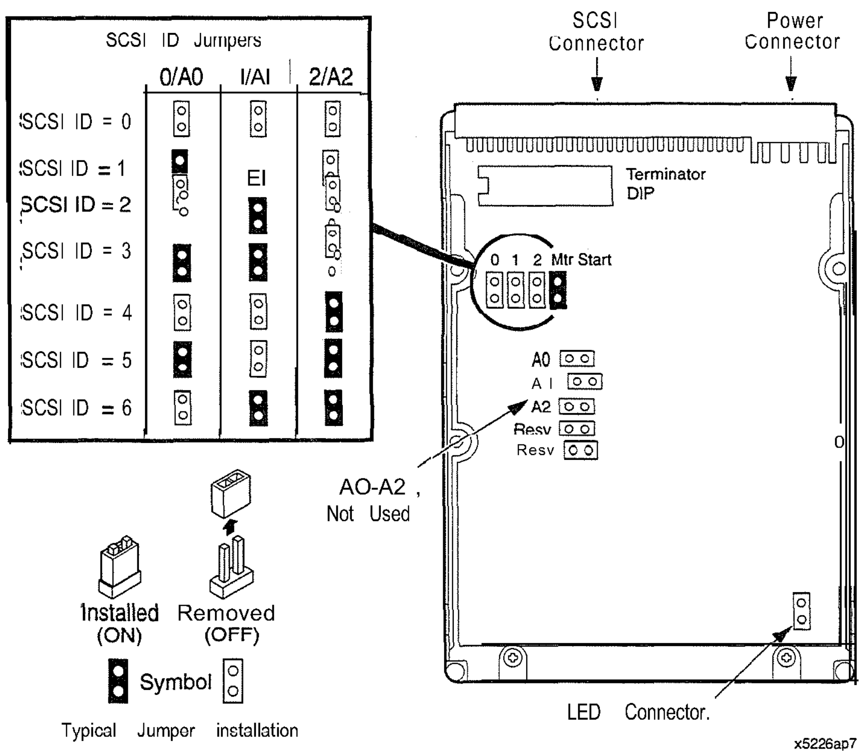


Figure 2 Fujitsu **M1606SAU** (1 Gigabyte) **Disk**

Seagate ST12400N (2 Gigabyte) SCSI Disk

This section describes the method of configuring the SCSI ID jumpers and enabling the SCSI terminator, if necessary, on the Seagate ST12400N 2.0 Gigabyte Hard disk (Figure 3).

Below is the SCSI ID jumpering diagram for the Seagate model ST12400N Drive. The SCSI terminator is a circuit that is enabled or disabled by respectively installing or removing the Term (terminator) jumper located by the power connector.

Please take the time to verify the proper Drive Manufacturer and Model Number, printed on the Hard disk before starting this procedure. All work is to be performed with the unit powered off. Remember to wear a properly grounded wrist strap to avoid component damage. All ESD procedures must be followed when handling system assemblies.

CAUTION!

This Section is to be used only for setting SCSI ID jumpers. Other default jumper and switch settings are provided for reference purposes only and should never be changed without specific instructions from Centigram Communications Corporation. Failure to comply with this warning could result in total, unrecoverable Hard disk Failure.

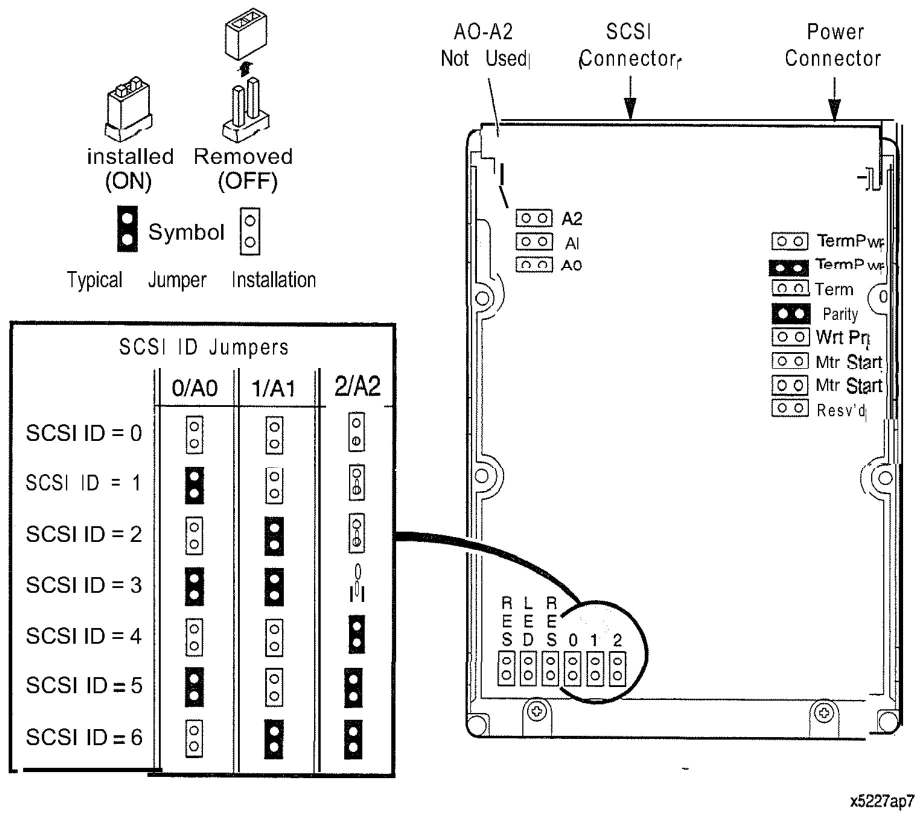


Figure 3 **Seagate** ST1 2400N (2 Gigabyte) Disk

Seagate ST32430N (2 Gigabyte) SCSI Disk

This section describes the method of configuring the SCSI ID jumpers and enabling the SCSI terminator, if necessary, on the Seagate ST32430N 2.0 Gigabyte Hard disk (Figure 4).

Below is the SCSI ID jumpering diagram for the Seagate model ST32430N Drive. The SCSI terminator is a circuit that is enabled or disabled by respectively installing or removing the Term (terminator) jumper located by the power connector.

Please take the time to verify the proper Drive Manufacturer and Model Number, printed on the Hard disk before starting this procedure. All work is to be performed with the unit powered off. Remember to wear a properly grounded wrist strap to avoid component damage. All ESD procedures must be followed when handling system assemblies.

CAUTION!

This Section is to be used only for setting SCSI ID jumpers. Other default jumper and switch settings are provided for reference purposes only and should never be changed without specific instructions from Centigram Communications Corporation. Failure to comply with this warning could result in total. unrecoverable Hard disk Failure.

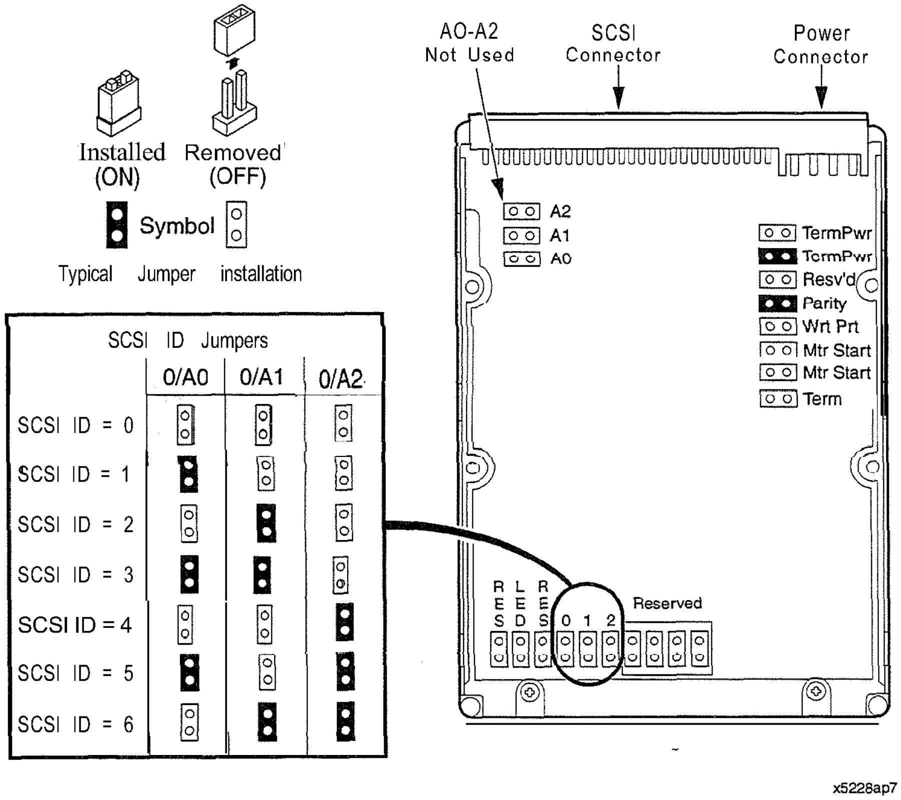


Figure 4 **Seagate ST32430N** (2 **Giga** byte) Disk

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's *Installation and Service Manual.*

Your disk is pre-configured at the Centigram factory, and it is ready to install. However, it is a good field practice to double check the disk's configuration. Before you install a new disk, check the following:

- Read the Configuration Data section. It gives information on how to set the disk's SCSI ID.
- If you are adding or replacing a disk, make sure that only the *last disk* on the chain is terminated. Then, set the new disk's SCSI ID.
- If you are replacing a disk, make sure that the replacement disk gets the same SCSI ID of the disk being replaced, after completing the "replace.disk" procedure.

Refer to your *Series 6 Server Model 120 Installation and Service Manual* for correct instructions on how to remove and replace disks.

This technical reference provides information for the Storage Assembly used in the Centigram Series 6 Communication server Model 640. It provides a brief description of the assembly's components and installation guidelines.

1 Introduction

The Storage Assembly (Figure 1) is a rack-mounted unit that houses one floppy disk subassembly and up to four hard disk subassemblies. At the bottom of the assembly, a fan subassembly houses two removable low-voltage cooling fans. The Storage Assembly is fully powered by its own, field-replaceable, power supply.

The method for setting the Model 640 SCSI ID differs from previous systems. In the Model 640, the SCSI ID contains two digits. The first digit is the bus number; the second is determined by the slot in which the disk is installed. In previous systems, the first digit was the bus number and the second digit the ID of the disk. (Refer to TR 1936 for disk configurations.)

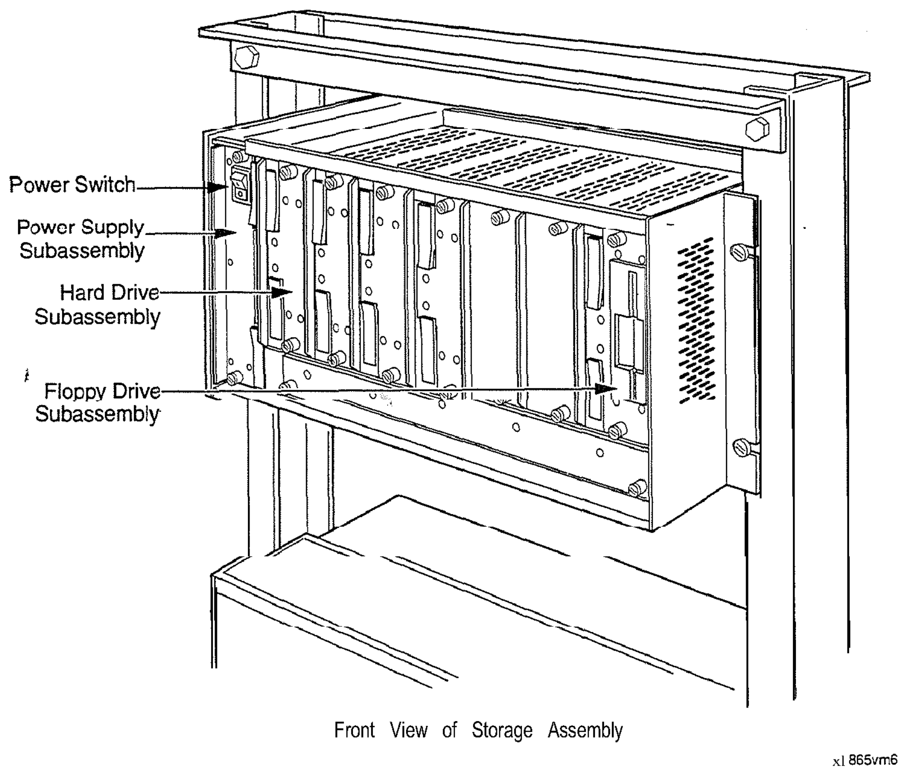


Figure 1 Storage Assembly, Front View

The rear of the storage assembly (Figure 2) provides connectors for input AC/DC power, SCSI and floppy cables, and an external alarm connection.

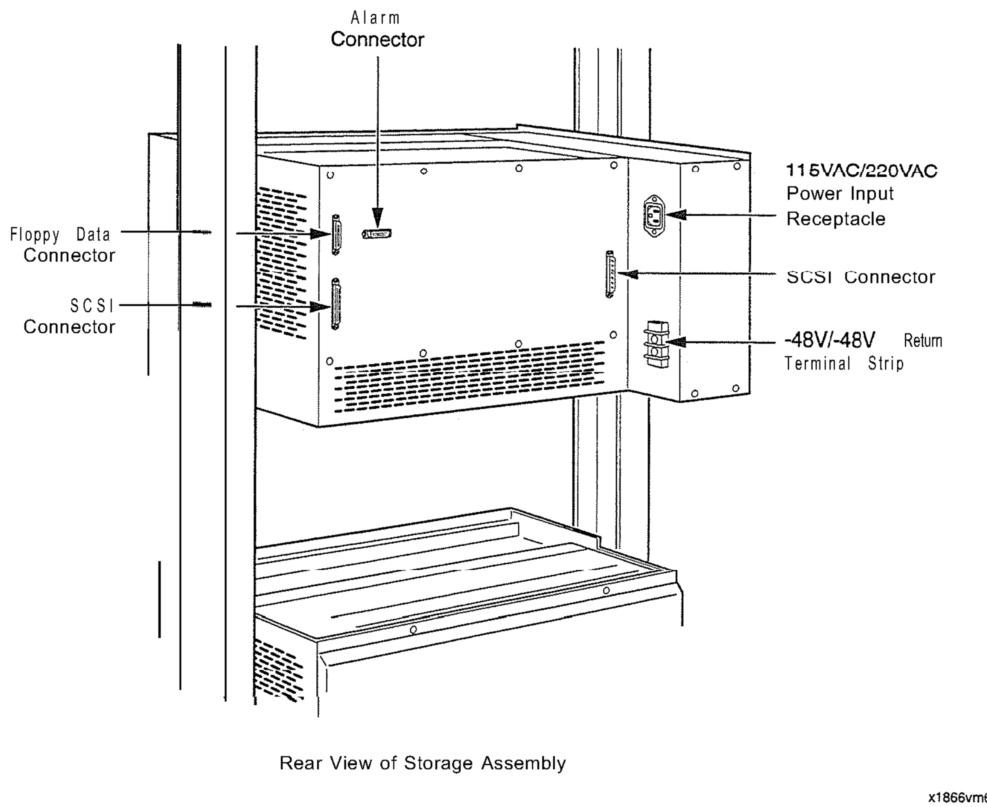


Figure 2 Storage Assembly, Rear View

2 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's *Installation and Service Manual.*

This section provides instructions for replacing subassemblies of the Storage Assembly. These instruction show how the various subassemblies slide into the Storage Assembly. Removing these components does not require removal of any cables. Also, you do not need to turn the power supply off. If you need to remove a cable from the Storage Assembly, unscrew the connector screws at the corners or squeeze the cable connector and gently pull to remove it. (See Figure 3.)

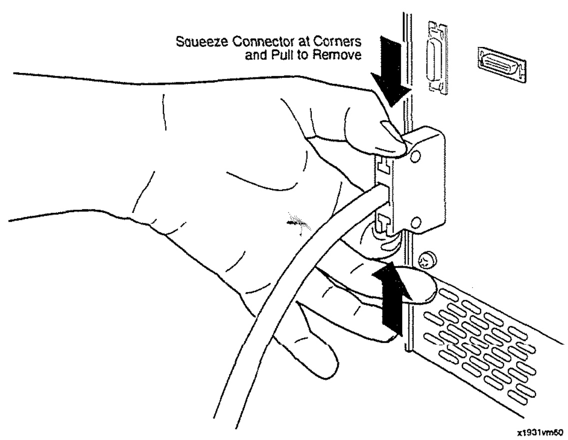


Figure 3 Removing **Cables**

Before you attempt to remove a subassembly, refer to *the Centigram Series 6 Communication Server Model 640 Installation and Service Manual* for instructions on how to power down your server in an orderly fashion.

Power Supply Subassembly

The power supply subassembly is mounted on a slide tray and held in place with retaining card-ejector clips. Figure 4 shows how it slides in and out of the Storage Assembly. There is no need to turn off the power supply to remove it, however, it is recommended that you do. When replacing the power supply, ensure that its rear panel connector is fully seated into the backplane of the Storage Assembly.

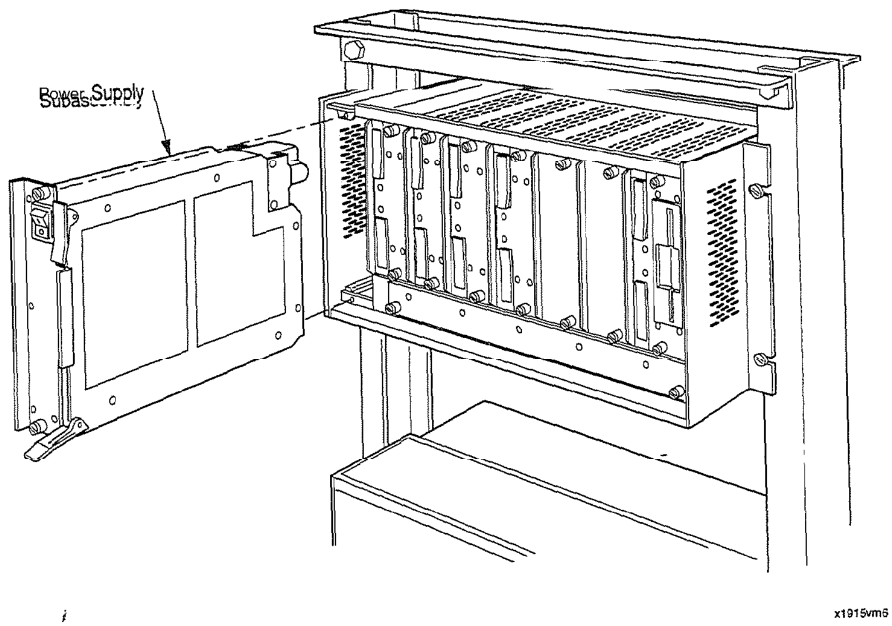


Figure 4 Power Supply **Subassembly**

Hard Disk Subassembly

The hard disk subassembly is mounted on a slide tray and held in place with retaining card-ejector clips. Figure 5 shows how it slides in and out of the Storage Assembly. There is no need to turn off the power supply to remove it, but see Caution below. When replacing the hard disk, ensure that its rear panel connector is fully seated into the backplane of the Storage Assembly.

CAUTION!

There is no need to turn the power supply off when replacing a disk. However, after you have ejected the disk-tray from the Storage Assembly, wait one minute for the disk to stop spinning before removing it from the assembly.

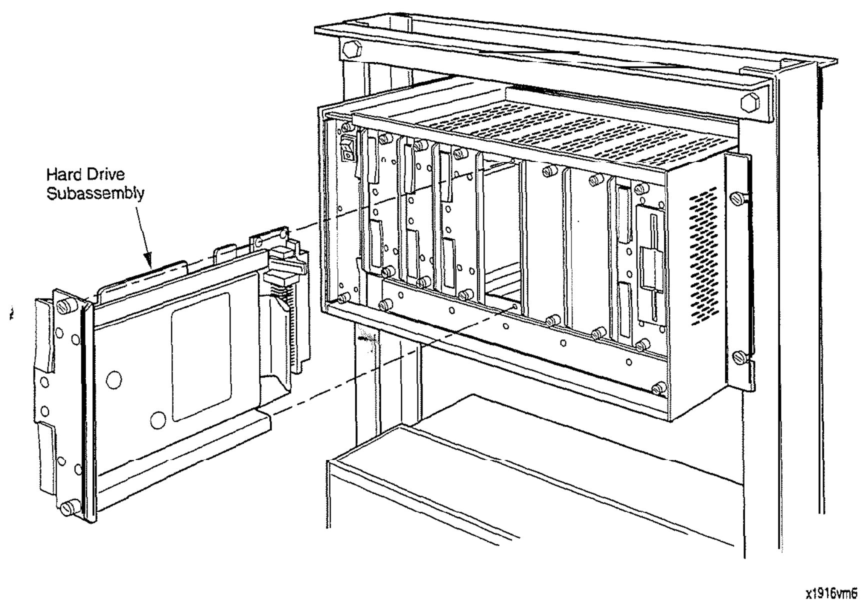


Figure 5 Hard Disk Subassembly

Floppy Drive Subassembly

The floppy drive subassembly is mounted on a slide tray and held in place with retaining card-ejector clips. Figure 6 shows how it slides in and out of the Storage Assembly. There is no need to turn off the power supply to remove the floppy drive. When replacing the floppy drive, ensure that its rear panel connector is fully seated into the backplane of the Storage Assembly.

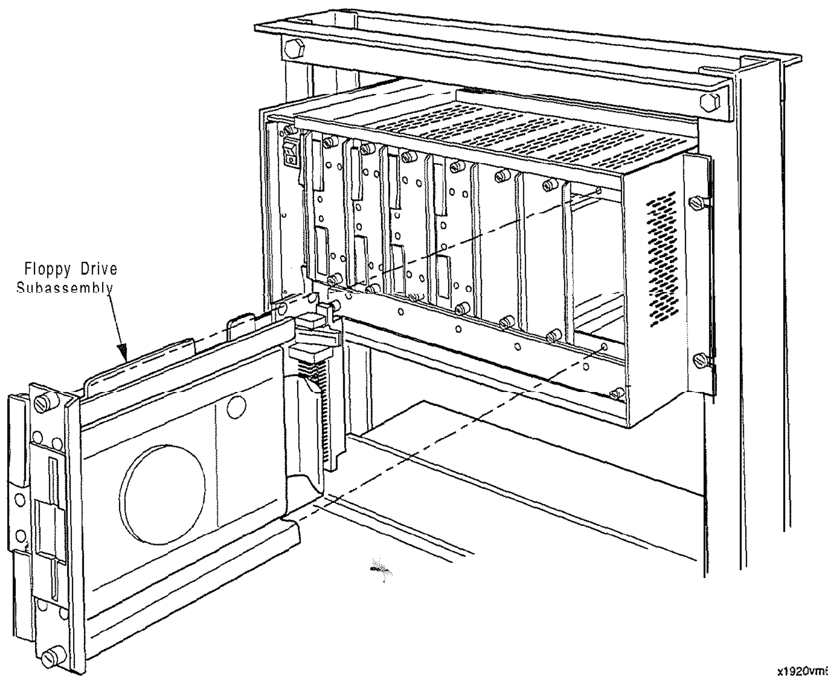


Figure **6** **Floppy Drive** Subassembly

Fan Subassembly

The fan subassembly is mounted on a slide tray and held in place with retaining card-ejector clips. Figure 7 shows how it slides in and out of the Storage Assembly. There is no need to turn off the power supply to remove the fan subassembly. When replacing the fan subassembly, ensure that its rear panel connector is fully seated into the backplane of the Storage Assembly.

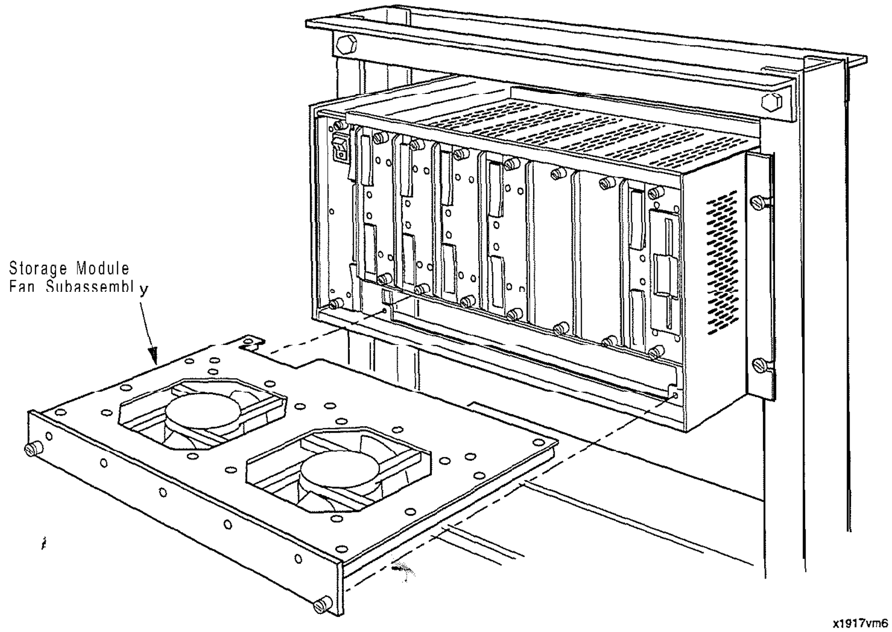


Figure 7 Fan Subassembly

This technical reference provides information for the IDE hard disk used in the Centigram Series 6 Communications server Model 1201 and Model 70. It provides a brief description of the disk, configuration data, and installation guidelines.

1 Introduction

2 Configuration Data

3 Installation Guidelines

1 Introduction

The Model 1201 and Model 70 use IDE-technology hard disk drives to store the operating system, speech, names, greetings, prompts, messages, and application programs to allow VoiceMemo to perform its functions.

2 Configuration Data

This subsection provides a summary of all new disks used with the Model 1201 and Model 70 at the time of publication. If you need information about an older disk, please consult your original documentation first. If you still have questions, contact your distributor or Centigram Technical Assistance Center (TAC) .

General Guidelines

- Identify the model number of your unit.
- Refer to the disk figure that matches your unit.
- Use the disk figure and associated table to set the disk's jumpers. Do not disturb any jumpers other than the MASTER/SLAVE jumpers.
- If you are using more than one disk, ensure that all jumpers are set correctly to provide the master/slave relationship between the two disks.

Note: In IDE disk drive technology, a "master" disk is equivalent to a primary disk; a "slave" disk to a redundant disk.

Hard Disk Types

Disk models available at the time of publication are described below. These are IDE hard disks used in the Centigram Series 6 Communication Server Model 1201 and Model 70

Fujitsu M2684TAU (500 MB) IDE Disk

This document describes the method of configuring the Master and Slave IDE jumpers on the Fujitsu M2684TAU 500 Megabyte IDE Hard Disk.

Below is the IDE jumpering diagram for the Fujitsu model M2684TAU Drive (Figure 1). The IDE drive jumpering options are one of the following:

1. As a Master in single drive configurations or

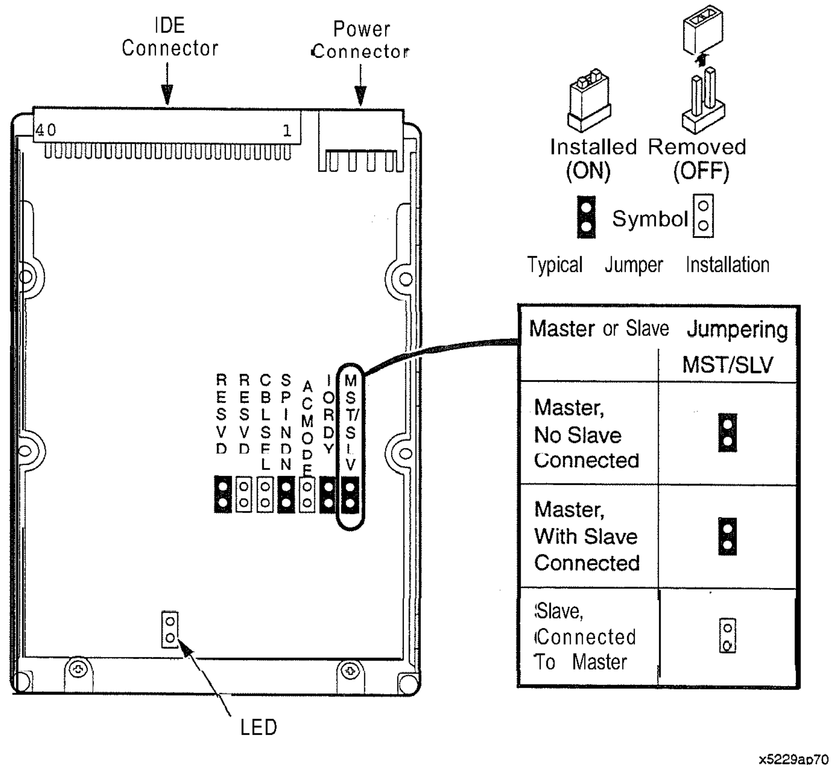
2. As a Master in a two-drive configuration where this is to be the master drive or

3. As a Slave drive connected to an existing master drive in a two-drive configuration.

Verify the proper Drive Manufacturer and Model Number, printed on the Hard Disk before starting this procedure. All work is to be performed with the unit powered off. Remember to wear a properly grounded wrist strap to avoid component damage. All ESD procedures must be followed when handling system assemblies.

CAUTION!

Only set the Master/Slave IDE jumpers. Other default jumper and switch settings are for reference purposes and should never be changed without specific instructions from Centigram Communications Corporation. Failure to comply with this warning could result in total, unrecoverable Hard Disk Failure.



Master or Slave	Jumpering MST/SLV
Master, No Slave Connected	ON
Master, With Slave Connected	ON
Slave, Connected To Master	OFF

Figure 1 Fujitsu **M2684TAU (500** MB) IDE Disk

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's Installation *and Service Manual.*

Your disk is pre-configured at the Centigram factory and it is ready to install. However, it is a good field practice to double check the disk's configuration. Before you install a new disk, check the following:

- Read the Configuration Data section above.
- Refer to your server's *Installation and* Service *Manual* for correct instructions on how to remove and replace disks.

This technical reference provides information for the SCSI hard disks used in the Centigram Series 6 Communications server Model 640. It provides hard disk physical descriptions, disk configuration data, and basic installation guidelines.

1 Introduction

2 Model 640 Disks

3 Disk Configuration Diagrams

3 Installation Guidelines

1 Introduction

The Model 640 uses Winchester-technology hard disk drives to store the operating system, speech, names, greetings, prompts, messages, and application programs to allow VoiceMemo to perform its functions. Additionally, all drives are interfaced to the system bus using the Small Computer System Interface (SCSI).

2 Model 640 Disks

This section provides a summary of all new SCSI disks used with the Model 640 at the time of publication. If you need information about an older disk, please consult your original documentation first. If you still have questions, contact your distributor or Centigram Technical Assistance Center (TAC).

Hard Disk Types

At the time of publication, the following disk models are available with the Model 640.

Fujitsu M2684SAU (500 MB) SCSI Disk

Figure 1 shows the Fujitsu M2684SAU (500 Mb) SCSI Disk.

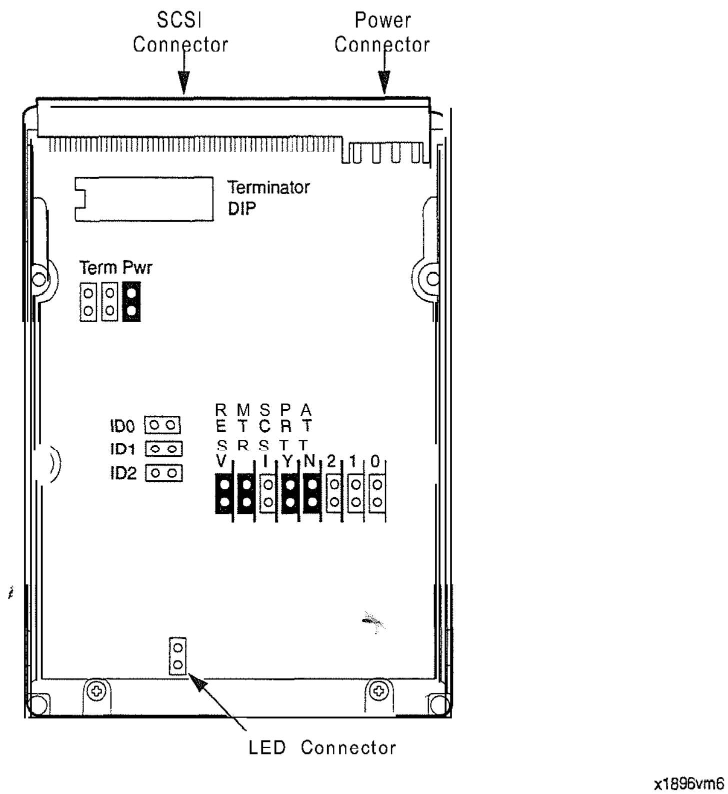


Figure 1 Fujitsu **M2684SAU** (500 MB) SCSI Disk

Fujitsu M1606SAU (1 Gigabyte) Disk

Figure 2 shows the Fujitsu M1606SAU (Gigabyte) Disk.

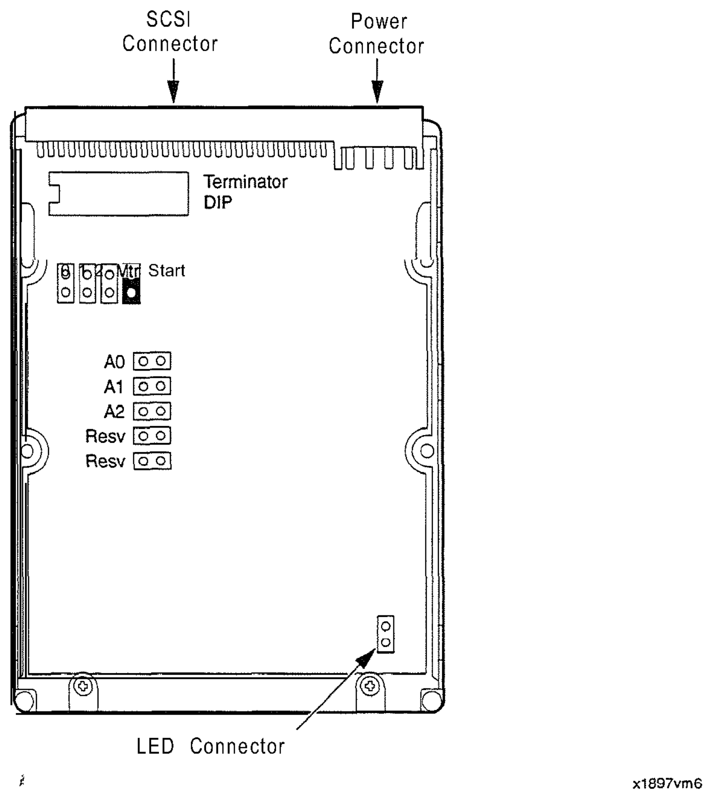


Figure **2** **Fujitsu** MI 606SAU (**1** Gigabyte) Disk

Seagate ST12400N (2 Gigabyte) Disk

Figure 3 shows the Seagate ST12400N (2 Gigabyte) Disk.

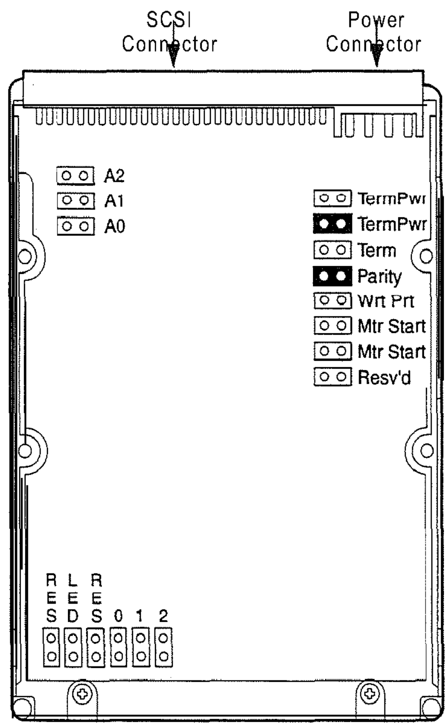


Figure 3 **Seagate ST1** 2400N (2 Gigabyte) Disk

Seagate ST32430N (2 Gigabyte) Disk

Figure 4 shows the Seagate ST32430N (2 Gigabyte) Disk.

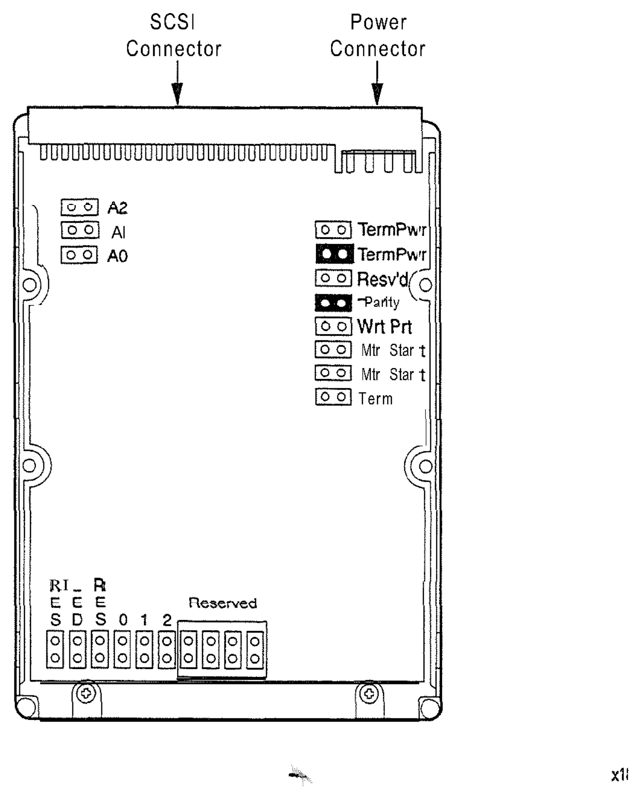


Figure 4 Seagate ST32430N (2 Gigabyte) Disk

3 Disk Configuration Diagrams

In the Model 640 storage assembly, the SCSI ID of a disk contains two digits. The first digit is the module number; the second digit is determined by the slot in which the disk is installed. In previous products the first digit was the module number and the second was the ID of the disk. There are no jumpers to set on the disk drives.

This section deals with the SCSI disk configurations for one, two, three, and four module systems. There must be at least one primary (active) disk per module. To obtain redundancy, a primary disk and its matching redundant disk should reside on separate modules as shown in the figures. This is done to protect speech and records in the event of the crash of a module.

Configuration Guidelines

1. Identify the model number of your unit from the Disk Type section above. In that section, refer to the disk diagram (Figures 1 through 4) that matches your unit

2. Ensure that all internal SCSI disk terminators are removed. (In the Model 640, the SCSI cable is terminated externally.)

3. Refer to the Configuration Diagrams (Figures 5 through 12). These figures provide disk configuration data and disk pairing rules.

CAUTION!

In the Model 640, there are no jumpers for setting the SCSI ID. Do not disturb the SCSI ID jumper configuration.

One Module Systems

Figure 5 shows the disk configuration for a one-module system with one or more disks.

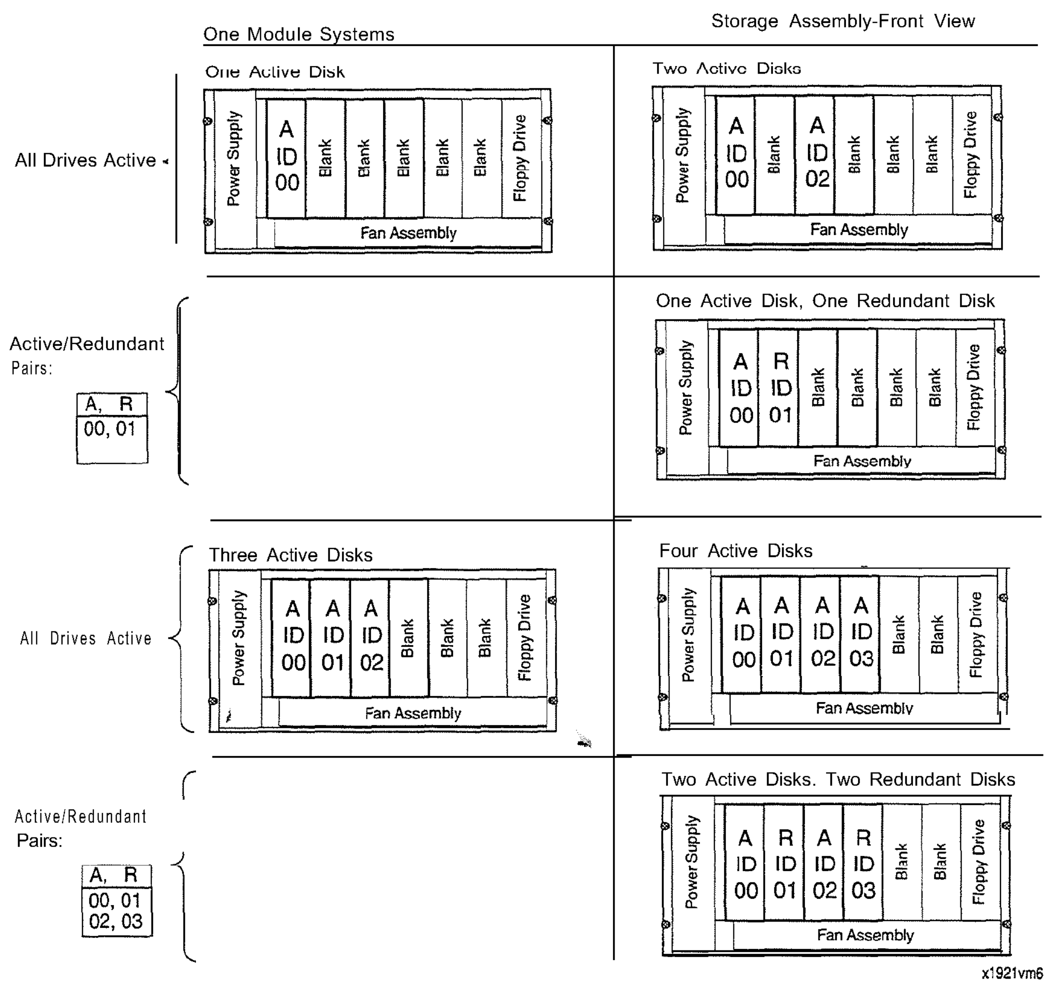


Figure 5 One Module Disk Configurations

Two Module Systems

Figure 6 and 7 show the disk configurations for a two-module system with two or more disks.

