

GE Healthcare

MUSE™  
Cardiology Information System

Service Manual

2033425-005    Revision C



**NOTE**

Due to continuing product innovation, specifications in this manual are subject to change without notice.

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**For your notes**

# 1 Introduction

# Manual Information

## Revision History

Each page of the document has the document part number followed by a revision letter at the bottom of the page. This letter identifies the document's update level. The revision history of this document is summarized in the table below.

<b>Revision</b>	<b>Date</b>	<b>Comment</b>
A	1 November 2006	Initial release of manual.
B	18 June 2007	Added DL360 G5 IU server.
C	12 October 2007	Added ML370 G5 server.

## Manual Purpose

This manual supplies technical information for service representatives and technical personnel so they can maintain the equipment to the assembly level. Use it as a guide for maintenance and electrical repairs considered field repairable. Where necessary the manual identifies additional sources of relevant information and or technical assistance.

See the operator manual for the instructions necessary to operate the equipment safely in accordance with its function and intended use.

## Chapter Content

- |                             |  |
|-----------------------------|--|
| <b>1 Introduction</b>       | Describes the service manual and chapter contents. Provides general information on safety, service requirements, equipment symbols, and serial number identification.                  |
| <b>2 Equipment Overview</b> | Describes the equipment and its characteristics, connector locations, and preparation for use.   |
| <b>3 Installation</b>       | This chapter contains a reference to installation/upgrade documents for the version 7.0 MUSE system. Also, there is a section which describes set up the "direct to database" feature. |
| <b>4 Database Backup</b>    | This chapter describes how to configure a GE-supplied file server for database backup and archive as well as procedures for disaster recovery.   |
| <b>5 Troubleshooting</b>    | Provides overall and specific troubleshooting help.  |
| <b>6 Maintenance</b>        | Contains a preventive maintenance schedule, instructions for opening the unit, and cleaning guidelines.  |
| <b>7 Parts Lists</b>        | Contains parts lists for reference in repairing the unit at the assembly level.  |
| <b>8 Glossary</b>           | This section contains definitions for technical words and terms used within this document.   |

## Manual Conventions

The following is a list of conventions used throughout the manual.

- Items shown in **Bold** text are keys on the keyboard, text to be entered, or hardware items such as buttons or switches on the equipment.
- To perform an operation which appears with a plus (+) sign between the names of two keys, you press and hold the first key while pressing the second key once. This is called a keystroke combination.

For example, “Press **Ctrl + Esc**” means to press and hold down the Ctrl key while pressing the Esc key.

- When instructions are given for typing a precise text string with one or more spaces, the point where the spacebar must be pressed is indicated as: [**Space**]. The purpose of the [ ] brackets is to ensure you press the spacebar when required.
- Enter means to press the “Enter” or “Return” key on the keyboard. Do not type “enter”.
- *Italicized* items are software terms which identify menu items, buttons, or options in various windows.

## Related Manuals

The following table references OEM websites. This information was current and accurate at the time this manual was released. Titles, part numbers, and URL addresses are subject to change without notice.

Adobe Acrobat Reader software must be installed on your system to read or print the OEM manuals. If you do not have the software installed on your system, it can be obtained for free from the Adobe website at:

<http://www.adobe.com>

Table 2. MUSE System Related Documents	
Part Number of Manual	Name
2014300-081	MUSE Cardiology Information System Operator's Manual (version 7.0)
<b>HP Components</b> Hewlett-Packard Corporation 3000 Hanover Street Palo Alto, California USA 94304	
HP part number: 404682-003	"HP ProLiant ML370 Generation 5 Server User Guide" <a href="http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00710507/c00710507.pdf">http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00710507/c00710507.pdf</a>
HP part number: 375445-005	"HP ProLiant Servers Troubleshooting Guide" <a href="http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00300504/c00300504.pdf">http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00300504/c00300504.pdf</a>
HP part number: 155450-003	"AIT Drive Reference Guide" <a href="ftp://ftp.compaq.com/pub/products/storageworks/techdoc/tapestorage/155450e3.pdf">ftp://ftp.compaq.com/pub/products/storageworks/techdoc/tapestorage/155450e3.pdf</a>
	"HP ProLiant ML370 Generation 5 Server Maintenance and Service Guide" <a href="http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?contentType=SupportManual&amp;lang=en&amp;cc=us&amp;docIndexId=179911&amp;askId=101&amp;prodTypeId=15351&amp;prodSeriesId=1121474">http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?contentType=SupportManual&amp;lang=en&amp;cc=us&amp;docIndexId=179911&amp;askId=101&amp;prodTypeId=15351&amp;prodSeriesId=1121474</a> (To view, save <b>.chm</b> file to hard drive.)
HP PN: 327304-001	"Compaq Rack Products Reference Guide" <a href="ftp://ftp.compaq.com/pub/supportinformation/techpubs/user_reference_guides/327304e1.pdf">ftp://ftp.compaq.com/pub/supportinformation/techpubs/user_reference_guides/327304e1.pdf</a>
HP PN: 384571-001	<a href="http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00368831/c00368831.pdf">http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00368831/c00368831.pdf</a>
HP PN: 391758-001	<a href="http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00383428/c00383428.pdf">http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00383428/c00383428.pdf</a>
HP PN: 373553-002	<a href="http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00218204/c00218204.pdf">http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00218204/c00218204.pdf</a>
HP PN: 341251-002	"Compaq 3000 Series UPS Operation and Reference Guide" <a href="http://www3.compaq.com/support/reference_library/viewdocument.asp?countrycode=1000&amp;prodid=121 Uninterruptible+Power+Supply&amp;source=341251-002.xml&amp;dt=264">http://www3.compaq.com/support/reference_library/viewdocument.asp?countrycode=1000&amp;prodid=121 Uninterruptible+Power+Supply&amp;source=341251-002.xml&amp;dt=264</a>
HP DL360 G5 Server Documents (MUSE EveryWARE)	<a href="http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?&amp;lang=en&amp;cc=us&amp;contentType=SupportManual&amp;docIndexId=179166&amp;prodTypeId=15351&amp;prodSeriesId=1121486&amp;lang=en&amp;cc=us">http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?&amp;lang=en&amp;cc=us&amp;contentType=SupportManual&amp;docIndexId=179166&amp;prodTypeId=15351&amp;prodSeriesId=1121486&amp;lang=en&amp;cc=us</a>

Table 2. MUSE System Related Documents (Continued)

Part Number of Manual	Name
<p><b>Laser Printer</b> Hewlett-Packard Company 11311 Chinden Boulevard Boise, Idaho 83714 U.S.A.</p>	
Hewlett-Packard	<p>"HP LaserJet 4250/4350 Series - User Guide" <a href="http://h200005.www2.hp.com/bc/docs/support/SupportManual/c00218691/c00218691.pdf">http://h200005.www2.hp.com/bc/docs/support/SupportManual/c00218691/c00218691.pdf</a></p>
Hewlett-Packard	<p>"HP LaserJet 4200, HP LaserJet 4300 Getting Started" <a href="http://h200005.www2.hp.com/bc/docs/support/SupportManual/c00227625/c00227625.pdf">http://h200005.www2.hp.com/bc/docs/support/SupportManual/c00227625/c00227625.pdf</a></p>
<p><b>Modem</b> Multi-Tech Systems, Inc. 2205 Woodale Drive Mounds View, MN 55112 U.S.A.</p>	
Multi-Tech PN: S0000195	<p>"MT5634ZBA-V92 V92 Data/Super G3 Fax Modem User Guide" <a href="http://www.multitech.com/DOCUMENTS/multimodemzba/manuals.asp">http://www.multitech.com/DOCUMENTS/multimodemzba/manuals.asp</a></p>
Multi-Tech PN: 82090150	<p>"MT5634ZBA-V92 V92 Data/Super G3 Fax Modem Quick Start Guide" <a href="http://www.multitech.com/DOCUMENTS/multimodemzba/manuals.asp">http://www.multitech.com/DOCUMENTS/multimodemzba/manuals.asp</a></p>
<p><b>Sony AIT-2 Turbo Tape Drive</b> Sony Corporation Osaki Gate City East Tower, 1-11-1, Osaki Shinagawa-ku, Tokyo, 141-0032 Japan</p>	<p>AIT Drive User's Guide <a href="http://sony.storagesupport.com/ait/downloads/sdx550v/SDX-550V_Users_Guide.pdf">http://sony.storagesupport.com/ait/downloads/sdx550v/SDX-550V_Users_Guide.pdf</a></p>
<p><b>Ethernet Hub</b> 3Com Corporation 5400 Bayfront Plaza Santa Clara, California 95052- 8145</p>	
DUA1670_0AAA04	<p>"OfficeConnect Ethernet Hub 4, 4C, 8, 8C User Guide (3C16704A, 3C16703A, 3C16700A, 3C16701A)" <a href="http://www.3com.com/products/en_US/searchbyfile.jsp?fileid=2&amp;path=support&amp;os=all&amp;sort=prodnum&amp;fname=&amp;prodcat=225&amp;pgnum=31">http://www.3com.com/products/en_US/searchbyfile.jsp?fileid=2&amp;path=support&amp;os=all&amp;sort=prodnum&amp;fname=&amp;prodcat=225&amp;pgnum=31</a></p>
<p><b>17- inch Monitor</b> Compaq Computer Corporation P.O. Box 692000 Houston, TX 77269-2000 Street Address: 20555 SH 249 Houston, Texas 77070-2698 U.S.A.</p>	
Compaq PN: 326689-002	<p>"Reference Guide Color Monitor Series 7500" <a href="http://h200005.www2.hp.com/bc/docs/support/SupportManual/c00068895/c00068895.pdf">http://h200005.www2.hp.com/bc/docs/support/SupportManual/c00068895/c00068895.pdf</a></p>

Table 2. MUSE System Related Documents (Continued)	
Part Number of Manual	Name
<p><b>19-inch Monitor</b>            NEC-Mitsubishi Electronics Display of            America, Inc.            Address: 1250 North Arlington Heights            Road, Suite 500            Itasca, Illinois 60143-1248 U.S.A.</p>	
	MultiSync LCD1990SX User's Manual <a href="http://www.necmitsubishi.com/corpus/5/!/LCD1980SX_manual2.pdf">http://www.necmitsubishi.com/corpus/5/!/LCD1980SX_manual2.pdf</a>
<p><b>Bar Code Reader</b>            Hand Held Products            (A Welch Allyn affiliate)            700 Visions Drive            P.O. Box 208            Skaneateles Falls, NY 13153-0208            U.S.A.</p>	
38/3900/DO/UG	"IMAGETEAM™ 3800/3900 Hand Held Linear Imager User's Guide" <a href="http://www.handheld.com/Site.aspx/na/en/products/sbus/?sbu=1">http://www.handheld.com/Site.aspx/na/en/products/sbus/?sbu=1</a>

# Safety Information

## Responsibility of the Manufacturer

GE is responsible for the effects of safety, reliability, and performance only if:

- Assembly operations, extensions, readjustments, modifications, or repairs are carried out by persons authorized by GE.
- The electrical installation of the relevant room complies with the requirements of the appropriate regulations.
- The equipment is used in accordance with the instructions for use.

## General

This device is intended for use under the direct supervision of a licensed health care practitioner.

The device stores ECGs generated by a computerized analysis program which can be used as a tool in ECG tracing interpretation. This computerized interpretation is only significant when used in conjunction with clinical findings. All computer-generated tracings should be overread by a qualified physician.

To ensure patient safety, use only parts and accessories manufactured or recommended by GE.

Contact GE for information before connecting any devices to this equipment that are not recommended in this manual.

If the installation of this equipment, in the USA, will use 240 V rather than 120 V, the source must be a center-tapped, 240 V, single-phase circuit.

Parts and accessories used must meet the requirements of the applicable IEC 601 series safety standards, and/or the system configuration must meet the requirements of the IEC 601-1-1 medical electrical systems standard.

The use of ACCESSORY equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Consideration relating to the choice shall include:

- use of the accessory in the PATIENT VICINITY; and
- evidence that the safety certification of the ACCESSORY has been performed in accordance to the appropriate IEC 601-1 and/or IEC 601-1-1 harmonized national standard.

## Equipment Symbols

For an explanation of the symbols that appear on the equipment, refer to the *MUSE Cardiology Information System Operator's Manual* (PN 2014300-081).

## Warnings and Cautions

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### **DANGER**

Do NOT use in the presence of flammable anesthetics.

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### **WARNINGS**

Replace only with same type and rating of fuse.

This is Class I equipment. The mains plug must be connected to an appropriate power supply.

Turn off power and disconnect power cord from AC power source before removing the cover.

Disconnect patient from unit BEFORE connecting personal computer to unit.

The file server contains an internal battery pack. There is risk of fire and burns if the battery pack is not handled properly. To reduce the risk of personal injury:

- ◆ Do not attempt to recharge the battery.
  - ◆ Do not expose to temperatures higher than 60°C.
  - ◆ Do not disassembly, crush, puncture, short external contacts, or dispose of in fire or water.
  - ◆ Replace only with the Hewlett-Packard spare parts designated for this product.
- 
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### **CAUTIONS**

This equipment contains no user serviceable parts. Refer servicing to qualified service personnel.

U.S. Federal law restricts this device to sale by or on the order of a physician.

Data loss or system failure can result due to ingress of liquids. The system does not provide protection against ingress of liquids. Ensure installation in a cool, dry environment.

To reduce the risk of electric shock, do NOT remove cover (or back). Refer servicing to qualified personnel.

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# Service Information

## Service Requirements

Refer equipment servicing to GE authorized service personnel only. Any unauthorized attempt to repair equipment under warranty voids that warranty.

It is the user's responsibility to report the need for service to GE or to an agent authorized by GE.

Failure on the part of the responsible individual, hospital, or institution using this equipment to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards.

Regular maintenance, irrespective of usage, is essential to ensure that the MUSE system will always be functional when required

## Security Updates

A list of viruses that pose a significant threat to GE customers' product security are posted on the GE Healthcare *Product Security Database* Web site. Vulnerability notification to customers will occur through the Web site. After security patches have been validated for specific GE Healthcare products, this information will be added to this database. After confirming that a particular security patch has been validated for your system configuration, you can download it directly from the Web site of the software manufacturer (Microsoft, etc.) and applied to the customer's GE product. To check on the latest information regarding validated security patches:

1. Browse to the GE Healthcare *Product Security Database* Web site:

<http://www.gehealthcare.com/usen/index.html>

2. Select *Product Security* from the *Solutions* drop-down list.



3. Select *Product Vulnerability Database*.
4. Log on with your SSO (Single Sign On) username and password.

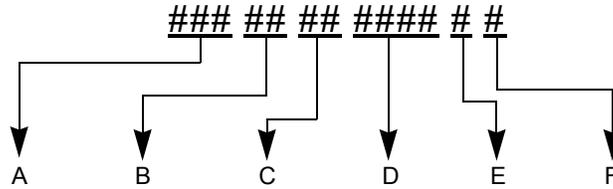
### NOTE

If you do not have an SSO, click the *Sign Up* link to obtain an SSO.

5. Use the features on the GE Healthcare *Product Security Database* Web site to determine security patches that can be applied to your system.
6. Download the applicable updates per the instructions that are provided on the update site.

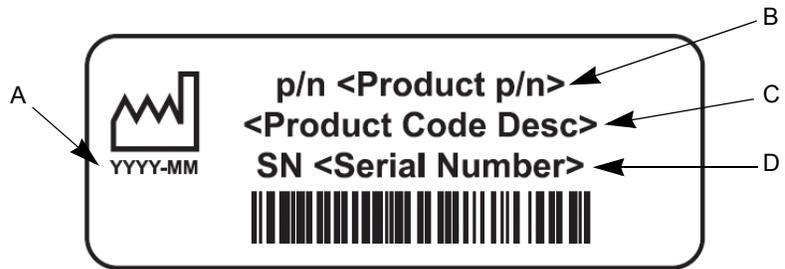
## Equipment Identification

### Serial Number Format



A	Product Code
B	Year Manufactured (00-99) 04 = 2004 05 = 2005 06 = 2006 (and so on)
C	Fiscal Week Manufactured
D	Production Sequence Number
E	Manufacturing Site
F	Miscellaneous Characteristic

### Label Format



A	Date of manufacture in YYYY-MM format
B	Part number of product
C	Product code description
D	Serial number (see "Serial Number Format" on page 1-10).

## FCC Requirements

### Modem Requirements

The modem in your GE device is designed to comply with FCC part 68, U.S. Telecommunication Requirements. See the equipment label on the GE device for the FCC registration number and the ringer equivalence number. The device is designed to be used on standard device telephone lines. Connection to telephone company-provided coin service (central office implemented systems) is prohibited. Connection to party lines service is subject to state tariffs.

The goal of the telephone company is to provide you the best service it can. In order to do this, it may occasionally be necessary for them to make changes in their equipment, operations, or procedures. If these changes might affect your service or the operation of your equipment, the telephone company will give you notice, in writing, to allow you to make any changes necessary to maintain uninterrupted service. If you have any questions about your telephone line, such as how many pieces of equipment you can connect to it, the telephone company will provide this information upon request.

In certain circumstances, it may be necessary for the telephone company to request information from you concerning the equipment which you have connected to your telephone line. Upon request of the telephone company, provide the FCC registration number and the ringer equivalence number (REN) of the equipment which is connected to your line; both of these items are listed on the equipment label. The sum of all of the RENs on your telephone lines should be less than 5 in order to assure proper service from your telephone company. In some cases, a sum of 5 may not be usable on a given line.

If any of your telephone equipment is not operating properly, you should immediately remove it from your telephone line, as it may cause harm to the telephone network. If the telephone company notes a problem, they may temporarily discontinue service. When practical, they will notify you in advance of this disconnection. If advance notice is not feasible, you will be notified as soon as possible. When you are notified, you will be given the opportunity to correct the problem and informed of your right to file a complaint with the FCC.

An analog telephone line is required. A digital PBX line will not work.

### Emissions (Interference) Requirements

This GE device has been tested and complies with the limits for a Class B computing device in accordance with the specifications in Part 15 of the FCC rules. These rules are designed to provide reasonable protection against radio-frequency interference. However, there is no guarantee that interference will not occur in a particular installation.

You can tell whether this device is causing interference by turning it off. If the interference stops, it was probably caused by the device.

**For your notes**

# 2 Equipment Overview

# System Characteristics

## General Description

The MUSE system is a multiple data-type system designed for managing cardiology data. It allows you to edit and store data acquired from many different areas. Data may be acquired from areas within the hospital, as well as from areas not directly connected to the hospital such as emergency care and outreach facilities.

The version 7.0 MUSE system has a file server running Windows Server 2003 which is networked to one or more workstations. The products range from a low-cost, single data-type system to multiple data-type systems with many workstations and virtually unlimited ECG storage capabilities. Options can be added to the standard configuration to suit a customer's particular needs.

## File Server Hardware

Turnkey MUSE systems include GE-supplied hardware, which will be configured with either an HP Proliant ML370 G4 or HP Proliant ML370 G5 server. The available configurations for both platforms are summarized in the following tables:

<b>Table 1. HP Proliant ML370 G4 File Server Configurations</b>		
<b>Features</b>	<b>Tower</b>	<b>Rack-ready</b>
Processor	Single	Single
CPU Slot 1 and PPM Slot 1 Populated	CPU	CPU
Memory, Total (6,144 MB max.)	1024 MB	1024 MB
DIMM 1	512 MB	512 MB
DIMM 2	512 MB	512 MB
DIMM 3	Empty	Empty
DIMM 4 – 8	Empty	Empty
<b>Case/Chassis (rear-Vertical)</b>		
Case slot #6 (Left)	Empty	Empty
Case slot #5	Empty	Empty
Case slot #4	Empty	Empty
Case slot #3	Digiboard Serial MUX (8-port)	Digiboard Serial MUX (8-port)
Case slot #2	10/100 NIC (NC7170)	10/100 NIC (NC7170)

<b>Table 1. HP Proliant ML370 G4 File Server Configurations (Continued)</b>		
<b>Features</b>	<b>Tower</b>	<b>Rack-ready</b>
Case slot #1	Smart Array Controller (642)	Smart Array Controller (642)
<b>External Drive Bay (Front-Horizontal)</b>		
Case slot - Top	48x IDE CD-ROM/16x DVD ROM	48x IDE CD-ROM/16x DVD ROM
Case slot - Middle	AIT-2 Tape Drive	AIT-2 Tape Drive
Case slot - Bottom	Filler panel	Filler panel
<b>HotPlug Drive Bay (Front-Horizontal)</b>		
Ultra3 SCSI ID 5, Top	146 GB	300 GB
Ultra3 SCSI ID: 4	146 GB	300 GB
Ultra3 SCSI ID: 3	146 GB	300 GB
Ultra3 SCSI ID: 2	146 GB	300 GB
Ultra3 SCSI ID: 1	Empty	300 GB
Ultra3 SCSI ID 0. Bottom	Empty	300 GB
<b>HotPlug - Supplies/Fans</b>		
Power Supply	500 Watts	500 Watts
Redundant PS (Rear-Lower Left)	Redundant PS Kit	Redundant PS Kit
Redundant Fans	Yes – Installed	Yes – Installed

<b>Table 2. HP Proliant ML370 G5 Server Configurations</b>		
<b>Features</b>	<b>Tower</b>	<b>Rack-ready</b>
Processor	Intel® Xeon® 5120 1.86 GHz, dual core	Intel® Xeon® 5120 1.86 GHz, dual core
L2 cache	4MB	4MB
System memory	2GB 2x1GB PC2-5300 Fully Buffered DIMM	2GB 2x1GB PC2-5300 Fully Buffered DIMM
Hard drive capacity	292GB Total 4x146GB	584GB Total 6x146GB

Table 2. HP Proliant ML370 G5 Server Configurations (Continued)		
Features	Tower	Rack-ready
Hard drive type	2.5" Hot-swappable SAS 10000RPM	2.5" Hot-swappable SAS 10000RPM
Hard drive fault tolerance	RAID Level 5	RAID Level 5
RAID controller	HP Smart Array P400 (256<B)	HP Smart Array P400 (256<B)
Video	Integrated ATI ES 1000 32MB, standard 1280 x 1024 x 16M color	Integrated ATI ES 1000 32MB, standard 1280 x 1024 x 16M color
Network	Embedded dual NIC373i multifunction Gigabit NICs	Embedded dual NIC373i multifunction Gigabit NICs
Optical Drive	HP - DVD RW 16x/8x 5.25" IDE	HP - DVD RW 16x/8x 5.25" IDE
Power supply	Two (2) redundant hot-swappable	Two (2) redundant hot-swappable
Serial ports	8, serial MUX	8, serial MUX
Tape backup	AIT-2 Turbo tape drive 80/208GB	Optional
Server management	Insight Manager	Insight Manager
Height	46.7 cm / 18.38 in.	21.92 cm / 8.63 in
Width	21.92 cm / 8.63 in.	44.45 cm / 17.5 in
Depth	72.39 cm / 28.5 in.	67.31 cm / 26.5 in
Input voltage	100 VAC, 200 VAC 100-240 VAC	100 VAC, 200 VAC 100-240 VAC
Server rated input power	1010 W Max	1010 W Max
UPS rated	1.5KVA	—

**NOTE**

The telephone line must be an analog telephone line for communication with the host MUSE system to work properly. Newer digital telephone systems will not work with this equipment.

**NOTE**

The HP RAID server can be configured with a 4-port KVM (Keyboard-Video-Mouse) switch for servicing “headless” clients.

## Client Hardware

### MUSE Desktop Workstation

The desktop workstation is based on Intel's 3.0 GHz Pentium 4 microprocessor. It comes standard with 512 MB of RAM, one 40GB SATA/100 hard drive and one 1.44-MB diskette drive.

## Optional Equipment

The following optional equipment may be purchased with your MUSE system.

- Monitor - 17" CRT monitor or 19" flat-panel LCD monitor
- HP LaserJet 4250N printer \*
- Fax Modem \*
- CSI Modem \*

\* Not available on the file server.

## Monitors

The 17" color monitor has a HP flat-faced shadow mask cathode ray tube. It has a 16" viewable image size and a maximum resolution of 1600 x 1200 at 65Hz.

The 19" flat panel display has an NEC-Mitsubishi MultiSync LCD with an 19" viewable image size and a 1280 x 1024 native resolution.

## Printers

The HP LaserJet 4250N printer contains 8MB of RAM, and prints all reports including Holter, stress, echo, pacemaker, resting and hi-res ECG's on standard paper. For additional information on this printer, please refer to the OEM (original equipment manufacturer) manual.

## Modems

A CSI modem is used for communication with MAC 5000, MAC 5500, MAC 3500, and MAC 1200 resting ECG analysis systems.

A Multi-Tech FAX modem is used for faxing reports to Group 3-compatible FAX machines.

## Software

The MUSE system is capable of acquiring data from a variety of sources, both within and outside the hospital. Data is acquired via a network, floppy diskette, direct line, or telephone transmission. Users may view and measure ECG waveforms, edit and confirm the acquired data, and create an assortment of configurable data reports.

The MUSE system software is a menu driven program which operates within Microsoft Windows. The overall program is divided into “applications”. Each application includes many related operations. For example, the *System Status* Application includes operations that let you display lists of errors, events, pending tasks, and print queues.

## Network Functions

Computers may be networked to each other via twisted pair ethernet. Every MUSE system comes equipped from the factory with the customer selected network interface.

TCP/IP is the standard networking protocol for the MUSE system.

## Workstation Setup

### NOTE

Some of the choices you will be asked to make when setting up workstations may be decided when they are installed. The choices available are as follows: add shortcut to launch MUSE using Windows Authentication and add shortcut to launch MUSE using MUSE Authentication. If missed during the installation the following command line entries can be used to add the shortcuts:

**museshorts -muse** (adds MUSE Authentication icon and will require user to enter their MUSE sign-on ). The other is: **museshorts -win** (adds Windows Authentication icon, MUSE will launch with no sign-on required). Refer to “MUSE Cardiology Information System Advanced Security Guide” for information about Authentication and how it affects the level of security on your MUSE v7.0 system.

## MUSE Authentication

MUSE authentication allows a user to login into the MUSE application using the MUSE Login Screen and a MUSE password. A MUSE login is typically used when MUSE must be accessed by several individuals sharing the same computer. MUSE authentication is enabled by using the switch **-museauthenticate** when opening the **MUSEEditor.exe** file to launch MUSE. A desktop shortcut to MUSE using MUSE Authentication is selectable at the initial installation of MUSE or can be added later using the **museshorts.bat** file located in the MUSE directory.

If using MUSE authentication the user must have a MUSE account but does not need a Windows account.

## Windows Authentication

Windows authentication allows a user to login directly into MUSE without using the MUSE login Screen. The user must first be logged into the MUSE workstation using their Windows account. The user must also have their Windows User Name identified in MUSE. The user needs to have both a MUSE and Windows account setup. A desktop shortcut to MUSE using Windows Authentication is selectable at the initial installation of MUSE or can be added later using the "museshorts.bat" file located in the MUSE directory.

# Preparation for Use

The following interconnect diagrams give a general overview of how your workstation should be set up. There are too many variations to show all of them, but enough information should be provided so someone reasonably familiar with computer system installations should have no problem.

Step-by-step instructions for setting your workstation up for the first time can be found in the sections following the interconnect diagram. Use the interconnect diagram as a reference when following these instructions. Please refer to the supplied OEM manuals and the “[System Components, Controls, Indicators, and Locations](#)” on page 2-19 for more specific information.

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**DANGER**

Do NOT use in the presence of flammable anesthetics.

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**WARNINGS**

This is Class I equipment. The mains plug must be connected to an appropriate power supply.

Keep leakage current within acceptable limits when connecting auxiliary equipment to this device.

Disconnect patient from unit BEFORE connecting personal computer to unit.

The file server contains an internal battery pack. There is risk of fire and burns if the battery pack is not handled properly. To reduce the risk of personal injury:

- ◆ Do not attempt to recharge the battery.
  - ◆ Do not expose to temperatures higher than 60°C.
  - ◆ Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
  - ◆ Replace only with the HP spare parts designated for this product.
- 
- 

**NOTE**

MUSE system operation may be affected if large machines with high current draws are connected to the same electrical circuit as the MUSE system. It is recommended that the MUSE system be connected to a power source away from these machines.

# Connect File Server and the Clients

The following tables provide information for interconnection of the two types of file servers (tower and rack) and for the MUSE clients.

<b>Table 3. Tower File Server Interconnections</b>		
<b>Connect From</b>	<b>Connect To</b>	<b>Comments/Remarks</b>
<b>UPS</b>		
Power Supply	Ext. AC	Ensure all devices are properly configured for the mains power (i.e. 110 or 220 VAC). Ensure all devices to be plugged into the UPS are turned 'OFF'.
Serial	Server (COM1)	See "Server" on page 2-9.
<b>Server</b>		
Power Supply	UPS	Via applicable AC power cord
COM1	UPS serial	Via serial: 9 pin-D to serial: 9 pin-D
Video	Display	See "Display" on page 2-10.
Keyboard	Keyboard	See "Keyboard" on page 2-10.
Mouse	Mouse or Trackball	See "Mouse/Trackball" on page 2-10.
Internal Ethernet	Ethernet Hub (#8)	Via applicable length Ethernet cable
Digi Card	Modems	Via serial: 78 pin-D to multiple 9 pin-D's [P1-8: plus 9 to 25 pin-D extension cables]
<b>Modems</b> (Common modem connections)		
DC Pwr	AC/DC power module	AC/DC power supplied from external power source
Line	Ext. phone jack	Via applicable length phone cord
<b>CSI modem application option(s)</b>		
Modem: CSI 1	Server via P1	Via Server serial: 78 pin-D to 9 pin-D (P1) plus 9 to 25 pin-D extension cable.
Modem: CSI 2	Server via P2	Via Server serial: 78 pin-D to 9 pin-D (P2) plus 9 to 25 pin-D extension cable.
Modem: CSI 3	Server via P3	Via Server serial: 78 pin-D to 9 pin-D (P3) plus 9 to 25 pin-D extension cable.
Modem: CSI 4	Server via P4	Via Server serial: 78 pin-D to 9 pin-D (P4) plus 9 to 25 pin-D extension cable.

<b>Table 3. Tower File Server Interconnections (Continued)</b>		
<b>Connect From</b>	<b>Connect To</b>	<b>Comments/Remarks</b>
<b>FAX modem application option(s)</b>		
Modem: FAX 1	Server via P5	Via Server serial: 78 pin-D to 9 pin-D (P5) plus 9 to 25 pin-D extension cable.
Modem: FAX 2	Server via P6	Via Server serial: 78 pin-D to 9 pin-D (P6) plus 9 to 25 pin-D extension cable.
Modem: FAX 3	Server via P7	Via Server serial: 78 pin-D to 9 pin-D (P7) plus 9 to 25 pin-D extension cable.
Modem: FAX 4	Server via P8	Via Server serial: 78 pin-D to 9 pin-D (P8) plus 9 to 25 pin-D extension cable.
<b>Display</b>		
Power Supply	UPS	Via applicable AC power cord
Video	Server	Via display video cable (hardwired into display)
<b>Keyboard</b>		
Keyboard	Server	Via keyboard cable (hardwired into keyboard)
<b>Mouse/Trackball</b>		
Mouse/Trackball	Server	Via mouse/trackball cable (hardwired in mouse/trackball)
<b>Ethernet Hub</b>		
Power Supply	Ext. AC	Ensure all devices with manual power selection are properly configured for the mains power (i.e. 110 or 220 Vac).
Port #8	Server Ethernet	Via applicable length Ethernet cable
Port #1-7	Clients (i.e. nodes)	Optional
<b>Clients (MUSE or HIS), see Clients</b>		
Power Supply	UPS if applicable	Via applicable AC power cord
NIC #2	Ethernet Hub (1-7)	Optional (see Client)

<b>Table 4. Rack-Mounted File Server Interconnections</b>		
<b>Connect From</b>	<b>Connect To</b>	<b>Comments/Remarks</b>
<b>UPS</b>		
Power Supply	Ext. AC	Install 'Heavy Duty' Line Cord for UPS 220V installation <ul style="list-style-type: none"> <li>■ Ensure all devices are properly configured for the mains power (i.e. 110 or 220 Vac).</li> <li>■ Ensure all devices to be plugged into the UPS are turned 'OFF'.</li> </ul>
Serial	Server (COM1)	See Server
<b>Server</b>		
Power Supply 1	UPS	Via applicable AC power cord
Power Supply 2	UPS	Via applicable AC power cord
COM1	UPS serial	Via serial: 9 pin-D to serial: 9 pin-D
Video	Display	See "Display" on page 2-10.
Keyboard	Keyboard	See "Keyboard" on page 2-10.
Mouse	Mouse or Trackball	See "Mouse/Trackball" on page 2-10.
SCSI RAID Card (case slot #1)	Hot Pluggable Drive Bay	OEM installed (internal cable connection)
Digi Card (case slot #5)	Modem Rack	Via serial: 78 pin-D to multiple 9 pin-D's [P1-8: plus 9 to 25 pin-D extension cables]
Network Interface Card (case slot #7)	External Ethernet	Via applicable length Ethernet cable
<b>Modem Rack</b>		
Power Supply	UPS	Via applicable AC power cord
<b>Modem Rack (Rear View) - shown with modem installed in Bay 12</b>		
Bay 03: not used	Bay 02: FAX 1 (optional)	Bay 01: CSI 1 (optional)
Bay 06: not used	Bay 05: FAX 2 (optional)	Bay 04: CSI 2 (optional)
Bay 09: not used	Bay 08: FAX 3 (optional)	Bay 07: CSI 3 (optional)
DC Pwr		
DC Pwr	(25 pin-D)	[Phone] [Line]
Modems in Modem Rack [reference: Modem Rack (Rear View - table above)]		
<b>Common modem connections to Modem Rack</b>		
Bay N DC Pwr	Modem Rack bay N DC	DC power supplied from the Modem Rack, applicable bay
Bay N [Line]	Ext. phone jack	Via applicable length phone cord
<b>CSI modem application option(s)</b>		
Bay 01 serial (CSI 1)	Server via P1	Via Server serial: 78 pin-D to 9 pin-D (P1) plus 9 to 25 pin-D extension cable.
Bay 04 serial (CSI 2)	Server via P2	Via Server serial: 78 pin-D to 9 pin-D (P2) plus 9 to 25 pin-D extension cable.

