

Technical Publications

2139768

Revision 9

LOGIQ[™] α100 **Service Manual**

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Operating Documentation

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8	. July 2, 2000	Version 5.0A (MP) System release for Americas.
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1-1 OVERVIEW

The LOGIQ $^{\text{TM}}$ α 100 is a compact portable ultrasound scanner which is designed for OB/GYN, Abdomen, Urology and small part Scans using the convex, linear and micro-convex (Transvaginal) probes. High quality images can be obtained by the proper selection of scan control parameters. The diagnostic clarity is further enhanced by the different measurement and calculation packages available in the system.

1-2 SERVICE MANUAL CONTENTS

This manual provides service information on the LOGIQTM α 100 Ultrasound Scanning System. It contains the following sections :

- 1. **Introduction**: Contains content summary, safety warnings, EMC and contact addresses.
- 2. **Installation**: Contains electrical and physical requirements that should be considered prior to installation and a complete LOGIQ[™] α100 installation procedure with installation check list.
- 3. **System Configuration**: Contains mechanical, electrical, environmental specifications and Peripherals/Accessory details.
- 4. **Functional Check**: Contains functional checks that should be performed as part of the installation, or as required during servicing and periodic maintenance. Also contains Diagnostic information for the LOGIQ™ α100 System.
- 5. System Architecture: Contains System Block Diagram and Wiring Diagrams.
- 6. **Renewal Part List**: Contains a complete list of field replacement units (FRU) for the LOGIQ[™] α100 and Disassembly/Assembly procedures for the same.
- Periodic Maintenance: Provides periodic maintenance procedures for the LOGIQ™ α100.

1-3 SAFETY

1-3-1 Warnings



CAREFULLY READ ALL THE WARNINGS LISTED BELOW!

- 1. Read the LOGIQ™ α100 Operator Manual thoroughly before operating the system and keep at hand for ready reference.
- 2. Although the ultrasound energy transmitted from the LOGIQ[™] α100 transducer is within AIUM/NEMA standards, unnecessary exposure should be avoided. Only trained personnel should operate/service the LOGIQ[™] α100.
- To avoid electrical shock, use only the supplied power cords and connect them to properly grounded power Socket. Do not use a three pin to two pin adapter. This defeats the purpose of safety grounding. System should be operated within the voltage limits.
- 4. Probes are fragile, please handle with care. A damaged probe may cause an electrically hazardous condition when coupled to the human body. A damaged probe will not produce a desirable image. A damaged probe has to be discarded. It cannot be repaired or reused. Do not allow the lens to come into contact with a sharp object or to be knocked against an object.
- 5. Do not place liquids on or above the console. If the liquid spills, it may come in to contact with live parts and can cause an electric shok. This system contains no operator serviceable components. To prevent shock, do not remove any covers or panels. Should problems or malfunctions occur, unplug the power cord. Only qualified Service personnel should service the system. Accidentally coming in contact with the electrical circuits inside the housing could cause serious injury.
- 6. Do not use Defibrillators when the LOGIQTM α 100 is operated.
- 7. Concerning outside markings, refer to ILLUSTRATION 1-1.
- 8. The LOGIQTM α 100 system should not be placed on a soft surface, as it prevents proper air circulation. The vents for air circulation are on the bottom cover.

Note

This medical equipment is approved, in terms of the prevention of radio wave interference, to be used in hospitals, clinics and other institutions which are environmentally qualified. The use of this equipment in an inappropriate environment may cause some electronic interference to radios and televisions around the equipment. Proper handling of this equipment is required in order to avoid such trouble according to the operator and service manuals.

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1-3-1 Warnings (Continued)

TABLE1-1 describes the purpose and location of safety labels and other important information provided on the equipment.

TABLE1-1
WARNING LABELS

Label/Symbol	Description	Location
Identification and Rating Plate	o Manufacturers name and address o Date of Manufacture o Model and Serial numbers o Electrical ratings	Rear of Console
Type/Class Label	Used to indicate the degree of safety or protection	Rear of Console (along with rating plate label)
Device Listing/ Certification Labels	Laboratory logo or labels denoting con- formance with industry safety stan- dards such as UL or IEC	Rear of Console
"DANGER - Possible explosion hazard, if used in the presence of flammable anesthetics."	This system is not designed for use with flammable anesthetic gases	External
<u></u>	ATTENTION - Consult accompanying documents "is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.	Rear of Console
*	Type BF Equipment (man in the box symbol) IEC 878-02-03 indicates B Type equipment having a floating applied part.	External
Δ	"CAUTION" The equilateral triangle is usually used in combination with other symbols to advise or warn the user.	Rear of Console
~	Alternating Current Single Phase	Rear panel and Front panel (above the power switch)
=	Protective earth (grounding)	On the chassis (inside the system)

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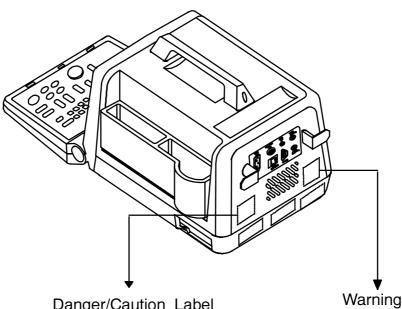
1-3-1 Warnings (Continued)

Label/Symbol	Description	Location
4	Warning, High Voltage	On the CRT, on fly- back transformer
	"Mains ON" indicates the power on position of the mains power switch.	Front Panel (on the Power switch)
0	"Mains OFF (Power: discon- nection from the Mains)	Front Panel (on the Power switch)

TABLE 1-1 WARNING LABELS (cont'd)

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1-3-2 Labels



Danger/Caution Label

DANGER

Possible explosion hazard if used in the presence of flammable anesthetics.

CAUTION

Do not use with Defibrillator.

United State law restricts this device to sale or use by or on the order of a physician

WARNING

Possible shock hazard. Do not remove Covers or Panels. Refer servicing to qualified personnel.

For continued protection against fire or shock hazard - Replace only with same type and rating of Fuse.