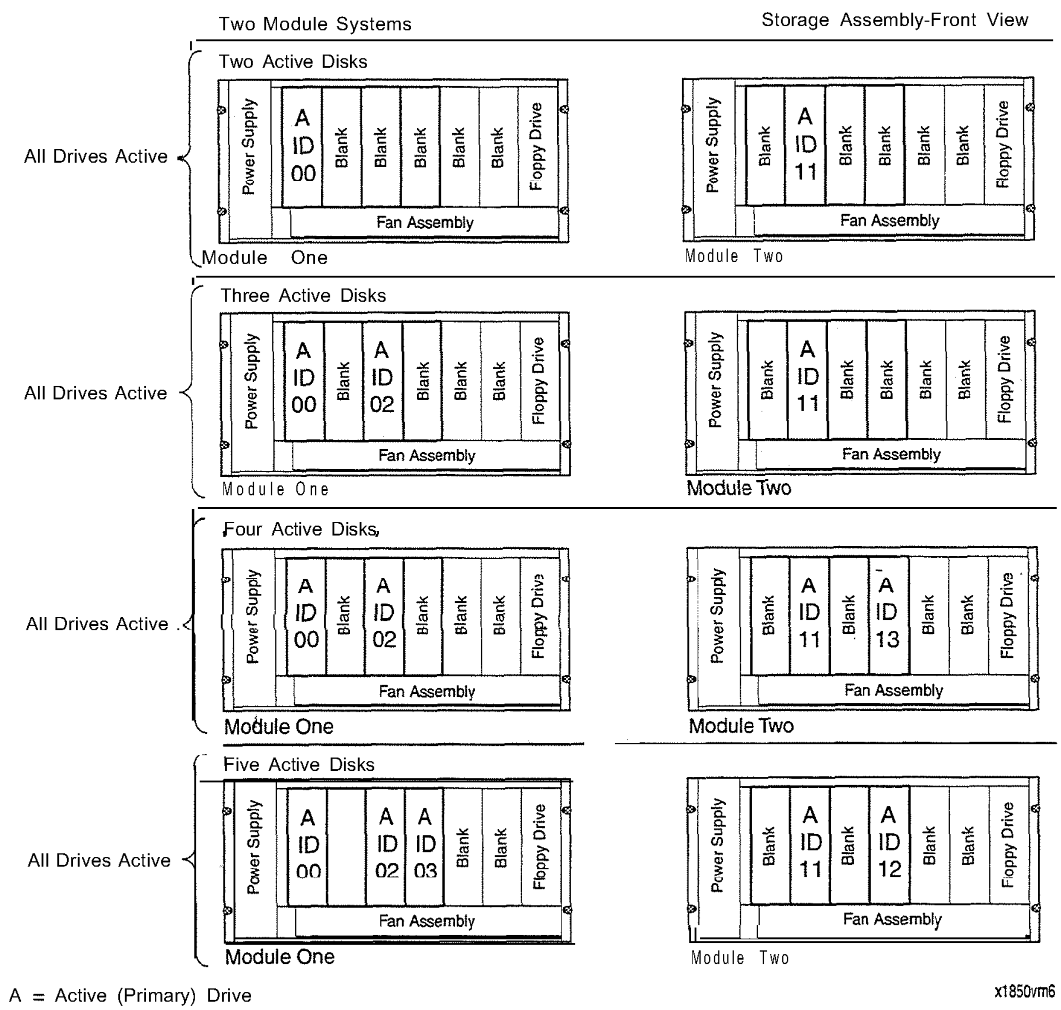


Figure 6 **Two Module Disk C**onfigurations

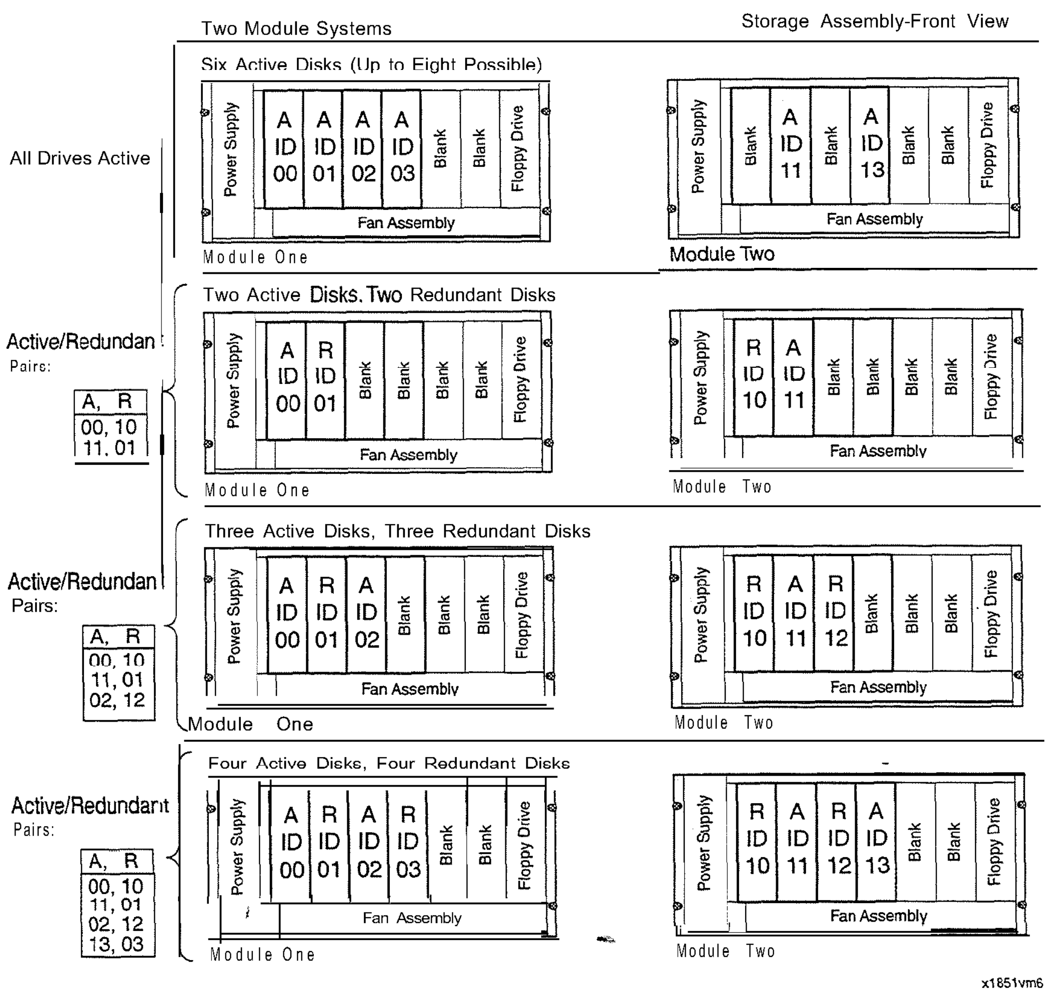


Figure 7 Two **Module** Disk Configurations

Three- or Four-Module Systems

Figures8 through 12 show the disk configuration for a three-module or four-module system with three or more disks.

Note: Four-module servers are shipped with a spare floppy disk drive installed on the Storage Assembly of the fourth module. No hard disks are installed on the fourth module.

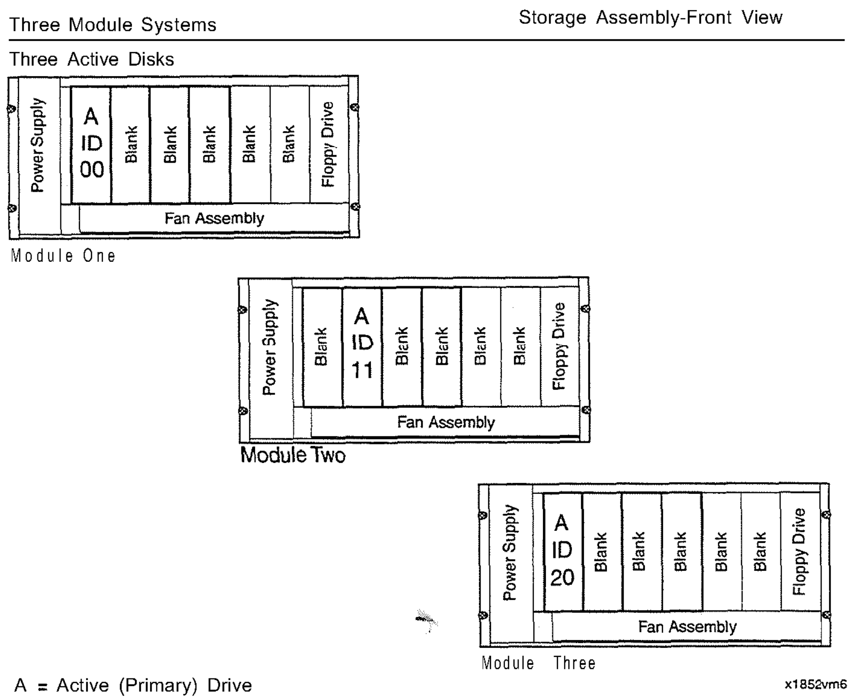


Figure 8 Three **Module D**isk Configurations

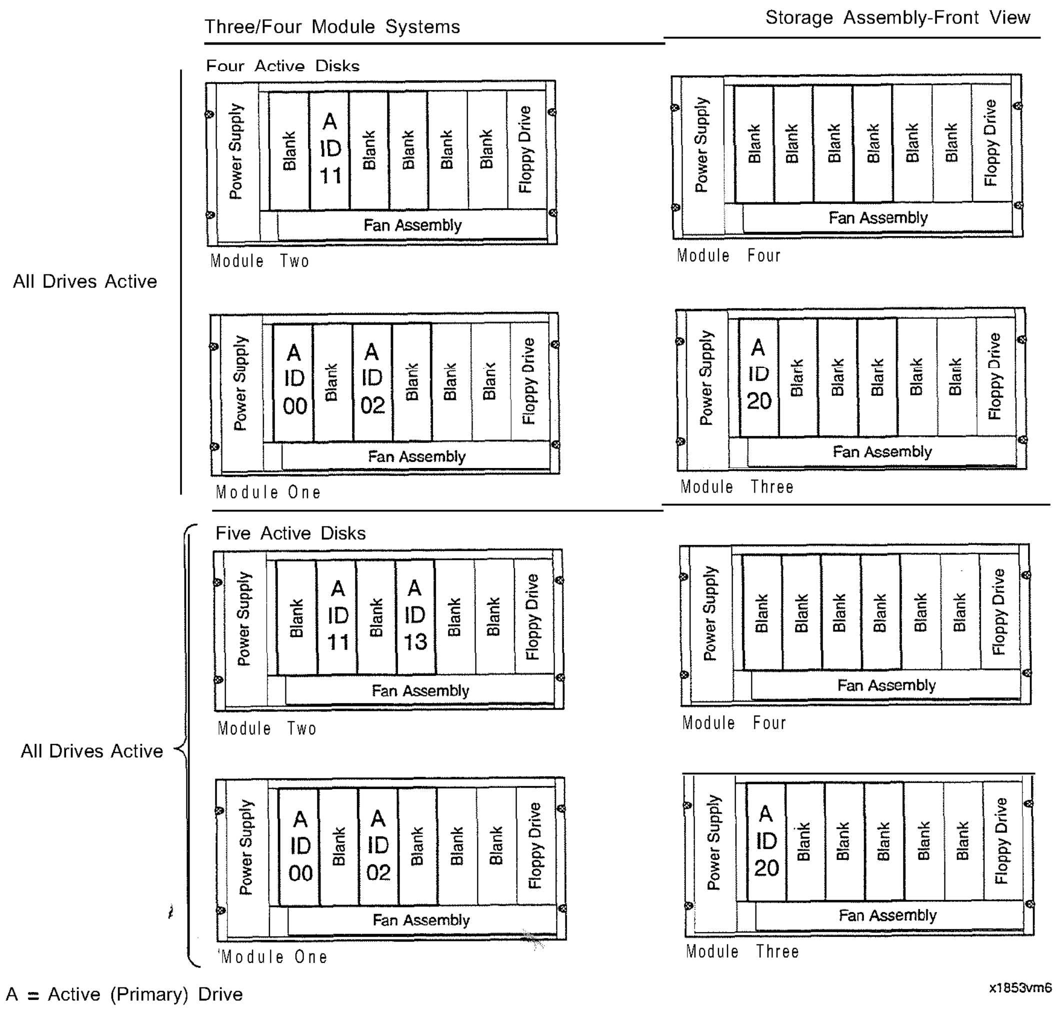


Figure 9 Three or Four Module Disk Configurations

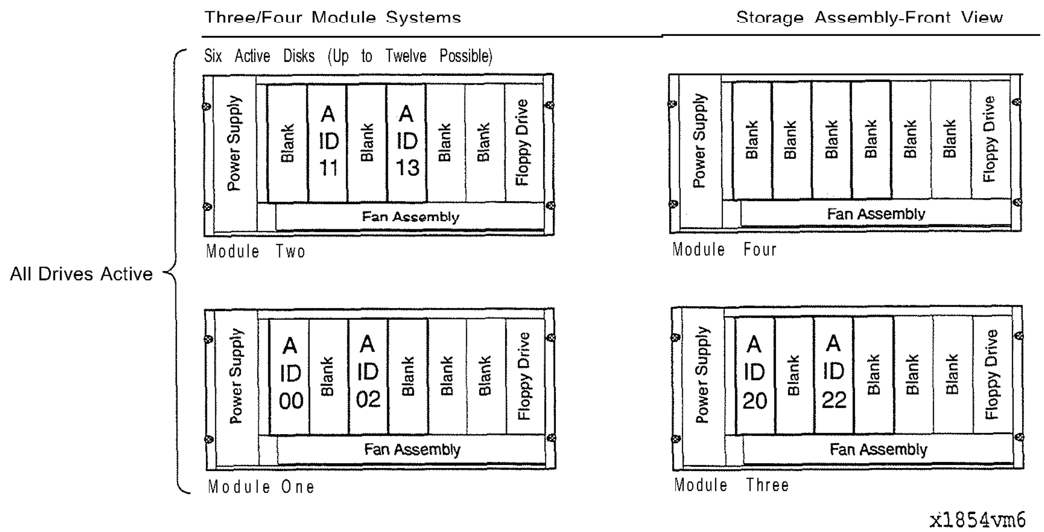


Figure 10 Three or Four Module Disk Configurations

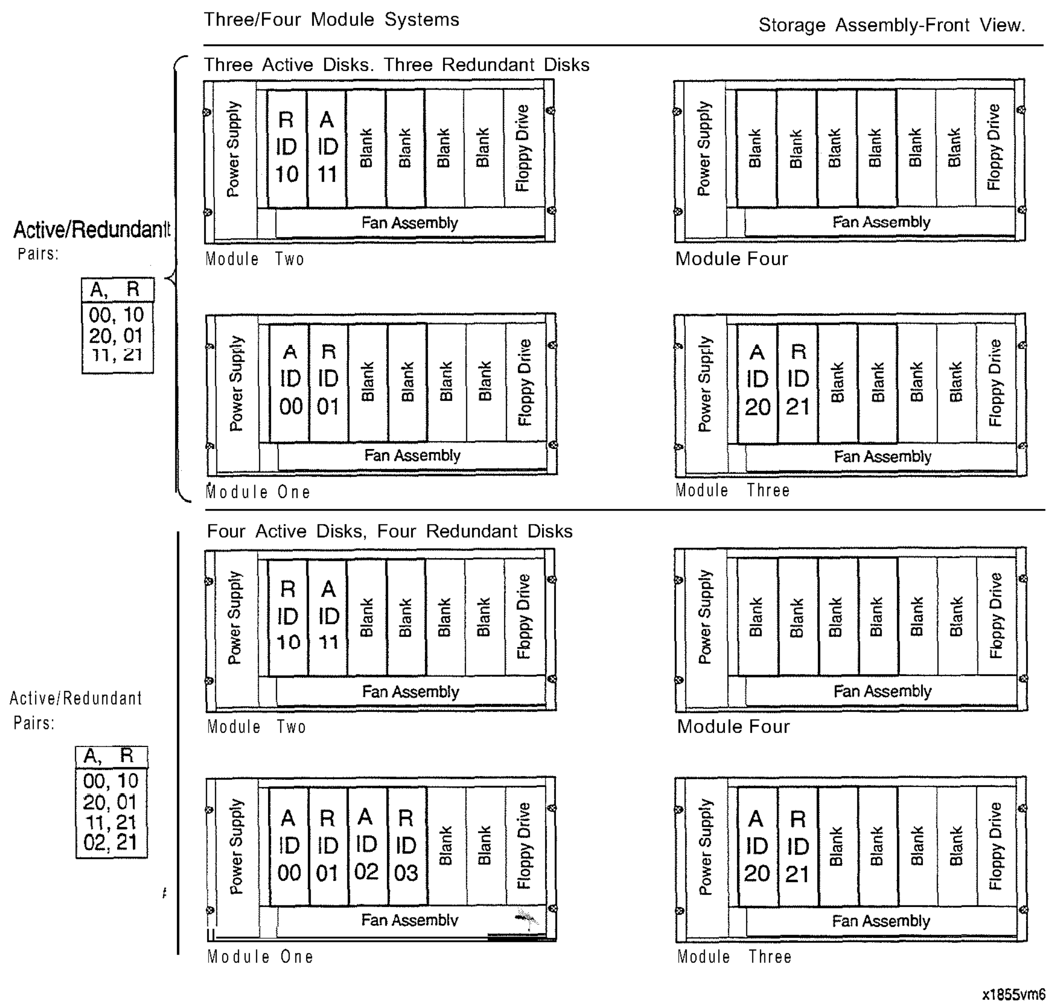


Figure 11 Three or Four Module Disk Configurations

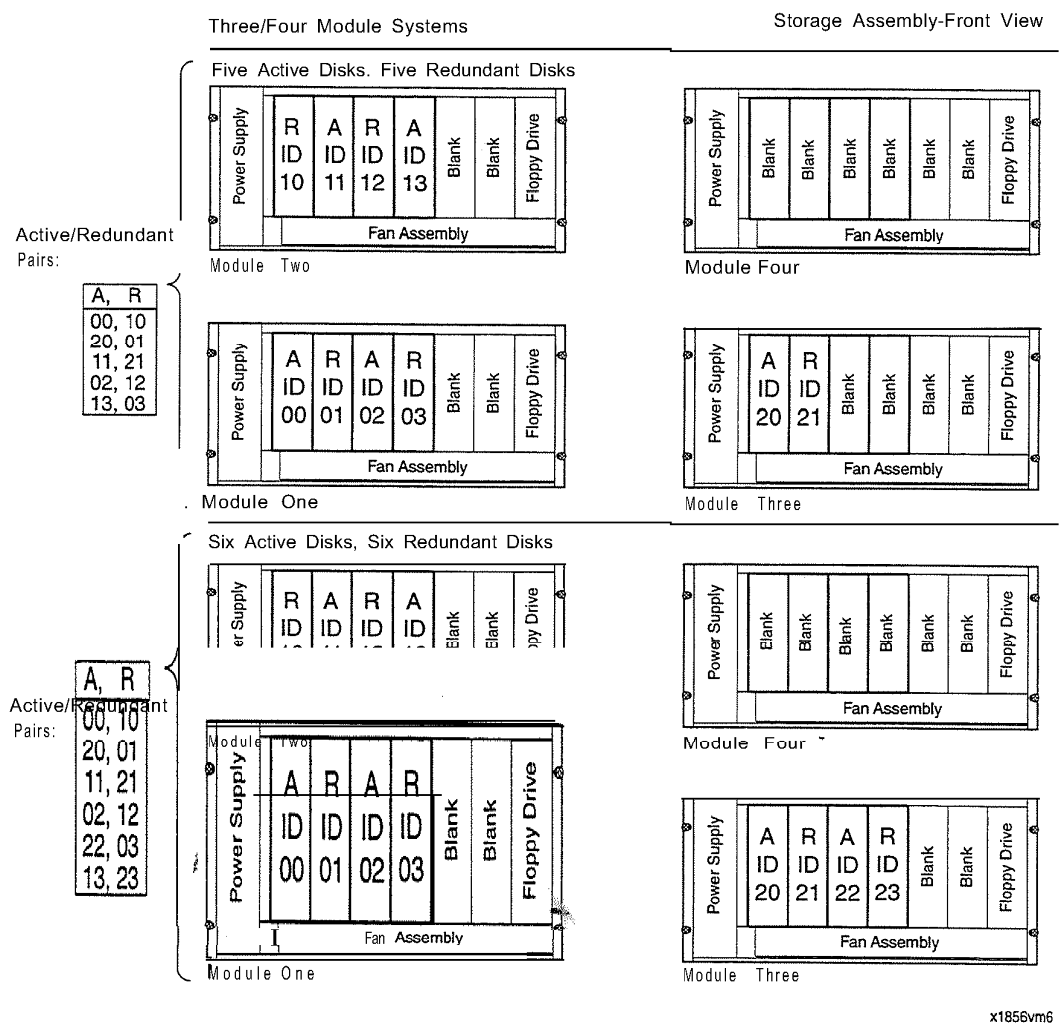


Figure 12 Three or Four Module Disk Configurations

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's Installation and *Service Manual.*

The hard disk subassembly is mounted on a slide tray and held in place with retaining card-ejector clips. Figure 13 shows how it slides in and out of the Storage Assembly.

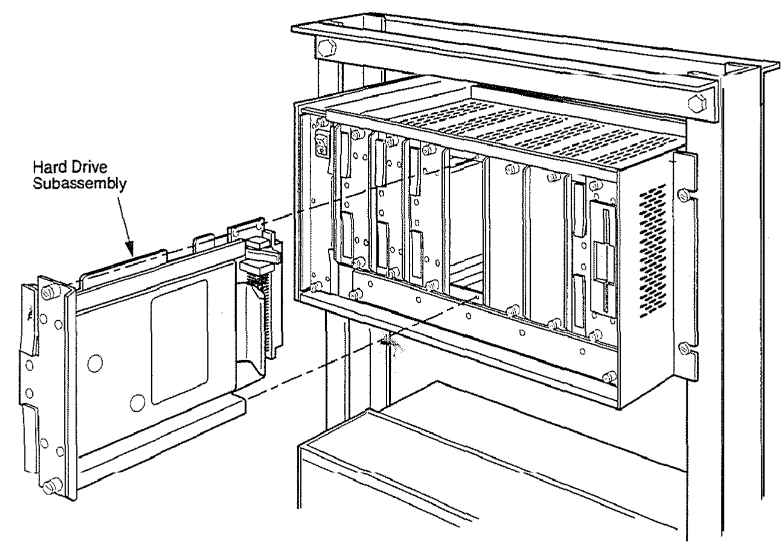


Figure 13 Hard Disk Installation or Removed

Your disk is pre-configured at the Centigram factory and it is ready to install. Before you install a new disk, refer to your server's Installation and Service Manual for correct instructions on how to remove and replace disks. (See Caution below.)

CAUTION!

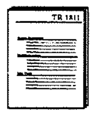
There is no need to turn the power supply off when replacing a disk. However, after you have ejected the disk-tray from the Storage Assembly, wait one minute for the disk to stop spinning before removing it from the assembly.

When replacing the hard disk, ensure that its rear panel connector is fully seated into the backplane of the Storage Assembly.

6 Power Components

- This chapter provides Technical References for Power Components.

Technical References



Use the technical references to find detailed background information about the hardware components of a Centigram Series 6 server. These are: the Model 640, the Model 120, and the Model 70.

How to Use This Chapter

Identify the Power *Components* that you want to study. Go to the "List of Technical References" in this chapter and identify their technical reference number. The references are listed in numerical order in the "List of Technical References" table.

If you remove a technical reference from this binder, mark its original location, and replace it when you are finished with the document.

6 Power Components
List of Technical References

Tech. Ref. Number	Title	Document Rev.	Release Number
TR 1900	Power and Grounding Requirements	Doc. Rev. A	6.0A
TR 1926	AMPS Power Supply	Doc. Rev. A	6.0A

Series 6 Servers Site Planning
Power and Grounding Requirements

This technical reference contains power supply and grounding requirements for a Centigram Series 6 Communications Server Model 640 (AC or DC) and Models 70/120 (AC only). It covers only installations in the United States. To ensure a safe and successful installation, Centigram recommends that the power and grounding for the servers meet these requirements.

Note: For information regarding *international* power and grounding requirements, contact Centigram.

WARNING!

The power and grounding information in this document is not intended to take the place of the National Electrical Codes (NEC) and local practices for your area. All site wiring must comply with NEC and local electrical codes.

1 Alternating Current (AC) Systems

2 Direct Current (DC) Systems

1 Alternating Current (AC) Systems

Transients or power disturbances can degrade the system's performance and are most often caused by heavy machinery such as air conditioners, elevators, copy machines, and other office equipment. Therefore, supplying the Series 6 servers with dedicated circuits minimizes this type of disturbance.

Installations in the United States require a standard, 3-prong, 110 VAC isolated ground (IG) receptacle. The receptacle should be located within three feet of the server to eliminate the need for an extension cord.

To assure Continuous System Operation (CSO) of Model 640 Server modules, Centigram recommends that the customer supply each CPU assembly and each Storage assembly with a dedicated branch circuit.

Note: In this document, a *module* is defined as a functional unit that includes a CPU assembly, a CPU power supply, and a Storage assembly. A system comprises one or more modules. The Storage Assembly is powered by a built-in power supply.

AC Power Requirements

Table 1 lists the power input specifications for 110 VAC systems. Figure 1 shows typical branch circuits from the equipment-room power panelboard when supplying a dedicated 110 VAC circuit. Figure 2 shows typical receptacle wiring. Note the following when analyzing the power requirements:

- The L (Line), N (Neutral), and G (Ground) conductors run in the same conduit. If a conduit is not used, an insulated ground wire connects the panelboard chassis to the Master Ground Bar (MGB).
- The N and G buses are isolated from the panelboard chassis.
- The N and G buses are not strapped together at the panelboard unless it is the main incoming service panel or the first point of distribution from the output of the service transformer feeding the main electrical service panel. If the MGB bonding was not accomplished within the transformer, then the first point of distribution is acceptable.
- The customer's electrician should provide a written verification of the MGB bonding with a procedure for checking all connected output panelboards to ensure that only one neutral-to-ground bond exists. This eliminates the possibility of ground loops.
- All outlets are conventional NEMA (National Electrical Manufacturer's Association) receptacles. There is only one duplex receptacle per dedicated circuit.

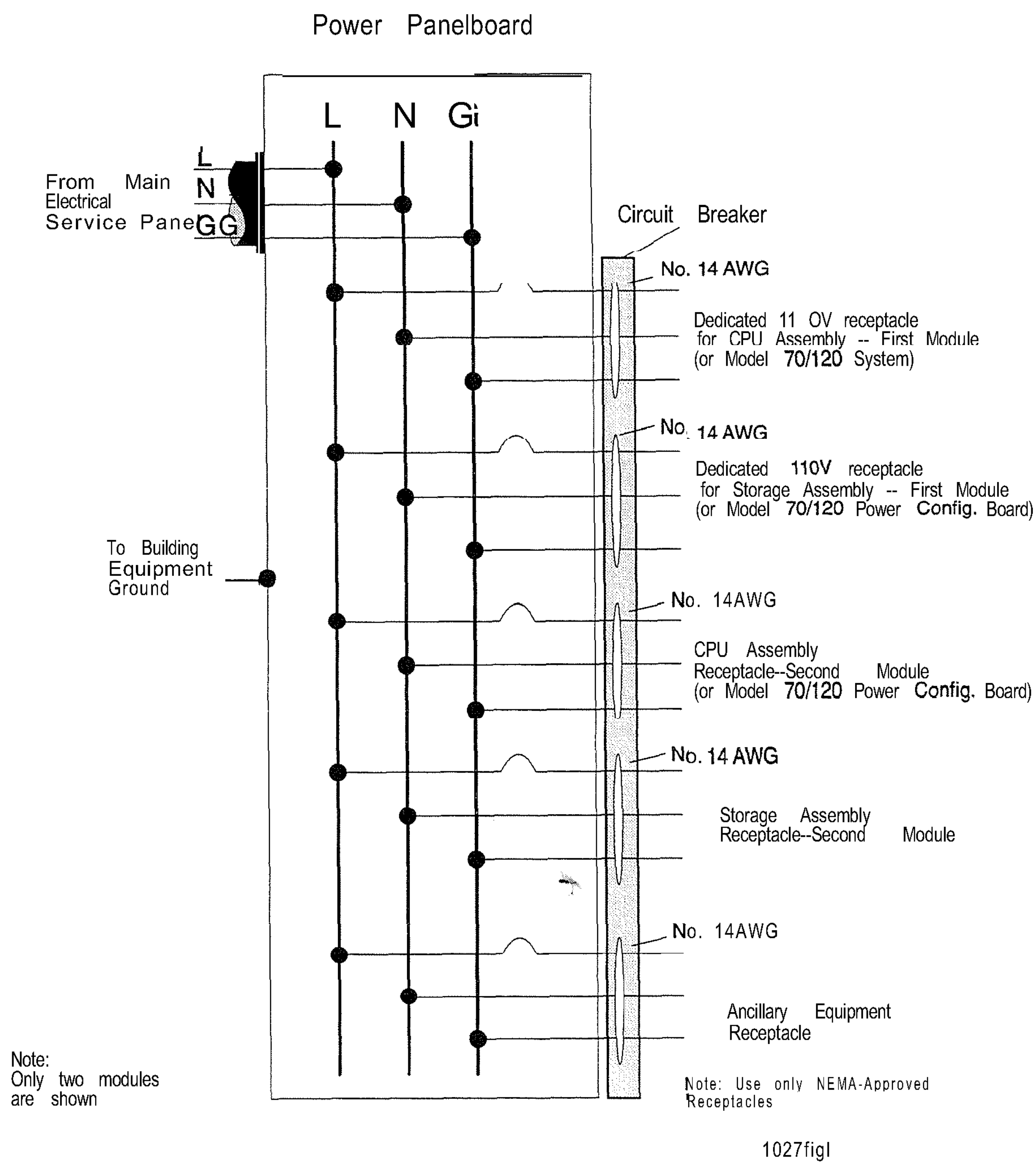


Figure 1 Typical AC Powering of Series 6 Servers

Table 1 110 VAC Power Specifications

Power Item	Model 640 CPU Assy Power Supply	Model 640 Storage Assy Power Supply	Model 70/120 System Power Supply	Model 70/120 Power Config. Bd. Converter
Input voltage	90-132 V	90-132 V	90-132 V	90-132 V
Input frequency	57-63 Hz	57-63 Hz	57-63 Hz	57-63 Hz
Maximum steady input current	9 amps	3 amps	6 amps	3.2 amps
Recommended circuit breaker	15 amps	15 amps	15 amps	15 amps
Recommended receptacle	NEMA No. 5-20R Minimum	NEMA No. 5-20R Minimum	NEMA No. 5-20R Minimum	NEMA No. 5-20R Minimum
Wire size from the power panelboard to the receptacle	14 AWG	14 AWG	Rated for 125% of Max. Current Rating	Rated for 125% of Max. Current Rating

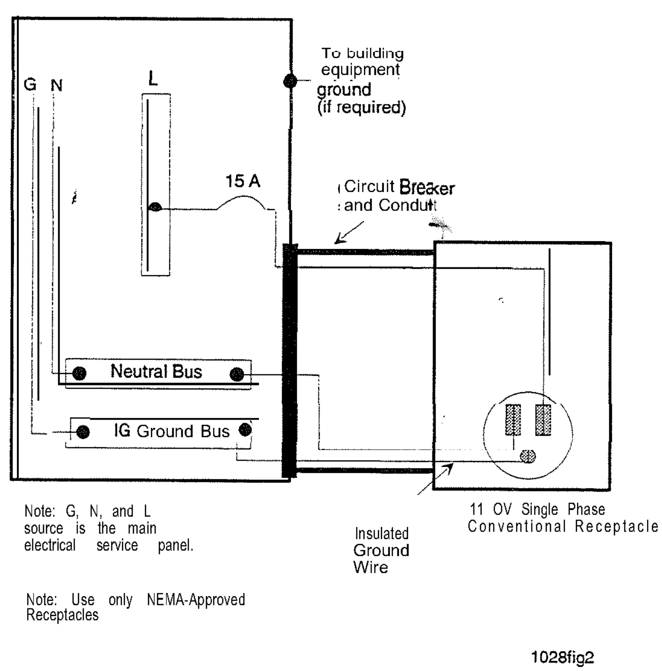


Figure 2 Typical 110-VAC Single Phase Receptacle

AC Grounding Requirements

The following sections discuss the grounding requirements for AC systems.

WARNING!

The Series 6 servers must be grounded correctly to ensure personnel safety and proper system operation. The Model 640's chassis ground terminals must be connected to the correct ground source to ensure personnel safety and proper system operation.

Isolated Ground (IG) Requirements

Centigram recommends isolation grounding for the Series 6 servers (Figure 3). Resistance and impedance between the Series 6 servers and the master ground bar system should be less than 1 ohm and have zero voltage potential. The maximum acceptable current level is 0.1 Amp RMS when all telephone lines are idle.

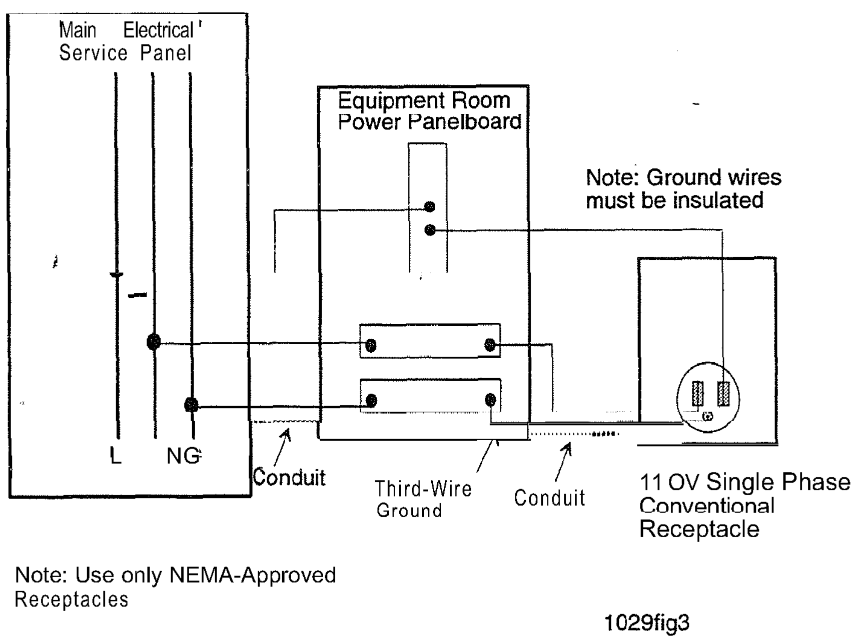


Figure 3 **Typical 1 10-VAC Site Wiring**

Model 640 CPU Assembly Grounds

WARNING!

The CPU assembly's ground terminals must be connected to the correct ground source to ensure personnel safety and proper system operation.

The Model 640's CPU assembly provides three ground lugs, which are labeled as follows in Figure 4:

- Logic Ground (LG): This ground provides the ground reference point for the TTL and CMOS logic levels used in the circuitry of the various active components of the Model 640 circuit cards.
- Chassis Ground (CG): This ground provides a return path for all spurious currents that might reach the chassis due to voltage transients induced by electromagnetic fields near inter-assembly cabling and other electrical harnesses.
- 48V Talk Return (TR): This ground provides the ground reference point for voltage levels used by telephone circuits in the Model 640.

When installing the Model 640 modules, the installer must route the grounds as shown in the figure below. Any significant deviations from Centigram recommendations will cause grounding problems and are not supported by Centigram.

In the figure, the terms GWB, MGB, and TGWB refer to Ground Window Bar, Master Ground Bar, and Talk Ground Window Bar respectively.

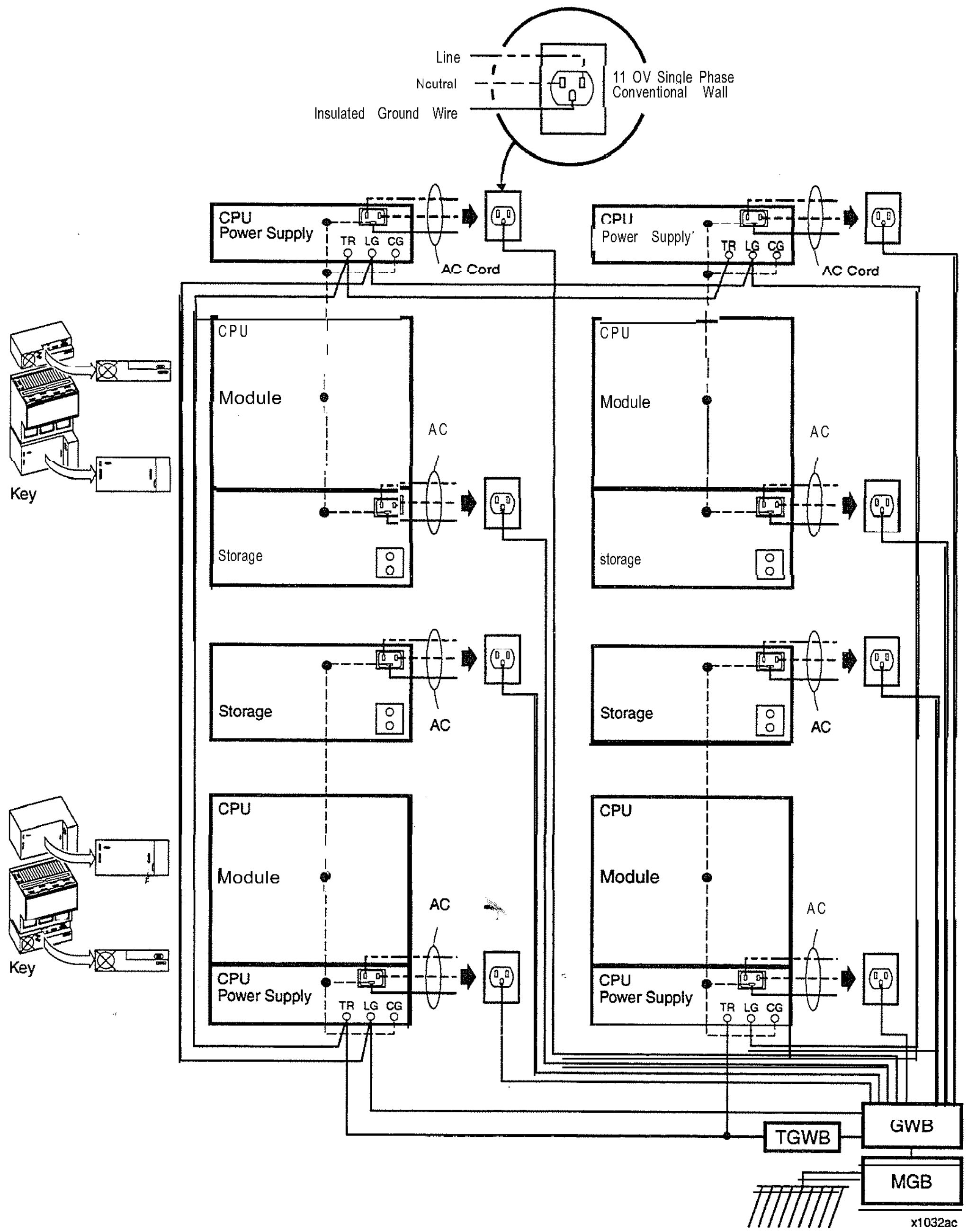


Figure 4 Model 640 --AC Power and Grounding

Pre-Installation Checklist--AC Systems

Use the following checklist to verify that the site's power and grounding will support the installation of the Series 6 servers. If an answer is "NO," correct &problem.

Power and Grounding Pre-installation Checklist 110 VAC Systems		
1. A dedicated equipment room power panelboard with ground isolation exists for the communication system and its peripherals.	Yes [ ]	No [ ]
2. A separate power panelboard supplies power for lighting, motors, compressors, and general office equipment.	Yes [ ]	No [ ]
3. The communications power panelboard has a dedicated ground originating from the facility's primary power source (that is, a ground connection exists between the panelboard ground bus and the facility's Master Ground Bar).	Yes Cl	No [ ]
4. Neutral-to-ground bonding occurs at the facility's primary dower source, not at the communications power panelboard.	Yes II	No [ ]
5. Resistance and impedance between the Series 6 servers and the master ground bar system is less than 1 ohm and has zero voltage potential.	Yes Cl	No [ ]
6. The size of the ground conductor is the same or larger than the current-carrying conductors.	Yes [ ]	No [ ]
7. The communications power panelboard has a set screw for every ground wire.	Yes [ ]	No [ ]

Power and Grounding Pre-installation **Checklist** 110 VAC Systems		
8. All conductors are copper.	Yes El	No [ ]
9. All conductors supplying the panelboard or individual circuits are in the same conduit.	Yes [ ]	No [ ]
10. All conductors meet or exceed minimum NEC size requirements.	Yes [ ]	No [ ]
1 1. A dedicated branch circuit and receptacle exists for each Series 6 servers assembly.	Yes [ ]	No El
12. Only one receptacle per dedicated circuit exists. (The receptacle and circuit do not run in parallel to any other equipment.)	Yes [ ]	No [1
13. Receptacles are located within three feet of the Series 6 servers.	Yes [ ]	No [ ]
1 4 . The isolated ground ends at the IG receptacle. (The ground does not daisy-chain from the receptacle to anything else.)	Yes [ ]	No [1
15. Receptacles and circuit breakers meet requirements. See Table 1 .	Yes [ ]	No [ ]

Comments: ____

____

2 Direct Current (DC) Systems

DANGER!

Be certain that the external breakers are set to OFF or the fuses are removed from the Main Distribution Frame (MDF) before installing the terminal lugs or connecting the power leads.

Systems using a 48 VDC power source require a Power Distribution Panel (PDP) between the battery and the Model 640. The PDP provides a dedicated circuit through a fuse or circuit breaker for each Model 640 DC power supply.

Figure 5 shows typical branch circuits from the PDP when supplying redundant battery plant power (i.e., -48V systems A and B) to the Model 640 DC power supply. The figure shows the branch circuits for a two-module system equipped with four power supplies that is located within 50 feet of the PDP. Table 2 lists the DC system power specifications. To assure Continuous System Operation (CSO) of system modules, Centigram recommends that the customer supply each CPU assembly and each Storage assembly with a dedicated branch circuit.

Note: In this document, a *module* is defined as a functional system which includes a CPU assembly, a CPU power supply, and a Storage assembly. A system comprises one or more modules. The Storage assembly is powered by a built-in power supply.

Table 2 DC Power Specifications

Power Item	CPU Assy Power Supply	Storage Assy Power Supply
Input voltage	42- 56 V	42 - 56 V
Maximum steady input current	17 amps	6 amps
Recommended circuit breaker for the -48 VDC power input	30 amps	10 amps

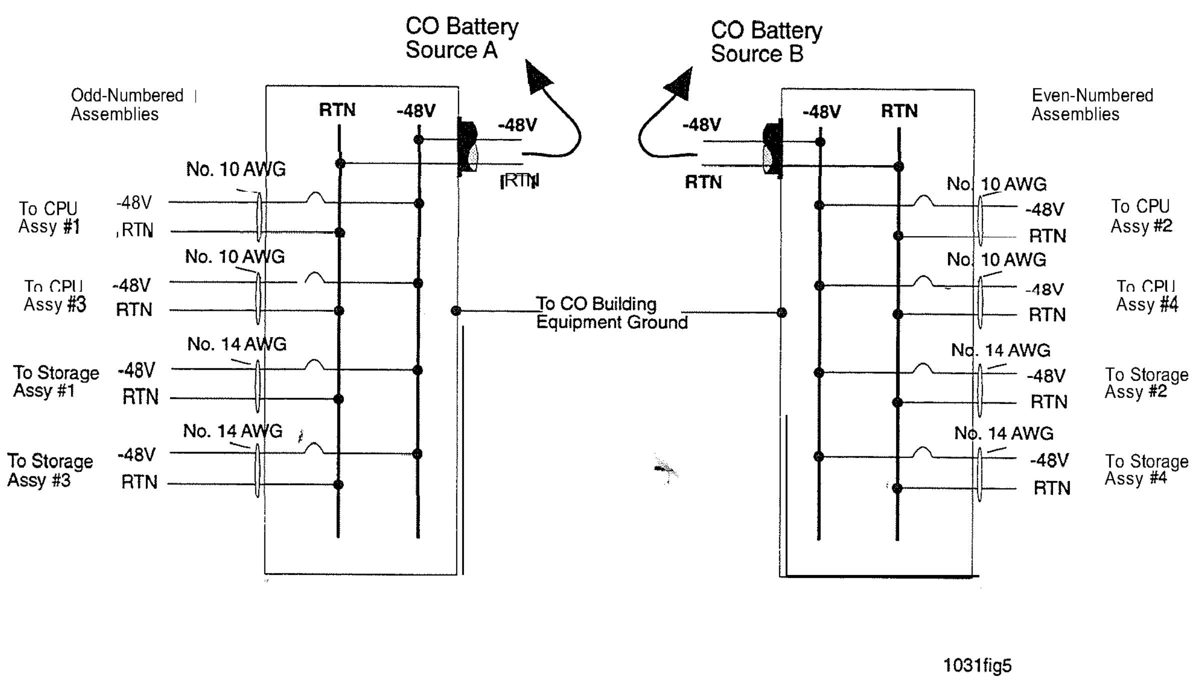


Figure 5 Typical DC Powering of Model 640 Modules

DC Wiring Requirements

Table 3 lists the wiring requirements between the -48 VDC battery source and the PDP and between the PDP and the Model 640 power supply. There should never be more than a 0.5 VDC voltage drop between the Model 640 and the PDP regardless of the wire size.

Table 4 lists the power wiring specifications.