<b>Table 4. Rack-Mounted File Server Interconnections (Continued)</b>		
<b>Connect From</b>	<b>Connect To</b>	<b>Comments/Remarks</b>
Bay 07 serial (CSI 3)	Server via P3	Via Server serial: 78 pin-D to 9 pin-D (P3) plus 9 to 25 pin-D extension cable.
Bay 10 serial (CSI 4)	Server via P4	Via Server serial: 78 pin-D to 9 pin-D (P4) plus 9 to 25 pin-D extension cable.
FAX modem application option(s)		
Bay 02 serial (FAX 1)	Server via P5	Via Server serial: 78 pin-D to 9 pin-D (P5) plus 9 to 25 pin-D extension cable.
Bay 05 serial (FAX 2)	Server via P6	Via Server serial: 78 pin-D to 9 pin-D (P6) plus 9 to 25 pin-D extension cable.
Bay 08 serial (FAX 3)	Server via P7	Via Server serial: 78 pin-D to 9 pin-D (P7) plus 9 to 25 pin-D extension cable.
Bay 11 serial (FAX 4)	Server via P8	Via Server serial: 78 pin-D to 9 pin-D (P8) plus 9 to 25 pin-D extension cable.
<b>Display</b>		
Power Supply	UPS	Via applicable AC power cord
Video	Server	Via display video cable (hardwired into display)
<b>Keyboard</b>		
Keyboard	Server	Via keyboard cable (hardwired into keyboard)
<b>Mouse/Trackball</b>		
Mouse/Trackball	Server	Via mouse/trackball cable (hardwired in mouse/trackball)

Table 5. MUSE Client/CCG Interconnections		
Connect From	Connect To	Comments/Remarks
<b>Workstation</b>		
Power Supply	Ext. AC	Ensure all devices are properly configured for the mains power (i.e. 110 or 220 VAC). Ensure all devices to be plugged into the UPS are turned 'OFF'.
Video	Display	See "Display"
Keyboard	Keyboard	See "Keyboard/Barcode"
Mouse	Mouse or Trackball	See "Mouse/Trackball"
COM1	Mac8 connector	Optional for MUSE Client
(PCI #4: top case slot) *		
Network Interface Card (PCI #3: 2nd case slot)	External Ethernet	Optional
(PCI #2: 3rd case slot) *		
Network Interface Card (PCI #1: bottom case slot)	Ethernet Hub	(Client -to- Ethernet Hub -to- Server) connection
<b>Display</b>		
Power Supply	Ext. AC	Via applicable AC power cord
Video	Client	Via display video cable (hardwired into display)
<b>Keyboard/Barcode</b>		
Keyboard/Barcode Reader	Client	Via keyboard cable (hardwired into keyboard)
<b>Mouse/Trackball</b>		
Mouse/Trackball	Client	Via mouse/trackball cable (hardwired in mouse/trackball)

\*Not used

## Uninterruptible Power Supply (UPS)

1. Unpack the UPS and place it in a location near where you plan to set up the workstation. An area on the floor and under the desk is recommended. Keep in mind that the unit needs to be accessible.
2. Ensure that the power switch on the back of the unit is in the **OFF** position.
3. Connect the UPS power cord into a 20 amp power outlet dedicated to the workstation.

### **NOTE**

Do not connect your laser printer to the UPS. The large periodic current draw of the printer will trigger the low voltage alarm on the UPS.

4. Connect the UPS serial cable from the UPS serial port to **COM1** on the file server.

## Client

1. Unpack the system box and place it in a location near the UPS.
2. Note the location of the items on the back of the system box. You need to know where each of the controllers or connectors are to properly set up your system.

Detailed descriptions of these items are in the original equipment manufacturer (OEM) manual you received with your system, and further defined in the “[System Components, Controls, Indicators, and Locations](#)” on page 2-19. You can also use the interconnect diagrams for locating the proper connectors.

3. Verify that the input power selection switch on the back of your system box is set correctly for your environment. The voltage visible on the switch is the voltage at which the system is set to operate.
4. Ensure the power control button, located on the front of the client hardware, is off. Also ensure that the system power enable switch on the back of the desktop server is in the off position by pressing the end marked **0**.
5. Connect the AC power cord to the AC power receptacle on the back of the system box and to one of the power outlets on the back of the UPS.

## Monitor

1. Unpack the monitor and place it on the desktop. The monitor may also be placed on top of the client.
2. Verify that the power switch is in the off position.
3. Connect the AC power cord to the power receptacle on the back of the monitor and to one of the power outlets on the back of the UPS.
4. Connect one end of the video cable to the back of the monitor and connect the other end to the appropriate port on the back of the system box. Use the interconnect diagrams as a reference.

### **NOTE**

Be sure to connect the monitor to the file server and not the modem module.

## Modem Module

1. If a modem module was ordered, unpack it and place it in a location near the UPS.
2. Note the location of the items on the back of the system box. You need to know where each of the controllers or connectors are to properly set up your system.

Detailed descriptions of these items are in the original equipment manufacturer (OEM) manual you received with your system, and further defined in the “System Components, Controls, Indicators, and Locations” section in this chapter. See Table 5, “[MUSE Client/CCG Interconnections](#),” on page 2-13 for locating the proper connectors.

### **NOTE**

The modem module does not use a keyboard or a monitor.

3. Ensure the power switch on the back of the unit is in the off position by pressing the end marked 0.
4. Connect the AC power cord into the AC receptacle on the back of the system box and to one of the power outlets on the back of the UPS.

## Fax/Asynch CSI Multitech Modem

Refer to “[How to Set Up Modems](#)” on page 3-4 for specific instructions regarding how to add either the STANDARD FAX modem or the ASYNCH CSI modem as Windows Services on a MUSE File Server or client running Windows.

## Keyboard and Mouse

1. Ensure the system power is off.

### **NOTE**

Power should always be OFF when connecting or disconnecting the keyboard or mouse.

2. Connect the keyboard/bar code wand cable to the 6-pin keyboard port on the back of the system box and to the port on the back of the keyboard. Use the interconnect diagrams as a guide.
3. Connect the mouse cable to the 6-pin mouse port on the back of the system box. See the interconnect diagram for the exact location.

## Network Connection

### Twisted Pair

1. If your network is twisted pair, unpack the 3Com Linkbuilder hub and place it near your system box or in the location designated by your customer's IS department.
2. Connect each system box to the network by running your twisted pair wire from the twisted pair network port on the back of the system box to a port on the hub.

If necessary, multiple hubs may be linked together to accommodate a large number of workstations.

### Enterprise Network

If you are connecting to the customer's enterprise network, your system contains a "special". An RSA should be involved in the installation.

## HP Laser Jet Printer

### **NOTE**

Do NOT plug your laser printer into the UPS.

1. If you are connecting the HP laser printer to your system, unpack the HP LaserJet and place it in the desired location.
2. Follow the installation instructions provided in the HP manuals which accompanied your shipment of equipment.

### **JAM RECOVER Setting**

After connecting your printer, ensure that the *JAM RECOVER* setting is turned on.

# Powering On and System Shutdown

## Introduction

The section includes the following procedures:

- Powering on the workstation
- Powering off the workstation

## Powering On the Workstation

Power on your client as specified below. Additional information can be found in your file server's OEM manual.

1. Verify that all system components such as the monitor, keyboard, etc. are connected. All connections should be made while the system is off.

### **NOTE**

If a laser printer is part of the system, do not plug it into the uninterruptible power supply (UPS). In some environments, the cycling of power in the laser printer will cause the UPS alarm to sound (approximately every minute).

2. Turn on the UPS power switch.
3. Turn on peripheral devices, monitors, and printers.
4. Turn on the power enable switch on the back of your desktop and communication servers.
5. Press the power control button on the front of your system to turn it on. The system will power up and immediately begin the power-on self test (POST).
6. Make sure the *Authorization* window appears.

### **NOTE**

System shutdown procedures are described in Chapter 4, "[Database Backup to Local Tape](#)".

# Checkout the Workstation

## Final Checkout

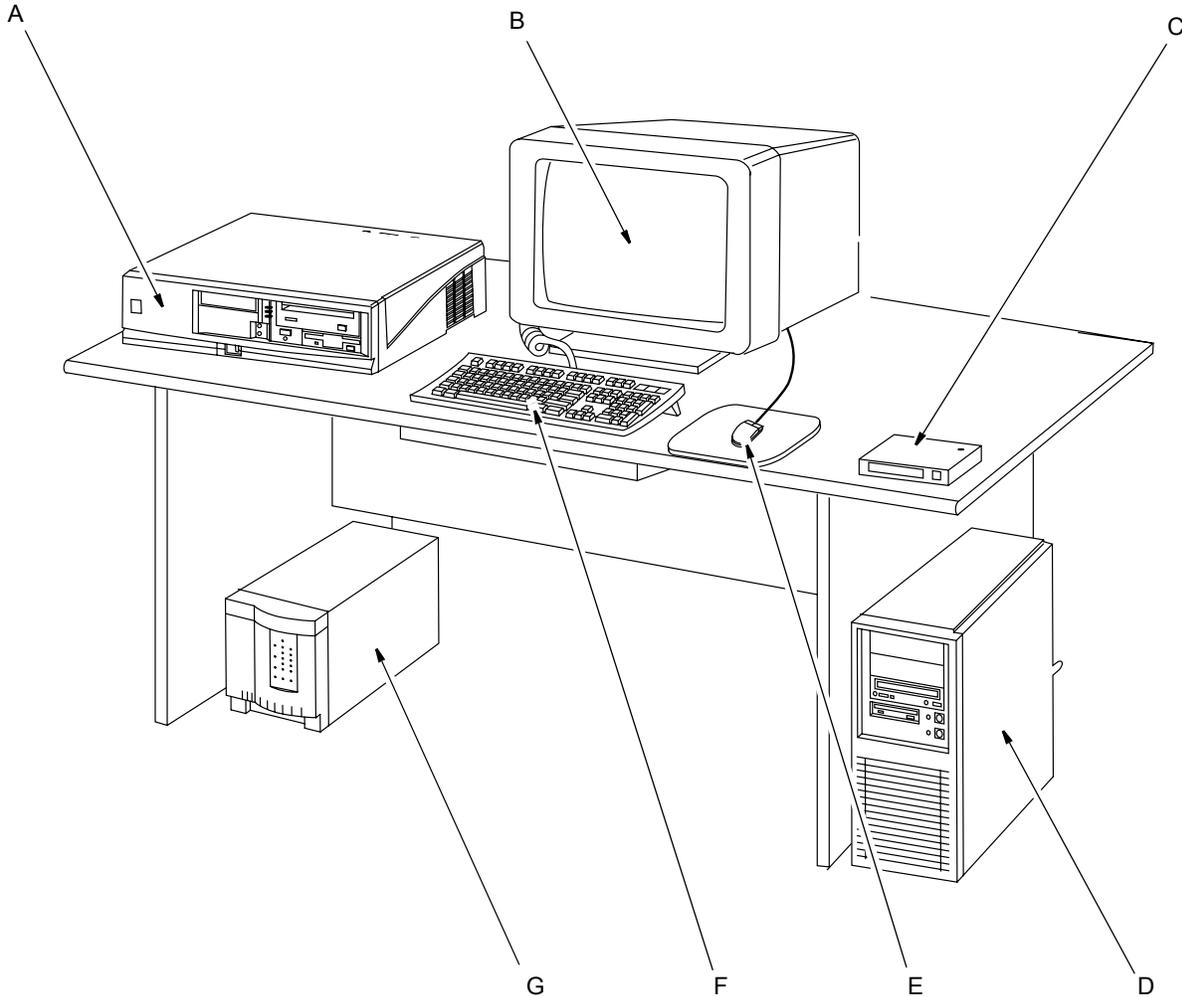
Perform the following for all applicable options. Use this manual and the MUSE system operator's manual for reference.

1. Client Initialization – Power up all clients and ensure each initializes, error free, and you can log in.
2. Diskette Acquisition – Acquire test ECGs via electrocardiograph diskettes and ensure they plot according to report distribution.
3. Phone Acquisition – Acquire test ECGs via remote electrocardiograph modems and ensure they plot according to report distribution.
4. Holter – Locally transmit data from the Holter to the MUSE system.
5. TRAM Module – Test that data is successfully flowing from the TRAM to the MUSE system.
6. CSI – Acquire test ECGs via remote CSI modems.
7. Remote Query – Test CSI modem connections if system has Remote Query.
8. Edit – View and edit an ECG from the *Edit List*.
9. Writer/Printers – Test writers to ensure they plot. Check for burned out dots, especially in the bar code region.
10. Fax – Fax a record to test fax modems.
11. Backups – Perform a non-scheduled backup. See Chapter 4, “[Database Backup to Local Tape](#)” for details. Check that all tapes are being successfully used. Replace tapes that are past their intended life span (customer should store old tapes for safe keeping).

# System Components, Controls, Indicators, and Locations

This section provides a description of the MUSE system hardware. The first diagram is a typical setup containing a tower file server and modem module. The second diagram shows a typical setup using a client.

## Tower File Server System



20A

**NOTE**

The components shown in the figure above are representative of a typical MUSE system with a tower file server. They may not appear identical to the components of your system.

**Table 6. Tower File Server System Description**

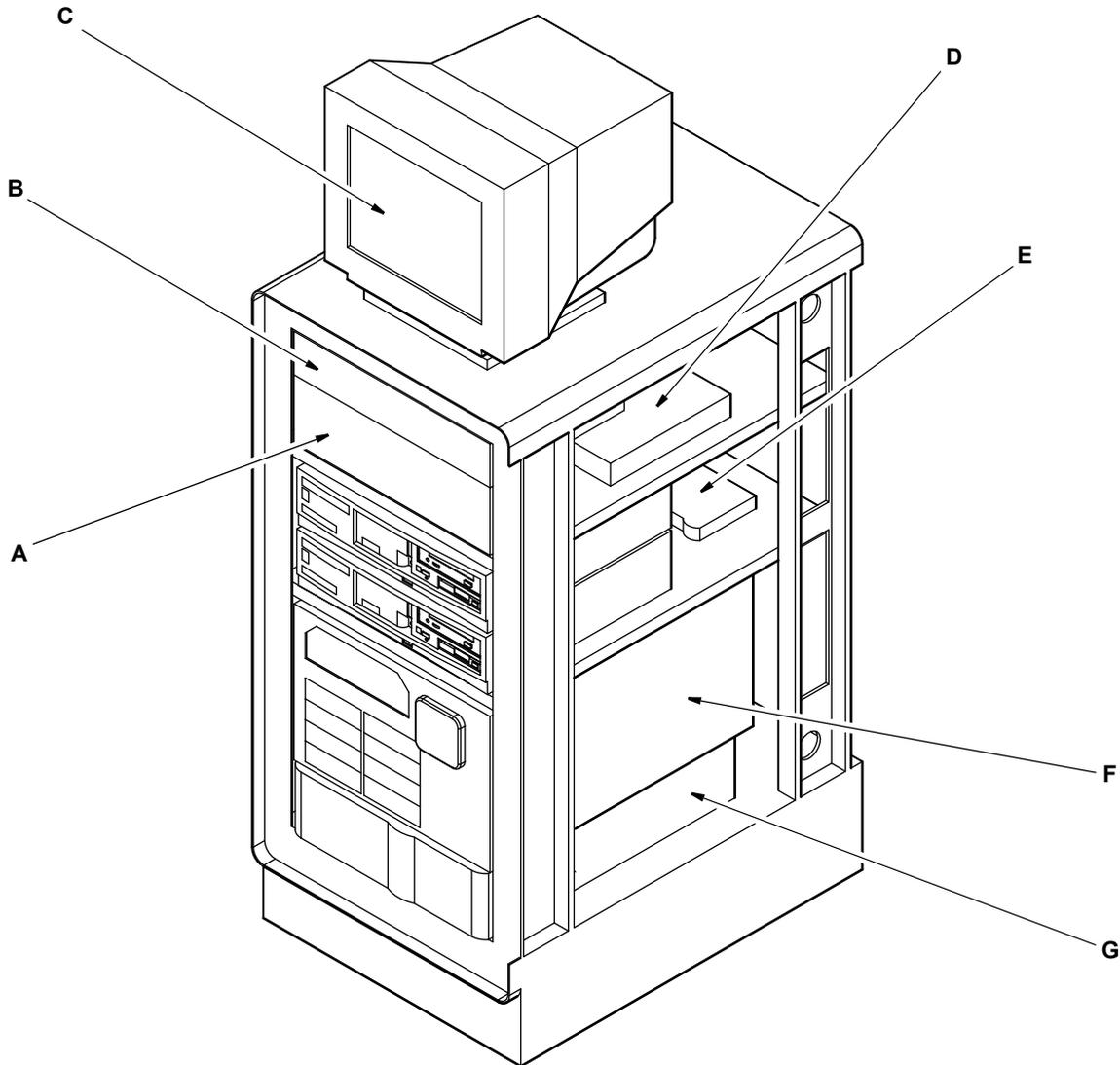
Item	Name	Description
A	modem module	Stores system's modems.
B	monitor	Displays information, messages, etc.

**Table 6. Tower File Server System Description (Continued)**

Item	Name	Description
C	Hub	Hub used in twisted pair networks. This item is optional.
D	file server	System box. Contains the power supply, hard disk drive, RAM, central processing unit, etc.
E	mouse	An input device used to move the cursor and select items on the display. The mouse is standard on the system.
F	keyboard	The keyboard is an input device. Use the keyboard to type information when required by the system.
G	UPS	The UPS automatically provides temporary power to the MUSE system in the event of a power interruption.

## Rack-Mounted File Server System

The figure below shows the RAID file server configuration in rack.



40A

**NOTE**

The components shown in the figure above are representative of a typical MUSE system with a rack-mounted server. They may not appear identical to the components of your system.

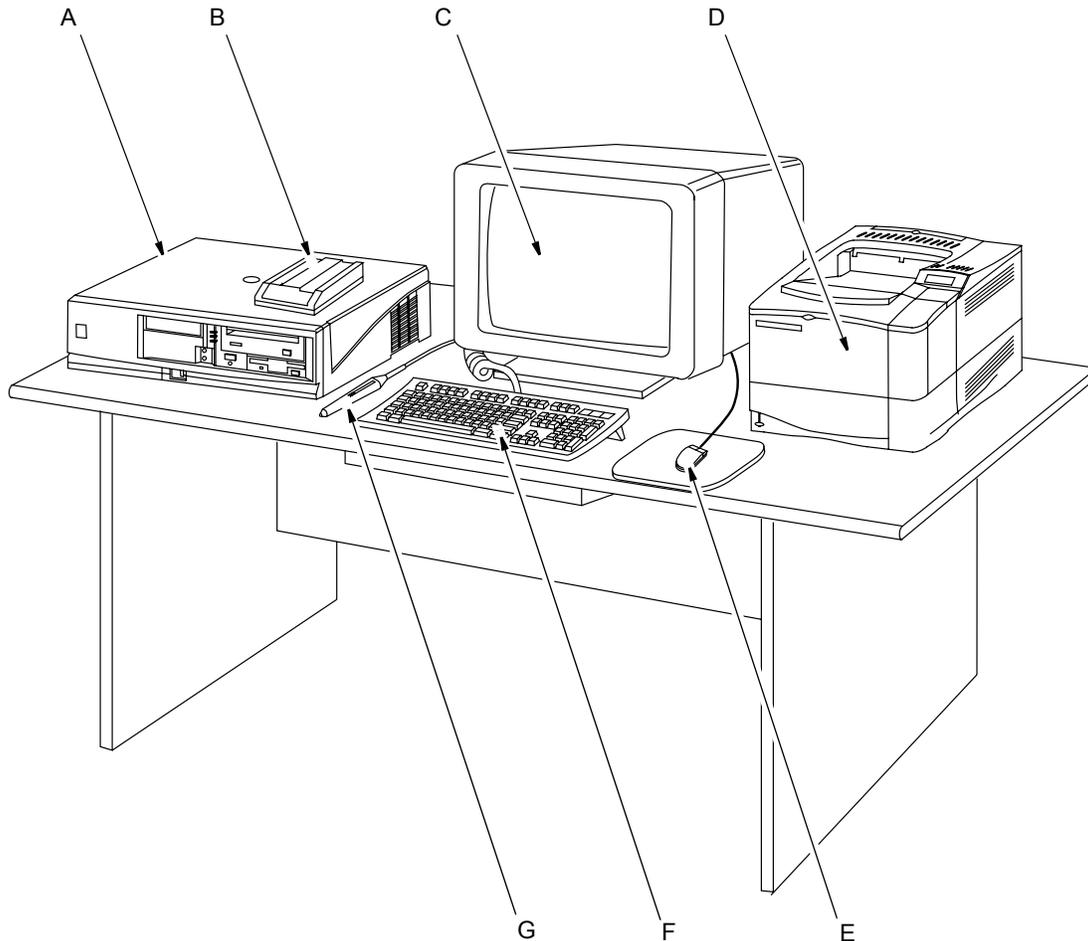
Table 7. Rack-Mounted File Server System Description		
Item	Name	Description
A	Modem Rack	Can hold up to 12 modems.
B	Keyboard Drawer	Pulls out to allow access to the keyboard.

**Table 7. Rack-Mounted File Server System Description (Continued)**

<b>Item</b>	<b>Name</b>	<b>Description</b>
C	Monitor	Displays data on the screen. See the OEM manual for operational details.
D	Keyboard-Video-Monitor (KVM) switch	Used to switch between PC1, PC2, and the file server.
E	Hub	Connects PC1, PC2, and the file server to the network.
F	File Server	Stores mirrored copies of MUSE system database.
G	Uninterruptible Power Supply (UPS)	Provides uninterruptible AC power in case of a power failure or power conditioning.

## Workstation Client System

This section provides a description of the MUSE system hardware. The hardware associated with a typical workstation client configuration is shown.



21A

**Table 8. Workstation Client System Description**

Item	Name	Description
A	client	The system box which contains the power supply, hard disk drive, RAM, central processing unit, etc.
B	CSI modem	Used to communicate with MAC 1200, MAC 5000, and MAC 5500 resting ECG analysis systems.
C	monitor	Displays information, messages, reports, ECGs, etc.
D	HP LaserJet 4250N printer	Optional Laser printer used to print various reports on standard paper.

**Table 8. Workstation Client System Description (Continued)**

<b>Item</b>	<b>Name</b>	<b>Description</b>
E	mouse	Input device used to move the mouse cursor and select items on the display.
F	keyboard	The keyboard is an input device. Use the keyboard to type information when required by the system.
G	bar code reader	Used to select and edit ECGs. Makes the system easier to use for those not used to working with computers.

# Component Descriptions

**NOTE**

The orientation of the HP ProLiant ML370 illustrations in this chapter is for the rack model. The orientation for the tower is on a 90-degree angle.

## MUSE File Server (ML 370 G5) CPU, Front

Rack-Ready Model

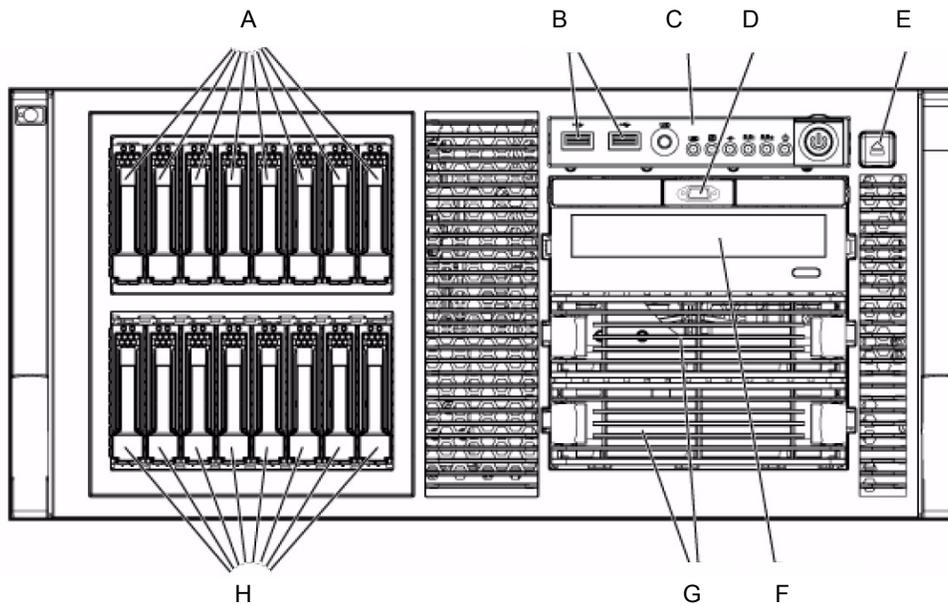


Table 9. CPU Front, HP ProLiant ML370 G5, Rack Model

Item	Description
A	Hard drive bays 9 – 16 (optional drive cage)
B	USB connectors
C	Front Panel LEDs and buttons (See “Front Panel LEDs and Buttons” on page 2-27 for more information.)
D	Video Connector (rack model only)
E	HP Systems Insight Display ejector button
F	DVD/CD-ROM drive
G	Removable media bays
H	Hard drive bays 1-8

## Tower Model

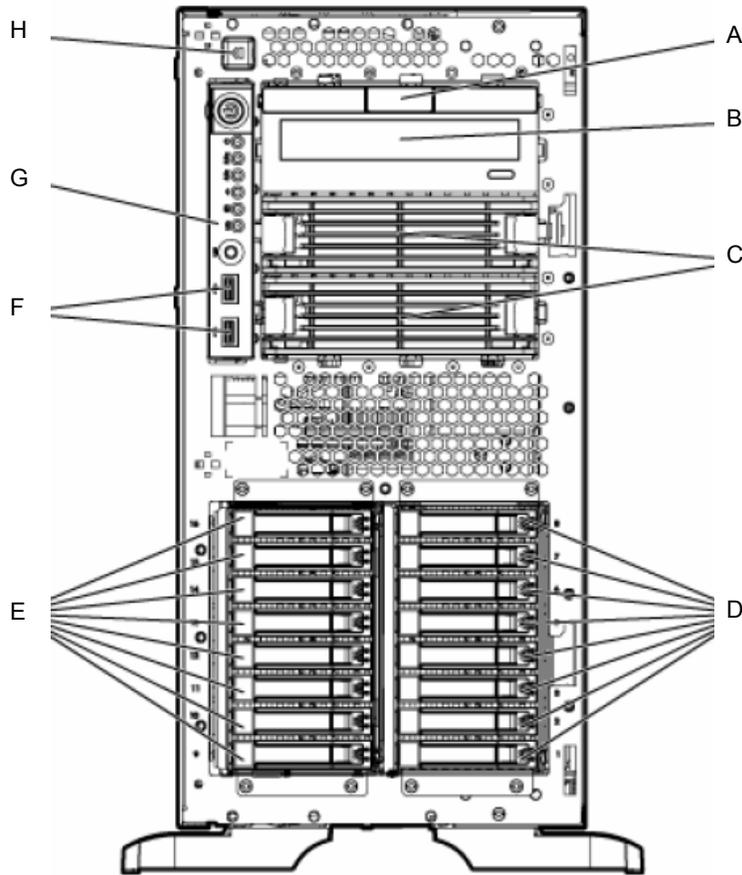


Table 10. CPU Front, HP ProLiant ML370 G5, Tower Model

Item	Description
A	Media bay spacer
B	DVD/CD-ROM drive
C	Removable media bays
D	Hard drive bays 1-8
E	Hard drive bays 9-16 (optional drive cage)
F	USB connectors
G	Front Panel LEDs and buttons (See <a href="#">"Front Panel LEDs and Buttons"</a> on page 2-27 for more information.)
H	HP Systems Insight Display ejector button

## Front Panel LEDs and Buttons

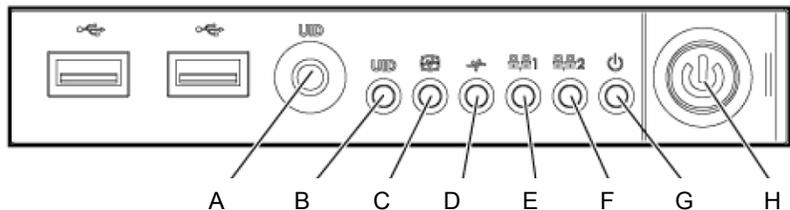


Table 11. CPU Front Panel LEDs and Buttons HP ProLiant ML370 G5		
Item	Description	Status
A	UID button	–
B	UID LED	Blue = Activated Flashing blue = System is being managed remotely Off = Deactivated
C	Internal system health LED	Green = Normal (system on) Amber = System health is degraded Red = System health is critical Off = Normal (system off)
D	External system health LED (power supply)	Green = Normal (system on) Amber = Redundant power supply failure Red = Power supply failure. No operational power supplies. Off = Normal (system off)
E	NIC 1 link/activity LED (embedded NIC)	Green = Linked to network Flashing green = Linked with activity on the network Off = No network connection
F	NIC 2 link/activity LED (embedded NIC)	Green = Linked to network Flashing green = Linked with activity on the network Off = No network connection
G	System power LED	Green = System has AC power and is powered up Amber = System has AC power and is in standby mode Off = System has no AC power
H	Power On/Standby button	–

File Server (ML370 G5) CPU, Back

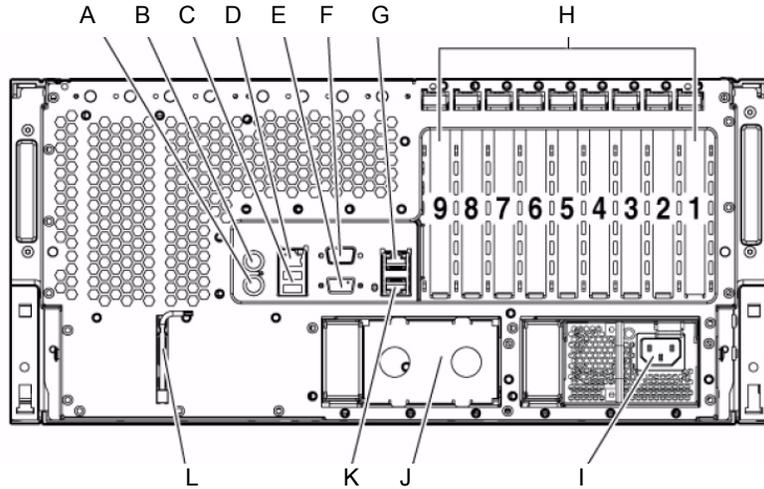
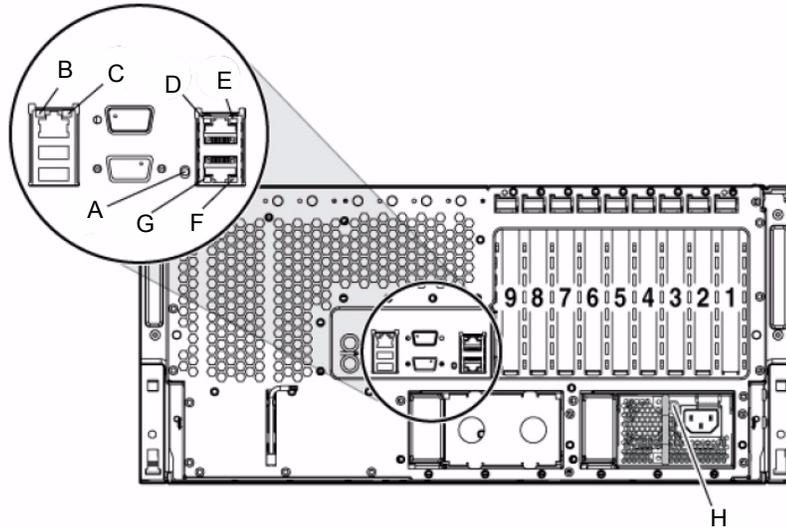


Table 12. CPU Back HP ProLiant ML370 G5

Item	Description	Item	Description
A	Keyboard connector	G	NIC 2 connector
B	Mouse connector	H	PCI expansion slots
C	USB connectors	I	Hot-plug power supply (primary bay)
D	iLO 2 management connector	J	Hot-plug power supply blank (redundant bay)
E	Video connector	K	NIC 1 connector
F	Serial connector	L	T-15 Torx screwdriver

## Rear Panel LEDs and Buttons



**Table 13. Rear Panel LEDs and Buttons**

Item	Description	Status
A	UID LED	Blue = Activated Flashing blue = system is being remotely managed Off = Deactivated
B	iLO 2 activity LED	Green or flashing green = Network activity Off = No network activity
C	iLO 2 link LED	Green = Linked to network Off = No network connection
D	NIC 2 activity LED	Green or flashing green = Network activity Off = No network activity
E	NIC 2 link LED	Green = Linked to network Off = No network connection
F	NIC 1 link LED	Green = Linked to network Off = No network connection
G	NIC 1 activity LED	Green or flashing green = Network activity Off = No network activity
H	Power supply LED	Green = System has AC power and is powered up Off = System has no AC power

## Sony AIT tape drive

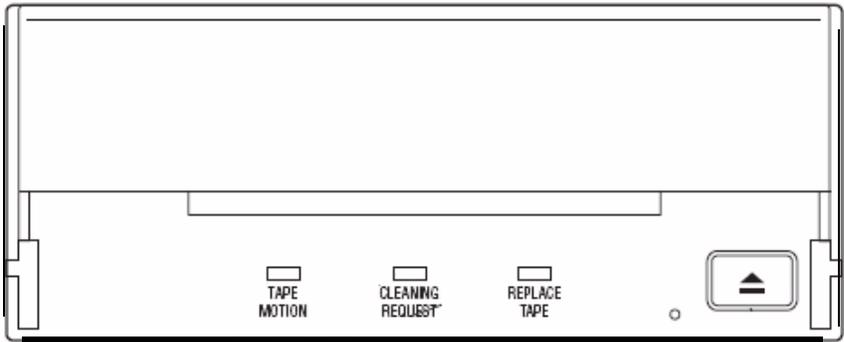


Table 14. Sony AIT tape drive LEDs

LED			Sense
TAPE MOTION	CLEANING REQUEST	REPLACE TAPE	
	Independent	Independent	Tape loaded
	Independent	Independent	Tape access in progress (write/read)
	Independent	Independent	Tape access in progress (others)
Independent		Independent	Cleaning is requested
Independent		Independent	Cleaning is not completed
Independent	Independent		Media error occurred
			H/W Error Occurred

### LED Legend (Sony AIT tape drive)



on



Slow  
1 pulse (0.9 sec on/0.3 sec off)



Fast  
1 pulse (0.3 sec on/0.3 sec off)

G5 HP Insight 2 display

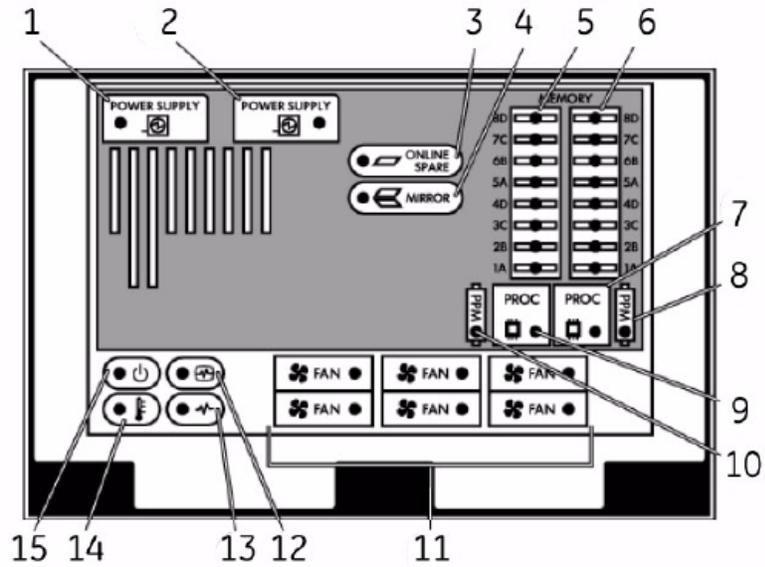


Table 15. Insight 2 Display

Item	Description	Indicator	Description
1	Primary power supply	Amber	Failure
		Off	Normal
2	Redundant power supply	Amber	Failure
		Off	Normal
3	Online spare memory	Green	Protection enabled
		Amber	Memory failure occurred
		Flashing amber	Memory configuration error
		Off	No protection
4	Mirrored memory	Green	Protection enabled
		Amber	Memory failure occurred
		Flashing amber	Memory configuration error
		Off	No protection
5	F8DIMM LEDs (Mem board 1) <sup>*</sup>	Amber	Failure
		Off	Normal

Table 15. Insight 2 Display (Continued)			
Item	Description	Indicator	Description
6	F8DIMM LEDs (Mem board 2)*	Amber	Failure
		Off	Normal
7	Processor 1	Amber	Failure
		Off	Normal
8	PPM 1	Amber	Failure
		Off	Normal
9	Processor 2	Amber	Failure
		Off	Normal
10	PPM2	Amber	Failure
		Off	Normal
11	Hot-plug fan	Amber	Failure (or fan not installed)
		Off	Normal
12	Internal system health	Green	Normal, system on
		Amber	Degraded health
		Red	Critical health
		Off	System off
13	External system health (power supply)	Green	Normal, system of
		Amber	Redundant power failure
		Red	Power supply failure, no operational power
		Off	System off
14	Over temperature	Red	Critical overheating
		Off	Normal
15	System power	Green	AC power on
		Amber	System in standby mode
		Off	No AC power

\* If all LEDs for a memory board are flashing, it indicates the memory board is unseated.

