GE Medical Systems

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Technical Publication

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GE Medical Systems
LightSpeed Plus Software Installation Procedures

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IMPORTANT PRECAUTIONS

LANGUAGE

WARNING

- **THIS SERVICE MANUAL IS AVAILABLE IN ENGLISH ONLY.**
- **IF A CUSTOMER'S SERVICE PROVIDER REQUIRES A LANGUAGE OTHER THAN ENGLISH, IT IS THE CUSTOMER'S RESPONSIBILITY TO PROVIDE TRANSLATION SERVICES.**
- **DO NOT ATTEMPT TO SERVICE THE EQUIPMENT UNLESS THIS SERVICE MANUAL HAS BEEN CONSULTED AND IS UNDERSTOOD.**
- **FAILURE TO HEED THIS WARNING MAY RESULT IN INJURY TO THE SERVICE PROVIDER, OPERATOR OR PATIENT FROM ELECTRIC SHOCK, MECHANICAL OR OTHER HAZARDS.**

AVERTISSEMENT

- **CE MANUEL DE MAINTENANCE N'EST DISPONIBLE QU'EN ANGLAIS.**
- **SI LE TECHNICIEN DU CLIENT A BESOIN DE CE MANUEL DANS UNE AUTRE LANGUE QUE L'ANGLAIS, C'EST AU CLIENT QU'IL INCOMBE DE LE FAIRE TRADUIRE.**
- **NE PAS TENTER D'INTERVENTION SUR LES ÉQUIPEMENTS TANT QUE LE MANUEL SERVICE N'A PAS ÉTÉ CONSULTÉ ET COMPRIS.**
- **LE NON-RESPECT DE CET AVERTISSEMENT PEUT ENTRAÎNER CHEZ LE TECHNICIEN, L'OPÉRATEUR OU LE PATIENT DES BLESSURES DUES À DES DANGERS ÉLECTRIQUES, MÉCANIQUES OU AUTRES.**

WARNUNG

- **DIESES KUNDENDIENST-HANDBUCH EXISTIERT NUR IN ENGLISCHER SPRACHE.**
- **FALLS EIN FREMDER KUNDENDIENST EINE ANDERE SPRACHE BENÖTIGT, IST ES AUFGABE DES KUNDEN FÜR EINE ENTSPRECHENDE ÜBERSETZUNG ZU SORGEN.**
- **VERSUCHEN SIE NICHT, DAS GERÄT ZU REPARIEREN, BEVOR DIESES KUNDENDIENST-HANDBUCH NICHT ZU RATE GEZOGEN UND VERSTANDEN WURDE.**
- **WIRD DIESE WARNUNG NICHT BEACHTET, SO KANN ES ZU VERLETZUNGEN DES KUNDENDIENSTTECHNIKERS, DES BEDIENERS ODER DES PATIENTEN DURCH ELEKTRISCHE SCHLÄGE, MECHANISCHE ODER SONSTIGE GEFAHREN KOMMEN.**

AVISO

- **ESTE MANUAL DE SERVICIO SÓLO EXISTE EN INGLÉS.**
- **SI ALGÚN PROVEEDOR DE SERVICIOS AJENO A GEMS SOLICITA UN IDIOMA QUE NO SEA EL INGLÉS, ES RESPONSABILIDAD DEL CLIENTE OFRECER UN SERVICIO DE TRADUCCIÓN.**
- **NO SE DEBERÁ DAR SERVICIO TÉCNICO AL EQUIPO, SIN HABER CONSULTADO Y COMPRENDIDO ESTE MANUAL DE SERVICIO.**
- **LA NO OBSERVANCIA DEL PRESENTE AVISO PUEDE DAR LUGAR A QUE EL PROVEEDOR DE SERVICIOS, EL OPERADOR O EL PACIENTE SUFRAN LESIONES PROVOCADAS POR CAUSAS ELÉCTRICAS, MECÁNICAS O DE OTRA NATURALEZA.**

ATENÇÃO

- **ESTE MANUAL DE ASSISTÊNCIA TÉCNICA SÓ SE ENCONTRA DISPONÍVEL EM INGLÊS.**
- **SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEMS, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, É DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIÇOS DE TRADUÇÃO.**
- **NÃO TENTE REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTÊNCIA TÉCNICA.**
- **O NÃO CUMPRIMENTO DESTE AVISO PODE POR EM PERIGO A SEGURANÇA DO TÉCNICO, OPERADOR OU PACIENTE DEVIDO A‘ CHOQUES ELÉTRICOS, MECÂNICOS OU OUTROS.**

AVVERTENZA

- **IL PRESENTE MANUALE DI MANUTENZIONE È DISPONIBILE SOLTANTO IN INGLESE.**
- **SE UN ADDETTO ALLA MANUTENZIONE ESTERNO ALLA GEMS RICHIEDE IL MANUALE IN UNA LINGUA DIVERSA, IL CLIENTE È TENUTO A PROVVEDERE DIRETTAMENTE ALLA TRADUZIONE.**
- **SI PROCEDA ALLA MANUTENZIONE DELL’APPARECCHIATURA SOLO DOPO AVER CONSULTATO IL PRESENTE MANUALE ED AVERNE COMPRESO IL CONTENUTO.**
- **NON TENERE CONTO DELLA PRESENTE AVVERTENZA POTREBBE FAR COMPIERE OPERAZIONI DA CUI DERIVINO LESIONI ALL’ADDETTO ALLA MANUTENZIONE, ALL’UTILIZZATORE ED AL PAZIENTE PER FOLGORAZIONE ELETTRICA, PER URTI MECCANICI OD ALTRI RISCHI.**

警告

このサービスマニュアルには英語版しかありません。
ＧＥＭＳ以外でサービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。
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注意:

本维修手册仅存有英文本。
非 GEMS 公司的维修员要求非英文本的维修手册时，
客户需自行负责翻译。
未详细阅读和完全了解本手册之前，不得进行维修。
忽略本注意事项会对维修员，操作员或病人造成触电，机械伤害或其他伤害。

DAMAGE IN TRANSPORTATION

All packages should be closely examined at time of delivery. If damage is apparent write “Damage In Shipment” on ALL copies of the freight or express bill BEFORE delivery is accepted or “signed for” by a GE representative or hospital receiving agent. Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier. A transportation company will not pay a claim for damage if an inspection is not requested within this 14 day period.

Call Traffic and Transportation, Milwaukee, WI (262) 785 5052 or 8*323 5052 immediately after damage is found. At this time be ready to supply name of carrier, delivery date, consignee name, freight or express bill number, item damaged and extent of damage.

Complete instructions regarding claim procedure are found in Section S of the Policy And Procedures Bulletins.

14 July 1993

CERTIFIED ELECTRICAL CONTRACTOR STATEMENT

All electrical Installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. In addition, electrical feeds into the Power Distribution Unit shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations and testing shall be performed by qualified GE Medical personnel. The products involved (and the accompanying electrical installations) are highly sophisticated, and special engineering competence is required. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE’s electrical work on these products will comply with the requirements of the applicable electrical codes.

The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE’s field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

IMPORTANT...X-RAY PROTECTION

X-ray equipment if not properly used may cause injury. Accordingly, the instructions herein contained should be thoroughly read and understood by everyone who will use the equipment before you attempt to place this equipment in operation. The General Electric Company, Medical Systems Group, will be glad to assist and cooperate in placing this equipment in use.

Although this apparatus incorporates a high degree of protection against x-radiation other than the useful beam, no practical design of equipment can provide complete protection. Nor can any practical design compel the operator to take adequate precautions to prevent the possibility of any persons carelessly exposing themselves or others to radiation.

It is important that anyone having anything to do with x-radiation be properly trained and fully acquainted with the recommendations of the National Council on Radiation Protection and Measurements as published in NCRP Reports available from NCRP Publications, 7910 Woodmont Avenue, Room 1016, Bethesda, Maryland 20814, and of the International Commission on Radiation Protection, and take adequate steps to protect against injury.

The equipment is sold with the understanding that the General Electric Company, Medical Systems Group, its agents, and representatives have no responsibility for injury or damage that may result from improper use of the equipment.

Various protective materials and devices are available. It is urged that such materials or devices be used.

LITHIUM BATTERY CAUTIONARY STATEMENTS

CAUTION Risk of Explosion

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

ATTENTION Danger d'Explosion

Il y a danger d'explosion s'il y a replacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

OMISSIONS & ERRORS

Customers, please contact your GE Sales or Service representatives.

GE personnel, please use the GEMS CQA Process to report all omissions, errors, and defects in this publication.

End of Section

Revision History

Revision	Date	Reason for change
0	10/03/00	Preliminary Release
1	10/13/00	CTCge51354: Included work-around for manually flashing RIP board firmware, and reconfiguring the Scan Data Disk during the QX/i Software Install on OC and SBC procedure (Section 2-10).
2	12/14/00	Device driver patch for OC added as Section 3.5 CTCge52782: Clarified manual pflash procedure.
3	02/23/01	Added: • New FlexTrial procedure/screens (Section 3.12.) • HW configuration screen and procedure for Pegasus IG. Removed: SBC references.
4	03/22/01	Changed: • Title of Document from LightSpeed Plus Software Load Procedure to LightSpeed Plus Software Installation Procedures. • All appendices, except troubleshooting, changed to chapters. CTCge54418: Updated driver Section 3.5 to include M4 SW.
5	07/23/01	Added ConnectPro Option (Chapter 8)
6	10/04/01	Added Mobile Software Patch Procedure (Chapter 2)
7	10/26/01	Update for release of H2.2 software.(Chapter 1)
8	10/30/01	CQA10110949: Clarified Installation of Device Drivers section in Section 3.5.
9	09/04/02	CQA 1025041: Added [f]ormat command.

List of Effected Pages

PAGES	REVISION
All	8
53	9

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Preface
Publication Conventions

Purpose: This section means to inform the reader on publication conventions used. So that the reader can identify safety and general material that is considered important by it format. This includes the interpretation of computer screen text as either input or output. There are a number of specific text and paragraph styles/conventions used within this section to accomplish this task.

Please become familiar with the conventions used within this publication before proceeding.

Section 1.0
Safety & Hazard Information

1.1 Text and Character Representation

Within this publication, different paragraph and character styles have been used to indicated potential hazards. Paragraph prefixes, such as hazard, caution, danger and warning, are used to identify important safety information. Text (Hazard) styles are applied to the paragraph contents that is applicable to each specific safety statement. Words describe the type of potential hazard that may be encountered and are placed immediately before the paragraph it modifies. Safety information will normally include:

- Type of potential Hazard
- Nature of potential injury
- Causative condition
- How to avoid or correct the causative condition

EXAMPLES OF HAZARD STATEMENTS USED

A few examples are provided that have been adapted form GEMS' global document standard (2119696-100). They include paragraph prefixes and modified text styles.

⚠ **DANGER EXCESSIVE VOLTAGE CRUSH POINT**

DANGER IS USED WHEN A HAZARD EXISTS WHICH WILL CAUSE SEVERE PERSONAL INJURY OR DEATH IF INSTRUCTIONS ARE IGNORED. THEY CAN INCLUDE:

- **ELECTROCUTION**
- **CRUSHING**
- **RADIATION**

⚠ **WARNING ROTATING EQUIPMENT BARE WIRES**

WARNING IS USED WHEN A HAZARD EXISTS WHICH COULD OR CAN CAUSE SERIOUS PERSONAL INJURY OR DEATH IF INSTRUCTIONS ARE IGNORED. THEY CAN INCLUDE:

- Potential for shock
- Exposed wires
- Failure to Tag and lockout system power could allow for un-command motion.

CAUTION
Pinch Points
Loss of Data
Sharp Objects

Caution is used when a hazard exists which can or could cause minor injury to self or others if instructions are ignored. They include for example:

- **Loss of critical patient data**
- **Crush or pinch points**
- **Sharp objects**

NOTICE
Equipment Damage Possible

Notice is used when a hazard is present that can cause property damage but has absolutely no personal injury risk.They can include:

- Disk drive will crash
- Internal mechanical damage, such as to the x-ray tube
- Coasting the rotor through resonance.

It's important that the reader not ignore hazard statements in this document.

1.2 Graphical Representation

Important information will always be preceded by the exclamation point ⚠ contained within a triangle, as seen throughout this chapter. In addition to text, several different graphical icons (symbols) may be used to make you aware of specific types of hazards that could possibly cause harm.

ELECTRICAL

MECHANICAL

RADIATION

LASER

HEAT

PINCH

Some others make you aware of specific procedures that should be followed.

AVOID STATIC ELECTRICITY

TAG AND LOCK OUT

WEAR EYE PROTECTION

Section 2.0
Publication Conventions

2.1 General Paragraph and Character Styles

Prefixes are used to highlight important non-safety related information. Paragraph prefixes (such as Purpose, Example, Comment and Note) are used to identify important but non-safety related information. Text styles and shading are also applied to text within each paragraph modified by the specific prefix.

EXAMPLES OF PREFIXES USED FOR GENERAL INFORMATION

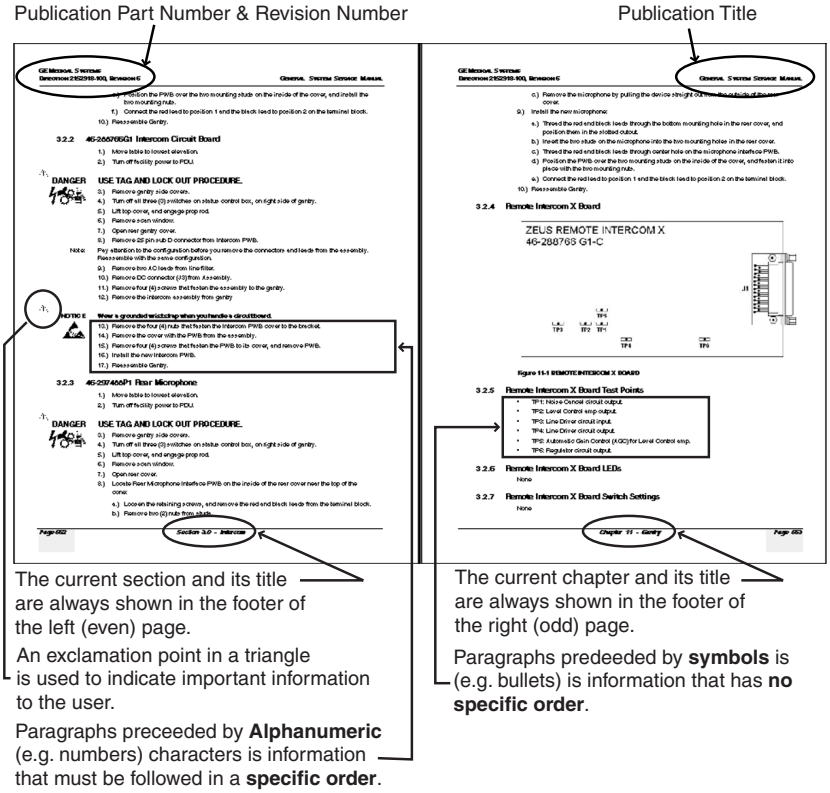
Purpose: Introduces and provides meaning as to the information contained within the chapter, section or subsection, Such as used at the beginning this chapter for example.

Note: **Conveys information that should be considered important to the reader.**

Example: Used to make the reader aware that the paragraph(s) that follow are examples of information possibly stated previously.

Comment: Represents "additional" information that may or may not be relevant.

2.2 Page Layout



Headers and footers in this publication are designed to allow you to quickly identify your location. The document's part number and revision number appears in every header on every page. Odd numbered page footers indicate the current chapter, its title and current page number. Even page footers show the current section and its title, as well current page number.

2.3 Computer Screen Output/Input Character Styles

Within this publication different character styles are used to indicate computer input and output text. Character (input, output, and variable) styles are used and applied to the text within a paragraph so as to indicated direction. Computer screen output and input is also formatted using mono (fixed width) spaced fonts.

Example: Fixed Output

```
This paragraph denotes computer screen fixed output. Its output  is fixed
from the sense that it does not vary from application to application.It's
the most commonly used style used to indicate filenames, paths and text.
```

Example: Variable Output

This paragraph denotes computer screen output that is variable. Its output varies from application to application. Variable output is sometimes found placed between greater than and lesser than operators. For example: <variable_ouput>

Example: Fixed Input

This paragraph denotes fixed input. It's typed input that will not vary from application to application. Fixed text the user is required to supply as input.

Example: Variable Input

This paragraph denotes computer input that can vary from application to application. Variable text the user is required to supply as input. Variable input sometimes is placed between greater than and lesser than operators. For example: <variable_input>. In these cases, the (<>) operators are dropped prior to input. Exceptions are noted in the text.

2.4 Buttons, Switches and Keyboard Inputs (Hard & Soft Keys)

Different character styles are used to indicate actions requiring the reader to press either a hard or soft button, switch or key. Physical hardware, such as buttons and switches, are called hard keys because they are hard wired or mechanical in nature. A keyboard or on/off switch would be a hard key. Software or computer generated buttons are called soft keys because they are software generated. Software driven menu buttons are an example of such keys. Soft and hard keys are represented differently in this publication.

Example: Hard Keys

A power switch **ON/OFF** or a keyboard key like **ENTER** is indicated by applying a character style that uses both over and under-lined bold text that is bold. This is a hard key.

Example: Soft Keys

Whereas the computer MENU button that you would click with your mouse or touch with your hand uses over and under-lined regular text. This is a soft key.

Chapter 1
Software Load Procedure

Section 1.0
Introduction

1.1 Document Overview

Before you begin, become familiar with the representation of computer text and character used in the load from cold procedure. Please review the Preface - "Publication Conventions", section 2.3 on page 20.

Chapter 1 is organized as follows:

- Section 1.0 - "Introduction": Overview of the SW installation procedure.
- Section 2.0 - "Before You Begin": Things you should know and do before you begin.
- Section 3.0 - "Load Procedure" for the operating system and CT applications software.