Table 3 Minimum Wiring Requirements for -48 VDC Systems

Power Leads	Battery to PDP (Less than 10 loop feet)	Battery to PDP (10 to 400 loop feet)	PDP to Model 640 Power Supply (Less than 100 loop feet)	
-48V PWR	10 AWG	8 AWG	CPU Assembly Power Supply: 10 AWG	Storage Assembly Power: 14AWG

Note: Wire sizes for cable runs not included in this table must be calculated. Have an electrician calculate the wire size needed for the installation.

Table 4 DC System Wiring Requirements

Description	Specification
Wire gauge:	See Table 3.
Required insulation:	PVC
Number of conductors:	2 or 3
Equipment terminal:	Crimp terminals
Distribution terminal:	Crimp terminals
Required approvals:	UL/CSA

Connecting the power leads to the Model 640 CPU power supply input terminals requires lugs that crimp on 10 AWG wire. Larger wires are not required and larger lugs may not fit the Model 640 power supply input terminals.

DC Grounding Requirements

The following sections discuss the grounding requirements for DC systems.

-48V Power Return Connection

-48V power return lead connects to the Model 640's DC power supply. The -48V power return lead should run separately and should be isolated from the -48V talk return lead if the site provides separate power and talk returns.

The PDP's -48V return bus bar must be bonded (connected) to a ground that originates at the facility's Master Ground Bar (MGB).

The Model 640 power supply has an output that internally generates 48 volts for analog telephony ports. For this output only, the -48 volts is accessible.

Note: Talk batteries are a low noise 48-volt power source used exclusively for analog telephone ports (i.e., Tip, Ring, and E&M leads).

CPU Assembly Grounds

WARNING!

The CPU assembly's ground terminals must be connected to the correct ground source to ensure personnel safety and proper system operation.

The Model 640's CPU assembly provides three ground lugs, which are labeled as follows in Figure 6:

- Logic Ground (LG): This ground provides the ground reference point for the TTL and CMOS logic levels used in the circuitry of the various active components of the Model 640 circuit cards.
- Chassis Ground (CG): This ground provides a return path for all spurious currents that might reach the chassis due to voltage transients induced by electromagnetic fields near inter-assembly cabling and other electrical harnesses.
- 48V Talk Return (TR): This ground provides the ground reference point for voltage levels used by telephone circuits in the Model 640.

When installing the Model 640 modules, the installer must route the above three grounds as shown in the figure below. Any significant deviations for Centigram recommendations will cause grounding problems and are not supported by Centigram.

In the figure, the terms GWB, MGB, and TGWB refer to Ground Window Bar, Master Ground Bar, and Talk Ground Window Bar respectively.

Note Centigram recommends connecting the Model 640's chassis ground wire to the 48V return bus bar at the PDP. The return bus bar must connect to a ground that originates at the facility's Master Ground Bar (MGB). Do not connect the chassis ground to ground points that are not connected to the grounding system's MGB. This can cause unwanted noise and interference on the server lines. Connecting the server's chassis ground to the MGB source eliminates problems caused by unreliable ground connections.

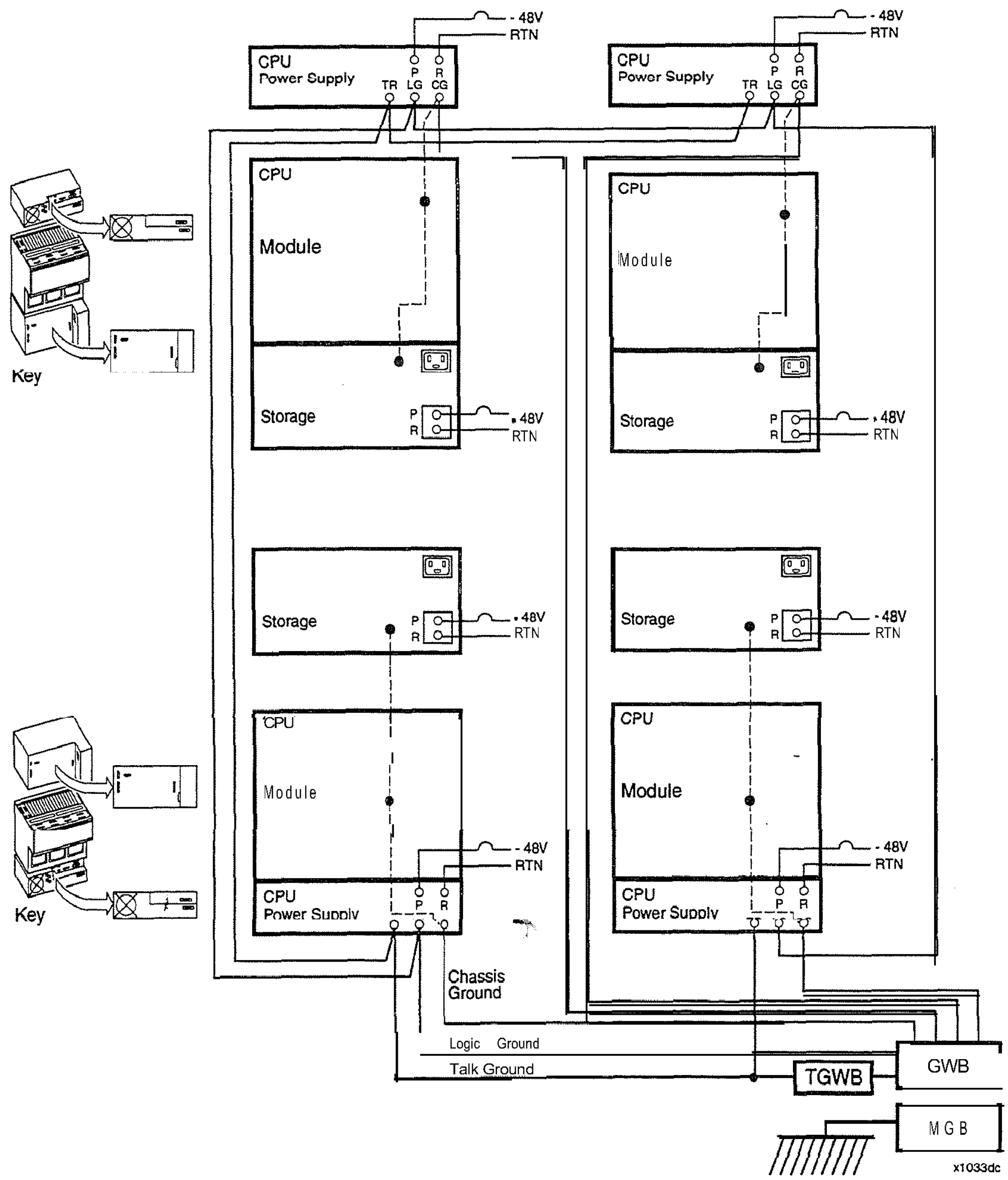


Figure 6 **Model** 640 **System--DC Power** and **G**rounding

Pre-Installation Checklist--DC Systems

Use the following checklist to verify that the site's power and grounding will support the installation of the Model 640. If an answer is "NO", correct the problem.

Power and Grounding Pre-installation Checklist **-48** VDC Systems		
1. A power distribution panel exists between the 48V power source and the Series 6 servers.	Yes [ ]	No [ ]
2. A dedicated branch circuit exists for each power supply.	Yes El	No [ ]
3. The PDP's return bus connects or bonds to a ground that originates at the facility's primary power source (that is, the return bus connects to the facility's Master Ground Bar).	Yes [ ]	No [1
4. The size of the ground conductor is the same or larger than the current carrying conductors;	Yes [ ]	No [ ]
5. All conductors are copper.	Yes [ ]	No [ ]
6. All conductors meet or exceed minimum NEC size requirements.	Yes [ ]	No El
7. The communications power panelboard has a set screw for every ground wire.	Yes [ ]	No [ ]
8. Circuit breakers have the correct rating. See Table 2.	Yes [ ]	No [ ]

Comments: ______________________________

This technical reference provides information for the Alarm and Monitor Power Supply (AMPS).

1 Description

2 Functional Overview

3 hdicators and Controls

4 Cabling Diagrams

5 Installation Guidelines

1 Description

The Centigram Alarm and Monitor Power Supply (AMPS) is a power supply assembly that, beginning on VoiceMemo Software Release 6.0, replaces all other power supplies used previously with Model 640 servers.

Physical and Electrical Characteristics

The AMPS assembly conforms with standard *EIA-31 0, Racks, Panels, an Associated Equipment* and *Bellcore TR-NTW-000063, Network Equipment - Building System (NEBS) Generic Equipment Requirements.* The assembly occupies 3U (5.25 inches) in a 19-inch rack and measures 16.88 inches wide, 5.22 inches high, and 12 inches deep.

A filter-fan unit cools the power assembly and prevents dust particles larger than 30 PPM from entering its interior. The filter, which is easily accessed, requires inspection and/or replacement every three months in an office-like environment. Optimal replacement period may be shorter if the environment conditions of the site are less ideal.

AMPS assemblies are either AC or DC powered. AC assemblies use 90-to-131 volts or 180-to-264 volts at 47-to-63 Hz. DC assemblies use 47-to-56 volts DC.

In cities where local electrical codes explicitly require branch-circuit protection, we recommend the use of a 20 Amp AC7DC circuit protector. We recommend connecting one assembly per single branch circuit. If attaching multiple assemblies to a single site circuit breaker, follow the recommendations of the National Electrica Code, and comply with all state and local ordinances.

The AMPS assembly powers and protects one CPU assembly and one CSO/IO Assembly. DC outputs, current levels, and protecting devices are tabulated in Table 1.

Table 1 **Outputs** and **O**ver-current/-voltage Protection

Voltage	Current	Protection Device
+ 5 Volts	60/80 Amps absolute maximum	Factory set on Electronic Circuit Breaker (ECB)
+ 5 Volts	Set point value	Programmed on ECB at power-on by operator
+ 12 Volts	15 Amps	Power supply assembly
- 12 Volts	8 Amps	Power supply assembly
- 48 Volts	3 Amps	Power supply assembly

Regulatory and Safety Compliance

The AMPS power assembly is fully complaint with UL1459, CSA 22.2 No. 0.7-M1985, FCC Part 15 Subpart J, Class A and DOC standards. All compliance was obtained through an approved Nationally Recognized Testing Laboratory.

The AMPS power assembly provides OSHA-compliant safety (frame) ground connections. It is the responsibility of the customer to provide an adequate fault path to ground beyond the perimeter of the power assembly enclosure and the server in which it is installed. Follow the recommendations of the National Electrical Code, and comply with all state and local ordinances in providing an adequate safety ground for the AMPS assembly.

2 Functional Overview

The AMPS assembly provides for the monitoring and regulating of system electrical voltage and current levels; fan functionality; blown fuse detection; and system temperature. Also, it monitors the server and displays visible alarms when conditions detrimental to the server are detected.

The AMPS assembly contains two plug-in boards: an Electronic Circuit Breaker (ECB) that monitors the power supply's output current to the system and a Fan Monitor Board (FMB). Under software control, the FMB and ECB work in conjunction with an internal module control board to monitor the power supply assembly, fan operation, and temperature changes. They also provide Critical, Major, and Minor visible alarm lights.

Monitoring and alarming of system power and cooling allows the server to operate continuously. Online monitoring reduces system maintenance and diagnostic time if a fault is detected. This results in a higher level of system reliability, availability, and serviceability.

Electronic Circuit Breaker (ECB)

The Electronic Circuit Breaker (ECB) monitors the +5V current. Over-current (Max current), undercurrent (Fault), and programmable delta current (Delta Monitor) levels are also monitored. Deviations beyond specified limits result in state changes to the front panel indicators on this board. State changes on the board are also communicated through the rear panel 9-pin connector AUX port for custom connection to a Site Event Buffer or other similar device. In multi-module environments, the ECB communicates state changes among power supplies on each module.

Fan Monitor Board (FMB)

The Fan Monitor Board (FMB) is a hardware feature, which monitors and enables alarms in single-module or multi-module servers. Alarms that can be enabled are: voltage levels, temperature, and fan rotation. The FMB is a field-installable plug-in board designed to physically reside beside the Electronic Circuit Breaker module in the power supply assembly.

Voltage Monitor Features

The +5V output on each power supply in a multi-module server is monitored. This feature allows another host in the server to sense when an adjacent CPU's5V logic power has been disrupted. This feature is handled as a combination of the ECB and FMB communication. It is intended to support Continuous System Operation or CSO, which is an optional feature. This feature allows the Master Module software to swap residency to another module should the Master Host develop a power supply problem interfering with operation of the server. Within each module, all voltages (±5V, ± 12V, −48V) are monitored, as well as +5V and + 12V in the module's Storage Assembly

Fan and Temperature Monitor Featut-es

Each fan in the new servers has a rotation sense capability. This capability is utilized by the Fan Monitor Board (FMB). An alarm state change occurs when the fan rotation falls outside of the limits set on the FMB, for proper fan operation. Similarly, temperature in each module is monitored and an alarm state change occurs when a module's internal temperature rises above parameters set for the system of 50°C.

Rear Panel ALARM I/O

The rear panel uses four industry standard 9-pin (DB9) connectors for alarm input/output (I/O). One pair of connectors (ECB IN and ECB OUT) carries Max, Delta, Fault, and +5V alarms to other modules within a server. The third connector (AUX) allows the customer to connect remotely to a Site Event Buffer or similar device, which can provide site-event monitoring functions externally. A fourth connector conveys voltage fan and temperature signals from the Storage Assembly for processing.

Power and Grounding

An external harness provides power and grounding lines to the AMPS assembly. Three grounds exit the assembly: a Chassis (frame) Ground (CG), a Logic Ground (LG) that references digital logic levels, and a -48V Talk Return (TR) ground that references analog signals. These connect to the site via a three-position terminal block (TB2) at the rear panel of the unit. They may be jumpered or separated as desired by the installer to meet the following conditions at the site:

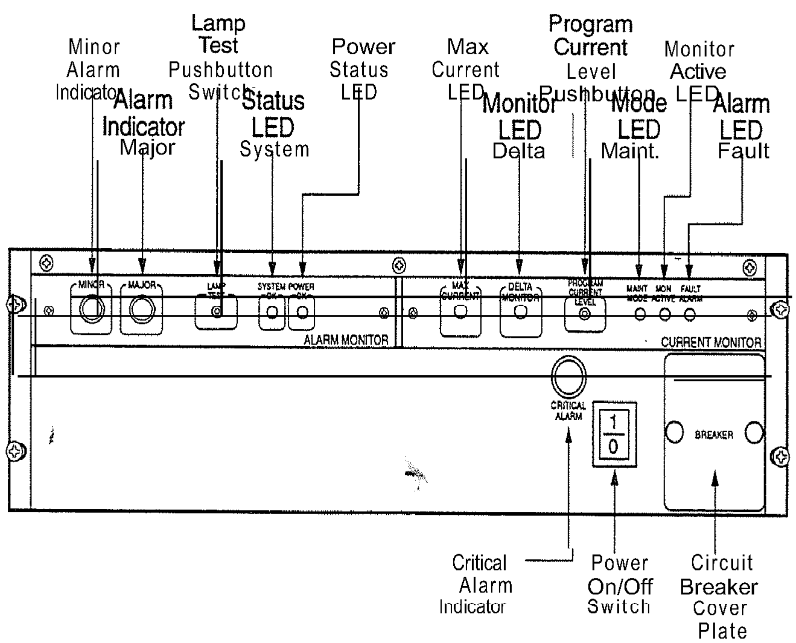
- Frame, digital, and analog grounding
- Frame and logic grounding or common grounding

3 Indicators and Controls

The technical user can interface the AMPS supply through indicators and controls. These are located on the front panel and the rear panel of the unit.

Front Panel (AC and DC Units)

The front panel indicators and controls (Figure 1) are explained in Table 2 and Table 3, respectively.



x1934vm6

Figure 1 AMPS' Front Panel

Table 2 AMPS' Front Panel indicators

Indicator	Function When Lighted	Normal State
Minor Alarm LED	Indicates a Minor Alarm condition.	Off
Major Alarm LED	Indicates a Major Alarm condition.	Off
System Status LED	Indicates normal system operation.	On
Power Status LED	Indicates power system is OK.	On
MAX Current LED	Indicates an over-current condition.	
DELTA Monitor LED	Indicates sensed current exceeds set point by 6 Amps for 30 milliseconds.	Off
MAINT Mode LED	Indicates Maintenance Mode is enabled.	Off
MON Active LED	Indicates normal power subsystem operation.	On
Fault Alarm LED	Indicates undercurrent fault.	Off
Critical Alarm Indicator	Indicates a Critical Alarm condition.	Off

Table 3 AMPS' Front Panel Controls

Control	Function
Lamp Test Switch	Lights all LEDs.
Program Current Level LED	When pressed during power up, programs Delta power levels.
MAX Current Pushbutton	When held pressed while power is turned on, it causes the assembly to "remember" the +5V current magnitude. This is called the "set point."
Power On/Off Switch	Turns power supply On or Off.
Circuit Breaker	Trips to prevent power supply overload.

Rear Panel (AC and DC Units)

The rear panel connectors and fuses (Figure 2) are explained in Table 4.

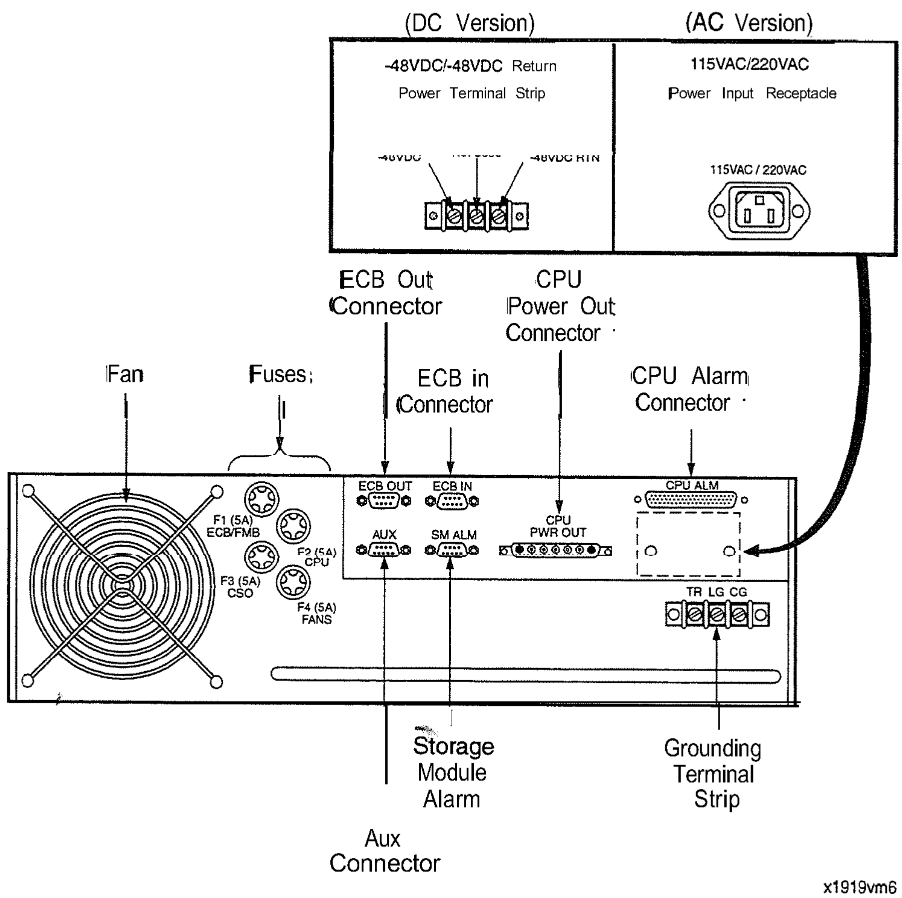


Figure 2 AMPS' Rear Panel

Table 4 AMPS' Rear Panel Fuses and Connectors

Fuse/Connector	Function
F1 ECB/FMB (5A)	Protects the ECB and FMB circuits.
F2 CPU (5A)	Protects the CPU Assembly.
F3 CSO (5A)	Protects CSO, if installed.
F4 Fans (5A)	Protects the Storage Assembly and AMPS fans.
ECB OUT Connector	Connects to succeeding module's ECB IN connector.
ECB IN Connector	Connects to preceding module's ECB OUT connector.
AUX Connector	Connects to Site Event Buffer.
SM ALM Connector	Connects to Storage Assembly. Conveys Storage Assembly's fan rotation, temperature, and voltage levels for monitoring.
CPU PWR OUT Connector	Supplies DC power to CPU Assembly and CSO/IO (if present). Conveys CPU Assembly's fan rotation signals to FMB.
CPU ALM Connector	Connects to CPU Assembly. Conveys fan status, temperature sense, blown fuse detection, and other voltage levels for monitoring.
110VAC/220VAC Receptacle	Connects to input power cord.
DC Receptacle	Connects to CO -48V source.
Grounding Terminal Strip	Provides terminals for Talk Return (TR), Logic Ground (LG), and Chassis Ground (CG) connections. **Note:** CG is not used in AC units.

4 Cabling Diagrams

The AMPS Power Supply is fairly simple to cable to other Model 640 assemblies. Figures 3 through 6 show how the power supply is connected in servers comprising one through four modules. For simplicity, only horizontal configurations are shown, but the cabling for vertical configurations is the same.

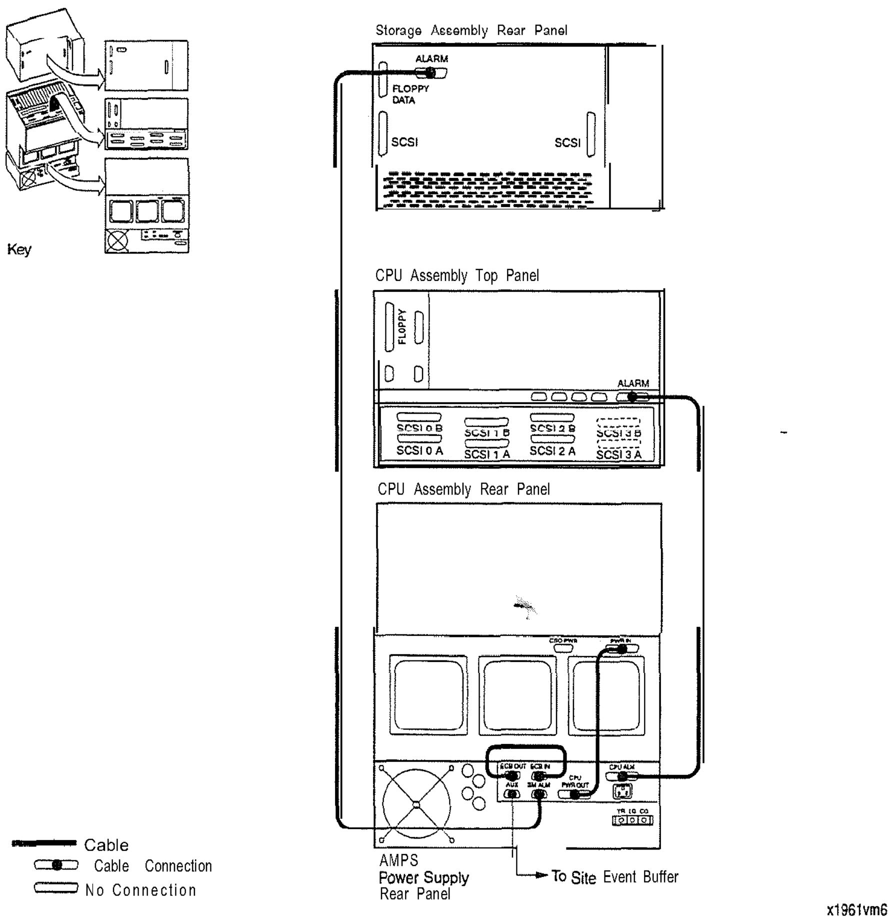


Figure 3 One Module Cabling

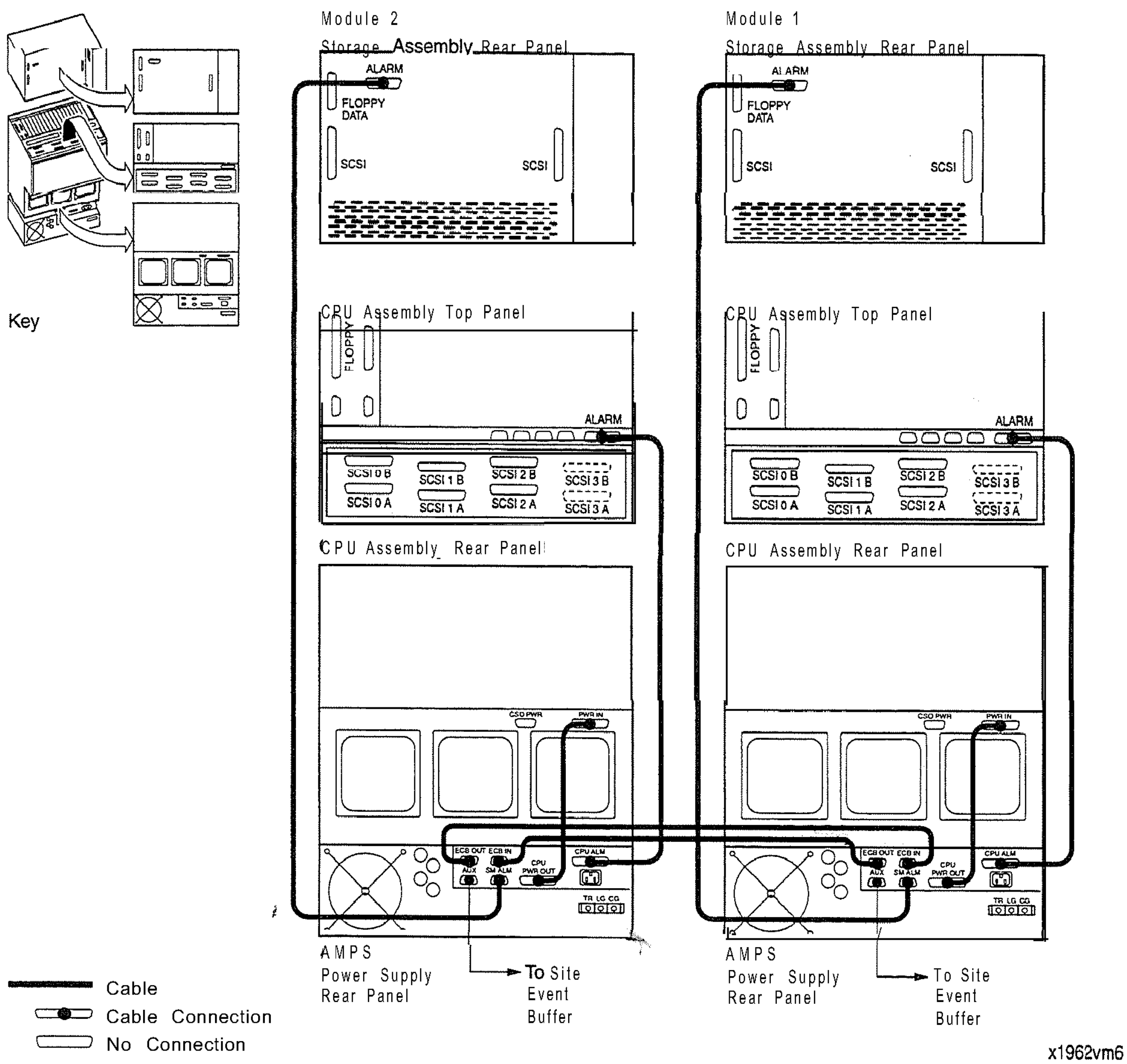


Figure 4 Two **Module Cabling**

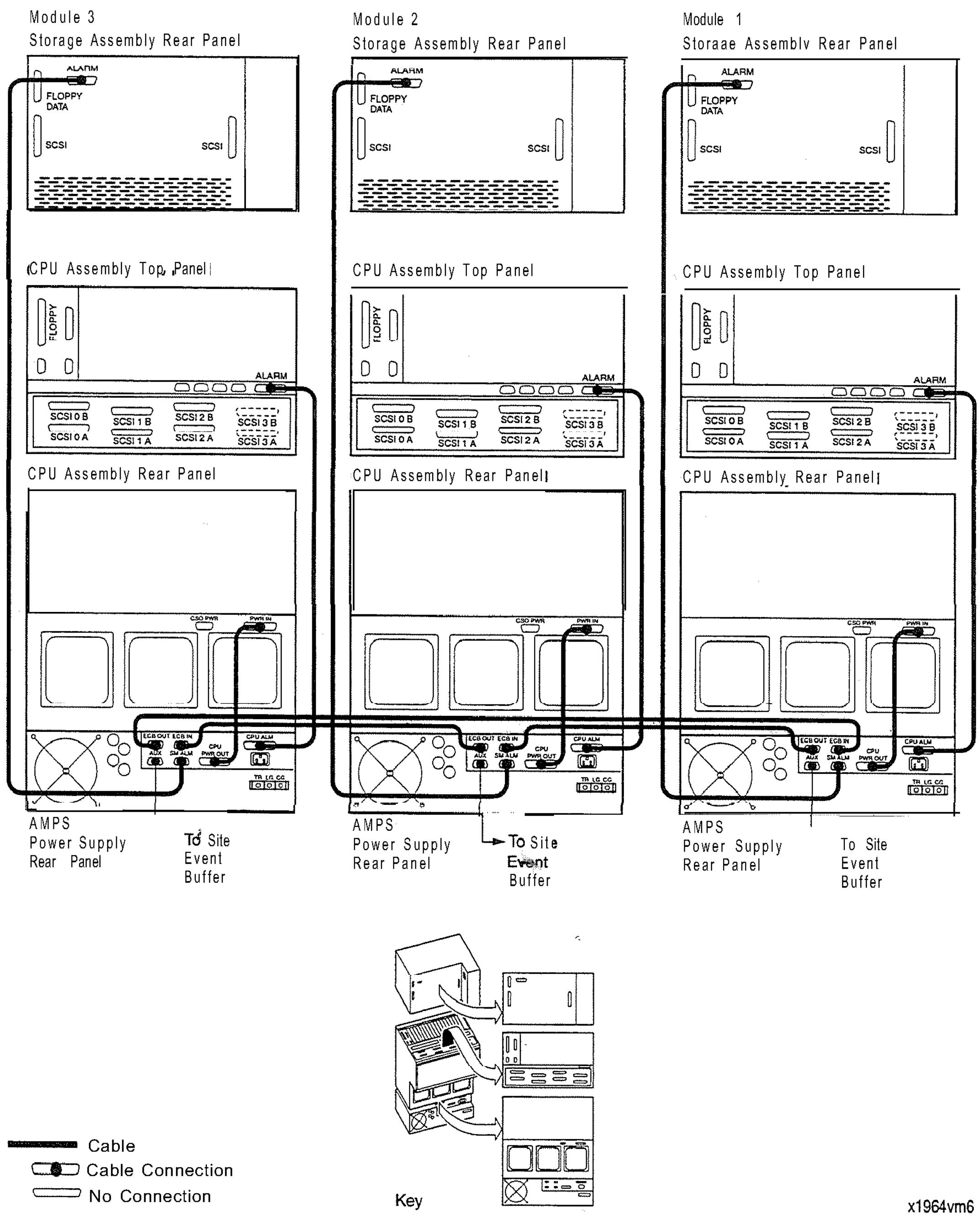


Figure 5 Three Module Cabling

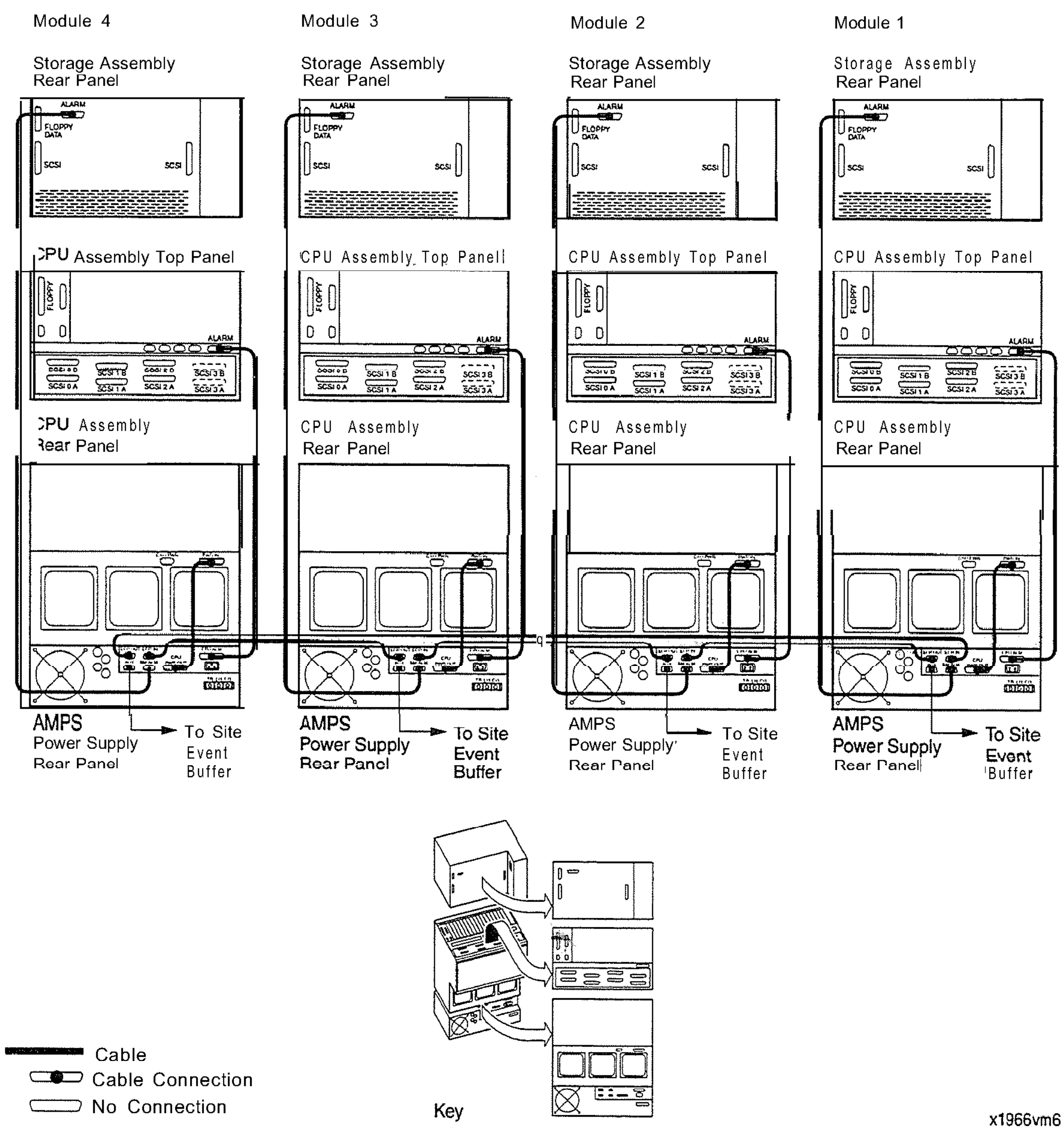


Figure 6 **Four Module Cabling**

5 Installation Guidelines

DANGER!

Disconnect the System from its power source before connecting cables, components, or both.

Before you install a new power supply, you should:

- Read this entire Technical Reference
- Refer to the *Centigram Series 6 Model 640 Installation and Service Manual* for correct instructions on how to remove and replace power supplies.

Note: After the power supply is installed, you should enable the Delta Monitor point by turning the power assembly power switch off, and then pressing and holding down momentarily (about 2 seconds) the switch labeled "Program Current Level" while turning the power switch ON.

The fan filter should be inspected at least every six months and replaced if it appears dirty. Figure 7 shows how to remove the four screws that hold the EMI-filter assembly to the fan.

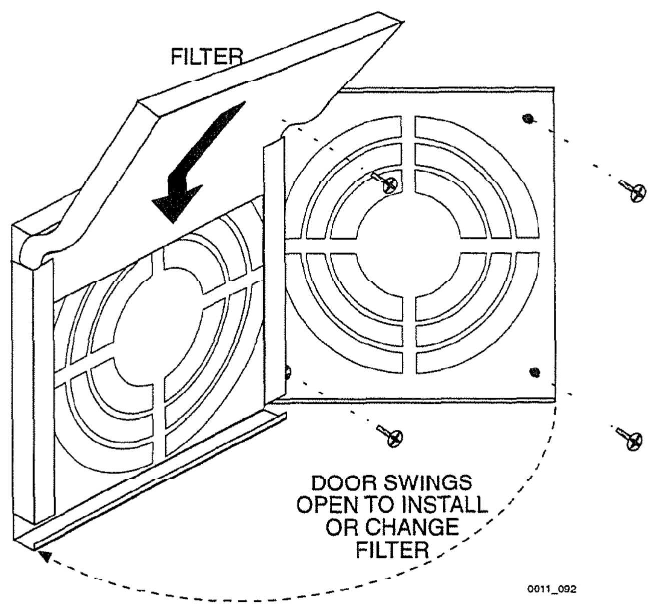
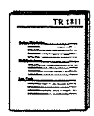


Figure 7 Power Supply's Filter

7 Operations, Administration, and Maintenance

This chapter provides Technical References for *Operations, Administration, and Maintenance* components.

Technical References



Use the technical references to find detailed background information about the hardware components of a Centigram Series 6 server. These are: the Model 640, the Model 120, and the Model 70.

How to Use This Chapter

Identify rhe *Operations, Administration, and Maintenance* component that you want to study. Go to the "List of Technical References" in this chapter and identify its technical reference number. The references are listed in numerical order in the "List of Technical References" table.

If you remove a technical reference from this binder, mark its original location, and replace it when you are finished with the document.

7 Oper. Admin., and Maint. List of Technical References

Tech. Ref. Number	Title	Document Rev.	Release Number
TR 1921	Floppy Disk Drive	Doc. Rev. A	6.0A
TR 1928	Printers	Doc. Rev. A	6.0A
TR 1929	Terminals	Doc. Rev. A	6.0A
TR 1932	Hardware Alarms Monitor	Doc. Rev. A	6.0A
TR 1933	Modems	Doc. Rev. A	6.0A

Floppy Disk Drive
Technical Reference

This technical reference provides information for the floppy drive used in the Centigram Series 6 Communication server Model 640, Model 120, and Model 70. It provides a brief description of the disk drive, configuration data, and installation guidelines.

1 Introduction

All servers are equipped with a 1.44 MB floppy disk drive that uses 3.5-inch double-sided, double-density disks or diskettes. This floppy disk drive is used to install, reconfigure, and update system software. The drive is also used to backup mailbox and account data files and to increase the storage capacity of the hard disk.

Drive Assembly

A floppy disk drive is an electromechanical bulk storage unit that uses floppy disks or diskettes to store data. Floppy diskettes are available in two sizes: 5.25-inch and 3.5-inch. The surface of the disk is coated with a magnetic material that is used to store digital information in the form of magnetized spots. Because of their flexibility and to protect the magnetic media, floppy disks are enclosed in a protective plastic envelope. These keep them rigid as they spin around in the floppy drive. Figure 1 shows a typical 3.5-inch disk drive and diskette.

When a diskette is inserted into the drive, the diskette's hub, which is the round opening on its center, fits over a raised drive spindle. When the gate door is closed, a lever clamps the diskette allowing the read/write heads to barely contact the surface of the recorded medium.

When data is stored or retrieved, the diskette spins inside its jacket and the read/write heads come in full contact with the medium through the data access slot on the surface of the diskette's jacket. While reading or writing the media, the disk drive rotates at approximately 300 revolutions per minute.

The important thing to remember about diskettes is that they are fragile storage devices that contain valuable data. Thus, they should be kept away from heat, dust, magnetic fields, and unnecessary handling.

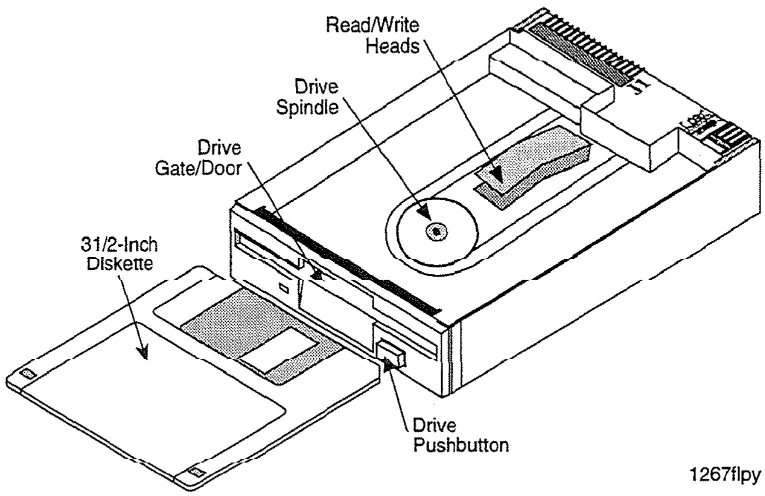


Figure 1 Typical **3.5-inch** Floppy **Disk D**rive and Diskette

System Interface

The floppy drive is interfaced to the system via a floppy drive controller embedded on the CPU of Models 640 and 120 or the motherboard of Model 70. This controller uses CMOS low power consumption logic and supports two drives.

2 Configuration Data

This subsection provides illustrations for all current floppy drives shipped with servers. If appropriate, the drive illustration is accompanied by a table that defines the configuration of jumpers and switches.

General Guidelines

- Identify the model number of your unit.
- Refer to the figure that matches your unit.
- Use the figure and associated table to set the drive's jumpers. Do not disturb any jumpers other than the ID jumpers.

All current floppy drives (i.e., in systems and spares) are shipped configured for Series 6 servers. For these servers, the Drive Select jumper is set to position 1.

Floppy Drive Types

Floppy drive models available at the time of publication are described below. Since floppy disk manufactures are constantly upgrading their products, you may find a diffeknt model number of disk drive in your server. Each drive uses three different mounting brackets depending upon which server it is installed:

- For Model 640 servers, it uses a 3.5-inch bezel mounted on the slide drawer assembly.
- For Model 70 servers, it uses a 3.5" bezel directly mounted on the drive card cage
- For Model 120 servers , it uses 5.2" side brackets and a 5.25" half-height bezel, directly mounted on the drive card cage

Sony MP-F520-K/121

The Sony MPF520-K/121 is a 3.5-, 1.44 MB floppy drive. The drive uses a jumper to select drive 0 (DSO) or drive 1 (DS1). For all servers, set the switch to DS1 as shown in Figure 2 .

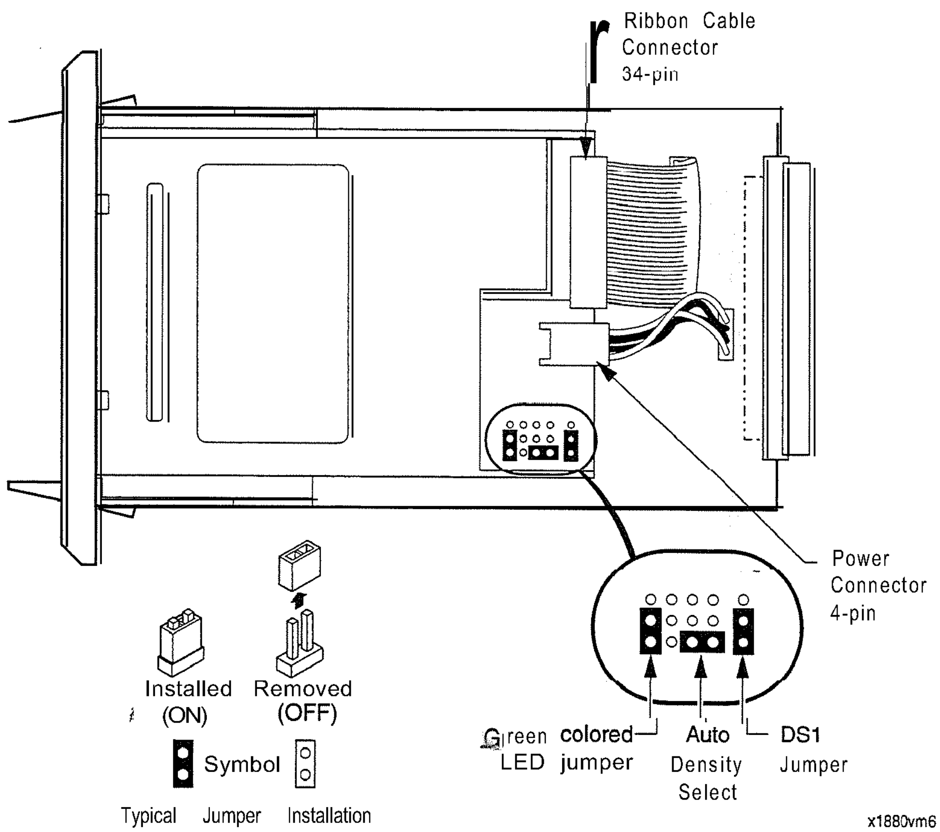


Figure 2 **Sony MP-F520-K/121** Disk Drive

TEAC FD-235HF Floppy Disk Drive

The TEAC FD-235HF is a 3.5-inch, 1.44 MB floppy drive (Figure 3). The Drive Select is set by two jumpers. There are two types of drives: one new style and one older style. The figure shows the newer style drive as viewed from the top.