# MUSE File Server (ML 370 G4)

Front

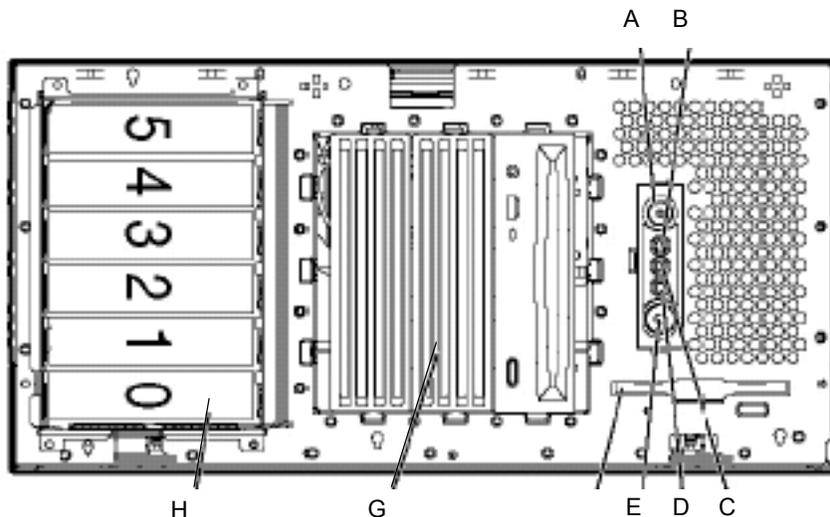
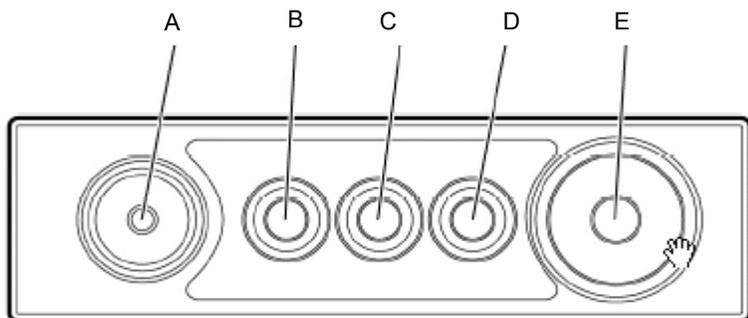


Table 16. CPU Front, HP ProLiant ML370 G4

Item	Description
A	UID switch and LED
B	Internal system health LED
C	External system health LED
D	NIC link/activity LED
E	Power On/Standby button/LED assembly
F	Diskette drive (behind the media door)
G	Removable media bays
H	Hot-plug SCSI hard drive bays (SCSI IDs 0 through 5)

## Front Panel LEDs and Buttons



**Table 17. CPU Front Panel LEDs and Buttons HP ProLiant ML370 G4**

Item	Description	Status
A	UID switch and LED	Blue = Activated Flashing blue=System being managed remotely
B	Internal system health LED	Green =Normal (system on) Amber = System health is degraded Red = System health is critical Off = Normal (system off)
C	External system health (power supply) LED	Green = Normal (system on) Amber = Redundant power supply failure Red = Power supply failure. No operational power supplies Off = Normal (system off)
D	NIC link/activity LED (embedded NIC only)	Green = Linked to network Flashing green = Linked with activity on the network Off = No network connection
E	Power on/Standby button and LED	Amber = System has AC power and is in standby mode Green = System has AC power and is turned on Off = System has no AC power

CPU, Back

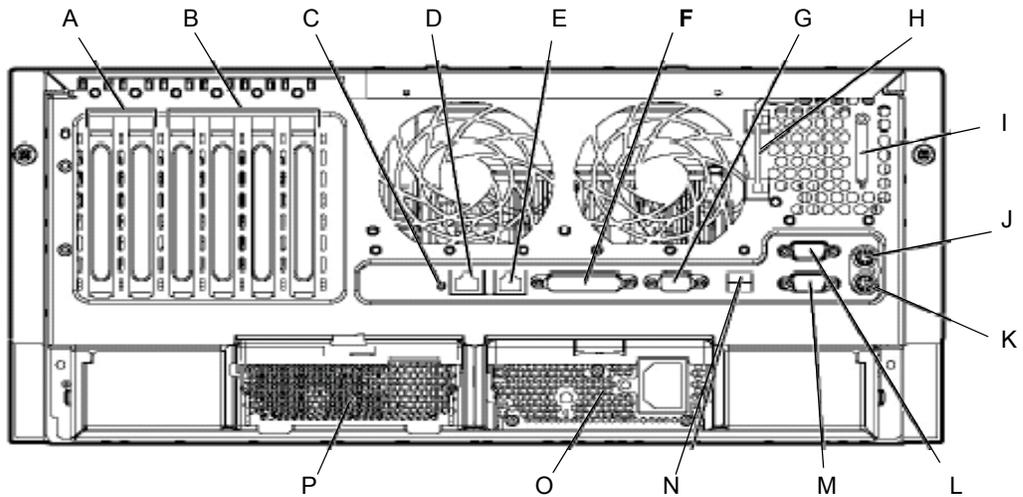
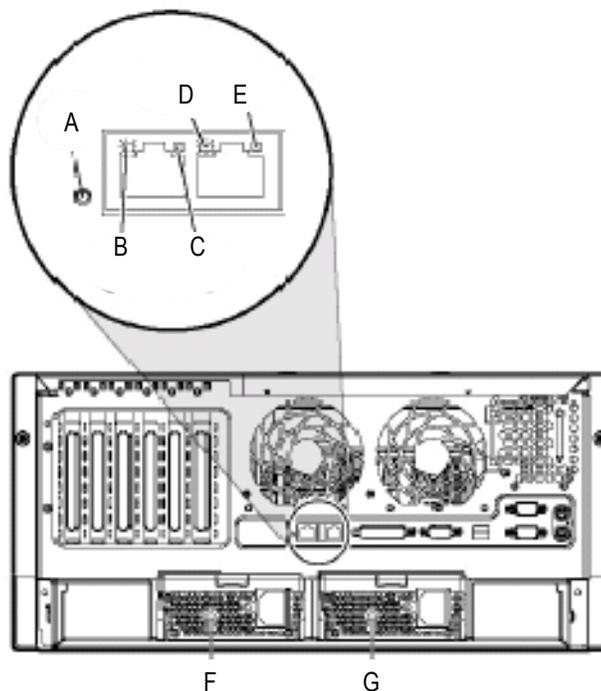


Table 18. CPU Back HP ProLiant ML370 G4

Item	Description
A	x PCI Express expansion slots
B	100-Mhz PCI-X expansion slots
C	Unit ID LD
D	Ethernet 10/100/1000 port
E	iLO management port
F	Parallel connector
G	Video connector
H	T-15 Torx screwdriver
I	Auxiliary VHDCI SCSI blank
J	Mouse connector
K	Keyboard connector
L	Serial connector B
M	Serial connector A
N	USB connectors

## Rear Panel LEDs and Buttons



**Table 19. Rear Panel LEDs and Buttons – HP ProLiant ML370 G4**

Item	Name	Color	Description
A	Unit ID LED	Blue	On = Activated Flashing = System remotely managed Off = Deactivated
B	NIC Activity LED (Integrated NC7781)	Green	On or flashing = Linked to network Off = Not linked to network
C	NIC Link LED (Integrated NC7781)	Green	On = Network activity Off = No network activity
D	iLO NIC Activity LED	Green	On or flashing = Network activity Off = No network activity
E	iLO NIC Link LED	Green	On = Linked to network Off = Not linked to network

Table 19. Rear Panel LEDs and Buttons – HP ProLiant ML370 G4			
Item	Name	Color	Description
F	Power supply LED (redundant)	Green	On = Power turned on and power supply functioning properly Off = One or more of the following conditions exists: <ul style="list-style-type: none"> <li>■ AC power unavailable</li> <li>■ Power supply failed</li> <li>■ Power supply in standby mode</li> <li>■ Power supply exceeded current limit</li> </ul>
G	Power Supply LED (primary)	Green	On = Power turned on and power supply functioning properly Off = One or more of the following conditions exists: <ul style="list-style-type: none"> <li>■ AC power available</li> <li>■ Power supply failed</li> <li>■ Power supply in standby mode</li> <li>■ Power supply exceeded current limit</li> </ul>

### AIT Drive

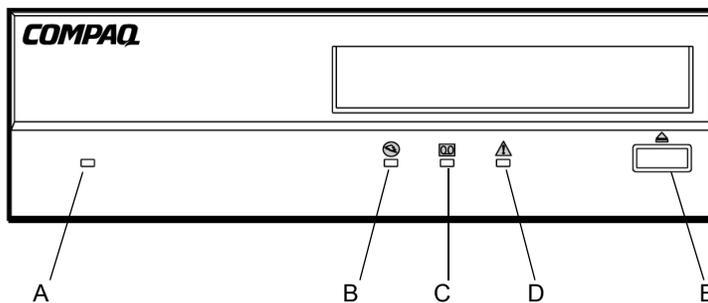


Table 20. AIT Drive		
Item	Icon	Description
A	None	Power LED
B		Busy LED
C		Tape LED

Item	Icon	Description
D		Status LED
E		Eject Button

LED Flash Symbol	LED Display
	Off
	On
	Quick flashes
	Quick flash with a long pause in between
	Long flash with a short pause in between
	Two quick flashes with a long pause in between.

UPS, Front

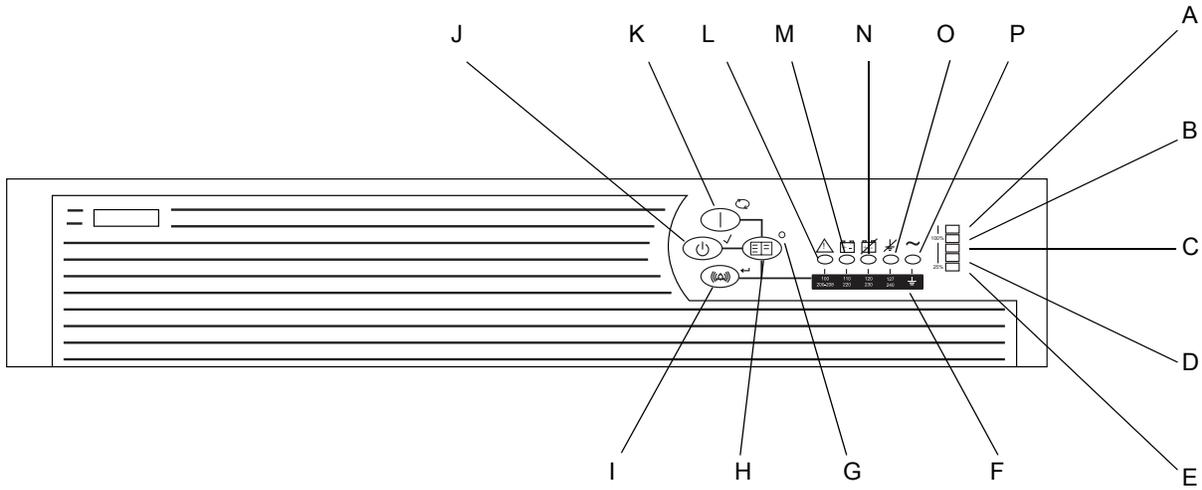


Table 22. UPS for HP File Server (Front)

Item	Name
A	LED indicating overload capacity
B	LED indicating 76% to 100% load capacity
C	LED indicating 51% to 75% load capacity
D	LED indicating 26% to 50% load capacity
E	LED indicating 0% to 25% load capacity
F	Voltage Configuration Panel *
G	Configure mode on LED *
H	Configure button *
I	TEST/ALARM RESET Button
J	STANDBY Button
K	ON Button
L	General Alarm
M	On Battery
N	Bad Battery / Low Battery
O	Site Wiring Fault Indicator
P	Utility LED

\* Accessible only when the front bezel is removed.

UPS, Back

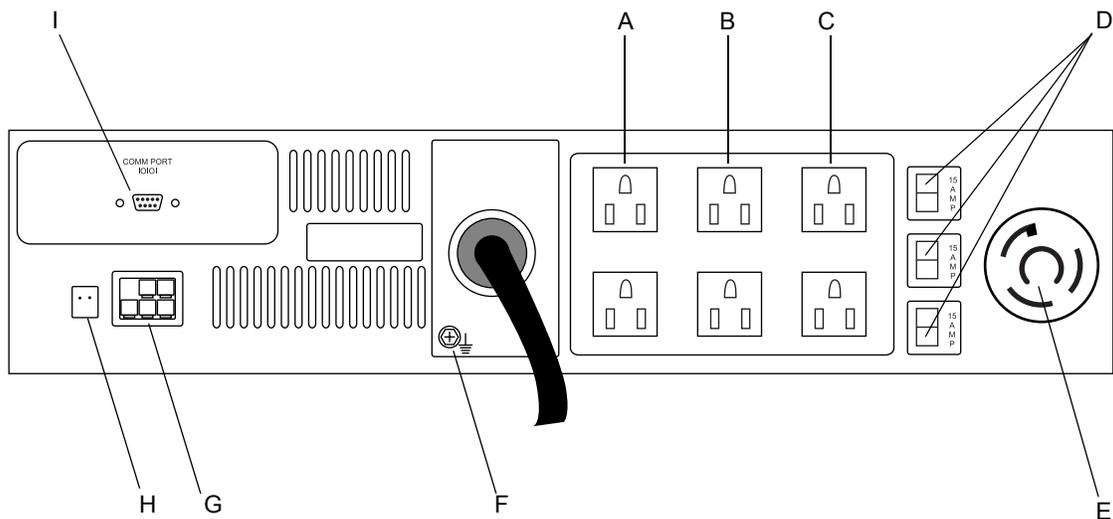
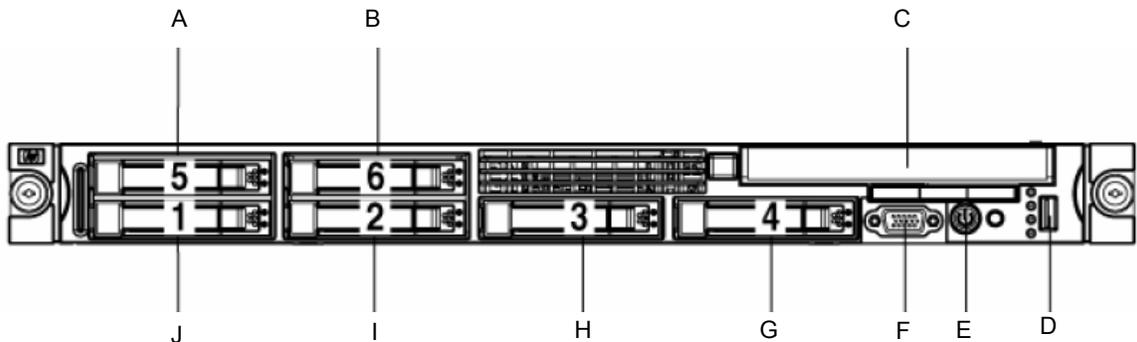


Table 23. UPS for HP File Server (Back)

Item	Name
A	Load Segment 1
B	Load Segment 2
C	Load Segment 3
D	Load Segment Circuit Protectors
E	PDU (Power Distribution Unit) output receptacle
F	Ground bonding screw
G	ERM (Extended Runtime Modules) connector
H	REPO (Remote Emergency Power Off) port
I	Communications Port / Option Slot

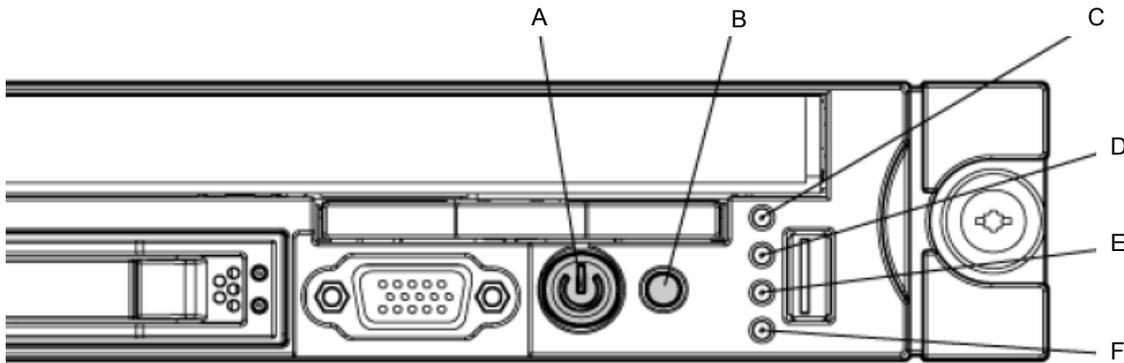
# MUSE EveryWARE File Server

## HP DL360 G5 Front Panel



Item	Name
A	Hard drive bay 5 (optional)*
B	Hard drive bay 6 (optional)*
C	Multibay drive bay
D	USB connector
E	HP Systems Insight Display
F	Video connector
G	Hard drive bay 4
H	Hard drive bay 3
I	Hard drive bay 2
J	Hard drive bay

## HP DL360 G5 Front Panel LEDs and Buttons



**Table 25. DL360 G5, Front Panel LEDs and Buttons**

Item	Description	Status
A	Power On/Standby button and system power LED	Green = System is on.  Amber = System is shut down, but power is still applied.  Off = Power cord is not attached, power supply failure has occurred, no power supplies are installed, facility power is not available, or disconnected power button cable.
B	UID button/LED	Blue = Identification is activated. Flashing blue = System is being remotely managed. Off = Identification is deactivated.
C	Internal health LED	Green = System health is normal.  Amber = System health is degraded.  Red = System health is critical.  Off = System health is normal (when in standby mode).
D	External health LED (power supply)	Green = Power supply health is normal.  Amber = Power redundancy failure occurred.  Off = Power supply health is normal when in standby mode.

Table 25. DL360 G5, Front Panel LEDs and Buttons (Continued)		
Item	Description	Status
E	NIC 1 link/activity LED	Green = Network link exists.  Flashing green = Network link and activity exist.  Off = No link to network exists. If power is off, the front panel LED is not active. View the LEDs on the RJ-45 connector for status by referring to the rear panel LEDs
F	NIC 2 link/activity LED	Green = Network link exists.  Flashing green = Network link and activity exist.  Off = No link to network exists. If power is off, the front panel LED is not active. View the LEDs on the RJ-45 connector for status by referring to the rear panel LEDs

HP DL360 G5 Rear Panel

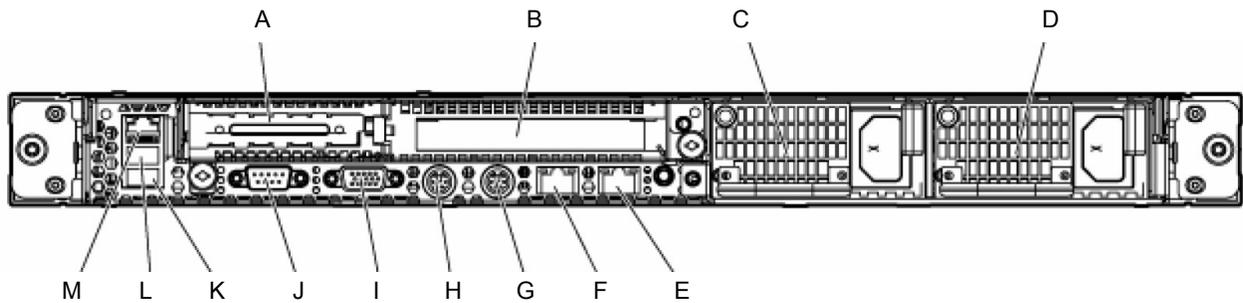
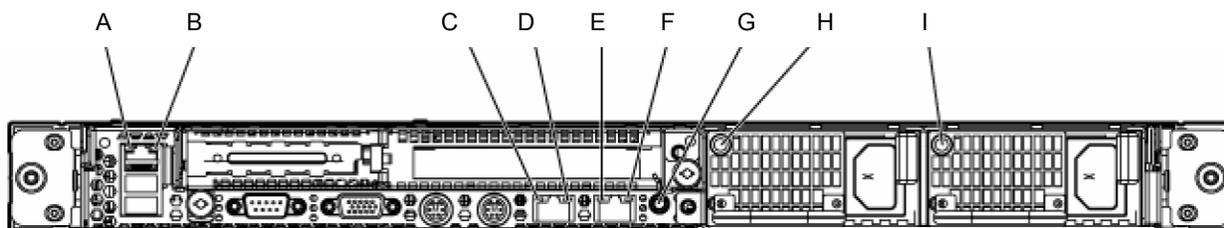


Table 26. DL360 G5, Rear Panel	
Item	Description
A	PCI Express expansion slot 1, low-profile, half-length
B	PCI Express expansion slot 2
C	Power supply bay 2
D	Power supply bay 1
E	NIC 2 connector
F	NIC 1 connector
G	Keyboard connector
H	Mouse connector
I	Video connector

Item	Description
J	Serial connector
K	USB connector
L	USB connector
M	iLO 2 NIC connector

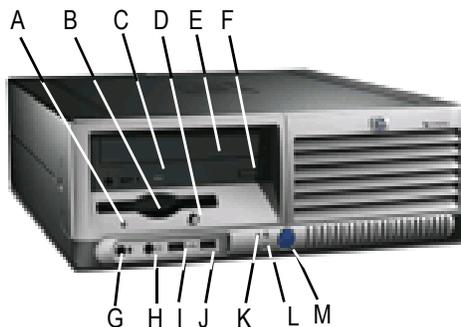
## HP DL360 G5 Rear Panel LEDs and Buttons



Item	Description	Status
A	iLO 2 NIC activity LED	Green = Activity exists. Flashing green = Activity exists. Off = No activity exists.
B	iLO 2 NIC link LED	Green = Link exists. Off = No link exists.
C	10/100/1000 NIC 1 activity LED	Green = Activity exists. Flashing green = Activity exists. Off = No activity exists.
D	10/100/1000 NIC 1 link LED	Green = Link exists. Off = No link exists.
E	10/100/1000 NIC 2 activity LED	Green = Activity exists. Flashing green = Activity exists. Off = No activity exists.
D	10/100/1000 NIC 2 link LED	Green = Link exists. Off = No link exists.
E	UID button/LED	Blue = Identification is activated. Flashing blue = System is being managed remotely. Off = Identification is deactivated.

<b>Table 27. DL360 G5, Rear Panel LEDs and Buttons (Continued)</b>		
<b>Item</b>	<b>Description</b>	<b>Status</b>
F	Power supply 2 LED	Green = Normal Off = System is off or power supply has failed
G	Power supply 1 LED	Green = Normal Off = System is off or power supply has failed

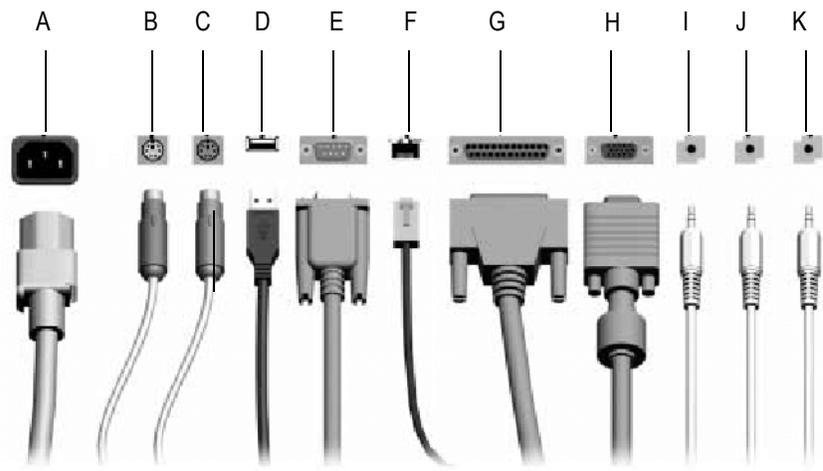
## MUSE dc7100 Client, Front Panel Controls and LEDs



**Table 28. MUSE dc7100 Client, Front Panel Controls and LEDs**

Item	Description	Item	Descriptions
A	Diskette Drive Activity Light	G	Microphone Connector
B	Diskette Drive	H	Headphone Jack
C	Optical Drive Activity Light	I	USB (Universal Serial Bus) Ports (2)
D	Diskette Eject Button	J	Hard Drive Activity Light
E	Optical Drive (CD-ROM CD-R/RW, DVD-ROM, DVD+R/RW, or CD-RW/DVD Combo Drive)	K	Power On Light
F	Optical Drive Eject Button	L	Power Button

## MUSE dc7100 Client, Rear Panel Connectors



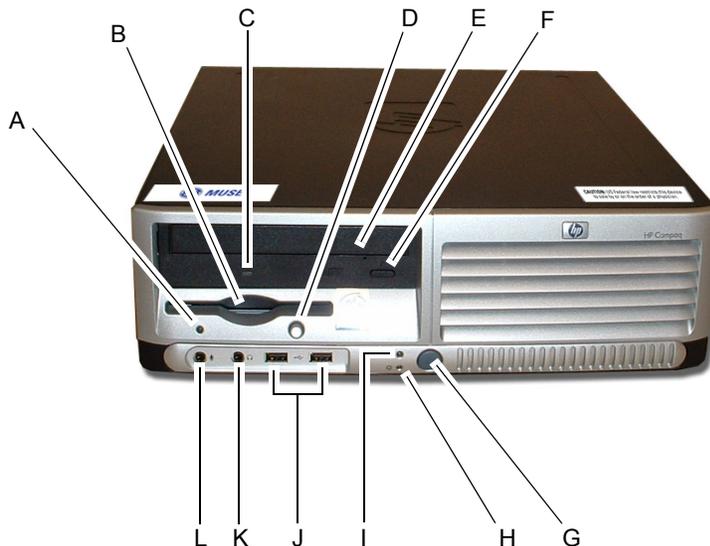
MD1350-175A

Item	Name
A	Power Connector
B	PS/2 Mouse Connector
C	PS/2 Keyboard Connector
D	Universal Serial Bus (USB)
E	Serial Connector
F	RJ-45 Network Connector
G	Parallel Connector
H	Monitor Connector
I	Headphone/Line-Out Connector
J	Line-In Audio Connector
K	Microphone Connector

**NOTE**

Arrangement and number of connectors may vary by model.