It may be necessry to reference the following additional information in this manual during the installation procedure:

- Chapter 3 - "Creating Default Partitions"
- Chapter 4 - "CT Application Reconfiguration"
- Chapter 6 - "Changing The System Time Zone"
- Chapter 7 - "Regenerating the Scan Database"
- Chapter 5 - "Laser & DICOM Camera Setup"
- Appendix - "Error Messages And Troubleshooting"

1.2 Software Load Procedure (LFC) Overview

LightSpeed CT load procedure, also referred to as Load From Cold (LFC,) prepares the system disk, installs and configures the operating system, and installs and configures applications software on the OC computer.

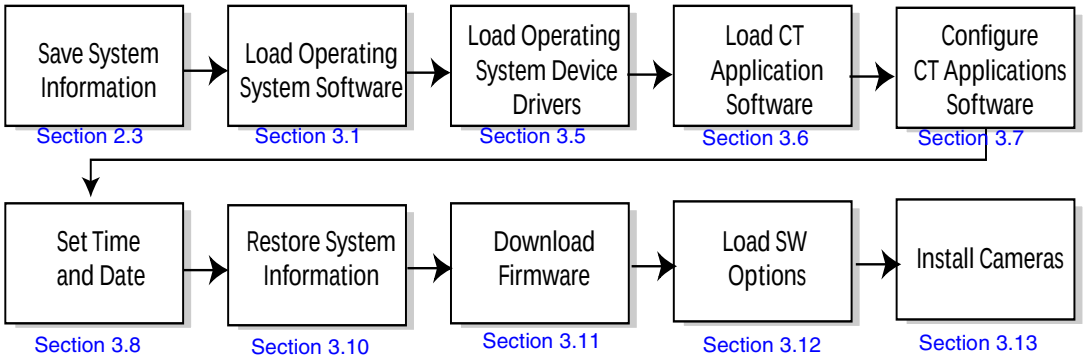


Figure 1-1 Software Overview

Section 2.0
Before You Begin

2.1 Software Dependencies

Only use software media that's appropriate for your console type. The following media dependencies have been created following the introduction of Octane 2 computer based CT systems. Please see Table 1-1 before you begin. Choose the media that's appropriate for your system from the table below.

Console Type	SOFTWARE MEDIA					
	2284117-2 Ver 9 H2M3	2284117-3 Ver 11 H2M3.1	2284117-5 Ver 12 H2M4	2284117-6 Ver 13 H2M4.1	2284117-8 Ver 14 H2.1M4	2284117-9 H2.2M3
Octane	YES	YES	YES	YES	YES	NO
Octane 2	NO	NO	NO	NO	NO	YES
Octane Console 2266832 and 2266832-2 Octane2 Console 2304732 and 2304732-2						

Table 1-1 Console and Media Matrix

Note: H2.2 software is not backward compatible with Octane consoles 2266832 and 2266832-2

Operating and applications software is contained on (4) CD-ROMS. To load system software, you must have the following CD-ROMs:

- LightSpeed Plus IRIX Operating System CDROM Disk #1
- LightSpeed Plus IRIX Operating System CDROM Disk #2
- LightSpeed Plus IRIX Operating System CDROM Disk #3
- LightSpeed Plus Applications Software CDROM

2.2 CD-ROM Drive Operation Check

Since the CDROM Drive is seldom used except for loading system software, it is advisable at this time to perform a quick test on the ability of the CDROM drive to read data from a CD before you begin the LFC procedure. This test is accomplished by inserting and mounting one of the OS CDROM disks, and performing a checksum (read check) on the files in one of the directories on the CD. If any errors occur while the system is reading this CDROM, you must stop to investigate and correct the CD problem (for example the SCSI Bus, CDROM Drive, etc. problems).

1.) Open a UNIX shell.

2.) Type: `tail -f /usr/adm/SYSLOG` **ENTER**

3.) Open a second UNIX shell.

4.) Insert the LightSpeed Plus IRIX Operating System CDROM Disk #1 into the CDROM Drive and type:

`mountCD /mnt` **ENTER**

`cd /mnt/dist` **ENTER**

`sum *` **ENTER**

5.) While the system is reading the CDROM and calculating checksums, you need to monitor the SYSLOG in the first UNIX shell window for any error messages that may occur that are related to SCSI or CDROM problems (timeouts, read errors, SCSI Bus resets, etc.).

6.) If checks are successful (no errors produced), you can continue with the LFC procedure. Continue to Section 2.3 .

7.) If you encounter any CDROM or SCSI related errors during this check, stop and troubleshoot/ repair the problem before attempting to perform an LFC.

8.) Terminate the 'tail' command by typing `^c` in the first UNIX shell window where the 'tail' command is running.

9.) Unmount the CDROM by typing the following commands in the second UNIX shell window:

`cd /` **ENTER**

`unmountCD` **ENTER**

2.3 Save System State Data

Before beginning the software install, you will want to save the system configuration information, characterization, calibration, protocols, etc. to a System State MOD.

1.) Bring the system up if it is not already up.

2.) Insert the System State MOD.

3.) Click on the SERVICE DESKTOP.

4.) Click on the PROACTIVE/PREVENTIVE/PLANNED MAINTENANCE icon.

5.) Click on SYSTEM STATE.

6.) Click on ALL. This will highlight Cals, Characterization, Reconfig Info, etc.

7.) Click on SAVE.

The save will take a few minutes. Review the output for errors or missing files; the scroll bar on the right works only when the tool isn't busy performing some task, it may take a little while. If you see any missing files or failures, then refer to the note below.

8.) Click on DISMISS.

If System State reported no problems, then you may proceed to Section 2.4

Note: **IF YOU SHOULD GET SAVE/RESTORE SYSTEM STATE ERRORS:** The Save/Restore System State process reports status on each file specification listed in the `/usr/g/config/SysState.cfg` file. The status may be:

- `Save (or Restore) of {filename} succeeded`
- `Save (or Restore) of {filename} skipped. File not found`
- `FAILED`

A status of `FAILED`, indicates potential problems, `skipped` means the file not found was not required. Please review the following for each file you see an error reported.

Some files simply may not exist on the system. If certain tools were never run then certain files may never get created. You may view `/usr/g/config/SysState.cfg` and look for a required field. `req=Y` means the file in question is required. You may also wish to check the system and MOD to verify whether it was actually missing or if there were permission or owner problems with the file.

2.4 Record KEY System Information

You should keep a record of system information in a safe place. System information is saved on the System State MOD, but to be safe it should also be recorded somewhere else at your site in case the State MOD becomes lost or damaged.

1.) Record the most important Reconfig INFO for the scanner. The following procedure will help you gather key system information from the INFO file and other system files, so that it can be recorded.

a.) Open or go to an UNIX shell on the OC.

b.) View the following files to find the information for the chart on the following page (Table 1-2); type the following:

`more /usr/g/config/INFO` **ENTER**

Gets all data except Exam Number and Camera information. HIS/RIS information will not be in the INFO file if the customer does not have this option.

`more /usr/g/bin/scanRx.db` **ENTER**

Gets the next Exam Number (Add 1 to the number to record the "next" exam number.)

For each of the fields below look at the `more file output` to find the associated **`setenv`** value and record the value in Table 1-2.

Note: IP Addresses and Net/Broadcast Masks have the following format: ***`www.xxx.yyy.zzz`***

SYSTEM NETWORK CONFIGURATION			
	FIELD NAME:	**"setenv" NAME:**	**VALUE:**
System Settings:	Service ID	SERVICE_ID	
	Hospital Name	HOSPITAL_NAME	
	Exam Number**	Use procedure above to determine Exam Number.	
	DASM Type	DASMTYPE	See Chapter 5
	Camera Type	CAMERATYPE	See Chapter 5
Network Settings:	Host Name	GATEWAY_HOSTNAME	
	Gateway IP Address	GATEWAY_IP	
	Gateway Net Mask	GATEWAY_NETMASK	
	Gateway Broadcast Mask	GATEWAY_BROADCAST	
	Default Gateway	GATEWAY_DEFAULT	
	Suite Name	SUITEID	
Optional - Network Printer	Printer Hostname	PRINTER_HOSTNAME	
	Printer IP Address	PRINTER_IPADDRESS	
Optional - HIS/RIS Systems*	CT AE Title	HRCTTITLE	
	Port Number	HRPORTNUM	
	H/R Server AE Title	HRAETITLE	
	IP Address	HRIPADDR	

Table 1-2 Re-configuration Information

Note: * HIS/RIS information will not be in the INFO file if the customer does not have the HIS/RIS option.

** Do not record the Exam Number from the data contained in the INFO file, because the value will be from the last time reconfig was performed. (See the procedure on the previous page to determine the current Exam Number.)

c.) Go to Chapter 5 - "Laser & DICOM Camera Setup", Table 5-1 on page 71 or Table 5-4 on page 72 to record camera information in the appropriate table provided.

2.) Now record the Networking Application (Image transfer) Configuration information, see Table 1-3. On the ImageWorks Desktop, in the Browser under Network, for each host configured for networking do the following and record the information in the table provided:

a.) Click on IMAGE WORKS

b.) Click on NETWORK

For each host configured for networking, perform the following steps, and record the information in Table 1-3 on page 27

c.) Click on SELECT REMOTE HOST.

d.) Click on the HOSTNAME.

e.) Click on UPDATE.

f.) Write the information in the table provided on the next page.

g.) Click on CANCEL to exit Select Remote Host.

If you find this process tedious, you can look at the file by typing:

`more /usr/g/ctuser/Prefs/SdCRHosts` *on the system to get this information. The* `1` *in the file means Advantage Net, the* `2` *means DICOM. If you see the pound sign (#), it's used as a separator and means nothing.*

TYPICAL OUTPUT WOULD APPEAR AS THE FOLLOWS

A	B	C	D	E	F	G	H	I	J
3.7.52.135	engbay04	#2	4006	engbay04	No comment	0	1	1	0
3.7.52.151	engbay26	#2	4006	engbay26	No comment	0	1	1	0
3.7.52.121	engbay16	#1	4005	engbay16	No comment	0	1	0	1

Where, the fields in the above file relate to the Network GUI settings.

***A** - IP Address*

***B** - Hostname*

***C** - # is a space, 1 is Advantage Net Protocol, 2 is DICOM Protocol*

***D** - Port Number*

***E** - AE Title*

***F** - Comment Fields*

***G** - Archive Node - 1 = Yes, 0 = No*

***H** - Send Images - 1 = Yes, 0 = No*

I *- Query/Retrieve - 1 = Yes, 0 = No*

J *- Custom Search - 1 = Yes, 0 = No*

3.) Check the memory to ensure it is recognized.

Open a UNIX shell and type: **`hinv`**

The output for the OC memory should be at least 512MB. If it is not, check the Host computer to make sure the proper amount of memory is installed.

NETWORKING APPLICATION (IMAGE TRANSFER) CONFIGURATION					**	**	**	**	**
Host Name	Network address	Network protocol	Port number	AE Title	Archive Node	Send Images	Query/ Retrieve	Custom Search	Comments

Table 1-3 Network Application Configuration

Section 3.0
Load Procedure

NOTICE
Potential for Data Loss

Make sure that all Images have been reconstructed and archived before performing this procedure. This procedure re-initializes all system data disks, erases all images and erases scan data.

3.1 Shutdown the System

Click on the SHUTDOWN button (shown in Figure 1-2). An attention box will pop up indicating "Shutdown the System?"; press OK to shutdown Applications. This will shutdown both LightSpeed Plus Applications and UNIX, and put you at the boot prompt.

Figure 1-2 Shutdown Icon

The following message should now come up:

```
Okay to power off the system now. Press any key to restart.
```

3.2 Boot Standalone IRIX Disk Partitioning Utility

1.) Power off the Console and wait for 15-20 seconds to reset everything properly.

2.) Please read carefully before proceeding.

You may notice a message about power up diagnostics running. Then a window will come up about starting the system. There will be a small button in the right hand corner named STOP FOR MAINTENANCE for 10 seconds after the console is powered "ON". Using the mouse, quickly press this button when it appears.

Figure 1-3 Starting System Pop-up Window

Now, power on the console and select STOP FOR MAINTENANCE.

3.) A screen will pop up with several icons displayed. The selections on the System Maintenance Menu are:

a.) Start System
b.) Install System Software
c.) Run Diagnostics
d.) Recover System
e.) Enter Command Mode
f.) Select Keyboard Layout

4.) Insert the LightSpeed Plus IRIX Operating System CDROM Disk #1 into the CDROM drive.

3.3 If you have a keyboard other than a US-English Keyboard.

If you have a non-US keyboard, you should follow the procedure that follows. Else you may proceed to section 3.4 on page 31.

1.) Using the mouse, click on SELECT KEYBOARD LAYOUT

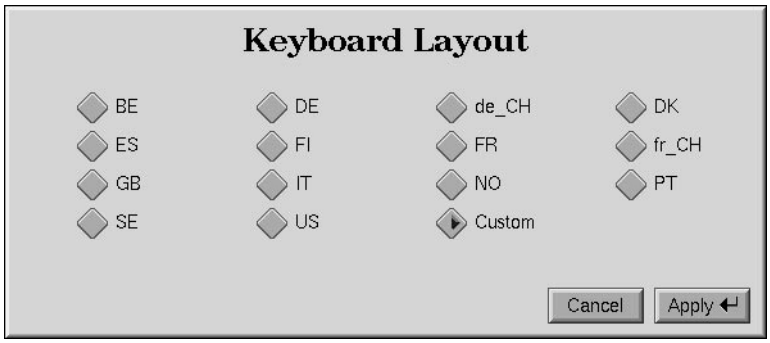


Figure 1-4 Keyboard Layout Window

2.) Select the appropriate keyboard type. Supported keyboards are:

- English - US (default)
- German - DE
- Swedish - SE
- French - FR

3.) Select APPLY to reconfigure.

3.4 Install System Software (IRIX OS) on Operator Console (OC)

This procedure assumes you have already created default partitions. You need to follow the procedures for creating default partitions in Chapter 3 - "Creating Default Partitions" *ONLY IF:* the disk is new, the disk has just been formatted, or if the disk has been corrupted. Otherwise continue on to step 1.

1.) Click on INSTALL SYSTEM SOFTWARE.

Make sure that the LightSpeed Plus IRIX Operating System CDROM Disk #1 is in the CDROM drive and *the CDROM drive is not busy before proceeding to the next step.*

2.) Click on LOCAL CD ROM. (It may be LOCAL SCSI CDROM DRIVE 6 ON CONTROLLER 1)

3.) Click on INSTALL to continue installation.

A message appears: `Insert the installation CD-ROM now`

4.) Click on CONTINUE.

The following message appears: `Obtaining installation tools`

Then another message appears: `Copying installation tools to disk`

The screen goes blank and another message appears: `Creating miniroot devices. please wait ...`

Note: Errors Possible

If you do not get one of the following 4 error messages below, continue on to step 5. If you receive an error that is not listed, please see Appendix - "Error Messages And Troubleshooting", on page 81.

- If the message `Unable to continue; press <Enter> to return to the menu` appears on screen, do the following:
  a.) Eject the CD from the CDROM drive, and re-insert the CD into the drive.
  b.) Click on the RETURN button to continue.
  c.) Click on the STOP FOR MAINTENANCE button.
  d.) Return to step 1 of this section.
- If the message `make new file system on /dev/dsk/dks0d1s0[yes/no/sh/help];` appears on the screen, do the following:
  a.) Type: **`yes`** and press **ENTER**.
  b.) When message `Are you sure ?[y/n](n)` appears, type: **`yes`** and press **ENTER**.
  c.) When message `Blocksize Of filesystem 512 or 4096 bytes ?` appears, type: **`512`** and press **ENTER**.
- If the message `Unable to mount partition /dev/dsk/dks0d1s0` appears on screen do the following:
  a.) Press **ENTER** to go to a `csh` shell.
  b.) Press **ENTER** and in the shell, type: **`mkfs /dev/dsk/dks0d1s0`**
  c.) Type: **`exit`** **ENTER** and proceed to step 5 on page 32.
- If the disk has never been paritioned, an error condition is reported when starting to partition the disk: `swap partition (1) is not a valid swap area .`
  Refer to Chapter 3 - "Creating Default Partitions" before continuing.

5.) The install menu should appear: Go to the next step if/when the menu appears.

Example: Screen Output

```
Default distribution to install from: /CDROM/dist
For help on inst commands, type help overview.
Inst Main Menu
 1. from [source]                Specify location of ...
 2. open [source]                Specify additional ...
 3. close [source]               Close distributions
 4. list [keywords] [names]      Display information ...
 5. go                           Perform software  ...
 6. install[keywords] [names]    Select subsystems ...
 7. remove[keywords] [names]     Select subsystems ...
 8. keep [keywords] [names]      Do not install or ...
 9. step [keywords] [names]      Interactive mode ...
10. conflicts [choice ...]       List or resolve ...
11. help [topic]                 Get help in general ...
12. view ...                     Go to the view ...
13. admin ...                    Go to the Admin ...
14. quit                         Terminate software ...
inst>
```

6.) Type: **sh** and press **ENTER**.

Ignore the message: `Can't open /etc/sys_id`

a.) At the prompt: # type: **mount /CDROM** and press **ENTER**.

b.) At the prompt: # type: **/CDROM/ct_prep** and press **ENTER**.

Messages appear: (Several pages of scrolling text appear)

```
Starting automatic disk partition script
Ensuring the unnecessary partitions are unmounted
Copying Miniroot Image to the new partition location
It may take a few minutes...
```

Note: Please ignore message: `UX:dd: ERROR:Read error: No space left on device`

```
Copying contents of the first OS Disk (Disk #1)to working directory
. . .
```

After a wait of about 5 minutes, you will see the message:

```
Eject the first OS Disk #1
Please insert the second OS Disk(Disk #2), then press ENTER.
```

c.) Replace the IRIX CDROM Disk #1 in the drive with the IRIX CDROM Disk #2 and press ENTER.

You will get a number of messages:

```
Copying Copying packages from the second OS Disk #2 to working
directory...
```

After approx. 5 minutes, you will see the message:

```
Eject the second OS Disk #2
Please insert the third OS Disk (Disk #3), then press ENTER
```

d.) Replace the IRIX CDROM Disk #2 in the drive with the IRIX CDROM Disk #3 and press **ENTER**

A message appears:

```
Copying packages from the third OS Disk #3 to working directory...
```

The packages from the last OS disk will be copied and the installation process will continue. This process will take approximately 30-40 minutes and no user input is required.