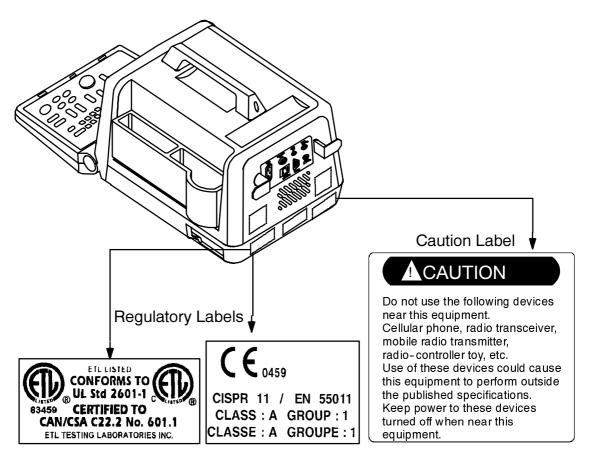
Grounding reliability can only be achieved with "Hospital only" or "Hospital Grade" cordset provided with the system

WARNING LABELS

ILLUSTRATION 1-1

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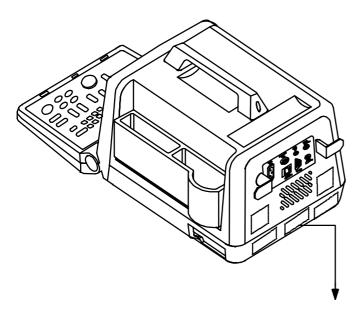
1-3-2 Labels (Continued)



WARNING LABELS
ILLUSTRATION 1-2

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1-3-2 Labels (Continued)



Rating Plate

MODEL: CLASS I

MANUFACTURED: LOCATION: Wipro GE Medical Systems Ltd.
Bangalore, India

SERIAL:

VOLTS: V~, PHASE I

AMP LONG TERM: AMP
FREQUENCY: 50/60 Hz

For Europe

Made for GE Medical Systems,
Milwaukee, Wisconsin by
Wipro GE Medical Systems Ltd.,
Bangalore, INDIA

Class I

MODEL
SERIAL
MANUFACTURED
VOLTS
Vac 1PHASE
POWER
VA
FREQUENCY 50/60 Hz

For Asia & America

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1-3-2 Labels (Continued)

A WARNING

Possible shock hazard. Do not remove Covers or Panels. Refer servicing to qualified personnel.

For continued protection against fire or shock hazard - Replace only with same type and rating of Fuse.

Grounding reliability can only be achieved with "Hospital only" or "Hospital Grade" cordset provided with the system

A AVVERTENZA

Pericolo di scariche elettriche. Non togliere i coperchi o i pannelli. Per la manutenzione, rivolgersi al personale specializzato.

Per prevenire incendi o scariche elettriche, sostituire i fusibili solo con fusibili dello stesso tipo e aventi le stesse condizioni di funzionamento.

Il collegamento a terra più sicuro è quello effettuato con i cavi "Hospital only" (Solo ospedale) o "Hospital Grade" (Grado ospedale) forniti con il sistema.

A AVERTISSEMENT

Risque de décharge électrique. Ne pas retirer les capots ni les panneaux. S'adresser à un technicien qualifié.

Pour assurer une protection continue contre les incendies et les décharges électriques, ne remplacer que par des fusibles de même type et de même courant nominal.

La fiabilité de la mise à la terre ne peut s'obtenir qu'avec le cordon portant l'étiquette "Hôpital seulement" ou "Qualité hôpital", fourni avec le système.

AVISO

Riesgo de descarga eléctrica. No retire las cubiertas ni los paneles. Consulte al personal de servicio cualificado.

Como protección contra las descargas eléctricas y los incendios, use sólo fusibles del mismo tipo y corriente nominal.

La seguridad de la conexión a la tierra se obtiene sólo con la toma "Sólo hospital" o "Grado hospital", suministrada con el sistema.

▲ 警告

感電の危険あり。カバー(または背板)を 取り除かないこと。修理点検はサービス センターに依頼すること。

火災の危険あり。 表示されたヒューズと交換のこと。

この機器は「医用コンセント(川マーク)」 に接続したときにのみ保護接地の信頼性 が保証されます。

AVISO

Risco de Choque elétrico. Não retire as Tampas nem os Painéis de proteção. Os serviços devem ser feitos por pessoal qualificado.

Para uma proteção constante contra perigo de incêndio ou de choque - Substitua sempre o Fusível por outro do mesmo tipo e com a mesma voltagem.

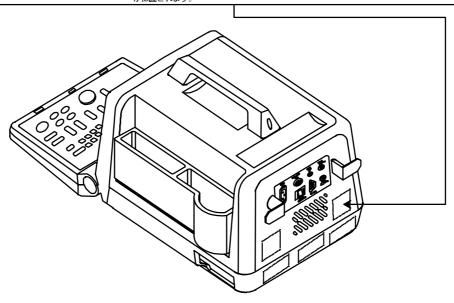
A confiabilidade na tomada com terra só é efetiva com o conjunto de fios "Hospital only" or "Hospital Grade" proporcionado com o sistema.

AWARNUNG

Stromschlaggefahr. Hauben oder Abdeckungen nicht entfernen. Überlassen Sie die Wartung qualifiziertem Personal

Ersetzen Sie die Sicherung für einen kontinuierlichen Schutz gegen Feuer oder Stromschlag nur durch den gleichen Typ mit dem gleichen Wert.

Eine zuverlässige Erdung ist nur mit dem Leitungskit "Hospital only" oder "Hospital Grad" gewährleistel, der mit dem System geliefert wird.



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1-3-2 Labels (Continued)

A DANGER

Possible explosion hazard if used in the presence of flammable anesthetics.

A CAUTION

Do not use with Defibrillator.

United States law restricts this device to sale or use by or on the order of a physician.

A PELIGRO

Riesgo de explosión. No emplear en presencia de anestésicos inflamables.

A ATENCION

No hacer funcionar con un desfibrilador.

A PERICOLO

Possibilitá di esplosione se il sistema é usato in presenza di gas anestetici infiammabili.