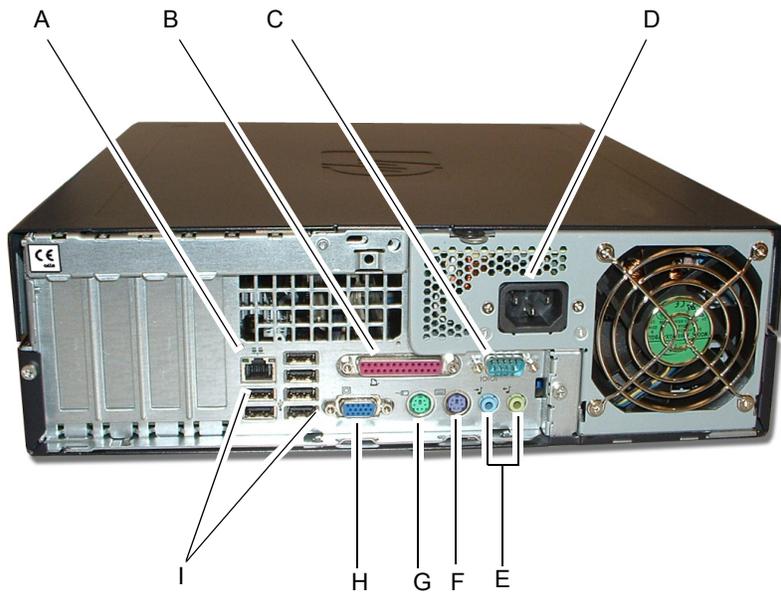
## MUSE dc7600 Client, Front Panel Controls and LEDs



**Table 30. MUSE dc7600 Client, Front Panel Controls and LEDs**

Item	Description	Item	Descriptions
A	Diskette drive activity light	G	Dual-state power button
B	Diskette drive	H	Power-on light
C	Optical drive activity light	I	Hard drive activity light
D	Diskette eject button	J	USB ports
E	Optical drive	K	Headphone connector
F	Optical drive eject button	L	Microphone connector

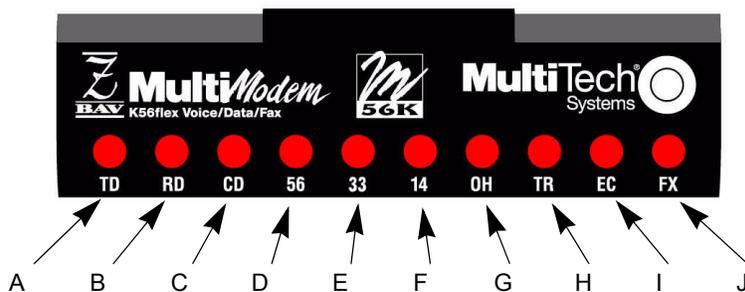
## MUSE dc7600 Client, Rear Panel Connectors



**Table 31. MUSE dc7600 Client – Rear Panel Connectors**

Item	Name
A	RJ-45 network connector
B	Parallel connector
C	O   O   Serial connector
D	Power cord connector
E	Line-in audio connectors
F	PS/2 keyboard connector (purple)
G	PS/2 mouse connector (green)
H	Monitor connector
I	USB Ports

## Universal Modem



48A

Item	Name	Description
A	<b>TD</b> (Transmit Data)	The TD LED flashes when the modem is transmitting data to another modem. The state of the LED matches the TD circuit on pin 2 of the RS-232C/V.24 interface.
B	<b>RD</b> (Receive Data)	The RD LED flashes when the modem is receiving data from another modem. The state of the LED matches that of the RD circuit on pin 3 of the RS-232C/V.24 interface.
C	<b>CD</b> (Carrier Detect)	The CD LED lights when the modem detects a valid carrier signal from another modem. It is on when the modem is communicating with the other modem and off when the link is broken.
D	<b>56</b> 56K Mode (56,000–32,000 bps)	The 56 LED lights whenever the modem connects to an ISP server in K56flex or V.PCM mode. The actual connection speed depends on server capabilities and line conditions.
E	<b>33</b> V.34 Mode (33,600–16,800 bps)	The 33 LED lights whenever the modem connects in V.34 mode.
F	<b>14</b> V.32bis Mode (14,400 bps–)	The 14 LED lights whenever the modem connects in V.32bis mode. Note: Although the modem can connect at lower than V.32bis speeds, no speed indicator lights during the connection.
G	<b>OH</b> (Off-Hook)	The OH LED lights when the modem is off-hook, which occurs when the modem is dialing, online, or answering a call. The LED flashes when the modem pulse-dials.
H	<b>TR</b> (Terminal Ready)	The TR LED lights when a datacomm program initializes the modem. It means the modem is ready for an outgoing or incoming call. It goes off when the datacomm program disconnects the COM port. When it goes off, a connected modem will disconnect. The state of the TR LED matches that of the DTR circuit on pin 20 of the RS-232C/V.24 interface.
I	<b>EC</b> Error Correction (V.42)	The EC LED lights continuously when the modem is in V.42 error correction mode, and blinks when compression is activated.
J	<b>FX</b> (Fax)	The FX LED lights when the modem is in fax mode.

### NOTE

When you turn on the modem, the speed lights flash briefly as the modem does a self-test, then the LED for the default modem baud rate lights. The default rate for the modem is 56K bps unless you select and store another baud rate. After a call, the LEDs for the connection's baud rate remain lit until another call is made or the modem is reset. If you connect at a rate under 14,400 bps, all speed LEDs remain off after the connection is broken, even though the modem is still turned on.

# 3 Installation

**For your notes**

# Installation Documents

The following table summarizes installation/upgrade documents that have been written for the MUSE system at version 7.0 software.

PN	Title
2000784-010	Information Interchange Developer's Manual
2033425-029	Advanced Security Guide, MUSE 7.0.2
2033425-009	MUSE System Installation Instructions
2033425-006	CASE to MUSE Installation Instructions
2033425-032	MUSE 7.0.2 Pre-Installation Manual
2033425-004	MUSE System Upgrade Instructions
2033425-011	MUSE V7.0 to V7.0.2 Update Instructions
2033425-014	MARS PC to MUSE v7.0.2 Installation Instructions
2033425-015	MARS Unix to MUSE v7.0.2 Installation Instructions
2033425-008	InSite 2 Installation Instructions
2014300-156	HL7 Reference Manual
2033425-010	MUSE 7.0.2 Client Installation Instructions
2020299-021	MobileLink Setup & Installation Instructions
2020299-025	MAC 3500/5500 LAN Installation Instructions
2033425-007	MUSE Web (Enterprise Integration) Installation Instructions
2033425-025	Monitoring Gateway Installation Instructions

## How to Set Up Modems

Modems are used to send and receive data, and can be configured to service a defined set of devices.

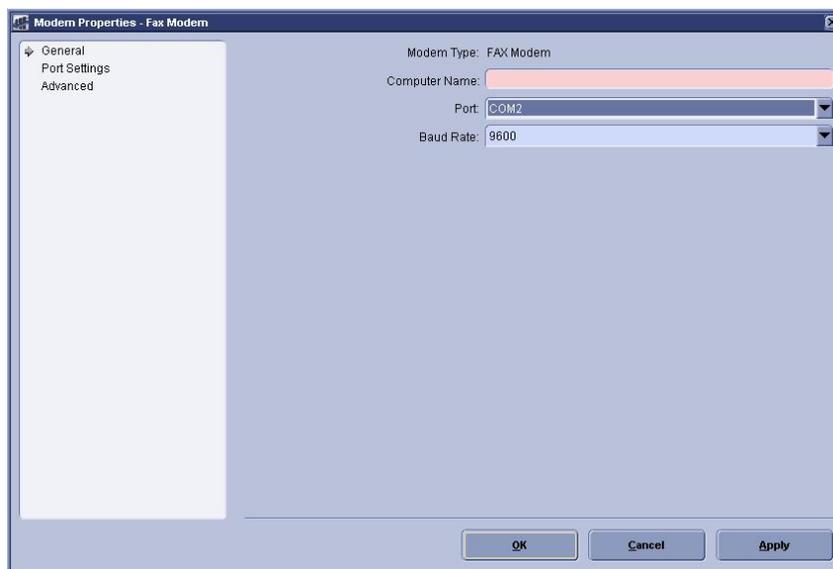
The following modems may be set up using the steps below: Fax Modem, CSI Modem, CSI Wireless, and CSI Direct.

### Set Up Modems in MUSE Setup

Repeat the following for each modem that needs to be configured.

1. Log in as a user with privileges to change *Modem Setup*.
2. At the *Modem* window open a *Modem Properties* window using one of the following methods:
  - select *Action* → *New*, or
  - click the *New* icon, or
  - right-click in the empty space and select *New*.
3. Select *Fax Modem*, *CSI Modem*, *CSI Wireless*, or *CSI Direct*, as appropriate.

The *Modem Properties...* window appears.



4. Enter *Computer Name*, select *Port*, and select *Baud Rate*.

#### NOTE

*Computer name* = computer name where modem is physically installed

*Port* = port number to which modem is connected

*Baud rate* (select appropriate baud rate)

*Fax* = 9600 or 4800 Baud \*

*CSI Direct & Wireless* = 115.2K Baud

*CSI Modem* = 9600 Baud

\* If problems are encountered when testing faxing, use the lower baud rate (4800 Baud)

5. Select *OK* to save your changes. The *Modem Properties* window closes.

## Add Service for Each Modem

For each modem which was set up in the previous section At the computer where the modem is physically installed, add the modem service.

1. Open the *Modem Setup* window to use as a reference for modem IDs while adding modem services.
2. Open a *Command Prompt*.
3. Change to the directory where MUSE was installed (default = **Program Files\muse**)

### NOTE

To see the usage for **musesvc**, type the following in the *Command Prompt*:  
**musesvc [Space] ?** and press **Enter**

### FAX Modem Example

For example, to install a fax modem, type the following in the *Command Prompt* window.

```
musesvc [Space] -fax [Space] <domain> \musebkgnd [Space]  
<password> [Space] <modemID> [Space] -cmdline:-db:  
<sql server name>
```

Where:

domain =	the domain or local computer name where the MuseBkgnd account was created
password =	password for MuseBkgnd account
modem ID =	the modem ID assigned in MUSE Modem Setup
sql server name =	name of sql server where the MUSE database resides (for a typical install this is the same as the MUSE server name)

For example, to install a CSI modem, type the following in the *Command Prompt* window.

```
musesvc [Space] -csi [Space] <domain> \musebkgnd [Space]  
<password> [Space] <modemID> [Space] -cmdline:-db:  
<sql server name>
```

Where:

domain =	the domain or local computer name where the MuseBkgnd account was created
password =	password for MuseBkgnd account
modem ID =	the modem ID assigned in MUSE Modem Setup
sql server name =	name of sql server where the MUSE database resides (for a typical install this is the same as the MUSE server name)

4. If installing modem on a MUSE client with Windows 2000 operating system, configure the SQL protocol as follows:
  - a. Open a *Command Prompt* window.
  - b. Type **cliconfg** and press **Enter**.  
This will open the *SQL Server Client Network Utility* window.
  - c. Select *TCP/IP* from the *Default network library* drop-down list.
  - d. Select *OK* to save the setting.
  - e. Start the CSI FAX or Modem service.

# Installing and Configuring the XML Import Option

## Introduction

The XMLImport option is required for systems that are acquiring data in XML format. The MUSE system can acquire data in XML format from the following devices:

- LifePak 12 through the LIFENET Receiving Station (reference document 2002783-040).
- From a Datamed FT (Format Translator) provided by Engineering Solutions, Inc.

This option is listed as **XMLImport**, and it is option number 20.

## Requirements

The following requirements must be met on the MUSE file server:

- The **XMLImport** option is installed.
  - ◆ Installed by GE Service using the **changeopts** utility.
- The MUSE XML Parser Service is installed and running.
  - ◆ Installed with this command:  
**musesvc [Space] -one [Space] <localcomputer> \MuseBkgnd <MuseBkgnd password> "MUSE XML Parser" [Space] "c:\program [Space] files\muse\musexmlparse.exe"**
- An **xml** folder under the **muse** folder, for example **d:\muse\xml**.
  - ◆ This folder is created when the database is installed.
  - ◆ Share the folder as **xml\$** so that it is hidden.
  - ◆ Configure permissions as required.
  - ◆ The DTD files are copied to the **xml** folder when the database is installed.
- The default location for the Parser Service to look for files is: **d:\muse\xml**. You can change the location by altering the **cfgServiceXML** table in the MUSE\_System database.
- The sending system needs to be configured to send to the shared **xml** folder.

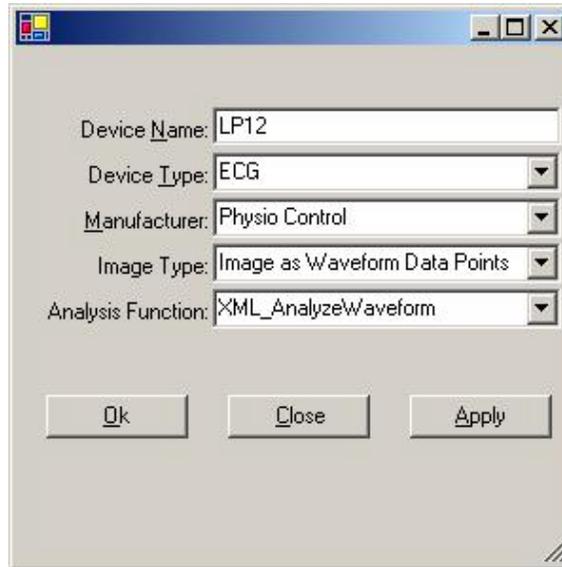
MUSE also needs the Microsoft XML Parser installed. Perform the following steps to install the Parser from Microsoft:

1. Run **msxml.msi** from the **MSXML 4.0** folder on the MUSE 7.0 Software Support CD.
2. Click *Next*, accept the license agreement and click *Next*.
3. Click *Next* to accept the default customer information.
4. Click the *Install Now* button.
5. Click *Finish*.

## Using XMLCONFIG.EXE to Configure the Option on MUSE

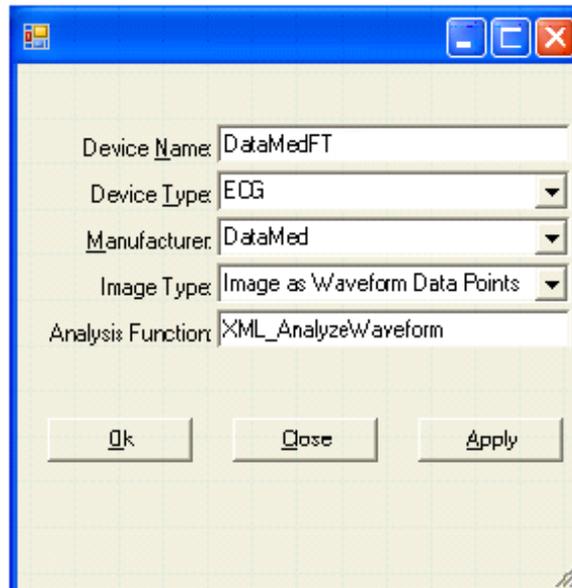
This utility is used to insert entries into the **cfgXmlInput** table in the **MUSE\_System** database.

1. Copy the **xmlconfig** utility to the folder where MUSE is installed and launch it.
2. Click *New Device*.
3. For LifePak 12 enter/select the following:



A screenshot of the XMLCONFIG.EXE dialog box. The dialog has a title bar with standard Windows window controls. It contains five input fields and three buttons. The fields are: Device Name (text box with 'LP12'), Device Type (dropdown menu with 'ECG'), Manufacturer (dropdown menu with 'Physio Control'), Image Type (dropdown menu with 'Image as Waveform Data Points'), and Analysis Function (dropdown menu with 'XML\_AnalyzeWaveform'). The buttons are 'Ok', 'Close', and 'Apply'.

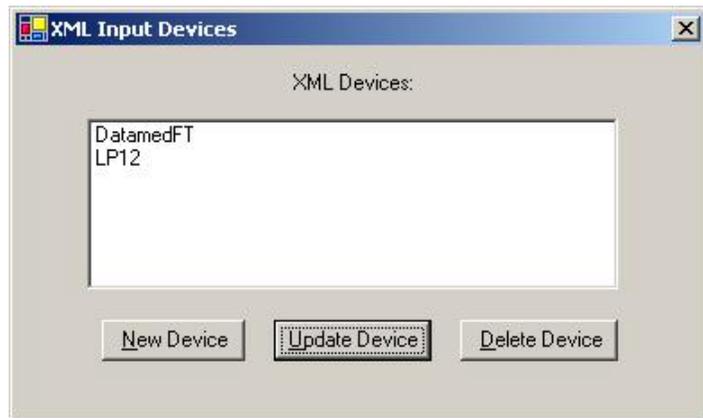
Or, for a DatamedFT, enter/select the following:



A screenshot of the XMLCONFIG.EXE dialog box. The dialog has a title bar with standard Windows window controls. It contains five input fields and three buttons. The fields are: Device Name (text box with 'DataMedFT'), Device Type (dropdown menu with 'ECG'), Manufacturer (dropdown menu with 'DataMed'), Image Type (dropdown menu with 'Image as Waveform Data Points'), and Analysis Function (dropdown menu with 'XML\_AnalyzeWaveform'). The buttons are 'Ok', 'Close', and 'Apply'.

4. Click *Ok*.

5. Create other devices, update an existing device, or delete a device as required.



6. Click the X to exit the utility when you are finished.

# How to Configure Windows High Contrast Color Scheme on MUSE Client

For each workstation which may be used by one or more individuals with color vision deficiency (color blind), you can enable the Windows *High Contrast Color Scheme* for MUSE as follows:

1. From the Windows Desktop of the client which will be used by a color blind individual, select *Start* → *Control Panel*.
2. Double-click *Display* to open the *Display Properties* window.
3. Select the *Appearance* tab.
4. Select *Windows Classic style* in the *Windows and buttons* list.
5. Select one of the *High Contrast* options in the *Color scheme* list.
  - ◆ *High Contrast #1*
  - ◆ *High Contrast #2*
  - ◆ *High Contrast Black*
  - ◆ *High Contrast White*
6. Click *Apply*.
7. From the Windows Desktop, copy and paste a MUSE shortcut icon which was created during installation and paste the copy to the Windows Desktop.
8. Rename the new shortcut by adding **Windows Default Colors** to the end of the name.
9. Right-click on the new shortcut and select *Properties*.
10. Add the following to the end of the string in the *Target* field:  
**[Space] -nocui**
11. Click *OK* to save your changes.
12. Repeat steps 7-11 for each of the MUSE shortcut icons.

## **NOTE**

Inform color blind system users to use the shortcuts with **Windows Default Colors** appended to the end of the name.

Also, inform system users who are not color blind to use the original shortcuts.

# Changing the Port Number of the File Server

If you need to change the port number of the file server:

- Manually edit the **server.remoting.config** file on the file server
- Run the **remotingcfg.bat** at the file server and at each client.

1. Shut down MUSE service at the file server.
2. At the file server, manually modify the **c:\program files\muse\server.remoting.config** file.
3. Scroll to <channels> section and modify port="nnnn" to the appropriate port.

```

type="MUSE.MiddleTier.Server.Config.StatementManager, MUSE.M
objectUri="StatementManager" />

<wellknown mode="singleCall"
  type="MUSE.MiddleTier.Server.Config.HISLocationManager,
  objectUri="HISLocationManager" />

<wellknown mode="singleCall"
  type="MUSE.MiddleTier.Server.DBSearch.DBManager, MUSE.M
  objectUri="DBManager" />
</service>

<channels>
  <channel ref="tcp" port="8001">
    <serverProviders>
      <provider type="MUSE.Security.SecurityServerChannelsir
      <formatter ref="binary" />
    </serverProviders>
  </channel>
</channels>

</application>
<customErrors mode="off"/>
</system.runtime.remoting>
</configuration>

```

4. Save the changes made to the **server.remoting.config** file.
5. From the **c:\program files\muse>** prompt, run **remotingcfg.bat** at the server and each client.  
arguments **-server** (name of MUSE file server) and **-port** (port number you want to change to)

### EXAMPLE:

To change the port number of **muse7server** to **8002**, type the following in a *Command Prompt* window.

```
remotingcfg [Space] -server:muse7server [Space] -port:8002
```

### NOTE

If the MUSE server is part of a domain, be sure to include the domain name as part of the server name.

This batch file will change the port numbers listed in the **muse.remoting.config** file.

# Set Up MUSE File Server for File Copy

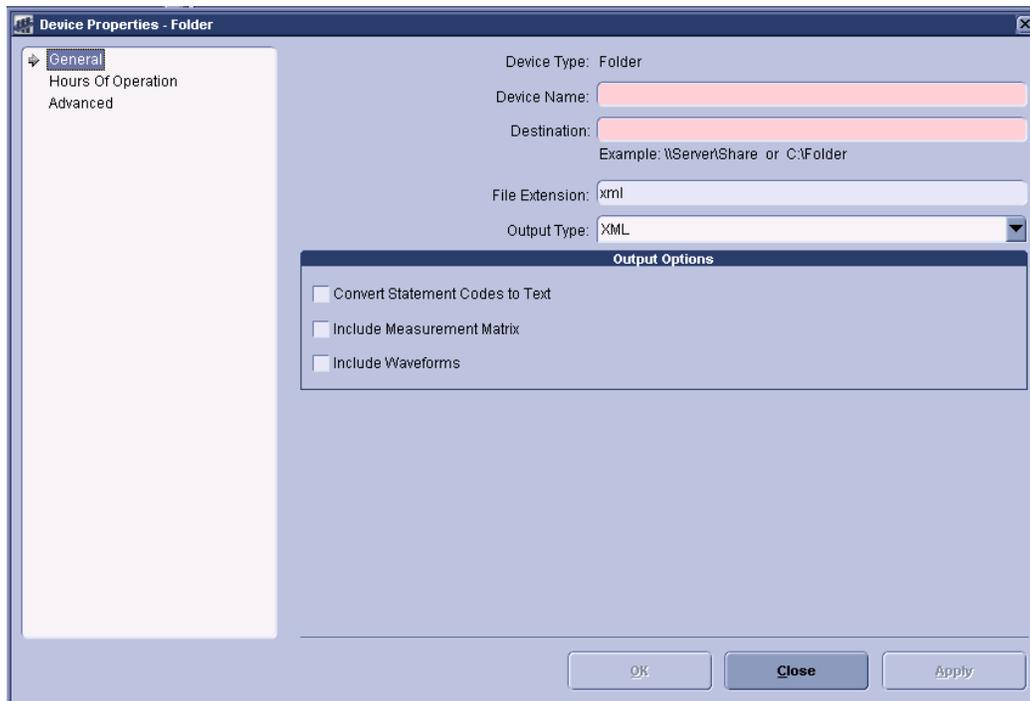
This section describes how to set up a File Copy Device. Use this if you want to copy to a folder on the MUSE file server or to a network share.

## Change the Log On Service

If sending files to another computer on domain, you will need to use a **MuseBkgnd** Windows domain account as the logon for the MUSE file copy service. This requires that the hospital network administrator, create a domain **MuseBkgnd** user account. That account must then be used as the logon credentials for the MUSE File Copy Service on the MUSE file server.

## Setting up a Folder

1. At the *Devices* window, select *Action* → *New* → *Folder*. The *Device Properties - Folder* window appears.



2. Type the device name and folder destination in the appropriate fields.
3. Select appropriate file type from the *Output Type* drop-down list.
4. Ensure that the appropriate file extension appears in the *File Extension* field.
5. Select the appropriate *Output Options*.
6. At the *Hours of Operation* tab, set up the hours of operation. Click *OK*.
7. At the *Advanced* tab, set up the format settings. Click *OK*.

# Installation Checkout Procedure

## **NOTE**

Use the checkout steps below as a guideline. Some of these steps can be verified by looking at the system or through discussions with the customer.

Use the Service and Operator's manual where necessary for reference. Perform the following for all applicable options.

## **REQUIREMENTS**

To perform this system checkout procedure you will need one or more output devices, such as a network laser printer and a Fax machine. Make sure that you configure and test at least one for each output type that will be used.

- Verify that all MUSE client computers are able to connect to the MUSE system and run the application. Verify that end users are able to log into MUSE with their user account.
- Verify that the clients generate the proper login and logout messages in the MUSE Process Log when they launch and then exit the MUSE application.
- Verify that records can be acquired via diskette, serial cable, modem and wireless connections, and that they route properly based on Report Distribution settings.
- Verify that data can be acquired from the MARS system(s), and that the data can be printed.
- Verify that data can be acquired from the Stress system(s), and that the data can be printed.
- Verify that reports are being successfully transmitted to the Monitoring Gateway, that MUSE is picking them up and processing them, and that the reports can be printed.
- Verify that the system can successfully send reports to laser printers and Fax machines.
- Verify that users can successfully edit and confirm reports from the Edit List.
- Test MUSE Web functionality to ensure that users can view and print records pulled up with their browser.

- Verify locally that the remote access connection is working. If possible, contact the Tech Support group in your country or region to verify that they can remotely access the system file server. If there is a CCG for HL7 interfaces, verify that they can also access that computer so that the HIS Implementation team will be able to work on the system.
  
- For customers that are using the local tape backup solution, verify that they understand the backup process, and how to rotate the tapes.
  
- Verify that the email notifications for backups are working, if configured, and that the nightly backup job is functioning properly.
  
- For customers that are doing network backups, verify that they understand what needs to be backed up on the system. Also verify that they understand they are responsible for the backup and disaster recovery procedures.
  
- For GE-supplied hardware, verify that you have created at least one ASR tape/diskette set for disaster recovery, and that the set is stored in a safe location.

Name of Installer: \_\_\_\_\_

Date: \_\_\_\_\_

# MUSE Authentication – Enable or Disable

Having MUSE Authentication enabled is the default setting for the MUSE v7 system. The steps below describe how to disable MUSE Authentication (or, how to re-enable this setting if it has been disabled).

## NOTE

When MUSE Authentication is disabled, users are forced to log into Windows in order to gain access to the MUSE system.

1. Log into the MUSE file server with a local administrator account.
2. Stop the MUSE Services.
3. From the Windows desktop select *Start → All Programs → Microsoft SQL Server 2005 → SQL Server Management Studio*.

The *SQL Server Management Studio* window is displayed.

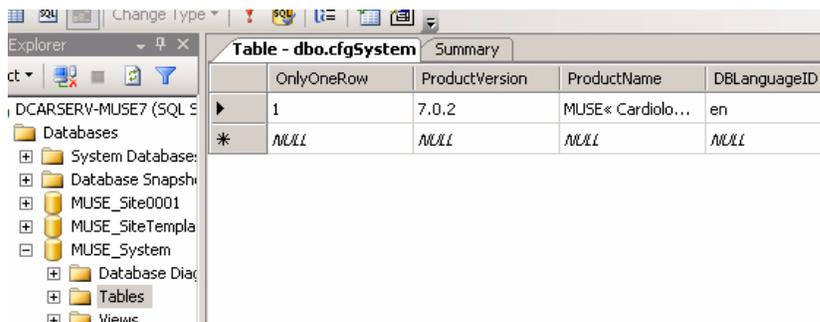
4. In the left pane, browse to *Databases → MUSE\_System → Tables*.



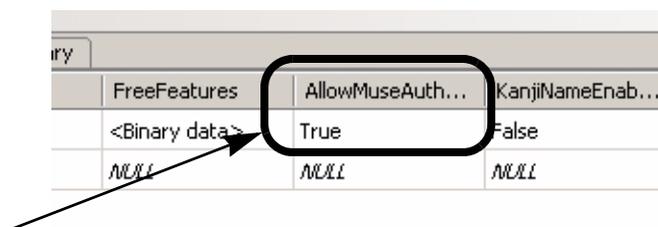
5. With *Tables* highlighted in the left pane, find *cfgSystem* in the main window.
6. Right-click *cfgSystem* and select *Open Table* from the menu.



The *cfgSystem* table is displayed.



7. Scroll to the *AllowMuseAuthentication* column in the table.



8. Click in the cell and type the desired setting for MUSE Authentication.

- ◆ Type **False** to disable MUSE Authentication.
- ◆ Type **True** to enable MUSE Authentication.

**NOTE**

DO NOT change any other settings in the table.

9. Close *SQL Server Management Studio*.

**NOTE**

All changes made to the table are immediately saved. There is no need to select a *Save* or *Save As* command.

10. Re-start the MUSE services.

**NOTE**

If MUSE Authentication has been disabled, all MUSE users who need to log into the system should be set up with their *Windows User Name* in their *User Properties* setup window in the MUSE interface.

# MUSE Install Statement of Work

Date: \_\_\_\_\_

## Hardware Installed

MUSE Server                       MUSE EveryWARE                       Printers  
 CCG Server                       Client                       Client (Upgrades)

## Applications Installed

MUSE Application                       MUSE Web                       MUSE EveryWARE (Citrix 4.0)  
 CCG                       CV Web                       Serial IP 4.0  
                     ADT                       MobileLink  
                     Orders                       LAN  
                     Out Bound  
                     File Transfer  
 InSite 2.0

## Conversions

to MUSE v7.0.2

## Backup Solution

Local Tape                       Network

## O/S Users Added

MuseAdmin                       MuseBkgnd

## Options

SerialComparison (0)                       Database Search (1)                       HIS\_ADT\_Interface (4)  
 HIS\_Orders\_Interface (5)                       HIS\_Results\_Interface (6)                       HIS\_Billing\_Interface (9)  
 HIS\_Waveform\_Interface (12)                       HISOrderDownload\_Interface (17)                       XML Import (20)  
 ACI\_TIPI (21)                       WirelessCommunication (23)                       Email (24)  
 21CFRPart11 (26)                       XMLExport (28)                       USEAPI\_And\_Web\_Interface (30)  
 OREO (Enhanced Editor) (31)                       Testtype\_RestingECG (50)                       Testtype\_HiresolutionECG (51)  
 TestType\_HiresolutionPWave (52)                       TestType\_ExerciseTesting (53)                       TestType\_HolterTesting (54)

## MUSE Application Users Added


## Devices Added

### Holter

MARS System Name \_\_\_\_\_

IP Address \_\_\_\_\_

### Physical Modems

ID:	Function (CSI, FAX)	Phone Number	Location (Server, Workstation)









# 4 Database Backup to Local Tape

# Introduction

MUSE 7.0.2 uses SQL Server 2005 for its Database Management System (DBMS), and by default there are at least three user databases that make up the MUSE system:

- **MUSE\_Site0001**
- **MUSE\_SiteTemplate**
- **MUSE\_System**

If a MUSE system has more than one Site database, there would be more than three user databases, and the system would include, for example, **MUSE\_Site0002**, and **MUSE\_Site0003** etc. Because of this change, the backup and disaster recovery plans for the MUSE database need to change from previous MUSE system software versions.

## SQL Server 2005 Backups

SQL Server 2005 has built in backup capabilities, and can backup to either a local tape device or to a disk device (a file). The backup functionality in SQL Server 2005 will allow only one database to be backed up at a time, but it is possible to include additional steps in a backup job to include multiple backups. The destination for a file based backup can be a disk that is either local or somewhere on the network. We can't always count on there being a network destination available, and writing the backup to the local disk would require additional disk space to accommodate both the database and the backup. A local file backup would also require the need for an additional step to backup the files to tape. The hardware that GE supplies for MUSE systems includes a local AIT tape drive. For this reason, and for the reasons mentioned above, the Local Tape Backup Option will involve using the local AIT tape drive for backups.

## MUSE System Backup Plan

### **NOTE**

MUSE 7.0 customers that select the software-only option for the MUSE file server will be responsible for implementing and managing their own backup and disaster recovery plans.

### **NOTE**

MUSE 7.0.2 customers that are using GE-supplied file server hardware will be given a choice of:

- ◆ Implementing their own backup and disaster recovery plans, or
- ◆ Selecting the Local Tape Backup Option described in the following section.

## Local Tape Backup Option

The local tape backup option will need to be selected when the MUSE 7.0.2 system or system upgrade is ordered. This option will include:

- An initial set of AIT tapes that will be used to perform nightly and monthly MUSE database backups, and a weekly C: drive backup. This will require 9 tapes.
- The initial setup and configuration of backups and notifications by GE Service.
- Service support of the backup and recovery plans as covered by any warranties or service agreements.

When the Local Tape Backup Option is being used, the MUSE databases will be configured for the Simple Recovery Model. MUSE databases are set for Simple Recovery Model during the MUSE database installation.

### **NOTE**

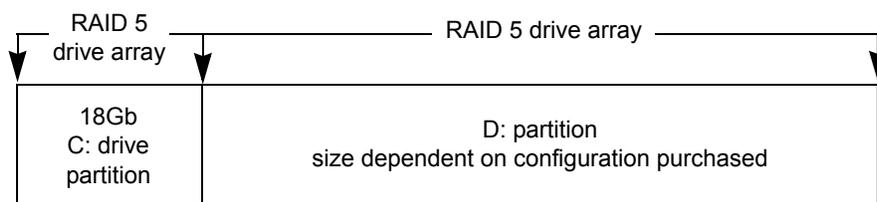
Customers that require a Full Recovery Model, so that they have *Transaction Logs* that provide the ability to recover to a point in time, will need to implement their own backup and recovery plans. The Local Tape Backup Option is for customers that need a simple to implement and manage solution.

The Local Tape Backup Option will include the following backup schedules.

- Nightly complete backups of the **MUSE\_System** and **MUSE\_Sitexxxx** user databases, and the master and msdb system databases.  
Where **xxxxx** = all the Site databases, including **MUSE\_SiteTemplate**.
- Weekly complete backups of the **C:** drive.
- Monthly complete backups of the **MUSE\_System** and **MUSE\_Sitexxxx** user databases, and the master and msdb system databases.  
(Where **xxxxx** = all the Site databases, including **MUSE\_SiteTemplate**)

The nightly database backups will be labeled externally for **Sunday** through **Saturday**, and the monthly backup tape will be labeled **Monthly Backup**. The weekly C: drive backup will be labeled **Weekly C: Backup**.

The diagrams below show the structure of the drive partitions on GE-supplied MUSE file server hardware.



### HP ML370 G4/G5 Server

The **C:** drive will contain:

- The Windows Server 2003 installation
- SQL Server 2000 - including the master and msdb system databases
- The MUSE client application

The **D:** drive will contain:

- The MUSE user databases (**d:\muse\db**)
- The backup report output and the supporting files (**d:\muse\backup\\*.\***)
- The **d:\muse\mars** folder used for temporary files being sent to the mars formatter when Holter reports are printed.
- The **d:\muse\xml** folder used as the XML input destination.
- The **d:\muse\acq** folder used for devices that send data to MUSE via a network share.

The **C:** drive is fairly static and would typically only need a new backup for operating system updates or configuration changes, or when other software is upgraded or changed. In addition to the Automated System Recovery backup of **C:** that Service does during installation and after software updates, the Local Tape Backup Option will include a weekly backup of the **C:** drive.

# Copy the Support Files and Add the Backup Jobs

## Add the D:\muse\backup Folder

If the **d:\muse\backup** folder doesn't already exist, create one.

The supporting files for the Local Tape Backup option are on the MUSE Software Support CD under **\Local Tape Backup**. Copy all the files from that folder to **d:\muse\backup**.

## Verify SQLSERVERAGENT is Running

The SQL Server Agent Service handles running SQL Jobs, such as the backup jobs that are added in the next section. It is also required for Database Searches and the Log and Queue Maintenance jobs to run.

1. Select *Start* → *Administrative Tools* → *Services* to display the *Services* list.
2. Right-click *SQL Server Agent* and select *Properties*.
3. Change/verify that startup type is set to *Automatic*.
4. Start the *SQL Server Agent* service if it is not already running.
5. Close the *Services* window.