Note: Look for errors

During this time, files will be uncompressed, installations and removals will take place, but no errors should be generated. If any errors do occur during this process, refer to ***Appendix - "Error Messages And Troubleshooting",*** *page 81.*

After the OS installation is complete the user will be instructed to type in the following commands to complete the IRIX OS(OC) install.

```
********** Done installing the OC System **********
```

e.) Type:'**exit**' to exit back into the original Inst session

f.) Type:'**exit**' again at the Inst> prompt, restart the system.

g.) Type:'**yes** ' when you are prompted to restart the system...

The system monitors will go blank and restart the OC Operating system, and automatically log you into the system as the root user on the SGI standalone workstation desktop.

Note: CD-ROM errors

Ignore the following messages during OC bootup:

```
Failed to configure ef1...
exportfs: /CDROM: No such file or directory
```

3.5 Install Device Drivers

The following procedure installs operating system software support for the serial PCI card located in the Octane..

1.) On the OC, open an “UNIX Shell” window by using the “Desktop” pull down menu.

2.) If necessary, change to super-user by typing:

`su -` **ENTER** Enter the root password to login as root, if required.

3.) Eject the IRIX Operating System CDROM Disk #3 by typing: **`eject 1 6`** **ENTER** in the OC UNIX shell.

4.) Insert the LightSpeed Plus Application Software into the CDROM drive.

5.) Wait until the CDROM drive is not busy and then type the following:

`/CDROM/install/OC/mountCD /mnt` **ENTER**

`cd /CDROM/install/OC` **ENTER**

`./install_device` **ENTER**

Note: If the message `/mnt/install - no such file or directory` appears, or if the CDROM fails to mount, proceed as follows:

a.) Type: **`umount /mnt`** and press **ENTER**

b.) Eject and then re-insert the CDROM media into the CDROM drive

c.) Return to step 5 of this section.

6.) The system will display the following message:

```
You must reboot the system now before CT app load and do the CT
application load after the system comes up.
Do you wish to reboot the system now (y/n) [n]? y
```

ENTER

The system restarts.

3.6 Installation of CT Application Software

Note: Error Msgs. If you have problems, see Appendix - "Error Messages And Troubleshooting", beginning on page 81 for possible error messages and their recovery.

1.) On the OC, open an “UNIX Shell” window by using the “Desktop” pull down menu.

2.) To ensure that the IRIX media daemon does not interfere with the "`install.qx`" script, stop it by typing:

`su -` **ENTER** And enter the root password to login as root.

`/etc/init.d/mediad stop` **ENTER**

3.) Reinsert the LightSpeed Plus Application Software into the CDROM drive, if necessary.

4.) Make sure that the System State MOD is in the MOD drive and is not busy. If you need to check the MOD, to eject the MOD cartridge.

Type: **`eject 1 3`** **ENTER**

5.) Wait until the CDROM drive is not busy. Then type:

`cd /CDROM` **ENTER**

`install.qx` **ENTER**

Note: CDROM errors

1.) If the message `/mnt/install - no such file or directory` appears, or if the CDROM fails to mount, proceed as follows:

a.) Type: **`umount /mnt`** and press **ENTER**

b.) Eject and then re-insert the CDROM media into the CDROM drive

c.) Return to step 5 of this section.

2.) If your system contains a TEAC CDROM drive, when you execute the command **`install.qx`** for the first time, it may fail and display a message that says:

"`mount_iso9660: Note: unknown CD-ROM type may not function correctly, Inquiry12 type = <TEAC CD-ROM CD-532S 1.0A>`".

If this occurs, cancel, and then execute the command again, and it will function properly.

6.) Wait for the window shown in Figure 1-5 to appear, before proceeding to the next step.

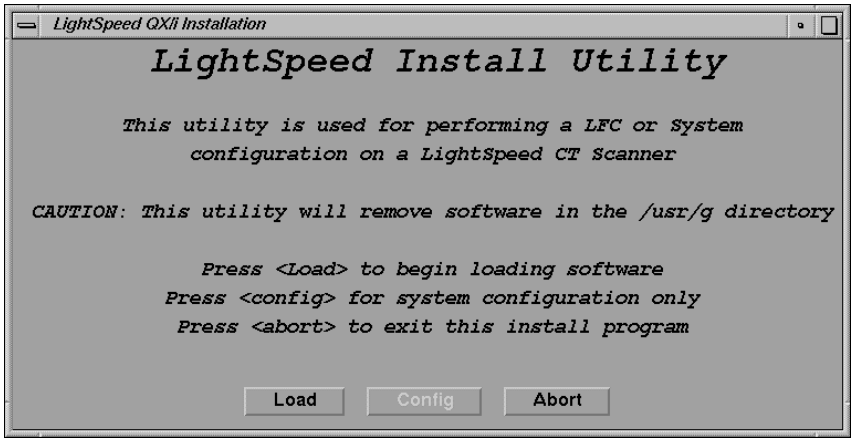


Figure 1-5 Install Utility Window

7.) In the Install Utility window, click on LOAD. A pop up message query is displayed. Asking if you wish to load the INFO file from the System State MOD. If you have a System State MOD, select YES. Another pop-up message appears. Make sure the System State MOD is in the drive and then select OK.

3.7 Configuring Application Software

In the steps that follow, go through each of the configuration screens and verify the informationis correct for your system. Make chnages as necessary. If you do not have a System State MOD, enter the appropriate information (refer to the data you recorded in section 2.4 on page 23).

1.) **Configure System Settings**:

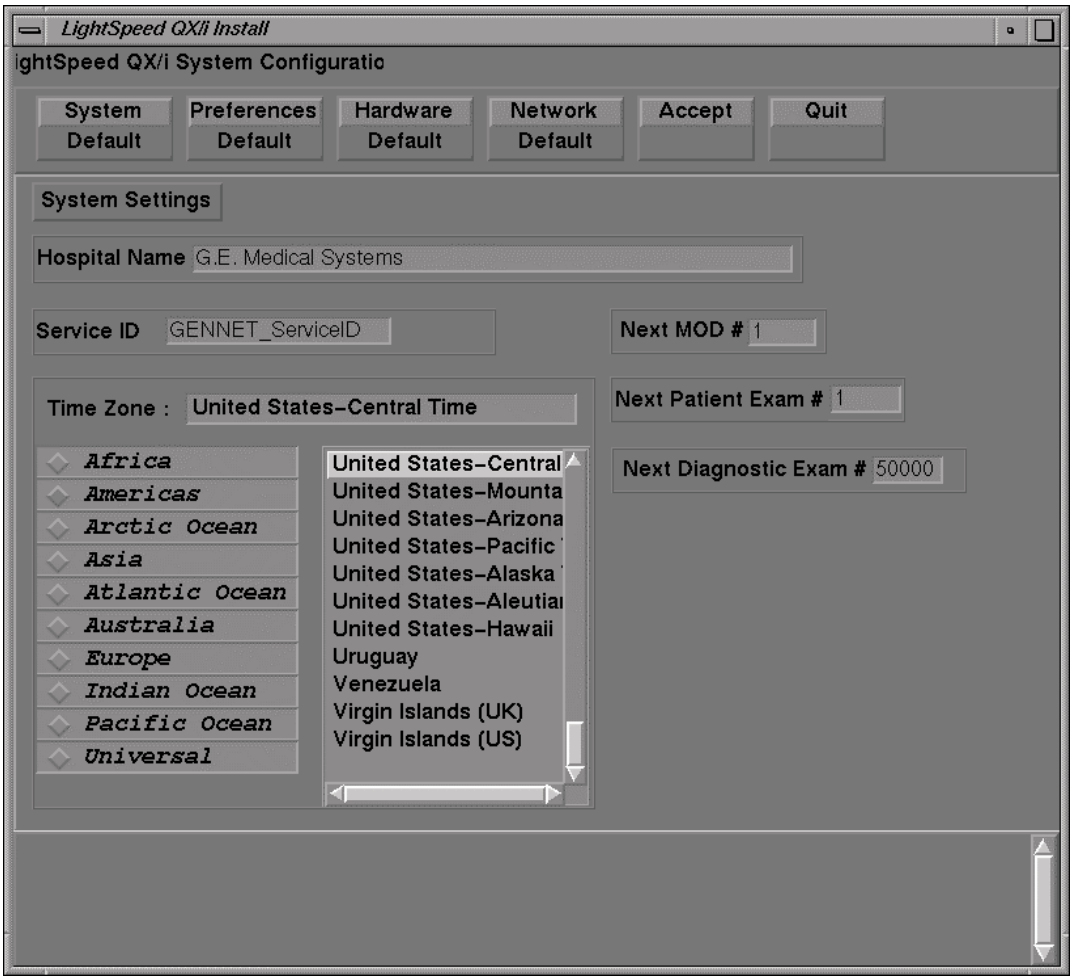


Figure 1-6 System Settings Screen

a.) Change the `Hospital Name` to the site's preferred name.

b.) Enter the `Service ID` issued by the service organization.

Note: Use the scrollbar at the bottom of the timezone selection list to view the entire description of the timezone you are about to select, to ensure that you are selecting the correct timezone for your location. If the time zone of your location is not in the list above, select one of the universal times in the selection menu. In this case, automatic changes for daylight savings time will not take effect.

c.) Verify and/or change `Next Patient Exam #` (it should be (1) larger than the "last exam number" recorded earlier with KEY system information in section 2.4 on page 23).

Note: The `Next MOD#` and `Next Diagnostic Exam #` screens are currently not implemented.

d.) Select PREFERENCES to proceed to the screen in the next step.

2.) **Configure Preferences**:

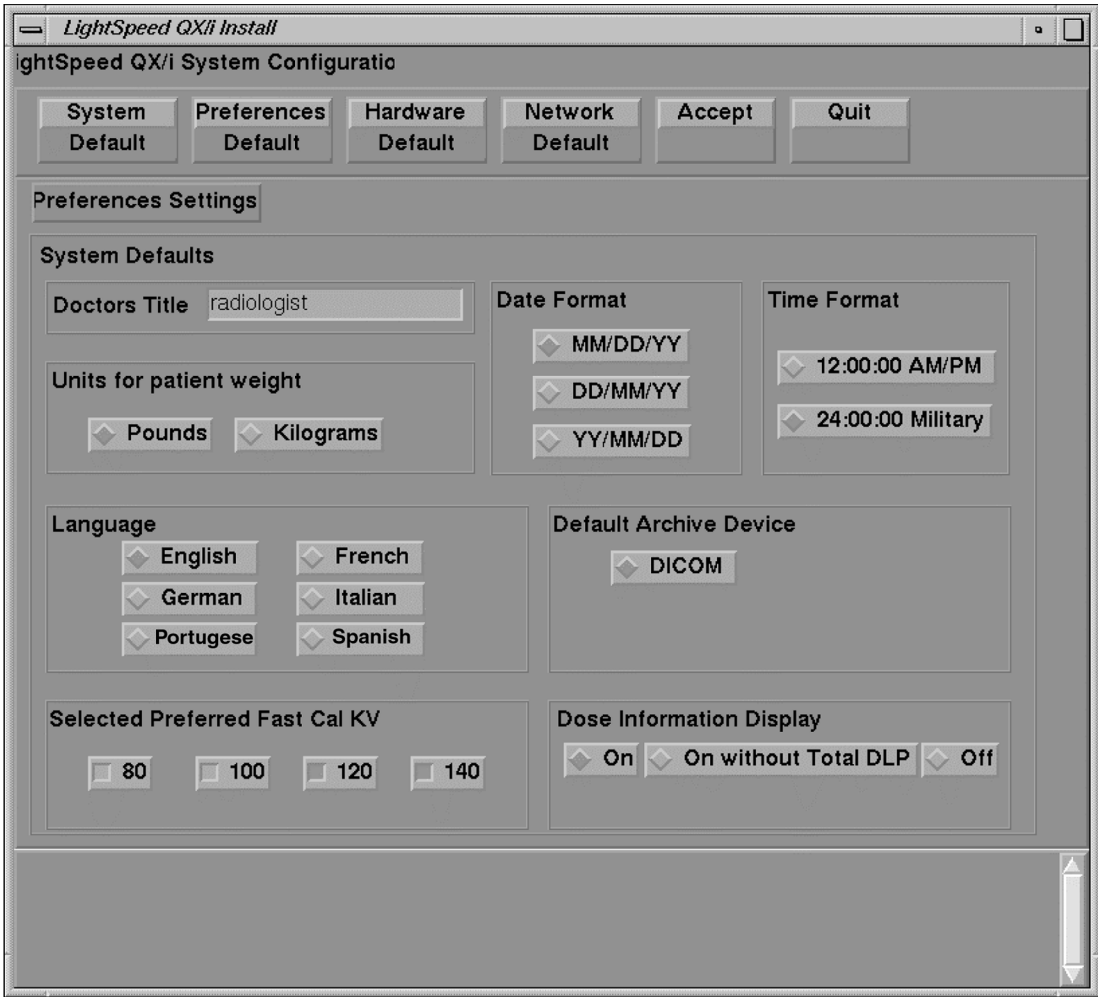


Figure 1-7 Preferences Setup Screen

a.) Select the `Language` (ENGLISH, FRENCH, GERMAN, ITALIAN)to display on the system.

b.) Select `Preferred FastCal KV` - select the kV to be calibrated during FastCal. (Default selections are 120 and 140)

These kVs should include all kVs which the site uses for patient scanning. Deselecting All Preferred FastCal KVs is the same as selecting ALL the Preferred FastCal KVs

c.) Select the desired `Date Format` and the desired `Time Format`.

d.) `Default Archive Device` is DICOM.

e.) Select HARDWARE to proceed to the screen in the next step.

3.) **Configure Hardware Settings**:

Note: Verify hardware	Verify your scan recon hardware and gantry type now. If you choose incorrectly now, you will have to re-load software again.

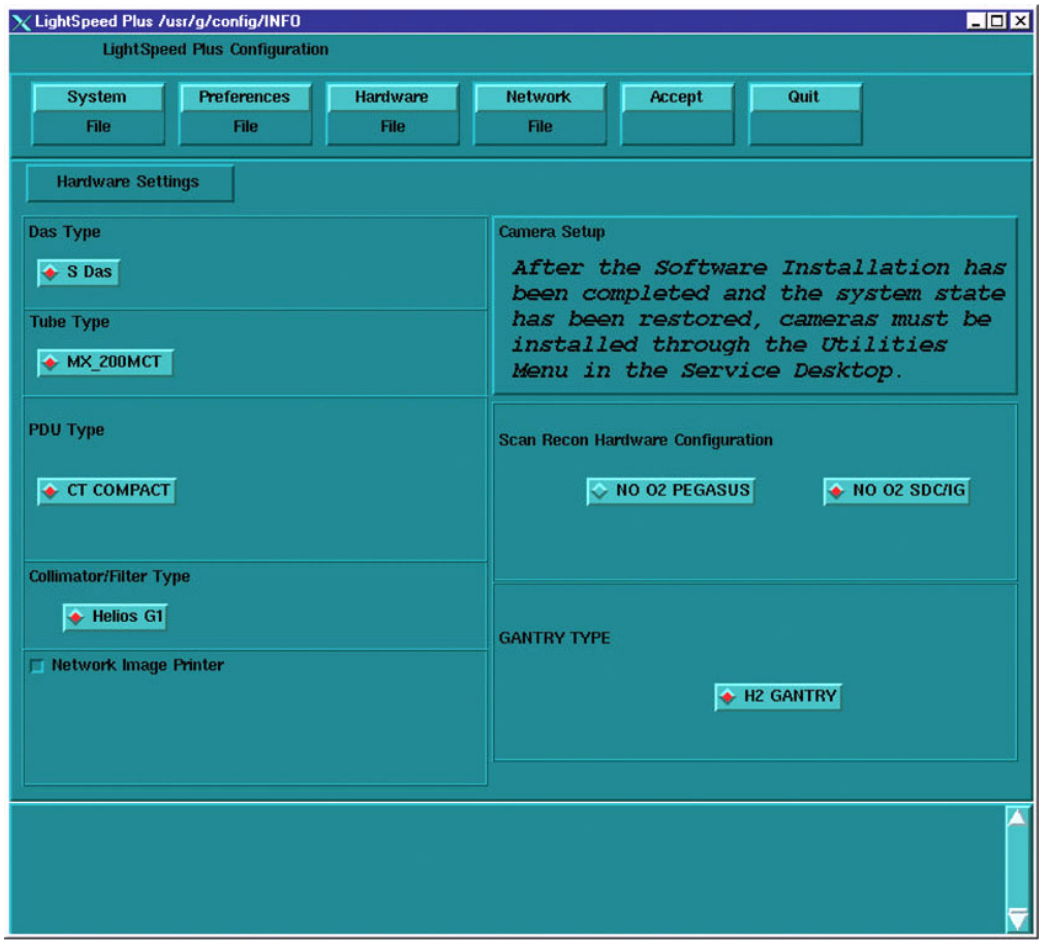


Figure 1-8 Hardware Settings Screen

a.) Select the `DAS Type` for this system. At present time, only S DAS is supported.

b.) Select the `Tube Type` for the system. At present time, there is only one `Tube Type`.

c.) Select the `PDU Type` for the system. At present time, only CT_COMPACT is supported.

d.) Select the desired `Collimator/Filter Type`. At present time, there is only one collimator selection.

e.) Always select H2 GANTRY for Gantry Type (at present, there is only one gantry setting).

f.) Select the correct Scan Recon Hardware Configuration. Examine your operator console hardware and select one of the two following Scan Recon Hardware Configurations:

* If using a Pegasus Board, select NO O2 PEGASUS
* If using a SDC/IG board, select NO O2 SDC/IG

The default setting is determined by the INFO file saved on the system disk or restored from the system state MOD.

Note: Pegasus Hardware

If upgrading to Pegasus, please verify the correct Scan Recon Hardware Configuration is chosen. Else installation of Flash Firmware will fail. You will have to re-install applications software to recover.