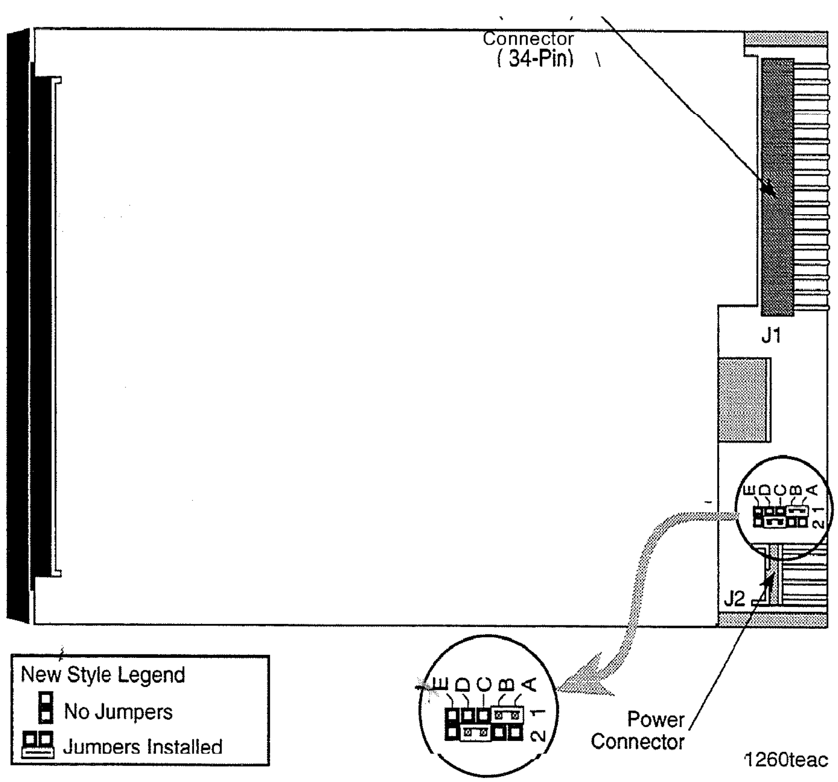
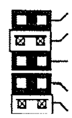
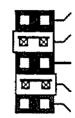


Figure 3 TEAC FD-235HF Disk Drive

Table 1 shows how to select the jumpers for both MCB-based systems and the 286-based systems.

Table 1 TEAC Jumpers—286/MCB Systems (Old and New Drives)

Drive Style	286 Systems	MCB Systems
Old Drive Type	 HHO OP • Do Not Move LHI D1 • Drive Select DO • Drive Select	 HHO OP • Do Not Move LHI D1 • Drive Select DO • Drive Select
New Drive Type	 E D C B A 2 1	 E D C B A 2 1

3 Installation Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's *Installation* and Service Manual.

Your floppy drive is pre-configured at the Centigram factory, and it is ready to install. However, it is a good field practice to double check the disk's configuration. Before you install a new disk, check the following:

- Read the Configuration Data section above.
- Refer to your server's *Installation and* Service *Manual* for correct installation procedures.

This technical reference provides information about printers used with the Centigram Series 6 Communications server Model 640, Model 120, and Model 70. This information is provided in tables and figures.

The servers can support DTE *serial* printers using X-On/X-Off data transmission protocols. This section provides printer specifications and connecting guidelines.

Specifications

Connecting Guidelines

Specifications

This section defines the serial port connections in servers. It also gives printer and cable specifications.

Serial Ports

The Model 640 server provides six serial ports (two from the CPU card and four from the MCB II), while the l 120 and Model 70 servers provided two serial ports, both from their CPU cards. The CPU for the Model 70 server is located on the unit's motherboard (MB). In Model 120 and 70 servers, additional ports can be obtained with optional cards such as the Serial Smartcard or the Serial 16/32 card.

Serial printers are connected to serial ports. Table 1 shows serial ports conventions for Model 640, Model 120, and Model 70 servers and where the serial ports originate. Table 2 shows the document where you can find additional information about the serial ports.

Table 1 Serial Port Conventions

	Port 1 (Where?)	Port 2 (Where?)	Port 3 (Where?)	Port 4 (Where?)	Port 5 (Where?)	Port 6 (Where?)
Model 70	Console (486 MB)	Modem (486 MB)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port [Optional Card)	Serial Port (Optional Card)
Model 1201	Console (486 CPU)	Modem (486 CPU)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)
Model 120s	Console (586 CPU)	Modem (586 CPU)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)
Model 640	Console (586 CPU)	Modem (586 CPU)	Serial Port (MCB II)	Serial Port (MCB II)	Serial Port (MCB II)	c s o I/O (If Used)

Note: Serial ports provided by optional cards will show up as "CTI #."

Table 2 Documentation for Serial Ports

Document	Name	Model 70	Model 1201	Model 120s	Model 640
TR 1908	Serial 16/32 Card	X	X	X	X
TR 1909	Serial Smartcard	X	X	X	
TR 1912	CPU (586) Card			X	X
TR 1913	CPU (486) Card		X		
TR 1914	MCB II Board				X
TR 1934	CPU (486) Motherboard	X			
cso I/O Manual	CSO I/O Manual				X

Printers

The customer's printer should meet the specifications given in Table 3.

Table 3 Printer Specifications

Parameter	Requirement
Baud Rate	9600 baud
Auto Line Feed	Disabled
Line Mode	Full Duplex
Parity	None
Data Bits	8
Stop Bits	1
Data Protocol	X-On/X-Off
Print Speed	380 Characters/sec.

Cables

The RS-232 cables (supplied by Centigram) have two connectors: one 25-pin D-type and one 9-pin D-type. Table 4 lists the cables that are shipped with the Series 6 servers. This table includes cable genders (male or female) and part numbers.

Table 4 **Serial Port Cables**

Type	Server Model	Part Number	Qty
9M-to-25F	Models 1201, 120S	1810-0533-01	2
9M-to-25F	Model 640, Module 1	1810-0533-01	3
9M-to-25F	Model 640, Modules 2, 3, & 4	1810-0533-01	1
9F-to-25F	Model 70	1810-0596-01	2

Table 5 shows connector pinouts and signals for the CPU card or MCB II serial ports.

Table 5 Serial Ports and **Adapter Pinouts**

Server Side (9-Pin)	Printer Side (25-Pin)	Signal Name
Pin 1	Pin 4, Pin 5	Carrier Detect
Pin 2	Pin 2	***Receive** Data*
Pin 3	Pin 3	*Transmit Data*
Pin 4	Pin 6	Data Terminal Ready
Pin 5	Pin 7	Signal Ground
Pin 6	Pin 20	*Data Set Ready*
Pin 7	Pin 8	*Request To Send*
Pin 8	Pin 8	Clear To Send
Pin 9	No Connection	Ring Indicate

Note: Signals required by a serial printer are in ***bold** italics*.

Connecting Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's Installation *and Service Manual.*

Before you attempt to connect your printer, become familiar with the material presented in the Specification section above.

CAUTION!

The input signals required by your printer's input connector may be present on different connector pins. If so, you may need to purchase an adapter.

Centigram provides RS-232 cables with two connectors, one 25-pin D-type and one 9-pin D-type (See Table 4 above.) The 9-pin connector connects to the serial port and the 25-pin connector to your printer.

Depending on the pin-outs of the printer's interface connector, you may need a "null-modem" cable to connect to it. A null-modem cable swaps pins 2 and 3 of the interface. If you are in doubt about the interface pin-outs, refer to the documentation provided with the printer.

After a printer is installed, it should be tested according to the manufacturer's instructions.

Terminals
Technical Reference

This technical reference provides information on console terminals for the Centigram Series 6 Communication Server Model 640, Model 120, and Model 70.

All servers can support a video display terminal (terminal equipped with a keyboard and a CRT display or printer) or a personal computer (PC). Such a terminal or PC is needed for performing operations, administration, and maintenance.

Specifications

Connecting Guidelines

Specifications

This section defines the console port connections for terminals connected to the servers. It also gives terminal and cable specifications.

Serial Ports and Console Port

The Model 640 server provides six serial ports (two from the CPU card and four from the MCB II), while the Model 120 and Model 70 servers provided two serial ports, both from their CPU cards. The CPU for the Model 70 server is located on the unit's motherboard (MB). In Model 120 and 70 servers, additional ports can be obtained with optional cards such as the Serial Smartcard or the Serial 16/32 card.

Terminals are connected to the console port. Table 1 shows serial ports conventions for Model 640, Model 120, and Model 70 servers and where the serial ports originate. Table 2 shows the document where you can find additional information about the serial ports.

Table 1 Serial Port Conventions

	Port 1 (Where?)	Port 2 (Where?)	Port 3 (Where?)	Port 4 (Where?)	Port 5 (Where?)	Port 6 (Where?)
Model 70	Console (486 MB)	Modem (486 MB)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)
Model 1201	Console (486 CPU)	Modem (486 CPU)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)
Model 120s	Console (586 CPU)	Modem (586 CPU)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)
Model 640	Console (586 CPU)	Modem (586 CPU)	Serial Port (MCB II)	Serial Port (MCB II)	Serial Port (MCB II)	cso I/O (If Used)

Note: Serial ports provided by optional cards will show up as "CTI#."

Table 2 **Documentation** for Serial Ports

Document	Name	Model 70	Model 1201	Model 120s	Model 640
TR 1908	Serial 16/32 Card	X	X	X	X
TR 1909	Smartcard	X	X	X	
TR 1912	CPU (586) Card			X	X
TR 1913	CPU (486) Card		X		
TR 1914	MCB II Board				X
TR 1934	CPU (486) Motherboard	X			
cso I/O Manual	CSO I/O Manual				X

Compatible Terminals

The customer's terminals should meet the specifications given in Table 3. Check that the customer's terminal is VT1 OO-compatible. Refer to the documentation provided by the terminal's manufacturer for switch settings.

If you are using a PC, you must be running Procomm 2.1 and have a special keyboard-driver file provided by Centigram.

Table 3 Console Terminal Specifications

Parameter	Requirement
Baud Rates	9600 Baud
Auto Scroll	Enabled
Auto Line Feed	Disabled
Line Mode	Full Duplex
Parity	None
Data Bits	8
Stop Bits	1
Data Protocol	X-On/X-Off

Cables

The RS-232 cables (supplied by Centigram) have two connectors: one 25-pin D-type and one 9-pin D-type. Table 4 lists al the cables that are shipped with the Series 6 servers. This table includes cable genders (male or female) and part numbers.

Table 4 **Serial Port Cables**

Type	Server Model	Part Number	Qty
9M-to-25F	Models 1201, 120S	1810-0533-01	2
9M-to-25F	Model 640, Module 1	1810-0533-01	3
9M-to-25F	Model 640, Modules 2, 3, & 4	1810-0533-01	1
9F-to-25F	Model 70	1810-0596-01	2

Table 5 shows connector pinouts and signals for the CPU card or MCB II CONSOLE port.

Table 5 Serial Ports and Adapter **Pinouts**

Server Side (9-Pin)	Console Side (25-Pin)	Signal Name
Pin 1	Pin 4, Pin 5	Carrier Detect
Pin 2	Pin 2	*Receive Data*
Pin 3	Pin 3	*Transmit Data*
Pin 4	Pin 6	Data Terminal Ready
Pin 5	Pin 7	Signal Ground
Pin 6	Pin 20	*Data Set Ready*
Pin 7	Pin 8	*Request To Send*
Pin 8	Pin 8	Clear To Send
Pin 9	No Connection	Ring Indicate

Note: Signals required by a console terminal are in ***bold italics.***

Connecting Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's Installation and Service Manual.

Before you attempt to connect your console terminal, become familiar with the material presented in the Specification section above; refer to TR 19 14 (MCB II), TR 1912 (CPU Pentium) or TR 1913 (CPU 486) for the location of the "console" port in your server; and follow these guidelines:

- When connecting the video display unit, use the adapter provided by Centigram and the cable purchased by the customer.
- If you are using a dumb terminal, you can connect it directly to the console port.
- If you are using a personal computer (PC), you will need a "null-modem" cable to connect to the console port. The null-modem cable swaps pins 2 and 3 of the interface connection to emulate a modem connection. You will also need Procomm 2.1 and a special keyboard-driver file provided by Centigram.

After the terminal or PC is installed, it should be tested according to the manufacturer's instructions.

Hardware Alarms Monitor Technical Reference

This document provides information for the Hardware Alarms Monitor (HAM) used in the Centigram Series 6 Communication server Model 640. It provides a brief description of the location of the alarm indicators, alarms configuration data, and guidelines for other HAM tasks you can perform. For more information on using the HAM software, refer to the *Centigram Series 6 Systems Diagnostics Manual.*

1 Introduction

The Hardware Alarms Monitor (HAM) software works with the Model 640 Module Control Board (MCB) II hardware alarms subsystem to serve as an alarms monitor for your voice mail system. The HAM software detects error events and posts those errors to the event log to assist in diagnosing system problems. HAM event counters track the number of times each type of alarm has occurred.

When an error or alarm occurs, the alarm event causes the following actions:

- The event is posted to the NVRAM event log
- The event is posted to the system error logfile if this feature is enabled
- The event is counted and added to the alarm event counters
- Depending on the severity, the appropriate front panel indicator lights
- Depending on the severity, the audible alarm sounds if this feature is enabled
- The event triggers a continuous interrupt protection (CIP) limit, and the alarm is disabled if the CIP limit is reached

The NVRAM event log is non-volatile so that the alarm configuration and details are retained when the server is powered off.

The indicator lights are light emitting diodes (LEDs) on the MCB II board. The indicators also show on the front panel of the Alarm and Monitor Power Supply. Each indicator is triggered by a relay. If you want to,you can connect the relays to a peripheral device to trigger external alarms. These indicators are described below:

Alarm Severity	MCB II LED	AMPS Lamp
Critical	Red	Red
Major	Yellow	Amber
Minor	Green	Yellow

Figure 1 shows the position of the alarm LEDs on the MCB II card,and Figure 2 shows the position of the alarm indicators on the front panel of the Alarm and Monitor Power Supply (AMPS).

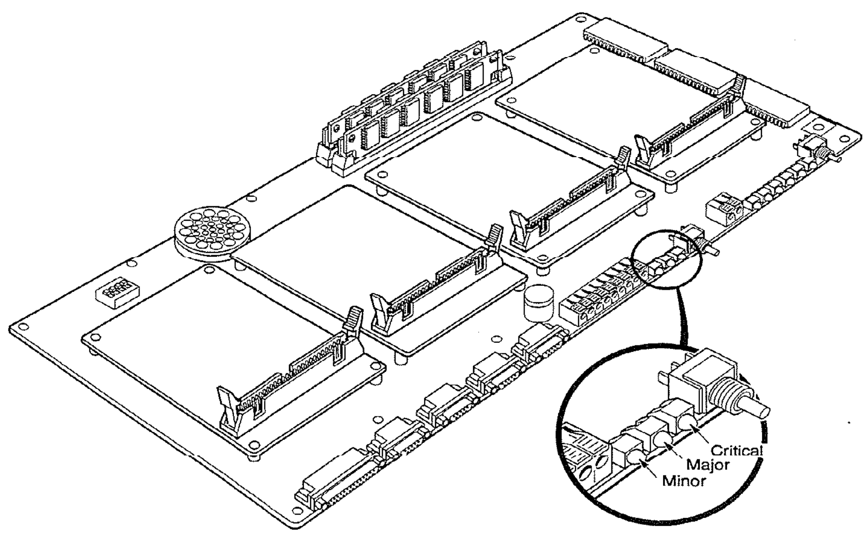


Figure 1 Alarm Indicator Lights on the MCB II Card

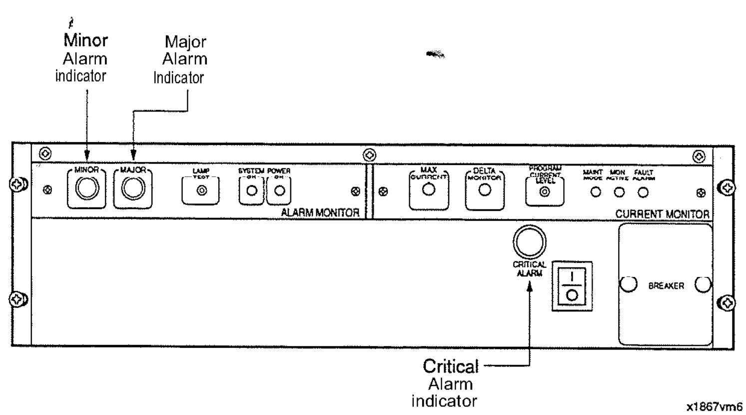


Figure 2 Alarm Indicators on AMPS' Front Panel

2 Alarms Configuration Data

The HAM software is included with VoiceMemo 6.0A release software for all Model 640 servers that use the MCB II card.

Assigning Alarm Levels

The Assign Alarm Levels Menu lets you assign an alarm level to a particular alarm. This assignment affects which indicator lights when the alarm condition is detected. You can assign the alarm level as critical, major, or minor. You can specify alarm levels for all alarms or separately for current fault alarms, fan fault alarms, power supply glitch alarms, MCB II memory parity error alarms, power supply surge alarms, power supply failure alarms, fuse alarms, and temperature alarms.

Table 1 shows the fault type and default settings for the alarm level classification.

Table 1 **Default** Alarm Levels

Fault Type	Minor	Major	Critical	Audible Alarm
Power supply negative glitch	X			
Power supply positive glitch	X			
Current limits exceeded		X		X
Fan faults		X		X
Power supply surge		X		X
Fuse faults		X		X
Memory parity error			X	X
Power supply failure			X	X
Temperature alarms			X	X

Setting Audible Alarms

The audible alarm is also configured using the Assign Alarm Levels Menu. By default, all major and critical faults trigger the audible alarm. You can change the fault level required to trigger the audible alarm. Table 2 shows the alarm level required to trigger the audible alarm, based on the level set for the audible alarm.

Table **2** **Audible Alarm T**rigger Levels

	Fault Levels		
Audible Alarm Level	Critical	Major	Minor
Critical	Enabled		
Major	Enabled	Enabled	
Minor	Enabled	Enabled	Enabled

For example, if you set the audible alarm level to critical, then only faults of critical severity will trigger the audible alarm. If you set the audible alarm level to minor, then critical, major, and minor faults will all trigger the audible alarm.

3 HAM Guidelines

In addition to assigning alarm levels and setting audible alarms, the HAM software features allow you to perform the following tasks:

- Enable and disable alarms
- Set limits for Continuous Interrupt Protection (CIP)
- Enable alarms that have been automatically disabled by CIP
- Specify a default module to configure one module differently from other modules
- Initialize the event log and event counters and restore the default alarm configuration
- Reset the audible alarm, alarm event counters, indicators, and event log
- Reset alarms and indicators automatically after the fault is cleared
- Test the audible alarm and indicators
- Display, print, or save the alarm configuration, counters, or event log

Enabling and Disabling Alarms

You can enable and disable alarms using the Enable Alarms Menu and the Disable Alarms Menu. Using the menus you can enable or disable all current fault alarms or only the fan fault alarms, power supply glitch alarms, power supply surge alarms, power supply failure alarms, fuse alarms, and temperature alarms.

Setting Continuous Interrupt Protection

You can enable continuous interrupt protection (CIP), which determines when an alarm should be automatically disabled. You use the Enable Menu to set CII? limits for the time period and number of faults. If the same alarm is reported the specified number of times within the specified time limit, the alarm is disabled.

You can specify a time limit of one second, one minute, or one hour and a fault limit of two to nine. By default, the CIP time limit value is two seconds and the CIP fault limit value is three. You can disable CIP using the Disable Menu. Also, the Reinstate Configuration options lets you re-enable alarms that have been automatically disabled by CIP.

Specifying a Default Module

The Host Selection Menu allows you to perform functions on a specific module or to specify that functions apply to all modules. After you select a module, all subsequent functions apply only to the selected module. By default, all functions apply to all modules. Once a module is selected, that module remains selected for all operations until another module or all modules are selected. This option is useful when you want to configure one module differently from the others.

Initializing Alarms, Event Counters, and the NVRAM Event Log

The Initialize Menu restores alarm configuration default values. This menu also clears the NVRAM event log and event counters.

Resetting the Audible Alarm, Alarm Event Counters, LEDs, and Event Log

The Reset Menu lets you reset the audible alarm, alarm event counters, the front panel LEDs, and the NVRAM event log.

The Reset Alarm Counters Menu lets you reset all alarm counters or reset separately the current fault counters, fan fault counters, power supply glitch counters, memory parity error counters, power supply surge counters, power supply failure counters, fuse counters, and temperature fault counters.

The Reset Indicators Menu lets you reset the LEDs for all panel indicators or reset separately the critical, major, or minor LED indicators.

The Reset NVRAM Event Log Menu lets you clear the NVRAM event log for a specific module or modules. This feature is useful when you have corrected a fault and the fault history is no longer relevant.

Automatically Resetting Alarms

When an alarm turns on the appropriate indicator, the indicator remains lit until you reset it, even if you have cleared the fault that triggered the alarm. Optionally, you can use the Auto Reset feature to automatically reset an indicator after the fault that triggered the indicator has been cleared.

Testing the Audible Alarm and Fault Indicators

The Test Menu lets you test and reset the audible and visual alarms. When you test the audible alarm, a message is displayed for three seconds which states you should be hearing the audible alarm. If the audible alarm is not working, the hardware switch settings might not be correct or the cables might not be connected properly.

Displaying, Printing, or Saving Alarm Information

The View Menu lets you display, print, or save to a file the alarm configuration, alarm counters, alarm faults, or the NVRAM event log. All options from the View menu display the Report Output Routing submenu from which you can direct the requested information. The information can be displayed on your screen, sent to one of two serial ports for printing, saved to a file, or appended to a file.

Modems
Technical Reference

This technical reference provides information about modems used with the Centigram Series 6 Communications server Model 640, Model 120, and Model 70. This information is provided in tables and figures.

The servers can support a DCE modem using X-On/X-Off data transmission protocols. This section provides specifications and connecting guidelines.

1 Specifications

This section defines the serial port connections on the servers. It also gives modem and cable specifications.

Serial Ports

The Model 640 server provides six serial ports (two from the CPU card and four from the MCB II), while the Model 120 and Model 70 servers provided two serial ports, both from their CPU cards. The CPU for the Model 70 server is located on the unit's motherboard (MB). In Model 120 and 70 servers, additional ports can be obtained with optional cards such as the Serial Smartcard or the Serial 16/32 card.

Modems are connected to Serial Port 2. Table 1 shows serial port conventions for Model 640, Model 120, and Model 70 servers and where the serial ports originate. Table 2 shows the documents where you can find additional information about the serial ports.

Table 1 Serial Port Conventions

	Port 1 (Where?)	Port 2 (Where?)	Port 3 (Where?)	Port 4 (Where?)	Port 5 (Where?)	Port 6 (Where?)
Model 70	Console (486 MB)	Modem (486 MB)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)
Model 1201	Console (486 CPU)	Modem (486 CPU)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)
Model 120s	Console (586 CPU)	Modem (586 CPU)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)	Serial Port (Optional Card)
Model 640	Console (586 CPU)	Modem (586 CPU)	Serial Port (MCB II)	Serial Port (MCB II)	Serial Port (MCB II)	cso I/O (If Used)

Note: Serial ports provided by optional cards will show up as "CTI #."

Table 2 **Documentation** for Serial Ports

Document	Name	Model 70	Model 1201	Model 120s	Model 640
TR 1908	Serial 16/32 Card	X	X	X	X
TR 1909	Smartcard	X	X	X	
TR 1912	CPU (586) Card			X	X
TR 1913	CPU (486) Card		X		
TR 1914	MCB II Board				X
TR 1934	CPU (486) Motherboard	X			
cso I/O Manual	CSO I/O Manual				X

Modem5

Any late-model, Hayes-compatible modem available in the United States market can be used with the servers.

Cables

The RS-232 cables (supplied by Centigram) have two connectors: one 25-pin D-type and one 9-pin D-type. Table 3 lists the cables that are shipped with the Series 6 servers. This table includes cable genders (male or female) and part numbers.

Table 3 Serial Port Cables

Type	Server Model	Part Number	Qty
9M-to-25F	Models 1201, 120S	1810-0533-01	2
9M-to-25F	Model 640, Module 1	1810-0533-01	3
9M-to-25F	Model 640, Modules 2, 3, & 4	1810-0533-01	1
9F-to-25F	Model 70	1810-0596-01	2

Table 4 shows connector pinouts and signals for the CPU card or MCB II serial ports.

Table 4 Serial Ports and Adapter Pinouts

Server Side (9-Pin)	Modem Side (25-Pin)	Signal Name
Pin 1	Pin 4, Pin 5	Carrier Detect
Pin 2	Pin 2	*Receive Data*
Pin 3	Pin 3	*Transmit Data*
Pin 4	Pin 6	Data Terminal Ready
Pin 5	Pin 7	Signal Ground
Pin 6	Pin 20	*Data Set Ready*
Pin 7	Pin 8	***Request** To Send*
Pin 8	Pin 8	Clear To Send
Pin 9	No Connection	Ring Indicate

Note: Signals required by a modem are in bold ***italics***.

2 Connecting Guidelines

CAUTION!

Unless you are highly experienced with Centigram servers, do not attempt to remove, replace, or install this hardware component without first consulting your server's *Installation and Service Manual.*

Before you attempt to connect your modem, become familiar with the material presented in the Specification section above.

CAUTION!

The input signals required by your modem's input connector may be present on different connector pins. If so, you may need to purchase an adapter from a local dealer.

The modem is connected to the server with an RS-232 cable with two connectors, one 25-pin D-type female and one 9-pin D-type male. The 9-pin connector connects to the serial port and the 25-pin connector to your modem. This cable is not provided by Centigram, and it can be obtained from your local computer retailer or from the modem's manufacturer.

The 9-pin cable connector is connected to Serial port 2 (designated "SER2" in system software). In Model 120 and Model 70 servers, if a printer is connected to Serial port 2, an A/B switch box is required. Connect the A/B switch box to Serial port 2 and then connect the modem and printer to the A/B switch box.

The 25-pin cable connector is connected to the modem. Configure the modem software in the Console/Serial Port Setup option in the System Maintenance menu/ Additional Options.

After a modem is installed, it should be tested according to the manufacturer's instructions.

List of Technical References

Tech. Ref. Number	Title	Category	Chapter
TR 1900	Power and Grounding Requirements	Power Component	6
TR 1901	LC8/DSP8 Line Card	Telephony Network Interface	2A
TR 1902	Model 120 Service Card Hardware Configuration	System Level Reference	1
TR 1903	DSP24/30 Line Card	Telephony Network Interface	2A
TR 1904	Fax Card	Special Service Component	3
TR 1905	Dual T1 Card	Telephony Network Interface	2A
TR 1906	Dual El Card	Telephony Network Interface	2A
TR 1907	Ethernet Card	Computing Network Interface	2B
TR 1908	Serial 16/32 Card	Computing Network Interface	2B
TR 1909	Serial Smartcard	Computing Network Interface	2B
TR 1911	SS7 Signal Processor	Telephony Network Interface	2A
TR 1912	CPU (Pentium) Card	Base System Component	4
TR 1913	CPU (486) Card	Base System Component	4
TR 1914	MCB II Card	Base System Component	4
TR 1915	QNet/MESA-Link Card	Base System Component	4
TR 1916	SCSI Interface Card	Base System Component	4
TR 1917	Power Configuration Card	Telephony Network Interface	2A
TR 1918	SCSI Hard Disk (Model 120S)	Storage Component	5
TR 1919	Storage Assembly	Storage Component	5
TR 1920	Model 70 Service Card Hardware Configuration	System Level Reference	1

List of Technical References

Tech. Ref. Number	Title	Category	Chapter
TR 1921	Floppy Disk Drive	Operations, Administration, and Maintenance	7
TR 1922	Model 640 Service Card Hardware Configuration	System Level Reference	1
TR 1923	IDE Hard Disk (Models 120I/70)	Storage Component	5
TR 1925	Phoneline Exceptions	Connectivity: Telephony	2A
TR 1926	AMPS Power Supply	Power Component	6
TR 1927	SCSI Bus Configurations	Base System Component	4
TR 1928	Printers	Operations, Administration, and Maintenance	7
TR 1929	Terminals	Operations, Administration, and Maintenance	7
TR 1932	Hardware Alarms Monitor	Operations, Administration, and Maintenance	7
TR 1933	Modems	Operations, Administration, and Maintenance	7
TR 1934	CPU (486) Motherboard	Base System Component	4
TR 1935	Series 6 Server Service Card Software Configuration	System Level Reference	1
TR 1936	SCSI Hard Disk (Model 640)	Storage Component	5

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Issue 1 Release 2.0 January 1996

MITEL MAIL™

Voice Processing Solutions 1

Diagnostics Manual

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Table of Contents

About This Manual

This Manual describes how to configure Hardware Diagnostics software and how to read the Error Log in any of the Centigram Series 6 Communications Servers:

- Model 640
- Model 120
- Model 70

In addition, this manual describes how to configure the Hardware Alarms Monitor (HAM) software for the Centigram Series 6, Model 640 voice mail system.

For information on the AIP Rackmount voice mail system, refer to the *Centigram Series 6, Model 640 Installation and Service Manual.*

Who Should Read This Manual

This manual is intended for technicians and administrators who are responsible for configuring the Hardware Diagnostics software and maintaining the Error Log for the Centigram Series 6 Communications Servers, and for administrators and technicians responsible for configuring the Hardware Alarms Monitor software on the Centigram Series 6, Model 640 voice mail system.

How to Use This Manual

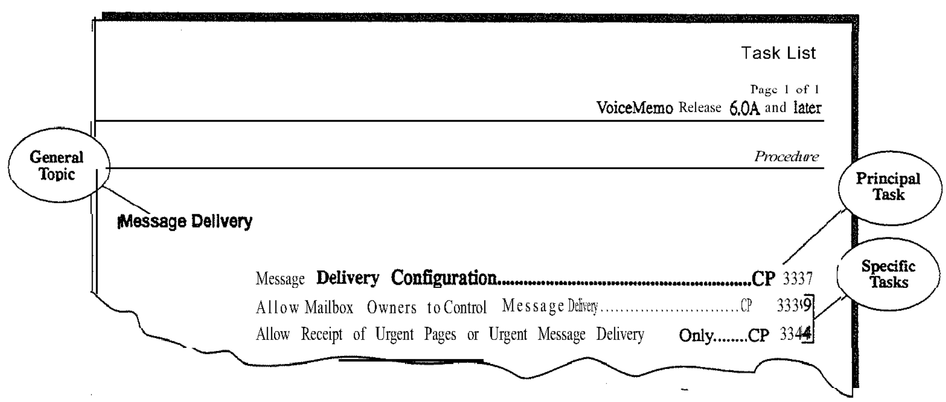
This manual contains detailed reference-information, a list of tasks that you can perform, a collection of procedures for performing the tasks, and reader aids such as menu maps.

Reference Chapters

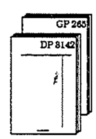
Use the material in this manual for detailed inquiry into the installation and configuration of the Hardware Diagnostics software in a Centigram Series 6 Communications Server and the Hardware Alarms Monitor software in a Centigram Series 6, Model 640 voice mail system. These chapters discuss how components are related, elaborate on concepts, give operational details, and contain all necessary tables and figures about configuration. *Use* the *Centigram Series 6 Installation* and *Service Manual* appropriate for your platform for an actual server installation and the *VoiceMemo Reference and Configuration Manual* for VoiceMemo software configuration.

Task Lists

Task lists follow Reference chapters that include procedures. Use the task list, starting with a principal task (shown in boldface), to install and configure Hardware Diagnostics Software or Hardware Alarms Monitor as appropriate to your platform. Each task listed is described in more detail in a procedure. The task list is alphabetized, which helps most readers find the desired task (and procedure) quickly. No particular sequence of tasks is implied. The following example shows-how a-task list is organized:



Procedures

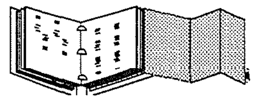


Procedures follow the task list in the Reference chapter. Follow the steps in Centigram Procedures (CPs) to accomplish the desired tasks. Readers familiar with a Centigram Series 6 server can use the CPs as a checklist if desired, while readers new to a Centigram Series 6 server can use CPs for step-by-step instructions.

A reference column in each CP contains pointers, when necessary, to supplemental information such as another procedure, another manual or guide, a technical reference, or a menu map.

Each CP is numbered for document identification and referencing; numbering does not indicate a sequence of performance. A numerical list of all CPs in this guide is also provided. It gives each CP's title, Chapter number, and which other procedures either call it or are called by it.

Menu Maps and Other Navigation Aids



Most of the documents in the new Centigram Series 6 document library have menu maps. You can refer to these document navigation aids at any point to help you reach a menu.

Conventions Used in This Manual

The procedures in this manual use the following conventions to describe how you enter Diagnostics configuration information and how information is displayed on the Centigram Series 6 server console:

Press Enter — Press the Enter key. For example, "Press Enter if the current number is correct." On some keyboards, this key is labeled "Return" or has a return arrow (↵) on it.

Enter — Type the text shown, then press the Enter key. For example, "Enter the line number (l-24)" means type a number from 1 through 24, and then press the Enter key.

bold — Words or characters in bold type indicate either a value to be entered by you exactly as shown or, when used to indicate a variable entry, describe the type of value to be supplied by you. See example above.

What you select from a displayed menu

A displayed prompt for information

Select: (G) Current Group
Prompt: Enter a group number =
Response: Number of the line group (l-24) to be used for the application.

What you enter in response to the prompt

Note: Unless otherwise stated, press Enter after each response you enter.

Reader Advisories

Reader advisories used in this manual are shown below.

Note: Information especially useful in relation to this procedure.

CAUTION!

Information that helps you prevent equipment or software damage.

CAUTION!

Information that helps you avoid electrostatic discharge (ESD) damage to the equipment.

WARNING!

Information that helps you prevent an interruption to telecommunications traffic.

WARNING!

A hazard that can cause you personal injury.

DANGER!

Warns of a condition that could severely injure or kill you.

Before You Start

This guide assumes that you are familiar with using a console and keyboard. This section describes how to use the Centigram Series 6 server effectively.

Console Tips and Techniques

The tips and techniques offered in the following paragraphs can make configuration entry sessions at the Centigram Series 6 server maintenance console more productive.

Viewing Menus

- When you finish entering a value for a parameter, the server displays an abbreviated form of the current menu, called the "short menu." To view the complete current menu when a short menu is displayed, just press Enter.

- To return to the Main Menu from any VoiceMemo application configuration menu, press X (Exit), until the Main Menu appears.

Accepting Defaults

- To accept a default displayed in a *prompt,* just press Enter.

- To accept a default displayed in a *menu,* no action is necessary.

Avoiding Automatic Exit

CAUTION!

The Centigram Series 6 server "times out" after 15 minutes. This means that if you do not enter anything at the console for 15 minutes, the server automatically exits from the current program. When this happens, all work that has not been saved on the disk is lost.

To avoid being timed out and losing your work, follow these steps:

1. When you need time to think, write down the name of the current menu.

2. Exit to the (server) Main Menu.

3. When you want to continue your work, enter the appropriate menu options to regain your place.

If you find that the Centigram Series 6 server has timed out, follow the steps below. If your screen is blank, press any key to reactivate the screen and then continue with these steps.

1. Press any key to start the login sequence.
2. Enter your user ID and password (if requested).
3. Starting from the Main Menu, enter menu options to proceed to the menu from which the server timed out.
4. Reenter data as needed to regain lost work.

Quitting an Entry Session

At any point during entry of offline or online parameters, you can quit. Quitting discards all parameter entries you have made and leaves the VoiceMemo application configuration the way it was before you started entering parameters.

To quit from the VoiceMemo Configuration Offline or Online Menu:

Select: (Q) Quit -- Forget Changes
Prompt: `Quit and forget changes? (y/n) =`
Response: Y to return to the **VoiceMemo** Configuration Main Menu.

Shortcut Commands

You can use the Ctrl (Control) key or the / (slash) key while simultaneously pressing another key to execute shortcut commands at a Centigram Series 6 server maintenance console.

To do this...	Type...
Activate a timed-out console.	any key
From the offline or online menus, or FCOS, LCOS, GCOS menus, return to the VoiceMemo Configuration Menu and save any entries.	/X
From the offline or online menus, or FCOS, LCOS, GCOS menus, return to the VoiceMemo Configuration Menu without saving any entries.	/Q Y
Stop scrolling a displayed report.	Ctrl-S
Resume scrolling a displayed report.	Ctrl-Q
Return to the VoiceMemo application when a # or $ prompt is displayed.	Ctrl-D *or type* exit

1 Hardware Alarms Monitor Overview

The Hardware Alarms Monitor (HAM) software works with the Model 640 Module Control Board (MCB) II hardware alarms subsystem to serve as an alarms monitor for your voice mail system. The HAM software detects error events and posts those errors to the event log to assist in diagnosing system problems. HAM event counters track the number of times each type of alarm has occurred.

When an error or alarm occurs, the alarm event causes the following actions:

- The event is posted to the event log.
- The event is posted to the system logfile.
- The event is counted and added to the alarm event counters.
- Depending on the severity, the appropriate indicator (LED) lights.
- Depending on the severity, the audible alarm sounds if this feature is enabled.
- The event triggers a continuous interrupt protection (CIP) limit, and the alarm is disabled if the CIP limit is reached.

The NVRAM event log is non-volatile so that the alarm configuration and details are retained when the system power is off.

The indicator lights are light emitting diodes (LEDs) on the MCB II board. The indicators also show on the front panel of the Alarm and Monitor Power Supply. Each indicator is triggered by a relay. If you want to you can connect the relays to a peripheral device to trigger external alarms.

The three alarm indicators show critical, major, and minor faults. The indicators are identified as follows:

- Critical-Red
- Major-Yellow
- Minor-Green

Figure l-l shows the position of the alarm indicators on the MCB II card.

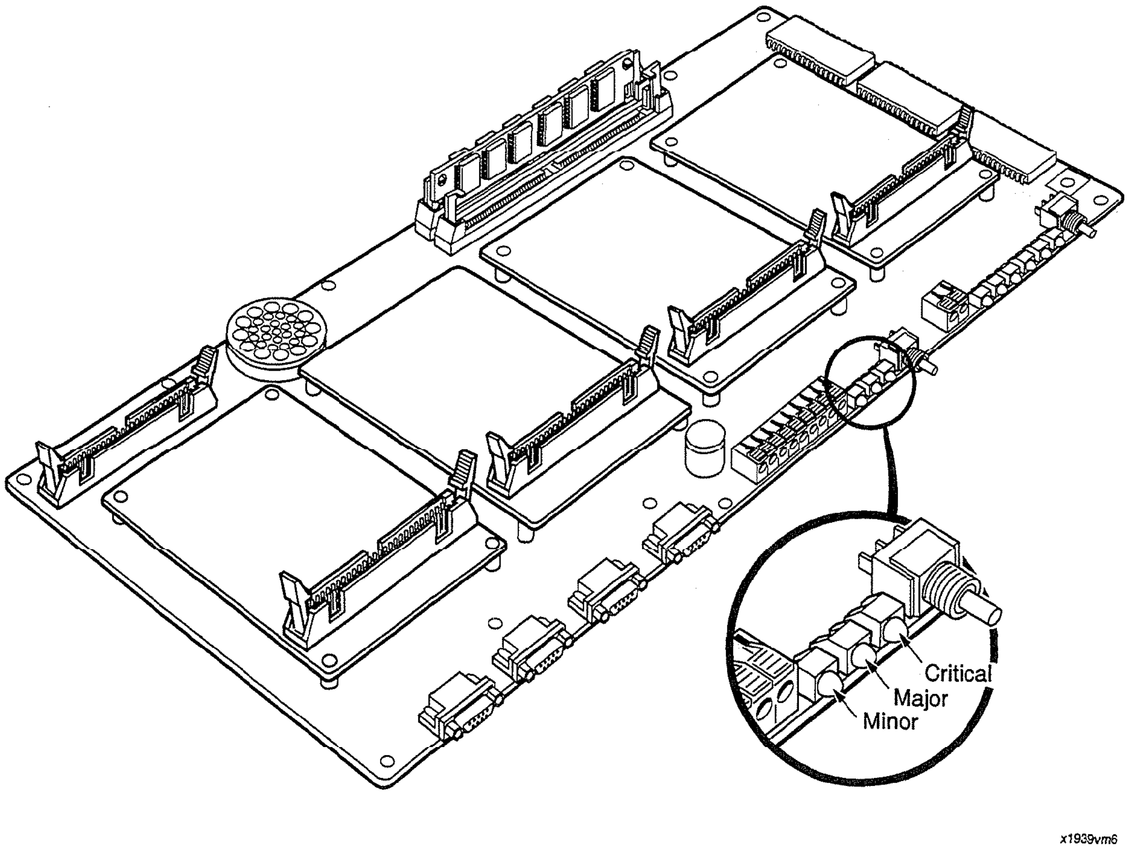


Figure l-l Alarm Indicators on the MCB II Card

Figure l-2 shows the position of the alarm indicators on the front panel of the Alarm and Monitor Power Supply (AMPS).

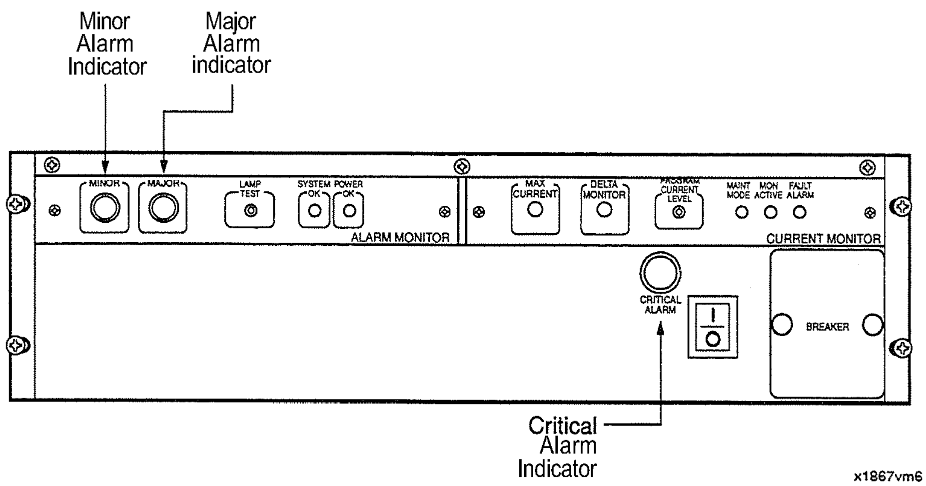


Figure 1-2 Alarm Indicators on the Alarm and Monitor Power Supply (AMPS) Front Panel

HAM Software Features

The HAM software is included with VoiceMemo 6.0A release software for all Model 640 systems that use the MCB II card. You access the HAM software from the System Maintenance Menu of the VoiceMemo application.

The HAM software features allow you to perform the following tasks:

- Assign alarm levels
- Enable and disable alarms
- Set limits for Continuous Interrupt Protection (CIP)
- Enable alarms that have been automatically disabled by CIP
- Specify a default module to configure one module differently from other modules
- Initialize the event log and event counters and restore the default alarm configuration
- Reset the audible alarm, alarm event counters, indicator, and event log
- Reset alarms and indicators automatically after the fault is cleared
- Test the audible alarm and indicators
- Display, print, or save the alarm configuration, counters, or event log

The VoiceMemo network allows up to four modules in the system and supports cross-monitoring of each module. Using HAM software you can choose to see any or all of the four modules, and the HAM software features affect the modules chosen.