A ATTENZIONE

Non fare funzionare con un defibrillatore.

⚠ DANGER

Risque d'explosion. Ne pas employer en présence d'anesthésiques inflammables.

AATTENTION

Ne pas faire fonctionner avec un défibrillateur.

A PERIGO

Possível explosão se usado na presença de anestésicos

A ATENÇÃO

Não use com desfibrilador.

爆発の危険あり。引火性麻酔剤のある場 所では使用しないこと。

▲ 注意

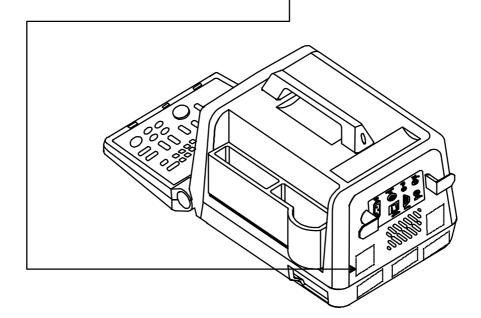
除細動器との併用はしないこと。

A VORSICHT

Explosionsgefahr! Nicht in Gegenwart brennbarer Narkosegase verwenden.

AACHTUNG

Nicht zusammen mit einem Defibrillator betreiben.



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1-3-2 Labels (Continued)

A CAUTION

Do not use the following devices near this equipment. Cellular phone, radio transceiver, mobile radio transmitter, radio-controller toy, etc. Use of these devices could cause this equipment to perform outside the published specifications Keep power to these devices turned off when near this equipment.

▲ ATTENTION

Ne pas utiliser les appareils suivants à proximité de cet équipement : téléphones mobiles, émetteurs-récepteurs, appareils radiocommandés, etc., cela pouvant entraîner des performances différentes des spécifications annoncées. Maintenir les appareils de ce type hors tension lors qu'ils se trouvent à proximité du système.

ATTENZIONE

Non usare i seguenti apparecchi in prossimità di questa apparecchiatura: cellulari, ricetras mettitore radio, tras mettitore radio mobile, giocattoli radiocomandati ecc

L'uso di questi apparecchi potrebbe modificare le specifiche dell'apparecchiatura. Mantenere gli apparecchi interferenti spenti, se in prossimità del sistema

VORSICHT

Verwenden Sie folgende Geräte nicht in der Nähe der Anlage

Funktelefon, Funkempfänger, mobiler Funksender, funkgesteuertes Spielzeug

Bei Gebrauch dieser Geräte arbeitet die Anlage evtl. nicht entsprechend der veröffentlichten Angaben.

Belassen Sie diese Geräte in der Nähe der Anlage ausgeschaltet.

CUIDADO

Não utilize os dispositivos seguintes per-

to deste equipamento: Telefone celular, radiotransceiver, radio-transmissor móvel, brinquedos de con-

trole remoto, etc.

O uso destes dispositivos pode levar o equipamento a ter um desempenho out-

ro que aquele publicado. Desligue estes dispositivos quando estiverem perto deste equipamento.

▲ CUIDADO

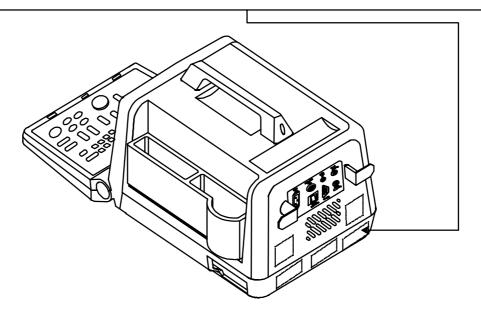
No use ninguno de los siguientes dispositivos cerca del equipo.

Teléfonos celulares, receptores de radio. juguetes controlados por transmisores de radio móviles, etc.

El uso de estos dispositivos puede hacer que el equipo funcione fuera de las especificaciones publicadas.

Mantenga apagados dichos dispositi-

voscuando estén cerca del sistema



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1-3-3 Classification

Type of protection against electric shock: Class I EQUIPMENT *1

Degree of protection against electric shock: Type BF EQUIPMENT**2

1. *Class I EQUIPMENT

EQUIPMENT in which protection against electric shock does not rely on BASIC INSULATION only, but which includes an additional safety precaution in that means are provided for the connection of the EQUIPMENT to the protective earth conductor in the fixed wiring of the installation in such a way that ACCESSIBLE METAL PARTS cannot become LIVE in the event of a failure of the BASIC INSULATION.

2. **Type BF EQUIPMENT*

Type B EQUIPMENT with a F-TYPE isolated applied part providing a degree of protection against electric shock to such a degree that the allowable PATIENT LEAKAGE CURRENT under SINGLE FAULT CONDITIONS is not exceeded when 1.1 times the highest rated MAINS VOLTAGE is applied between the APPLIED PART and earth.

1-4 EMC (Electromagnetic Compatibility)

1-4-1 EMC Performance

All types of electronic equipment may characteristically cause electromagnetic interference with other equipment, either through air or connecting cables. The term EMC (Electromagnetic Compatibility) indicates capability of the equipment, which curbs electromagnetic influence from other equipment and at the same time does not affect other equipment with similar electromagnetic radiation from itself.

This product is designed to fully comply with the EN60601-1-2 (IEC601-1-2), in Medical electrical equipment EMC regulations.

Proper installation following this service manual is required in order to achieve the full EMC performance of the product.

The product must be installed as stipulated in 1-4-2, Notice upon Installation of Product.

In case of issues related to EMC, please follow procedures stated in 1-4-4, Countermeasures against EMC-related Issues.

1-4-2 Notice upon Installation of Product

- Use either power supply cords provided by GEMS or ones approved by GEMS. Products equipped with power source plug should be plugged into the fixed power socket which has the protective grounding conductor.
- 2. Connect a three-pin plug to a three-pin socket without using a three-pin-to-two-pin converter.
- 3. Keep the equipment as far as possible from other electronic equipment.
- 4. Be sure to use the only cables provided by GEMS or ones approved by Wipro GE. Install the unit/peripherals as per the installation procedure provided in Chapter 2 INSTALLATION.
- The layout of the LOGIQ™ α100 & other peripherals should be as per installation procedures described in Chapter
 INSTALLATION.