If upgrading to Pegasus, please verify the correct Scan Recon Hardware Configuration is choosen. Else installation of F;ash Firmware will fail. You will have to re-install applications software to recover.

g.) If you have a `Network Image Printer`, do not select it at this time. You will need to run Reconfig (See Chapter 4 on page 55) after Applications load has completed, to set it up.

Note: Print Servers

A "PRINT SERVER" IS NOT SUPPORTED (i.e.: a computer with a printer attached); a Network Image Printer (which is supported) is a printer directly attached to the network.

h.) Camera setup:

Cameras will be installed later in the load through the Utilities menu in the Service Desktop. See Section 3.13 .

i.) Select NETWORK to proceed to the screen in the next step.

4.) **Configure the Network Settings**.

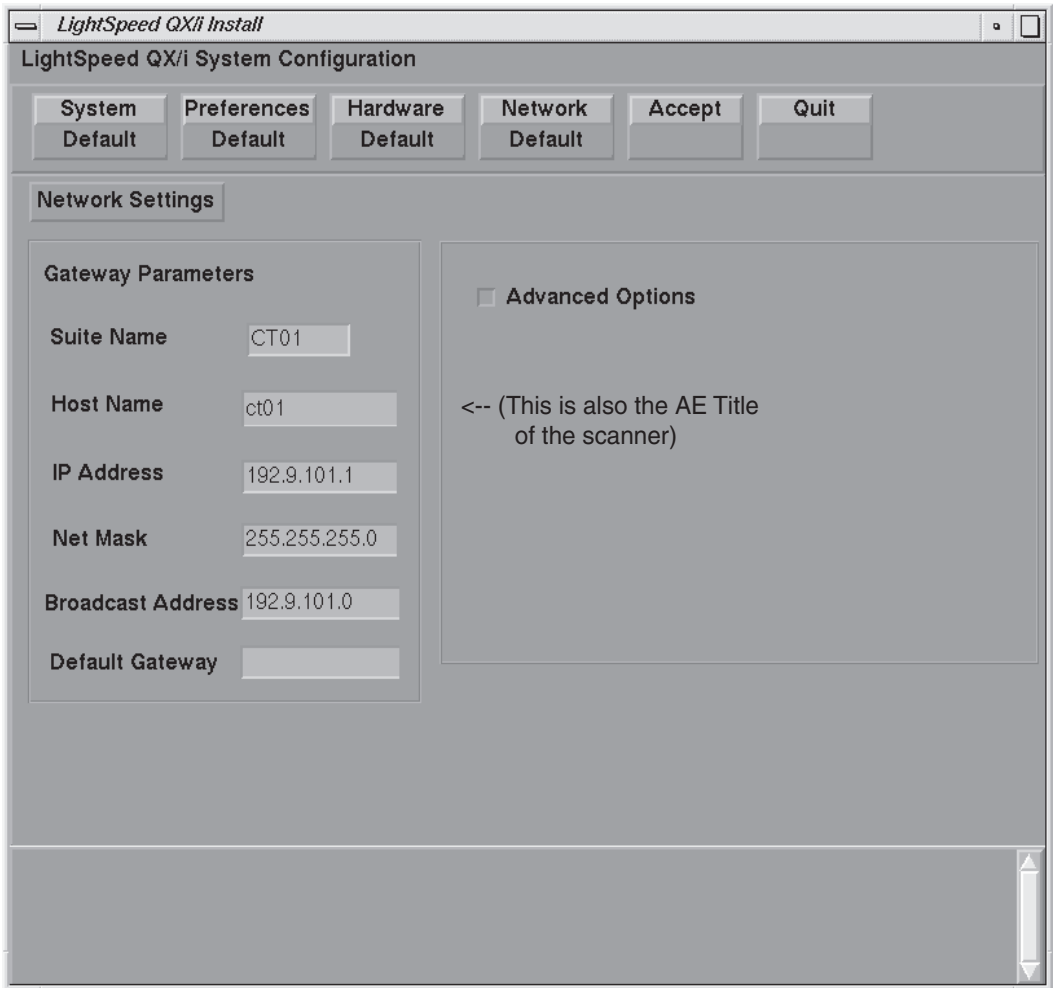


Figure 1-9 Network Settings Screen

Refer to the data you recorded in Section 2.4 to verify these entries.

a.) Enter the Suite Name.

The Suite Name must start with a letter, followed by 3 alphanumeric characters (i.e.: it MUST be 4 characters long). The name of the OC interface is **<Suite Name>_oc**.

b.) Enter the Host Name.

The Host Name identifies the hostname and AE Title of the scanner. The Host Name CANNOT be **<Suite Name>_oc or <SUITE NAME>_OC .**

c.) Enter the Host System's IP Address.

If possible consult the site's network administrator before configuring the interface to the site's network. The site administrator should provide the System's Host Name, IP Address, Net Mask, Broadcast Address, and Default Gateway (if a Default Gateway is used at the site).

d.) If you changed the Host System's IP address from the default then the Broadcast Address also needs to be updated. The Broadcast Address should be the Gateway IP address with the bits of the host id portion of the address either set to 1s or 0s depending on the configuration of the network. The standard default is 1's but older SunOS machines used 0's.

If the Host System's IP address is 192.100.9.17 the broadcast address should be 192.100.9.255 if the network is configured to use 1's to specify the broadcast address. If the network contains genesis based scanners or other SunOS 3.5 or 4.1 machines the broadcast address should be 192.100.9.0.

---

e.) Enter the Default Gateway IP Address (optional).

If there is a Default Gateway for the site's network, enter the IP Address of the gateway. Otherwise, leave the field blank.

f.) Check/select ADVANCED OPTIONS. The Advanced networking options provide support for NIS.

Do Not turn on NIS unless requested by the site's network administrator. Turning on NIS by selecting the Use NIS? option allows the scanner to use the site's NIS (a.k.a. Yellow Pages) database. The Domain Name must be provided by the site's network administrator

---

* To turn on NIS:

  1.)Highlight ADVANCED OPTIONS.

  2.)Highlight USE NIS?.

  3.)Enter ***Domain Name***

* To Turn off NIS:

  1.)Highlight ADVANCED OPTIONS.

  2.)De-select USE NIS.

System is now ready to initiate installation.

5.) Select ACCEPT to utilize the configuration and continue installation.

6.) The system will load the CT software, OS patches, kernel changes and configure the system on the OC.

This loading process will take about 15 minutes.While the load is going on, the results will be displayed in a shell window (which closes when the load is complete). All the window output is

logged to a file named `/var/adm/install.log.YYYYMMDDWWWHHMMSS`. (Where *`YYYYMMDDWWWHHMMSS`* is the Date/Time that the process was started.)

Note: Pflash Failure

During an applications load, the system automatically performs a firmware flash and re configures the Scan Data Disk. If either should fail, the system logs (but does not display) the event.

Prior to the reboot prompt in the next step, a pop-up window will be displayed, indicating that pflash or re configuration has failed and must be manually performed. Press OK to continue.

To perform the manual pflash, please see Appendix - "Error Messages And Troubleshooting".

7.) When the loading process and configuration changes are complete, the system will prompt you to reboot. Click on YES.

The system will now shut down and restart.

8.) The system will automatically login in as `ctuser` after the reboot. Select OK on the `AutoStart Disabled` popup message.

3.8 Setting Time and Date

You must always set date and time on the OC

1.) Open an Unix Shell on the OC from the toolchest, become root by typing: **`su root`** **ENTER**.

2.) Type the root password and press **ENTER**. (The password is **`#bigguy`**)

3.) Type: **`setdate`** ***`mmddhhmmyyyy`*** (e.g.: **`setdate 050409001999`**) and press **ENTER**.

Note: Alternate method exists

You may also type: `setdate` ENTER and you will be prompted through the individual entries. *Where:*

`mm` is month (01-12)

`dd` is day (01-31)

`hh` is hour (00-23)

`mm` is minutes (00-59)

`yyyy` is year (1980-2030)

4.) The **`setdate`** program will set and display the time and date for on the OC. Verify the date and time on the OC is correct.

5.) **`exit`** **ENTER** (to exit the root session).

3.9 Start up CT Applications

To start up the system, open a unix shell window and type: **`startup`** **ENTER**

3.10 Restore System State

This procedure restores Characterization Data, Calibration Data, Protocols, etc., from your System State MOD. If you don't have a System State MOD, skip this section (however, understand that you will have to perform ALL Characterizations and Calibrations in order to make the system operational).

Comment: Image Works should not be displaying any images when you restore System State (to ensure preferences are restored correctly). If you were in Image Works earlier, you should go back and exit to the Browser.

1.) Insert the Save System State MOD into the MOD drive.

2.) Click the SERVICE DESKTOP button.

Comment: If the Service Key is installed, the user has to press the (1), (2), (3) keys in order to proceed.

3.) Press the PM option from the list.

4.) Press SYSTEM STATE.

5.) Click on ALL, which will highlight the cals, characterization, etc.

6.) Press RESTORE; the restore takes a few minutes.

Note: If you have problems, see Appendix - "Error Messages And Troubleshooting", beginning on page 81 for possible error messages and their recovery.

7.) Review the screen output for errors or missing files.

The scroll bar on the right works only when the tool is not busy performing some task. Please be patient, it takes a little while.

Note: **If you should get SAVE/RESTORE SYSTEM STATE ERRORS:**

The Save/Restore System State process reports status on each file specification listed in the `/usr/g/config/SysState.cfg` file. The status may be:

- `Save (or Restore) of {filename} succeeded`
- `Save (or Restore) of {filename} skipped. File not found`
- `FAILED`

A status of `FAILED`, indicates potential problems, `skipped` means the file not found was not required. Please review the following for each file for which you see an error reported.

Some files simply may not exist on the system. If certain tools were never run then certain files may never get created. You may view `/usr/g/config/SysState.cfg` and look for a required field. `req=Y` means the file in question is required. You may also wish to check the system and MOD to verify whether it was actually missing or if there was a permission or owner problem with the file.

8.) Click NO for `Reset Scan hardware` pop up message.

9.) Click on DISMISS.

3.11 Downloading Flash Firmware

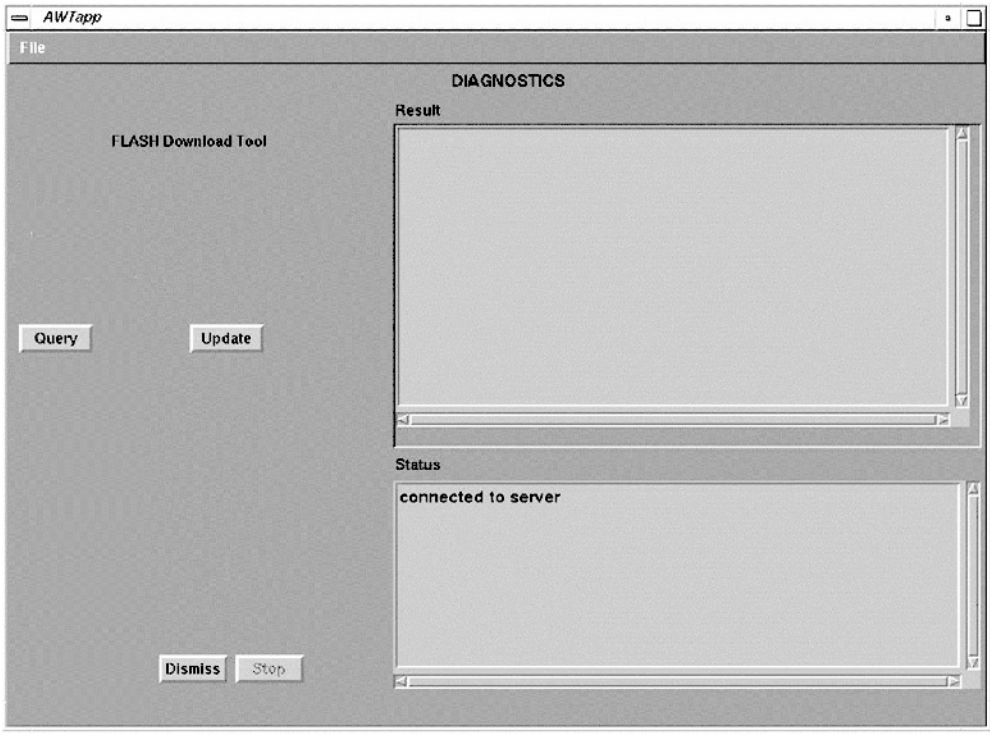


Figure 1-10 Flash Download Tool Graphical User Interface (GUI)

1.) If not already in the Service Desktop, click on SERVICE DESKTOP.

2.) Proceed to Flash Download Tool GUI:

   a.) Select TOOLBOX/UTILITIES menu.

   b.) Select INSTALL from the menu.

   c.) Select FLASH DOWNLOAD TOOL from the list.

3.) Click UPDATE button to start download.

Note: Ignore all pop-up messages by choosing CANCEL.

This will take a few minutes. Any invalid files should be re-downloaded by the software, and the output can be seen on screen.

4.) Click DISMISS to exit the graphical user interface.

3.12 Adding Software Options

Software Options must be loaded every time the OC software is loaded. INSTALL OPTIONS must be executed once, for each option MOD. For example, if you have two options MODs, you must run INSTALL OPTIONS twice.

Remember, MOD's cannot be interchanged between systems. The first time the MOD is used to install a software option, it must not be write protected. Prior to loading software, the MOD is checked for a valid system ID. If none exists, the system writes a serial number to the MOD. The MOD becomes serialized to specific CT systems.

1.) On the Service Desktop, select TOOLBOX/UTILITIES -> INSTALL -> INSTALL OPTIONS. The `Software Options` Window appears (see Figure 1-11):

2.) Click on the INSTALL button. (see Figure 1-11).

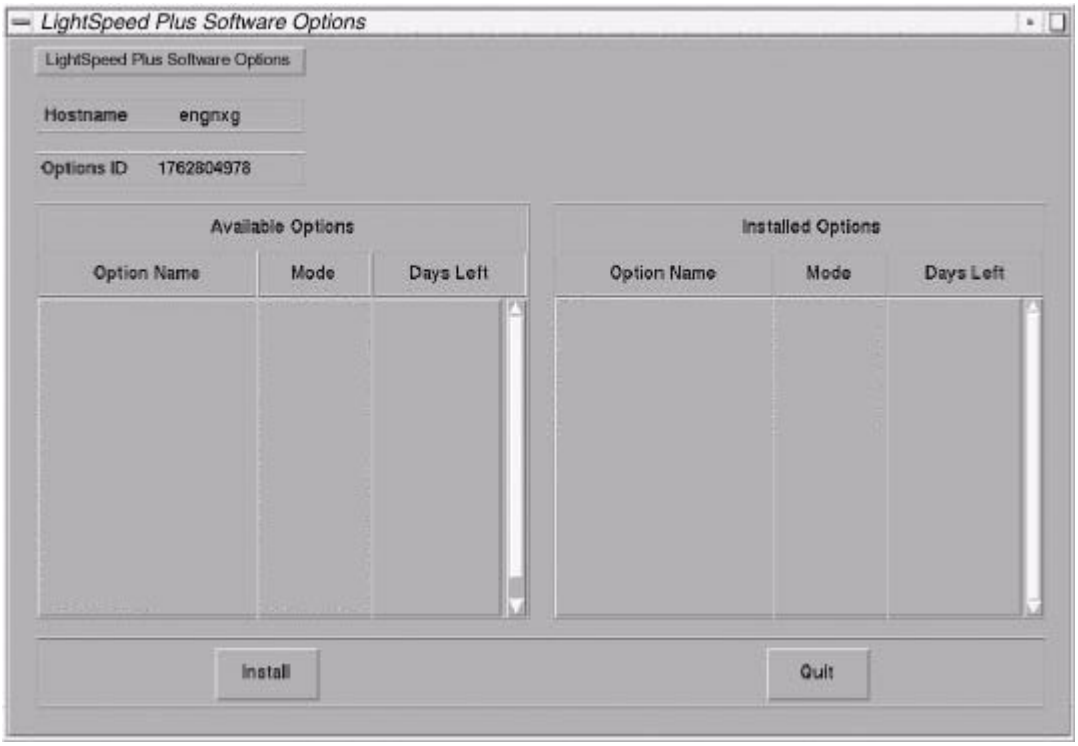


Figure 1-11 Software Options Screen

3.) Click on the PERMANENT button. (See Figure 1-13).

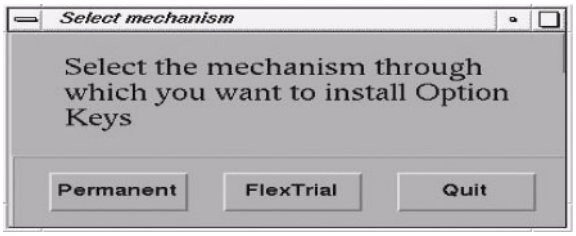


Figure 1-12 Select Mechanism Screen

4.) Click on the MOD button (Figure 1-13) and insert the Options MOD.

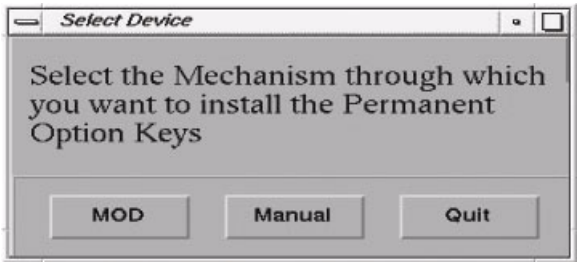


Figure 1-13 Select Device Screen

5.) Click on OK. Software options available for installation are displayed on the options screen.

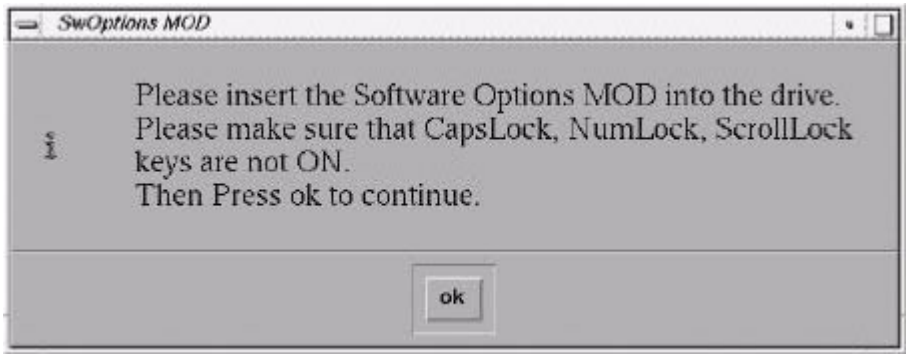


Figure 1-14 SW Options MOD screen

Example: Options screen with Permanent & FlexTrial options.