By default, the HAM software applies all functions to all modules. However, you can select a specific module to work with. Once a module is selected, that module remains selected until you select another module or until you exit the Alarms Menu System. When you exit the Alarms Menu System, the HAM software resets to all modules.

Fault Types

The alarms are categorized by fault type, and a description of each fault type follows.

Power Supply Glitch Alarm

A power supply negative glitch alarm activates when a temporary negative voltage fluctuation occurs in the power supply. Similarly, a power supply positive glitch alarm activates when a temporary positive glitch occurs in the power supply. Each power supply has an acceptable range for voltage fluctuation, and the negative or positive glitch is outside of the acceptable range.

The glitch alarm could indicate that you have a bad power supply, that you need a line filter, or that you have other equipment that temporarily draws a large current on the same line. If a problem occurs in your system after a reported power glitch, the glitch could be the cause of the problem. You can set power glitch alarms separately for each main power supply, each drive bay power supply, or an external power supply.

Current Limit Alarm

The current limit alarm is affected by the external and local power supplies. The external power supply refers to the external +5 V power supply on another module. The local power supply refers to the +5 V power supply on the same module. A current limit alarm activates when one of the following conditions occurs:

1. The current for the external +5 V power supply exceeds the maximum value allowed (80 amps).
2. The current on the external +5 V power supply has a greater relative change than the delta value allowed.
3. The current on the local power supply has a greater relative change than the delta value allowed. (This value is set after all boards are installed, and reset when there is a change in the configuration.)

You can set current limit alarms separately for the ceiling (maximum) fault on the external +5 V supply, for the delta fault on the external +5 V supply, and for a fault on the local supply.

Fan Fault Alarm

A fan fault alarm is activated when a fan loses 20% of its speed. This can occur if lint slows the fan, if air flow to the fan is blocked, if a fan connector is disconnected. or if a fan goes bad. You can set fan fault alarms separately for each of the three CPU fans, each of the two drive bay fans, and each of the three main power supply fans.

Power Supply Surge Alarm

A power supply surge alarm activates when a sustained positive or negative voltage change occurs in the power supply. Each power supply has an acceptable range for voltage fluctuation, and the negative or positive surge is defined as a continued voltage change outside of the acceptable range. You can set power surge alarms separately for each main power supply, each drive bay power supply, or an external power supply.

Fuse Fault Alarm

A fuse fault alarm activates when a fuse is out. You can set fuse alarms separately for the SCSI channel 0, 1, 2, and 3 fuses, for the drive bay fuse, and for the CSO/IO fuse.

MCB II Memory Parity Error Alarm

The MCB II memory parity error alarm activates when a parity mismatch is found. This alarm could indicate a problem with a memory module on the MCB II board.

Power Supply Failure Alarm

The power supply failure alarm activates when a power supply fails and no voltage is detectable. You can set power supply failure alarms separately for each main power supply, each drive bay power supply, or an external power supply.

Temperature Alarms

The temperature alarm activates when the temperature exceeds the normal operating temperature. This can happen because of poor air flow or any other condition that raises the temperature. You can set temperature alarms separately for the MCB II board, the main power supply, the drive bay power supply, the drive bay, and the CPU.

Assigning Alarm Levels

The Assign Alarm Levels Menu lets you assign an alarm level to a particular alarm. This assignment affects which indicator lights when the alarm condition is detected. You can assign the alarm level as critical, major, or minor. You can specify alarm levels for all alarms or separately for current fault alarms, fan fault alarms, power supply glitch alarms, MCB II memory parity error alarms, power supply surge alarms, power supply failure alarms, fuse alarms, and temperature alarms.
Table 1-1 shows the fault type and default settings for the alarm level classification.

Table 1- 1 Default Alarm Levels

Fault Type	Minor	Major	Critical	Audible Alarm
Power supply negative glitch	X			
Power supply positive glitch	X			
Current limits exceeded		X		X
Fan faults		X		X
Power supply surge		X		X
Fuse faults		X		X
Memory parity error			X	X
Power supply failure			X	X
Temperature alarms			X	X

The audible alarm is also configured using the Assign Alarm Levels Menu. By default, all major and critical faults trigger the audible alarm. You can change the fault level required to trigger the audible alarm. Table 1-2 shows the alarm level required to trigger the audible alarm, based on the level set for the audible alarm.

Table l-2 Audible Alarm Trigger Level

	Fault Levels		
Audible Alarm Level	Critical	Major	Minor
Critical	Enabled		
Major	Enabled	Enabled	
Minor	Enabled	Enabled	Enabled

For example, if you set the audible alarm level to critical, then only alarms of critical severity will trigger the audible alarm. If you set the audible alarm level to minor, then critical, major, and minor alarms will all trigger the audible alarm.

Enabling and Disabling Alarms

You can enable and disable alarms using the Enable Alarms Menu and the Disable Alarms Menu. Using the menus you can enable or disable all current fault alarms or only the fan fault alarms, power supply glitch alarms, power supply surge alarms, power supply failure alarms, fuse alarms, and temperature alarms.

Setting Continuous Interrupt Protection

You can enable continuous interrupt protection (CIP), which determines when an alarm should be automatically disabled. You use the Enable Menu to set CIP limits for the time period and number of faults. If the same alarm is reported the specified number of times within the specified time limit, the alarm is disabled.
You can specify a time limit of one second, one minute, or one hour and a fault limit of two to nine. By default, the CIP time limit value is two seconds and the CIP fault limit value is three. You can disable CIP using the Disable Menu. Also, the Reinstate Configuration options lets you reenable alarms that have been automatically disabled by CIP.

Specifying a Default Module

The Host Selection Menu allows you to perform functions on a specific module or specify that functions apply to all modules. After you select a module, all subsequent functions apply only to the selected module. By default, all functions apply to all modules. Once a module is selected, that module remains selected for all operations until another module or all modules are selected. This option is useful when you want to configure one module differently from the others.

Initializing Alarms, Event Counters, and the NVRAM Event Log

The Initialize Menu restores alarm configuration default values. This menu also clears the NVRAM event log and event counters.

Resetting the Audible Alarm, Alarm Event Counters, Indicators, and Event Log

The Reset Menu lets you reset the audible alarm, alarm event counters, the front panel indicators, and the NVRAM event log.
The Reset Alarm Counters Menu lets you reset all alarms counters or reset separately the current fault counters, fan fault counters, power supply glitch counters, memory parity error counters, power supply surge counters, power supply failure counters, fuse counters, and temperature fault counters.
The Reset Indicators Menu lets you reset the indicators for all panel indicators or reset separately the critical, major, or minor LED indicators.
The Reset NVRAM Event Log Menu lets you clear the NVRAM event log for a specific module or modules. This feature is useful when you have corrected a fault and the fault history is no longer relevant.

Automatically Resetting Alarms

When an alarm turns on the appropriate indicator, the indicator remains lit until you reset it, even if you have cleared the fault that triggered the alarm. Optionally, you can use the Auto Reset feature to automatically reset an indicator after the fault that triggered the indicator has been cleared.

Testing the Audible Alarm and Indicators

The Test Menu lets you test and reset the audible alarm and the alarm indicators. When you test the audible alarm, a message is displayed for three seconds which states you should be hearing the audible alarm. If the audible alarm is not working, the hardware switch settings might not be correct or the cables might not be connected properly. When you test the critical, major, or minor indicators, the panel indicator should light when you set the alarm indicator. The indicators should go out when the alarm indicator is reset.

Displaying, Printing, or Saving Alarm Information

The View Menu lets you display, print, or save to a file the alarm configuration, alarm counters, alarm faults, the NVRAM event log, the system temperature values, and the system voltage values. All options from the View menu display the Report Output Routing submenu from which you can direct the requested information. The information can be displayed on your screen, sent to one of two serial ports for printing, saved to a file, or appended to a file.

Task	*Procedure*

Hardware Alarms Monitor Tasks

Access HAM Software

This procedure describes how to access HAM software from within the VoiceMemo 6.0A application.

Step	*Reference*
1. Reach the System Maintenance Menu, then go to the Additional Options Menu.	Menu Map 1
2. Access HAM software from the Additional Options Menu.	

Select: (Q) System Alarms

Prompt:

```
*** ALARMS Maintenance Menu ***

(C) - CONFIGURE
(I) - INITIALIZE
(M) - SELECT MODULE
(R) - RESET
(T) - TEST
(V) - VIEW
(X) - EXIT
```

Response: The letter corresponding to the task you want to perform.

You are now using the HAM software.

Assign Alarm Levels

This procedure describes how to assign alarm levels to specific alarms. This assignment affects the indicators and the audible alarm. You can assign alarm levels for:

- Default alarms
- Critical alarms
- Major alarms
- Minor alarms

Step	*Reference*
1. Reach the Assign Alarm Levels Menu.	Menu Map 4
2. Go to the task you want to perform.	

Assign Default Alarm Levels Menu

3. Enter the type of alarm that you want to assign to the default level. — Menu Map 4

Select: (0) Set default level

Prompt:
```
ASSIGN Alarm Levels Menu

(A) All Alarms
(C) Current fault alarms
(F) Fan fault alarms
(G) Power supply glitch alarms
(M) MCB2 Memory parity error
(O) Power supply surge alarms
(P) Power supply failures
(S) Fuse alarms
(T) Temperature alarms
(Z) Audible alarm
```

Response: The letter corresponding to the alarm that you wish to set to the default level, or
A to set all alarms to their default levels.

Prompt:
```
Alarm Level assigned.
Press any key to continue....
```

Response: Press any key. The alarm level is now set.

Assign Critical Alarm Levels Menu

3. Enter the type of alarm that you want to designate as critical. — Menu Map 4

Step	*Reference*

Select: (1) Critical Alarm
Prompt: `ASSIGN Critical Alarm Levels Menu`

```
(A) All Alarms
(C) Current fault alarms
(F) Fan fault alarms
(G) Power supply glitch alarms
(M) MCB2 Memory parity error
(O) Power supply surge alarms
(P) Power supply failures
(S) Fuse alarms
(T) Temperature alarms
(Z) Audible alarm
```

Response: The letter corresponding to the alarm that you want to set to the critical level, or
A to set all alarms to the critical level.

Prompt: `Alarm Level assigned.`
`Press any key to continue....`
Response: Press any key. The alarm level is now set.

Assign Major Alarm Levels Menu

3. Enter the type of alarm that you want to designate as major. — Menu Map 4

Select: (2) Major Alarm
Prompt: `ASSIGN Major Alarm Levels Menu`

```
(A) All Alarms
(C) Current fault alarms
(F) Fan fault alarms
(G) Power supply glitch alarms
(M) MCB2 Memory parity error
(O) Power supply surge alarms
(P) Power supply failures
(S) Fuse alarms
(T) Temperature alarms
(Z) Audible alarm
```

Response: The letter corresponding to the alarm that you want to set to the major level, or
A to set all alarms to the major level.

Prompt: `Alarm Level assigned.`
`Press any key to continue....`
Response: Press any key. The alarm level is now set.

Step	*Reference*

Assign Minor Alarm Levels Menu

3. Enter the type of alarm that you want to designate as minor. — Menu Map 4

Select: (3) Minor Alarm
Prompt:
```
ASSIGN Minor Alarm Levels Menu

(A) All Alarms
(C) Current fault alarms
(F) Fan fault alarms
(G) Power supply glitch alarms
(M) MCB2 Memory parity error
(O) Power supply surge alarms
(P) Power supply failures
(S) Fuse alarms
(T) Temperature alarms
(Z) Audible alarm
```
Response: The letter corresponding to the alarm that you want to set to the minor level, or
A to set all alarms to the minor level.

Prompt:
```
Alarm Level assigned.
Press any key to continue....
```
Response: Press any key. The alarm level is now set.

Disable Alarms and CIP

This procedure describes how to disable continuous interrupt protection (CIP) and the alarms. You can disable the following features:

- CIP
- Auto Reset alarm indicators
- Audible alarm
- All other alarms:
  - Current fault alarms
  - Fan fault alarms
  - Power supply glitch
  - MCB 2 memory parity error
  - Power supply surge
  - Power supply failure
  - Fuse alarms
  - Temperature alarms

Step	*Reference*
1. Reach the Disable Menu.	Menu Map 5
2. Go to the task you want to perform.	

Disable CIP

3. Disable CIP.	Menu Map 5

Select: (C) CIP Interrupt Protection
Prompt: `Continuous Interrupt Protection disabled.`
`Press any key to continue....`
Response: Press any key. CIP is now disabled.

Disable the Audible Alarm

3. Disable the audible alarm.	Menu Map 5

Select: (Z) Audible alarm
Prompt: `Alarm feature(s) disabled.`
`Press any key to continue....`
Response: Press any key. The audible alarm is now disabled.

Disable All Other Alarms

3. Disable all alarms.	Menu Map 5

Step	*Reference*

Select: (A) Alarms
Prompt:
```
Disable Alarms Menu

(A) All Alarms
(C) Current fault alarms
(F) Fan fault alarms
(G) Power supply glitch
(M) MCB2 Memory parity error
(O) Power supply surge
(P) Power supply failure
(S) Fuse alarms
(T) Temperature alarms
```
Response: A to disable all alarms.

Prompt:
```
Alarm feature(s) disabled.
Press any key to continue....
```
Response: Press any key. All alarms are now disabled.

Disable Current Fault Alarms

3. Reach the Disable Alarms Menu. — Menu Map 5
4. Disable the current fault alarms.

Select: (C) Current fault alarms
Prompt:
```
DISABLE Current Fault Alarms

(A) All current fault alarms
(C) Ceiling fault on remote supply
(D) Delta fault on remote supply
(L) Local supply current warning
```
Response: A to disable all current fault alarms,
C to disable the alarm activated when the current on the remote supply exceeds the ceiling limit,
D to disable the alarm activated when the current on the remote supply has a change greater than the delta limit, or
L to disable the alarm activated when the current on the local power supply changes.

Prompt:
```
Alarm feature(s) disabled.
Press any key to continue....
```
Response: Press any key. The current fault alarm is now disabled.

Disable Fan Fault Alarms

3. Reach the Disable Alarms Menu. — Menu Map 5
4. Disable the fan fault alarms.

Step | *Reference*

Select: (F) Fan fault alarms
Prompt:
```
DISABLE Fan Fault Alarms

(A) All fan fault alarms
(1) CPU       Fan #1
(2) CPU       Fan #2
(3) CPU       Fan #3
(4) Drive Bay Fan #1
(5) Drive Bay Fan #2
(6) Main P.S. Fan #1)
(7) Main P.S. Fan #2
(8) Main P.S. Fan #3
```
Response: The number corresponding to the fan fault alarm that you want to disable, or
A to disable all fan fault alarms.

Prompt:
```
Alarm feature(s) disabled.
Press any key to continue....
```
Response: Press any key. The fan fault alarm is now disabled.

Disable Power Supply Glitch Alarms

3. Reach the Disable Alarms Menu. — Menu Map 5
4. Disable the power supply glitch alarms.

Select: (G) Power supply glitch
Prompt:
```
DISABLE Power Supply Glitch Alarms

(A) All power supply alarms
(1) Main   5 volt power supply alarm
(2) Main  -5 volt power supply alarm
(3) Main  12 volt power supply alarm
(4) Main -12 volt power supply alarm
(5) Main -48 volt power supply alarm
(6) Drive Bay  5 volt supply alarm
(7) Drive Bay 12 volt supply alarm
(8) External   5 volt supply alarm
```
Response: The number corresponding to the power supply glitch alarm that you want to disable, or
A to disable all power supply glitch alarms.

Prompt:
```
Alarm feature(s) disabled.
Press any key to continue....
```
Response: Press any key. The power supply glitch alarm is now disabled.

Disable the MCB 2 Memory Parity Error Alarm

3. Reach the Disable Alarms Menu. — Menu Map 5
4. Disable the MCB 2 memory parity error alarm.

Step	*Reference*

Select: (M) MCB2 Memory parity error
Prompt: `Alarm feature(s) disabled.`
`Press any key to continue....`
Response: Press any key. The memory parity error alarm is now disabled.

Disable Power Supply Surge Alarms

3. Reach the Disable Alarms Menu. — Menu Map 5
4. Disable the power supply surge alarms.

Select: (O) Power supply surge
Prompt: DISABLE Power Supply Surge Alarms

```
(A) All power supply alarms
(1) Main    5 volt power supply alarm
(2) Main   -5 volt power supply alarm
(3) Main   12 volt power supply alarm
(4) Main  -12 volt power supply alarm
(5) Main  -48 volt power supply alarm
(6) Drive Bay  5 volt supply alarm
(7) Drive Bay 12 volt supply alarm
(8) External   5 volt supply alarm
```

Response: The number corresponding to the power supply surge alarm that you want to disable, or
A to disable all power supply surge alarms.

Prompt: `Alarm feature(s) disabled.`
`Press any key to continue....`
Response: Press any key. The power supply surge alarm is now disabled.

Disable Power Supply Failure Alarms

3. Reach the Disable Alarms Menu. — Menu Map 5
4. Disable the power supply failure alarms.

Step | *Reference*

Select: (P) Power supply failure
Prompt:
```
DISABLE Power Supply Failure Alarms

(A) All power supply alarms
(1) Main      5 volt power supply alarm
(2) Main     -5 volt power supply alarm
(3) Main     12 volt power supply alarm
(4) Main    -12 volt power supply alarm
(5) Main    -48 volt power supply alarm
(6) Drive Bay  5 volt supply alarm
(7) Drive Bay 12 volt supply alarm
(8) External   5 volt supply alarm
```
Response: The number corresponding to the power supply failure alarm that you want to disable, or
A to disable all power supply failure alarms.

Prompt:
```
Alarm feature(s) disabled.
Press any key to continue....
```
Response: Press any key. The power supply failure alarm is now disabled.

Disable Fuse Alarms

3. Reach the Disable Alarms Menu. — Menu Map 5
4. Disable the fuse alarms.

Select: (S) Fuse alarms
Prompt:
```
DISABLE Fuse Alarms

(A) All Fuse faults
(0) SCSI channel #0
(1) SCSI channel #1
(2) SCSI channel #2
(3) SCSI channel #3
(4) Drive Bay Fuse
(5) CSOIO Fuse
```
Response: The number corresponding to the fuse alarm that you want to disable, or
A to disable all fuse alarms.

Prompt:
```
Alarm feature(s) disabled.
Press any key to continue....
```
Response: Press any key. The fuse alarm is now disabled.

Disable Temperature Alarms

3. Reach the Disable Alarms Menu. — Menu Map 5
4. Disable the temperature alarms.

Step	*Reference*

Select: (T) Temperature alarms

Prompt:
```
DISABLE Temperature Sensor Alarms

(A) All temperature sensor alarms
(1) MCB2 Temperature sensor
(2) Main Power Temperature sensor
(3) Drive Bay Power Supply sensor
(4) Drive Bay Temperature sensor
(5) CPU Temperature sensor
```

Response: The number corresponding to the temperature sensor alarm that you want to disable, or
A to disable all temperature sensor alarms.

Prompt:
```
Alarm feature(s) disabled.
Press any key to continue....
```

Response: Press any key. The temperature sensor alarm is now disabled.

Enable Alarms and CIP

This procedure describes how to enable continuous interrupt protection (CIP) and the alarms. You can complete the following tasks:

- Enable CIP
- Set the CIP fault limit
- Set the CIP time limit
- Enable the audible alarms
- Enable all other alarms
- Enable current fault alarms
- Enable fan fault alarms
- Enable power supply glitch alarms
- Enable the MCB 2 memory parity error alarm
- Enable power supply surge alarms
- Enable power supply failure alarms
- Enable fuse alarms
- Enable temperature alarms

Step	*Reference*
1. Reach the Enable Menu.	Menu Map 6
2. Go to the task you want to perform.	

Enable CIP

3. Enable CIP.	Menu Map 6

Select: (C) CIP Interrupt Protection
Prompt:
```
ENABLE Continuous Interrupt Protection
(D) Default Setting
(F) Fault Limit
(T) Time Limit
```
Response: D to enable CIP using the default settings for the fault and time limit,
F to set the CIP fault limit, or
T to set the CIP time limit.

The default value for fault limit is three, and the default value for time limit is two seconds.

Prompt:
```
Continuous Interrupt Protection limits updated.
Press any key to continue....
```
Response: Press any key. CIP is now enabled.

Set the CIP Fault Limit

3. Reach the Enable Continuous Interrupt Protection Menu.	Menu Map 6
4. Set the CIP fault limit.	

Step	*Reference*

Select: (F) Fault Limit

Prompt:
```
Setup CIP Fault Limit Menu
(2) Fault limit = 2
(3) Fault limit = 3
(4) Fault limit = 4
(5) Fault limit = 5
(6) Fault limit = 6
(7) Fault limit = 7
(8) Fault limit = 8
(9) Fault limit = 9
```
Response: The number of the fault limit you want to set for CIP.

Prompt:
```
Continuous Interrupt Protection limits updated.
Press any key to continue....
```
Response: Press any key. The CIP fault limit value is now enabled.

Set the CIP Time Limit

3. Reach the Enable Continuous Interrupt Protection Menu. — Menu Map 6

4. Set the CIP time limit.

Select: (T) Time Limit

Prompt:
```
Setup CIP Time Limit Menu
(S) One Second limit
(M) One Minute limit
(H) One Hour limit
```
Response: S to set the CIP time limit to one second,
M to set the CIP time limit to one minute, or
H to set the CIP time limit to one hour.

Prompt:
```
Continuous Interrupt Protection limits updated.
Press any key to continue....
```
Response: Press any key. The CIP time limit value is now enabled.

Enable the Audible Alarm

3. Reach the Enable Menu. — Menu Map 6

4. Enable the audible alarm.

Select: (Z) Audible alarm

Prompt:
```
Alarm feature(s) enabled.
Press any key to continue....
```
Response: Press any key. The audible alarm is now enabled.

Enable Other Alarms

3. Reach the Enable Menu. — Menu Map 6

4. Enable the alarms.

Step | *Reference*

Select: (A) Alarms
Prompt: `ENABLE Alarms Menu`

```
(A) All Alarms
(C) Current fault alarms
(F) Fan fault alarms
(G) Power supply glitch
(M) MCB2 Memory parity error
(O) Power supply surge
(P) Power supply failure
(S) Fuse alarms
(T) Temperature alarms
```

Response: The letter of the alarm type that you want to enable, or A to enable all alarms.

Prompt: `Alarm feature(s) enabled.`
`Press any key to continue....`
Response: Press any key. The alarms are now enabled.

Enable Current Fault Alarms

3. Reach the Enable Alarms Menu. — Menu Map 6

4. Enable the current fault alarms.

Select: (C) Current fault alarms
Prompt: `ENABLE Current Fault Alarms`

```
(A) All current fault alarms
(C) Ceiling fault on remote supply
(D) Delta fault on remote supply
(L) Local supply current warning
```

Response: A to enable all current fault alarms,
C to enable the alarm activated when the current on the remote supply exceeds the ceiling limit,
D to enable the alarm activated when the current on the remote supply has a change greater than the delta limit, or
L to enable the alarm activated when the current on the local power supply changes.

Prompt: `Alarm feature(s) enabled.`
`Press any key to continue....`
Response: Press any key. The current fault alarm is now enabled.

Enable Fan Fault Alarms

3. Reach the Enable Alarms Menu. — Menu Map 6

4. Enable the fan fault alarms.

Step | *Reference*

Select: (F) Fan fault alarms
Prompt: ENABLE Fan Fault Alarms

```
(A) All fan fault alarms
(1) CPU       Fan #1
(2) CPU       Fan #2
(3) CPU       Fan #3
(4) Drive Bay Fan #1
(5) Drive Bay Fan #2
(6) Main P.S. Fan #1
(7) Main P.S. Fan #2
(8) Main P.S. Fan #3
```

Response: The **number** corresponding to the fan fault alarm that you want to enable, or A to enable all fan fault alarms.

Prompt: `Alarm feature(s) enabled.`
`Press any key to continue....`
Response: Press any key. The fan fault alarm is now enabled.

Enable Power Supply Glitch Alarms

3. Reach the Enable Alarms Menu. — Menu Map 6

4. Enable the power supply glitch alarms.

Select: (G) Power supply glitch
Prompt: ENABLE Power Supply Glitch Alarms

```
(A) All power supply alarms
(1) Main   5 volt power supply alarm
(2) Main  -5 volt power supply alarm
(3) Main  12 volt power supply alarm
(4) Main -12 volt power supply alarm
(5) Main -48 volt power supply alarm
(6) Drive Bay  5 volt supply alarm
(7) Drive Bay 12 volt supply alarm
(8) External   5 volt supply alarm
```

Response: The **number** corresponding to the power supply glitch alarm that you want to enable, or
A to enable all power supply glitch alarms.

Prompt: `Alarm feature(s) enabled.`
`Press any key to continue....`
Response: Press any key. The power supply glitch alarm is now enabled.

Enable the MCB 2 Memory Parity Error Alarm

3. Reach the Enable Alarms Menu. — Menu Map 6

4. Enable the MCB 2 memory parity error alarm.

Step	*Reference*

Select: (M) MCB2 Memory parity error
Prompt:
```
Alarm feature(s) enabled.
Press any key to continue....
```
Response: Press any key. The memory parity error alarm is now enabled.

Enable Power Supply Surge Alarms

3. Reach the Enable Alarms Menu. — Menu Map 6

4. Enable the power supply surge alarms.

Select: (O) Power supply surge
Prompt:
```
ENABLE Power Supply Surge Alarms

(A) All power supply alarms
(1) Main   5 volt power supply alarm
(2) Main  -5 volt power supply alarm
(3) Main  12 volt power supply alarm
(4) Main -12 volt power supply alarm
(5) Main -48 volt power supply alarm
(6) Drive Bay  5 volt supply alarm
(7) Drive Bay 12 volt supply alarm
(8) External   5 volt supply alarm
```
Response: The number of the power supply surge alarm that you want to enable, or A to enable all power supply surge alarms.

Prompt:
```
Alarm feature(s) enabled.
Press any key to continue....
```
Response: Press any key. The power supply surge alarm is now enabled.

Enable Power Supply Failure Alarms

3. Reach the Enable Alarms Menu. — Menu Map 6

4. Enable the power supply failure alarms.

Step	*Reference*

Select: (P) Power supply failure
Prompt:

```
ENABLE Power Supply Failure Alarms

(A) All power supply failure alarms
(1) Main       5 volt power supply alarm
(2) Main      -5 volt power supply alarm
(3) Main      12 volt power supply alarm
(4) Main     -12 volt power supply alarm
(5) Main     -48 volt power supply alarm
(6) Drive Bay  5 volt supply alarm
(7) Drive Bay 12 volt supply alarm
(8) External   5 volt supply alarm
```

Response: The number corresponding to the power supply failure alarm that you want to enable, or
A to enable all power supply failure alarms.

Prompt:

```
Alarm feature(s) enabled.
Press any key to continue....
```

Response: Press any key. The power supply failure alarm is now enabled.

Enable Fuse Alarms

3. Reach the Enable Alarms Menu. — Menu Map 6

4. Enable the fuse alarms.

Select: (S) Fuse alarms
Prompt:

```
ENABLE Fuse Alarms

(A) All Fuse faults
(0) SCSI channel #0
(1) SCSI channel #1
(2) SCSI channel #2
(3) SCSI channel #3
(4) Drive Bay Fuse
(5) CSOIO Fuse
```

Response: The number corresponding to the fuse alarm that you want to enable, or
A to enable all fuse alarms.

Prompt:

```
Alarm feature(s) enabled.
Press any key to continue....
```

Response: Press any key. The fuse alarm is now enabled.

Enable Temperature Alarms

3. Reach the Enable Alarms Menu. — Menu Map 6

4. Enable the temperature alarms.

Step *Reference*

Select: (T) Temperature alarms

Prompt:
```
ENABLE Temperature Sensor Alarms

(A) All temperature sensor alarms
(1) MCB2 Temperature sensor
(2) Main Power Temperature sensor
(3) Drive Bay Power Supply sensor
(4) Drive Bay Temperature sensor
(5) CPU Temperature sensor
```

Response: The **number** corresponding to the temperature alarm that you want to enable,
or
A to enable all temperature alarms.

Prompt:
```
Alarm feature(s) enabled.
Press any key to continue....
```

Response: Press any key. The temperature alarm is now enabled.

Intitialize Alarms

This procedure describes how to initialize the alarms to restore the default configuration values. Initialize also clears the NVRAM event log and event counters.

Step	*Reference*
1. Reach the Alarms Maintenance Menu.	Menu Map 1
2. Initialize the alarms.	

Select: (I) INITIALIZE

Prompt:
```
INITIALIZE alarm subsystem on selected host(s)?

(N) No
(Y) Yes
(M) Select Module
```

Response: Y to initialize the alarms.

Prompt:
```
Alarm indicator(s) reset on module 1.
Alarm Counters reset on module 1.
Event Log reset on module 1.
Alarm enabled for SCSI board 1 on module 1.
Alarm enabled for SCSI board 2 on module 1.
Alarm feature(s) enabled.
Event Log already enabled.
Alarm Level assigned.
Configuration Reinstated.
Continuous Interrupt Protection limits updated.
Press any key to continue....
```

Response: Press any key. The alarms are now restored to the default values, and the event log and event counters are cleared.

Reset Alarm Counters, Indicators, and Event Log

This procedure describes how to reset the audible alarm, alarm counters, the panel indicators, and the NVRAM event log. You can accomplish the following tasks:

- Reset the audible alarm
- Reset alarm counters
- Reset current fault counters
- Reset fan fault counters
- Reset power supply glitch counters
- Reset MCB 2 memory parity error counter
- Reset power supply surge counters
- Reset power supply failure counters
- Reset fuse counters
- Reset temperature fault counters
- Reset panel indicators
- Reset NVRAM event log

Step	*Reference*
1. Reach the Reset Menu.	Menu Map 7
2. Go to the task you want to perform.	

Reset Audible Alarm

3. Reset the audible alarm.

Select: (A) Audible alarm
Prompt:
```
Alarm indicator(s) reset on host 1.
Press any key to continue....
```
Response: Press any key. The audible alarm is now reset.

Reset Alarm Counters

3. Reset the alarm counters.

Select: (E) Alarm Event Counters
Prompt:
```
RESET Alarm Counters Menu

(A) All Alarm counters
(C) Current fault counters
(F) Fan fault counters
(G) Power supply glitch
(M) MCB2 Memory parity error
(O) Power supply surge
(P) Power supply failure
(S) Fuse alarm counters
(T) Temperature fault counters
```

Response: The letter corresponding to the alarm counter that you want to reset, or A to reset all alarm counters.

Prompt:
```
Press any key to continue....
```
Response: Press any key. The alarm counters are now reset.

Reset Current Fault Counters

Step	*Reference*
3. Reach the Reset Alarm Counters Menu.	Menu Map 7
4. Reset the current fault counters.	

Select: (C) Current fault counters
Prompt: `RESET Current Fault Counters`

```
(A) All current fault counters
(C) Ceiling fault on remote supply
(D) Delta fault on remote supply
(L) Local supply current fault
```

Response: A to reset all current fault counters,
C to reset the event counter set by a ceiling fault on a remote supply,
D to reset the event counter set by a delta fault on a remote supply, or
L to reset the event counter set by a local supply current fault.

Prompt: `Press any key to continue....`
Response: Press any key. The current fault counters are now reset.

Reset Fan Fault Counters

3. Reach the Reset Alarm Counters Menu.	Menu Map 7
4. Reset the fan fault counters.	

Select: (F) Fan fault counters
Prompt: `RESET Fan Fault Alarms`

```
(A) All fan fault counters
(1) CPU       Fan #1
(2) CPU       Fan #2
(3) CPU       Fan #3
(4) Drive Bay Fan #1
(5) Drive Bay Fan #2
(6) Main P.S. Fan #1
(7) Main P.S. Fan #2
(8) Main P.S. Fan #3
```

Response: The number of the fan fault counter that you want to reset, or
A to reset all fan fault counters.

Prompt: `Press any key to continue....`
Response: Press any key. The fan fault counters are now reset.

Reset Power Supply Glitch Counters

3. Reach the Reset Alarm Counters Menu.	Menu Map 7
4. Reset the power supply glitch counters.	

Step	*Reference*

Select: (G) Power supply glitch
Prompt: `RESET Power Supply Glitch Alarm Counters`

```
(A) All power supply alarm counters
(1) Main        5 volt power supply alarm
(2) Main       -5 volt power supply alarm
(3) Main       12 volt power supply alarm
(4) Main      -12 volt power supply alarm
(5) Main      -48 volt power supply alarm
(6) Drive Bay  5 volt supply alarm
(7) Drive Bay 12 volt supply alarm
(8) External   5 volt supply alarm
```

Response: The number corresponding to the power supply glitch counter that you want to reset, or
A to reset all power supply glitch counters.

Prompt: `Press any key to continue....`
Response: Press any key. The power supply glitch counters are now reset.

Reset MCB 2 Memory Parity Error Counter

3. Reach the Reset Alarm Counters Menu. — Menu Map 7
4. Reset the MCB 2 memory parity error counter.

Select: (M) MCB2 Memory parity error
Prompt: `Press any key to continue....`
Response: Press any key. The memory parity error event counter is now reset.

Reset Power Supply Surge Counters

3. Reach the Reset Alarm Counters Menu. — Menu Map 7
4. Reset the power supply surge counters.

Step *Reference*

Select: (O) Power supply surge
Prompt:
```
RESET Power Surge Alarm Counters

(A) All power supply alarm counters
(1) Main       5 volt power supply alarm
(2) Main      -5 volt power supply alarm
(3) Main      12 volt power supply alarm
(4) Main     -12 volt power supply alarm
(5) Main     -48 volt power supply alarm
(6) Drive Bay  5 volt supply alarm
(7) Drive Bay 12 volt supply alarm
(8) External   5 volt supply alarm
```
Response: The number corresponding to the power supply surge counter that you want to reset, or
A to reset all power supply surge counters.

Prompt: `Press any key to continue....`
Response: Press any key. The power supply surge counters are now reset.

Reset Power Supply Failure Counters

3. Reach the Reset Alarm Counters Menu. — Menu Map 7
4. Reset the power supply failure counters.

Select: (P) Power supply failure
Prompt:
```
RESET Power Failure Counters

(A) All power supply failure counters
(1) Main       5 volt power supply
(2) Main      -5 volt power supply
(3) Main      12 volt power supply
(4) Main     -12 volt power supply
(5) Main     -48 volt power supply
(6) Drive Bay  5 volt supply
(7) Drive Bay 12 volt supply
(8) External   5 volt supply
```
Response: The number corresponding to the power supply failure counter that you want to reset, or
A to reset all power supply failure counters.

Prompt: `Press any key to continue....`
Response: Press any key. The power supply failure event counters are now reset.

Reset Fuse Counters

3. Reach the Reset Alarm Counters Menu. — Menu Map 7
4. Reset the fuse counters.

Step | *Reference*

Select: (S) Fuse alarms counters
Prompt: `RESET Fuse Counters`

```
(A) All Fuse faults
(0) SCSI channel #0
(1) SCSI channel #1
(2) SCSI channel #2
(3) SCSI channel #3
(4) Drive Bay Fuse
(5) CSOIO Fuse
```

Response: The number corresponding to the fuse counter that you want to reset, or A to reset all fuse counters.

Prompt: `Press any key to continue....`
Response: Press any key. The fuse event counters are now reset.

Reset Temperature Fault Counters

3. Reach the Reset Alarm Counters Menu. — Menu Map 7
4. Reset the temperature fault counters.

Select: (T) Temperature fault counters
Prompt: `RESET Temperature Sensor Counters`

```
(A) All temperature sensor alarms
(1) MCB2 Temperature sensor
(2) Main Power Temperature sensor
(3) Drive Bay Power Supply sensor
(4) Drive Bay Temperature sensor
(5) CPU Temperature sensor
```

Response: The number corresponding to the temperature sensor counter that you want to reset, or
A to reset all temperature sensor counters.

Prompt: `Press any key to continue....`
Response: Press any key. The temperature sensor event counters are now reset.

Reset Panel Indicators

3. From the Reset Menu. — Menu Map 7
4. Reset the panel indicators.

Step | *Reference*

Select: (I) Panel Indicators
Prompt:
```
RESET Indicators menu

(A) All panel indicators
(1) Critical indicator
(2) Major indicator
(3) Minor indicator
```
Response: The number corresponding to the panel indicator that you want to reset, or A to reset all indicators.

Prompt:
```
Alarm indicator(s) reset on host 1.
Press any key to continue....
```
Response: Press any key. The panel indicators are now reset.

Reset NVRAM Event Log

3. Reach the Reset Menu. — Menu Map 7
4. Reset the NVRAM event log.

Select: (L) NVRAM event log
Prompt:
```
Reset NVRAM event log?

(N) No
(Y) Yes, Clear event log
(M) Select Module
(V) View NVRAM Log
```
Response: Y to clear the NVRAM event log.

Prompt:
```
Event Log reset on module 1.
Press any key to continue....
```
Response: Press any key. The NVRAM event log is now reset.

Select a Module

This procedure describes how to select a module. All functions that follow module selection apply only to the selected module. By default, the HAM software applies all functions to all modules, so you use module selection if you want functions to apply only to a specific module. Once a module is selected, that module remains selected until another module is selected or until you exit the Alarms Menu System. When you exit the Alarms Menu System, the HAM software resets to apply to all modules.

Step	*Reference*
1. Reach the Alarms Maintenance Menu, then go to the Module Selection Menu.	Menu Map 2
2. Select a module.	

Prompt:
```
MODULE Selection Menu

(A) All Modules
(1) Select Module #1
(2) Select Module #2
(3) Select Module #3
(4) Select Module #4
(V) View Selected Module(s)
```

Response: A to select all modules,
V to display the currently selected modules, or
the number corresponding to the module you want to select.

Prompt:
```
All modules selected.
Press any key to continue....
```

Response: Press any key. The module is now selected.

Test Alarms

This procedure describes how to test the audible alarm and panel indicators. For panel indicator tests, the indicator should light when the alarm indicator is set, and the indicator should turn off when the alarm indicator is reset. Also, if you have external alarms connected to the relays, you can test the alarms following these procedures. When the audible alarm is tested, the following message appears:

```
You should now be hearing the audible alarm on module 1...
```

At the end of the audible alarm test, the following message appears:

```
Test complete on module 1.
Press any key to continue....
```

The messages show which module you are testing (1 through 4). If the audible alarm is not working, the hardware switch settings might be incorrect or the cables might not be connected properly.

Step	*Reference*
1. Reach the Alarms Maintenance Menu, then go to the Test Menu.	Menu Map 2
2. Test the alarms.	

Prompt:

```
TEST Menu

(A) Alarm system
(R) Reset all alarm indicators
(S) Set all alarm indicators
(1) Reset Critical alarm indicator
(2) Reset Major    alarm indicator
(3) Reset Minor    alarm indicator
(4) Set   Critical alarm indicator
(5) Set   Major    alarm indicator
(6) Set   Minor    alarm indicator
(H) Select Host
```

Response: **A** to test all alarms (the audible alarm and all indicators,
R to reset all indicators,
S to test all indicators, or
the **number** of the alarm you want to test or reset.

When you test (set) an indicator, the following prompt appears:

Prompt:

```
Alarm indicator(s) set on module 1.
Press any key to continue....
```

When you reset an indicator, the following prompt appears:

Prompt:

```
Alarm indicator(s) reset on module 1.
Press any key to continue....
```

Update the Alarm Configuration

This procedure describes how to update the alarm configuration. When you update the configuration, the most current alarm configuration is copied to the selected modules.

Step	*Reference*
1. Reach the Alarms Maintenance Menu, then go to the Configure Menu.	Menu Map 3
2. Update the alarm configuration. *Select:* `(U) Update Configuration` *Prompt:* `Configuration updated on selected host(s). Press any key to continue....` *Response:* Press any key. The alarm configuration is now updated.	

Reinstate the Alarm Configuration

This procedure describes how to reinstate the alarm configuration. When you reinstate the configuration, you reenable the alarms that have been automatically disabled by CIP.

Step	*Reference*
1. Reach the Alarms Maintenance Menu, then go to the Configure Menu.	Menu Map 3
2. Reinstate the alarm configuration. *Select:* `(R) Reinstate Configuration` *Prompt:* `Configuration Reinstated on selected module(s).` `Press any key to continue....` *Response:* Press any key. The alarm configuration is now reinstated.	

Use the Auto Reset Feature

This procedure describes how to use the Auto Reset feature. Auto Reset then automatically resets any indicator when the fault that triggered the indicator is recovered.

Step	*Reference*
Enable Auto Reset	
1. Reach the Enable Alarms Menu.	Menu Map 6
2. Turn on Auto Reset. *Select:* (R) Auto Reset alarm indicators *Prompt:* `Alarm feature(s) enabled.` `Press any key to continue` *Response:* Press any key. Auto Reset is now enabled.	
Disable Auto Reset	
1. Reach the Disable Alarms Menu.	Menu Map 5
2. Turn off Auto Reset. *Select:* (R) Auto Reset alarm indicators *Prompt:* `Alarm feature(s) disabled.` `Press any key to continue` *Response:* Press any key. Auto Reset is now disabled.	

Run an Alarm Configuration Report

This procedure describes how to run an alarm configuration report.

Step	*Reference*
1. Reach the Alarms Maintenance Menu, then go to the View Menu.	Menu Map 8
2. Choose the Alarm configuration option and specify the destination of the report.	

Select: `(C) Alarm configuration`
Prompt: `REPORT OUTPUT ROUTING`

```
(C) Console (screen)
(P) Console with pause
(1) Serial port 1
(2) Serial port 2
(F) File...
(A) Append to file...
```

Response: C to display the alarm configuration on the screen,
P to display the alarm configuration on the screen after a pause,
1 to send the alarm configuration listing to serial port 1,
2 to send the alarm configuration listing to serial port 2,
F to save the alarm configuration to a file, or
A to append the alarm configuration to a file.

- Figure 1 is a sample alarm configuration report.

Step *Reference*

```
==============================================================
              A L A R M   C O N F I G U R A T I O N
==============================================================
Date: Tue Aug  8 14:02:30 1995
Module: ALL
                   |  ALARM          UNIT
     ALARMS        |  LEVEL    0     1     2     3
===============+==========================
AUDIBLE ALARM   |  Major   ENA    -     -     -
----------------+-------------------------
FANS:           |
  CPU           |  Major   DIS   DIS   DIS    -
  Drive Bay     |  Major   DIS   DIS    -     -
  Power Supply  |  Major   DIS    -     -     -
----------------+-------------------------
FUSES:          |
  CSOIO         |  Major   ENA    -     -     -
  Drive Bay     |  Major   ENA    -     -     -
  SCSI          |  Major   ENA   ENA   DIS   DIS
----------------+-------------------------
MCB2 MEMORY     | Critical ENA    -     -     -
----------------+-------------------------
TEMPERATURE:    |
  CPU           | Critical ENA    -     -     -
  Drive Bay     | Critical DIS    -     -     -
  Drive Bay Pwr.| Critical DIS    -     -     -
  Main P. S.    | Critical DIS    -     -     -
  MCB2          | Critical ENA    -     -     -
===============+=========================================
                |  ALARM  |Ext.|   Main Power Supply      | Drive Bay
                |  LEVEL  | +5 | +5   +12   -5   -12  -48|  5     12
POWER SUPPLY:   |========+====+==================+==============
  Failure       | Critical ENA  ENA   ENA   ENA   ENA   ENA  ENA   ENA
  Glitch        | Minor    ENA  ENA   ENA   ENA   ENA   ENA  ENA   ENA
  Surge         | Major    ENA  ENA   ENA   ENA   ENA   ENA  ENA   ENA
----------------+-----------------------------------------------
CURRENT LIMIT:  |
  Ceiling       |  Major   ENA   -    ENA    -     -     -    -     -
  Delta         |  Major   ENA   -     -     -     -     -    -     -

FEATURES:
              Alarm Indicator Auto Reset: ENA
   Continuous Interrupt Protection (CIP): ENA
                                 CIP Fault Limit: 3
                                  CIP Time Limit: 60second(s)
                ************************************
                *  CIP = Alarm disabled by CIP     *
                *  DIS = Alarm or feature disabled *
                *  ENA = Alarm or feature enabled  *
                ************************************

All alarms enabled.

Press any key to continue....
```

Figure 1 Alarm Configuration Report

Run an Alarm Event Counters Report

This procedure describes how to run an alarm event counters report.

Step	*Reference*
1. Reach the Alarms Maintenance Menu, then go to the View Menu.	Menu Map 8
2. Choose the Alarm event counters option and specify the destination of the report.	