## Add the Backup Jobs

From a *Command Prompt*, run **d:\muse\backup\buildjobs.bat** to add the SQL Server backup jobs. If the jobs already exist they will not be replaced. If you want to replace the existing jobs with the default ones, delete the existing ones and rerun **buildjobs.bat**.

The existing jobs can be deleted using *SQL Server Management Studio*. View existing jobs by selecting *SQL Server Agent* → *Jobs*.

The **buildjobs** batch file also adds a *Backup Device* under *Server Objects* → *Backup Devices*. If the device already exists when you run (or rerun) the batch file, you will see an error that the device already exists. This error can be ignored.

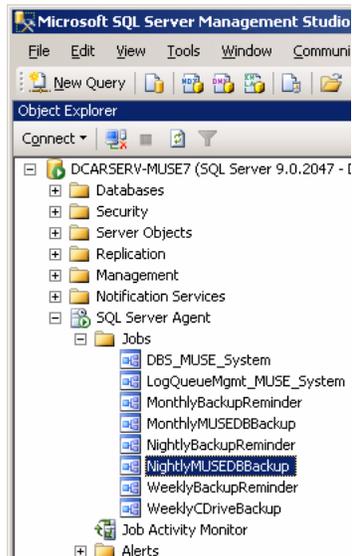
The table below is the list of jobs that are created by the buildjobs batch file, along with the default schedule for them to run.

Job Name	Default Time to Run
NightlyMUSEDDBBackup	Daily at 2:00 a.m.
MonthlyMUSEDDBBackup	First Monday of the Month at 9:00 a.m.
WeeklyCDriveBackup	Each Friday at 3:00 p.m.
NightlyBackupReminder	Daily at 3:00 p.m.
MonthlyBackupReminder	First Monday of the Month at 6:00 a.m.
WeeklyBackupReminder	Each Friday at 1:00 p.m.

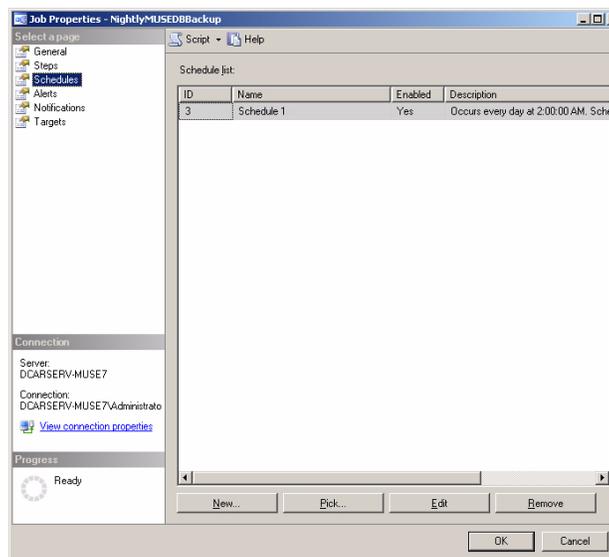
# Changing the Nightly Backup Schedule

If necessary, the backup schedule can be altered to meet customer requirements. For example, to exclude Saturday and Sunday from the backup schedule. Use the following procedure to change the schedule.

1. Right-click on the **NightlyMUSEDDBBackup** job and select *Properties*.

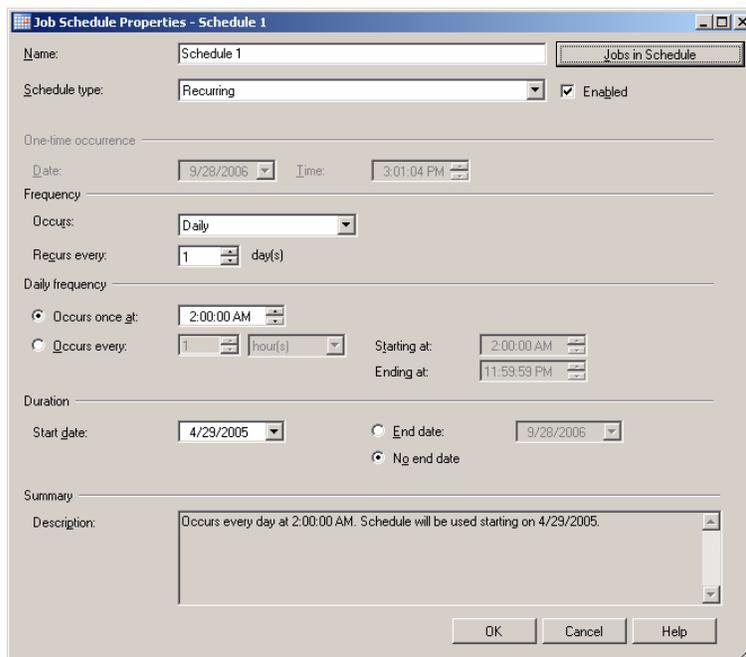


A window similar to the one shown below appears:



2. Click on the *Schedules* in the left pane.
3. Click the *Edit* button.

A window similar to the one shown below is displayed.



4. In the *Frequency* section, select *Weekly* in the *Occurs* list.
5. Select the each day you want the backup days that you want the backup to run. You can also change the time of day to run the backup if required.
6. Click on *OK* for all the opened windows to save your changes.

**NOTE**

If customers want to include additional backup sets, for example, so that one or more backup sets can be rotated off-site, that would be possible by purchasing additional backup tapes. Each backup job will overwrite the previous backup.

**NOTE**

The schedule for any of the jobs can be changed to meet customer requirements by editing the *Job Properties* in *SQL Server Management Studio* as described above.

# Notifications

## NOTE

The MUSE application does not provide information about backup status, but information about the backups is available either via notification messages or by looking at the Report Log file that is generated by the backups.

The **MUSEBackup.log** file can be found in the **d:\muse\backup** folder. Failures will also be logged in the *Windows Event Viewer*.

Every time the backup job runs, it over-writes the previous log. Only information on the last backup job run will be in log file.

## Configure Email Notifications

MUSE uses the freely available *Blat* utility to send email notifications. To configure the *Blat* utility, perform the following steps:

1. From a **d:\muse\backup** *Command Prompt*, type:

**Blat [Space] -install [Space] <email server address> [Space] <sender address>**  
and press **Enter**

### For Example:

**Blat [Space] -install [Space] mail.someplace.com [Space]**  
**someone@someplace.com** and press **Enter**

## NOTE

When running the BLAT utility for the first time, you will get an error message because BLAT needs to create *Registry* entries. You can ignore this error.

2. You should see a message returned that the SMTP server has been set to the email server address on port 25, with the user/sender address you provided, and that it is set to retry 1 time.

## NOTE

If you need to alter the *Blat* installation settings, they can be found in the following Registry key - **HKLM\Software\Public Domain\Blat**.

There are two email notifications possible

- ◆ one as a reminder to change the backup tapes, and
- ◆ one to report the status of the previous backup.

## Email of Backup Status

Edit **d:\muse\backup\NightlyBackupStatus.bat** to reflect the desired values. The batch file has the following instructions embedded into it.

Edit the **d:\muse\backup\nightlybackupstatus.txt** file to reflect what you want in the email message body. The default is:

The MUSE system nightly backup status message is attached.  
Please read the attachment and verify the backup was successful.

Edit the parameters below as required for this installation

**-subject** edit this text to change the email subject  
**-attach** leave this value as the default  
**-to** enter an individual or group email address  
**-server** enter the address of the email server that will route the message

Edit **d:\muse\backup\MonthlyBackupStatus.bat** in the same way to reflect the desired values for the monthly backup.

When these notifications are configured, the system will email the **MUSEBackup.log** file to the email address that is setup to receive it.

## Email Reminder to Change the Tapes

There are two parts to setting up the email reminders. One is to edit the batch and text files to reflect where to send the reminder, and the other is to configure the schedule for the jobs if the default time to run does not meet customer requirements.

## Edit the Batch and Text Files

Edit **d:\muse\backup\NightlyBackupReminder.bat** to reflect the desired values. The batch file has the following instructions embedded into it.

Edit the **d:\muse\backup\nightlyreminder.txt** file to reflect what you want in the email message body. The default is:

**Please remember to change the Nightly Backup tape for the MUSE system.**

Edit the parameters below as required for this installation

**-subject** edit this text to change the email subject  
**-to** enter an individual or group email address  
**-server** enter the address of the email server that will route the message

Edit **d:\muse\backup\MonthlyBackupReminder.bat** and **MonthlyReminder.txt** in the same way to reflect the desired settings for the monthly reminder.

When these notifications are configured, the system will email a reminder to change the backup tape to the email address that is setup to receive it.

# Net Send Notifications

## NOTE

It is not a requirement to configure Net Send notifications, since they are not as reliable as email notifications. This procedure is only documented here for cases where the customer wants this type of notification.

Net Send notifications can be configured as part of a database backup job. Typically they are used to send a message when the backup job fails. If the computer that you are sending the message to is not online, the message will not be received.

There are two parts to configuring a Net Send message.

- Create and configure the *Operator* that will receive the message
- Configure the backup job to send the message

## Create and Configure the Operator

1. Log into the MUSE file server with a local administrator account.
2. From the Windows desktop select *Start → All Programs → Microsoft SQL Server 2005 → SQL Server Management Studio*.  
The *SQL Server Management Studio* window is displayed.
3. In the left pane, browse to *SQL Server Agent → Operators*.



4. Right-click *Operators* and select *New Operator...* from the menu.  
The *New Operator* window is displayed.
5. Enter the name you would like to use for the *Operator*, and the address of the computer you want to receive the Net Send message.
6. Click on *OK* to save your changes.

## Configure Backup Job to Send Message

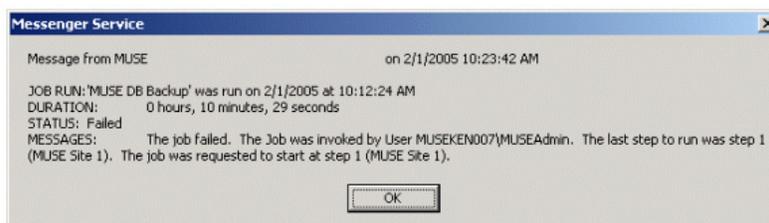
1. In the left pane of the *SQL Server Managment Studio* window, browse to *SQL Server Agent* → *Jobs*.
2. Right-click on the job you want to send a Net Send message and select *Properties* from the menu.
3. Click on *Notifications* in the left pane of the *Job Properties* window.
4. In the *Actions to perform when the job completes* section of the window, check the *Net send* checkbox, select the appropriate operator from the first drop-down list, and select an event from the second drop-down list.

Actions to perform when the job completes:

<input type="checkbox"/> E-mail:	[ ]	When the job fails
<input type="checkbox"/> Page:	[ ]	When the job fails
<input checked="" type="checkbox"/> Net send:	admin notice	When the job fails
<input checked="" type="checkbox"/> Write to the Windows Application event log:		When the job fails
<input type="checkbox"/> Automatically delete job:		When the job succeeds

5. Click OK to save your changes.
6. Exit *SQL Server Management Studio*.

Here is an example of a typical *Net Send* message:



### NOTE

In order for Net Send messages to be successfully transmitted, the *Messenger Service* must be *Started* at both the sending and receiving computers.

## Set Up the Weekly C: Drive Backup

The C drive backups involve running a SQL Server agent job that runs a batch file. The batch file uses the NTBackup utility that is built into Windows Server 2003 to do the backup. The weekly backup tape for the C: drive will be labeled Weekly C: Backup.

### Edit CBackup.bat File

- The default is for Sony branded AIT tape drives. If the system (ML370 G3) has a Compaq branded AIT tape drive, do the following:
  - ◆ Open `d:\muse\backup\CBackup.bat` in *Notepad*.
  - ◆ In the *Eject the tape* section, comment out the `rsm` line for the Sony tape drive and uncomment the `rsm` line for the Compaq tape drive.
- To configure the system to send an email reminder to check the success of the weekly C: drive backup, do the following:
  - ◆ If not already open from step 1, open the **CBackup.bat** file in *Notepad*
  - ◆ Edit the **-to** and **-from** values in the *To email backup status* section to match customer requirements.
- Save any changes made to the **CBackup.bat** file and close *Notepad*.

### Initialize a New Tape

- To initialize a new weekly backup tape, insert a new tape into the tape drive.
- Right-click on *My Computer* and select *Manage*.
- Expand *Removable Storage* and select *Media*.

The tape should be listed on the right, and if it is new it will show as **Unrecognized 8mm AIT 1** under the *Media Pool* column.

- Highlight the new tape in the list.
- Click on *Action* → *Free* from the menu.

The following message will be displayed:



- Click on *Yes*.  
You will get another message to confirm that you want to make it free.
- Click on *Yes*.
- Label the tape externally as **Weekly C: Backup**. The tape is now ready for use as the **Weekly C Backup** tape.

## Schedule the Weekly C: Backup

The Weekly Backup job was added as a SQL Server Agent job when you ran the buildjobs batch file earlier in this process. You can change the schedule for the Weekly backup job by altering the job in SQL Server, just as described above for the Nightly Backup job.

## Email Reminder to Insert the Weekly C: Backup Tape

The Weekly Backup Reminder job was added as a SQL Server Agent job when you ran the buildjobs batch file earlier in this process. You can change the schedule for the Weekly Backup Reminder job by altering the job in SQL Server, just as described above for the Nightly Backup job.

The important thing to consider for the reminder to insert the weekly C: drive backup tape is to send it to the right person, and to give them time to insert the tape before the backup is scheduled to run.

For example, if the Weekly C: Backup is scheduled to run at 11:00 a.m. each Monday, you might want the email reminder to be sent at 9:00 a.m. each Monday.

# Manual Database Backup

The steps in this section describe how to perform a database backup between scheduled times.

1. Insert the appropriate backup tape in the tape drive of the file server.
2. Log into the MUSE file server with the username and password of a user with administrative privileges.
3. From the Windows desktop, select *Start* → *All Programs* → *Microsoft SQL Server 2005* → *SQL Server Management Studio*.  
The *Connect to Server* window is displayed.
4. Select/verify the name of the server you wish to connect to is displayed in the *Server Name* list.
5. Click the *Connect* button.
6. In the left pane of the *SQL Server Management Studio* window, browse to *SQL Server Agent* → *Jobs*.
7. Right-click *NightlyMUSEDDBBackup* and select *Start Job at Step...*
8. With Step 1 highlighted, click the *Start* button.
9. Verify each step completes successfully.
10. Exit *SQL Server Management Studio* when the backup is complete.

# Disaster Recovery MUSE File Server

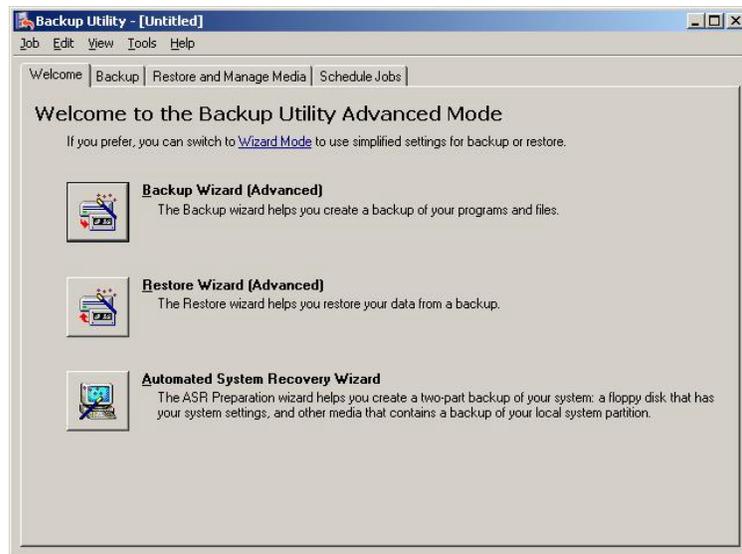
## Creating the Automated System Recovery Media

This procedure takes advantage of the Automated System Recovery (ASR) feature that is part of Windows Server 2003. You will need a new blank AIT tape and a blank formatted diskette to create the ASR media set.

### NOTE

Before performing this procedure, inform the customer that the system will be shutdown for approximately 30 minutes. This will allow you enough time to make two ASR sets.

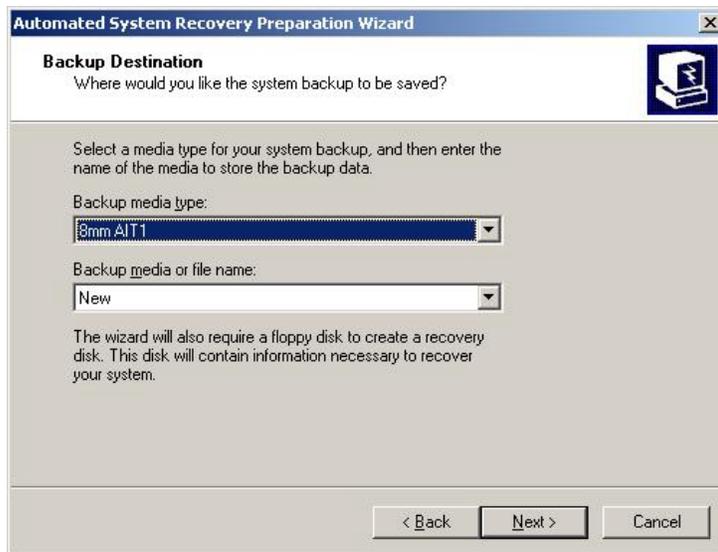
1. Log into the file server as a local administrator.
2. Open a *Command Prompt* and change to the folder where MUSE is installed. This is typically `c:\program files\muse`.
3. Type `asrprep` and press **Enter**.  
This will shutdown some of the Services so that they won't interfere with the ASR tape creation.
4. To create an AIT tape/Diskette ASR set, click on *Start* → *Run...*
5. Type `ntbackup` and press **Enter**. If backup is already configured for advanced mode, the following screen will be displayed. If not, click on the advanced mode link to go into advanced mode.



- Click on the *Automated System Recovery Wizard* button to launch the wizard. The following screen will be displayed.



- Click on *Next>*. The following screen will be displayed.



**NOTE**

If you are reusing an existing ASR tape, you will need to select it from the *Backup media or file name* drop-down list.

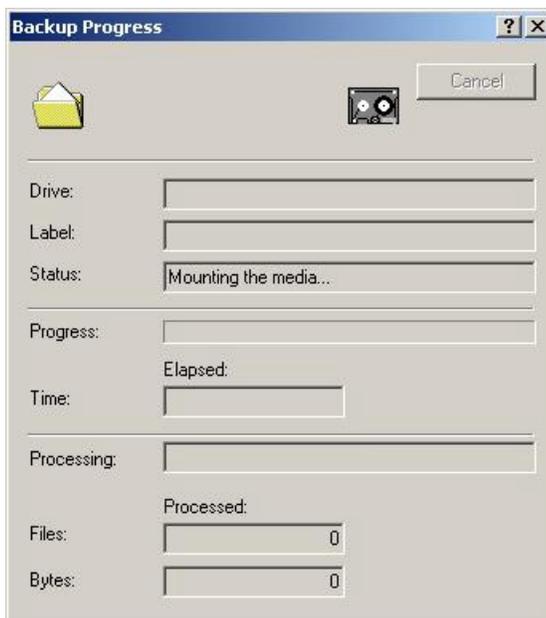
If you are reusing an existing ASR tape, you will either need to select it from the *Backup media or file name* drop-down list, or select to overwrite it when the backup starts.

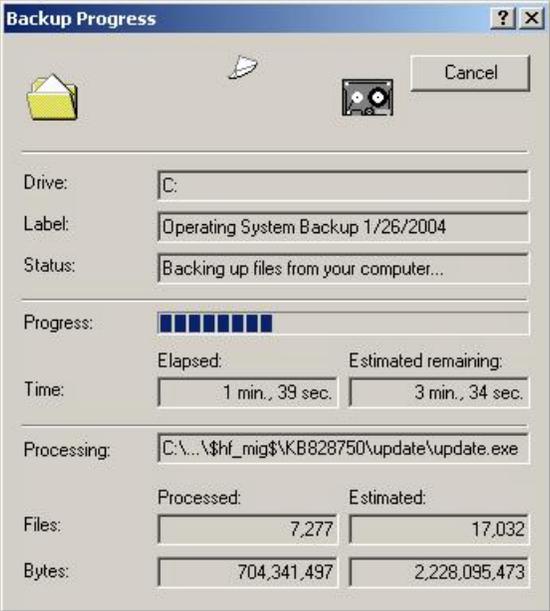
- Verify that the information matches and then click *Next*>. The following screen will be displayed.



- Make sure you have a new blank AIT tape in the tape drive (or an existing one that is being replaced) and that you have a blank formatted diskette ready. Click *Finish*.

A series of windows similar to the following figures will be displayed to indicate the progress of the backup.





- When the backup finishes, you will be prompted for the diskette. Insert the blank formatted diskette and click *OK*.



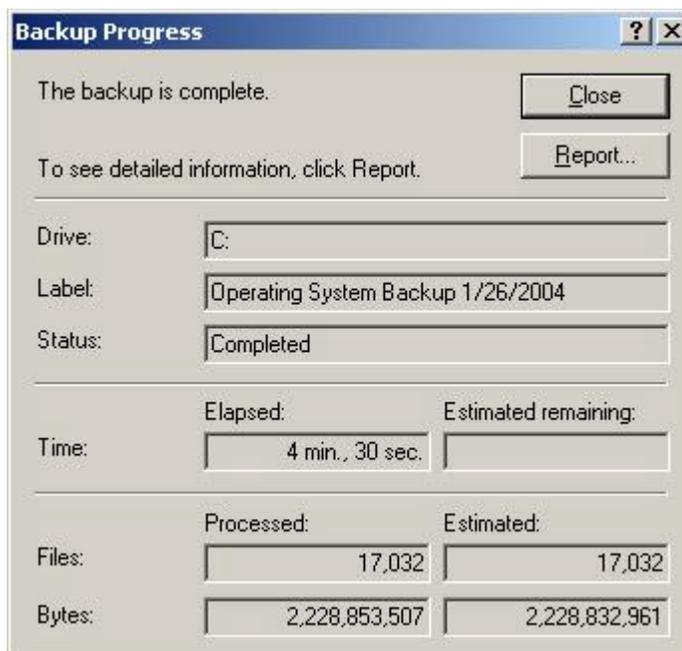
Files will be copied to the diskette.



- After the diskette is created, you will be prompted to remove the diskette and tape and to label them appropriately.



12. Click *OK*. Click *Close* to close the *Backup Progress* window.



13. Click the **X** to close the *Backup Utility* window.

14. Use the following steps to copy the drivers needed for the Sony SDX-550V tape drive from the MUSE Support CD to the ASR floppy disk.
  - a. Insert the MUSE Support CD into the CD-ROM drive.
  - b. Navigate to *x:\SDX-550V*, where *x*: is the CD-ROM driver letter.
  - c. Copy the entire contents of the SDX-550V folder to the root directory of the ASR floppy disk.

**NOTE**

If you cannot locate the MUSE Support CD, you can download the necessary files from [http://sony.storagesupport.com/ait/ait\\_asr.htm](http://sony.storagesupport.com/ait/ait_asr.htm).

15. Verify the floppy drive contains the following files and directory structure:

Directory	Files	Comments
A:\ (root)		
	asr.sif asrnpn.sif setup.log	ASR Files
	sonyait.txt txtsetup.oem	Tape Drivers
W2k3		
32	s32ait.cat s32ait.inf s32ait.sys	Tape Drivers
64	sx64ait.cat sx64ait.inf sx64ait.sys	Tape Drivers

16. Store the tape and diskette in a safe place.

#### NOTES

It is recommended that two separate ASR Tape/Diskette sets be created and stored in separate locations. One should be easily retrievable to minimize delay when it is needed. To create the second set, simply go through this procedure again.

New ASR Tape/Diskettes should be created whenever the system partition changes, such as after a MUSE software update, or when new Windows Users, printers, or security patches are added. Creating new ASR sets is recommended during any preventive maintenance work.

17. Restart the MUSE file server when you are finished making ASR media.

## Recovering From System Failures

There are two possible routes to take when you need to recover from a system failure.

- Recovery Console (used to repair minor problems)
- Automated System Recovery (used to completely restore the system partition)

### Using Recovery Console

If Safe Mode and other startup options do not work, consider using the *Recovery Console*. This method is recommended only if you are an advanced user who can use basic commands to identify and locate problem drivers and files. In addition, you will need the password for the built-in administrator account to use the *Recovery Console*.

Using the *Recovery Console*, you can enable and disable services, format drives, read and write data on a local drive (including drives formatted to use NTFS), and perform many other administrative tasks. The *Recovery Console* is particularly useful if you need to repair your system by copying a file from a floppy disk or CD-ROM to your hard drive, or if you need to reconfigure a service that is preventing your computer from starting properly.

If you are unable to start your computer, you can run the Recovery Console from your Setup CD.

To start the computer and use the *Recovery Console*.

1. Insert the Setup CD and restart the computer from the CD drive.
2. When the text-based part of Setup begins, follow the prompts; choose the repair or recover option by pressing **R**.
3. When prompted, type the password for the local administrator account.
4. At the system prompt, type the relevant *Recovery Console* commands; type **help** for a list of commands or **help [Space] <commandname>** for help about a specific command.
5. To exit the *Recovery Console* and restart the computer, type **exit**.

## Using Automated System Recovery

There are several reasons why you might need to perform a disaster recovery. This procedure describes a situation where you have replaced multiple failed hard drives and would need to start by configuring the server just like it was new.

Another disaster recovery situation may be different, so you should use this information as a guide to helping you recover a system. For example, you may not need to reconfigure the RAID 5 drive array.

### **NOTE**

To use the Automated System Recovery (ASR) backup media for recovery, you must have the floppy disk that you created with that set of media. You cannot use a floppy disk created at a different time or with a different set of media.

Make sure you have the following available before you begin the recovery procedure:

- Your most recent ASR media set (floppy disk and AIT tape).
- A Windows Server 2003 CD.
- The most recent MUSE backup tape.
- *370G5 MUSE Pre-Install CD* (G5 platforms only)

## Configuring the File Server RAID Array

The process for configuring the file server's RAID array differs depending on whether your system is running on a G4 platform or a G5 platform. If necessary, refer to Chapter 2, "[Equipment Overview](#)" for guidance in identifying which platform the MUSE server is on. After identifying the platform, refer to the appropriate instructions for your platform.

### Configuring the FILE Server RAID Array on a G4 Platform

1. Power-up the system.
2. Watch closely during system boot and when *Press <F8> to run the Option ROM Configuration for Arrays Utility* is displayed, press **F8**.
3. Highlight *Delete Logical Drive* and press **Enter**.
4. Do one of the following:
  - ◆ If the *There are no available logical drives* screen opens, press **Esc** and skip to step 5.
  - ◆ If logical drives exist, do the following:
    - a. Press **F8** to delete them.
    - b. On the warning window, press **F3**.
    - c. On the configuration saved screen, press **Enter**.
5. Highlight *Create Logical Drive* and press **Enter**.
6. In the *Available Physical Drives* box, cursor down to the last drive and press the **spacebar** to remove the drive from the array.
7. Verify RAID 5 is selected.

8. Press the **Tab** key twice to select *Use one drive as spare* and press the **spacebar**. Verify that the letter *S* appears in the check box.
9. Press **Enter** to create the drive.
10. Press **F8** to save the configuration.
11. Press **Enter** on *Configuration Saved* screen.
12. From the *Main Menu* screen, press **Esc** to exit and resume the boot process.

**NOTE**

This next section of steps would not normally need to be done if the system was already running MUSE v7, but they might be necessary, depending on what hardware was replaced on the file server.

13. Press **F9** when the message *Press "F9" key for ROM-Based Setup utility* opens.
14. Select *System Options* and press **Enter**.
15. If *OS selection* is present perform the following steps.
  - a. Select *OS selection* and press **Enter**.
  - b. Select or verify *Microsoft Windows 2000/Windows Server 2003* as the O/S to be installed. (This may show as *Microsoft Windows 2000/Windows .NET*.)
  - c. Press **Enter**.
  - d. Press **Esc**.
16. Select *Boot controller Order* and press **Enter**.
17. Select or verify *Smart Array controller* and press **Enter**.

Depending on the server, the array could be labeled 400, 641, or 643.
18. Select *Controller Order 1* and press **Enter**. Press **Esc**.
19. Select *Date and Time* and press **Enter**; enter the current date and time and press **Enter**.
20. Select *Advanced Options* and press **Enter**.
21. If *Post FI Prompt* is present, perform the following steps.
  - a. Select *Post FI Prompt* and press **Enter**.
  - b. Select *Disabled* and press **Enter**.
  - c. Press **Esc**; press **Esc** again.
22. Press **F10** to confirm current boot controller is *Compaq Smart Array (641 or 642) Controller*.

The system will reboot.
23. When the system reboots, proceed to **“Recover the System Partition”** on page 4-25.

## Configuring the FILE Server RAID Array on a G5 Platform

1. Power-up the system.
2. Watch closely during system boot and when *Press <F8> to run the Option ROM Configuration for Arrays Utility* is displayed press **F8**.
3. Highlight *Delete Logical Drive* and press **Enter**.
4. Do one of the following:
  - ◆ If the *There are no available logical drives* screen opens, press **Esc** and skip to step 5.
  - ◆ If logical drives exist, do the following:
    - a. Select the drive with the highest number.  
  
For example, if the logical drives are Drive 0 and Drive 1, delete Drive 1 before deleting Drive 0.
    - b. Press **F8** to delete the selected drive.
    - c. On the warning window, press **F3**.
    - d. On the configuration saved screen, press **Enter**.
    - e. Repeat step a through step d for each logical drive.
5. Insert the *370G5 MUSE Pre-Install CD* into the CD-ROM drive.
6. On the *Option ROM Configuration for Arrays Utility* main menu, press the **Esc** key to reboot the server.  
  
The system will reboot from the CD.
7. When prompted, press **R** for Rack or **T** for Tower, whichever is appropriate for the platform, and press **Enter**.  
  
The drive array will be configured. When it is done, the system will automatically reboot.
8. Remove the CD.
9. Proceed to **“Recover the System Partition”** on page 4-25.

## Recover the System Partition

1. Insert the Windows Server 2003 Recovery CD into your CD drive, and the ASR AIT Tape into the tape drive.
2. Restart your computer.  
The computer should boot from the CD. If it does not, check the boot order in the BIOS setup.
3. Press the **F6** key when the F6 prompt appears at the bottom of the Windows Setup window.
4. When you are prompted to run the Automated System Recovery (ASR), press the **F2** key.
5. When prompted, insert the ASR floppy disk and press **Enter**.
6. When the system prompts you for the floppy drive with the tape driver, press the **S** key.

### **NOTE**

If the SDX-550V tape driver was not added to the ASR floppy when it was originally created, you will need to copy it onto a floppy disk from the MUSE Support CD that shipped with the system before pressing the **S** key.

7. When you are prompted to select the driver to install, select *Sony AIT - SAIT 32 Bit Tape Driver for Windows Server 2003* and press **Enter**.
8. When *Windows Setup* prompts you for additional device drivers, press **Enter** to continue.
9. When prompted to delete and recreate the disk partitions, press **C** to continue.  
The drive will be formatted and setup files will be copied to the Windows installation folders. When it is done, the system will reboot and the normal Windows installation will continue. When Windows is installed, the *Automated System Recovery* process will start.
10. Follow the prompts to allow the system to restore from the ASR tape.

When the process is complete, the system will reboot. At this point, the original **C:** drive will be restored from the ASR tape. This process does not restore the MUSE database. You must restore the databases separately. Proceed to [“Recovering the MUSE Databases”](#) on page 4-26.

## Recovering the MUSE Databases

The process of recovering the MUSE database consists of three basic steps:

1. Formatting the D: partition.
2. Installing the default MUSE databases.
3. Restoring data from the most recent backup tape.

Each step is described in more detail in the following topics.

### Formatting the D: Partition

1. Sign on to the server as an administrator.
2. Shut down all MUSE and MACCRA services.
3. Run the *Microsoft SQL Management Studio*.
4. Right-click on each MUSE database and select *Delete*.
5. On the *Delete Object* window, set the *Delete backup and restore history information for databases* check box and click *OK*.
6. Repeat steps 4 and 5 for each MUSE database.
7. Close the *Microsoft SQL Management Studio*.
8. Right-click on *My Computer* and select *Manage*.
9. On the *Computer Management* window, select *Storage > Disk Management*.
10. Right-click on drive D: and select *Format...*
11. On the *Format* window, verify the *File System* is set to NTFS and the *Perform a Quick Format* check box is set.
12. Click *OK*.
13. When the warning message appears, click *OK*.

The system will begin formatting the D: partition. When it is done, you will have a clean D: drive and its status will be changed to *Healthy*. Continue to [“Installing the Default MUSE Databases”](#).

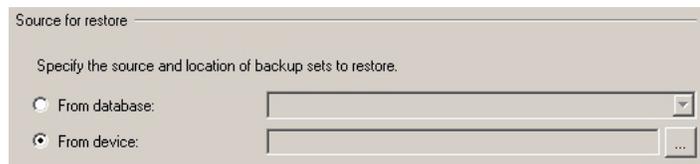
### Installing the Default MUSE Databases

1. Login with the **MUSEAdmin** account.
2. Insert the MUSE application CD.
3. Open a *Command Prompt* and change to the x:\**musedb** directory, where x: is the CD-ROM drive letter.
4. Type **install** and press **Enter**.
5. Respond to the License Agreement prompt.