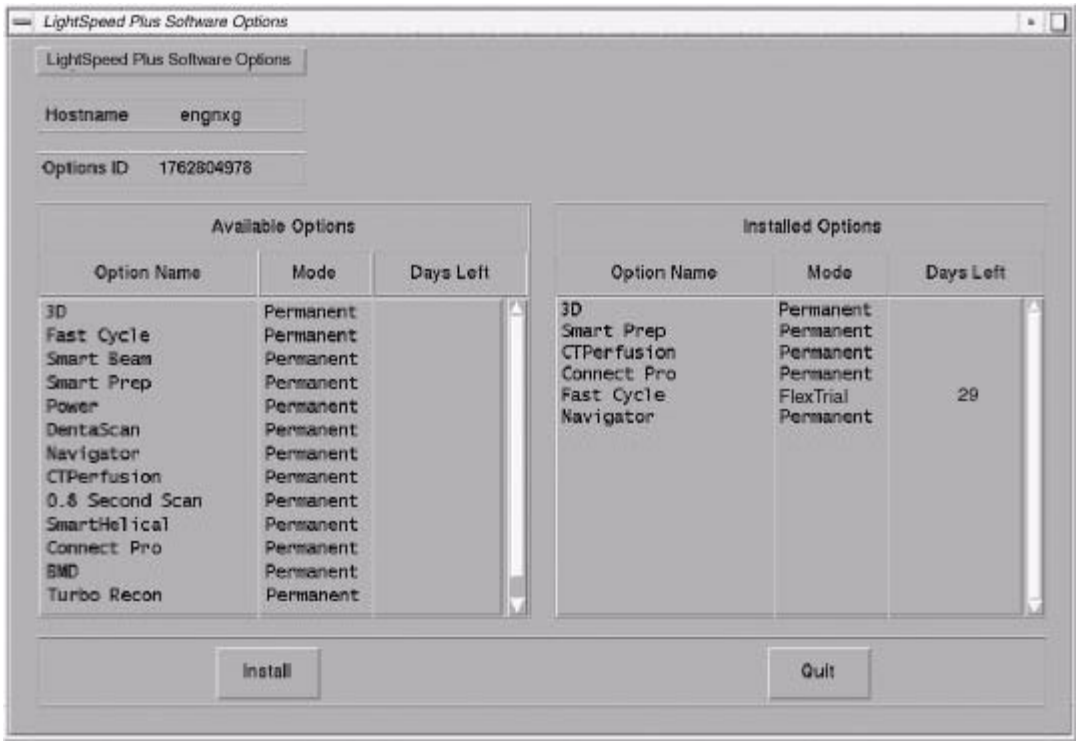


Figure 1-15 Example Options Screen

6.) Select the option(s) to be installed, using your mouse. You can click, drag downwards to select multiple options. Use the scroll bar to reveal options not visible in the window.

7.) Click on the INSTALL button. When the option appears in the “Installed Options” list, the installation of that option is complete. Please be patient, installation time varies by option.

8.) After installing the options, select QUIT twice, then OK. Do not reboot.

9.) Remove the MOD & write protect the side of the MOD with the option installed. The initial install requires the MOD to NOT be write protected; subsequent installs can be done with the MOD write protected). Repeat step this section (Section 3.12) if you have additional options to load.

Note: See Chapter 8 - "Modality Performed Procedure Step (PPS) Option" for installing Modality Performed Procedures Step (or MPPS) option.

3.13 Install Cameras

Camera installation is required in the following cases:

- Loading a new system
- When a system state MOD is unavailable, unreadable or does not contain camera preference information
- If changes need to be made to existing camera configurations

To install cameras, proceed to Chapter 5 - "Laser & DICOM Camera Setup".

3.14 Shutdown the System

1.) Press the pink SHUTDOWN button to bring down the system.

2.) Once the Applications and the OS have shutdown, press RESTART to bring the system back up again.

3.15 Verify System Operation

The following procedure makes sure the system is operating properly after upgrading or reloading the software.

1.) Open a UNIX shell and type: **`hinv`**

The output for the OC memory should be at least 512MB. If it is not, check the Host computer to make sure the memory is installed. If it is not installed, order the additional memory.

Note: Check memory	The system must have at least 512MB Memory for proper operation. System performance will be seriously impaired if less than 512MB is present.

2.) ExamRx Desktop

a.) Start the system and make sure you are on the ExamRx desktop.

b.) Verify that the date and time shown in the system status area is correct.

c.) Perform Tube Warm-up and Fastcal.

d.) Set ExamRx Display up to Autoview using your favorite Autoview layout

e.) Scan your favorite image quality phantoms to ensure the system is making good images. Make more than one image in a series so you can play with the images below.

f.) Verify that the date and time shown on the images and in the browser are correct.

g.) Watch to make sure the images autoview.

h.) Use List/Select to bring an image up in an ExamRx free viewport.

i.) Try each of the Window/Level Preset keys to make sure they are set correctly.

j.) Set the window level via the mouse.

k.) Set the window level via the trackball.

l.) Use the Trackball to Page through the images.

m.) Film at least 1 sheet of film and verify the image quality.

n.) If the site has a Network Image Printer, verify the print quality.

3.) ImageWorks Desktop

a.) Go to the Image Works Desktop.

b.) Select Network and make sure all of the Remote hosts were restored when you restored the system state. If they were not restored, use the information you saved earlier (section

2.4 on page 23) to configure the site's networking.

c.) If you have any Genesis based systems configured for networking, and they are up and running, select one of the remote systems and **Query** to see if you can see those systems. *(If the Hospital and the user on a remote system grants you permission, try pushing images to the remote system.)* Use both genesis and non-genesis images if available.

d.) If you can see those systems, try pulling one or more exams onto this system.

e.) If it is all right with your site, try pushing images to all Genesis and DICOM systems that you have in your network configuration.

f.) Use Archive to restore one or more of the most recent Exams performed by the site.

g.) Select an interesting Exam in the Browser and click on CT Viewer to see the images.

h.) Try each of the Window/Level Presets to make sure they are set correctly.

i.) Set the window level via the mouse.

j.) Try a reformat of an interesting series.

k.) If you have the 3D option, try doing a 3D rendering of an interesting series.

l.) Print at least one film and check the image quality.

m.) Remove one or more of the Exams you pulled onto the system.

4.) Service Desktop

a.) Go to the Service Desktop.

b.) Click on TOOLBOX/UTILITIES to see the list of Utility Applications.

c.) Click on TOOLS and then VERIFY SECURITY to see if the system can see your security key.

d.) Click on INSTALL and then VERIFY OPTIONS to see if the right options are configured.

e.) Click on SCAN ANALYSIS to see if you can see the scan files you made earlier.

f.) Click on SYSTEM RESETS, perform a SCAN HARDWARE RESET, and verify that it completes normally.

g.) When the Scan Hardware Reset is complete, click on CLEANUP to exit all the Service applications.

SOFTWARE LOAD COMPLETE

Chapter 2
Mobile Software (H2.1M4 System Only)

Section 1.0
Software Dependencies

CT Mobile Software can only be installed on CT systems using an Octane computer console and H2.1 M4 software. No other configuration will work. Check your hardware and software configuration before preceding.

Section 2.0
Loading the Software Patch

To load the software patch for mobile, do the following:

1.) Shutdown CT applications from the service desktop
2.) Open a Shell and do the following:
   a.) Type **`su -`**
   b.) `password`: **`#bigguy`**
3.) Insert patch CD-ROM into CD-ROM drive.
4.) WIthin the Shell:
   a.) Type **`mountCD /mnt`**
   b.) Type **`cd /mnt`**
   c.) Type **`install_mobilePatch`**
   (software will load)
   d.) Type **`unmountCD`** *(you may remove CD-ROM)*
   e.) Press **CTL+D** *(This will return you to ctuser.)*
5.) As `ctuser`, type **`st`** *(CT applications will start)*
6.) Refer to Figure 2-1. On the Service Desktop:
   a.) Click on the UTILITIES icon
   b.) Select INSTALL from the menu
   c.) Select FLASH DOWNLOAD TOOL *(Flash Download will run)*

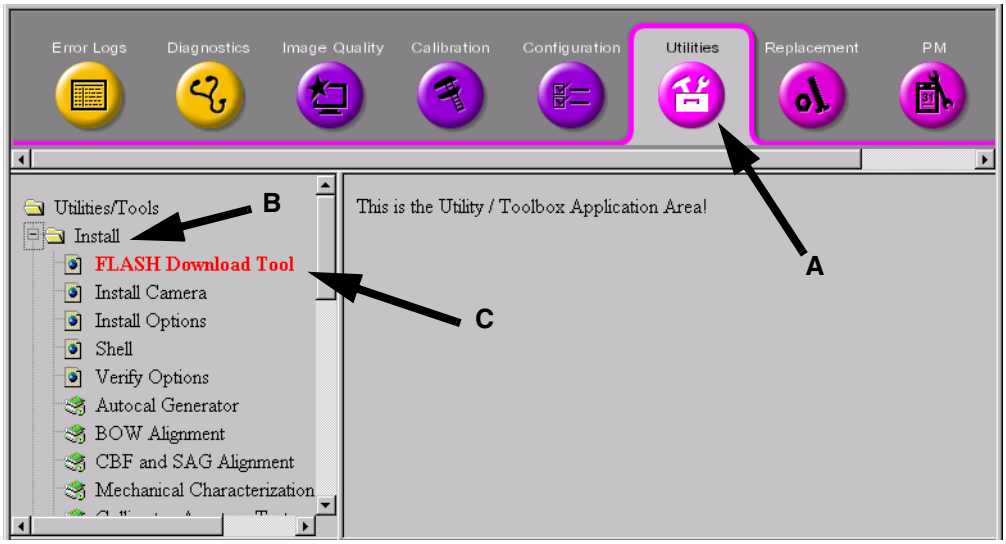


Figure 2-1 Accessing the FLASH Download Tool

Section 3.0
Verifying Mobile Software is Installed

Use the following procedure to verify that mobile software has been installed correctly.

1.) At a command prompt within an UNIX shell window, type the following:
`showprods | grep -i mobile`

2.) Verify that the word "`Mobile`" appears in the screen output, as follows:

```
====================
HM13_1_H2_1M4_Mobile_Install_SW_Patch_ver1  10/03/2001  Patch for Moblile
Shutdown
HM13_1_H2_1M4_Mobile_Install_SW_Patch_ver1.sw  10/03/2001  Files to patch for
Mobile
HM13_1_H2_1M4_Mobile_Install_SW_Patch_ver1.sw.mobile_subsys 10/03/2001
Mobile install Subsystem files
HM13_1_H2_1M4_Mobile_SW_Patch_ver1 10/03/2001 Patch for Moblile Shutdown
HM13_1_H2_1M4_Mobile_SW_Patch_ver1.sw 10/03/2001 Files to patch for Mobile
HM13_1_H2_1M4_Mobile_SW_Patch_ver1.sw.ETCScan 10/03/2001 fw hwctrl
ETCScanHM13_1_H2_1M4_Mobile_SW_Patch_ver1.sw.fwmgr 10/03/2001 fwmgr
executable
HM13_1_H2_1M4_Mobile_SW_Patch_ver1.sw.scripts_envmgr 10/03/2001 install
config + scripts and envmgr
```

When the mobile SW patch is removed, the above entries will be missing.

Section 4.0
Unloading Software Patch

To unload the software patch for mobile, do the following:

1.) Shutdown CT applications from the service desktop

2.) Open a Shell and do the following:

   a.) Type **`su -`**

   b.) `password`: **`#bigguy`**

3.) WIthin the Shell:

   a.) Type **`cd /usr/g/scripts`**

   b.) Type **`uninstall_mobilePatch`** *(software will be removed)*

   c.) Press **CTL+D** (This will return you to ctuser.)

4.) As ctuser, type **`st`** *(CT applications will start)*

5.) Refer to Figure 2-1. On the Service Desktop:

   a.) Click on the UTILITIES icon

   b.) Select INSTALL from the menu

   c.) Select FLASH DOWNLOAD TOOL *(Flash Download will run)*

Chapter 3
Creating Default Partitions

Section 1.0
Overview

Partitioning is the process of preparing a disk to work with an operating system. In doing this, the process destroys all data stored on the disk. Normally, it's only necessary to partition a disk when a hard drive has been replaced, reformatted or has become damaged.

Do not attempt to partition the Scan Data Disk. The Scan Data Disk is prepared when you run **`reconfig`**, and select "Re-generate Database" (See "Chapter 7" on page 77).

Note: Ensure the LightSpeed Plus Operating System CDROM Disk #1 is in the drive before continuing. If the disk has never been partitioned, `swap partition (1) is not a valid swap area` is reported. This is normal.

If you need to format the System Disk, see Appendix - "Error Messages And Troubleshooting" page 82 for details.

NOTICE
Potential for Data Loss

Make sure that all Images have been reconstructed and archived before performing this procedure.

Section 2.0
Procedure

1.) Select the ENTER COMMAND MONITOR, selection 5. A boot monitor screen will be displayed. Check to make sure the CDROM drive is NOT busy before you proceed. Start the standalone disk partitioning utility.

For the Octane Computer (OC), type:

`boot -f dksc(1,6,8)sash64 dksc(1,6,7)stand/fx.64` **ENTER**

2.) Enter the responses as indicated, in the following:

a.) `Do you require extended mode with all options available(no)?` **`yes`**

b.) `fx: device-name = (dksc)` **ENTER**

c.) `fx: ctrl # = (0) .....` **ENTER**

d.) `fx: drive # = (1) .....` **ENTER**

A message appears: `SGI drive type = <Disk Model No>.`

```
please choose one (? for help, .. to quit this menu) ---
[exi]t  [d]ebug/[l]abel/
[b]adblock/[exe]rcise/ [r]epartition/
```

Note: Not shown, but also available, is the command: `[f]ormat/`

e.) `fx>` **`r`** **ENTER**

```
 --- please choose one (? for help, .. to quit this menu) ---
[ro]otdrive[o]ptiondrive[e]xpert
[u]srrootdrive[re]size
```

f.) Select: `[ro]otdrive`

`fx/repartition>` **`ro`** **ENTER**

g.) `fx/repartition/rootdrive: type of data partition = (xfs) ...` **ENTER**

h.) `Continue?` **`y`** **ENTER**

i.) A menu appears asking: `Please Choose One.`

j.) Go up a menu: **`..`** **ENTER** *(two periods)*

k.) Type: **`d/fi`** **ENTER** *(There are no spaces in this command)*

l.) `fx/debug/fillbuf: buf offset = (0)`

Press **ENTER**

m.) `fx/debug/fillbuf: "fill string" = ( )`

Type: **`a`** and press **ENTER**

n.) `fx/debug/fillbuf: nbytes = (524288)`

Type: **`0x10000`** and press **ENTER**

o.) A menu appears asking: `Please Choose One.`

Type: **`d/see`** and press **ENTER** *(No spaces in this command.)*

p.) `fx/debug/seek:blocknum = (0)`

Type: **`266240`** and press **ENTER**

q.) A menu appears asking: `Please Choose One.`

Type: **`d/w`** and press **ENTER** *(No spaces in command.)*

r.) `fx/debug/writebuf: buf offset = (0)`

Press **ENTER**

s.) `fx/debug/writebuf: nblocks = (4294967296)`

Type: **`128`** and press **ENTER**

t.) A menu appears asking: `Please Choose One.`

Type: **`l/sy`** and press **ENTER** *(No spaces and lower case "L")*

u.) You are Done

Type: **`exit`** and press **ENTER**.

3.) You may now continue installation. After performing disk partitioning on OC, See "Install System Software (IRIX OS) on Operator Console (OC)" on page 31., to continue system software installation.

Chapter 4
CT Application Reconfiguration

Section 1.0
Overview

This chapter describes how to modify an existing LightSpeed Plus CT Applications configuration. Many of the parameters entered during a LFC can be changed without a complete re-installing software. However, to change computer type or image generator hardware used requires a re-load of CT applications.

The procedure consists of executing reconfig on the OC, changing the configuration on the screens, and accepting the reconfig (to allow the changes to be made). The following table indicates the parameter settings that can be changed using this Reconfiguration Procedure:

SYSTEM SETTINGS	PREFERENCES	HARDWARE SETTINGS	NETWORK SETTINGS
Hospital Name	Screen Display Language	Network Image Printer	Suite Name
Service ID	Preferred Fastcal kV		Host Name/AE Title
Time Zone	Date Display Format		Host IP Address
Next Exam #	Time Display Format		Net Mask
Scan Database Regeneration	Dose Information Display		Broadcast Address
			Default Gateway Address
			NIS (Yellow Pages)

Table 4-1 System Re-configuration Settings

Section 2.0
Procedure

On the following screens, you should make the changes necessary, pressing the corresponding button at the top of the screen to move from screen to screen. When you are done, you can either press the ACCEPT button to start the reconfiguration process, or press the QUIT button to exit without changing the system configuration.

While the reconfiguration is going on, messages are displayed in a shell window, which closes when reconfiguration is complete. Should you later want to review the reconfiguration output, it is logged to the file **`/var/adm/install.log.`*`YYYMMDDWWWHHMMSS`***

Where *`YYYYMMDDWWWHHMMSS`* is the Date/Time that the reconfiguration was started.To view the file, type:**`more /var/adm/install.log.`*`YYYMMDDWWWHHMMSS`***

It is possible to abort the reconfiguration while entering information on the reconfiguration screens. Simply press the QUIT button at the top of the screen. There is NO safe way to abort the reconfiguration after pressing the ACCEPT button. If the entries made in the screens were incorrect,

DO NOT try to stop the reconfiguration, instead wait for it to complete, and rerun reconfig, entering the correct parameters.