Select:: `(E) Alarm event counters`

Prompt: `REPORT OUTPUT ROUTING`

```
(C) Console (screen)
(P) Console with pause
(1) Serial port 1
(2) Serial port 2
(F) File...
(A) Append to file...
```

Response: C to display the alarm event counters listing on the screen,
P to display the listing on the screen after a pause,
1 to send the listing to serial port 1,
2 to send the listing to serial port 2,
F to save the listing to a file, or
A to append the listing to a file.

- Figure 1 is a sample alarm event counters report.

Step | *Reference*

```
+==============================================+
|         A L A R M   C O U N T E R S          |
+==============================================+

Date: Tue Aug  8 16:25:04 1995
Module: 1
                          UNIT
     ALARMS      |   0    1    2    3
================+==================
FANS:            |
  CPU            |   0    0    0    -
  Drive Bay      |   0    0    -    -
  Power Supply   |   0    -    -    -
----------------+------------------
FUSES:           |
  CSOIO          |   0    -    -    -
  Drive Bay      |   0    -    -    -
  SCSI           |   0    0    0    0
----------------+------------------
MCB2 MEMORY      |   0    -    -    -
----------------+------------------
TEMPERATURE:     |
  CPU            |   0    -    -    -
  Drive Bay      |   0    -    -    -
  Drive Bay Pwr.|   0    -    -    -
  Main P. S.     |   0    -    -    -
  MCB2           |   0    -    -    -
================+=====================================
                 | Ext.|     Main Power Supply    |Drive Bay
                 |  +5 | +5   +12  -5   -12  -48 | 5   12
POWER SUPPLY:    +=====+======================+========
  Failure        |   0    0    0    0    0    0    0
  Neg. Glitch    |   0    0    0    0    0    0    0
  Pos. Glitch    |   0    0    0    0    0    0    0
  Surge          |   0    0    0    0    0    0    0
----------------+-------------------------------------
CURRENT LIMIT:   |
  Ceiling        |   0    -    0    -    -    -    -
  Delta          |   0    -    -    -    -    -    -

COUNTER TOTAL:    0
Date all counters reset: Tue Aug  8 15:59:40 1995

Press any key to continue....
```

Figure 1 Alarm Event Counters Report

Run an Alarm Faults Report

This procedure describes how to run an alarm faults report.

Step	*Reference*
1. Reach the Alarms Maintenance Menu, then go to the View Menu.	Menu Map 8
2. Choose the Alarm faults option and specify the destination of the report.	

Select:: `(F) Alarm faults`
Prompt: `REPORT OUTPUT ROUTING`

```
(C) Console (screen)
(P) Console with pause
(1) Serial port 1
(2) Serial port 2
(F) File...
(A) Append to file...
(X) Exit (no report)
```

Response: C to display the alarm faults listing on the screen,
P to display the listing on the screen after a pause,
1 to send the listing to serial port 1,
2 to send the listing to serial port 2,
F to save the listing to a file, or
A to append the listing to a file.

- Figure 1 is a sample alarm faults report.

```
==========================================================
              A L A R M   F A U L T S
==========================================================

Date: Fri Mar 17 01:37:27 1995

 MODULE | ALARM LEVEL |             ALARM DETAIL
--------+-------------+-------------------------------------
   1         Major       Current delta fault on remote supply
   1         Major       #2 CPU Fan fault

   2                     NO ALARM FAULTS DETECTED ON THIS MODULE

   3        Critical     #5 CPU Temp. sensor fault
   3       Major       SCSI board #3 not installed

   4                     NO ALARM FAULTS DETECTED ON THIS MODULE


Press any key to continue....
```

Figure 1 Alarm Faults Report

Run an NVRAM Event Log Report VoiceMemo Release 6.0A and later

This procedure describes how to run an NVRAM event log report. The NVRAM event log for each host has the capacity to store 1000 events. When the event log fills to capacity, new information overwrites information in the log, with the oldest information overwritten first. Event information is processed in chronological order starting with the oldest events. Events in the log are grouped by module.

Step	*Reference*
1. Reach the Alarms Maintenance Menu, then go to the View Menu.	Menu Map 8
2. Choose the NVRAM event log option and specify the destination of the report.	

Select:: `(L) NVRAM event log`
Prompt: `REPORT OUTPUT ROUTING`

```
(C) Console (screen)
(P) Console with pause
(1) Serial port 1
(2) Serial port 2
(F) File...
(A) Append to file...
```

Response: C to display the NVRAM event log on the screen,
P to display the listing on the screen after a pause,
1 to send the listing to serial port 1,
2 to send the listing to serial port 2,
F to save the listing to a file, or
A to append the listing to a file.

- Figure 1 is a sample NVRAM event log report.

Step *Reference*

```
======================================================================
                        N V R A M   E V E N T   L O G
======================================================================
Date: Fri Feb  3 14:39:14 1995

 MODULE |          TIME            |             EVENT DETAIL
------+-------------------------+--------------------------------------
   1     Fri Feb  3 14:39:14 1995   Main -48 volt supply surge
   1     Fri Feb  3 14:39:14 1995   Main  -5 volt supply negative glitch
   1     Fri Feb  3 14:39:14 1995   Main -48 volt supply positive glitch
   1     Fri Feb  3 14:39:14 1995   Drive Bay 12 volt supply positive glitch
   1     Fri Feb  3 14:39:14 1995   Main  -12 volt supply failure

   2                         NO EVENTS LOGGED ON THIS MODULE

   3     Fri Feb  3 14:39:14 1995   Current delta fault on remote supply
   3     Fri Feb  3 14:39:14 1995   Current ceiling fault on remote supply
   3     Fri Feb  3 14:39:14 1995   Current warning on local supply
   3     Fri Feb  3 14:39:14 1995   #1 CPU Fan fault
   3     Fri Feb  3 14:39:14 1995   #4 Main P.S. Fan fault
   3     Fri Feb  3 14:39:14 1995   #4 Main P.S. Fan fault recovered
   3     Fri Feb  3 14:39:14 1995   SCSI Board #2 Fuse fault
   3     Fri Feb  3 14:39:14 1995   #2 Main P. S. Temp. sensor fault
   3     Fri Feb  3 14:39:14 1995   MCB2 Memory Parity Error
   3     Fri Feb  3 14:39:14 1995   WDT timeout - possible system reset
   3     Fri Feb  3 14:39:14 1995   MCB2 Continuous Alarm Interrupt
   3     Fri Feb  3 14:39:14 1995   MCB2 Continuous Interrupt Fault
   3     Fri Feb  3 14:39:14 1995   SCSI Board #3 not installed
   4                                EVENT LOG IS CORRUPTED ON THIS MODULE

Press any key to continue....
```

Figure 1 NVRAM Event Log Report

Notice the event log message for module four:

`EVENT LOG IS CORRUPTED ON THIS MODULE`

This message indicates that the event log data structures in NVRAM are not valid. If you see this message, clear this condition by resetting the NVRAM event log for the specified module.

Run a Temperature Values Report

This procedure describes how to run a temperature values report.

Step	*Reference*
1. Reach the Alarms Maintenance Menu, then go to the View Menu.	Menu Map 8
2. Choose the Temperature values option and specify the destination of the report.	

Select: `(T) Temperature values`
Prompt: `REPORT OUTPUT ROUTING`

```
(C) Console (screen)
(P) Console with pause
(1) Serial port 1
(2) Serial port 2
(F) File...
(A) Append to file...
```

Response: C to display the alarm configuration on the screen,
P to display the alarm configuration on the screen after a pause,
1 to send the alarm configuration listing to serial port 1,
2 to send the alarm configuration listing to serial port 2,
F to save the alarm configuration to a file, or
A to append the alarm configuration to a file.

- Figure 1 is a sample temperature values report.

```
+=================================================+
|        S Y S T E M   T E M P E R A T U R E      |
+=================================================+
Date: Tue Sep 19, 9:20:04 1995

========+========================================
        |            Drive    Drive     Main
 Module |   CPU       Bay    Bay P.S.   P.S.     MCB2
========+========================================
   1      28C/82F  21C/70F  26C/79F  25C/77F  24C/75F

   2      28C/82F  21C/70F  26C/79F  25C/77F  24C/75F

   3      28C/82F  21C/70F  26C/79F  25C/77F  24C/75F

   4      28C/82F  21C/70F  26C/79F  25C/77F  24C/75F

All alarms enabled.

Press any key to continue....
```

Figure 1 Temperature Values Report

Run a Voltage Values Report

VoiceMemo Release 6.0A and later

This procedure describes how to run a voltage values report.

Step	Reference
1. Reach the Alarms Maintenance Menu, then go to the View Menu.	Menu Map 8
2. Choose the Voltage values option and specify the destination of the report.	

Select: (V) Voltage values
Prompt: REPORT OUTPUT ROUTING

```
(C) Console (screen)
(P) Console with pause
(1) Serial port 1
(2) Serial port 2
(F) File...
(A) Append to file...
```

Response: C to display the alarm configuration on the screen,
P to display the alarm configuration on the screen after a pause,
1 to send the alarm configuration listing to serial port 1,
2 to send the alarm configuration listing to serial port 2,
F to save the alarm configuration to a file, or
A to append the alarm configuration to a file.

- Figure 1 is a sample voltage values report.

```
+================================================================+
|                     S Y S T E M   V O L T A G E                |
+================================================================+

Date: Tue Sep 19  9:20:04 1995

==========+=====+==================================+============
          | Ex  |       Main  Power  Supply         | Drive Bay
  Module  | +5  |  +5    +12    -5    -12     -48  |  5     12
==========+=====+==================================+============
     1    | 4.87| 4.98  12.02  -4.92  -11.97  -48.20 | 5.12  11.80
     2    | 4.87| 4.98  12.02  -4.92  -11.97  -48.20 | 5.12  11.80
     3    | 4.87| 4.98  12.02  -4.92  -11.97  -48.20 | 5.12  11.80
     4    | 4.87| 4.98  12.02  -4.92  -11.97  -48.20 | 5.12  11.80


All alarms enabled.

Press any key to continue....
```

Figure 1 Voltage Values Report

2 Hardware Diagnostics Overview

The Hardware Diagnostics program is a series of offline diganostics that allow you to test the following server components:

- MCB II
- QNET Cards
- QNX Network Nodes

The Hardware Diagnostics program requires all modules in the server be disabled (VoiceMemo software is inactive). When running the Hardware Diagnostics program, the QNX operating system should be operating on all modules. The Hardware Diagnostics program must be run individually for each module in the server. In each case, you must install the console on the module to be tested.

Note: Please refer to the *Centigram Series 6 Installation and Service Manual* for your server for console installation procedures.

The Hardware Diagnostics program can only be used to test Serial Ports 3 through 6. Serial Ports 1 and 2 cannot be tested with this program.

In some cases, a user-supplied loopback adapter is required to perform diagnostic tests. A loopback adapter is a common interface cable that connects the module output port with the input port to simulate signal transmission from the module to a destination.

Some hardware diagnostic tests are run for components that might not be presently installed in the server. In such cases, an error message is displayed. For example, when the QNX Network Node test is run, it tries to test for a system that has four modules. If the server under test contains only two modules, Modules 3 and 4 are shown as failures on the screen. This is a correct reading, since Modules 3 and 4 do not exist in the server.

Task *Procedure*

Hardware Diagnostics

Run Hardware Diagnostics From Diskette

This procedure describes how to run the hardware diagnostics program from the Diagnostics Diskette. This software version supports only the MCB 2 and QNET cards at this time. Future versions of this diagnostic software will support additional Centigram hardware products. Both the Floppy Boot Diskette and the Diagnostics Diskette are required to run this diagnostics program.

WARNING!

This version of the On-Site Diagnostics program requires that the server be removed from normal operation. When a server is shut down, it cannot take incoming calls. Centigram recommends that the diagnostics program be run during periods of low call traffic.

CAUTION!

Be sure to shut down and disable the server using the system shutdown procedure. When a module is booted from floppy, it is automatically disabled. In a multi-module server, each module must be individually shut down and disabled to run the diagnostics program.

Step	*Reference*
1. Shut down the system.	CP 5700

2. Insert the Floppy Boot Diskette. Press the Reset button or turn on the system. The system displays the self test results.

   Prompt: `IPL100:  Boot system from (Hard disk, Floppy)?`
   Response: f

3. The system only allows 4 seconds for the "f" to be entered. If the system did not accept the "f," press the reset button and try again. When the system accepts the "f," select the service option.

   Prompt:
   ```
   Choose one of the following activities:
   floppy
   service
   Enter one of the names:
   ```
   Response: floppy

4. The system reads from the floppy boot diskette, then requests the next diskette.

   Prompt:
   ```
   Insert the floppy diskette and press the
   CARRIAGE RETURN.
   ```
   Response: Insert the On-Site Diagnostics Diskette, then press **Enter**.

Step | *Reference*

5. The system displays the following Hardware Diagnostics Menu:

   Prompt:
   ```
   Welcome to VoiceMemo Hardware Diagnostics
   Options:
   (1)..MCB II
   (2)..Test QNET Card(s)
   (3)..Test QNX network Node(s)
   (C)..Clear hardware diagnostics error log
   (H)..Help
   (L)..Display hardware diagnostics error log
   (R)..Reboot
   ```

6. Select the test you want to run.

   Prompt: `Please enter your choice.`

   Response: Enter the desired test or operation. The system automatically displays the selected screen or runs the selected test.

Run MCB 2 Test Program

1. To run the MCB 2 test program:

   Select: (1) MCB II

   Prompt: `Please enter your choice.`

   Response: 1. The system displays the following MCB 2 Test Menu.

   Prompt:
   ```
   Running MCB 2 diagnostics...
   Centigram Communications Corporation Copyright (C) 1995
   MCB II Diagnostics Version 1.0.0
   MFG Ver. 1.0
   ==============================================
   (A)  Local Memory Test
   (B)  NCR 53C720
   (C)  BIOS Test
   (D)  EEPROM Test
   (E)  NVRAM R/W Test
   (F)  NVRAM Battery Test
   (G)  Serial Port 3 Test (need loopback adapter)
   (H)  Serial Port 4 Test (need loopback adapter)
   (I)  Serial Port 5 Test (need loopback adapter)
   (J)  Serial Port 6 Test (need loopback adapter)
   (K)  System Monitor Test
   (Q)  View the MCB logfile
   (R)  Run All Tests except serial port tests
   (S)  Set Test Loop <** Current Setting = 1 **>
   (X)  Exit
   ```

Step *Reference*

2. Select the desired MCB 2 test option.

   Prompt: `Enter:`
   Response: Enter the letter of the desired MCB 2 test. The system automatically runs the test. After the test is completed, the system displays a pass or fail message prompt. All errors are recorded in the hardware diagnostic error logfile.

3. Select another test option or return to the Hardware Diagnostics Menu.

   Prompt: `Press any key to continue:`
   Response: To return to the MCB 2 test menu, press any key. To run another MCB 2 test, enter the character of the desired test.

4. When you are finished running tests, exit to return to the Hardware Diagnostics Main Menu.

Run QNET Card Test Program

1. To run the QNET Card test program:

   Select: (2) Test QNET Card(s)
   Prompt: `Please enter your choice.`
   Response: 2. The system runs the QNET card test. After the test is completed, the system displays a pass or fail message prompt. All errors are recorded in the hardware diagnostic error logfile.

2. Return to the Hardware Diagnostics Menu.

   Prompt: `Press Enter to continue:`
   Response: Press Enter.

Run QNX Network Node Test Program

1. To run the QNX Network Node(s) test program

   Select: (3) Test QNX Network Node(s)
   Prompt: `Please enter your choice.`
   Response: 3. The system runs the QNX Network Node(s) test. After the test is completed, the system displays a pass or fail message prompt. All errors are recorded in the hardware diagnostic error logfile.

Step *Reference*

2. Return to the Hardware Diagnostics Menu.

   Prompt: `Press Enter to continue:`
   Response: Press Enter.

Clear Hardware Diagnostics Error Log

1. To clear all records from the hardware diagnostic log:

   Select: Clear Hardware Diagnostics Error Log
   Prompt: `Please enter your choice.`
   Response: C. All error messages are cleared from the error logfile.

2. Return to the Hardware Diagnostics Menu.

   Prompt: `Press Enter to continue:`
   Response: Press Enter.

Display Help Screen

1. To display the diagnostics help screen:

   Select: (H) Help
   Prompt: `Please enter your choice.`
   Response: H. The system displays the help screen.

2. Return to the Hardware Diagnostics Menu.

   Prompt: `Press Enter to continue:`
   Response: Press Enter.

Display Hardware Diagnostics Error Log

1. To display the test error log results:

   Select: (L) Display Hardware Diagnostics Error Log
   Prompt: `Please enter your choice.`
   Response: L. The system displays the error logfile.

2. Return to the Hardware Diagnostics Menu.

   Prompt: `Press Enter to continue:`
   Response: Press Enter.

Step	*Reference*

Reboot the System

1. To reboot the system from the Hardware Diagnostics Menu:

   Select: (R) Reboot
2. The system reboots. You must then enable the modules that were disabled.

Enable Modules

1. Reach the System Maintenance Menu, then go to the Module Maintenance Menu. — Menu Map 12
2. Enable a module.

   Select: (E) ENABLE a module
   Prompt: `Which Module?`
   Response: The number of the module.

   The specified module automatically resets itself and returns to normal operation.
3. Repeat step 2 until all modules are enabled.

Shut Down a System

This procedure describes how to shut down a module or an entire Series 6 server. You should use this procedure before turning off the power to a module, as the shutdown command halts call processing in a clean and orderly fashion.

WARNING!

You should follow the policies of the site to warn users prior to the system shutdown. This process removes the system from call processing. Centigram recommends that you perform this procedure only during periods of low call traffic.

Step *Reference*

1. Reach the System Maintenance Menu.

   Menu Map 1

2. Execute a shutdown command.

   Select: (S) System Shutdown

   - The system displays the status of each line and the lengths of the message
     indicator request queues.

   Prompt: `WARNING!!  This will terminate call processing.`
   `Type "shutdown" if you really want to do this.`
   Response: shutdown

3. If you have a multi-module system, specify which modules to shut down.

   Prompt: `modules to shutdown:`
   Response: a for all modules, or the number of a specific module (1, 2, 3, or 4). You can select multiple modules by entering the IDs separated by commas (3,4), or a range by using a hyphen (2-4).

   - The system displays the status of each line of the specified modules as "idle," "active," or "stopped," and updates the status every minute until all lines are stopped. The system stops any calls still in progress after five minutes.

4. If you are executing a *system* shutdown, wait for the message waiting queue to clear.
   If you are executing a *module* shutdown on a multi-module system, do not wait for the message waiting queue to clear.

   Prompt: `Wait for message waiting queues to be empty?`
   Response: Y to wait for the queue to clear,
   N to continue immediately with the shutdown.

Step *Reference*

5. When the system has taken all lines of the specified modules off-hook, it continues by asking if a verify is to be executed.

   Prompt: `Perform Offline System Verification? (Y/N):`
   Response: Y to execute the verify,
   N to skip verify and continue with the shutdown.

6. Specify if changes to the status of each module are to be made.

   Prompt: `Enable or Disable Modules?`
   Response: Y to change the status of modules,
   N to keep the module status the same and continue at step 11

7. If you answered yes in step 6, a chart with the status of each module is displayed and then the Module Maintenance Menu is displayed.

8. Enable a module, if necessary:

   Select: (E) ENABLE a module
   Prompt: `Which Module?`
   Response: The number of the module.

9. Disable a module, if necessary:

   Select: (D) DISABLE a module
   Prompt: `Which Module?`
   Response: The number of the module. If you are disabling multiple modules, disable the module attached to the console last.

   Prompt: `type "disable" to confirm your request:`
   Response: disable

   If you are disabling multiple modules, repeat step 9.
   If the status of the module attached to the console was changed to disabled, the balance of this procedure is not seen, due to the module resetting. The console then resets to the Maintenance From Hard Disk Menu.

10. When you are done configuring the modules, exit the menu.

11. The system completes the shutdown.

   Prompt: `****SHUTDOWN COMPLETE****`

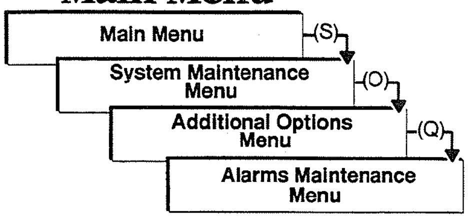
   The System Maintenance Menu is displayed. You can now either reboot the module(s) or remove power to the module(s).

Index

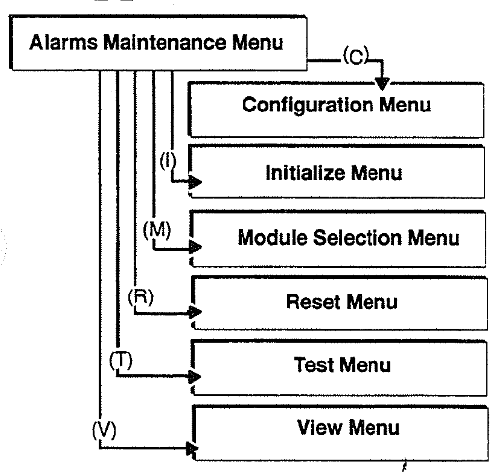
Error! Cannot open file referenced on page 1

Hardware Alarms Monitor Menu Maps

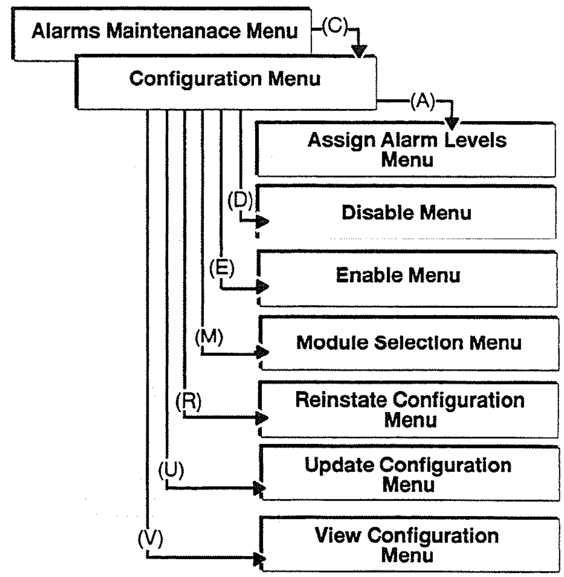
1 VoiceMemo Configuration Main Menu



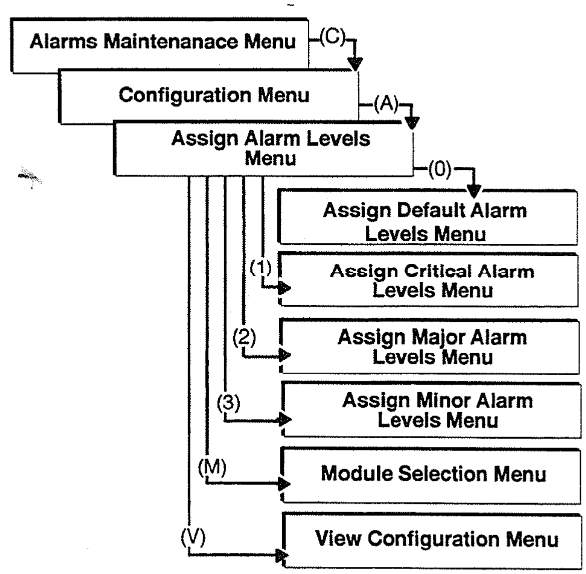
2 Hardware Alarms Monitor Application



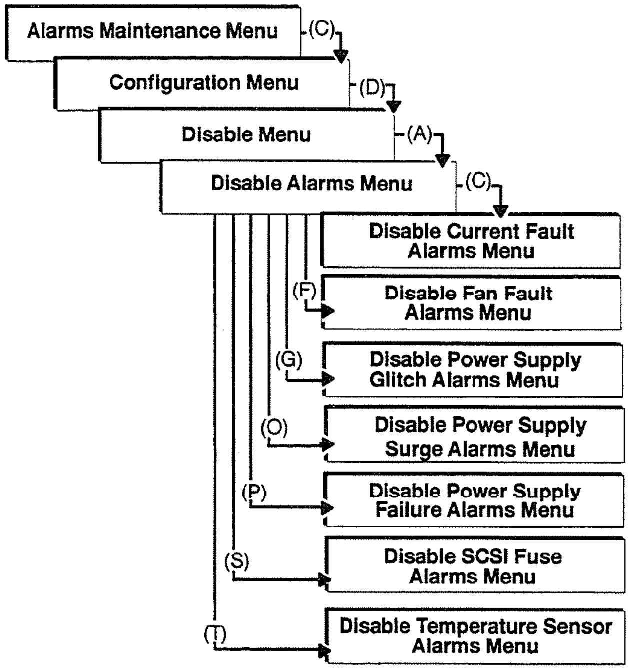
3 Configuring Alarms



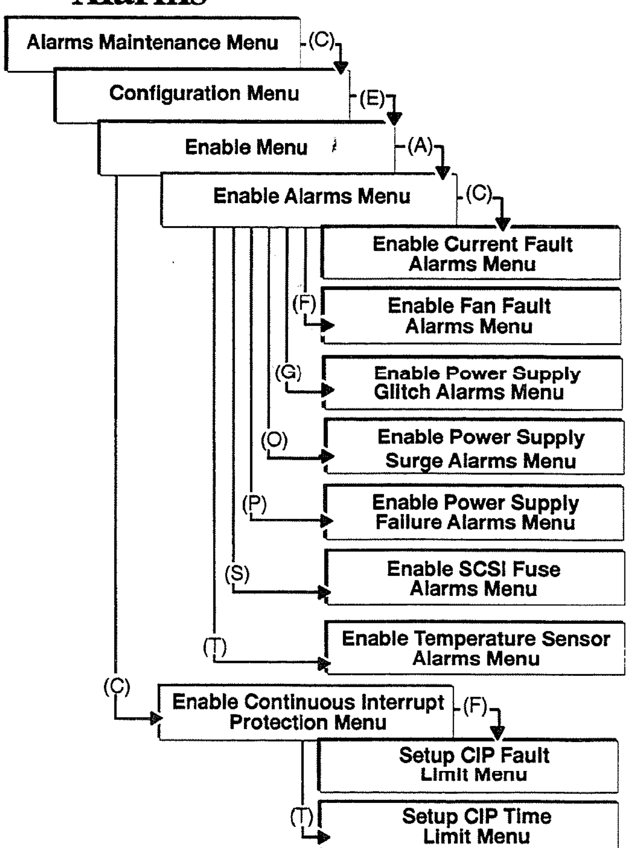
4 Assigning Alarm Levels



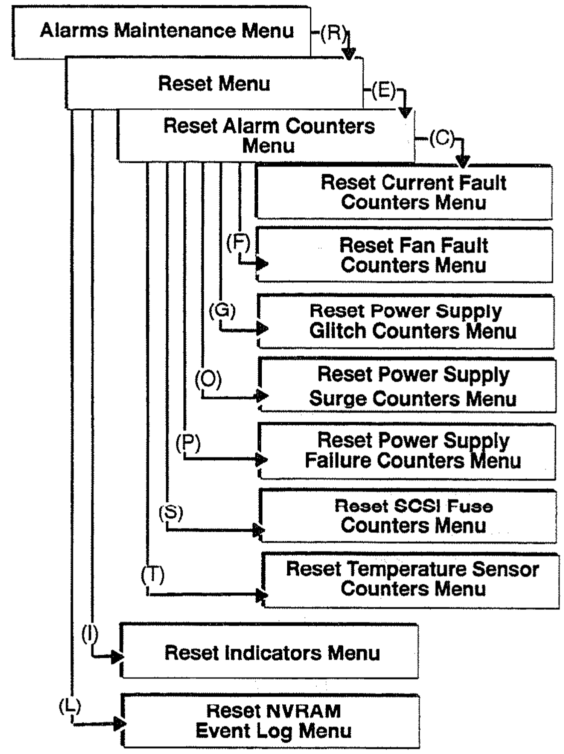
5 Disabling Alarms



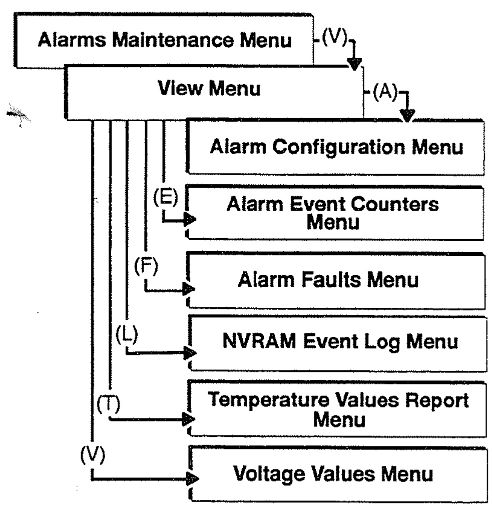
6 Enabling Alarms



7 Resetting Alarms



8 Viewing



Issue 1 Release 2.0 January 1996

MITEL MAIL™

Voice Processing Solutions

Error Log Messages

MITEL®

REPRODUCTION

PROPRIETARY TERMS

NOTICE

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Document Format

The error messages in this document are organized in alphabetical order, like an encyclopedia.

Each error message description is divided into four sections; message, description, severity, and action.

Message:

The message section contains the actual message that is printed in the logfile. The message text is boxed as shown above.

Message Convention: Each message is enclosed in double quotation marks. If there is a variable field within the message, one of the following notations will appear in the message text: i, x, y, nnnn, xxx, %d, %s, %t, %02x, %04x, %02d, %04d, %08ld, %lx etc...

Description:

The description section contains a brief description of the error.

Severity:

The severity section describes how severe the error is. The possible severities are P1, P2, P3, and P4, with P1 being the most severe. Their implications to the Series 6 server are as follows:

- P1 The server is down or the system requires immediate attention.
- P2 The server is up, however, there are major service impacts. Therefore, 20% or more of the ports are down, or 20% or more of the calls are not being serviced correctly.
- P3 The server is up, however, there are minor service impacts. Therefore, less than 20% of the ports are down, or less than 20% of the calls are not being serviced correctly.
- P4 The server is up and the error is benign. No action is required.

Action:

The action section describes what action to take when the specified error message appears in the logfile. In general, the server configuration should be checked and available error data collected and checked prior to contacting the Technical Assistance Center.

Error Messages

" *** SCAN: could not find GCOS record, use defaults (All 1)"

Description: GCOS record is not found. GCOS is assumed to be all 1's.
Severity: P2
Action: Create GCOS record.

"%s<%s> vmvg task not ready after <%d> seconds"
Description: @This is a timeout condition for vmemo. It will wait only so long on a one call application.@@@Severity: @P3@@@Action: @Could be a problem with the one call application. Contact the person who wrote your one call application.@@@
"%s<%s> receive timeout after <%d> seconds"
Description: @This is a timeout condition for vmemo. It will wait only so long on a one call application.@@@@Severity: @P3@@@@Action: @Could be a problem with the one call application. Contact the person who wrote your one call application.@@@@
"%s: Bad RCOS %d"

Description: Out-of -range error for RCOS value. Indicates a software bug.
Severity: P3
Action: Contact Centigram.

"%s: Bad character in dial string: %c"

Description: An invalid digit got into a dial string. This could be caused by poor integrity checking by a console routine or by data corruption.
Severity: P3
Action: Contact Centigram nd let us know what the character is.

"%scannot attach name<%s>"
Description: @Vmemo could not attach its name for one call applications.@@@Severity: @P2@@@Action: @The one call application will not work. Check system resources by doing "sin info" and call TAC.@@@

"%s Could not spawn oaa_agent, abort"

Description: Could not find oaa_agent.
Severity: P1
Action: Call TAC.

"%s Could not spawn relay agent, abort"

Description: Unable to run agent task.
Severity: P1
Action: Call TAC.

"%d:%d invalid handle (%d)"

Description: At fax application startup the H:S:P: specified is not a fax HW
Severity: P3
Action: Check fax configuration

"%d:%d invalid handle(%d)"

Description: The program got a bad parameter for the slot number and port number, which results in an invalid handle. The program will terminate.
Severity: P2
Action: Make sure the offline configuration has been invoked after the hardware resource configuration is changed.

`"[%d:%d:%d] pager_mailbox cannot send voice msg"`

Description: A voice pager mailbox cannot send a recorded voice message to sendvm for delivery. The message is lost.
Severity: P3
Action: Try to place another call on the voice pager mailbox. If problem persists call TAC.

`"[%d]%d: send to sfa failed"`

Description: The speech file service is not available or accessible
Severity: P3
Action: reboot

`"[%d]%d: sfopen for read failed"`

Description: The speech file system is not responding properly
Severity: P3
Action: Reboot

`"[%d]%d: sfopen for write failed"`

Description: The speech file system is not responding properly
Severity: P3
Action: Reboot

`"*** DBN: scan died"`

Description: Either scan died (scan is the task that hold the dial-by-name database) or an arcnet problem exists if multi-host.
Severity: P3
Action: If multi-host, check the arcnet. Look for death of scan in logfile. Reset the system. Call TAC if the problem persists.

`"*** DBN: send to scan failed"`

Description: Either scan died (scan is the task that hold the dial-by-name database) or an arcnet problem exists if multi-host.
Severity: P3
Action: If multi-host, check the arcnet. Look for death of scan in logfile. Reset the system. Call TAC if the problem persists.

`"*** DTA_AGENT: Unable to attach name!"`

Description: An attempt to register the DTA_AGENT process has failed
Severity: P2
Action: Report to TAC if problem continues

`"*** DTA: Unable to attach name!"`

Description: An attempt to register the DTA process has failed
Severity: P2
Action: Report to TAC if problem continues

`"*** GL_QUE: Another GL_QUE is running in the system, Abort"`

Description: Internal error.
Severity: P1
Action: Report to TAC.

`"*** GL_QUE: can not register with master"`

Description: Internal error.
Severity: P1
Action: Report to TAC.

```
"*** GL_QUE: invalid queue index %d"
```

Description: Internal error.
Severity: P1
Action: Report to TAC.

```
"*** GL_QUE: no memory available for global queues, abort"
```

Description: Out of memory.
Severity: P1
Action: Add more memory.

```
"*** GL_QUE: res %d GL_SB %d differ"
```

Description: Internal error.
Severity: P3
Action: Report to TAC.

```
"      HOLD queue is full. Reqs will be discarded."
```

Description: Problem manipulating the request queue.
Severity: P1
Action: Call TAC.

```
"*** NETQ: Unable to attach name!"
```

Description: An attempt to register the NETQ process has failed.
Severity: P2
Action: Report to TAC if problem continues.

```
"*** NETQ_AGENT: Unable to attach name!"
```

Description: An attempt to find the named process to establish communidation with failed.
Severity: P2
Action: Report to TAC if problem continues.

```
"*** NTA_AGENT: Unable to attach name!"
```

Description: An attempt to register the NTA_AGENT process has failed.
Severity: P2
Action: Report to TAC if problem continues.

```
"*** QUE_RELAY: invalid queue index %d"
```

Description: Internal error.
Severity: P1
Action: Report to TAC.

```
"*** QUE_RELAY: Out of queue %d space"
```

Description: Internal error.
Severity: P1
Action: Report to TAC.

```
"*** QUE_RL: rl_agent died, commit suicide"
```

Description: Internal error.
Severity: P1
Action: Report to TAC.

```
"*** RAM ***: could not register to master, abort"
```

Description: Internal error.
Severity: P1

Action: Report to TAC.

`"*** ram at Node %d: Out of queue %d space"`

Description: Internal error.
Severity: P4
Action: Report to TAC.

`"*** RAM: agent is dead, commit suicide"`

Description: ram_agent died for some reason, causing ram to exit.
Severity: P4
Action: Report to TAC.

`"*** RAM: Another ram is running in the system, Abort"`

Description: Internal Error.
Severity: P4
Action: Report to TAC.

`"*** RAM: Cound not attach RAM PORT %d, abort"`

Description: Internal Error.
Severity: P4
Action: Report to TAC.

`"*** RAM: Cound not spawn ram_agent, abort"`

Description: ram is unable to start up agent task.
Severity: P1
Action: Call TAC.

`"*** RAM: For task %d:%04x, RAM req %d, OAA req %d"`

Description: Internal Error.
Severity: P4
Action: Report to TAC.

`"*** RAM: get a unknown result %d"`

Description: Internal Error.
Severity: P4
Action: Report to TAC.

`"*** RAM: No memory for directory buffer"`

Description: Running out of memory within the system.
Severity: P1
Action: Add more memory to the system (on all modules).

`"*** RAM: record %s"`

Description: Internal Error.
Severity: P4
Action: Report to TAC.

`"*** RAM: relay to standby failed due to broken vc -1"`

Description: Internal information keeping.
Severity: P4
Action: None, information message.

`"*** RAM: req %d, node %d, tid %04X"`

Description: Internal information keeping.

Severity: P4
Action: None, information message.

"* RAM: res from RAM %d and RAM_SB %d differ"**

Description: Internal Error.
Severity: P4
Action: Report to TAC.

"* RAM: Standby dead"**

Description: Internal information log.
Severity: P4
Action: None, for information only.

"* RAM: This should not have been put into backup queue %d"**

Description: Internal information log.
Severity: P3
Action: Report to TAC.

"%s: ** unknown record error(%d)\n"**

Description: Onecall application was recording speech and got an error.
Severity: P4
Action: Contact the writer of the onecall application.

"%s Bad data type %s (host %d), Func = %s, Tag = %s"

Description:
Severity: P2
Action:

"%s can't read oaa data!"

Description: Failed to read the configuration record. The program will terminate.
Severity: P2
Action: Call TAC.

"%s can't read oaa data!\n"

Description:
Severity: P2
Action:

"* SCAN: close oaa rcrd: %s update failed"**

Description: Could not open scan database record.
Severity: P3
Action: A result code will be logged.

"* SCAN: Could not setup scan database"**

Description: Usually due to no account space in the system.
Severity: P3
Action: Dial by name will be affected, add more account drives.

"* SCAN: Cound not spawn scan_agent, abort"**

Description: scan_agent is not started.
Severity: P1
Action: Contact TAC.

`"*** SCAN: open oaa rcrd: %s failed, result %d"`

Description: Could not open scan database record.
Severity: P3
Action: A result code will be logged.

`"%d:%d invalid handle(%d)"`

Description: The line handle manager does not recognize the triplet as valid.
Severity: P2
Action: Reconfigure the system from resmgr, to the offline menu, activatecfg, and try again.

`"%d:%d invalid handle(%d)"`

Description: The application running on slot:port has an invalid handle.
Severity: P2
Action: Redo the offline configuration and activate the new configuration.

`"%s: **** unknown record error(%d)\n"`

Description: Error from sfa while recording a message.
Severity: P2
Action: Check statistics to make sure speech is not full. Contact TAC.

`"%s: Can'tattach \"%s\" on node %u", program, taskname, node_for_attach"`

Description: OneView could not 'attach' the program and tsk listed.
Severity:
Action: Verify that the program name is valid and the program is still running. Note the taskname and node number and call TAC.

`"%s: Could not send to %s, aborting"`

Description: Some or all of the routines for npa are not running.
Severity: P2
Action: Check the log file for task deaths, and report to Centigram. A reboot should clear this up.

`"%s: creatl error (%d)"`

Description: Cannot perform the basic administrtion jobs or cannot get status from the other processes.
Severity: P1
Action: Call TAC.

`"%s %d: creatl error (%x)"`

Description: Error invoking the tnppsnd task. System resources may be running out.
Severity: P2
Action: Check the system resources, such as memory.

`"%s: Error in reading call info from device"`

Description: Error in reading call info from the serial port. Will try to reset the integration set 244PC.
Severity: P2
Action: Check the serial port connection.

`"%s: Error in reading call info from device"`

Description: Error in reading call info from the serial port.
Severity: P2
Action: Check the serial port connection.

"%s: Error reading configuration.", program"

Description: OneView could not read it's configuration file.
Severity:
Action: Check to see that the configuration file is in usr/vm/config. Run CM_CONFIG to create another configuration file.

"%s: Error while starting allocator, exiting."

Description: Module unable to start critical task.
Severity: P3
Action: Call TAC.

"%s: fast_poll2 send hangup to admin"

Description:
Severity:
Action:

"%s: Invalid msg_type in message to SL1MP_ADMIN."

Description: This is an unknown request message. This is a software error and the request is ignored.
Severity: P3
Action: Call TAC.

"%s: Invalid request, %d", program, req_p->func_code"

Description: OneView received a request to process a function that is not supported from the program 'program'.
Severity:
Action: Verify that the program name is valid and the program is still running. Note the function code returned and call TAC

"%s no line"

Description: The application could not attach to the port.
Severity: P2
Action: Check the offline configuration and make sure the line does exist. Contact Centigram if the configuration looks OK.

"%s no line"

Description: Vmemo could not check into sfa.
Severity: P2
Action: No calls will occur on this line. Check configuration to make sure this is a valid line. Call TAC.

"%s: network query during resolution failed, retrying"

Description: System error in communicating to other modules in network.
Severity: P4
Action: None.

"%s: Queue full, request lost"

Description: The npa admin routine could not keep up with the requests coming in.
Severity: P2
Action: If this message appears more than once, contact Centigram.

"%s: Rebooting. '%.30s' died too many times"

Description: Multiple failures for critical system task.
Severity: P2
Action: Call TAC.

`"%s: receive failed"`

Description: Error in receiving a message.
Severity: P1
Action: Call TAC.

`"%s: Reply to %d failed.", program, pid"`

Description: OneView sent a message to a program, 'program' with the program ID, pid and it was not successful.
Severity:
Action: Verify that the program name is valid and the program is still running. If not try to restart the program.

`"%s: SCSI UP & QNET failure, rebooting"`

Description: Network problem in cabling or interface card.
Severity: P2
Action: Call service.

`"%s: spawn error = %d, link %s, %s."`

Description: Cannot spawn a task. This is a software error.
Severity: P1
Action: Call TAC.

`"%s: system is licensed for too many nodes (%d), forced to %d.\n"`

Description: System license information is corrupt.
Severity: P2
Action: Call TAC.

`"%s: Too many restarts (%d) for allocator, exiting."`

Description: System is unreliable and unable to operate Voicememo.
Severity: P3
Action: Call TAC.

`"%s: *** Unable to attach name (%s), module #: %d!"`

Description:
Severity: P1
Action:

`"%s: Unable to attach timer proxy %d"`

Description: Rolm failed to attach a timer proxy from OS or may need a new OS boot image file.
Severity: P1
Action: Call TAC.

`"%s: UNABLE to disable myself. Rebooting."`

Description: Problem encountered in attempt to configure module as inactive.
Severity: P4
Action: None.

`"%s: Unable to get stty on RS232 port"`

Description:
Severity: P2
Action:

```
"%s: Unable to open serial port"
```

Description:
Severity: P2
Action:

```
"%s: Unable to read OAA record."
```

Description:
Severity: P2
Action:

```
"%s: Unable to read OAA record."
```

Description: Failed to read the configuration record. The program will terminate.
Severity: P2
Action: Call TAC.

```
"%s: Unable to read oaa record."
```

Description:
Severity: P2
Action:

```
"%s:  unable to read oaa record!"
```

Description: Failed to read the configuration record. The I/O task will terminate and a new one will be started.
Severity: P1
Action: Call TAC.

```
"%s: Unable to send to rolmadmin"
```

Description: Error in sending a message to admin task. This is a software error. The I/O task will terminate and a new one will be started.
Severity: P2
Action: Call TAC.

```
"%s: Unable to send to SL1MP_ADMIN"
```

Description: Error in sending a message to admin task. This is a software error. The I/O task will terminate and a new one will be started.
Severity: P2
Action: Call TAC.

```
"%s: Unable to send to SMSMWI_ADM"
```

Description:
Severity: P2
Action:

```
"%s: Unable to SET stty on RS232 port"
```

Description:
Severity: P2
Action:

```
"%s: wait_pkup send hang up to admin."
```

Description: The caller hangs up while the integration is collecting data from the PBX.
Severity: P4
Action: No action necessary.

"%sget input's timeout <%d>"

Description: Requested timeout on keystrokes by one call application was more than we allow. We will use the limit of 5 seconds as the maximum.
Severity: P4
Action: Contact the author of the application.

"%sget input's timeout <%d>"

Description: This is for a onecall application and indicates the onecall application did not respond to the Nynex task in the allotted time.
Severity: P4
Action: Contact the person who wrote the onecall application.