The system will install the default databases and any ancillary files. When it is done, proceed to [“Restore From Most Recent Backup Tape”](#).

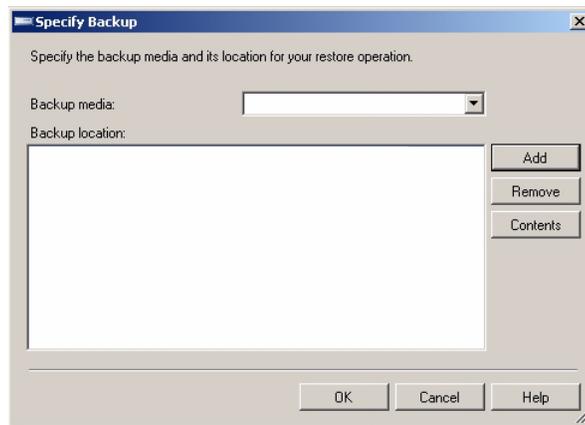
## Restore From Most Recent Backup Tape

1. Stop MUSE Services.
2. Open *SQL Server 2005 Management Studio* and delete the default **MUSE\_Site0001**, **MUSE\_SiteTemplate** and **MUSE\_System** databases by right-clicking each database and selecting delete. Click *OK* if prompted to also delete the backup history.
3. Insert the most recent backup tape.
4. Open *SQL Server Management Studio* and right-click on *Database* in the left pane.
5. Select *Restore database* from the pop-up menu.
6. Select *From device* in the *Source for Restore* box.



7. Click on the  button.

The *Specify Backup* window is displayed.



8. Select the following in the *Specify Backup* window:
  - a. Select *Tape* from the *Backup media* list.
  - b. Select the *Add* button to add **\\.\Tape0** to the *Backup location* list.
  - c. Select the *OK* button.
9. Select *OK* in the *Restore Database* window.

**NOTE**

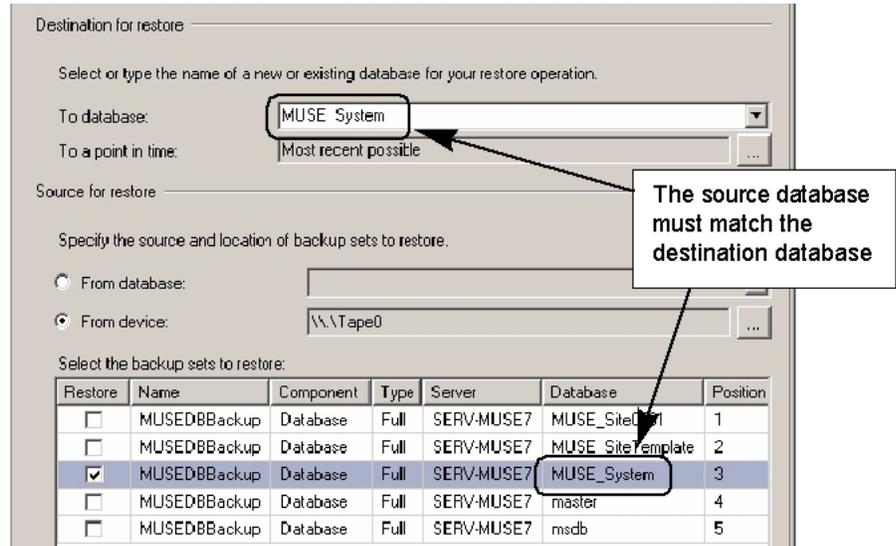
After a minute or two, a list of databases on the tape will be displayed in the *Restore Database* window. The window provides no indication to the user to wait. Please be patient and wait for the list of databases on the tape to appear.

10. After the list of databases appears in the window, select a database.

11. Select the same database from the *To database* dropdown list in the *Destination for restore* box.

**EXAMPLE:**

If you selected **MUSE\_System** as the *Source for restore*, you should select **MUSE\_System** in the *Destination for restore* as shown in the example below. The name of the source database and the destination database must match.

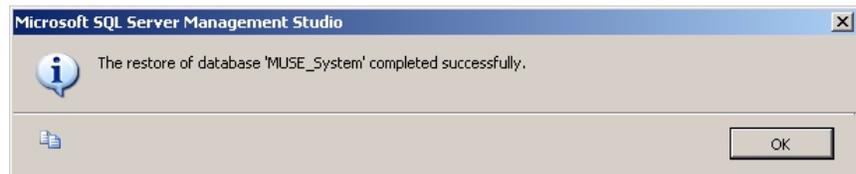


12. Click *OK* in the *Restore Database* window.

**NOTE**

After a minute or two, a green arrow going in a circular path will appear in the progress section (lower left corner) of the window. Until this green progress indicator appears, there is no indication to the user that the program is working. Be patient and wait for the green progress arrow to appear.

13. When the restore is complete, a window similar to the one shown below is displayed.



14. Click *OK* to close the window.
15. Repeat the steps in this section to restore the **MUSE\_SiteTemplate** and each **MUSE\_Sitexxxx** database.
16. Restart the MUSE services and verify the database restore was successful.

## Other Tasks to Perform After System Restore

1. If the customer is acquiring CASE data over the network, you will need to perform the following steps.
  - a. Right-click on the folder in *Windows Explorer* and select *Sharing and Security...*
  - b. Select *Share this folder*. Change the share name to **acq\$** and click on the *Permissions* button.
  - c. Remove the *Everyone* group, and add the local **case8000** user. Give the **case8000** user *Change and Read* permissions.
  - d. If there were Stress systems already copying data to this folder, you may also need to share the folder as “case8000” if that is how the Stress systems are configured.
2. If the customer is using the XML import option, share the **d:\muse\xml** folder as described in “[Installing and Configuring the XML Import Option](#)” on page 3-7 of this manual.
3. Re-install InSite 2.0. See “MUSE – Installing InSite 2.0” (2033425-008) for detailed procedures.
4. If the system had been configured with the MUSE Web option, re-install MUSE Web. See “MUSE Web Installation Instructions” (pn 2033425-007) for detailed procedures.

## Restoring Database Backups

The disaster recovery process (see “[Disaster Recovery MUSE File Server](#)” on page 4-15) is used when the system or the database becomes corrupted or unresponsive. However, the daily database backups can be used outside of that process to restore a valid or healthy database to an earlier state.

The process to restore the database consists of the following basic tasks:

1. Copy the current databases.
2. Restore the most recent database backup.
3. Revert to the current database, if necessary.

Each task is described in more detail in the following topics.

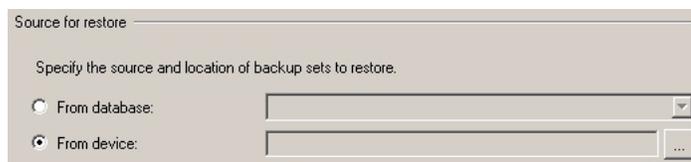
### Copying the Current Database

GE recommends that you copy the current database before restoring a backup. This allows you to back out of the restore process, if necessary, and revert to the current database.

1. Shut down all MUSE, MACCRA (if present), and SQL services.
2. Navigate to *d:\muse*.
3. Right-click the *\muse\db* folder and select *Copy*.
4. Right-click in a blank area in the *\muse* folder and select *Paste*.  
This creates a *\muse\Copy of db* folder.
5. Proceed to “[Restoring the MUSE Database](#)”.

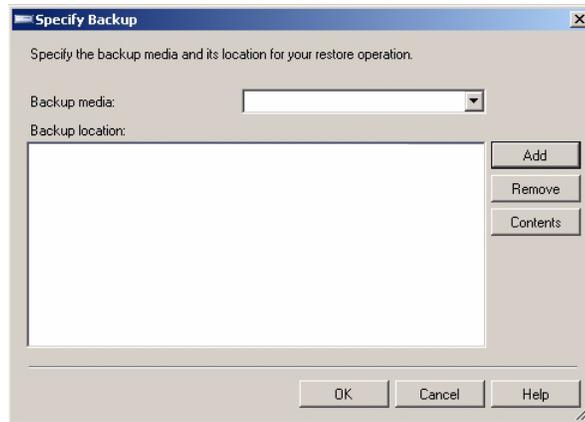
### Restoring the MUSE Database

1. Stop MUSE Services.
2. Open *SQL Server 2005 Management Studio* and delete the default **MUSE\_Site0001**, **MUSE\_SiteTemplate** and **MUSE\_System** databases by right-clicking each database and selecting delete. Click *OK* if prompted to also delete the backup history.
3. Insert the most recent backup tape.
4. Open *SQL Server Management Studio* and right-click on *Database* in the left pane.
5. Select *Restore database* from the pop-up menu.
6. Select *From device* in the *Source for Restore* box.



7. Click on the  button.

The *Specify Backup* window is displayed.



8. Select the following in the *Specify Backup* window:
- Select *Tape* from the *Backup media* list.
  - Select the *Add* button to add \\.\Tape0 to the *Backup location* list.
  - Select the *OK* button.
9. Select *OK* in the *Restore Database* window.

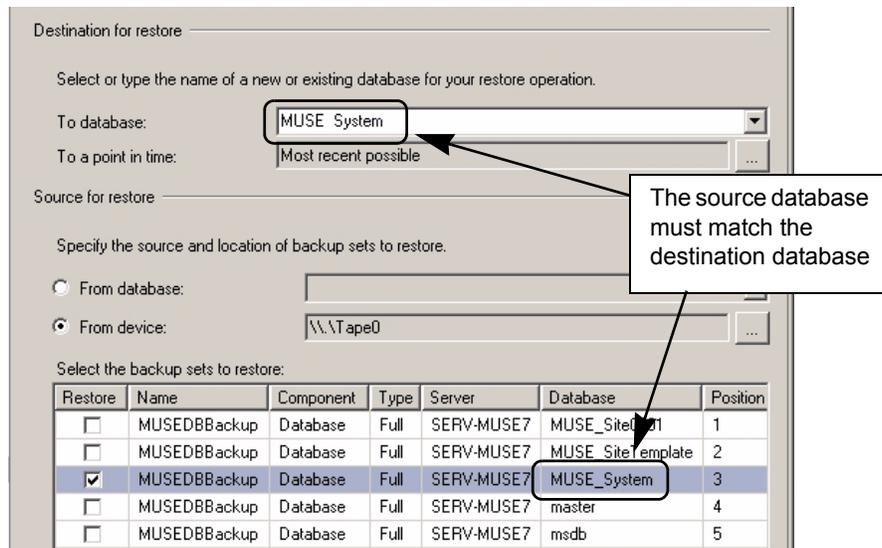
**NOTE**

After a minute or two, a list of databases on the tape will be displayed in the *Restore Database* window. The window provides no indication to the user to wait. Please be patient and wait for the list of databases on the tape to appear.

10. After the list of databases appears in the window, select a database.
11. Select the same database from the *To database* dropdown list in the *Destination for restore* box.

**EXAMPLE:**

If you selected **MUSE\_System** as the *Source for restore*, you should select **MUSE\_System** in the *Destination for restore* as shown in the example below. The name of the source database and the destination database must match.

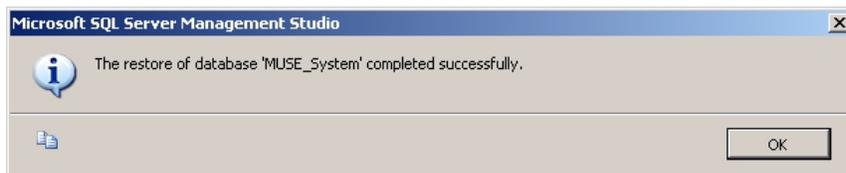


12. Click *OK* in the *Restore Database* window.

**NOTE**

After a minute or two, a green arrow going in a circular path will appear in the progress section (lower left corner) of the window. Until this green progress indicator appears, there is no indication to the user that the program is working. Be patient and wait for the green progress arrow to appear.

13. When the restore is complete, a window similar to the one shown below is displayed.



14. Click *OK* to close the window.

15. Repeat the steps in this section to restore the **MUSE\_SiteTemplate** and each **MUSE\_Sitexxxx** database.

16. Restart the MUSE services and verify the database restore was successful.

# System Shutdown & Restart Procedures

## Shutdown the MUSE System

There are no requirements to shutdown the MUSE system, other than making sure users are aware that the system will be unavailable while it is shutdown. Users that have tests open for editing need to save their changes and close the tests before the system is shutdown, or the changes will be lost. If a test is open when the user is disconnected, the test will remain locked, but can be unlocked by a user with the proper permissions under *Status* → *Locked Data List*.

## Shutdown or Restart the File Server

1. You can shut down the file server by selecting *Start* → *Shut Down* from the *Windows* desktop.
2. Select either *Restart* or *Shut down* as required.

### NOTES

- ◆ A *Restart* will reboot the computer making MUSE system available again.
- ◆ A *Shut down* will cause the computer to shut down until you turn it back on.
- ◆ If the system has a CCG for HL7 interfaces, the inbound messages will queue up on the CCG until the MUSE is restarted.
- ◆ There is no requirement to shut down/restart clients as they will reauthenticate automatically.

## Power Up Procedure

1. Power up the file server and monitor if required.
2. Restart any clients or the MUSE application on the clients as required.

## Start-Up Verification

1. Verify that all of the MUSE-related *Services* have started, and that you can run the MUSE application on the file server.
2. Also verify that clients are able to attach when running the MUSE application.

**For your notes**

# 5 Troubleshooting

# Assembly Descriptions

## Introduction

If you encounter a problem that is not addressed in the OEM manuals or if you would like further assistance, please call Technical Support at 1-800-558-7044.

## File Server

Assembly and disassembly instructions can be found in the Compaq manuals that accompanied your system.

## Desktop Client

Assembly and disassembly instructions as well as basic troubleshooting procedures can be found in the Compaq manuals that accompanied your system.

## Monitors

Basic troubleshooting procedures for the monitors can be found in the Operating Instruction manual that accompanied your monitor. The monitor is a field replaceable unit and should not be disassembled in the field.

## UPS

Basic troubleshooting procedures for the UPS can be found in the PowerVAR or Compaq manual that accompanied your UPS. The UPS is a field replaceable unit and should not be disassembled in the field.

## HP LaserJet 4250N Printer

Troubleshooting procedures and instructions for the removal and replacement of repairable items are provided in the HP Printer User's Manual and Getting Started Guide that accompanied your printer.

# High Level System Description

## Introduction

The MUSE system consists of a file server that stores the system configuration and patient records, and client computers that run the MUSE application. The MUSE application allows the users of the system to access the file server to perform system functions, such as: editing, test retrieval, system setup, running database searches, and checking system status.

Each MUSE system is configured, as required, to support the different devices that are sending data into the system, and to support the different ways that MUSE needs to send data from the system, for example: to laser printers, fax machines, or to an HL7 (Health Level 7) interface. Several different data types are supported by the MUSE system, but the most common ones are ECG, Stress and Holter. These different data types come from devices or systems such as ECG Electrocardiograph Carts, CASE Stress systems, or MARS Holter systems.

This document provides detailed information about the hardware and software requirements of the MUSE system. It also provides information on topics such as the flow of data through the system, networking requirements, system sizing guidelines, and the remote access methods that are used by service to support the system.

## Theory of Operation

Some of the information described in this section is dependant on the options that are purchased for use with the system.

The MUSE system consists of computers connected together via a network. The file server stores patient tests (ECG, Stress, Holter, HiRes) in a relational database. The tests are acquired from the associated devices for a particular type of study. Depending on the device and the system configuration, tests can be acquired over the wired network, over a combination wireless and wired network, from a floppy diskette or secure digital card, over a modem, or via a serial download cable. The [“Data Flow Diagram”](#) on page 5-6 illustrates the flow of data through the system.

The system includes applications for performing different tasks like configuring the system, running database searches, and checking system status. It also includes an editor application for tasks like overreading, retrieving and confirming tests. The tests can be either manually or automatically routed to output devices such as laser printers and fax machines, or they can be routed to destinations such as email addresses and shared folders.

Client workstations are connected to the file server over the network, and are used to perform the above-mentioned tasks. Workstations are identified in the system by their computer name.

## Operating System & Database Description

The MUSE System is built on the following architecture. The file server requires Microsoft Windows Server 2003 as the operating system, and Microsoft SQL Server 2005 as the Relational Database Management System (RDBMS). Client workstations require either Windows 2000 Professional or Windows XP Professional as the operating system. Client computers also require .NET Framework 2.0 to be installed.

## System and Device Interfaces

### MARS (Unix and PC)

MARS Holter systems can be configured to store saved reports to the MUSE system for long-term storage. Full Disclosure is not part of what gets sent to MUSE. The data transfer mechanism involves the MUSE system connecting to a network share on the MARS system over the network and copying the files back to the MUSE file server for processing. The Holter Data Type option is required on the MUSE system. Unix-based MARS systems require the enterprise network card option.

### MAC Carts

ECG data that is acquired at the MAC carts can be sent into the MUSE system for long-term storage. Depending on the type of cart and the options installed, data can be sent one of several ways:

- Removing the diskette or secure digital card from the cart and downloading it into a MUSE client
- CSI modem
- CSI wireless
- CSI direct (serial)

### CASE/CardioSoft Stress Systems

CASE/CardioSoft Stress systems can be configured to store saved reports to the MUSE system for long-term storage. CASE/CardioSoft systems require a network option to send data to the MUSE. The data transfer method involves the CASE/CardioSoft system copying the files to a shared folder on the MUSE system, and then the MUSE system will pick up the files locally for processing.

### HL7 (Health Level 7)

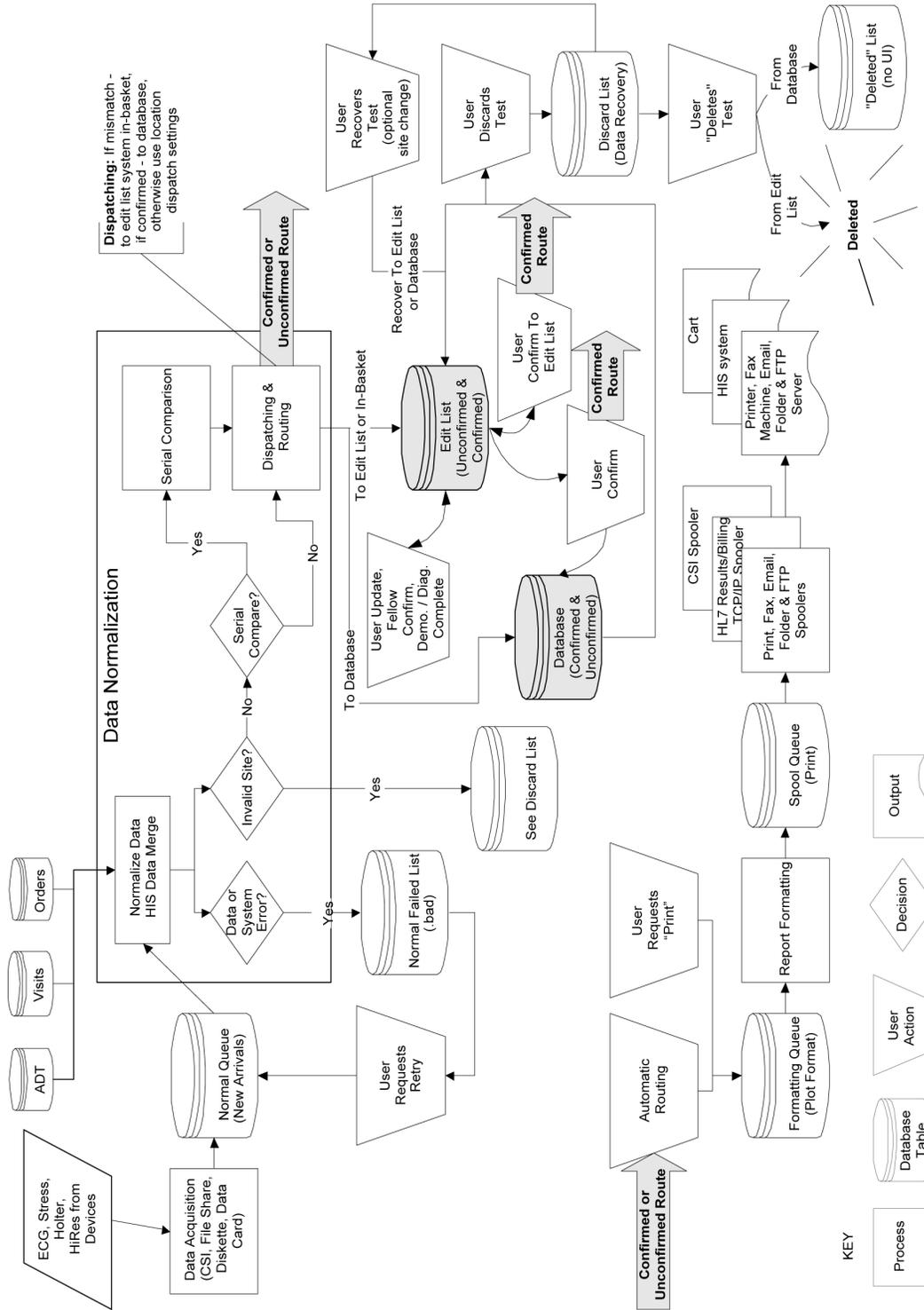
The MUSE system supports HL7 interfaces for ADT, Orders, Results and Billing. The version 7.0 MUSE system uses the CCG (Centricity Cardiology Gateway) v5.1 as the interface with the HIS.

## Interface to Monitoring Systems

Bedside monitors can be configured to send ECG data to the MUSE system for long term storage. This is accomplished through the use of a monitoring gateway, which is a computer that has two network interfaces - one on the monitoring network, and one on the hospital network on which the MUSE file server is located. When a test is sent to MUSE from a bedside monitor, it is received by the monitoring gateway and stored locally in a shared folder. The MUSE file server is configured to look for data on that network share, and when it finds new data it will be moved to the MUSE file server and processed into the system.

# Data Flow Diagram

This figure shows data flow from acquisition to confirmation into the database.



MUSE System v7.0 Data Flow Diagram

# General Fault Isolation

## First Things to Ask

If the unit is not working properly, save yourself some time troubleshooting by asking yourself these basic questions.

- Is the unit turned on?
- Have there been any changes in the use, location, or environment of the equipment that could cause the failure?
- Has the unit been modified in any way, either in software or hardware?
- Is operator error the cause of the problem? Try to repeat the user’s scenario exactly and compare that to the proper operation of the equipment. Check the operator’s manual as necessary.

## Visual Inspection

A thorough visual inspection of the equipment can save time. Small things—disconnected cables, foreign debris on circuit boards, missing hardware, loose components—can frequently cause symptoms and equipment failures that may appear to be unrelated and difficult to track.

Read the disassembly guidelines in the products OEM manual before you perform an internal visual inspection of the components.

Take the time to make all the recommended visual checks (refer to the following visual inspection chart) before starting any detailed troubleshooting procedures.

Table 1. Visual Inspection List	
Area	Look for the following problems
I/O Connectors and Cables	<ul style="list-style-type: none"> <li>■ Fraying or other damage</li> <li>■ Bent prongs or pins</li> <li>■ Cracked housing</li> <li>■ Loose screws in plugs</li> </ul>
Fuses	<ul style="list-style-type: none"> <li>■ Type and rating, replace as necessary</li> </ul>
Interface Cables	<ul style="list-style-type: none"> <li>■ Excessive tension or wear</li> <li>■ Loose connection</li> <li>■ Strain reliefs out of place</li> </ul>
Circuit Boards	<ul style="list-style-type: none"> <li>■ Moisture, dust, or debris (top and bottom)</li> <li>■ Loose or missing components</li> <li>■ Burn damage or smell of over-heated components</li> <li>■ Socketed components not firmly seated</li> <li>■ PCB not seated properly in edge connectors</li> <li>■ Solder problems: cracks, splashes on board, incomplete feedthrough, prior modifications or repairs</li> </ul>
Ground Wires/Wiring	<ul style="list-style-type: none"> <li>■ Loose wires or ground strap connections</li> <li>■ Faulty wiring</li> <li>■ Wires pinched or in vulnerable position</li> </ul>

**Table 1. Visual Inspection List (Continued)**

<b>Area</b>	Look for the following problems
Mounting Hardware	<ul style="list-style-type: none"><li>■ Loose or missing screws or other hardware, especially fasteners used as connections to ground planes on PCBs</li></ul>
Power Source	<ul style="list-style-type: none"><li>■ Faulty wiring, especially AC outlet</li><li>■ Circuit not dedicated to system</li><li>■ (Power source problems can cause static discharge, resetting problems, and noise.)</li></ul>

# 6 Maintenance

# Introduction

## Recommended Maintenance

A regular equipment maintenance program helps prevent unnecessary equipment and power failures and also reduces possible health hazards. This chapter contains instructions for the following recommended maintenance:

- Inspecting and cleaning the unit
- System Checkout

## Inspection Report

To help you establish a systematic maintenance routine, GE recommends that, every six months, you perform the maintenance checks and test procedures on the “Preventive Maintenance Inspection Report,” included at the end of this chapter.

### **NOTE**

Unless you have an Equipment Maintenance Contract, GE does not in any manner assume the responsibility for performing the recommended maintenance procedures. The sole responsibility rests with the individual or institution using the equipment. GE service personnel may, at their discretion, follow the procedures provided in this manual as a guide during visits to the equipment site.

## Required Tools and Supplies

The following equipment is required to maintain or repair the MUSE system.

- Standard set of hand tools
- Multimeter
- Leakage Current Tester
  - ◆ 120 V (or equivalent)
  - ◆ 240 V (or equivalent)
- Tape Head Demagnetizer
- Cleaning kits for the following components:
  - ◆ DAT drive
  - ◆ Tape drive
  - ◆ Optical drive
  - ◆ Floppy drive
- Vacuum
- Isopropyl alcohol
- Can of compressed air
- Tie wraps for securing cables

# Pre-Service Procedures

## System Shutdown

Before opening the unit for maintenance or service, be sure to shut the system down and remove power. Instructions for shutting the system down can be found in “Powering On and System Shutdown” in Chapter 2.

In addition, the OEM manuals provide information regarding proper shutdown of individual systems and devices.

# Inspection and Cleaning

## Visual Inspection

Perform a visual inspection daily. Turn off the unit and remove power before making an inspection or cleaning the unit.

- Check the case and display screen for cracks or other damage.
- Regularly inspect all cords and cables for fraying or other damage.
- Inspect all plugs, cables, and connectors for bent prongs or pins.
- Verify that all cords, socketed components, and connectors are securely seated.
- Inspect keys and controls for proper operation.
  - ◆ Toggle keys should not stick in one position.
  - ◆ Knobs should rotate fully in both directions.

## Precautions

Turn off the unit and remove all power before inspecting or cleaning.

Do not immerse any part of the equipment in water.

Do not use organic solvents, ammonia based solutions, or abrasive cleaning agents which may damage equipment surfaces.

Do not use a cleaning solution or solvent on the cassette tapes. Doing so can cause loss of data or damage to the tape drive.

Do not use metal articles, such as a screwdriver, to clean the tape heads, or bring any magnetic material near the head assembly.

## Exterior Cleaning

Clean the exterior surfaces once per month, and more frequently if needed, with a clean, soft cloth and a mild dishwashing detergent diluted in water.

- Wring the excess water from the cloth. Do not drip water or any liquid on the writer assembly, and avoid contact with open vents, plugs, or connectors.
- Dry the surfaces with a clean cloth or paper towel.

## Cleaning the Monitor Screen

Use a commercial glass cleaner.

- Follow directions for use on product.
- Use non-abrasive, antistatic lint-free cloth.
- Wipe carefully and allow to dry.

## Interior Cleaning

Complete any pre-service procedures prior to opening the unit or performing any interior cleaning. Clean the unit as needed, but at least once per month.

The equipment is sealed before it leaves the factory. There should be no dust buildup on the surfaces of the interior PCB assemblies and components when you receive it. However, if dust is an environmental problem, use a commercially available dust remover (compressed air). Follow the manufacturer's directions for use

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**WARNING**

Only qualified personnel should perform the following procedure.

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**WARNING**

Turn off power and disconnect power cord from AC power source before removing the cover.

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## Cleaning the System Box Interior

Follow these steps to clean the system box interior.

1. Power off the workstation. See "Powering Off the Workstation" in chapter 2, "Equipment Overview" for steps to power off the workstation.
2. Detach the AC power cord before cleaning the interior of the system box.
3. Remove the system box top cover. See the OEM manual for your specific system for detailed information.
4. Clean the interior. See the "Preventative Maintenance Inspection Report" for more detail.
5. Replace the system box cover. Refer to the OEM manual for your specific system for detailed information.

## Cleaning the Floppy Diskette Drive

The floppy disk drive cleaning kit is PN 407546-001. See Storage Device Cleaning Information, PN 409623-001, for detailed information on cleaning the floppy diskette drive.

## Cleaning the Tape Drive

See the OEM manual for the steps required to clean the tape drive heads on the file server.

## Cleaning the CD-DVD Drive

Follow these steps to clean the CD-DVD drive.

1. Open the drive.
2. Insert the cleaning CD-ROM, brushes down, into the drive.
3. Close the CD-ROM drive. The activity led blinks for about 10 seconds.
4. Open the CD-ROM drive.
5. Remove the cleaning CD-ROM and place it in its case.
6. Close the CD-ROM drive.

## Cleaning the Printer

See the OEM manual for cleaning and adjusting instructions for the HP LaserJet 4200N printer.

## Cleaning the Mouse

1. Make sure the computer is turned off.
2. Disconnect the mouse cable from the computer.
3. Turn the mouse over and look carefully at the bottom. To remove the retainer ring, turn it in the direction indicated by the diagram on the bottom of the mouse.
4. Turn the mouse over, top side up, so that the retainer ring and ball drop out.
5. Wash the ball in warm, soapy water; then dry it with a clean cloth. Blow air carefully into the ball-cage to dislodge dust and lint.
6. Look for a build-up of dirt on the plastic rollers inside the ball-cage. This build-up usually appears as a stripe running around the middle of the rollers.
7. If dirty, clean the rollers by using a cotton swab soaked in isopropyl (rubbing) alcohol. Turn the rollers with your finger and repeat the process until all deposits are removed. After cleaning, make sure the rollers are still centered in their channels.
8. Make sure that fluff from the swab is not left on the rollers.
9. Replace the ball and retainer ring. Turn the retainer ring to lock it into place.
10. Connect the mouse cable to the computer. Turn your computer back on.

## UPS Maintenance

All UPS sub-systems used in MUSE systems use sealed lead acid batteries. These batteries do not require any specific preventive maintenance other than testing for functionality.

### UPS Battery Care

Keep the area around the unit clean and relatively dust free. If the atmosphere is very dusty, clean the outside of the system periodically with a vacuum cleaner.

### Battery Life

Battery life will vary based on ambient temperature and amount of time that the batteries are used. Maintaining an ambient temperature of 25°C (77°F) will help attain maximum battery life. Typical battery life is approximately 2 – 4 years. It is recommended that floor mount UPS systems be returned for battery replacement and testing every 3 years or sooner if the preventive maintenance tests described below fail.

The rack mounted UPS systems are designed to allow on site replacement of batteries. Contact your authorized service provider or follow the recommended procedures in the Rack Mount UPS manual.

## UPS Testing

### NOTE

The following test should not be run on system that is in operation. It should only be done during scheduled down time for preventive maintenance. The following test disconnects the power from the line and attempts to supply the load from batteries. If the batteries can not hold the load the system attached to the UPS will experience a power failure.

There is a self-test built into the UPS. This can be run from the front panel of the unit by depressing and holding the **Test/Alarm Reset** button for 3 seconds. The unit will do an internal self-test. If a problem is found the unit will sound an alarm and an LED will turn on to indicate the nature of the problem.

The test can be run from the Fail Safe III software.

1. At the file server select *Start* → *Programs* → *FailSafe III* → *FailSafe III console*.
2. From the console window select *Maintenance* → *Test Hardware*.
3. At the test hardware window press the **Test** button.
4. The system will respond with *maintenance is running*. After about 42 seconds the system will respond with a *maintenance completed OK* message.
5. Close the *FailSafe III* window.

It is possible that if the system has gone for a long period of time without loss of input power the batteries could be in an unrecognized failed condition. It is also possible that the built in test may pass. During scheduled down time, the most thorough test is to disconnect the input power from the UPS with the full load applied to the system. The unit should maintain power to the system for the recommended amount of backup time based on the equipment load. Typically better than 5 minutes.

# Disassembly Guidelines

## PCB Assemblies

Observe the following guidelines when working on all PCB assemblies:

- Take precautions against electrostatic discharge damage.
- Handle all PCB assemblies by their edges.
- Use a heatsink when soldering any phototransistors, photodiodes, or optical isolators.
- After soldering, clean excess flux from the PCB assembly.

## Hardware

- Before disassembly, note the positions of any wires or looms (cables), marking them if necessary to ensure that they are replaced correctly.
- Save and set aside all hardware for re-assembly.

## Opening the File Server

See the OEM manual for your specific system for the steps to open, disassemble, and reassemble your system.

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**WARNING**

Turn off power and disconnect power cord from AC power source before removing the cover.

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## Opening the HP LaserJet 4200N Printer

Instructions on opening the HP printer, adding RAM, and other maintenance procedures can be found in the OEM manual.