1-4-3 General Notice

 Designation of Peripheral Equipment Connectable to this Product. The peripheral which conforms to EN60601-1-2 (IEC601-1-2), can be connected up to the LOGIQ[™]α100 without compromising its EMC performance.

Failure to comply with the above instruction may result in poor EMC performance of the product.

- 2. Notice against User Modification
 - Do not modify this product. Unilateral user modification may cause degradation in EMC performance. Modification of the product includes:
 - a. Changes in cables (length, material, wiring etc.)
 - b. Changes in system installation/layout
 - c. Changes in system configuration/components
 - d. Changes in means of fixing system/parts (cover open/close, cover screwing)

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3. Operate the system with all covers closed. If you open any cover for some reason, be sure to shut it before starting/resuming operation.

Operating the system with any cover open may affect EMC performance.

1-4-4 Countermeasures against EMC-related Issues

Generally it is very difficult to handle with issues related to EMC. It is time consuming and expensive. General countermeasures for Electromagnetic interference with other equipment

- Electromagnetic interference may be reduced by positioning other equipment far away from the system.
- 2. Electromagnetic interference may be reduced by changing the relative location (installation angle) of the system and other equipment.
- 3. Electromagnetic interference may be reduced by changing wiring locations of power/signal cables of other equipment.
- Electromagnetic influence may be reduced by altering the path of power supply for other equipment.

1-4-5 Notice on Service

Ensure all screws are tight after servicing. Loose screws may cause degradation in EMC performance.



Do not use the following devices near the $LOGIQ^{TM}$ $\alpha 100$ system. Devices which intrinsically transmit radio waves such as cellular phone, radio transceiver, mobile radio transmitter radio-controlled toy, etc. Use of these devices could cause the $LOGIQ^{TM}$ $\alpha 100$ system to perform outside the published specifications. Keep power to these devices turned OFF when near the system.

Medical staff in charge of the LOGIQTM α 100 system is required to instruct technicians, patients and other people who may be around the system to fully comply with the above regulation.

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1-5 CONTACT ADDRESSES

This system is not repairable by the customer. If this equipment does not work as indicated in the Operator's Manual, please contact your service support center. If the service engineer needs additional information to repair this equipment, please contact any relevant addresses given below:

AMERICAS

GE Medical Systems America

Ultrasound Business Group

4855 W. Electric Ave., Milwaukee WI 53219

U.S.A

On-Line Center (OLC)

Tel: 1-800-321-7937 or (1) 414-524-5690

Fax: (1) 414-647-4125

CANADA

Phone: (1) 800-668-0732

LATIN & SOUTH AMERICA

Phone: (1) 305-735-2304

EUROPE

GE Ultrasschall Deutschland GmbH & Co. KG:

Beethovenstrabe 239, Postfach 11 05 60, D-42655 Solingen

GERMANY

Tel.: OLC-Europe Toll Free Numbers

or

Radiology Hotline (49) (212) 2802 207 Cardiology Hotline (49) (212) 2802 208

Fax: (49) (212) 2802 431

ASIA

GE Yokogawa Medical Systems

On-Line Center (OLC), Asia Ultrasound Group 67-4 Takakura-cho, Hachioji-shi, Tokyo, 192-0033

JAPAN

Tel: (81) 426-48-2940 Fax: (81) 426-48-2905

INDIA

Wipro GE Medical Systems Ltd.

Ultrasound Service Engineering No. 4 Kadugodi Plantation Industrial Area Sadaramangala

Bangalore - 560 067

Phone: (91) (80) 8453359/60/61/62; Fax: (91) (80) 8452924

2-1 PRE-INSTALLATION

2-1-1 Overview

This section describes various general electrical, operational and environmental considerations that must be considered before installing the LOGIQ $^{\text{\tiny M}}\alpha$ 100 System.

All necessary imaging functions are performed by this console and its transducers. The console front panel contains operator controls for optimizing the image and a keyboard for entering data onto the image. Selected key LEDs illuminate when their respective key is pressed. Unacceptable keyboard entries trigger a beeper alarm. In addition, a graphics controller central processing unit automatically superimposes certain machine parameters over the edges of the image.



It is strongly recommended that the equipment should be installed on an even hard surface to provide proper cooling, as the vents for air circulation are on the bottom cover.

2-1-2 Power Line Requirements

The following power line parameters should be monitored one week before installation. We recommend that a Drantez Model 605-3 Power Line monitor with options 101 to be used.

PARAMETER : LIMITS

Voltage Range : USA, Japan : 100-115 Vac ±10% (90-127 Vac)

: Europe : 220-240 Vac ±10% (198-264 Vac)

Power : USA, Japan : MAX. 145VA

: Europe : MAX. 175 VA

Line Frequency : All applications : 50/60Hz (±2Hz)

Power Transients : Less than 25 % of nominal peak voltage for less than 1 millisecond for any type of

transient, including line frequency, synchronous, asynchronous, or aperiodic

transients.

Decaying Oscillation: Less than 15 % of peak voltage for less than 1 millisecond.

2-1-3 Physical Specifications

The LOGIQ™α100 System weighs approximately 9.95 Kgs (without probe). Refer Page 3-3, for System Dimensions.

Operating Conditions

The unit is designed to operate at a temperature range of 10°C - 40°C (50°F - 104°F) and at a relative humidity of 35% to 75% (non condensing).

Patient Comfort

Despite permissible operating temperature and humidity tolerances, we recommend that ambient room temperature be maintained between 20 to 26 degrees C (68 to 79 degrees F). Humidity should be maintained between 50% and 70% for patient comfort during ultrasound scanning.

Electromagnetic Interference (EMI)

Ultrasound machines are susceptible to interference from the radio frequencies, magnetic fields and transients in the air or power leads. Electrical and electronic equipment may produce EMI air or power leads. Possible EMI sources should be identified. Electrical and electronic equipment may produce EMI unintentionally as the result of a malfunction. These sources include medical lasers, cauterizing guns, computers, monitors, fans, gel warmers, microwave ovens and cellular phones. The presence of a broadcast station or van may also cause interference.