1.) If Applications is currently running, you must shutdown system applications to the `ctuser` desktop.

   a.) Click on the SERVICE DESKTOP button.

   b.) On the desktop toolbar select UTILITIES.

   c.) Select APPLICATIONS SHUTDOWN (to bring down applications only).

2.) On the OC, open a UNIX Shell window.

   a.) Type: **`su -`** **ENTER** at the prompt.

   b.) Enter the root (super user) password: **`#bigguy`**

3.) Change directory to scripts:

   Type: **`cd /user/g/scripts`** **ENTER** at the prompt.

4.) Launch the LightSpeed Install utility:

   Type: **`reconfig`** **ENTER** at the prompt.

   The OC displays the LightSpeed Install Utility Window as shown in Figure 4-1.

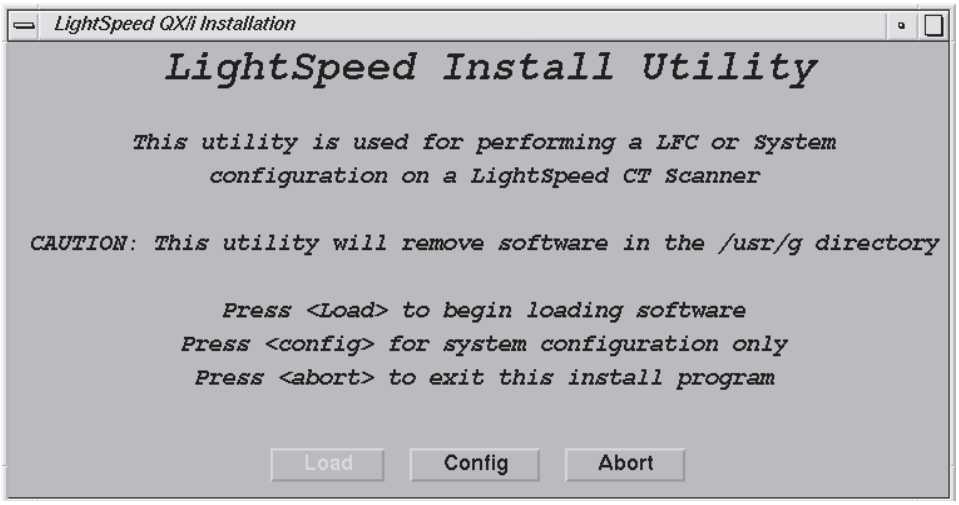


Figure 4-1 Install Utility Window

5.) Using the mouse, click on the CONFIG button.

   The OC displays the LightSpeed Plus System Configuration - System Settings Screen as shown in Figure 4-2.

Comment: *The following pages show the screens that are used to change the configuration of the system. These screens are the same as those used for the Software Configuration during Load From Cold. The actual screens will vary depending on the current configuration of your system.*

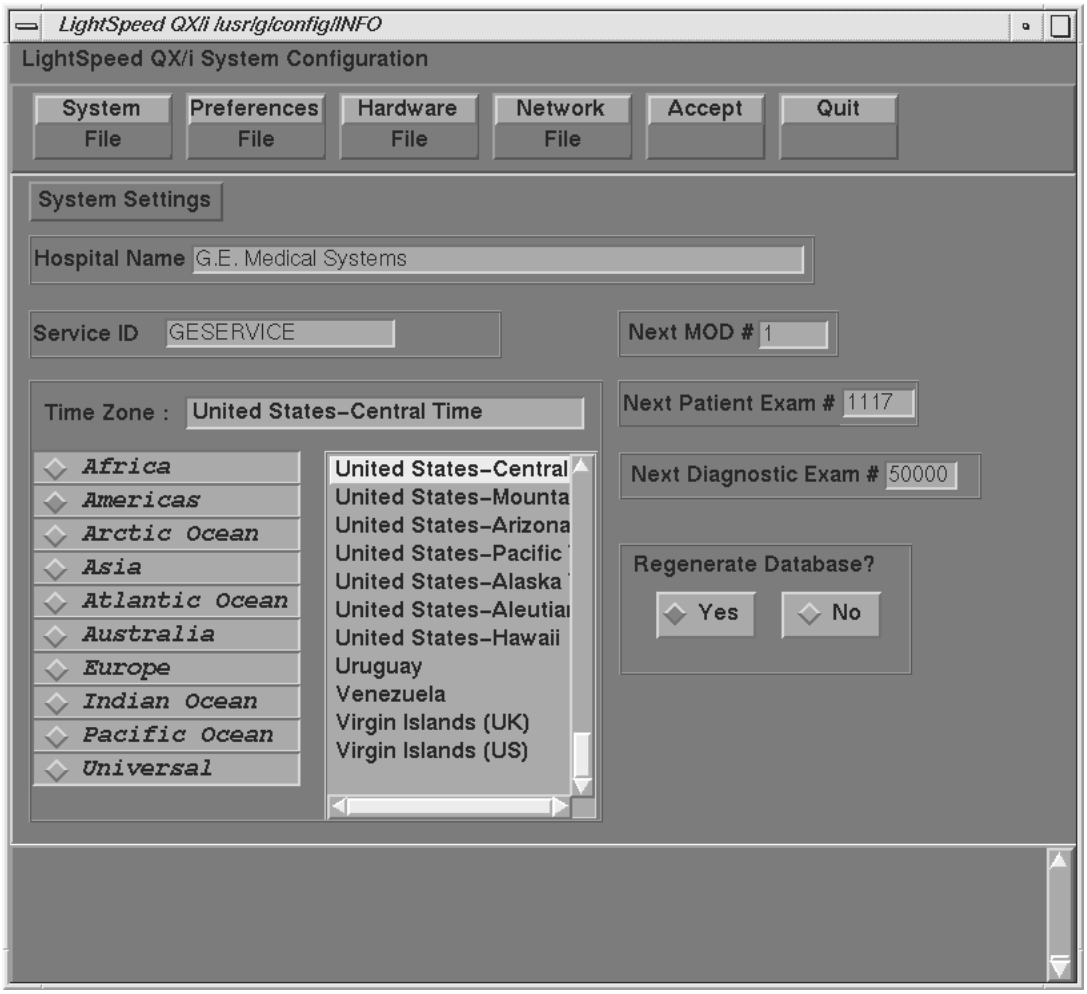


Figure 4-2 System Settings Screen

6.) `Regenerate Database` determines whether the Scan Database will be regenerated during reconfiguration.

Note: If YES is selected, then all scan data will be deleted on the Scan Data Disk. To avoid accidental “regen”, NO is selected by default each time reconfig is run.

Regenerating the Scan Database destroys all the scan and calibration files on the Scan Data Disk. Make sure that all images have been reconstructed before regenerating the Scan Database.

This procedure is normally only needed when a Scan Data Disk is replaced or reformatted. See Chapter 7 - "Regenerating the Scan Database" if you require more information regarding Scan Database Regeneration.

7.) Configure System Settings

a.) `Hospital Name` configures the name that will show up on images produced by this scanner.

b.) `Service ID` is issued by the Service organization.

c.) Select the `Time Zone` for the site.

Note: Use the scrollbar at the bottom of the timezone selection list to view the entire description of the timezone you are about to select, to ensure that you are selecting the correct timezone for your location.

If the timezone of your location is not in the list above, select one of the universal times in the selection menu. In this case, automatic changes for daylight savings time will not take effect. See Chapter 6 - "Changing The System Time Zone" if you require more information regarding timezone setting & selection.

d.) `Next MOD #` *Currently this field is not implemented.*

e.) `Next Patient Exam #` configures the next Exam number the scan user interface will use. Get this information from the customer's patient log, or by examining the information recorded previously. (See "Record KEY System Information" on page 23.)

f.) `Next Diagnostic Exam #` *Currently this field is not implemented.*

8.) Select the PREFERENCES button to display the Preference Settings Screen, as shown in Figure 4-3.

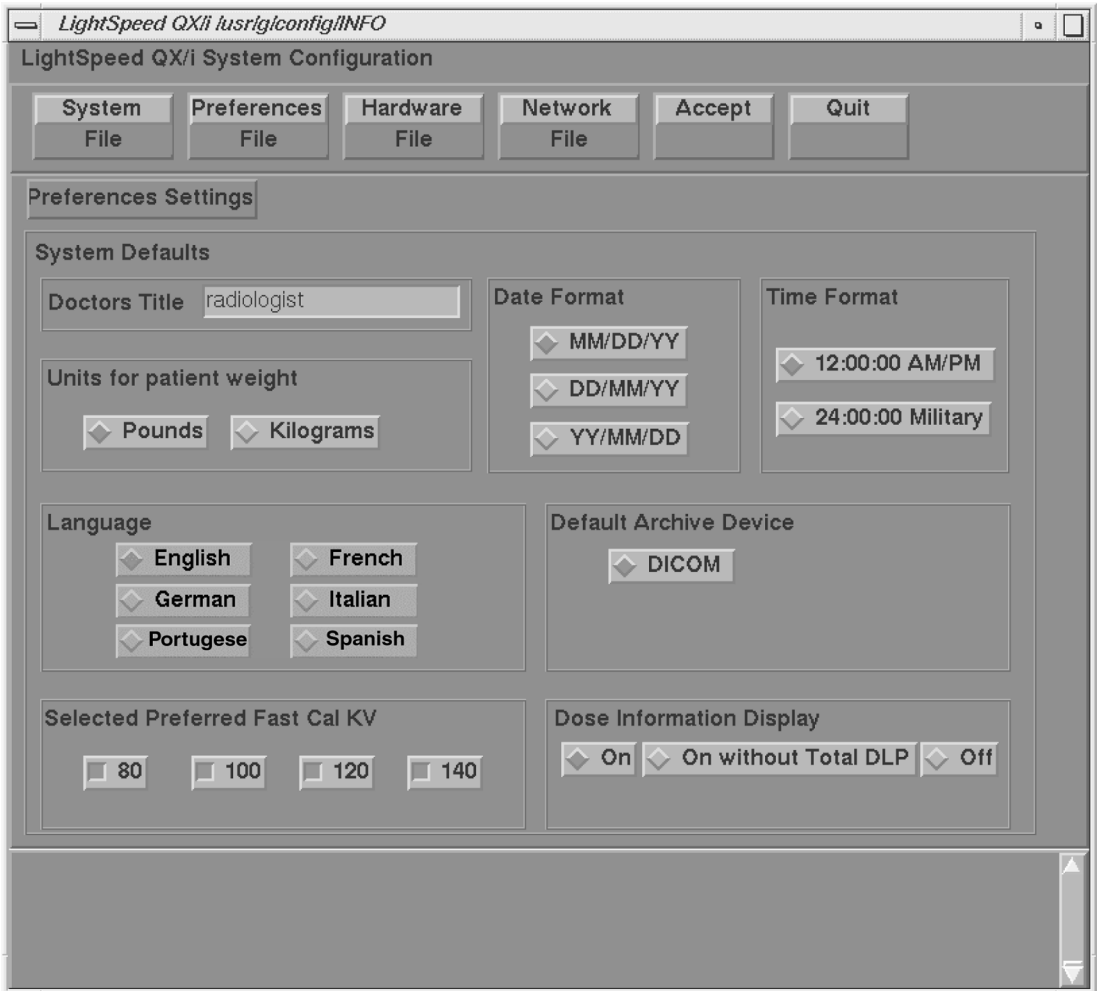


Figure 4-3 Preferences Setup Screen

Note: The `Doctor's Title` and `Units for patient weight` options are not currently implemented.

9.) Configure Preferences Settings

a.) `Language` configures the language to be displayed on the Application screens (ENGLISH, FRENCH, GERMAN, ITALIAN).

b.) `Preferred Fast Cal KV` configures the preferred kV that the Fast Cal Routine will calibrate (80, 100, 120, 140 in the `Selected Preferred Fast Cal KV` field). The default selections are 120 and 140.

Comment: *These kVs should include all kVs which the site uses for patient scanning. Deselecting All Preferred FastCal KVs is the same as selecting ALL the Preferred FastCal KVs*

c.) `Date Format` and `Time Format` configures the format in which the date and time will be displayed on the images.

d.) Select the site preferred Dose Information Display option for the site to use in monitoring calculated Patient Dose:

* Select ON (full CTDiw Display)
* Select ON WITHOUT TOTAL DLP (no Dose Length Product Display), or
* Select OFF (no CTDIw Display)

10.) Select the HARDWARE button to display the Hardware Settings Screen (see Figure 4-4).

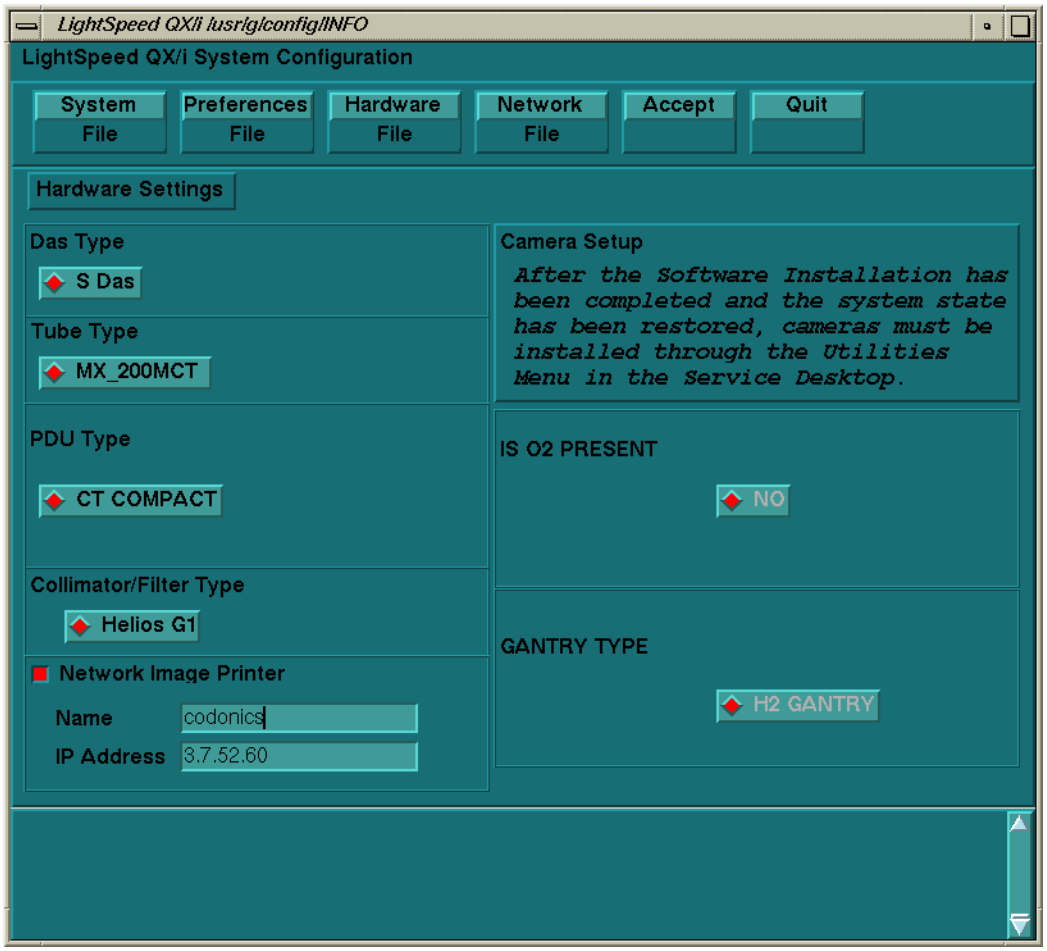


Figure 4-4 Hardware Settings Screen

11.) Configure Hardware Settings

a.) `DAS Type` configures which DAS the software should expect. Presently, LightSpeed systems only support S DAS.

b.) `Tube Type` configures which X-Ray Tube the software should expect. Presently,

LightSpeed systems only support MX_200MCT.

c.) `PDU Type` configures which PDU the software should expect. Presently, LightSpeed systems only support CT COMPACT.

d.) `Collimator/Filter Type` configures which Collimator/Filter the software should expect. Presently, LightSpeed Plus systems only support HELIOS G1.

e.) `Gantry Type` selects the type of Gantry connected to this console. Currently, LightSpeed Plus systems only support H2 GANTRY for Gantry Type.

f.) Select Network Image Printer only if the site plans to use a network connected postscript printer (such as Codonics printers) with this system. When selected:

* Enter the printer Hostname in the `Name` field.
* Enter the printer IP Address in the `IP Address` field.

Note: A "PRINT SERVER" (i.e., a computer with a printer attached) IS NOT SUPPORTED; a Network Image Printer (which is supported) is a printer directly attached to the network.

g.) Camera Setup:

Comment: *Camera Setup is not performed using Reconfig, but rather is performed from the Service Desktop once Applications have been started. See Chapter 5 - "Laser & DICOM Camera Setup" for details.*

12.) Select the NETWORK button to display the Network Settings Screen, as shown in Figure 4-5.