# Equipment Safety Tests

## Introduction

This section contains equipment safety tests to ensure that the MUSE system poses no electrical health hazards. It is suggested that the equipment safety tests be performed every 6 months and every time a circuit board/assembly is removed and replaced.

Equipment necessary to perform these equipment safety tests includes a 110-volt leakage current tester, pn MT-1216-01AAMI, (referred to as tester) and a digital multimeter. Note that for 220-volt use tester, PN MT-1216-02AAMI.

### NOTE

Failure to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards. Unless an Equipment Maintenance Contract exists, GE does not in any manner assume the responsibility for performing the recommended maintenance procedures. The sole responsibility rests with the individual or institution using the equipment. GE service personnel may, at their discretion, use this procedure as a helpful guide during visits to the equipment site.

## Preparation for Tests

### NOTE

The following procedure checks for proper wiring of the power receptacle. If the proper indications of step A (normal polarity and ground) are not obtained, the following procedures will be ambiguous. Do not proceed until a properly wired outlet is found.

This procedure verifies that a properly wired outlet is used to furnish power to the MUSE system. Note also that Chapter 6, “Troubleshooting” contains an additional and important power source verification procedure that should also be done.

- Connect the appropriate leakage tester to the power outlet.
- Insure that the GND switch on the leakage tester is in the down (closed) position.
- Check the O, K, and R indicators for the condition according to the table below. Normal polarity and ground is the desired and safe condition.

**Table 2. Power Receptacle Wiring Check**

Step	Indicator			Condition
	O	K	R	
A	On	On	Off	Normal polarity and ground
B	Off	On	On	Reverse polarity
C	Off	On	Off	No ground
D	On	Off	On	No neutral

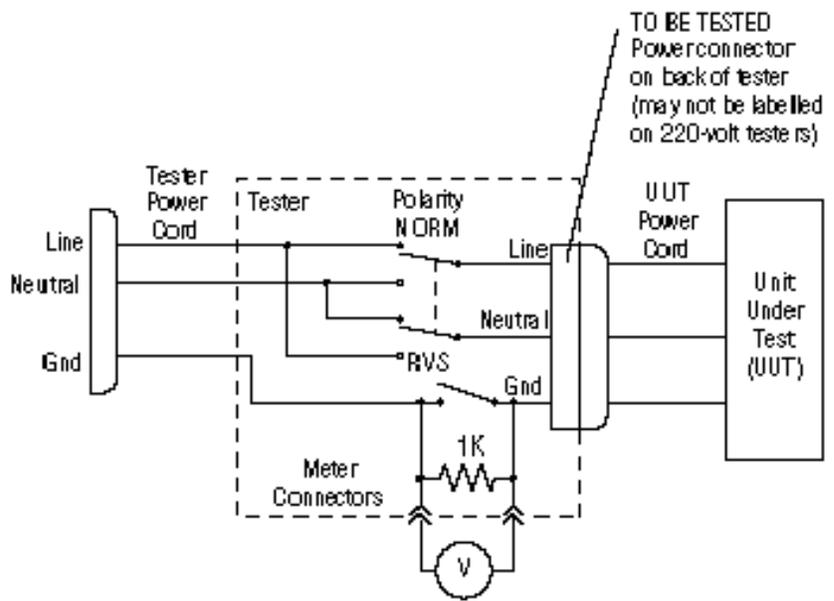
Table 2. Power Receptacle Wiring Check (Continued)

Step	Indicator			Condition
	O	K	R	
E	Off	Off	On	No neutral/reverse polarity
F	Off	Off	Off	No power

### Test #1 – Ground-Wire-Leakage-to-Ground Test

**NOTE**

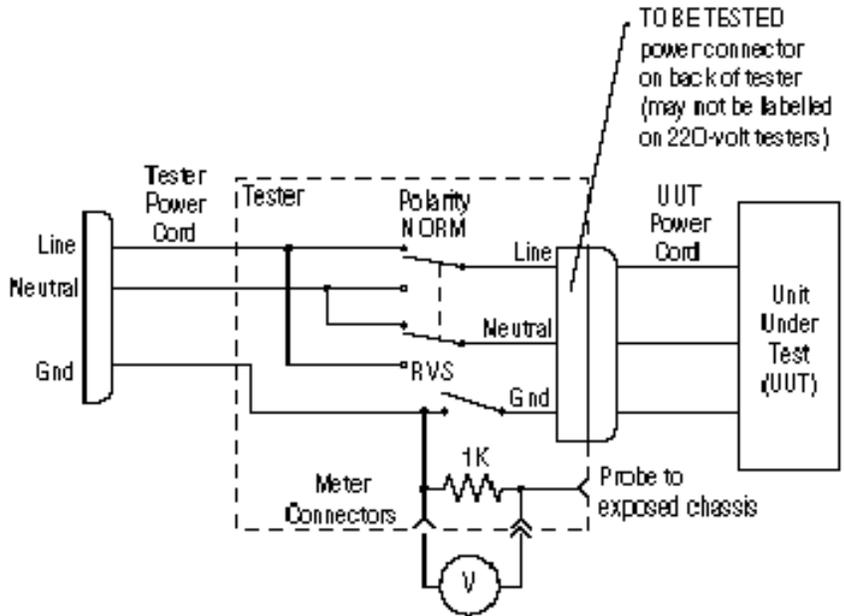
This diagram shows only a representation of how a typical leakage current tester functions. Follow the instructions provided with your leakage tester.



## Test #2 – Chassis-Leakage-to-Ground (Exposed Chassis) Test

**NOTE**

This diagram shows only a representation of how a typical leakage current tester functions. Follow the instructions provided with your leakage tester.



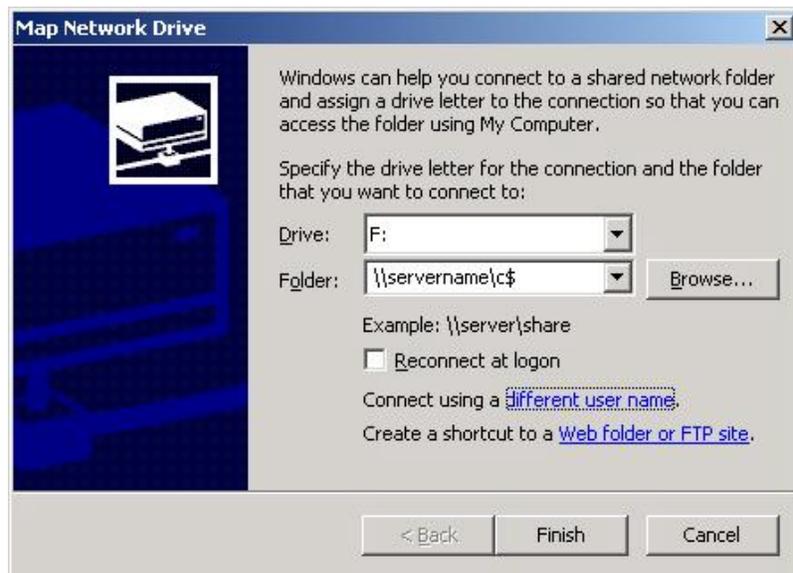
# Performing Anti-Virus Scanning From an FE Notebook Computer

## Introduction

This procedure describes how to scan the MUSE file server for viruses, over the network, by using the Symantec AntiVirus Corporate Edition software that is installed on an FE notebook computer.

## Mapping Drives to the MUSE File Server

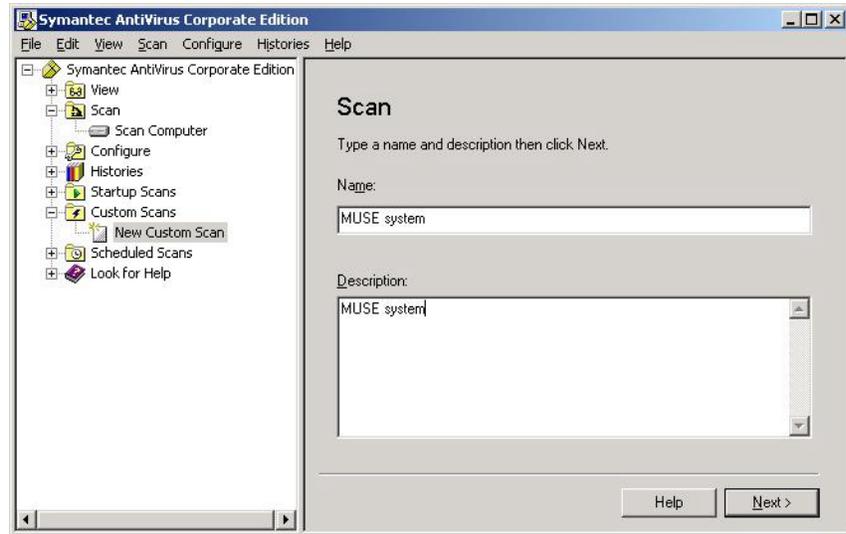
The first step is to map drives to the MUSE file server so that they can be selected within the antivirus software for scanning. You can use Windows Explorer to map to the `\\servername\c$` and `\\servername\d$` administrative shares.



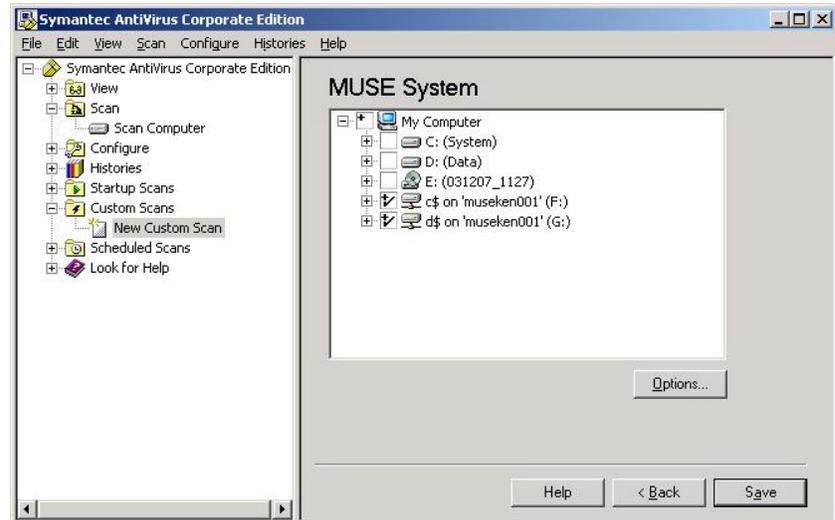
Use the *Connect using a different user name* feature to provide a username and password that has administrator rights on the MUSE file server. On MUSE systems you should be able to use the local administrator account and the corresponding password. For example, in the *Connect As* dialog box you would enter **administrator** for the *User name* and **password** for the *Password*. The real password is not supplied here for obvious reasons.

## Configuring a Custom Scan

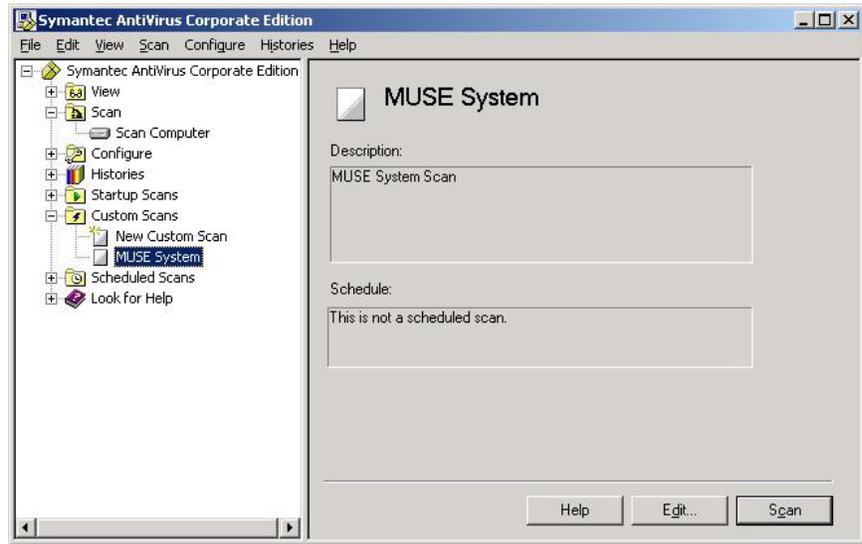
1. Open Symantec AntiVirus and select *New Custom Scan* as shown below.



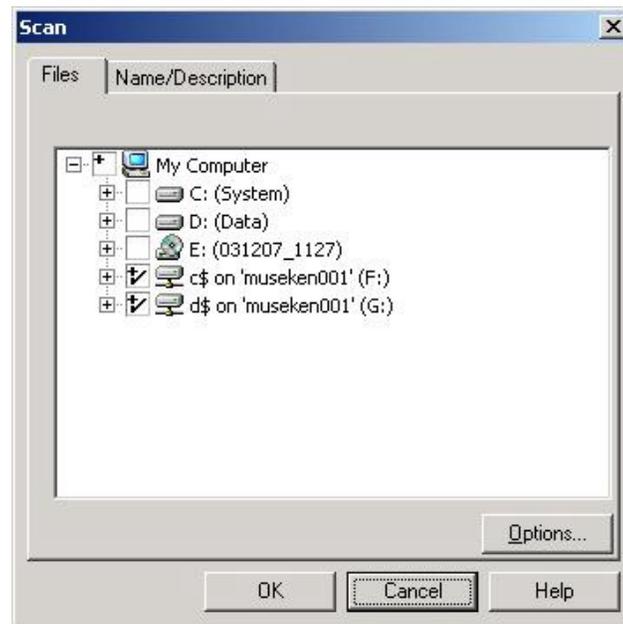
2. Enter a descriptive *Name* and *Description* so that you will recognize it when you want to run it.
3. Click the *Next*> button.
4. Select the **c\$** and **d\$** drives that you mapped previously.



- Click on *Save* to save this custom scan. Now you can highlight the custom scan you created and click on *Scan* to run it.



Or, if you need to make changes to the configuration for the scan, you can click on *Edit* as shown below.



- Click on *Options* to bring up the *Scan Option* dialog where you can configure different options such as the files to include or exclude.

**NOTE**

You wouldn't normally want to exclude any files for a one time scan, but keep in mind that for a large system the scan could take quite a long time.

# How to Change the Name of the File Server

## Rename the Windows Server

### NOTE

You must be logged in as **MuseAdmin** account in order to change the name of the file server.

1. Right-click my computer. Click on *Properties*; click on *Computer Name* tab; click on *Change...* and record the computer name, as you will need it later.  
Original Computer Name: \_\_\_\_\_
2. Enter the new computer name and record it. Click on *OK* for the name change window and then computer properties to close the Properties window.  
New Computer Name: \_\_\_\_\_
3. When the window appears asking if you want to restart the computer now, select *No*. You will be restarting the computer after renaming the SQL server in the next section.

## Rename the SQL Server

1. From the MUSE file server Windows desktop, select *Start* → *All Programs* → *Microsoft SQL Server 2005* → *SQL Server Management Studio*.  
The *Connect to Server* window is displayed.
2. Select/verify the name of the server you wish to connect to is displayed in the *Server Name* list.
3. Click the *Connect* button.
4. Click the *New Query* button.
5. Type the following command in the query window:  
**exec sp\_dropserver 'oldname'** substituting 'oldname' with the name you had written down earlier. And press **Enter**. Type **go** and press **Enter**.
6. Next, type the following command in the query window:  
**exec sp\_addserver 'newname', 'local'** substituting 'newname' with the new server name you had written down earlier and hit enter. Type **go** and press **Enter**.
7. Verify the syntax before executing the query.

### NOTE

Below is an example of what you should have entered in the query analyzer text box before executing:

```
exec sp_dropserver 'MUSE001'  
go  
exec sp_addserver 'HospName', 'local'  
go
```

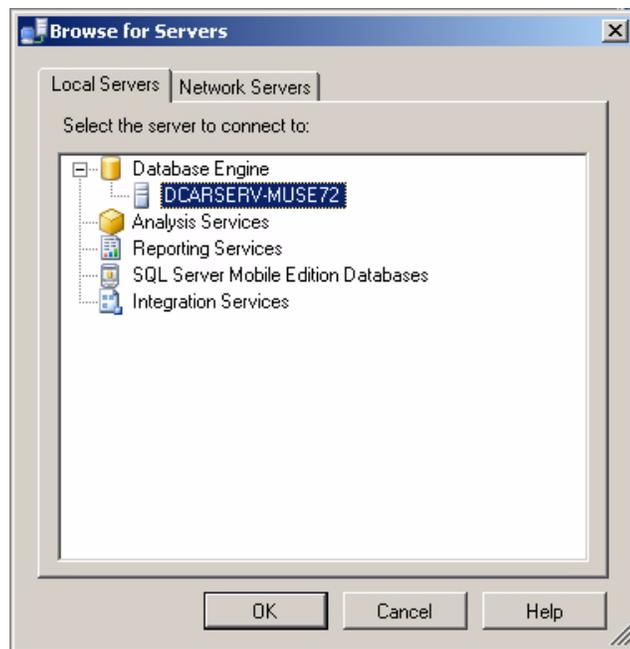
8. Click the *Execute* button in the menu bar (or press **F5**) to execute the query.  
The *Message* window will display a message indicating the query was successfully executed.

9. Now you can check your work.
  - a. Erase the text in the *Query* window and type the command:  
**exec sp\_helpserver** and press **Enter**.
  - b. Type **go** and press **Enter**.
  - c. Click on the *Execute* button in the menu bar (or press **F5**).

The command will return a row with a 'name' column that says the new name of the server, 'HospName' in our example.
10. Restart the MUSE file server.
11. After the file server reboots, verify you can connect the the file server using the new name.
  - a. Open *SQL Server 2005 Management Studio*.

The *Connect to Server* window is displayed. The old server name will be displayed in the *Server Name* field.
  - b. Click the arrow to open the *Server Name* drop-down list and select *<Browse for more...>*.

The *Browse for Servers* window is displayed.



- c. Select the new file server name from the list of *Database Engines*.
- d. Click *OK*.
- e. Click the *Connect* button.

## Setup the MUSE Accounts

If changing the name of the MUSE file server name after MUSE install, perform the step given below:

1. If the domain changed for **MuseAdmin** and **MuseBkgnd** (the domain shouldn't change as these shouldn't be local accounts) then run **museusers.bat** to change these users' Windows account names in the MUSE user table:

```
museusers %USERDOMAIN%
```

## Setup the MUSE Server and Client Software

If changing the name of the MUSE file server name after MUSE install, perform the step given below:

1. Run **remotingcfg.bat** on the server and each client to point the clients to the new server name in **muse.remoting.config**:

```
remotingcfg [Space] -server:<newname>
```

# Upgrading the BIOS Firmware

If the 1MB processor which was originally shipped with a G4 file server needs to be replaced, you may need to replace it with a 2MB processor (pn 2031370-001). After replacing a 1MB processor with a 2MB processor, you may need to upgrade the BIOS firmware.

## NOTE

The BIOS firmware upgrade procedure described below is needed if the BIOS firmware date displayed when the file server boots is dated earlier than 11/09/2005 (November, 2005). If the BIOS firmware date displayed on reboot is 11/09/2005 or later, the BIOS firmware upgrade is not necessary.

1. Create a BIOS upgrade floppy diskette by inserting a blank diskette into the floppy drive and the v7.0 Support CD (pn 2026446-001) in the CD drive.
2. Select *Start* → *Run...* .
3. Click *Browse...* and browse to:  
[CD drive letter]:\BIOS\ML370G4\SP31871.exe
4. Follow the on-screen prompts to create the BIOS upgrade floppy.
5. When the process is done, reboot the system with the floppy diskette in the drive.

The system should automatically boot from the floppy disk and display *ROMPAQ Firmware Upgrade Utility V4.20M*.

## NOTE

If the system does not boot from the floppy, you may need to reboot the system and press **F9** during the boot process and then select the floppy as the boot device.

6. At *Select a Device* window, select *Compaq ML370G4* and press **Enter**.
7. At the *Select an Image* window, select **11/09/2005**, and press **Enter**.
8. At the *Caution* window, read and follow the warning, *...Do not reboot or turn off your machine while programming is in process*. Press **Enter**.
9. Wait for the upgrade process to complete (2-3 minutes) and display *Flash Programming Completed Successfully*. Press **Enter**.
10. At *Do you want to reprogram another ROM?*, press the **Esc** key.
11. Remove the floppy and power cycle the system.

# Miscellaneous Maintenance Form

GE recommends that every six months you perform the maintenance checks and test procedures on the (see following pages). These maintenance procedures can be performed more often if indicated.

# MUSE™ 7.0

## System Preventive Maintenance Inspection Report

Customer \_\_\_\_\_ Customer # \_\_\_\_\_ Date \_\_\_\_\_

Field Engineer \_\_\_\_\_ Case # \_\_\_\_\_

Equipment Serial # \_\_\_\_\_ MUSE Software Version \_\_\_\_\_

### Required Tools

1. Standard hand tools (p/n NA)
2. Compressed air (p/n NA)
3. Multimeter (p/n NA) (Not always required)
4. AIT cleaning tape (p/n 2291441) (GE-supplied hardware)
5. Floppy Drive cleaning kit (p/n 407546-001)
6. Field Service manual - reference only
7. Operator's manual - reference only

### Visual Inspection

Inspect the following for visual wear and/or for proper functionality

1. \_\_\_\_\_ Network cabling (broken insulation)
2. \_\_\_\_\_ Network cabling (proper stress relief)
3. \_\_\_\_\_ AC power cord(s)
4. \_\_\_\_\_ Fans
5. \_\_\_\_\_ Internal and external system cables and connectors

### Cleaning

1. \_\_\_\_\_ Clean all internals of dust (may not be necessary in raised floor computer rooms)
2. \_\_\_\_\_ Clean all keyboards
3. \_\_\_\_\_ Clean mouse contacts (only necessary on roller ball style)
4. \_\_\_\_\_ Clean all fans and air intakes
5. \_\_\_\_\_ Clean floppy drives
6. \_\_\_\_\_ Clean CD-ROM drives (use canned air to carefully blow out any dirt or debris)
7. \_\_\_\_\_ Clean the AIT backup tape drive
8. \_\_\_\_\_ Clean external surfaces and monitor screens

### Calibration

There is no calibration required on the MUSE system.

## Miscellaneous System Checks

1. \_\_\_\_\_ Verify that the MUSE software version is up to date, based on customer entitlement. Inform the customer if their file server or client hardware does not meet the specifications for the latest update.
2. \_\_\_\_\_ Check the free space on the system and database partitions on the file server. Inform the customer if available hard drive free space is low.
3. \_\_\_\_\_ Verify that all of the latest validated Microsoft service packs and security patches have been installed.
4. \_\_\_\_\_ On GE-supplied hardware, where the customer is using the local tape backup option, verify that backups are working properly by checking the Job History for the backup jobs in *Microsoft SQL Server Management Studio*. Make sure the email notifications are working if they have been configured, and that the email messages are being sent to the correct person.
5. \_\_\_\_\_ Update the Automated System Recovery (ASR) media sets for GE-supplied hardware.
6. \_\_\_\_\_ Check the hardware if GE-supplied (fans, hard drives, etc.) to make sure nothing has failed.
7. \_\_\_\_\_ Verify that the floppy and CD-ROM drives are working properly.
8. \_\_\_\_\_ Placeholder for any required SQL database maintenance.

## Antivirus Procedure

Check with the customer, or on the system, to see if they are running an antivirus program on the MUSE. If they are, and if they are keeping the virus definition files up to date, you do not need to do anything more. You may need to remind them to keep the definition files up to date. If they are not running antivirus software, and if in the process of doing this PM or in discussions with the customer you suspect that the system may have a virus, you can follow the procedure outlined on page “[Performing Anti-Virus Scanning From an FE Notebook Computer](#)” on page 6-13 to run an antivirus check over the network from your notebook computer. Please keep in mind that the procedure is just a guideline, and that running the antivirus check could take a long time on some systems.

## Checkout Procedure

### NOTE

Use the checkout steps below as a guideline. Some of these steps can be verified by looking at the system logs or through discussions with the customer. Use the Service and Operator Manuals where necessary for reference. Perform the following for all applicable options.

1. Verify that all clients can connect to the file server and run the MUSE application.
2. Verify that tests can be acquired via diskette, serial cable, modem, wireless and LAN connections, and that they route properly based on report distribution settings.
3. Verify that tests can be acquired from the MARS system(s).
4. Verify that tests can be acquired from the CASE system(s).
5. Verify that tests are being successfully transmitted through the Monitoring Gateway.
6. Verify that the system can successfully send reports to laser printers and fax machines.
7. Verify that users can successfully edit and confirm reports from the *Edit List*.
8. Contact the Jupiter Online Center and verify that they can remotely access the system. (See “Remote Checkout Procedure” on the following page.)
9. Check the backup tapes to ensure they have not exceeded their expected lifespan. (Customers should store old tapes for safekeeping).

# Remote Checkout Procedure

This section should be performed by Jupiter Online Center while connected to test remote access.

1. Check the MUSE *Application Log* and the Windows *Event Viewer* for any obvious problems.
2. Verify that the Queue and Log Maintenance job is running properly.
3. Delete any old files that may have been left on the system for troubleshooting purposes.

## Reference

This section has been maintained from previous versions for reference. You are not expected to shutdown the system to perform these tests.

### AC Line Voltage Checkout

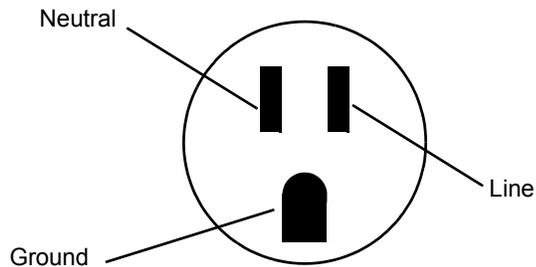
Line to neutral = 120V

Line to ground = 120V

Neutral to ground < 3V

### Neutral-ground loop resistance test

Neutral to ground < 2Ω



**This report is to be filed at customer site.**

Briefly describe all repairs/adjustments made and list any parts replaced:

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Additional Comments:

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Customer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

FE Signature: \_\_\_\_\_ Date: \_\_\_\_\_

10/01/2005



# 7 Parts Lists

# Ordering Parts

## Introduction

The parts lists and assembly drawings in this chapter supply enough detail for you to order parts for the assemblies considered field serviceable.

If you require additional information, schematic diagrams, or troubleshooting assistance, contact Technical Support.

To order parts, contact Service Parts at the address or telephone number on the, “How to Reach Us...,” page provided at the beginning of this manual.

## Field Replaceable Units (FRUs)

The following items may not be assigned separate manufacturing part numbers because they are normally part of a larger assembly. Since they are considered FRUs (field replaceable units), they have specific service part numbers so they can be ordered and replaced by service technicians. Contact Tech Support for FRU information for assemblies used on previous configurations.

### NOTE

Verify part numbers before ordering service parts (FRUs). See the tech memo series for this product for changes or additions to these lists.

## MUSE File Server – HP Model ML370 G5

Description	GE Part Number	HP Part Number
FRU HP ML370 ACCESS PANEL (TOP COVER)	2036800-001	409410-001
FRU HP ML370 FRONT BEZEL (TOWER ONLY)	2036800-002	409411-001
FRU HP ML370 RACK BEZEL (RACK ONLY)	2036800-003	409412-001
FRU HP ML370 TOWER CONFIGURATION PANEL	2036800-004	409413-001
FRU HP ML370 CENTER WALL	2036800-005	409433-001
FRU HP ML370 REMOVABLE MEDIA BLANK	2036800-006	409414-001
FRU HP ML370 MEDIA BAY SPACER	2036800-007	409415-001
FRU HP ML370 SAS DRIVE CAGE BLANK	2036800-008	409416-001
FRU HP ML370 POWER SUPPLY BLANK	2036800-010	409417-001
FRU HP ML370 PROCESSOR AIR BAFFLE	2036800-011	409419-001
FRU T-10/T-15 TORX SCREWDRIVER L-HEAD	2036800-012	413965-001
FRU SYSTEM DISPLAY TRAY W/EJECT BUTTON	2036800-013	409420-001
FRU ML370 HOT-PLUG POWER SUPPLY 1000-W	2036800-014	403781-001
FRU HP ML370 HOT-PLUG FAN, 120-MM	2036800-015	409421-001
FRU HP ML370 3.3-V LITHIUM BATTERY	2036800-016	153099-001
FRU ML370 DUAL-CORE XEON PROCESSOR 5120	2036800-017	416794-001
FRU HP ML370 HEATSINK GREASE/ALCOHOL PAD	2036800-018	409426-001
FRU ML370 DSPLY PANEL W/BRD, LBL, BEZEL	2036800-019	409427-001
FRU ML370 SYS BOARD W/PROCEESSOR CAGE	2036800-020	409428-001
FRU HP ML370 PPM	2036800-021	407748-001
FRU HP ML370 POWER SUPPLY BACKPLANE	2036800-022	399787-001

<b>Table 1. FRUs, HP ML370 G5 File Server (Continued)</b>		
<b>Description</b>	<b>GE Part Number</b>	<b>HP Part Number</b>
FRU SAS BACKPLANE DUPLEX BRD W/DRV CAGE	2036800-023	409429-001
FRU HP ML370 MEMORY BOARD	2036800-024	409430-001
FRU HP ML370 DVD-RW	2036800-025	384069-001
FRU HP ML370 DISKETTE DRIVE	2036800-026	399397-001
FRU HP ML370 PLASTICS KIT	2036800-027	409431-001
FRU HP ML370 HARDWARE KIT	2036800-028	409432-001
FRU HP ML370 RACK-MOUNTING KIT	2036800-029	377839-001
FRU RETURN KIT PACKING BOX AND CUSHIONS	2036800-030	409434-001
FRU ML370 MISCELLANEOUS CABLE KIT	2036800-031	409436-001
FRU ML370 SAS OPTION CABLE	2036800-032	389952-001
FRU ML370 DISKETTE DRIVE CABLE	2036800-033	431243-001
FRU ML370 2ND PARALLEL/SERIAL PORT CABLE	2036800-034	418300-001
FRU ML370 SFF HARD DRIVE 146 GB	2036800-036	432320-001
FRU HP SMARTARRAY P400 CNTRLR CACHE MOD	2036800-038	405832-001
FRU HP DL360 HARD DRIVE BLANK LFF	2036798-003	392613-001
FRU HP DL360 AC POWER CORD	2036798-021	187335-001
FRU HP FBDIMM PC2-5300F FULLY-BUFFERED	2036798-017	416471-001

## MUSE File Server – HP Model ML370 G4

<b>Table 2. FRUs, MUSE File Server, HP Model ML370 G4</b>		
<b>Description</b>	<b>GE Part Number</b>	<b>HP Part Number</b>
Access Panel Top Cover	2026980-001	359233-001
Front Bezel – Tower Model Only	2026981-001	359234-001
Rack Bezel – Rack Model Only	2026982-001	359235-001
Hood Cover – Tower Model Only	2026983-001	359236-001
Power Supply, 800 W	2026984-001	347883-001
Fans, 92 MM	2026985-001	231213-001
Power Button/Switch with Cable	2026987-001	359714-001
Intel Xenon 3.4-GHZ 1-MB L2 Cache	2026988-001	364757-001
Intel Xenon 3.4-GHZ 2-MB L2 Cache	2031370-001	379429-001

<b>Table 2. FRUs, MUSE File Server, HP Model ML370 G4 (Continued)</b>		
<b>Description</b>	<b>GE Part Number</b>	<b>HP Part Number</b>
System Board with Processor Cage	2026989-001	347882-001
PPM	2026990-001	347884-001
Power Supply Backplane	2026991-001	347886-001
SCSI Backplane Simplex W/6X1-IN Drive Cage	2026992-001	359719-001
SCSI Backplane Duplex Board	2026993-001	371722-001
Diskette Drive, 3-Mode 1.44 MB	2026994-001	233409-001
DVD-ROM Drive, IDE, 12X	2026995-001	217801-001
Plastics Kit	2026996-001	365962-001
Hardware Kit	2026997-001	365963-001
Wall, Center	2026998-001	359238-001
Round Hole Rack Mounting Kit	2026999-001	373115-001
Country Kit	2027000-001	359712-001
Return Kit Packing Box/Cushions – Tower	2027001-001	359713-001
Processor Air Baffle	2027002-001	359240-001
Miscellaneous Data Cable Kit	2027003-001	365964-001
Miscellaneous Power Cable Kit	2027004-001	365967-001
Cable Management Arm	2027005-001	367831-001
512-MB PC2-3200-R DIMM	2027006-001	359241-001
Rear Fan Cage	2027007-001	230984-001
146.8-GB 10K rpm SCSI Ultra320 hot-plug hard drive	2027078-001	289044-001
300-GB 10K rpm SCSI Ultra320 hot-plug hard drive	2027079-001	351126-001'zp
Digi Board - DIGI International, Inc.	412946-006	77000707
Digi Cable - DIGI International, Inc.	414961-003	76000529
Tape Drive SONY AIT-2 SDX-500V/RB Int	2024244-001	SDX-500V/RB