Carefully read the following precautions before installing the unit.

- 1. Connect the power plug of the equipment into the fixed outlet with ground wire.
 - 2. Securely connect any equipment with permanent ground connection to the earth ground furnished in the building.
- 3. Install the unit as far away as possible from any electrical or electronic equipment.

If any EMI troubles are known or suspected to be present, try to deal with the equipment suspected to have influence on the Ultrasound machine as follows.

- 1. Move the ultrasound machine as far from the equipment as possible.
- 2. Change the arrangement of the equipment in the room.
- Plug the equipment into another power outlet.
 - 4. Move the power cable or signal cable connected with the equipment,
- Re-tighten screws for the Ultrasound machine after re-assembling for service operation.

2-2 INSTALLATION

2-2-1 Overview

This section contains procedures required to install the LOGIQ[™]α100 System. The "Functional Checks" chapter contains checks required to complete the installation. Use the checklist in TABLE 2-1 to check each installation step.

2-2-2 Average Installation Time

The LOGIQ[™]α100 has been designed to be installed in approximately one hour.



It is strongly recommended that the equipment should be installed on an even and hard surface to provide proper cooling, as the vents for air circulation are on the bottom cover.

Checklist For Installation

TABLE 2-1
INSTALLATION CHECK LIST

Procedures	Paragraph	Initials
Observe Warnings	Page 2-6	
Unpack LOGIQ™α100 System	2-2-4	
Assemble LOGIQ™α100 System	2-2-5	
Perform Electrical Safety Tests	See Chapter 7	
Perform Functional Checks	See Chapter 4	

2-2-3 Checking the components

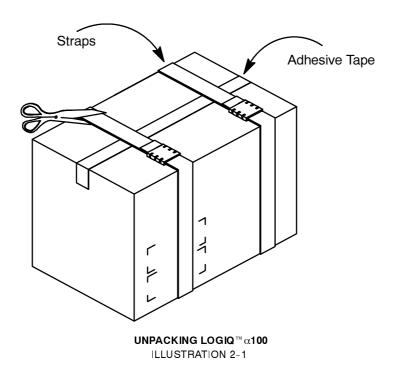
When a new system arrives check that components are not damaged and are not short shipped. If shipping or shortage occurs, contact the addresses given in Chapter 1.



- 1. To prevent electric shock the LOGIQ[™]α100 should be connected to a properly grounded power socket. Do not use a three pin to two pin adapter. This defeats safety grounding.
 - 2. This system has no operator serviceable components. To prevent shock, do not remove any covers or panels. Should problems or malfunctions occur, unplug the power cord. Only Service personnel should carry out servicing and trouble shooting.
 - 3. Keep the vent on the rear panel open.
- 4. Do not damage the rubber lens of the probe. If damaged, do not use it.
 - 5. Though the ultrasound energy which is transmitted from the LOGIQ[™]α100 probe is within AIUM/NEMA standards, unnecessary exposure to ultrasound energy should be avoided.

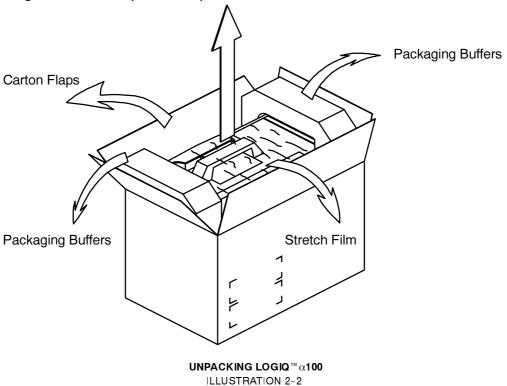
2-2-4 Unpacking LOGIQ™ a 100

- 1. Cut the two straps wrapped around the box. Refer ILLUSTRATION 2-1.
- 2. Remove the adhesive tape. Refer ILLUSTRATION 2-1.
- 3. Open the carton flaps. Refer ILLUSTRATION 2-2.
- 4. Remove the Operator Manual, Service Manual, Gel Bottle, Power Cord and other accessories kept on either side of the equipment. Refer ILLUSTRATION 2-3.
 - 5. Lift the system (wrapped with stretch film) out of the box along with the packaging buffers. Refer ILLUSTRATION 2-2.
 - 6. Slide the packaging buffers out to free the system.
 - 7. Remove the stretch film which is wrapped around the system. Refer ILLUSTRATION 2-2.



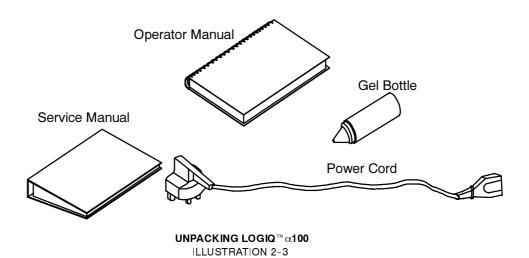
2-7

2-2-4 Unpacking LOGIQ $^{\text{\tiny M}}\alpha$ 100 (Continued)

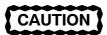


Note

The Service Manual, Operator Manual, Gel Bottle and Power Cord are wrapped in bubble sheet and are kept allong the sides of the corrogated carton box. Refer Illustration below for details



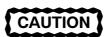
2-2-5 Assembling The LOGIQ™ a 100 System



It is strongly recommended that the equipment should be installed on an even and hard surface to provide proper cooling, as the vents for air circulation are on the bottom cover.