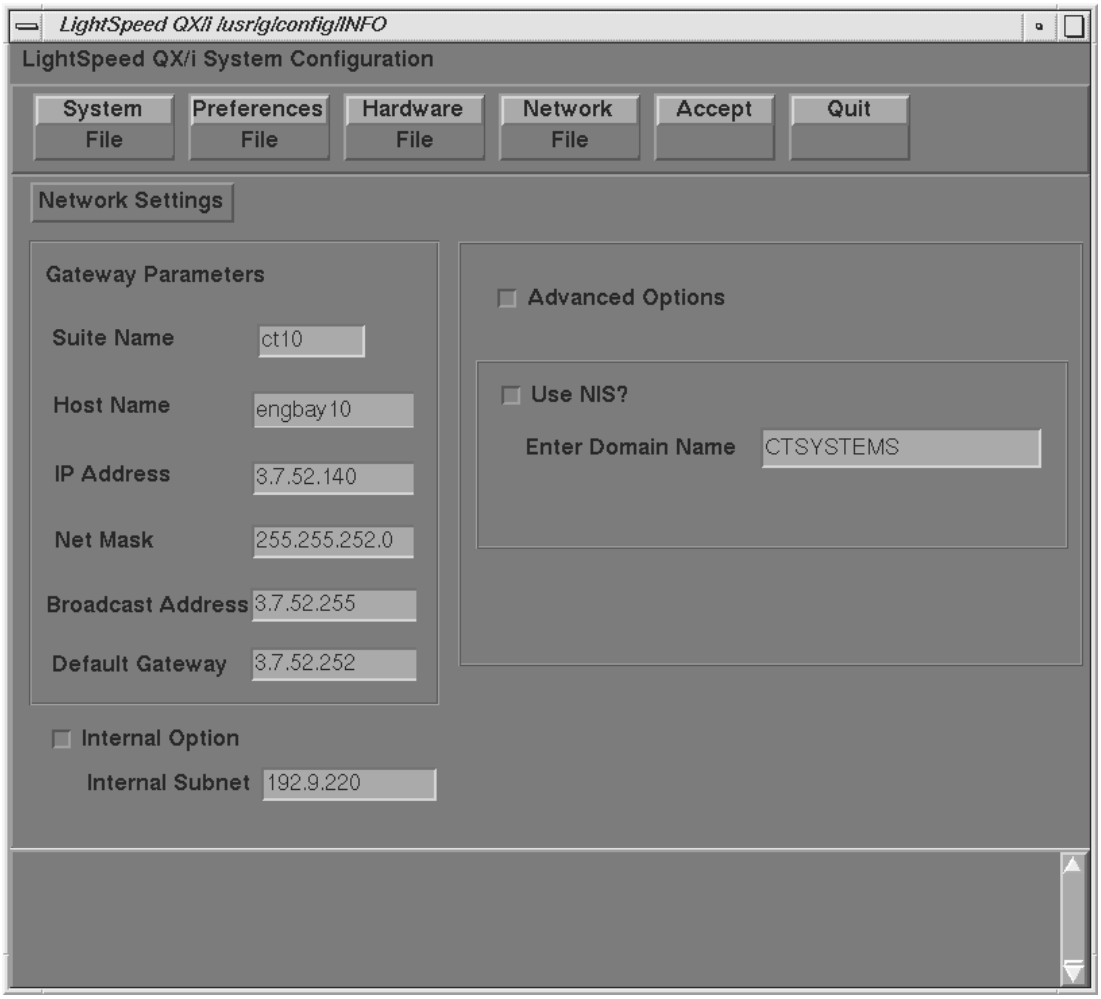


Figure 4-5 Network Settings Screen

13.) Configure Network Settings

Comment: *This screen provides the ability to declare the LightSpeed system on a hospital network. Key information such as Host Name, IP Address, Net Mask, and Default Gateway must be obtained from the hospital's network administrator.*

a.) Enter the `Suite Name`.

Note: The Suite Name must start with a letter, followed by 3 alphanumeric characters. Total must be four characters long. The name of the OC interface is *<Suite Name>*`_oc` within the scanner's subnet. Typically you should use CT01, unless the customer prefers a different Suite Name.

b.) Enter the hospital provided `Host Name`.

Note: The Host Name identifies the network hostname and AE Title of the LightSpeed system to the hospital's network.

The Host Name**:**

* **MUST NOT** be *<Suite Name>*`_oc` or *<Suite Name>*`_OC`.
* **MUST NOT** exceed 16 Characters.
* **MUST** only contain the following characters: **`A` through `Z`, `a` through `z`, `0` through `9`, `-` and `_`**

c.) Enter the hospital provided `IP Address` for the system.

d.) Enter the hospital provided `Net Mask` (if the LightSpeed system is on a subnet).

e.) Enter the `Broadcast Address`.

Comment: The Broadcast Address should be the same as the IP Address except for the bits of the host id portion (last digit group) set to 1's or 0's depending on the configuration of the network. The standard default is 1's, but older Sun OS machines used O's.

For example:

If the IP Address is 192.100.9.17, the Broadcast Address should be 192.100.9.255 if the network is configured to use 1's to specify the Broadcast Address.

If the network contains genesis based scanners or other SunOS 3.5 or 4.1 computers, the Broadcast Address should be 192.100.9.0.

---

f.) Enter the hospital provided `Default Gateway` IP Address in the Default Gateway field (if applicable). If the site network does not use a default gateway, leave the field blank.

g.) Select NIS (a.k.a. Yellow Pages database) `Advanced Option` only if requested by the hospital network administrator as follows:

* Select ADVANCED OPTIONS button on the Network Settings Screen.
* Select USE NIS button.
* Enter the hospital provided `Domain Name`.

14.) Select ACCEPT on the LightSpeed Plus System Configuration Screen.

Comment: The system loads the CT Application Software, OS patches, kernel changes and configures the system on the OC computer.

The loading process takes approximately 15 minutes. While the load is going on, the results are displayed in a shell window which closes when the loading process is complete. All the window output is logged to a file named:

`/var/adm/install.log.YYYYMMDDWWWHHMMSS`

(Where *YYYYMMDDWWWHHMMSS* is the Date/Time that the loading process was started).

15.) When the loading process and configuration changes are complete, the system displays a prompt to reboot. Click on YES. (See Figure 4-6.)

Figure 4-6 Reboot Screen

16.) The system will automatically login as `ctuser` after the reboot. Select OK on the Autostart Disabled popup message.

APPLICATIONS START-UP

17.) In the Console shell, type: **`st`** ENTER

Chapter 5
Laser & DICOM Camera Setup

Purpose: This Chapter contains procedures for recording important Camera setup information. Use the table(s) at the end of this chapter to permanently record information your current setup.

⚠ **NOTICE**
Potential For Data Loss

Empty all filming queues before modifying any camera parameter.

Section 1.0
Setup Procedure

1.) Click on the SERVICE DESKTOP button.

2.) On the Desktop Toolbar select UTILITIES -> INSTALL -> INSTALL CAMERA. The LightSpeed Plus Install Camera window appears, along with a warning message pop-up box. To remind you that all filming queues must be empty before you begin to update or delete a camera.

3.) The Graphical User Interface displayed shows a list of cameras installed (See Figure 5-2). First, you must click OK in the warning message box. See Figure 5-1.

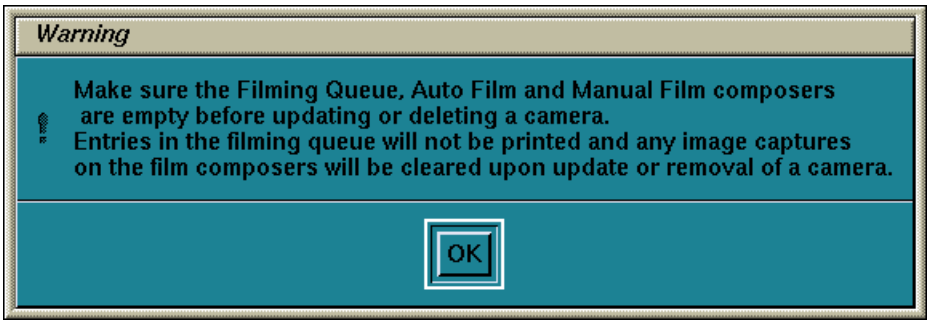


Figure 5-1 Warning Screen

4.) Now you are asked a series of questions.

a.) To add a new camera, click the ADD button (See Figure 5-2).

b.) Now a dialog window for the camera type (DASM/DICOM) appears. If no DASM is detected during the OC boot, the DASM button will be disabled (See Figure 5-3). If a DASM is present and has not been detected, re-boot the OC and run the camera

configuration tool again.

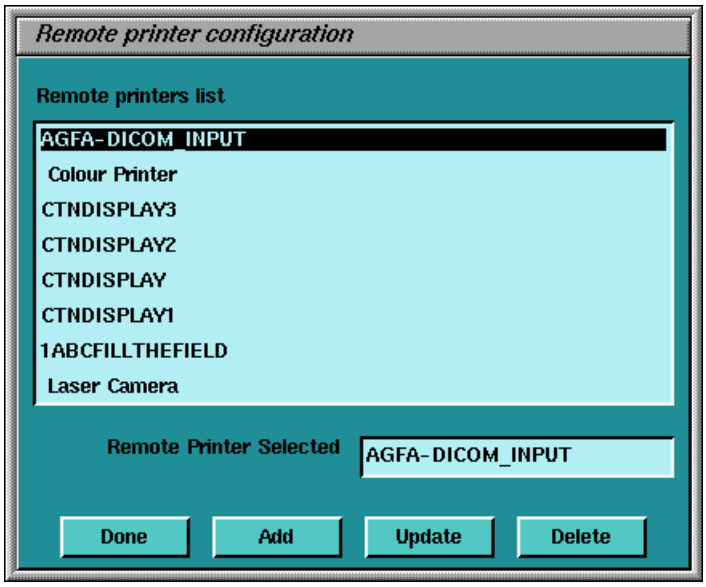


Figure 5-2 Printer Configuration GUI

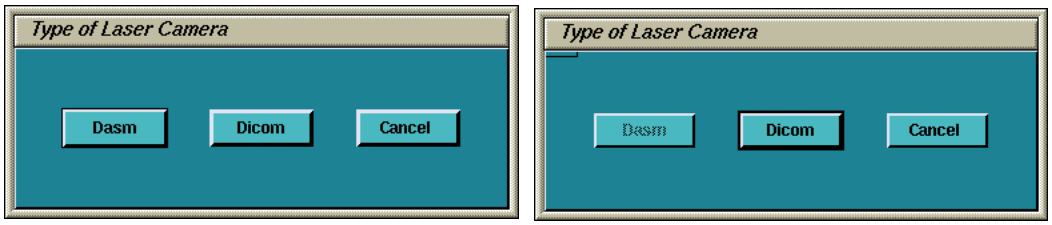


Figure 5-3 Dialog Box for camera Type (with and without DASM)

5.) To add a new laser camera, click DASM in the camera type dialog box. This brings up a list of available camera models. Select the appropriate model form the list and click SELECT (See Figure 5-4). Now configure it.

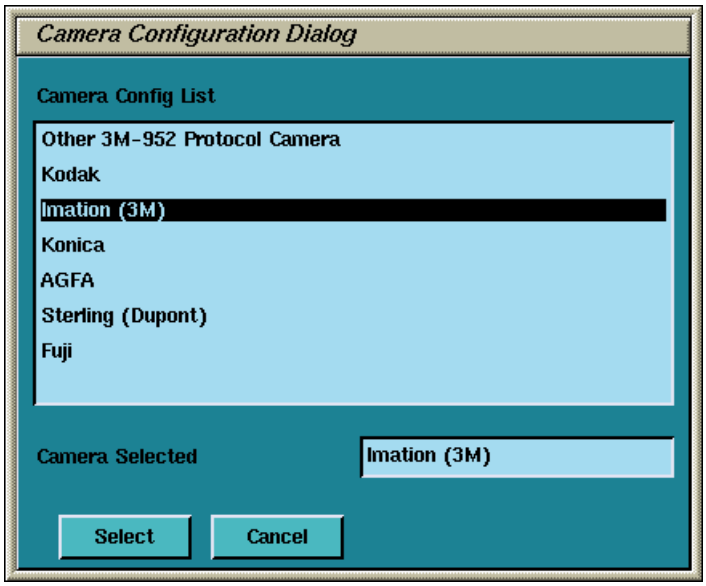


Figure 5-4 Camera Model Dialog (with DASM)

a.) `DASM Interface` is automatically detected as either `Analogue` or `Digital`

b.) Two `Laser Options` are available for laser cameras: SLIDES and ZOOM. Set this option only if the camera being installed supports slides and zoom. Setting the option allows it to be enabled or disabled at the application level.

c.) Camera manufactures provide two (2) `Magnification Type` options for cameras. The SMOOTH resolution blurs the image, while the SHARP resolution makes the image pixels more pronounced. The default is smooth.

To film good images, and have them look like images filmed by other GE CT products, the following camera settings are suggested:

Kodak:`SMOOTH`

Dupont/Sterling:`SMOOTH`

3M/Imation (Laser Camera):`SHARP`

3M/Imation (Dry View):`SMOOTH`

Agfa:`SMOOTH`

---

d.) Select the appropriate `File Format`. Select ON from the drop down list boxes on the menu. Valid film formats are determined by the camera manufacture. IMATION for example, doesn't support 4x4, 2x4 or 1x2 and AGFA does not support 2x4) The DICOM print convention designates film formats by column and row (e.g. 12 on 1 film is 3x4).

When finished setting parameters, click on DONE and proceed to step 8.

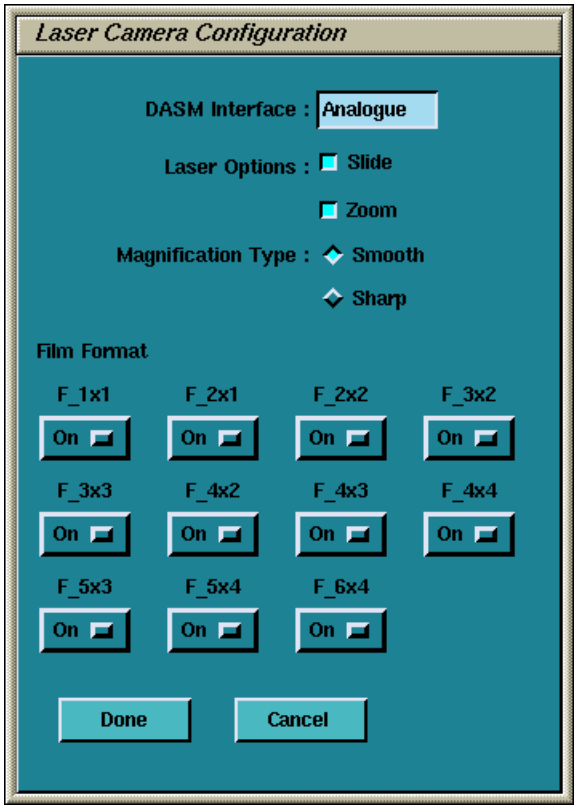


Figure 5-5 Laser Camera Configuration

6.) To add a new DICOM camera, click on ADD and then DICOM in the dialog box that appears.

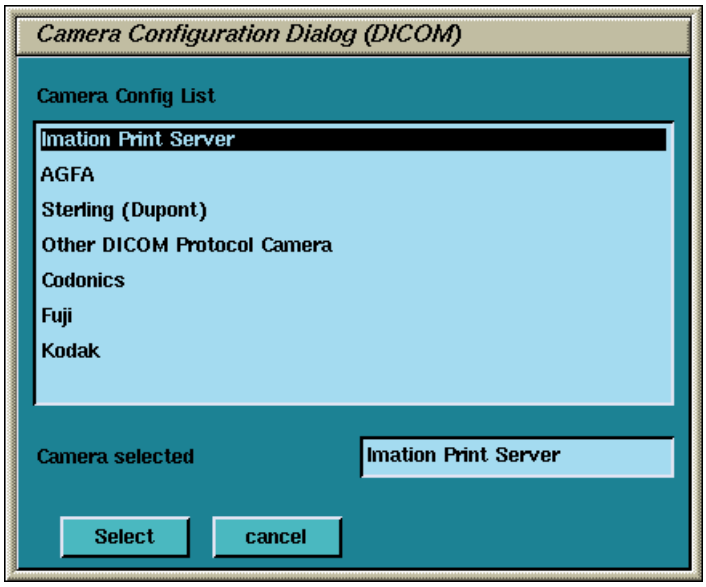


Figure 5-6 Camera Model Dialog (DICOM)

a.) A list of camera models appears (See Figure 5-6). Select the appropriate model from the list and click SELECT. Clicking SELECT presets all the parameters to that models except the Network parameters.

Selection of a different camera model clears the Image Quality parameters, because these are camera manufacture dependent.

Comment: It's advised to re-check the preset information with the camera manufacturer's representative.

b.) Enter the `Network Parameters` (See Figure 5-7)

> `Device Name` A unique name used to identify the camera.

> `Host Name` DICOM print server host name, as defined by the hospital.

> `IP Address` DICOM print server IP address, as defined by the hospital.

> `AE Title` DICOM print server application entity title, as defined by the print server. *You should consult the manufacturers DICOM Conformance Statement.*

Note: The Application Entity Title for the Camera may be site specific. Make sure that you check with the Camera Manufacturer's Representative and the hospital network administrator to ensure you are using the correct AE Title for the destination DICOM Print Camera.

> `TCP/IP Listen Port` DICOM print server TCP/IP listen port, as defined by the server. *You should consult the manufacturers DICOM Conformance Statement.*

> `Comments` Optional comments used by the DICOM print server.

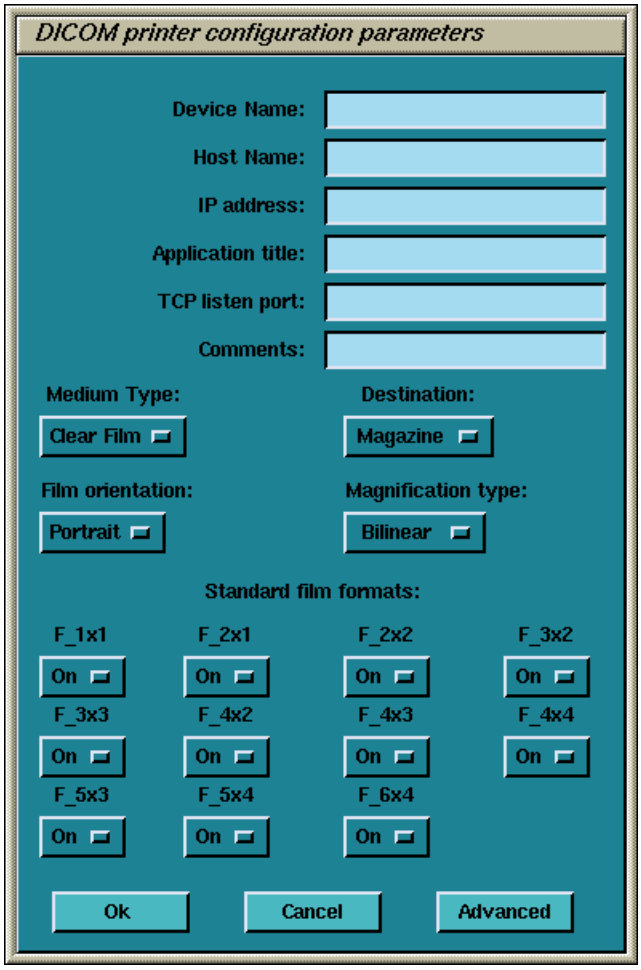


Figure 5-7 DICOM Camera Configuration

c.) `Medium Type specifies` the type of film being used. Currently, only BLUE FILM and CLEAR FILM are suported.

d.) Set `Destination` to the final location for film output. This is either MAGAZINE or PROCESSOR.

e.) `Orientation` selects film orientation. Ony PORTRAIT is currently supported.

f.) Set the `Magnification Type`. This parameter selects the algorithm used to interpolate pixels for proper film resolution. Set this parameter after consulting the camera manufacture to ensure optimal image quality. Choices are describe below:

> `None` No interpolation. This option is not suported by all cameras.