"%sget input's count <%d>"

Description: Requested timeout on keystrokes by one call application was more than we allow. We will use the limit of 5 seconds as the maximum.
Severity: P4
Action: Contact the author of the application.

"%sget input's count <%d>"

Description: User input less digits that the onecall application asked for.
Severity: P4
Action: Information only.

""\t%c"

Description: This is the data to go with CANNED_ERR number 17.
Severity:
Action:

"\t%d"

Description: This is the data for CANNED_ERR, number 18.
Severity:
Action:

"\t...net_name = %d, nt_mcnt = %d"

Description: Further data on NETVM message length limit being exceeded.
Severity: none
Action: None, informational

"\t...sndr: %s, node %d"

Description: Further data on NETVM message length limit being exceeded.
Severity: none
Action: None, informational

"\tE=%s, R=%d G=%d"

Description: Problem manipulating the request queue.
Severity: P1
Action: Call TAC.

"\tno index entry E=%s R=%d G=%d"

Description: Cannot locate the index position of the request in the index file.
Severity: P1
Action: Call TAC.

`"VMINIT: bad vm_recep %c"`

Description: The flag indicating whether receptionist is on or off for the integration has garbage in it.
Severity: P3
Action: Rerun the configuration option to set this.

`"2 successive OPEN failures for mbox %s"`

Description: Corruption might exist in the mailbox database (for this mailbox).
Severity: P2
Action: Run a vac ASAP. The mailbox in question might not receive any messages until a vac is run.

`"740D Data Link [%s] Initialization completed."`

Description: Normal message after link initialization after a system reboot.
Severity: P4
Action: None

`"AAMIS: failed [%d] to create list [%s]"`

Description: VoiceMemo software failed to create a new amis copy list which stores the addresses of AMIS recipients. This error message could be due to a software problem which does not handle the amis copy list properly, a hardware error on the account drive, or the account drive itself is full. If this error message shows up frequently along with any other error log messages which are related with failure to read mailbox records or copy list then it could be related to the disk drive.
Severity: P3
Action:
- Check system's total statistics to make sure there are at least several hundred free/unused account records. These records are needed by VoiceMemo to store the copy lists used in delivery of messages.
- Perform a verify on the system.
- Check the logfile often after the verification for at least a week, if the problem did not go away, contact TAC for further assistance in investigation of the problem.

`"AAMIS: failed [%d] to open list [%s]"`

Description: VoiceMemo software failed to open the amis copy list which stores the addresses of AMIS recipients. This error message could be due to a software problem which does not handle the amis copy list properly, or it could be related to a hardware error on the account drive. If this error message shows up frequently along with any other error log messages which are related with failure to read mailbox records or copy list then it could be related to the disk drive.
Severity: P3
Action:
- Perform a verify on the system.
- Check the logfile often after the verification for at least a week, if the problem did not go away, contact TAC for further assistance in investigation of the problem.

`"AAMIS: failed [%d] to read list [%s]"`

Description: VoiceMemo software failed to read the amis copy list which stores the addresses of AMIS recipients. This error message could be due to a software problem which does not handle the amis copy list properly, or it could be related to a hardware error on the account drive. If this error message shows up frequently along with any other error log messages which are related with failure to read mailbox records or copy list then it could be related to the disk drive.

Severity: P3

Action: - Perform a verify on the system.
- Check the log file often after the verification for at least a week, if the problem did not go away, contact TAC for further assistance in investigation of the problem.

```
"AAMIS: failed [%d] to save list [%s]"
```

Description: VoiceMemo software failed to close the amis copy list which stores the addresses of AMIS recipients. This error message could be due to a software problem which does not handle the amis copy list properly, or it could be related to a hardware error on the account drive. If this error message shows up frequently along with any other error log messages which are related with failure to read mailbox records or copy list then it could be related to the disk drive.

Severity: P3

Action: - Perform a verify on the system.
- Check the log file often after the verification for at least a week, if the problem did not go away, contact TAC for further assistance in investigation of the problem.

```
"ACCESS TEN: bad ten_num -->%d"
```

Description:

Severity: P2

Action:

```
"Activatecfg: Unable to talk to mail resolver"
```

Description: The resolver task is not running.

Severity: P1

Action: Reset the system.

```
"ACTIVATECFG: can't locate (mwla), unable to init mwla queues."
```

Description: During activation of a configuration, the Message Waiting Light Administrator task cannot be located by the activatecfg task. The message waiting queues will not be initialized.

Severity: P3

Action: Activate the configuration again. Call TAC if message persists.

```
"ACTIVATECFG: can't locate (pga), unable to init pga queues."
```

Description: During activation of a configuration, the pager administrator task cannot be located by the activatecfg task. The Pager queues will not be initialized.

Severity: P3

Action: Activate the configuration again. Call TAC if message persists.

```
"ACTIVATECFG: can't send to mwla, unable to init queues."
```

Description: During activation of a configuration, the activatecfg task cannot send to the Message Waiting Light Administrator task. The message waiting queues will not be initialized.

Severity: P3

Action: Activate the configuration again. Call TAC if message persists.

```
"ACTIVATECFG: can't send to pga, unable to init queues."
```

Description: During activation of a configuration, the activatecfg task cannot send to the pager administrator task. The Pager queues will not be initialized.

Severity: P3

Action: Activate the configuration again. Call TAC if message persists.

`"Activate ioctl to DK driver failed"`

Description: The request to activate the MTP processor failed.
Severity: P2
Action: Please review SS7 troubleshooting guide for further action.

`"Adapter command timed out, retry #%d"`

Description: Attempted operation not responding.
Severity: P3
Action: None.

`"Adapter returned id=%x camstat=0x%x mbstat=0x%x hastat=0x%x scsistat=0x%x"`

Description: Adapter internal status report.
Severity: P3
Action: Call TAC.

`"Adapter returned status=0x%x"`

Description: Status report on internal adapter.
Severity: P3
Action: Call TAC.

`"Adapter shows internal diagnostic failure"`

Description: System hardware problem.
Severity: P1
Action: Call service.

`"add_new_disk()Invalid disk id %d"`

Description: Invalid SCSI disk ID passed to sfa when adding a disk online.
Severity: P3
Action: Verify that disk ID was entered correctly in disk add procedure.

`"add_new_disk()Vid %d exists for disk %d"`

Description: An attempt was made to add a new SCSI disk with the same ID as an existing disk.
Severity: P4
Action: Rejumper the disk to be added to an unused SCSI ID and attempt add again.

`"ADMIN 75 : CTI task fails to start !"`

Description: Cannot start CTI program.
Severity: P3
Action: Check the CTI card and smart card table configuration. If the problem persists, the CTI card may be bad. If no anomalies are found, call TAC.

`"Agent died, exit"`

Description: Resource manager detects a death of its agent, exiting.
Severity: P1
Action: Contact TAC

`"ALSPCH: speech allocation ptr in reserve area.apt:%u, rpt:%u, msp=%u"`

Description: This message will be received after a software update from Release 5.01. If seen at any other time, then it is a software error.
Severity: P4 or P2
Action: Call TAC if seen during normal system operation.

```
"Another WPC is running on the same node, EXIT"
```

Description: Attempted running wpc program when it is already running
Severity: P4
Action: None.

```
"aopen fail reslt=%d,rcrd=%s"
```

Description: Request to open a mailbox record failed.
Severity: P3
Action: Report results to Centigram.

```
"ApplName: FATAL !!!!"
"ApplName: message"
"ApplName: sleep forever"
```

Description: A fatal error occurred in the application ApplName. The emssage shows the fatal error that occurred, and the program goes into a zombie state.
Severity: P1
Action: Call TAC.

```
"ATLG: %s unable to read configuration record."
```

Description: Problem reading configuration record from oaa.
Severity: P3
Action: Reconfigure audit trail parameters.

```
"ATLOG: %s %x is inactive, unable to attach name"
```

Description: QNX error or another copy of atlogad is running.
Severity: P3
Action: Audit train information will not be recorded. Reboot system to clear this condition.

```
"ATLOG: %s %d inactive, unable to create configuration record"
```

Description: Could not create the record to store confiuration data on disk. This could only happen when configuring audit trail.
Severity: P4
Action: Try to configure again.

```
"ATLOG: %s,%d unable to create %s
```

Description: Some of the components of the audit trail could not be started.
Severity: P2
Action: Reboot the system. If the message persists, contact Centigram.

```
"ATLOG: %s %d unable to read %s
```

Description: Could not read some of the database from disk. Uses oaa records.
Severity: P3
Action: Rerun the configuration of the audit trail and see if the problem clears up.

```
"ATLOG: %s unable to find %s. "
```

Description: Agent task could not find admin task.
Severity: P3
Action: Restart the audit trail. If this keeps happening, reset the system.

```
"ATLOG: %s %x unable to read msg record %d
```

Description: Indicates problem reading or writing the database into oaa records.
Severity: P3
Action: Rerun the configuration of the audit trail and see if the problem clears up.

"ATLOG: %s %x unable to open msg record %s

Description: Indicates problem reading or writing the database into oaa records.
Severity: P3
Action: Rerun the configuration of the audit trail and see if the problem clears up.

"ATLOG: %s %x unable to close msg record %s

Description: Indicates problem reading or writing the database into oaa records.
Severity: P3
Action: Rerun the configuration of the audit trail and see if the problem clears up.

"ATLOG: %s %x failed to open cfg record for write

Description: Indicates problem reading or writing the database into oaa records.
Severity: P3
Action: Rerun the configuration of the audit trail and see if the problem clears up.

"ATLOG: %s %x cannot close cfg record"

Description: Indicates problem reading or writing the database into oaa records.
Severity: P3
Action: Rerun the configuration of the audit trail and see if the problem clears up.

"ATLOGAD: %s %x stop request from %x"

Description: No error. Indicates audit trail was stopped (from menus).
Severity:
Action: Information only.

"ATLOGAD: %s %x delete request from %x"

Description: No error. Indicates request to delete audit trail (from menus).
Severity:
Action: Information only.

"ATLOGAD: %s %x invalid req %d from %x"

Description: Indicates software bug in audit trail software.
Severity: P4
Action: Contact Centigram.

"ATLOGAD: sender queue full

Description: Could not write audit trail data to disk fast enough, or one of the components of the audit trail not running.
Severity: P3
Action: Run "sin" and contact Centigram with the results.

"atlogad: %s %d is INACTIVE!!"

Description: A problem occured with audit trail. Records will not be written to disk anymore.
Severity: P2
Action: Reset the system to clear.

"atlogag: %d,%s unable to attach name"

Description: System error or multiple copies running.
Severity: P2
Action: Reset system.

"ATLOGSD: %s %x inactive, unable to read configuration record"

Description: Problem reading configuration record from oaa.

Severity: P3
Action: Reconfigure audit trail parameters.

`"ATLOGSD can not find atlogad,%04x\n"`

Description: Send agent could not find the admin task.
Severity: P3
Action: Try restarting the audit trail. If this does not work, reset the system.

`"ATLOGSD can not Send to ATLOGAD, result %04x\n"`

Description: Send agent could not find the admin task.
Severity: P3
Action: Try restarting the audit trail. If this does not work, reset the system.

`"AUDIT TRAIL is 85 percent full at %s,%s"`

Description: Indicates problem reading or writing the database into oaa records.
Severity: P3
Action: Rerun the configuration of the database and see if the problem clears up.

`"AUDIT TRAIL is 90 percent full at %s,%s"`

Description: Indicates problem reading or writing the database into oaa records.
Severity: P3
Action: Rerun the configuration of the database and see if the problem clears up.

`"AUDIT TRAIL is 95 percent full at %s,%s"`

Description: Indicates problem reading or writing the database into oaa records.
Severity: P3
Action: Rerun the configuration of the database and see if the problem clears up.

`"AUDIT TRAIL is re-used at %s,%s,"`

Description: Indicates problem reading or writing the database into oaa records.
Severity: P3
Action: Rerun the configuration of the database and see if the problem clears up.

`"bblpager: Invalid serial port selected (%d)"`

Description: The bblpager application runs on serial port 1 or 2. A serial port other than this has been specified. The task will exit. If the system started this task, then it will try to restart it up to 4 more times. If it cannot be restarted by the system, the module will reboot.
Severity: P1
Action: Check the configuration and make sure that either $term1 or $term2 is specified for the bblpager application. If the module is rebooting, call TAC.

`"bcst_pc: aopen %s = %d"`

Description: When attempting to broadcast a passcode, the mailbox to deposit the passcode could not be opened or closed.
Severity: P2
Action: Check the mailbox for corruption or to see if it exists.

`"bcst_pc: aclose %s = %d"`

Description: When attempting to broadcast a passcode, the mailbox to deposit the passcode could not be opened or closed.
Severity: P2
Action: Check the mailbox for corruption or to see if it exists.

`"Board number %d already configured in atSlot %d\n"`

Description: Driver received request to configure a board a second time.
Severity: P3
Action: Please contact TAC for further action.

`"boot_count%d: Unable to create %s"`

Description: Control file not found and cannot be created.
Severity: P3
Action: Call TAC..

`"boot_count%d: Unable to create %s"`

Description:
Severity: P3
Action:

`"boot_count%d: Unable to disable node"`

Description: System problem in updating configuration.
Severity: P3
Action: Call TAC.

`"boot_count%d: Unable to fseek on %s"`

Description: Failure to read boot control file.
Severity: P3
Action: Call TAC.

`"boot_count%d: Unable to disable node"`

Description: The module was not successfully disabled. If the module continues to reset, an attempt will be made to disable it again.
Severity: P3
Action: If persistent, call TAC.

`"boot_count%d: Unable to fseek on %s"`

Description: A disk error was detected when trying to create the boot record. The boot record logs the frequency of a module's reboots. This information is used to disable modules that have reset excessively. The system will recover if the disk error is not fatal.
Severity: P3
Action: None - A fatal disk error will result in other log messages indicating the condition.

`"boot_count%d: Unable to read from %s"`

Description: Failure to read boot control file.
Severity: P3
Action: Call TAC.

`"boot_count%d: Unable to read from %s"`

Description:
Severity: P3
Action:

`"boot_count%d: Unable to write to %s"`

Description: Failure in updating boot control file.
Severity: P3
Action: Call TAC.

`"boot_count%d: Unable to write to %s"`

Description: A disk error was detected when trying to create the boot record. The boot record logs the frequency of a module's reboots. This information is used to disable modules that have reset excessively. The system will recover if the disk error is not fatal.
Severity: P3
Action: None - A fatal disk error will result in other log messages indicating the condition.

`"boot_count: Too many reboots within %d sec. Disabling node"`

Description: System is rebooting too frequently. Module considered unreliable and disabled.
Severity: P3
Action: Call TAC to determine cause of reboots. If system has been rebooted manually, use host.status option to enable module.

`"boot_count: Too many reboots within %d sec. Disabling node"`

Description: A node has rebooted more than four times in one hour. It has been disabled.
Severity: P2
Action: Examine the logfile to determine why the module has reset. The host status menu can be used to re-enable the module.

`"Called node %d but reached node %d. Disc. Check Node Table."`

Description: The node table is probably misconfigured, this misrouting the MESA-NET connection attempt.
Severity: P1
Action: Fix configuration errors in node table.

`"Cannot find sfa on node[%d], i"`

Description: OneView is looking for the Speech File System on the specific node. We need the speech file system to operated.
Severity:
Action: Call TAC

`"can not become a server:%s"`

Description: Resource manager fails to become a server task, exiting.
Severity: P1
Action: Contact TAC

`"Cannot mark disk %d:%d out of sync: rdn disk out of svc"`

Description: Primary and redundant failures cause loss of drive.
Severity: P1
Action: Call service.

`"Cannot mark disk %d:%d out of sync: rdn disk out of sync"`

Description: Primary and redundant failures cause loss of drive.
Severity: P1
Action: Call service.

`"Cannot mark QNX %d out of sync: QNX %d out of sync"`

Description: Both software drives are down.
Severity: P1
Action: Call service.

`"Cannot mark QNX %d out of sync: QNX %d out of sync"`

Description:

Severity: P1
Action:

`"Cannot read directory for vid=<xxx> (retry = <xxx>)"`

Description: The account directory is unreadable. Disk may be faulty.
Severity: P1
Action: Call TAC.

`"Cannot send to COSSERVER"`

Description: An attempt to execute a send from MKLIB has failed.
Severity: P2
Action: Report to TAC if problem continues.

`"Cannot send to NTA_AGENT"`

Description: A NTALIB based SEND to NTA_AGENT has failed.
Severity: P2
Action: Report to TAC if problem continues.

`"Cannot send to OTA_AGENT"`

Description: Can not send to DTA task.
Severity: P3
Action: Call TAC if this occurs often.

`"Can't attach fax chan %d. Fax init done?"`

Description: Fax startup procedure cannot complete
Severity: P3
Action: Check that the fax dimer and initialization programs have run to complete

`"Can't attach \"%s\" on node %d", DEFAULT_MBOX_SERVER, getnid()"`

Description: OncView could not connect tot he default voice memo server.
Severity:
Action: OneView will not start. There is not much the user can do about this. Call TAC

`"can't locate %s within MCSS"`

Description: The application cannot find the admin task (SFA). This is a software error or else SFA is not running.
Severity: P1
Action: If SFA is not halted, contact TAC.

`"Can't name attach faxmgr."`

Description: The operating system failed to register program "faxmgr"
Severity: P4
Action: The system will retry 4 times and then stop trying. Reboot.

`"Can't send to wua, did not cancel wakeups for mbox %s"`

Description:
Severity: P2
Action:

`"Can't set time on node %d\n"`

Description: The admin attempted to set the time using admin by phone and the system failed to set it on a particular node. Either that hardware or sotware clock.
Severity: P3
Action: Check time for accuracy on all nodes and if wrong, set from console.

"Can't set hardware clock on node %d\n"

Description: The admin attempted to set the time using admin by phone and the system failed to set it on a particular node. Either that hardware or sotware clock.
Severity: P3
Action: Check time for accuracy on all nodes and if wrong, set from console.

"Can't set hardware clock on node %d\n"

Description: The admin attempted to set the time using admin by phone and the system failed to set it on a particular node. Either that hardware or sotware clock.
Severity: P3
Action: Check time for accuracy on all nodes and if wrong, set from console.

"Card %s on slot %d does not have the authorized Centigram signature"

Description: Linecard does not have the Centigram authorization.
Severity: P1
Action: Contact TAC

"CATCH ROLM: can't send to sfa!"

Description: rolmcatch could not find sfa.
Severity: P1
Action: sfa may have died. If this error persists call TAC.

"CATCH:*** Unable to get sfa tid"

Description: The catch task of the SL1 IVMS integration is unable to locate the sfa task. It will retry forever. This message indicates a possible software error.
Severity: P2
Action: If this occurs repeatedly, reboot the system. If the problem persists, call TAC.

"cdr overflow, lost 16 msgs in blk %d"

Description: Event recorder overflowed, and 16 messages were thrown away before they could write tothe disk.
Severity: P4
Action: Try logging less information, or try a less busy time.

"CFG_APACK:bad acct #, len=%d"

Description:
Severity: P2
Action:

"CFN message received on CIC %d"

Description: SS7 received a message from the adjacent point code that was not expected.
Severity: P3
Action:

"Circuit %d on board in slot %d is not being used by SS7!"

Description: This is a warning issued when a board circuit has not been allocated to any SS7 line groups.
Severity: P4
Action: None required if it is consistent with line group definition.

"cm_oaa_fns: Send to OAA timed out"

Description: OneView has sent a request to the OAA process and it has not returned in the time allocated.
Severity:

Action: There is probably a very bad system problem if this occurs. Verify that VMEMO is running.

`"CM_SERVER: Error reading configuration"`

Description: OneView could not read it's configuration file.
Severity:
Action: Check to see that the configuration file is in usr/vm/config. Run CM_CONFIG to create another configuration file.

`"CM_SERVER: ERROR Out of memory for new handles"`

Description: OneView needs memory for each mailbox that logs onto the system.
Severity:
Action: Kill some other processes or install more RAM.

`"Cmd failed, locator %d, (%(errno))"`

Description: General disk error.
Severity: P2
Action: Call TAC.

`"Config ioctl to DK driver failed"`

Description: The request to download and configure the MTP processor failed.
Severity: P2
Action: Please review SS7 troubleshooting guide for further action.

`"COSSTART: task %x cannot find COSSERVER"`

Description: An attempt to find the COSSERVER process has failed.
Severity: P2
Action: Report to TAC if problem continues.

`"Could not spawn rm_agent (%s), exit"`

Description: Resource manager could not spawn its agent, exiting
Severity: P1
Action: Contact TAC

`"CQM message received on CIC %d"`

Description: SS7 received a message from the adjacent point code that was not expected.
Severity: P3
Action:

`"CQR message received on CIC %d"`

Description: SS7 received a message from the adjacent point code that was not expected.
Severity: P3
Action: Please contact TAC for further action.

`"CSOIOTEST: bad card type in print status %c"`

Description: The wrong card is installed on the CSOIO hardware.
Severity: P1
Action: Check to make sure that all of the cards installed on the CSOIO hardware are of the type PCC (primary control card). SIC (serial interface card), or BOC (busy out card).

```
"Deteced module %d went down, i"
```

Description: OneView is trying to send a message to a processes on another module and it is not responding.
Severity:
Action: Call TAC

```
"delete_msg: aclose failed "ECDR is 85 percent full at %s,%s"
or
"ECDR is 90 percent full at %s,%s"
or
"ECDR is 95 percent full at %s,%s"
```

Description: This is just a warning, it's not an error. The CDR log file is getting full and will be overwritten (its space would be recycled) as soon as its capacity is reached. This message means 85%, 90%, or 95% of CDR records on your system has not been downloaded.
Severity: P4
Action: Download your CDR records as soon as possible. It this log message shows up too often, you may need to increase the CDR file' size

```
"console: %s"
```

Description: A message has been logged by someone at the console. This is a manually entered log message. The message can either be routine or major.
Severity: Varies
Action: Varies

```
"CTI not started, attempt #:%d.(check CTI card)"
```

Description: Software error.
Severity: P1
Action: Check the system configuration to verify that the CTI card is properly installed and correctly assigned to the Fujitsu 960 Integration. Re-install the Fujitsu 960 Integration and try again. If the problem persists, check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

```
"deactivating %d, INTG state=%d"
```

Description: An integration error has occurred.
Severity: P2
Action: Check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

```
"Deallocating invalid tspch block %02x%04x"
```

Description: An attempt was made to de-allocate an invalid speech block. The system will remain functional.
Severity: P2
Action: Perform a system verify. If the problem recurs after the system verify or if the verify report shows an excessive amount of errors, call TAC.

```
"delete_msg: aclose failed, rslt = %d"
```

Description:
Severity: P2
Action:

```
"delete_msg: delete_links failed for %s"
```

Description:
Severity: P2

Action:

```
"delete_msg: error %d msg %d sib %d\n"
```

Description:
Severity: P2
Action:

```
"del_mbox: delete of msgs failed (%s)"
```

Description:
Severity: P2
Action:

```
"Dev.DK Started"
```

Description: This is a normal alarm when SS7 is started.
Severity: P4
Action: None required.

```
"Dev.T1/E1: CARD %02d TRUNK %01d: Unknown event.\n"
```

Description: A software fault was detected.
Severity: P4
Action: Please contact TAC for further action.

```
"Dev.T1/E1: Event queue full\n"
```

Description: An operating system failure was encountered by the T1/E1 driver.
Severity: P2
Action: Please contact TAC for further action.

```
"Dev.T1/E1: Host Clock Ref. changed from TRUNK %01d to TRUNK %01d"
```

Description: The clock reference for this host has been moved to an alternate PCM due to a failure.
Severity: P4
Action: None required.

```
"Dev.T1/E1: TRUNK %01d: Local Alarm Cleared.\n"
```

Description: This PCM trunk is no longer in a failed state.
Severity: P4
Action: None required.

```
"Dev.T1/E1: TRUNK %01d: Local Alarm.\n"
```

Description: This PCM trunk has entered a local carrier failure state.
Severity: P3
Action: Troubleshoot T1/E1 facility connecting Voicememo to switch/PBX.

```
"Dev.T1/E1: TRUNK %01d: Remote Alarm Cleared.\n"
```

Description: This PCM trunk is no longer receiving an alarm indication from the far end. (The other side is no longer in a failed state.)
Severity: P4
Action: None required.

```
"Dev.T1/E1: TRUNK %01d: Remote Alarm.\n"
```

Description: This PCM trunk is receiving an alarm indication from the far end. (The other side is in a failed state.)
Severity: P3
Action: Troubleshoot T1/E1 facility connecting Voicememo to switch/PBX.

`"Dev.T1/E1: Unable to Reply() to agent\n"`

Description: An operating system error was encountered by the T1/E1 driver.
Severity: P3
Action: Please contact TAC for further action.

`"Disable cards that use this loader program"`

Description: Disable cards that need loader program which fails.
Severity: P5
Action: This is a result of another error prior to this. Look at the previous error message.

`"DISABLE FLOAT: CAN'T CLOSE MASTER CONFIG REC(%d)."`

Description: An error has occurred while turning off the continuos system operation optional feature. The task was not able to communicate with the Account Administrator program. This is probably due to a temporary fault, for example, a module death. The optional feature will not be disabled.
Severity: P3
Action: If persistent, call TAC.

`"DISABLE FLOAT: CAN'T READ MASTER CONFIG REC(%d)."`

Description: An error has occurred while turning off the continuos system operation optional feature. The task was not able to communicate with the Account Administrator program. This is probably due to a temporary fault, for example, a module death. The optional feature will not be disabled.
Severity: P3
Action: If persistent, call TAC.

`"Disable the card"`

Description: Mark the card unusable due to problem of communicating with the card.
Severity: P5
Action: This is a result of another error prior to this. Look at the previous error message.

`"Disabling all cards which use MVIP"`

Description: Due to a failure in cofiguring MVIP clock, all the cards which use MVIP bus are diasbled and become unusable.
Severity: P1
Action: Check and verify the MVIP clock configuration and I/O address configuration.

`"Disk %d:%d: partition 88 start %d, size %d"`

Description: Comment on partition characteristics.
Severity: P4
Action: None.

`"disk_error: Error %d returned from master\n"`

Description:
Severity: P4
Action:

`"disk_error: REBOOT - shutdisk 0X%04x died."`

Description:
Severity: P4
Action:

`"disk_error: unable to send to master %#x"`

Description:
Severity: P4
Action:

`"disk_error:Could not find master"`

Description:
Severity: P4
Action:

`"disk_error:Could not start up shutdisk"`

Description:
Severity: P4
Action:

`"dist_copy: BEFORE loop: cnd = %d, lst %s"`
`"...net_sndr = %d, dl_outside = %d, dl_cnt = %d, ms_node = %d"`

Description: The indicated copy list's local member counter is corrupted. This results in not processing the list.
Severity: P3
Action: Run a verify. If this message still shows up, call TAC.

`"DK config failed! Trying again.."`

Description: The request to download and configure the MTP processor failed.
Severity: P2
Action: Please review SS7 troubleshooting guide for further action.

`"DK start failed! Trying again.."`

Description: The request to active the MTP processor failed.
Severity: P2
Action: Please review SS7 troubleshooting guide for further action.

`"DK: DK board configuration sequence failed!"`

Description: Unable to download and configure the board.
Severity: P2
Action: Review SS7 troubleshooting guide for further action.

`"DK: DK board download sequence failed!"`

Description: The image download to the MTP coprocessor board did not complete.
Severity: P4
Action: Review SS7 troubleshooting guide for further action.

`"DK: Failed to activate ss7 links!"`

Description: The activate command to the MTP coprocessor board failed.
Severity: P4
Action: Contact TAC for further action.

`"DK: Failed to configure DK board!"`

Description: The configure command to the MTP coprocessor board failed.
Severity: P2
Action: Review SS7 troubleshooting guide for further action.

`"DK: Failed to deactivate ss7 links!"`

Description: The deactivate command to the MTP coprocessor board failed.

Severity: P4
Action: Contact TAC for further action.

`"DK: Failed to reset DK board, error code : %s"`

Description: The MTP processor board did not respond to reset sequence.
Severity: P4
Action: Review SS7 troubleshooting guide for further action.

`"DK: Failed to reset mvip on DK board"`

Description: The MVIP reset command to the MTP coprocessor board failed.
Severity: P2
Action: Review SS7 troubleshooting guide for further action.

`"DK: Failed to set clock on DK board"`

Description: The MVIP clock configure command to the MTP coprocessor board failed.
Severity: P2
Action: Review SS7 troubleshooting guide for further action.

`"DK: SS7 link %d Alignment not ready!"`

Description: The MTP alignment procedure failed.
Severity: P3
Action: Review SS7 troubleshooting guide for further action.

`"DK: SS7 link %d Alignment started!"`

Description: MTP has restarted the link alignment procedure.
Severity: P4
Action: None required.

`"DK: SS7 link %d is aligned and ready!"`

Description: The MTP alignment procedure succeeded.
Severity: P4
Action: None required.

`"DK: SS7 link %d is experiencing a processor outage!"`

Description: MTP received a remote processor outage indication.
Severity: P4
Action: None required.

`"DK: SS7 link %d is in service!"`

Description: MTP has successfully aligned the specified SS7 task.
Severity: P4
Action: None required.

`"DK: SS7 link %d is out-of-service!"`

Description: MTP experienced a link failure.
Severity: P3
Action: Review SS7 troubleshooting guide for further action.

`"DK: SS7 Link MTP test failed!"`

Description: The periodic MTP test message failed.
Severity: P3
Action: Review SS7 troubleshooting guide for further action.

`"DK: Unable to start SS7 board!"`

Description: The start command to the MTP coprocessor board failed.
Severity: P2
Action: Review SS7 troubleshooting guide for further action.

`"DK: Unexpected User Part Message Received!"`

Description: A software failure resulted in the device driver receiving an SS7 user part message.
Severity: P4
Action: Contact TAC for further action.

`"DMA test failed on adaptor @0x%x on pass %d"`

Description: System hardware problem.
Severity: P1
Action: Call service.

`"Double open from %x, rcrd %s opened rcrd is %s"`

Description: Internal information log.
Severity: P4
Action: Report to TAC, along with task name.

`"Driver call (config clock) failed"`

Description: Resource manager gets a failure from driver when trying to configure clock.
Severity: P1
Action: Contact TAC

`"Driver call (mvip connect) failed, Brd %d OutSM %d OutSlot %d, InSM %d InSlot %d Dir %D"`

Description: Resource manager gets a failure from driver when trying to make MVIP connection.
Severity: P1
Action: Contact TAC

`"Driver call (mvip disconnect) failed, Brd %d SM %d Slot %d Dir %d"`

Description: Resource manager gets a failure from driver when tryig to tear down MVIP connection.
Severity: P1
Action: Contact TAC

`"Driver call (set pattern) failed"`

Description: Resource manager gets a failure from driver when trying to send a pattern.
Severity: P1
Action: Contact TAC

`"Driver %s died, exit"`

Description: Resource manager detects a death of one of the drivers, exiting.
Severity: P1
Action: Contact TAC

`"DTA_AGENT: can't send to DTA"`

Description: Process DTA_AGENT cannot complete a send_name to DTA.
Severity: P2
Action: Report to TAC if problem continues

`"DTASTART: task %x cannot find DTA_AGENT"`

Description: Can not find DTA task from my task id.
Severity: P3
Action: Contact TAC if this occurs often.

`"DTI ADMIN : bad msg type = %d, tid %x"`

Description: Software error in dti_comm or dti_admin.
Severity: P2
Action: Call TAC.

`"DTI ADMIN : dti_a2c_q full!!"`

Description: dti_comm not responding or dti_a2c not responding.
Severity: P2
Action: If seen repeatedly, call TAC.

`"dti ADMIN: bad card num = %x, type=%d"`

Description: Misconfigured DTI card jumpers.
Severity: P1
Action: Check DTI card hardware switch settings. Reference Technical Memo 91013.

`"dti ADMIN: bad msg origin=%d, tid=%x"`

Description: Software error or incompatible software.
Severity: P2
Action: Check software revision dates and support disk compatibility.

`"DTI ADMIN: BOARD [%d] call xfer SEQ [%d]"`

Description: Software error.
Severity: P3
Action: If the problem persists, call TAC.

`"dti ADMIN: can't attach_name [%s]."`

Description: Another task has registered the dti_admin name.
Severity: P1
Action: Verify the configuration (offline menu). Call TAC.

`"DTI CALLXFR: bad inform type for ixfr: USER_ABORT Contact Centigram TAC Department"`

Description: Software error.
Severity: P3
Action: If the problem persists, call TAC.

`"DTI CALLXFR: bad inform type for ixfr:%d Contact Centigram TAC Department"`

Description: Software error.
Severity: P3
Action: If the problem persists, call TAC.

`"DTI COMM: admin msg not recognized: %d"`

Description: Software error in dti_comm or dti_admin.
Severity: P2
Action: If the problem occurs frequently, call TAC.

`"dti COMM: bad amsg_org = %d, tid= %04x"`

Description: Software error or incompatible software revisions.
Severity: P2
Action: Check software revision dates and support disk compatibility.

"DTI COMM: bad xy0 type!"

Description: Software error in dti_comm or dti_admin.
Severity: P2
Action: If the problem occurs frequently, call TAC.

"DTI TIMER: can't locate (%s)"

Description: dti_timer can not locate <tsk_name>.
Severity: P4
Action: The system should correct itself. If seen frequently, call TAC.

"DTI(%d): software sync error; ixfr msg"

Description: Software timing problem.
Severity: P3
Action: If the problem persists, call TAC.

"DTI: bad ixfr cmd for board %d"

Description: Software error or incompatible software.
Severity: P2
Action: Check software revision dates.

"DTI: queue full, element size:%d"

Description: The dti_ixfragnt died or is not responding.
Severity: P2
Action: Call TAC.

"DTI_ADMIN: initialized board %d"

Description: Informational Message only.
Severity: P4
Action: None

"DTI_ADMIN: starting to initialize board %d"

Description: Informational message only.
Severity: P4
Action: None

"DTI_COMM: interrupt out_q full. Address = %x"

Description: Software error.
Severity: P2
Action: Call TAC.

"DTIA2C: can't locate (%s)"

Description: dtia2c can not locate dti_admin name.
Severity: P4
Action: The system should correct itself. If not, contact TAC.

"DTIC2A: can't locate (%s)"

Description: dtic2a can not locate a tsk name.
Severity: P4
Action: The system should correct itself. If not, contact TAC.

"DTICOMM: dti_c2a_q full!!"

Description: The dti_admin task or the dti_c2a task died or not responding.
Severity: P2

Action: If the problem is persistent, call TAC.

`"DTIIXFRAGNT: can't locate (%s)"`

Description: dti_xfragent can not locate dti_admin.
Severity: P4
Action: The system should correct itself. If not, contact TAC.

`"EAGENT: can't open queue <queue name>"`

Description: Unable to open the queue for incoming integration packets. The integration data received by ecrcv is written to the queue, then eagent reads the queue and sends the data to sfa. Since eagent is unable to open the queue, integration information will not be received for incoming calls. Therefore, incoming calls will get general greeting. EAGENT will continually retry until it successfully opens the queue.
Severity: P2
Action: Contact TAC.

`"ECDR is re-used at %s,%s"`

Description: This is just a warning, it's not an error. The CDR log file is getting full and is being overwritten.
Severity: P4
Action: Download your CDR records as soon as possible. It this log message shows up too often, you may need to increase the CDR file' size.

`"ECDR: %s %x cannot close cfg record"`

Description: Task ecdrad of Call Detail Recorder failed to close an account record which is used to store the CDR configuration. This problem if occur can cause loss of CDR records.
Severity: P2
Action: Do not reboot the system. Contact TAC to figure out the cause for this problem.

`"ECDR: %s %x failed to open cfg record for write"`

Description: Task ecdrad of Call Detail Recorder failed to open an account record which is used to store the CDR configuration. This problem if occur can cause loss of CDR records.
Severity: P2
Action: Do not reboot the system. Contact TAC to figure out the cause for this problem.

`"ECDR: %s %x inactive, unable to create configuration record"`

Description: Task ecdrad is started by the system but was not able to create its internal configuration record. Caused by a software error which failed to create or read Call Detail Recorder account record. The inactive task would remain on the system to prevent system from being reboot. However, this problem should be fixed as soon as possible.
Severity: P2
Action: Do not reboot the system. Contact TAC for instruction on how to fix this problem.

`"ECDR: %s %x inactive, unable to read configuration record"`

Description: Call Detail Recorder send agent failed to read the CDR configuration. This can cause a command issued by user to be ignored by CDR.
Severity: P4
Action: Do not reboot the system. Contact TAC for instruction on how to fix this problem.

```
"ECDR: %s %x is INACTIVE !!"
```

Description: This error message shows up one every hour to remind you of inactive ecdrad task(s) on your system.
Severity: P4
Action: Do not reboot the system. Contact TAC.

```
"ECDR: %s %x is inactive, unable to attach name"
```

Description: Task ecdrad is started by the system but was not able to register its name on the QNX network. This can be caused by a software error which starts too many ecdrad tasks on the same system (only one ecdrad should be active on the system at any one time), or by some problem with the QNX network. The inactive task would remain on the system to prevent system from being reboot. However, it should be removed manually by the administrator when possible.
Severity: P2
Action: Do not reboot the system. Contact TAC.

```
"ECDR: %s %x unable to close msg record %s"
```

Description: Task ecdrad of Call Detail Recorder failed to close an account record after writing CDR records to it. This problem if occurs will prevent CDR records to be stored on the system.
Severity: P2
Action: Do not reboot the system. Contact TAC to figure out the cause for this problem

```
"ECDR: %s %x unable to open msg record %s"
```

Description: Task ecdrad of Call Detail Recorder failed to open an account record to write CDR records. This problem if occurs will prevent CDR records to be stored on the system.
Severity: P2
Action: Do not reboot the system. Contact TAC to figure out the cause for this problem.

```
"ECDR: %s %x unable to read %s"
or
"ECDR: %s %x unable to read msg record %d"
```

Description: Task ecdrad of Call Detail Recorder failed to read an account record used for storing CDR records. This problem if occurs will prevent CDR records to be stored properly on the system.
Severity: P2
Action: Do not reboot the system. Contact TAC to figure out the cause for this problem.

```
"ECDR: %s unable to find %s."
```

Description: Call Detail Recorder agent failed to locate the administrator task (ecdrad) to send CDR records to. This can cause CDR records not being written to disk.
Severity: P3
Action: Do not reboot the system. Contact TAC for instruction on how to fix this problem.

```
"ECDR: %s unable to read configuration record."
```

Description: Call Detail Recorder agent failed to read the latest configuration for CDR. This can cause unwanted call type CDR records to be recorded.
Severity: P4
Action: Do not reboot the system. Contact TAC for instruction on how to fix this problem.

`"ECDR: %s,%x unable to create %s"`

Description: Task ecdrad of Call Detail Recorder failed to create its agent "ecdrsd" for some reason. This problem would block all commands issued by CDR menu program such as start/stop/configuration.

Severity: P3

Action: Do not reboot the system. Contact TAC to figure out the cause for this problem.

`"ECDRAD: %s %x delete request from %x"`

Description: This is not an error. This log message is there to inform the system administrator of when Call Detail Recorder file was deleted.

Severity: P4

Action: No action is required, this is not a problem.

`"ECDRAD: %s %x download cfg from %x"`

Description: This is not an error. This log message is there to inform the system administrator of when Call Detail Recorder file was downloaded.

Severity: P4

Action: No action is required, this is not a problem.

`"ECDRAD: %s %x invalid req %d from %x"`

Description: An invalid request was received by ecdrad from another task on the system. Caused by incompatible Call Detail Recorder software or by problem with the QNX network. Depending on which type of request was received, it could be a severe error which caused loss of CDR records or some minor error sent by the menu program.

Severity: P4

Action: Do not reboot the system. Contact TAC.

`"ECDRAD: %s %x stop request from %x"`

Description: This is not an error. This log message is there to inform the system administrator of when Call Detail Recorder was stopped.

Severity: P4

Action: No action is required, this is not a problem.

`"ECDRSD can not find ecdrad,%04x"`

Description: Call Detail Recorder send agent failed to locate the CDR administrator task and would not retry. Caused by the administrator task (ecdrad) died unexpectedly, usually it would be restarted by the system.

Severity: P4

Action: Contact TAC if more than one log messages of this type show up in the log file (agent does not get restarted).

`"ECDRSD can not send to %s,%04x result %d"`

Description: Call Detail Recorder send agent failed to deliver a command to another CDR agent and would not retry. This can cause command issued by user to CDR to be lost/ignored.

Severity: P4

Action: Most of the time the agent would be restarted. Contact TAC if more than one log messages of this type show up in the log file (agent cannot be restarted).

`"ECDRSD can not send to ECDRAD, result %04x"`

Description: Call Detail Recorder send agent failed to send a request to the CDR administrator task (ecdrad). At this point, it should terminate itself (assuming the administrator is terminated by the user or by the system).

Severity: P3

Action: Contact TAC only if you get this log message while CDR is supposed to be running.

"ECRCV: can't get stty on RS232 port"

Description: Unable to read from the serial port.
Severity: P2
Action: Check the system configuration for possible problems/inconsistencies. Check for possible hardware problems. If no anomalies are found, call TAC.

"ECRCV: can't open <port name> for read"

Description: The system is configured incorrectly. Cannot open serial link <port name>.
Severity: P1
Action: Check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

"ECRCV: could not open record = %s"

Description: System is configured incorrectly. Could not open the configuration record.
Severity: P2
Action: Check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

"ecrcv: could not open rs232 port"

Description: The system is configured incorrectly.
Severity: P2
Action: Check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

"ECRCV: no prefixes defined for centrex; aborting"

Description: The system is configured incorrectly.
Severity: P1
Action: Check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

"ECRCV[<host>:<serial port>]: BAD MD: %d"

Description: Unable to match Message Desk number.
Severity: P2
Action: Check the configuration. If error continues, check the switch.

"ec_resync: Unable to locate MWLA, aborting."

Description: MWLA died.
Severity: P1
Action: Call TAC.

"EECO: link is down."

Description: EECO PMS sends a character followed by the ETX character to the VoiceMemo integration. If this character is not echoed back within two seconds, the link between the integration and the PMS is assumed to be down and this error message is sent. No integration can take place while the link is down.
Severity: P1
Action: Reactivate the link by sending a "C" from the PMS.

"EECO: link is up."

Description: This is an informative message to notify the user that the link between the EECO PMS and the VoiceMemo Integration is working correctly.

Severity: P4
Action: No action is necessary.

`"Emulation task is not running! exit"`

Description: SFA can't find the emulation software for linecard. Exiting
Severity: P1
Action: Contact TAC

`"Error: can't send to wakeup administrator."`

Description: A voicememo or NYNEX task can't communicate with the wakeup administrator. This could result in not being able to place wakeup and/or reminder calls.
Severity: P2
Action: Reset the system if more occurrences are found. This could resolve the problem if the system resources were temporarily exhausted. If this still happens, call TAC.

`"Error from Receive but continuing.\n"`

Description: The fax applicaton received an illegl request which was ignored.
Severity: P3
Action: None needed. The software receives automatacally

`"Error in reading line exception records"`

Description: Vmemo could not read the line exception record.
Severity: P3
Action: All defaults will be used, but go check the line exceptions with a verify or the menus.

`"Error starting allocator\n"`

Description: Software module (allocator) not found or corrupt.
Severity: P1
Action: Call TAC.

`"F960_ADM: bad message origin ($x)"`

Description: Internal software error. F960_admin task received unexpected messages.
Severity: P3
Action: The problem should be investigated. Check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

`"F960_ADM: can't read OAA data!"`

Description: F960_admin can't access oaa data records for necessary configuration parameters.
Severity: P1
Action: Check the system configuration to verify that Fujitsu 960 Integration has been installed and properly configured. If the problem persists, check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

`"F960_ADM: creatl error for IN task, link ($s),Ports (%s)."`

Description: F960_admin can't create F960_in task.
Severity: P1
Action: Check the system configuration to verify that Fujitsu 960 Integration has been installed and properly configured. If the problem persists, check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

`"F960_ADM: creatl error for OUT task, link ($s),Ports (%s)."`

Description: F960_admin can't create F960_out task.
Severity: P1
Action: Check the system configuration to verify that Fujitsu 960 Integration has been installed and properly configured. If the problem persists, check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

`"F960_ADM: general receive failure"`

Description: This message indicates that the F960_admin task received an invalid message or event. F960_admin task will re-synchronize itself.
Severity: P3
Action: If the problem persists, contact TAC.