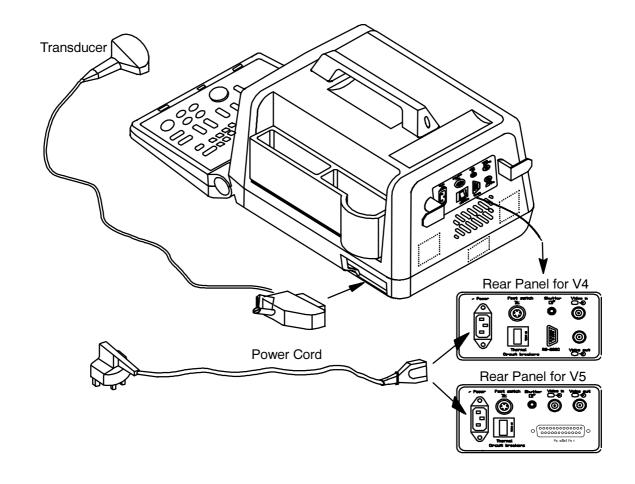
Installation of the System

- 1. Locate, remove and unpack the probes located in the separate container.
- 2. Make sure that system power is OFF before connecting or disconnecting the probe.
- 3. Secure the probe to the receptacle as follows:
 - a. Ensure probe 'twist lock' lever points towards the 12 o'clock position
 - b. Install probe connector on the receptacle guide pin until it touches the receptacle mating surface.
 - c. Twist the probe connector 'twist lock' lever to the 3 o'clock position to lock it in place (Twist the lever to the 12 o'clock position to disconnect the probe).
 - 4. Connect the LOGIQ[™] α 100 Power cable's female part to the power connector located on the rear panel and the male part to a hospital grade power socket of a proper voltage. Never use a three-to-two pin adapter; this defeats the purpose of safety ground.
 - 5. Unlock the keyboard by pressing the lock release on top of the system.



Do not move or lift the unit, holding the keyboard alone.

2-2-5 Assembling The LOGIQ[™]α 100 System (Continued)



ASSEMBLING LOGIQ $^{\text{\tiny{M}}}$ α 100 SYSTEM | ILLUSTRATION 2-4

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2-2-6 Installation of LOGIQ ™α100 to PC Image Transfer Software (This is an Option for Americas)

The image transfer software can be used to download images from the LA100 to the PC via the parallel port cable provided as a standard accessory. It can also be used to retrieve & view images already stored in the PC.

Note: For more details on the application of the Image *Transfer Software*, please refer to the Operator manual.

Pre-requisites

Hardware & Software requirements

Hardware:

- 1. Any PC meeting the IEC 950 standrad with a minimum of 16MB RAM
- 2. LA100 Version5 (LA100 MP)
- 3. Image Transfer Cable (2247461), (for Americas use Isolated Image Transfer cable).

Software:

- 4. Windows 95 Operating System & MS Paint Installed
- 5. 2 Floppy Disks (2249732) Supplied by GE Medical Systems

PC Settings:

The parallel port of the PC should be configured in the EPP/ECP/Bi directional mode. This acen be done by entering into the CMOS setting of the PC. If required, for more details contact your local PC supplier.

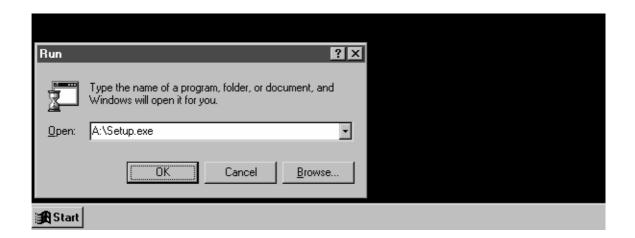
Installation

Software Installation

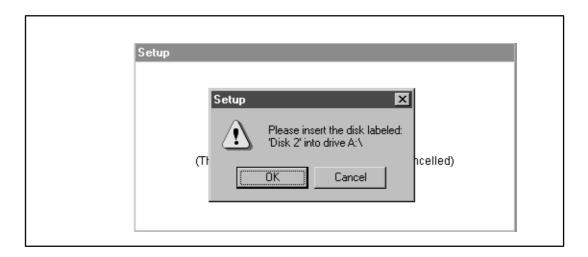
- 1. Before starting to install the *Image Transfer* software, close all applications.
- 2. Insert Disk1 and click Start and then click Run as shown below.



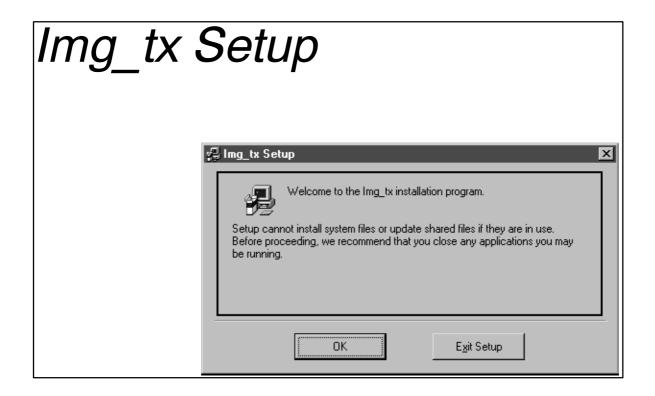
3. Now type A:\Setup.exe as shown below and click OK.



4. Set-up will copy the files from Disk1 to the PC. After completion, it will ask for Disk2 as shown below. Remove Disk1 and insert Disk2 and click *OK*. Now Disk2 files will be transferred to the PC.

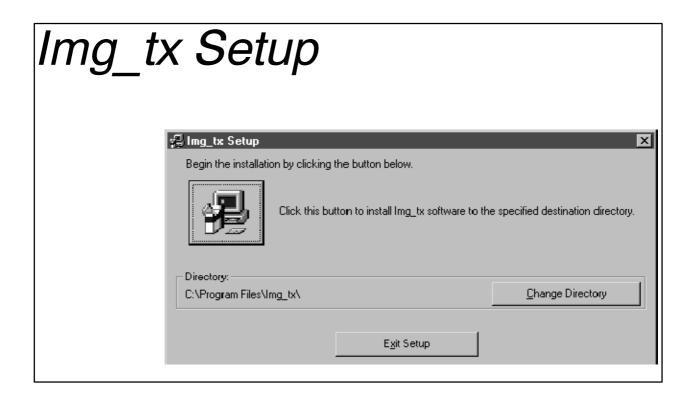


5. Click *OK* if other applications are closed else click *Exit Set-up*, close all programs and go through steps 2 to 5 again.