> `Replicate` Adjacent pixels are interpolated. This can result in "pixelized" images. *This algorithm is not normal prefrerred.*

> `Bilinear` A 1st order interpolation of pixels. Results in images usaually described as blurred. *This algorithm is not normal prefrerred.*

> `Cubic` A 3rd order interpolation. Used with a large number of possible formulations. Camera manufactures define parameters called "smoothing type" to set coefficients used in this algorithm. The implementation of these "smoothing soefficients" is camera dependent.

Comment: For most Camera Manufacturers, the preferred selection is CUBIC.

g.) Select the `Standard Film Formats`. Select the film format by choosing ON in the pull-

down menu box located below each selection. See Figure 5-7. Valid film formats are set by the camera manufacture. IMATION for example, doesn't support 4x4, 2x4 or 1x2 and AGFA does not support 2x4) The DICOM print convention designates film formats by column and row (e.g. 12 on 1 film is 3x4).

h.) After the camera has been configured, click the ADVANCED button. This creates the camera device file for you automatically and pops up the Advanced Parameters screen. See Figure 5-8.

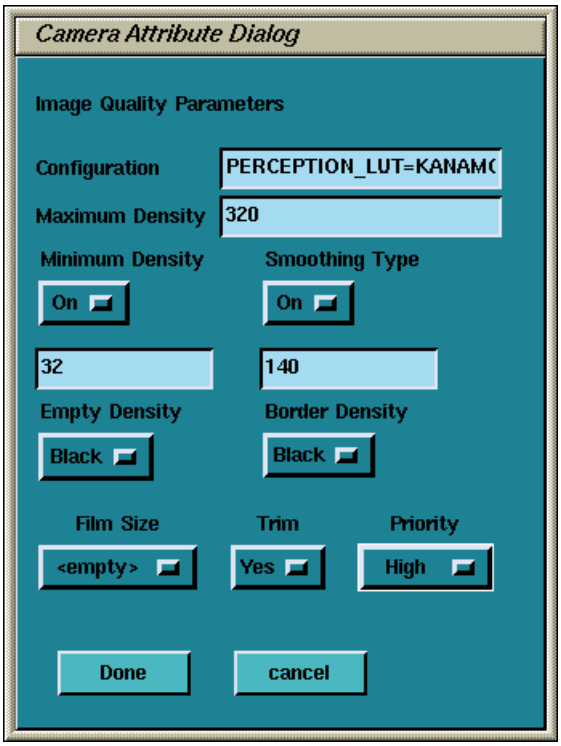


Figure 5-8 Advanced Parameters (Camera Attribute Dialog)

7.) Advanced camera parameters control the image quality of films.

Note: For more information on the proper settings for these parameters, please see the Camera's DICOM Print Device Conformance Statement or the Camera Manufacturer Representative.

A detailed DICOM Conformance Statement for LightSpeed Plus is available. You may need to refer to this document as you are working with the Camera Manufacturer's Representative, to correctly set up the DICOM Print Camera I/Q and Time-out Settings.

a.) `Configuration` - This parameter is camera manufacturer dependent as is typically used to specify the image contrast. The Configuration field may be up to 1024 characters long. The field will scroll automatically as text is entered. To review your entry, simply click and hold the middle mouse button, while the cursor is in the field, and drag the mouse towards the right (or left) as needed.

Note: Typical Configuration Setting Values:

Agfa Drystar (MG3000) **`PERCEPTION_LUT=KANAMORI (100)`**

Imation Dryview (8700) **`LUT=0,7`**

Kodak Laser Printer 190**`CS434\CN0\PD1.20`**

b.) `Smoothing Type` - Set `Smoothing Type` to ON, and input the selected value. This

parameter is used when the magnification type is CUBIC. It represents the coefficient for the image resolution alogrithm.This parameter is camera manufacturer dependent, and should be re-verified with your radiology department.

Note: Recommended Smoothing Type Starting Values and Ranges:

Agfa DryStar (MG3000)	Start Value:	`140`	Range:	`137-150`
Imation Dryview (8700)	Start Value:	`3`	Range:	`3-13`
Kodak Laser Printer 190	Start Value:	**`Enhanced`**	Range:	**`Normal`**

c.) `Minimum` and `Maximum Density` - Used to set brightness of the images on film. The range of values is 0-4095, although the valid range for a specific camera is manufacture dependent. For `Maximum Density`, input the correct value into the text box. For `Minimum Density`, set it to ON and input the correct value in the text box.

Note: Recommended Minimum and Maximum Density Starting Values:

Agfa Drystar (MG3000)Min.:	`20` or `23`	Max:	`300`
Imation Dryview (8700)Min.:	**`(Blank)`**	Max:	`300`
Kodak Laser Printer 190Min.:	`20`	Max:	`300`

d.) `Empty Image Density` - This parameter sets the density for empty film viewports. Typically, BLACK is used but WHITE is an avialble option. The minimum and maximum density values are used as the representation.

e.) `Border Density` - This sets the density for the border used around the film viewports. Typically, BLACK is used but WHITE is an available option. The minimum and maximum density values are used as the representation.

f.) `Film Size` - Allows the system to specify a particular film size, if selected.

g.) `Trim` - YES produces a white (clear) box surrounding each image.

h.) `Priority` - This sets the print priority.

i.) If you have completed entry of advanced parameters, click DONE.

8.) Go to section 3.14 on page 46 for continuing installation if you are performing a LFC.

9.) **Camera Data Tables:** To locate Install Camera Information: Click on the SERVICE DESKTOP button. On the Desktop Toolbar select UTILITIES -> INSTALL -> INSTALL CAMERA. The LightSpeed Plus Install Camera window appears. Select each of the cameras that are installed from the list of installed cameras, and click on UPDATE to view the camera's settings. Record the values used to setup each camera in the tables that follow. Extra tables are provided for multiple cameras

Note: You can determine this information by looking at the contents of the following files:
For a DASM Camera: **`/usr/g/ctuser/app-defaults/devices/camera.dev`**
For a DICOM Print Camera: **`/usr/g/ctuser/app-defaults/devices/`*`name.cfg`***
where, ***`name.cfg`*** is the camera device name from the printer configuration GUI.
Example: **`more <`*`filename from above`*`>`** **ENTER**

End of Procedure

Section 2.0
Data Records

DASM CAMERA #1

GUI SETTING	SELECTIONS	VALUE
Camera Type	Model Type of Camera	
DASM Type	Digital or Analog	❑ Digital ❑ Analog
Options	Slides or Zoom	❑ Slides ❑ Analog
Film	Smooth or Sharp	❑ Smooth ❑ Sharp
Film Format Available	1x1, 2x1, 2x2, 3x2, etc.	
Film Format Default	1x1, 2x1, 2x2, 3x2, etc.	

Table 5-1 DASM Camera #1

DASM CAMERA #2

GUI SETTING	SELECTIONS	VALUE
Camera Type	Model Type of Camera	
DASM Type	Digital or Analog	❑ Digital ❑ Analog
Options	Slides or Zoom	❑ Slides ❑ Analog
Film	Smooth or Sharp	❑ Smooth ❑ Sharp
Film Format Available	1x1, 2x1, 2x2, 3x2, etc.	
Film Format Default	1x1, 2x1, 2x2, 3x2, etc.	

Table 5-2 DASM Camera #1

DASM CAMERA #3

GUI SETTING	SELECTIONS	VALUE
Camera Type	Model Type of Camera	
DASM Type	Digital or Analog	❑ Digital ❑ Analog
Options	Slides or Zoom	❑ Slides ❑ Analog
Film	Smooth or Sharp	❑ Smooth ❑ Sharp
Film Format Available	1x1, 2x1, 2x2, 3x2, etc.	
Film Format Default	1x1, 2x1, 2x2, 3x2, etc.	

Table 5-3 DASM Camera #1

DICOM CAMERA #1

GUI SETTING	SELECTIONS	VALUES
DICOM Camera Type	Model Type of Camera	
Film Format Available	1x1, 2x1, 2x2, 3x2, etc.	
Network Parameters	Host Name	
	IP Address	
	AE Title	
	TCP Listen Port	
	Comments	
	Destination	❑ Magazine ❑ Processor
Special Set Up	Orientation	❑ Portrait ❑ Landscape
	Medium Type	❑ Blue ❑ Clear
	Magnification Type	❑ None ❑ Replicate ❑ Bilinear ❑ Cubic
*Advanced Parameters - IQ	Smoothing Type	❑ ON ❑ OFF Value:
	Configuration	
	Minimum Density	❑ ON ❑ OFF Value:
	Maximum Density	
	Empty Density (Black/White)	❑ Black ❑ White
	Border Density (Black/White)	❑ Black ❑ White
	TRIM	❑ YES ❑ NO
	Priority	❑ HI ❑ MED ❑ LOW
	Film Size	
NOTES		

*To view Advanced DICOM Camera Settings, you must click on ADVANCED.

Table 5-4 DICOM Camera #1

DICOM CAMERA #2

GUI SETTING	SELECTIONS	VALUES
DICOM Camera Type	Model Type of Camera	
Film Format Available	1x1, 2x1, 2x2, 3x2, etc.	
Network Parameters	Host Name	
	IP Address	
	AE Title	
	TCP Listen Port	
	Comments	
	Destination	❑ Magazine ❑ Processor
Special Set Up	Orientation	❑ Portrait ❑ Landscape
	Medium Type	❑ Blue ❑ Clear
	Magnification Type	❑ None ❑ Replicate ❑ Bilinear ❑ Cubic
*Advanced Parameters - IQ	Smoothing Type	❑ ON ❑ OFF Value:
	Configuration	
	Minimum Density	❑ ON ❑ OFF Value:
	Maximum Density	
	Empty Density (Black/White)	❑ Black ❑ White
	Border Density (Black/White)	❑ Black ❑ White
	TRIM	❑ YES ❑ NO
	Priority	❑ HI ❑ MED ❑ LOW
	Film Size	

NOTES

*To view Advanced DICOM Camera Settings, you must click on ADVANCED.

Table 5-5 DICOM Camera #1

DICOM CAMERA #3

GUI SETTING	SELECTIONS	VALUES
DICOM Camera Type	Model Type of Camera	
Film Format Available	1x1, 2x1, 2x2, 3x2, etc.	
Network Parameters	Host Name	
	IP Address	
	AE Title	
	TCP Listen Port	
	Comments	
	Destination	❑ Magazine ❑ Processor
Special Set Up	Orientation	❑ Portrait ❑ Landscape
	Medium Type	❑ Blue ❑ Clear
	Magnification Type	❑ None ❑ Replicate ❑ Bilinear ❑ Cubic
*Advanced Parameters - IQ	Smoothing Type	❑ ON ❑ OFF Value:
	Configuration	
	Minimum Density	❑ ON ❑ OFF Value:
	Maximum Density	
	Empty Density (Black/White)	❑ Black ❑ White
	Border Density (Black/White)	❑ Black ❑ White
	TRIM	❑ YES ❑ NO
	Priority	❑ HI ❑ MED ❑ LOW
	Film Size	
NOTES		

*To view Advanced DICOM Camera Settings, you must click on ADVANCED.

Table 5-6 DICOM Camera #1

Chapter 6
Changing The System Time Zone

Reconfig has the ability to change the system's time zone setting without having to perform a complete LFC. The following procedure can be followed when the system is installed in a location where there is no local time zone selection available. (See "Setting Time and Date" on page 41.)

1.) If Applications is running, shutdown Applications first by selecting UTILITIES -> SHUTDOWN APPLICATIONS from the SERVICE DESKTOP.
2.) Open the console window, by double-clicking on the console icon in the task box.
3.) In the console window, type **`su -`** and press **ENTER**
4.) Enter the root (super user) password: **`#bigguy`**
5.) Now type: **`reconfig`** **ENTER**
6.) Select CONFIG from the installation title screen
7.) On the System Configuration screen, select the Time zone for this site. It's suggested that you record it below for future use:

Region / Time Zone

Table 6-1 Time Zone Setting

8.) Press ACCEPT to accept re-configuration
9.) Now click YES to reboot the system.
10.) Proceed to Setting Time and Date on page 41 to setup time on OC.

Chapter 7
Regenerating the Scan Database

NOTICE
Potential for Data Loss

This procedure removes all scan and calibration data from the system disks. Make sure that all Images have been reconstructed before performing this procedure.

This procedure will re-initialize the Scan Data Disk, erasing all scan and calibration data. You will need to restore Calibrations (from System State), or recalibrate the system once you have performed this procedure.

Reconfig has the ability to regenerate the Scan Database. The initial OC reconfiguration screen (System Settings Screen on page 57) defaults the `Regenerate Database` selection to NO.

This procedure will most likely be needed/used when the Scan Data Disk has been replaced or reformatted. Using this procedure will eliminate the need to perform a complete LFC in these circumstances.

1.) If you need to regenerate the Scan Database, perform the CT Application Reconfiguration on page 55, and select the YES button for `Database Regeneration` on the System Settings Screen.

2.) Select ACCEPT, and allow the Reconfiguration to complete.

3.) Once the Reconfiguration has completed, and the system is rebooted, reload System Calibrations from the System State MOD, or if the State MOD is not available, perform all system Calibrations.

Chapter 8
Modality Performed Procedure Step (PPS) Option

Note: Refer to the *LightSpeed Series Options Installation* manual (2211224-100) for information on configuring the PPS server and other related information.

Section 1.0
Prerequisites

ConnectPro option should be installed.

Section 2.0
To Enable PPS Option

Make sure new patient is not open. Press END EXAM to close. Enter the following:

```
usr/g/scripts/enablePpsOption
```

Section 3.0
To Disable PPS Option

Make sure new patient is not open. Press END EXAM to close. Enter the following:

```
usr/g/scripts/disablePpsOption
```

Appendix
Error Messages And Troubleshooting

A table of potential error messages and potential solutions is provided below.

SECTION	ERROR	POSSIBLE CAUSE	SUGGESTED RECOVERY SOLUTION
Install System Software (IRIX OS) on Operator Console (OC) on page 31 (step 4)	`dks1d6s8: drive not ready`	CDROM busy when the operating system tried to mount it.	Exit menu and try again. Type: **ENTER** Continue from beginning of Section 3.4
Install System Software (IRIX OS) on Operator Console (OC) on page 31 step 6 and (sub)step b	`OS Hangs. Does not accept user input`	IRIX6.5 problem	Restart system and restart installation at Section 3.2
Installation of CT Application Software on page 35	Specific Errors unknown.		Review the installation log file: **`more /var/adm/install.log.YYYYMMDDWWWHHMMSS`** (where YYYYMMDDWWWHHMMSS is the date/time that the software installation was started. Restart the Applications Software Installation at Section 3.6, page 35.
Installation of CT Application Software on page 41	"pflash" failed to download.	Failure to perform section 3.5 on page 34, for an M3.1 LFC.	A.) The system must be shut down and restarted prior to manual flash or reconfig. B.) Manually flash the RIP Board firmware. At the `ctuser` prompt, type: **`/usr/g/ice/bin/pflash`** **ENTER** If the RIP Board firmware flash routine operates correctly, the screen displays firmware loading type text in approximately 12 lines. If the routine continues to fail: - Shutdown the system. - Open the Console to gain access to the VME Chassis (right side of console). - Check the seating of the RIP Board and SDC Board in the VME Chassis. - Power up the system. - Repeat the manual RIP Board pflash process. C.) Manually reconfigure the Scan Data Disk. At the `ctuser` prompt, type: **`/usr/g/scripts/reconfigScanDisk`** **ENTER**

Table 8-1 Potential LFC Error Messages and Recovery Solutions

SECTION	ERROR	POSSIBLE CAUSE	SUGGESTED RECOVERY SOLUTION

Restore System State on page 42 (step 6)	`Corruption detected on the MOD in the drive.`
	`MOD cannot be mounted.`
	`MOD initialization completed with failure`
	`Save/Restore System State: Completed with failures.`
		Bad or corrupted MOD.	Attempt to repair MOD with **`fsck`** and reissue command. Open a new UNIX window, insert MOD in drive and type (as root):
			`fsck -n /dev/dsk/dks1d3s7` **ENTER**
			If **`fsck`** fails or system hangs, the system state cannot be loaded from the MOD and the system must be re-calibrated and manually reconfigured. Use re-configuration data recorded in Section 2.4
			If **`fsck`** completes successfully, restart procedure at Section 3.10

Chapter 3	FORMATTING PROCEDURE for Octane Disk		Issue commands in Chapter 3 up to and including step 2, step d. For the next step, select `[f]ormat` by typing: **`f`** **ENTER**
			`fx/format: Drive parameters to use in formatting = (current)`
			Type: **ENTER**
			`format will take approximately 90 minutes . .`
			`This is seldom necessary and may cause drive problems`
			`* * * * * WARNING * * * * *`
			`about to destroy data on disk dksc(0,1,0)! Ok?`
			Type: `y` **ENTER**

Table 8-1 Potential LFC Error Messages and Recovery Solutions (Continued)

GE MEDICAL SYSTEMS

GE MEDICAL SYSTEMS-AMERICAS: FAX 262.312.7434
3000 N. GRANDVIEW BLVD., WAUKESHA, WI 53188 U.S.A.

GE MEDICAL SYSTEMS-EUROPE: FAX 33.1.40.93.33.33
PARIS, FRANCE

GE MEDICAL SYSTEMS-ASIA: FAX 65.291.7006
SINGAPOR