`"F960_ADM: IN started, awaiting PBX initialization"`

Description: This message indicates that F960_in task has been started properly and ready to service incoming calls from the Fujitsu switch.
Severity: P4
Action: None

`"F960_ADM: IN task for link %d already running."`

Description: Informational message. It is logged after F960_admin task found F960_in task has been started.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

`"F960_ADM: IN task for link %d re-started."`

Description: F960_admin task has successfully restarted the F960_in task.
Severity: P4
Action: If the problem persists, call TAC.

`"F960_ADM: lost a msg for F960_OUT (Q full) for lk:%d."`

Description: Informational message. The internal queue for F960_admin task has received more events due to some unexpected activities.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_ADM: lost messages from SFA (queue full)"`

Description: Informational message. The internal queue for F960_admin task has received more events from the Fujitsu switch than expected.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

`"F960_ADM: OUT started, awaiting PBX initialization"`

Description: This message indicates that F960_out task has been started properly and ready to service incoming calls from the Fujitsu switch.
Severity: P4
Action: None

`"F960_ADM: OUT task for link %d already running."`

Description: Informational message. It is logged after F960_admin task found F960_out task has been started.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

`"F960_ADM: OUT task for link %d re-started."`

Description: F960_admin task has successfully restarted the F960_out task.
Severity: P4
Action: If the problem persists, call TAC.

`"F960_ADM: receive failed due to exception"`

Description: This message indicates that the F960_admin task received an invalid message or event. F960_admin task will re-synchronize itself.
Severity: P3
Action: If the problem persists, contact TAC.

`"F960_ADM: received bad timer type.  Type: %d"`

Description: Informational message.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies or reboot the system or re-install the software in an attempt to clear.

`"F960_ADM: unable to send to undertaker"`

Description: F960_admin task is unable to report the task death to the undertaker.
Severity: P1
Action: Reboot the system in an attempt to clear the error. If the problem persists, check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

`"F960_ADMIN: *** Unable to attach name (%s)!"`

Description: F960_admin was not able to start up properly.
Severity: P1
Action: Check the system configuration to verify that Fujitsu 960 Integration has been installed and properly configured. If the problem persists, check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC..

`"F960_ADMIN: utility request in unknown for lk:%d."`

Description: Information message. F960_admin task found the request from debug utility was invalid.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

`"F960_DBTOOL: Unable to send to F960_ADMIN"`

Description: The debug utility is unable to send messages to F960_admin task. It could be that F960_admin task died or is not responding.
Severity: P3
Action: Check the system configuration to verify that Fujitsu 960 Integration has been installed and properly configured. Re-install the Fujitsu 960 Integration.

`"F960_IN task for lk:%d died."`

Description: F960_in task has died. F960_admin task will attempt to start it.
Severity: P4
Action: If the problem persists, call TAC.

`"F960_IN: %s re-started, awaiting PBX initialization"`

Description: F960_in task has died and the F960_admin task has successfully restarted it.
Severity: P4
Action: If the problem persists, call TAC.

`"F960_IN: **** Unable to name_locate F960ADM"`

Description: Informational message. F960_in task will attempt to re-synchronize itself.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_IN: can't read oaa data!"`

Description: Software error. F960_in task is unable to read oaa data record for necessary configuration parameters.
Severity: P1
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_IN: Error in opening %g (lk:%d) for read"`

Description: F960_in task was unable to open ctix device for read. x is 1-16.
Severity: P1
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_IN: Error in opening %g (lk:%d) for write"`

Description: F960_in task was unable to open ctix device for write. x is 1-16.
Severity: P1
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_IN: Invalid msg_type in message to F960_ADMIN."`

Description: Informational message. F960_in task will recover from this error.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_IN: Started"`

Description: Informational message.
Severity: P4
Action: None

`"F960_IN: Unable to initialize serial port:%s"`

Description: Software error.
Severity: P1
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_IN: Unable to read oaa record."`

Description: Software error.
Severity: P1
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_IN: Unable to send to F960_ADMIN"`

Description: Informational message. F960_in task will attempt to re-synchronize itself.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_IN: usage: %s link_number, link_name."`

Description: Informational message.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_MWAGENT: Cannot send to mwla !"`

Description: F960_mwagent task of the Fujitsu 960 Integration is unable to locate the mwla task.
Severity: P3
Action: The F960_mwagent task will retry forever. If the problem persists, check the system configuration for possible problems/ inconsistencies for re-install the software. If no anomalies are found, call TAC.

`"F960_MWI: Could not locate MWLA!"`

Description: F960_mwagent task of the Fujitsu 960 Integration is unable to locate the mwla task.
Severity: P3
Action: The F960_mwagent task will retry forever. If the problem persists, check the system configuration for possible problems/ inconsistencies for re-install the software. If no anomalies are found, call TAC.

`"F960_MWAGENT: Invalid request from mwla"`

Description: F960_mwagent task received an invalid request from the mwla task.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies. If no anomalies are found, call TAC.

`"F960_OUT task for lk: %d died."`

Description: F960_out task has died. F960_admin task will attempt to start it.
Severity: P4
Action: If the problem persists, call TAC.

`"F960_OUT: %s re-started, awaiting PBX initialization"`

Description: F960_out task has died and the F960_admin task has successfully restarted it.
Severity: P4
Action: If the problem persists, call TAC.

`"F960_OUT: *** Unable to name_locate F960ADM"`

Description: Informational message. F960_out task will attempt to re-synchronize itself.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_OUT: rec'd invalid msg(%d) fr ADMIN,lk:%d."`

Description: Informational message. F960_in task will recover from this error.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_OUT: rec'd invalid reply, orig(%d),lk:%d."`

Description: Informational message. F960_in task will recover from this error.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_OUT: Started"`

Description: Informational message.
Severity: P4
Action: None

`"F960_OUT: Unable to initialize CTI port:%s"`

Description: Software error.
Severity: P1
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_OUT: Unable to read oaa record."`

Description: Software error.
Severity: P1
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_OUT: Unable to send to F960_ADMIN. Link number: %d."`

Description: Software error.
Severity: P1
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_OUT: usage: %s link_number, link_name."`

Description: Informational message.
Severity: P3

Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_SFAGENT: *** Node ID out of range!"`

Description: This message indicates that F960_sfagent task found the F960_admin task with an invalid node ID. F960_sfagent task will attempt to locate the F960_admin task again.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"F960_SFAGENT: can't send to f960admin!"`

Description: Informational message. F960_sfagent task can not send messages to the F960_admin task and will try again later.
Severity: P3
Action: If the problem persists, check the system configuration for possible problems/inconsistencies, reboot the system, or re-install the software in an attempt to clear the error.

`"Failed request on disk %d:%d due to out of service"`

Description: Redundant disk failed operation.
Severity: P4
Action: None.

`"Failed to access NVRAM (EXIT)"`

Description: System error during startup.
Severity: P3
Action: Call TAC.

`"Failed to allocate redundant info structures"`

Description: System failure.
Severity: P2
Action: Call TAC.

`"Failed to attach interrupt handler: %s(EXIT)`

Description: System error during startup.
Severity: P3
Action: Call TAC.

`"Failed to attach name space: %s (EXIT)"`

Description: System error during startup.
Severity: P3
Action: Call TAC.

`"Failed to attach timer: %s(EXIT)"`

Description: System error during startup.
Severity: P3
Action: Call TAC.

`"Failed to get proxy: %s (EXIT)"`

Description: System error during startup.
Severity: P3
Action: Call TAC.

```
"Failed to get sector 0 lock, owner %d"
```

Description: Lock out control sector is in use.
Severity: P4
Action: Try again later.

```
"Failed to map physical memory: %s (EXIT)"
```

Description: System error during startup.
Severity: P3
Action: Call TAC.

```
"Failed to malloc sector 0 (%c)"
```

Description: System failure on startup.
Severity: P3
Action: Call TAC.

```
"Failed to prefix to FAM node%d"
```

Description: System failure.
Severity: P1
Action: Call TAC.

```
"Failed to Reassign block (request=%d block=%lx)"
```

Description: Device failure.
Severity: P2
Action: Call for service. Disk might need replacing.

```
"Failed to remount as READ ONLY"
```

Description: System failure.
Severity: P1
Action: Call TAC

```
"Fam node reassigned & mounted READ ONLY"
```

Description: QNX file can not be written due to loss of control over cache coherency.
Severity: P4
Action: None.

```
"FAM: Unexpected Message%d "
```

Description: Program interface error or system failure.
Severity: P1
Action: Call TAC

```
"Forcing system reboot"
```

Description: A module has determined that the system (all modules), must be reset. This will occur in the event of multiple failures that result in the loss of a critical resource, and it's hot standby.
Severity: P1
Action: If the multiple failure was related to a hardware failure, the faulty hardware should be replaced. If other messages indicate a software problem, contact TAC.

```
"Forcing system reboot\n"
```

Description: Reboot event.
Severity: P4
Action: None.

`"FOT message received on CIC %d"`

Description: SS7 received a message from the adjacent point code that was not expected.
Severity: P3
Action: Contact TAC for further action.

`"FREE_ENTRY: invalid pointer %d"`

Description: Internal information log.
Severity: P4
Action: Report to TAC.

`"gather: Out of bound size in copying, %x, oaa billing record %d"`

Description: Error while storing billing data. Some billing data will be lost, the program will recover.
Severity: P2
Action: This indicates an error in the billing software. This message is leftover from an error that has been fixed.

`"gather:Unable to get write access error (0x%x)"`

Description: Gather must write to the QNX partition of the drive which is write protected. It could not get access to it.
Severity: P2
Action: Gather only writes its header information to the QNX partition. Try running gather manually if this message was from the auto gather. The gather would not have taken place if this message was logged. This message could also occur if another program was trying to get write access at the same time. If this happens re-running gather would fix the problem.

`"gather:Unable to give up write access error (0x%x)"`

Description: This message would appear if gather was unable to turn on write protection after it was done writing to the qnx partition.
Severity: P2
Action: By this point in gather, the gather is completely done. This must be fixed before another gather can be run, or another program can write to the disk. Contact TAC if this error occurs. Resetting the system would also clear this condition.

`"getapi1: long str %s"`

Description: The one call application is using a string longer than the buffer we have allocated for it. We will shorten the string.
Severity: P3
Action: Contact the author of the one call application, which might have a bug.

`"get_api2: date str too long [%s]"`

Description: One call application told us to say a date, and the string containing the date was too long for our buffer.
Severity: P3
Action: Likely a bug in the one call application. Contact the author.

`"get_api3: time str too long [%s]"`

Description: The string for time too long.
Severity: P3
Action: Likely a bug in the one call application. Contact the author.

`"get_api2: digit str too long [%s]"`

Description: The string for digits too long.
Severity: P3

Action: Likely a bug in the one call application. Contact the author.

`"get_copylist: acreate rslt = %d, list = %s"`

Description: A failure occurred in creating a copy list data record. This is done whenever a message is recorded and sent for delivery. As a result, a message did not get delivered. This error indicates a serious problem with the system. Perhaps the account data capacity of the system has been reached and there are no free data records to be used for copy list creation.
Severity: P1
Action: Delete all unneeded mailboxes in attempt to free up data records. If the problem still occurs, or there are no mailboxes that can be deleted, call TAC.

`"get_cpy_list: acreate rslt = %d, list = %s"`

Description:
Severity: P4
Action:

`"get_netvm_sib_list: acreate rslt = %d, sib = %s"`

Description:
Severity: P4
Action:

`"get_sib_list: acreate rslt = %d, list = %s"`

Description:
Severity: P4
Action:

`"GET_TIME: delay was %d ticks, will retry later"`

Description: Indication of system performance level.
Severity: P4
Action: None.

`"GET_TIME: delay was %d ticks, will retry later"`

Description: This message indicates a delay was detected while reading the system time. This is an information only message.
Severity: P4
Action: If this message is seen repeatedly, (more than 20 times in a day) contact TAC.

`"GET_TIME: Resolver returned an error"`

Description: Task 'resolver' died. It will be restarted.
Severity: P3
Action: If this happens repeatedly contact TAC. Otherwise it is not a problem.

`"GET_TIME: Resolver returned an error"`

Description: System control module communication failure.
Severity: P4
Action: None.

`"GET_TIME: Send to resolver failed"`

Description: Problem in communicating to system control module.
Severity: P4
Action: None.

`"GET_TIME: Send to resolver failed"`

Description: Task 'resolver' died. It will be restarted.

Severity: P3
Action: If this happens repeatedly contact TAC. Otherwise it is not a problem.

`"GET_TIME: Unable to find primary resolver"`

Description: The system was not able to select a primary host for allocating system resources. The system should reboot.
Severity: P1 or P4
Action: Maybe seen when system boots up or if a module dies. If seen at any other time, check QNET connections, this message could indicate a QNet problem. If still having problems, contact TAC.

`"GET_TIME: Unable to find primary resolver"`

Description: Startup comment.
Severity: P4
Action: None.

`"GET VSEQ for %d failed, result=%d, retrying"`

Description: An application has failed in an attempt to get information from the SFA. This could be due to an SFA death. The request will be retried.
Severity: P4
Action: None

`"Hard disk %d error.Key=%02x, Code=%02x, Sect=%s"`

Description: Hard disk error.
Severity: P1-4
Action: Take action based on the specific error reported.

`"Hard disk %d error=%04x, Sect=%s"`

Description:
Severity: P3
Action:

`"Hard disk %d is down!!!"`

Description:
Severity: P3
Action:

`"Hardware lost mailboxes, reiniting try %d"`

Description: Restarting request to device after failed attempt.
Severity: P4
Action: None.

`"HCXMWI: cannot send to mwla"`

Description: hcxmwi cannot communicate with the mwla task.
Severity: P2
Action: Reboot module, then reboot the system. Call TAC if problem persists.

`"HCXMWI: Unable to locate hcxsnd"`

Description: hcxsnd cannot find hcxsnd and cannot give it any requests. The integration will not work properly.
Severity: P1
Action: Reboot the module, then the system. Call TAC if the problem persists.

```
"HCXMWI: Unable to locate mwla"
```

Description: The hcxmwi task cannot locate mwla and cannot process message waiting requests.
Severity: Severity P1 if received more than once.
Action: Reboot the module, then the system. Call TAC if the problem persists.

```
"HCXMWI: Unable to update MWI %s for mailbox %.6s"
```

Description: This happens if the link goes down during the message wait process or if hcxmwi has tried to send to hcxsnd twice and has been unsuccessful. If this happens often, there may be other problems with the link or with hcxsnd.
Severity: P2 or P3
Action: Check both sides of the serial link to make sure communication is set up properly. Call TAC if the problem persists.

```
"HCXRCV: Bad RS232 port name"
```

Description: This message is logged if hcxrcv is started up without a valid port name. hcxrcv will abort.
Severity: Severity P1 if the system is starting hcxrcv.
P3 if the user started hcxrcv from the qnx prompt.
Action: Check the configuration and make sure there is a valid port configured for the Hitachi integration. Reboot the module. If this message appears after a reboot, call TAC.

```
"HCXRCV: Bad value %d for checkin FCOS"
or
"HCXRCV: Bad value %d for checkout FCOS"
```

Description: A value less than 0 or greater than the maximum FCOS number (currently 64) has been entered in the configuration data for the checkin FCOS. The task will abort
Severity: P1
Action: Check the configuration data. Call TAC if this problem persists.

```
"HCXRCV: Bad value %d for checkin FCOS"
```

Description: This error occurs when the value of the check-in FCOS, which is read in from the Eeecooaa record, is not valid, meaning the value is less than zero.
Severity: P1
Action: Amend the Eeecooaa record by reconfiguring the FCOS check-in value from the console.

```
"HCXRCV: Bad value %d for checkout FCOS"
```

Description: This error occurs when the value of the check-out FCOS, which is read in from the Eeecooaa record, is not valid, meaning the value is less than zero.
Severity: P1
Action: Amend the Eeecooaa record by reconfiguring the FCOS check-out value from the console.

```
"HCXRCV: Bad value %d for clear greet on checkin"
or
"HCXRCV: Bad value %d for clear greet on checkout"
```

Description: A value other than 0 or 1 is in the configuration data for clear greet on checkin. If a 'y' or 'Y' was entered, the value should be 1, otherwise it should be 0. The task will abort.
Severity: P1
Action: Check the configuration data. Call TAC if this problem persists.

```
"HCXRCV: Bad value %d for clear msgs on checkin"
or
"HCXRCV: Bad value %d for clear msgs on checkout"
```

Description: A value other than 0 or 1 is in the configuration data for clear msgs on checkin. If a 'y' or 'Y' was entered, the value should be 1, otherwise it should be 0. The task will abort.

Severity: P1

Action: Check the configuration data. Call TAC if this problem persists.

```
"HCXRCV: Bad value %d for clear name on checkin"
or
"HCXRCV: Bad value %d for clear name on checkout"
```

Description: A value other than 0 or 1 is in the configuration data for clear name on checkin. If a 'y' or 'Y' was entered, the value should be 1, otherwise it should be 0. The task will abort.

Severity: P1

Action: Check the configuration data. Call TAC if this problem persists.

```
"HCXRCV: Bad value %d for clear passcode on checkin"
or
"HCXRCV: Bad value %d for clear passcode on checkout"
```

Description: A value other than 0 or 1 is in the configuration data for clear passcode on checkin. If a 'y' or 'Y' was entered, the value should be 1, otherwise it should be 0. The task will abort.

Severity: P1

Action: Check the configuration data. Call TAC if this problem persists.

```
"HCXRCV: Failed to swap mailbox %s with %s"
```

Description: hcxrcv has received a ROOM_SWAP request and has failed while processing it. A log message indicating what part of the swap failed will appear before this one. If the "..Deleted mailbox xxx, unable to re-create.." message is NOT logged before this one, the old mailbox will still exist.

Severity: P2

Action: Check the mailboxes for corruption and delete any bad mailboxes. If this message happens often, contact TAC.

```
"HCXRCV: Failed to swap mailbox %s with %s"
```

Description: This error occurs when the source oaa record can not be unlocked or read. This results in a room swapping failure as the data from the source mailbox can not be read into a new location.

Severity: P2

Action: Check that a mailbox has been created and that the mailbox number falls within the dialing plan.

```
"HCXRCV: Incorrect HCX data config'd in re-read eeco rec"
```

Description: The configuration data is not valid. A log message will appear before this message that will indicate what part of the configuration is incorrect.

Severity: P1

Action: Check the configuration. If the configuration is correct and the problem persists, call TAC.

```
"HCXRCV: Incorrect HCX data configured in eeco record"
```

Description: The configuration data is not valid. A log message will appear before this message that will indicate what part of the configuration is incorrect.

Severity: P1

Action: Check the configuration. If the configuration is correct and the problem persists, call TAC.

`"HCXRCV: Unable to find eeco OAA record"`

Description: hcxrcv is unable to read the configuration data for the integration. hcxrcv will abort and the integration will not run.

Severity: P1

Action: Go to the Offline menu and configure the application again. Save changes when you exit the Offline menu and activate the inactive configuration. If the record was corrupted, doing this will write it to disk again and hopefully correct the problem. If the problem persists, call TAC.

`"HCXRCV: Unable to get stty on RS232 port"`

Description: hcxrcv is unable to get tty information (baud rate, parity, etc) on the configured port. The task will abort.

Severity: P1

Action: Make sure that a valid port is configured and that it is good. Try moving the application to another port. If the same thing happens on a known good port, call TAC.

`"HCXRCV: Unable to locate hcxsnd"`

Description: The hcxrcv task has tried to locate hcxsnd 5 times and failed. The link is probably down.

Severity: P1

Action: Check the serial link connections. If the problem persists, call TAC.

`"HCXRCV: Unable to open serial port"`

Description: hcxrcv is unable to open the serial port so it can read from it. hcxrcv will abort.

Severity: P1

Action: Check the configuration and make sure that no other application is trying to use the same serial port. Make sure that a valid serial port is configured. If the problem persists, call TAC.

`"HCXRCV: Unable to SET stty on RS232 port"`

Description: hcxrcv is unable to set the tty information (baud rate, parity, etc) on the configured port. The task will abort.

Severity: P1

Action: Make sure that a valid port is configured and that it is good. Try moving the application to another port. If the same thing happens on a known good port, call TAC.

`"HCXSND: Bad RS232 port name"`

Description: This message is logged if hcxsnd is started up without a valid port name. hcxsnd will abort.

Severity: P1 if the system is starting hcxsnd.
P3 if the user started hcxsnd

Action: Check the configuration and make sure there is a valid port configured for the Hitachi integration. Try rebooting the module. If this message appears after a reboot, call TAC.

`"HCXSND: Bad RS232 port name"`

Description: The integration serial port can not be opened because the name does not begin with "S". This means that HCXSND can not send data packets to the PMS and thus the integration fails.

Severity: P1

Action: Call TAC. There is little that the user can do. The QNX library function "open_device" has corrupted the cti serial port name,and the name no longer begins with "S".

`"HCXSND: Unable to attach name"`

Description: The QNX library function "qnx_name_attach" was unable to attach HCXSND to HCXSND_NAME. This means that HCXSND cannot be located and thus integration will fail.
Severity: P1
Action: Call TAC. "Errno" is a Watcom C error file that will contain a value indicating the type of error that has been detected. There is nothing that the user can do.

`"HCXSND: Unable to attach name"`

Description: hcxsnd cannot start up and the task will abort.
Severity: P1
Action: Reboot the module, then the system. If the problem persists, call TAC.

`"HCXSND: Unable to get stty on RS232 port"`

Description: hcxsnd is unable to get tty information (baud rate, parity, etc) on the configured port. The task will abort.
Severity: P1
Action: Make sure that a valid port is configured and that it is good. Try moving the application to another port. If the same thing happens on a known good port, call TAC.

`"HCXSND: Unable to open serial port"`

Description: hcxrcv is unable to open the serial port so it can read from it. hcxrcv will abort.
Severity: P1
Action: Check the configuration and make sure that no other application is trying to use the same serial port. Make sure that a valid serial port is configured. If the problem persists, call TAC.

`"HCXSND: Unable to open serial port"`

Description: The integration serial port cannot be opened. The number could be out of range, or an error could have occurred in the funtion "open_device". The integration cannot send or receive information and the integration fails.
Severity: P1
Action: Check the configuration. If an AG 8 card is used, the allowable port range is 0 to 7. If a Digi board is used, the allowable port range is 0 to 23. If the port number is within range, then this is a hardware related problem.

`"HCXSND: Unable to SET stty on RS232 port"`

Description: hcxsnd is unable to set the tty information (baud rate, parity, etc) on the configured port. The task will abort.
Severity: P1
Action: Make sure that a valid port is configured and that it is good. Try moving the application to another port. If the same thing happens on a known good port, call TAC.

`"HD assertion failed: %d %d line %d, file %s"`

Description: Program error.
Severity: P3
Action: Call TAC.

`"HD: Can't allocate disk info structure"`

Description:	System failure.
Severity:	P4
Action:	Call TAC.

`"HD: Can't allocate disk request buffers"`

Description:	System failure.
Severity:	P1
Action:	Call TAC.

`"HD: Can't attach name (%(errno))"`

Description:	Startup failure.
Severity:	P3
Action:	Call TAC.

`"HD: Failed to select disk %d:%d"`

Description:	Disk failure.
Severity:	P3
Action:	Call service.

`"HD: Failed to send to hdfsys process (%(errno))"`

Description:	System failure.
Severity:	P1
Action:	Call TAC.

`"HD: mmap failed during update of DOS part for disk %d:%d"`

Description:	System failure.
Severity:	P3
Action:	Call TAC.

`"HD: No hard disks in the system"`

Description:	Disks not installed or not deleted.
Severity:	P1
Action:	Check cables and power to drive bays.

`"HD: Out of request buffers"`

Description:	Startup failure.
Severity:	P1
Action:	Call TAC.

`"HD: Process %d updating sector 0"`

Description:	Configuration record update. Comment only.
Severity:	P1
Action:	None.

`"HD: RDN_cbf - read failed from disk %d:%d, submitting rdn read"`

Description:	Primary attempts to read data failed on disk attempting data read on redundant disk.
Severity:	P3
Action:	Call service.

`"HD: Received invalid message (op %d)"`

Description:	System or interface error.
Severity:	P3

Action: Call TAC.

"HD: Received invalid message (type %d)"

Description: System or interface error.
Severity: P3
Action: Call TAC.

"HD: Unable to add disk %d:%d -- no units available"

Description: Unable to complete add disk operation.
Severity: P4
Action: None.

"HD: Unable to locate hdfsys process"

Description: Startup failure.
Severity: P1
Action: Call TAC.

"HD: unable to open shmem to update DOS part for disk %d:%d"

Description:
Severity: P3
Action:

"HD: write of block 0 on disk %d:%d invalid DOS part table"

Description: Corrupted boot disk.
Severity: P3
Action: Call TAC.

"HD: XPT_action() failed with status 0x%x"

Description: Device fault.
Severity: P3
Action: Report to TAC.

"HDFSYS: Can't attach name (%(errno))"

Description: Startup failure.
Severity: P1
Action: Call TAC.

"HDFSYS: Can't attach proxy (%(errno))"

Description: Startup failure.
Severity: P1
Action: Call TAC.

"HDFSYS: Can't locate Fsys"

Description: Startup failure.
Severity: P1
Action: Call TAC.

"HDFSYS: Can't share segments with Fsys (%(errno))"

Description: System failure.
Severity: P1
Action: Call TAC.

"HDFSYS: Error connecting to Fsys (%(errno))"

Description: Startup failure.

Severity: P1
Action: Call TAC.

`"HDFSYS: MAP_seg can't get Fsys segment (%(errno))"`

Description: System failure.
Severity: P1
Action: Call TAC.

`"HDFSYS: MAP_seg Fsys segment too large (%d)"`

Description: System failure.
Severity: P1
Action: Call TAC.

`"HDFSYS: MAP_seg unable to get segment info (%(errno))"`

Description: System failure.
Severity: P1
Action: Call TAC.

`"HDFSYS: Receive from CAM failed (%(errno))"`

Description: Startup failure.
Severity: P1
Action: Call TAC.

`"HDFSYS: Unable to allocate DMA memory (%(errno))"`

Description: System failure.
Severity: P1
Action: Call TAC.

`"HDFSYS: Unable to get segment info (%(errno))"`

Description: System failure.
Severity: P1
Action: Call TAC.

`"HDFSYS: Unknown message type: %d"`

Description: System failure.
Severity: P1
Action: Call TAC.

`"HD_cbf: error from SIM: camErr:%x, senseKey:%x"`

Description: Device failure.
Severity: P3
Action: Report to TAC.

`"HD_cbf: XPT_action() failed with status 0x%x"`

Description: Device error.
Severity: P3
Action: Call TAC.

`"HISADMIN: Close cpy_list failed, MB%s msg#%d !merged"`

Description: If the cpy_list of a message is not closed after copying, then the message is not moved. Mail merge is incomplete.
Severity: P3
Action: QNX library command problem. Call TAC.

"HISADMIN: Close sib list failed, MB%s msg#%d !merged"

Description: If the sibling list cannot be closed, then the message is not sent and the mail merge is incomplete.

Severity: P3

Action: QNX library command problem. Call TAC.

"HISADMIN: Excessive Q_Open Errors"

Description: HISADMIN has tried to open the queue 10 times in a row. It is unlikely that the queue is busy for this long, so there is a problem with opening the queue. HISADMIN cannot operate if it cannot receive instructions from HISRCV so the process dies and integration fails.

Severity: P1

Action: Call TAC. There is a problem with "queue_open," which is a QNX library function.

"HISADMIN: Excessive Q_Read Errors"

Description: HISADMIN has tried to open the queue 10 times in a row. It is unlikely that the queue is busy for this long, so there is a problem with opening the queue. HISADMIN cannot operate if it cannot receive instructions from HISRCV so the process dies and integration fails.

Severity: P1

Action: Call TAC. There is a problem with "queue_read," which is a QNX library function.

"HISADMIN: Get_cpy_list failed, MB%s msg#%d !merged"

Description: Each message has a cpy_list associated with it that contains the message script and to whom the message has been sent. This error is reported during mail merging when the contents of the source mailbox must be moved and merged with the destination mailbox. Failure to get a cpy_list of a message means that mail merging has no message to transfer. Thus mail merging for this particular message does not take place and the mail merge is incomplete.

Severity: P3

Action: Call TAC. There is nothing the user can do.

"HISADMIN: Get_sib_list failed, MB%s msg#%d !merged"

Description: A message has a sibling list attached to it. A sibling list is a list of the forwarding history of the message. Most messages have an empty sibling list. Only messages that have been forwarded have information in the sibling list. However, Get_sib_list should not fail. If it fails then the message is not copied and mail merging is incomplete.

Severity: P3

Action: Call TAC. There is nothing the user can do.

"HISADMIN: Lock Error MB %s. No msgs merged"

Description: An error occurred when locking the source mailbox. The mailbox was located but cannot be locked. This is an internal oaa record problem. No mail is merged.

Severity: P2

Action: Call TAC.

"HISADMIN: MB %s in use. No msgs merged"

Description: The source mailbox was in use then the PMS tried to lock it for merging. No merging could take place.

Severity: P4

Action: Try again later, and make sure no one is using the source mailbox that need to be be merged.

"HISADMIN: No MB %s. No msgs merged"

Description: PMS could not locate the acc record for the gine source mailbox number. This should not happen since the mailbox number has previously been validated. No mail merge takes place.

Severity: P2

Action: Verity that an accurate source mailbox number is used. This is most likely a software bug.

"HISADMIN: Open cpy_list failed, MB%s msg#%d !merged"

Description: This error is reported during mail mergin when a cpy_list of a particular source mailbox message fails to open. There is a cpy_list associated with each mailbox message. Failure to open a cpy_list of a message means that the message cannot be merged into the destination mailbox. Thus mail merging of the source mailbox to the destination mail box is incomplete.

Severity: P3

Action: Call TAC. There is nothing that the user can do.

"HISADMIN: Open sib list failed, MB%s msg#%d !merged"

Description: The sibling list of a message could not be opened. All messages possess a sibling list, which is a list that contains the forwarding history of the message. However, most sibling lists are empty lists. If the sibling list cannot be opened then the message is not copied and an incomplete mail merge occurs.

Severity: P3

Action: QNX library command problem. Call TAC.

"HISADMIN: Q_Open Error %d"

Description: Unable to open the queue which hols requests for action from HISRCV. This error occurs is the queue is busy.

Severity: P4

Action: No action is necessary. HISADMIN will try to open the queue again.

"HISADMIN: Q_Read Error %d"

Description: Unable to read from queue. This error occurs is the queue is busy.

Severity: P4

Action: No action necessary. HISADMIN will try to read the queue again.

"HISADMIN: Read Error MB %s. No msgs merged"

Description: The destination mailbox oaa record could not be read. This caused mail merge to fail and the room swapping function did not succeed.

Severity: P2

Action: Check that the destination mailbox address is within the required range. There is a problem with the oaa record reading function or the mailbox address.

"HISADMIN: Read Error MB %s. No msgs merged"

Description: The source mailbox oaa record could not be read even through it has been located and locked to prevent others from changing the contents while merging. The mail merge ailed and the foom swapping function did not succeed.

Severity: P2

Action: There is a problem with the oaa record reading function fround in oa_send. This is not a user related problem.

"hisinit: Exit mailbox resynchronize loop"

Description: This is an informative message. Either ther are no mailboxes to update during the resync mailbox process or all updates have been completed.
Severity: P4
Action: No action is necessary.

"hisinit: Unable to attach to HISINIT name"

Description: HISINIT is unable to attach a name to itself. Thus HISRCV cannot call it. HISRCV calls HISINIT to RESYNC mailboxes and turn on any pending message waiting light indicators. Thus the message waiting light indicators fail.
Severity: P2
Action: QNX "qnx_name_attach" library function error. Call TAC.

"hisinit: Unable to locate MWLA"

Description: HISINIT turns on message waiting lights following a link resync message in HISRCV. This error message states that the message waiting light Administer cannot be located and therefore the message waiting light does not go on. There is a message waiting light failure.
Severity: P2
Action: MWLA problem. Call TAC.

"HISMWI: Unable to locate mwla"

Description: The message waiting light administrator cannot be located. HISMWI gets requests from the administrator and translates the formats of the request so that the HISSSND can read them. Failure to locate the message waiting light administrator means message waiting light failure.
Severity: P2
Action: MWLA problem. Call TAC.

"HIS PMS Link is down"

Description: Data has been sent across the PMS link and has not been acknowledged. Since the other end of the link is not responding, VoiceMemo logs this "link down" message.
Severity: P2 (link is down but VoiceMemo is up)
Action: Check the serial link connections and make sure that the PMS is communicating with the VoiceMemo. If the problem persists, call TAC.

"HIS PMS Link is up"

Description: VoiceMemo has received data over the PMS link.
Severity: P4
Action: No action. This is an informational message.

"HISMWI: cannot send to mwla"

Description: hismwi cannot communicate with the mwla task.
Severity: P2
Action: Reboot the module, then try rebooting system. Call TAC if problem persists.

"HISMWI: Unable to update MWI %s for mailbox %.6s"

Description: This happens if the link goes down during the message wait process or if hismwi has tried to send to hissnd twice and has been unsuccessful. If this happens often, there may be other problems with the link or with hissnd.
Severity: P2 or P3
Action: Check both sides of the serial link to make sure communications is set up properly. Call TAC if the problem persists.

"HISRCV: Failed to swap mailbox %s with %s"

Description: hisrcv has received a MOVE_MBOX request and has failed while processing it. A log message indicating what part of the move failed will appear before this one. If the "..Deleted mailbox xxx, unable to re-create.." message is NOT logged before this one, the old mailbox will still exist.

Severity: P2

Action: Check the mailboxes for corruption and delete any bad mailboxes. If this message happens often, contact TAC.

"HISRCV: Q_Open Error %d"

Description: Unable to open queue in which have been placed the requests to HISRCV for mailbox merge. This can occur because the queue is busy. Queue ID number will thus be incorrect and the mail merge will be corrupted.

Severity: P2

Action: Try again later.

"HISRCV: Q_Write Error %d"

Description: Queue is open but there is a failure in writing to the queue. This means that HISRCV cannot send instructions to HISADMIN about mailbox merging. As a result, mail merging will not occur.

Severity: P2

Action: QNX queue failure. Call TAC.

"HISRCV: Unable to locate hissnd"

Description: HISRCV has tried five times to attach HISSND by name and failed. HISSND must have died so no integration can take place.

Severity: P1

Action: Restart integration.

"HISSND: Unable to attach name, retrying."

Description: HISSND cannot attach a name to itself. Therefore, others are unable to locate it. HISSND will keep trying to attach a name to itself. If it succeeds, integration resumes as normal. Otherwise, integration fails.

Severity: P1 is the loop is not exited.
P4 if the system recovers.

Action: QNX library function.

"Hitachi PMS link is down"

Description: Data has been sent across the PMS link and has not been acknowledged. Since the other end of the link is not responding, VoiceMemo logs this "link down" message.

Severity: P2 (link is down but VoiceMemo is up)

Action: Check the serial link connections and make sure that the PMS is communicating with the VoiceMemo. If the problem persists, call TAC.

"Hitachi PMS link is down"

Description: The integration polls the PMS three times. If there is no answer, it assumes that the link is down and sends the error message. If a reply is received after this time period then a further error message confirms the link is up. This message indicates the link is non-responsive, rather than down.

Severity: P4

Action: Reactive the link by sending an “ack” or “aok” from the PMS.

`"Hitachi PMS link is up"`

Description: This is an informative message. All checks have been carried out and the PMS link is working correctly.
Severity: P4
Action: No action is necessary.

`"Hitachi PMS link is up"`

Description: VoiceMemo has received data over the PMS link.
Severity: P4
Action: No action. This is an informational message.

`"Hold queue is full. Reqs will be discarded"`

Description: Request will be discarded.
Severity: P3
Action: No Action

`"Ignoring an offhock cmd in active stare in ln %d\n"`

Description: Some misconfiguration which make application try to go offhook while it is already offhook
Severity: P4
Action: Check the configuration, usually the pager configuration.

`"INBAND: Cannot find SFA"`

Description: Inband cannot find SFA. This is a software error. SFA must be running work inband to work.
Severity: P1
Action: Call TAC.

`"INBAND: Error executing action A"`

Description: inband tried to execute the action "A" specified in the template, but received an error code from the sfa. The possible cause is vmemo task died.
Severity: P3
Action: Call TAC.

`"INBAND: Invalid Action (n) in template"`

Description: Invalid character "n" in the action field of a template.
Severity: P2
Action: Correct template from online menu.

`"INBAND: Invalid character (n, hex xx) in template"`

Description: Invalid character "n" in the data field of a template. The hex value is xx.
Severity: P2
Action: Correct templates from online menu.

`"INBAND: Invalid input %d in state %d. Software error"`

Description: This is a software error that indicates the state machine is lost. Inband will not be operational.
Severity: P1
Action: Call TAC.

`"INBAND: Not enough memory to run application"`

Description: inband unsuccessfully tried to allocate scratch pad memory.
Severity: P1
Action: Not enough memory in the system. Add more memory.

`"INBAND: Please install application and reactivate configuration"`

Description: The inband template has not yet been installed.
Severity: P2
Action: Install the template and reactivate the configuration.

`"infoadmin: cannot create QUERY_REC"`

Description: This may be seen if a module has died. If the continuous operation feature is enabled, the system will recover. Otherwise, the system will reboot.
Severity: P3
Action: None

`"infoadmin: cannot register name, node %d"`

Description: This may be seen if a module has died. If the continuous operation feature is enabled, the system will recover. Otherwise, the system will reboot.
Severity: P3
Action: None

`"infoadmin: could not read FAX GROUP REC %s"`

Description: Fax configuration information cannot be accessed
Severity: P3
Action: Check fax configuration or possible disk failure.

`"infoadmin: could not read GROUP REC %s"`

Description: Line configuration information cannot be accessed
Severity: P3
Action: Check line configuration or possible disk failure

`"informing process %s failed (%s)"`

Description: The agent task fails to inform sfa with some data.
Severity: P2
Action: Contact TAC

`"Initial loading of card %s failed (%s)"`

Description: Resource manager failes to spawn the loader program. This will disable all the cards.
Severity: P1
Action: Contact TAC

`"INIT WKUP LIST: oa send returns %d"`

Description: The wua program upon start up tries to read the wakeup account from disk. If the wakeup account does not exist, wua tries to create a new one. This error message comes up when wua fails to create a record for the wakeup account (there are 12 records per wakeup account). This is caused by a corrupted record. If it happens frequently, it can signal a problem with the hard disk.
Severity: P2
Action: If more than one message shows up each time the system is reset, the hard disk may need to be replaced or reformatted.

`"INIT: spchblk %ld(pt=%u) in rsrv msg %u, rsrv=%u"`

Description: sam task allocated a reserved speech block for a non reserved message.
Severity: P2
Action: Perform a system verify. If the problem persists, call TAC.

`"Initialize 7404D Data Link [%s]"`

Description: This is a normal message during a system reboot, otherwise vmemo is receiving an unknown data packet from SYS75/SYS85 on the host system at a different baud rate, so vmemo will try to resynchronize with the SYS75/85 by re-initializing the link.
Severity: None for system reboot.
P2 (normal operation).
Action: If this message appears during normal system operation, turn on CDR and log CDR to a file. Also check your SYS75/85 for any discrepancy in user phone setup. Immediately call TAC.

`"Invalid disk error queue. No disk errors reported."`

Description:
Severity: P1
Action:

`"Invalid disk index %d. Num account disks is %d"`

Description: Internal error.
Severity: P1
Action: Report to TAC.

`"Invalid fax channel assigned. Check line and fax configuration."`

Description: At fax application startup the H:S:P: specified is not a fax HW
Severity: P3
Action: Check fax configuration

`"Invalid Record compression rate, default used"`

Description: An invalid compression rate was received from the application. This is a software error.
Severity: P3
Action: Call TAC.

`"Invalid sector 0, initializing to default values"`

Description: Corrupted or blank boot disk.
Severity: P1
Action: Call TAC.

`"ISUP alarm event 0x%x"`

Description: An unexpected event was forwarded by the ISUP protocol layer.
Severity: P3
Action: Please contact TAC for further action.

`"I/O request while redundant disk %d:%d not present"`

Description: Attempted request on non-installed, non-deleted redundant disk.
Severity: P4
Action: PleNone.ase review SS7 troubleshooting guide for further action.

`"ISUP cir grp maint msg on CIC %d failed"`

Description: The ISUP SS7 message on the circuit group was not acknowledged by the adjacent point code.
Severity: P2
Action:

`"ISUP cir maint msg on CIC %d failed"`

Description: The ISUP SS7 message on the circuit was not acknowledged by the adjacent point code.
Severity: P3
Action: Please review SS7 troubleshooting guide for further action.

`"ISUP circuit validation on CIC %d failed"`

Description:
Severity: P3
Action: Please review SS7 troubleshooting guide for further action.

`"ISUP circuit validation on CIC %d succeeded"`

Description:
Severity: P4
Action: None required.

`"ISUP error indication on ckt %d"`

Description: The SS7 state machine and the protocol layer are out of sync.
Severity: P3
Action: Please contact TAC for further action.

`"ISUP failed to receive BLA on CIC %d"`

Description: The adjacent point code did not respond to our blocking message.
Severity: P3
Action: Review SS7 troubleshooting guide for further action.

`"ISUP failed to receive CGBA on CIC %d"`

Description: The adjacent point code did not respond to our circuit group blocking request.
Severity: P3
Action: Review SS7 troubleshooting guide for further action..

`"ISUP failed to receive CGUA on CIC %d"`

Description: The adjacent point code did not respond to our circuit group unblocking request.
Severity: P3
Action: Review SS7 troubleshooting guide for further action..

`"ISUP failed to receive GRA on CIC %d"`

Description: The adjacent point code did not respond to our circuit reset request.
Severity: P3
Action: Review SS7 troubleshooting guide for further action..

`"ISUP failed to receive RLC on CIC %d"`

Description: The adjacent point code did not respond to our reset request.
Severity: P3
Action: Review SS7 troubleshooting guide for further action..

`"ISUP failed to receive UBA on CIC %d"`

Description: The adjacent point code did not respond to our unblocking request.
Severity: P3
Action: Review SS7 troubleshooting guide for further action..

`"ISUP high level conjestion"`

Description: The system messaging capacity is exceeding operating level and is now in congestion.

Severity: P2
Action: Please contact TAC for further action.

`"ISUP low level conjestion"`

Description: The system messaging capacity is exceeding the normal level.
Severity: P3
Action: Please contact TAC for further action.

`"ISUP maintenance request on CIC %d failed"`

Description: An administrator initiated maintenance action failed.
Severity: P3
Action: Please review SS7 troubleshooting guide for further action.

`"ISUP reattempt indication on ckt %d"`

Description: The SS7 state machine and the protocol layer are out of sync.
Severity: P3
Action: Please contact TAC for further action.

`"ISUP received message for unequipped CIC %d"`

Description: SS7 activity was received for a circuit that is not configured in SS7 line groups.
Severity: P3
Action: Please review SS7 troubleshooting guide for further action.

`"ittmwi: cannot send to mwla"`

Description: ittmwi cannot send to mwla and will not be able to get message waiting requests from mwla, or send the result of any previously processed request to mwla. The integration will not process message waiting requests. ittmwi will try to locate mwla, then try to start mwla, then exit if it cannot get the task id.
Severity: P1
Action: Try rebooting the module. If the problem continues, call TAC.

`"ITTMWI: could not find ittsnd"`

Description: The ittmwi task tries to locate ittsnd by doing a detach_port on the argument that is passed to ittmwi. ittmwi will try to find ittsnd forever.
Severity: P1
Action: Call TAC.

`"ITTRCV: can not send to sfa, aborting"`

Description: The ITT 3100 phase II integration program was unable to talk to the sfa program.
Severity: P2 or P3
Action: Check the log file for other errors. The ittrcv task should be seen to have died and restarted. If it repeatedly dies, look for some other system anomaly in the log file. If no other anomalies are found, verify that the communication over the QNET is still working. If still no problems are found, call TAC.

`"IVMSXFR: bad dtiagnt type %d. Contact Centigram"`

Description: Bad dti agent type.
Severity: P3
Action: Check the DTI/MRO configuration. Check the SL1-IVMS configuration. Check the PBX group configuration. Check the line from the SL1-IVMS PBX. Check the mailbox configuration. Check the online configuration transfer type. Contact TAC if there are still problems.