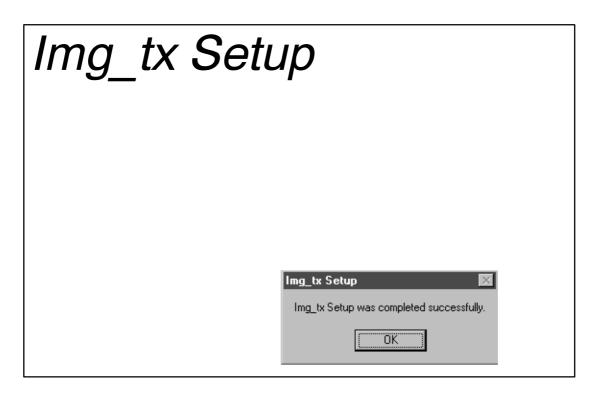


6. Next you will get the start of installation screen as shown below. Click the installation Icon to start the installation

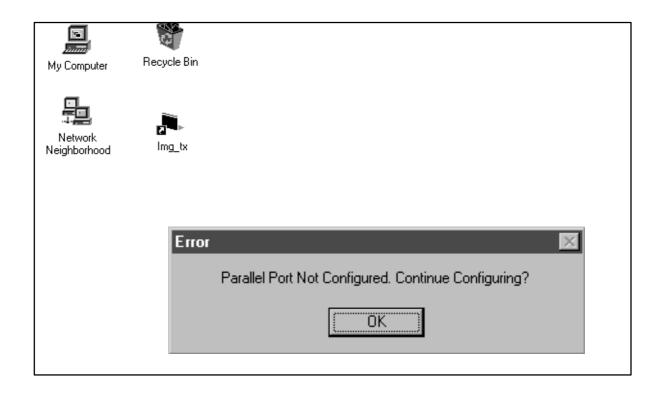
Note: The *Image Transfer* files are installed under *C:\Pragram Files\Img_tx*. In case the *Image Transfer* files are to be installed elsewhere then click *Change Directory* and specify the path.



7. Next you will get the following screen indicating the completion of the installation. Click *OK* to come out of the installation set–up.



8. Click on the *Img tx* Icon. You may get the following message while doing for the first time. Click *OK*.



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9. The software is fully installed and ready to use when you get the following screen



Hardware Installation

Connect the LA100MP to the PC through the Image Transfer Cable - 2247461 provided (for Americas use Isolated Image transfer cable). This completes the total installation of the *Image Transfer* software.

Note: To transfer images, please refer to the Operator manual.

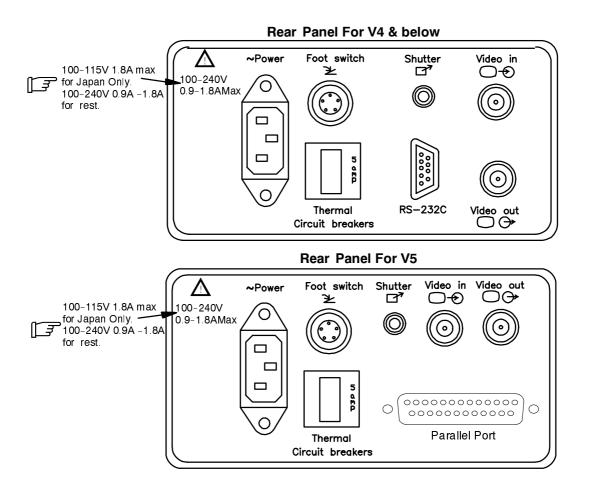
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2-2-7 Installation of Optional Accessories

- 1. Unpack the foot switch and connect it to the connector on the rear panel. (Refer ILLUSTRATION 2-5)
- 2. Connect the VCR to a suitable power outlet. Using the BNC to BNC cable connect the Video Out on the rear panel of LOGIQTM α 100 to the Video IN of the VCR.
- 3. Connect the Video Graphic Printer (VGP) to a suitable power outlet. Using the BNC to BNC cable connect the Video Out on the rear panel of LOGIQ[™]α100 to the Video IN of the VGP.

Note

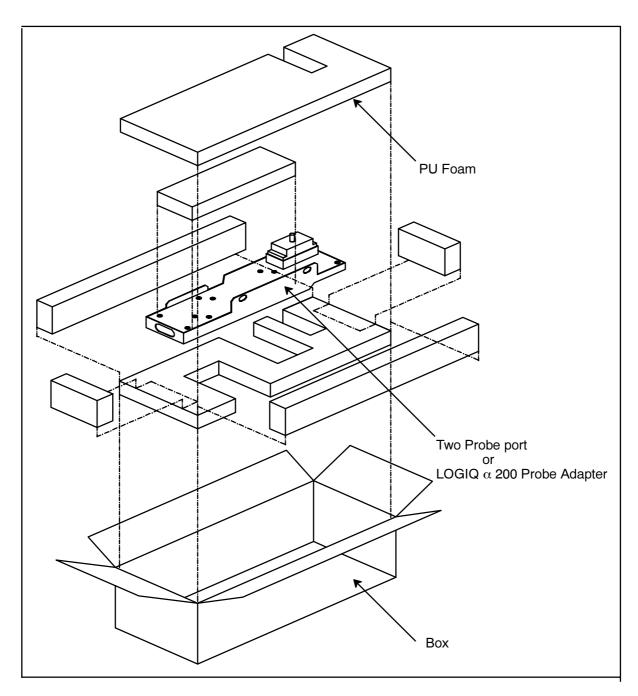
The LOGIQ[™]α100 has only one Video Out connection Therefore either a VGP or a VCR only can be connected at a time



INSTALLATION OF ACCESSORIES
ILLUSTRATION 2-5

2-2-8 Installation of Two Probe Port / LOGIQ $\alpha~200$ Probe Adapter (Optional)

- 1. Remove the adhesive tape to open the flaps of two probe port or LOGIQ lpha 200 Probe Adapter box
- 2. Remove the PU Foams inside the two probe port or LOGIQ α 200 Probe Adapter box (refer Illustration 2-6)
- 3. Take out the two probe port or LOGIQ α 200 Probe Adapter (refer Illustration 2-6)