## MUSE File Server Configurations

<b>Table 3. G4 Configurations</b>	
<b>Configurations</b>	<b>Qty.</b>
<b>Computer Server Rackable ML370 G4 MUSE</b>	
HP ProLiant ML370 G4 - Rack 0 MB - HD: none - LAN EN, Fast EN, Gigabit EN - Monitor: none 5U - CTO	1
Processor upgrade - 1 x Intel Xeon 3.4 GHz (800 MHz) - Socket 604 - L2 2MB	1
HP - Memory - 512 MB x 2 - DIMM 240-pin - DDR 11 - 400 MHz/PC2-3200	1
HP Standard FIO Memory ALL	
HP Universal Hard Drive - Hard drive - 300 GB - hot-swap - 3.5" - Ultra320 SCSI	6
HP Smart Array 642 Controller - Storage controller (RAID) - Ultra320 SCSI - 320	1
HP - Power supply - hot-plug/redundant (plug-in module) - ACC 100-240 V 77	1
HP - System fan kit	1
HP NC7170 - Network adapter - PCI-X - EN, Fast EN, Gigabit EN - 10Base-T, 10	1
HP - DVD-ROM drive - plug-in module - 12x - 5.25" - IDE	1
Ultra-3, twisted wrapped, 4 connector, terminated SCSI cable (40")	
Microsoft Windows Server 2003 Standard Edition License - 1 server - Standard	1
<b>Computer Tower ML370 G4 MUSE</b>	
HP ML370G4 TWR CTO Chassis	1
Processor upgrade - 1 x Intel Xeon 3.4 GHz (800 MHz) - Socket 604 - L2 2MB	1
HP - Memory - 12 MB x 2 DIMM 240-pin - DDR II - 400 MHz/PC2-3200HP	1
Standard FIO Memory ALL	1
HP Universal Hard Drive - Hard drive - 146.8 GB - hot-swap - 3.5" - Ultra320 SC	4
HP Smart Array 642 Controller - Storage controller (RAID) - Ultra320 SCSI - 320	1
HP - Power supply - hot-plug/redundant (plug-in module) - AC 100-240 V - 77	1
HP - System fan kit	1
100Base-TX, 1000Base-T - 2 ports	1
HP - DVD-ROM drive - plug-in module - 12x - 5.25" - IDE	1
Ultra-3, twisted wrapped, 4 connector, terminated SCSI cable (40")	1
Microsoft Windows Server 2003 Standard Edition - License - 1 server - STD	1
<b>Computer Server ML370 G4 MUSE with Rack</b>	
Rack MUSE Integrated Kit Graphite	1
Computer Server Rackable ML370 G4 MUSE	1

<b>Table 3. G4 Configurations (Continued)</b>	
Tape Drive SONY AIT-2 SDX-500V/RB INT	1
Adapter PCI Digi AccelePort 8P Serial MLTPLR	1
Cable 8 Port HD68 TO DB9M Serial/Digi 8P	1
Label Prescription Device	1
Label MUSE CV Info System	1
Computer Server ML370 G4 MUSE + Rack 220V	1
Rack MUSE Integrated Kit - 220V	
<b>Computer Server Rackable ML370 G4 MUSE</b>	<b>1</b>
Tape Drive Sony AIT-2 SDX-500V/RB INT	1
Adapter PCI Digi AccelePort 8P Serial MLTPLR	1
Cable 8 Port HD68 to DB9M Serial/Digi 8P	1
Label MUSE CV Info System	1
Label Prescription Device	1

## MUSE EveryWARE Server – HP Model DL360 1U G5

Description	GE Part Number	HP Part Number
Access panel	2036798-001	412209-001
Plastics kit: a) Optical drive ejector assembly b) Front bezel c) Optical device blank d) Expansion slot covers (2) e) Screws, M3×0.5×4 in, T-10 (4) f) Bezel screw, T-10, flathead, 1/4-in g) Power supply air baffle h) Processor air baffle i) HP Smart Array E200i Controller battery tray j) HP Smart Array P400i Controller battery tray k) Hard drive bezel blank SFF l) Power supply blank	2036798-002	412208-001
Hard drive blank LFF	2036798-003	392613-001
Rack mounting hardware kit	2036798-004	360104-001
Cable management arm	2036798-005	360105-001
System fan module	2036798-006	412212-001
Hot-plug power supply, 700 W	2036798-007	412211-001
PCI riser board assembly	2036798-008	412200-001
Dual-Core, Intel® Xeon™ Processor 5110 (1.6-GHz, 1066- MHz FSB, 2x2-MB L2 cache)	2036798-009	416795-001
Heatsink with grease and alcohol swab	2036798-010	412210-001
HP Smart Array E200i Controller, integrated SAS	2036798-011	412205-001
System board with processor cage supporting Intel® Xeon™ 50xx and 51xx processors	2036798-012	412199-001
SAS backplane	2036798-013	412201-001
Multibay media backplane	2036798-014	412202-001
HP Systems Insight Display, LEDs, and power button assembly, with cable	2036798-015	412204-001
CD-ROM Slimline Drive	2036798-016	228508-001
FBDIMM, PC2-5300F, Fully-Buffered DIMM (Qty 2)	2036798-017	416471-001
SAS hard drives 72-GB, 10,000-rpm (Qty 2)	2036798-018	376597-001
HP Smart Array E200i Controller memory module, 64-MB	2036798-019	412800-001
SAS cable	2036798-020	408763-001

Table 4. FRUs, HP DL360 1U G5 (Continued)		
Description	GE Part Number	HP Part Number
AC power cord	2036798-021	187335-001
Battery, 3.3-V, lithium	2036798-022	234556-001

## CCG Computer – HP Model DL360 G4

Table 5. FRUs, HP DL360 1U G4		
Description	GE Part Number	HP Part Number
Access Panel DL360 G4	2030506-001	361400-001
Intel® 3.60-GHZ Xeon 1-MB L2 Cache G4	2030506-005	361382-001
3.6 Volt, 500 MAH NIMH Battery DL360 G4	2030506-006	307132-001
Sys Board w/Processor SCSI Model	2030506-008	361384-001
SCSI Backplane DL360 G4	2030506-010	305443-001
Optical Device/Disk Drive Interface G4	2030506-011	361395-001
2 GB DL360 G4	2030506-016	367553-001
SCSI Ultra320 72.8-GB 15K RPM DL360 G4	2030506-018	289243-001
Diskette Drive/Optical Drive Cable G4	2030506-019	361391-001
AC Power Cord DL360 G4	2030506-020	187335-001
Optical Drive Ejector Assembly DL360 G4	2030506-022	30545-001
Hardware Kit DL360 G4	2030506-023	361397-001

## FRUs HP dc7100 SFF Client

Description	GE Part Number	HP Part Number
Computer HP dc7100 P4 2.8GHZ 512MB SFF	2027481-001	PP458US#ABA
40GB Serial ATA hard drive	2027481-002	365555-001
16X/40X DVD-ROM	2027481-003	325313-005
512MB 400MHz DDR-DIMM	2027481-004	325313-005
System Board	2027481-005	361682-001
Intel Pentium 4 processor - 2.80GHz , 800MHz FSB	2027481-006	367594-001
Power supply,240 watts	2027481-007	350030-001
Keyboard	2027481-008	355630-005
Mouse	2027481-009	323614-005
SD Card Reader	2027495-001	1

1. SD Card Reader is not an HP part.

## FRUs HP dc7600 SFF Client

Description	GE Part Number	HP Part Number
dc7600 HP Client	2030496-001	ES329UC#ABA
Computer Cover Assembly Front Bezel w/o Inserts	2030505-018	393599-001
Power Supply 5 Output 240W DC7600	2030505-019	381024-001
40 GB\7200 RPM SATA Hard Drive DC7600	2030505-020	365555-001
48X CDROM Drive w/Mounting Screws DC7600	2030505-021	326773-005
SATA Hard Drive Cable 19.5" DC7600	2030505-022	391739-001
Power Switch/LED Cable USE W/370857-001	2030505-023	392410-001
Front I/O Device w/Cable USB+Audio 7600	2030505-024	393606-001
CD Drive Bezel w/Disk Drive Slot DC7600	2030505-025	370501-001
Speaker HP DC7600 SFF	2030505-026	394778-001
Heatsink w/Thermal Grease & Alcohol Pad	2030505-027	382024-001
Chassis Fan HP DC7600 SFF	2030505-028	392412-001
Heatsink Duct Baffle DC7600 SFF	2030505-029	375514-001
Foot Kit Oval and Round (4 each) 7600 SFF	2030505-030	370708-001
Sys Board w/Alcohol Pad & Thermal Grease	2030505-032	381028-001
SD Card Reader	2027495-001	1

1. SD Card Reader is not an HP part.

# 8 Glossary

**For your notes**

**Glossary:**

archive	Permanent storage of data.
ACC	<b>American College of Cardiology.</b> A professional society whose membership comprises more than 24,000 cardiovascular physicians and scientists from around the world.
AIT	<b>Advanced Intelligent Tape.</b> A form of magnetic tape and drive using AME developed by Sony for storing large amounts of data. AIT features high speed file access, long head and media life, the ALDC compression algorithm, and a MIC chip.
ANSI	<b>American National Standards Institute.</b> The United States government body responsible for approving US standards in many areas, including computers and communications. ANSI is a member of ISO.
API	<b>Application Program Interface.</b> The interface (calling conventions) by which an application program accesses operating system and other services. An API is defined at source code level and provides a level of abstraction between the application and the kernel (or other privileged utilities) to ensure the portability of the code.
ASCII	<b>American Standard Code for Information Interchange.</b> This is a standard means of representing characters, consisting of 256 characters. The first 128 characters are standardized, and the first 32 of those are control codes, which don't really represent visible characters but rather codes that can be used for text formatting or actions, such as making the computer beep. After the 32 control codes, the next 96 standardized characters represent numbers, letters (both uppercase and lowercase), and standard punctuation marks. The last 128 characters represent different things on different platforms.
ATAPI	<b>AT Attachment Packet Interface.</b> Part of the EIDE interface that provides additional commands to control a CD-ROM drive or magnetic tape.
backup	A spare copy of a file, file system or other resource for use in the event of failure or loss of the original.
BIOS	<b>Basic Input/Output System.</b> The part of the system software of the IBM PC and compatibles that provides the lowest level interface to peripheral devices and controls the first stage of the bootstrap process, including installing the operating system. The BIOS is stored in ROM, or equivalent, in every PC. Its main task is to load and execute the operating system which is usually stored on the computer's hard disk, but may be loaded from CD-ROM or floppy disk at install time.
BNC	<b>Bayonet Navy Connector.</b> A connector for coaxial cable such as that used for some video connections and RG58 "cheapernet" connections. A BNC connector has a bayonet-type shell with two small knobs on the female connector which lock into spiral slots in the male connector when it is twisted on.
cache	A small fast memory holding recently accessed data, designed to speed up subsequent access to the same data. Most often applied to processor-memory access but also used for a local copy of data accessible over a network etc.
CE Marking	<p>The European Commission refers to the CE Marking of products as a "passport" which can allow a manufacturer to freely circulate their products within the European marketplace. The marking applies only to products regulated by European health, safety and environmental protection legislation (product directives) but this is estimated to include more than 50% of the goods currently exported from the U.S. to Europe.</p> <p>The letters "CE" are an abbreviation of a French phrase "Conformite Europeene". The marking indicates that the manufacturer has conformed with all the obligations required by the legislation.</p>
client/server	A network system where a dedicated computer (server) handles some of the processing tasks while multiple smaller computers (clients) complete other processes by tapping into the server's shared files and programs.
CMOS	<b>Complementary Metal Oxide Semiconductor.</b> A semiconductor fabrication technology using a combination of n- and p-doped semiconductor material to achieve low power dissipation. Any path through a gate through which current can flow includes both n and p type transistors. Only one type is turned on in any stable state so there is no static power dissipation and current only flows when a gate switches in order to charge the parasitic capacitance.

**Glossary:**

CPU	<b>Central Processing Unit.</b> The part of a computer which controls all the other parts.
DICOM	<b>Digital Imaging and Communications in Medicine.</b> An industry standard to define connectivity and communication protocols of medical imaging devices. It conforms to the ISO reference model for network communications and incorporates object-oriented design concepts.
DIMM	<b>Dual In-line Memory Module.</b> Small circuit boards carrying memory integrated circuits, with signal and power pins on both sides of the board.
DLL	<p><b>Dynamically Linked Library.</b> A library which is linked to application programs when they are loaded or run rather than as the final phase of compilation. This means that the same block of library code can be shared between several tasks rather than each task containing copies of the routines it uses. The executable is compiled with a library of “stubs” which allow link errors to be detected at compile-time. Then, at run-time, either the system loader or the task’s entry code must arrange for library calls to be patched with the addresses of the real shared library routines, possibly via a jump table.</p> <p>The alternative is to make library calls part of the operating system kernel and enter them via some kind of trap instruction. This is generally less efficient than an ordinary subroutine call.</p> <p>It is important to ensure that the version of a dynamically linked library is compatible with what the executable expects.</p>
DMA	<b>Direct Memory Access.</b> A facility of some architectures which allows a peripheral to read and write memory without intervention by the CPU. DMA is a limited form of bus mastering.
DRAM	<b>Dynamic Random Access Memory.</b> A type of semiconductor memory in which the information is stored in capacitors on a MOS integrated circuit. Typically each bit is stored as an amount of electrical charge in a storage cell consisting of a capacitor and a transistor. Due to leakage the capacitor discharges gradually and the memory cell loses the information. Therefore, to preserve the information, the memory has to be refreshed periodically. Despite this inconvenience, the DRAM is a very popular memory technology because of its high density and consequent low price.
DTMF	<b>Dual Tone Multi Frequency.</b> (“Touch-Tone”) A method used by the telephone system to communicate the keys pressed when dialling. Pressing a key on the phone’s keypad generates two simultaneous tones, one for the row and one for the column. These are decoded by the exchange to determine which key was pressed.
ECC	<b>Error Detection and Correction.</b> A collection of methods to detect errors in transmitted or stored data and to correct them. This is done in many ways, all of them involving some form of coding. The simplest form of error detection is a single added parity bit or a cyclic redundancy check. Multiple parity bits can not only detect that an error has occurred, but also which bits have been inverted, and should therefore be re-inverted to restore the original data. The more extra bits are added, the greater the chance that multiple errors will be detectable and correctable.
ESD	<b>Electrostatic Discharge.</b> One kind of test that hardware usually has to pass to prove it is suitable for sale and use. The hardware must still work after it has been subjected to some level of electrostatic discharge. Some organizations have their own ESD requirements which hardware must meet before it will be considered for purchase. Different countries have different legal regulations about levels of ESD.
Ethernet	A popular method for sending data through a local area network using single channel cable and a special data collision protocol to detect network availability.
expansion slot	A connector in a computer into which an expansion card can be plugged. The connector supplies power to the card and connects it to the data bus, address bus and control signals of the motherboard.
fax	<b>Facsimile.</b> A process by which fixed graphic material including pictures, text, or images is scanned and the information converted into electrical signals which are transmitted via telephone to produce a paper copy of the graphics on the receiving fax machine.

**Glossary:**

FAT	<b>File Allocation Table.</b> The component of an MS-DOS or Windows 95 file system which describes the files, directories and free space on a hard disk or floppy disk.
file server	A computer dedicated to managing the flow of information among networked computers and used as a storage location for programs and files shared by network users.
firmware	Refers to the software that is embedded onto a piece of hardware to control that hardware. Generally, firmware can be upgraded and is placed on an EEPROM. Sometimes, if a new driver for a piece of hardware is released, new firmware will also be released that is required to get the full functionality or performance of the driver. In other cases, firmware will have some bugs or undesirable features, and can be upgraded to work out the problems. Of course, the rest of the hardware cannot be upgraded without replacing pieces of it, so manufacturers try to store as many critical function controls as they can in the firmware, in case they need to change them. For them, it is the difference between recalling a product and simply telling their customers to upgrade the firmware.
FTP	<b>File Transfer Protocol.</b> The method of moving files from system to system using TCP/IP.
FTS	<b>Fast Transient Surge.</b>
gateway	A term for a device that enables data to flow between different networks (forming an internet).
HIS	<b>Hospital Information System.</b> A system that provides the information management features hospitals need for daily business. Typically includes patient tracking, billing and administrative programs. May also include clinical features.
HL7	<b>Health Level 7.</b> A standard interface for exchanging and translating data between computer systems.
Hot-pluggable	This type of mechanism implies that you can remove or add things while the system is running. For example, hard drives and power supplies are often candidates for this term. Normally, they come in special proprietary form factors in server machines and RAID boxes. If you've got mission-critical applications you want your servers to have as many hot swappable components as possible. Recently, servers have been introduced with hot-swappable PCI cards and buses.
IDE	<b>Integrated Drive Electronics.</b> A disk drive interface standard based on the IBM PC ISA 16-bit bus but also used on other personal computers.
IEC	<b>International Electrotechnical Commission.</b> The international standards and conformity assessment body for all fields of electrotechnology.
IEEE	<b>Institute of Electrical and Electronics Engineers, Inc.</b> The world's largest technical professional society, based in the USA. Founded in 1884 by a handful of practitioners of the new electrical engineering discipline, today's Institute has more than 320,000 members who participate in its activities in 147 countries. The IEEE sponsors technical conferences, symposia and local meetings worldwide, publishes nearly 25% of the world's technical papers in electrical, electronics and computer engineering and computer science, provides educational programs for its members and promotes standardization. Areas covered include aerospace, computers and communications, biomedical technology, electric power and consumer electronics.
IIS	<b>Internet Information Server.</b> The name for Microsoft's webserver. It works with server versions of Microsoft's operations systems and was first developed for Windows NT Server.
I/O	<b>Input/Output.</b> Communication between a computer and its users, its storage devices, other computers (via a network) or the outside world. The devices the computer uses to do this are called "peripherals".
IrDA	<b>Infrared Data Association.</b> A non-profit trade association providing standards to ensure the quality and interoperability of infrared (IR) hardware. The association currently has a membership of over 160 companies from around the world, representing computer and telecommunications hardware, software, components and adapters.

**Glossary:**

IP	<b>Internet Protocol.</b> The network layer for the TCP/IP protocol suite widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation and re-assembly through the data link layer.
IRQ	<b>Interrupt Request.</b> The name of an input found on many processors which causes the processor to suspend normal instruction execution temporarily and to start executing an interrupt handler routine.
ISA	<b>Industry Standard Architecture.</b> A bus standard for IBM compatibles that extends the XT bus architecture to 16 bits.
ISO	<b>International Organization for Standardization.</b> A voluntary, nontreaty organization founded in 1946, responsible for creating international standards in many areas, including computers and communications. Its members are the national standards organizations of 89 countries, including the American National Standards Institute.
KVM Switch	<b>Keyboard Video Mouse switch.</b> This is a switch that connects 2 or more computers to the same keyboard, mouse, and monitor. The KVM switch fools each computer into thinking that they are actively connected to a separate keyboard, mouse and monitor. There is always some mechanism (a button and or keyboard command) on a KVM switch to switch between which computer accepts the input of the keyboard and mouse, and displays output to the monitor. Thus, when you move the mouse connected to the switch, your mouse movement is only echoed to the active computer at the time.
LAN	<b>Local Area Network.</b> A data communications network which is geographically limited (typically to a 1 km radius) allowing easy interconnection of terminals, microprocessors and computers within adjacent buildings.
LCD	<b>Liquid Crystal Display.</b> An electro-optical device used to display digits, characters or images, commonly used in digital watches, calculators, and portable computers.
LED	<b>Light-Emitting Diode.</b> A type of diode that emits light when current passes through it.
MIME	<b>Multipurpose Internet Mail Extensions.</b> Refers to functions used for the attachment of binary files to an e-mail message. MIME is the most common group of functions used to make this translation, and allows us to tack on graphics, sound, and executable files to our e-mail messages.
motherboard	The main printed circuit board in an electronic device, particularly a computer, which may contain sockets that accept additional boards ("daughter-boards"). In a personal computer, the motherboard contains the bus, the microprocessor, and integrated circuits used for controlling any built-in peripherals such as the keyboard, text and graphics display, serial ports and parallel ports, and mouse interfaces.
MPEG	<b>Moving Picture Experts Group.</b> An ISO committee that generates standards for digital video compression and audio. Also the name of their algorithms.
NEMA	<b>National Electrical Manufacturers Association.</b>
NetBIOS	<b>Network Basic Input/Output System.</b> An applications programming interface (API) which activates network operations on IBM PC compatibles running under Microsoft's DOS. It is a set of network commands that the application program issues in order to transmit and receive data to another host on the network. The commands are interpreted by a network control program or network operating system that is NetBIOS compatible.
NetBEUI	<b>NetBIOS Extended User Interface.</b> The network transport protocol used by all of Microsoft's network systems and IBM's LAN Server based systems.
NIC	<b>Network Interface Card.</b> An adapter circuit board installed in a computer to provide a physical connection to a network.
ns	<b>nanosecond.</b> $10^{-9}$ seconds (one thousand millionth part of a second)
OEM	<b>Original Equipment Manufacturer.</b> A company which makes equipment (e.g. computers) as opposed to one which sells equipment made by other companies.

**Glossary:**

OS	<b>Operating System.</b> The program that allows you to access the basic functions of your computer. It is the minimum software required to run a program.
PBX	<b>Private Branch Exchange.</b> A telephone exchange local to a particular organization who use, rather than provide, telephone services. The earliest PBXs were manual (Private Manual Branch EXchange, PMBX) but are now more likely to be automatic (Private Automatic Branch eXchange).
PCB	<b>Printed Circuit Board.</b> A thin board to which electronic components are fixed by solder. Component leads and integrated circuit pins may pass through holes ("vias") in the board or they may be surface mounted, in which case no holes are required (though they may still be used to connect different layers).
PCI	<b>Peripheral Component Interconnect.</b> A standard for connecting peripherals to a personal computer.
PCL	<b>Printer Control Language.</b> A Document description language used by Hewlett-Packard LaserJet printers.
PDC	<b>Primary Domain Controller.</b> In Windows NT, this machine is the main machine that responds to security authentication requests, such as logging in, within its domain. The PDC may be backed by one or more backup domain controllers that can also handle security authentication.
PDF	<b>Portable Document Format.</b> The native file format for Adobe Systems' Acrobat. PDF is the file format for representing documents in a manner that is independent of the original application software, hardware, and operating system used to create those documents.
PING	<b>Packet INternet Groper.</b> A program used to test reachability of destinations by sending them one, or repeated, ICMP echo requests and waiting for replies.
PostScript	A Page Description Language based on work originally done by John Gaffney at Evans and Sutherland in 1976, evolving through "JaM" ("John and Martin", Martin Newell) at XEROX PARC, and finally implemented in its current form by John Warnock et al. after he and Chuck Geschke founded Adobe Systems, Inc. in 1982. Its primary application is to describe the appearance of text, graphical shapes and sampled images on printed or displayed pages.
PRML	<b>Partial Response Maximum Likelihood.</b> A method for converting the weak analog signal from the head of a magnetic disk drive into a digital signal. PRML attempts to correctly interpret even small changes in the analog signal, whereas peak detection relies on fixed thresholds. Because PRML can correctly decode a weaker signal it allows higher density recording.
PS/2	IBM's second generation of personal computers. The PS/2 series introduced three advances over the PC series: 3.5" 1.44 megabyte microfloppy disks, VGA and 8514 graphics display standards, and the Micro Channel bus architecture. The 3.5" disks and VGA can be easily installed on other PCs and will become the standard for new compatible computers.
RAID	<b>Redundant Array of Inexpensive Disks/Drives.</b> A unit with several magnetic disks which protects against data loss in the event of the failure of any one disk.
RAM	<b>Random Access Memory.</b> A data storage device for which the order of access to different locations does not affect the speed of access.
RFI	<b>Radio Frequency Interference.</b> Electromagnetic radiation which is emitted by electrical circuits carrying rapidly changing signals, as a by-product of their normal operation, and which causes unwanted signals (interference or noise) to be induced in other circuits.
RISC	<b>Reduced Instruction Set Computer.</b> A processor whose design is based on the rapid execution of a sequence of simple instructions rather than on the provision of a large variety of complex instructions.
RJ-45	A serial connector which looks very much like a standard telephone connector, except it houses eight wires instead of four.

**Glossary:**

ROM	<b>Read-Only Memory.</b> A type of data storage device which is manufactured with fixed contents. In its most general sense, the term might be used for any storage system whose contents cannot be altered. The term is most often applied to semiconductor integrated circuit memories, of which there are several types, and CD-ROM.
RS-232	The most common asynchronous serial line standard.
SCSI	<b>Small Computer System Interface.</b> A processor-independent standard for system-level interfacing between a computer and intelligent devices including hard disks, floppy disks, CD-ROM, printers, scanners, and many more.
SDLC	<b>Synchronous Data Link Control.</b> An IBM protocol. A discipline conforming to subsets of the ADCCP of ANSI and the HDLC of the International Organization for Standardization. SDLC manages synchronous, code-transparent, bit-serial communication which can be duplex or half-duplex; switched or non-switched; point-to-point, multipoint, or loop.
seek time	The time it takes for a disk drive to move its head(s) from one track to another. The seek time depends on the power of the servo, the mass of the heads, the number of tracks traversed and the time taken to position the heads over the target track accurately enough to start data transfer.
SIMM	<b>Single In-line Memory Module.</b> A small circuit board or substrate, typically about 10cm x 2cm, with RAM integrated circuits or die on one or both sides and a single row of pins along one long edge. Several SIMMs are mounted with their substrates at right-angles to the main circuit board (the motherboard). This configuration allows greater packing density than direct mounting of, e.g. DIL (dual in-line) RAM packages on the motherboard. In 1993 one SIMM typically held one or four megabytes, by early 1997 one could hold 8, 16, or 32 MB.
SMTP	<b>Simple Mail Transfer Protocol.</b> A protocol defined in STD 10, RFC 821, used to transfer electronic mail between computers, usually over Ethernet. It is a server to server protocol, so other protocols are used to access the messages.
STS	<b>Society for Thoracic Surgeons.</b>
Subnet Mask	This is a TCP/IP number used to determine which TCP/IP subnet a device belongs to. Devices in the same subnet can be communicated with locally without going through a router. When a TCP/IP device tries to communicate with another device, the bits of the TCP/IP destination address are "ANDed" with the subnet mask to determine whether the address is a local address (broadcastable) or must be reached through a router.
TCP/IP	<b>Transmission Control Protocol over Internet Protocol.</b> The de facto standard Ethernet protocols incorporated into 4.2BSD Unix. TCP/IP was developed for internetworking and encompasses both network layer and transport layer protocols.
track ball	A pointing device consisting of a ball housed in a socket containing sensors to detect rotation of the ball about two axes - like an upside-down mouse. The user rolls the ball with his thumb or the palm of his hand to move a cursor. Track balls are common on modern portable computers, where there may be no desk space on which to use a mouse. Some clip onto the side of the keyboard and have integral buttons which have the same function as mouse buttons.
twisted pair	A type of cable in which pairs of conductors are twisted together to randomize possible cross-talk from nearby wiring. Inadequate twisting is detectable using modern cable testing instruments.
UDMA	<b>Ultra Direct Memory Access.</b> A development of the Advanced Technology Attachment specifications which gives nearly twice the maximum transfer speed of the ATA-3 standard (PIO Mode 4).
UL	<b>Underwriters Laboratories Inc.</b> is an independent, not-for-profit product safety testing and certification organization.
UNC	<b>Universal Naming Convention.</b> The name given for the naming used when one specifies: \\the sever\the volume\the path\then the file name of a file. An example of a UNC is: \\Myserver\Docdrive\Magazine\glossary.doc

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**Glossary:**

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UPS	<b>Uninterruptible Power Supply.</b> Unit which supplies ten minutes of battery backup power to the file server in the event of main power source failure.
USB	<b>Universal Serial Bus.</b> A technology in the works that will replace the current way that some peripheral devices connect to your computer. It is much faster than serial and parallel communications. It is also much more flexible: it will be able to connect to possibly hundreds of devices simultaneously.
VESA	<b>Video Electronics Standards Association.</b> An industry standards organization created in 1989/1990 primarily concerned with IBM compatible personal computers. The first standard it created was the 800 x 600 pixel Super VGA (SVGA) display and its software interface. It also defined the VESA Local Bus (VLB).
VGA	<b>Video Graphics Array.</b> A display standard for IBM PCs, with 640 x 480 pixels in 16 colors and a 4:3 aspect ratio. There is also a text mode with 720 x 400 pixels.

**For your notes**

# A Electromagnetic Compatibility

**For your notes**

# Introduction

Changes or modification to the MUSE system server or client not expressly approved by GE could cause electromagnetic compatibility (EMC) issues. This system is designed and tested to comply with applicable regulation regarding EMC and needs to be installed and used according to the EMC information stated as follows.

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**CAUTION**

RADIO FREQUENCY INTERFERENCE – Use of portable phones or other radio frequency (RF) emitting equipment near the system may cause unexpected or adverse operation.

Do not use RF emitting equipment near the device.

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**CAUTION**

EQUIPMENT INTERFERENCE – If adjacent or stacked use is necessary, the equipment or system should be tested to verify normal operation in that configuration.

The equipment or system should not be used adjacent to, or stacked with, other equipment.

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## Guidance and manufacturer's declaration – electromagnetic emissions

Emissions test	Compliance	Electromagnetic environment-guidance
RF emissions EN 55022	Group 1	The MUSE server and client use RF energy for their internal functions. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions EN 55022	Class A (Server)  Class B (Client)	The MUSE server and client are suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic Emissions EN 61000-3-2	Class A	
Voltage fluctuations/Flicker emissions EN 61000-3-3	Complies	

## Guidance and manufacturer's declaration – electromagnetic immunity

Immunity test	EN55024 test level	Compliance level	Electromagnetic environment-guidance
Electrostatic discharge (ESD) EN 61000-4-2	± 4 kV contact ± 8 kV air	± 4 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast Transient/burst EN 61000-4-4	± 1 kV for power supply lines ± 500V for input/output lines	± 2 kV for power supply lines ±1 kV for input/output lines	Mains power should be that of a typical commercial or hospital environment.
Surge EN 61000-4-5	± 1 kV differential mode ± 2 kV common mode	± 1 kV differential mode ± 2 kV common mode	Mains power should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines EN 61000-4-11	<5% Ut (>95% dip in Ut) for 0.5 cycles 40% Ut (60% dip in Ut) for 5 cycles 70% Ut (30% dip in Ut) for 25 cycles <5% Ut (>95% dip in Ut) for 5 sec	<5% Ut (>95% dip in Ut) for 0.5 cycles 40% Ut (60% dip in Ut) for 5 cycles 70% Ut (30% dip in Ut) for 25 cycles <5% Ut (>95% dip in Ut) for 5 sec	Mains power should be that of a typical commercial or hospital environment. If the user of the MUSE file server or client requires continued operation during power mains interruptions, it is recommended that the MUSE file server or client be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field EN 61000-4-8	N/A	N/A	Power frequency magnetic fields should be at levels characteristics of a typical location in a typical commercial or hospital environment.

Immunity test	EN55024 test level	Compliance level	Electromagnetic environment-guidance
<p>Conducted RF EN 61000-4-6</p> <p>Radiated RF EN 61000-4-3</p>	<p>3 Vrms 150 KHz to 80 MHz</p> <p>3V/m 80 MHz to 2.5 GHz</p>	<p>3 Vrms</p> <p>3V/m</p>	<p>Portable and mobile RF communications equipment should be used no closer to any part of the MAC 400, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance</p> <p><math>d = 1.2\sqrt{P}</math></p> <p><math>d = 1.2\sqrt{P}</math> 80 MHz to 800 MHz</p> <p><math>d = 2.3\sqrt{P}</math> 800 MHz to 2.5 GHz</p> <p>where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer, and d is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
<p><b>Note:</b> At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p><b>Note:</b> These guidelines may not apply in all situations. Electromagnetic propagation is affected by reflection from structures, objects, and people.</p>			
<p><sup>a</sup> Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radio, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the equipment is used exceeds the applicable RF compliance level above, the equipment should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the equipment.</p>			
<p><sup>b</sup> Over the frequency range 150 KHz to 80 MHz, field strengths should be less than 3 V/m.</p>			

## Recommended separation distance

The following table provides the recommended separation distances (in meters) between portable and mobile RF communication equipment and the MAC 400 system. The MAC 400 system is intended for use in the electromagnetic environment on which radiated RF disturbances are controlled. The customer or the user of the MAC 400 system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the MAC 400 system as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter in watts	Separation distance in meters (m) according to frequency of transmitter			
	150KHz to 80MHz outside ISM bands $d = 1.2 \sqrt{P}$	150KHz to 80MHz outside ISM bands $d = 1.2 \sqrt{P}$	80MHz to 800MHz $d = 1.2 \sqrt{P}$	800MHz to 2.5GHz $d = 2.3 \sqrt{P}$
0.01	0.12	0.12	0.12	0.23
0.1	0.38	0.38	0.38	0.73
1	1.2	1.2	1.2	2.3
10	3.8	3.8	3.8	7.3
100	12	12	12	23

At 80MHz and 800MHz the separation distance of high frequency range applies.

For transmitters rated at a maximum output power not listed above, the recommended separation distance [d] in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (w) according to the transmitter manufacturer.

These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

# Exceptions

Component	Model	Type (i.e. ESD)	Exception(s)	EMC Environment Guidance
Server	HP ML370G5	N/A	None	N/A
	HP ML370G4	N/A	None	N/A
	HP DL360G5	N/A	None	N/A
Client	HP DC7600	N/A	None	N/A
	HP DC7100	N/A	None	N/A
Accessories	LCD (NEC Model 1990SXi)	N/A	None	N/A
	UPS 120V Powerware PW5115 1400	—	—	—
	UPS 230V Powerware PW5115 1400i	—	—	—

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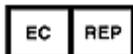
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