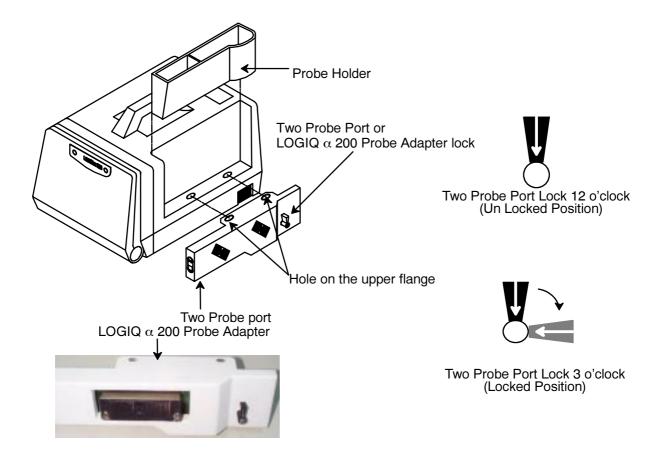


Unpacking Two Probe Port or LOGIQ $\alpha\,\text{200}$ Probe Adapte |LLUSTRAT|ON 2-6

2-2-7 Installation of Two Probe Port or LOGIQ α 200 Probe Adapter (Optional) (Continued)

The two probe port or LOGIQ α 200 Probe Adapter can be connected to or disconnected from the system at any time regardless of whether the system is powered ON or OFF.

4. Ensure that no probe is connected to the system. If connected remove it first.



Installing Two Probe Port
| ILLUSTRATION 2-7

- 5. Remove the probe holder by lifting it vertically up
- 6. Make sure that the two probe port or LOGIQ α 200 Probe Adapter lock points to the 12 o'clock position.
- 7. Align the Two Probe Port or LOGIQ α 200 Probe Adapter Connector with the System Probe Port and carefully push it in.
- 8. Align the slots on the upper flange to its counterparts on the top cover of the system.
- 9. Turn the Two Probe Port or LOGIQ α 200 Lock to the 3 o'clock position to secure the Two Probe Port or LOGIQ α 200 Probe Adapter to the system.
- 10. Carefully replace the probe holder to its place and press firmly till the projections at the bottom fit into the slots in the upper flange and the system.

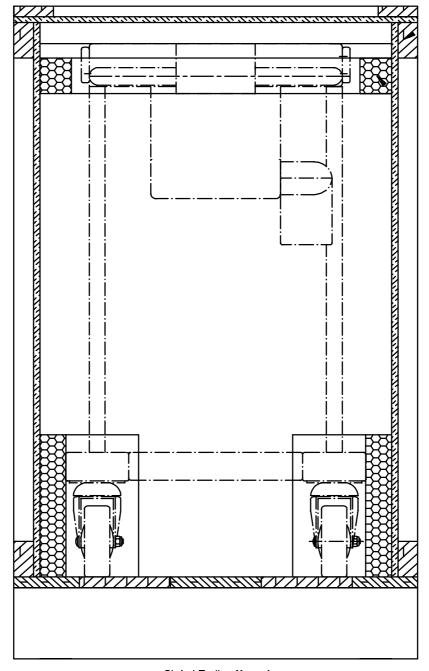
LOGIQ α200 Probe Adapter is only for LOGIQ ™α100 MP (V5 & above.)

2-2-9 Installation of LOGIQ™α100 with Global Trolley or Modular Trolley

Note

 $LOGIQ^{\intercal}\alpha 100$ has two types of Trolleys, the Global Trolley and the Modular Trolley. The Global Trolley comes in the assembled form and the Modular Trolley comes in a modular form which needs assembly at field.

1. Unpack the global trolley packed in a wooden box by opening the top cover, refer Illustration 2–8 (trolley which is inside the box is seen in the diagram).



Global Trolley Unpack ILLUSTRATION 2-8

Foam

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2-2-8. Installation of LOGIQ™ α100 with Global Trolley or Modullar Trolley (continued)

Unpack the Modular Trolley packed in a box by opening the top cover, refer Illustration 2-8

STEP 3 Remove the top from the box, unwrap the top and remove the PU

STEP 4

Remove the base from the box. Unwrap the base and remove the PU foam on the castors and the bottom

STEP 5

Remove the pouch containing Printer tray, Gel Bottle Holder. Remove it from the Pouch and unwrap the stretch film on them

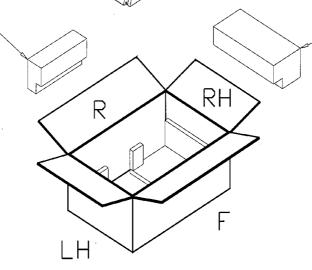


STEP 6

Remove the frame from the box and unwrap the stretch film from the frame.

Remove the small thermocoal from the gap at the rear side of the box



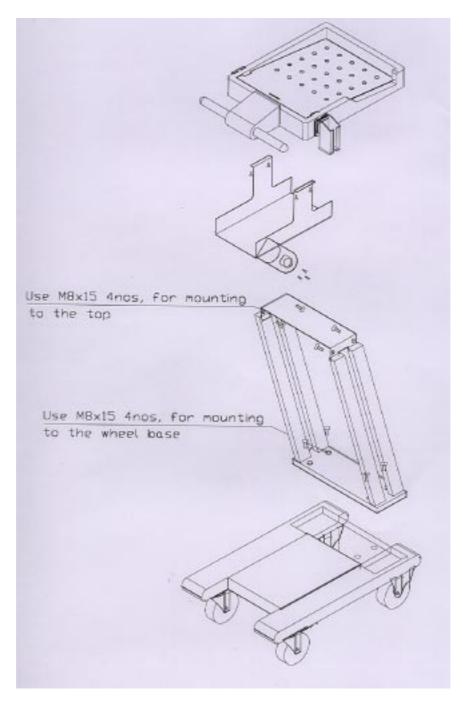


STEP 1

Remove the big thermocoal from the gap at the RH side of the box.

Modular Trolley Unpack ILLUSTRATION 2-9

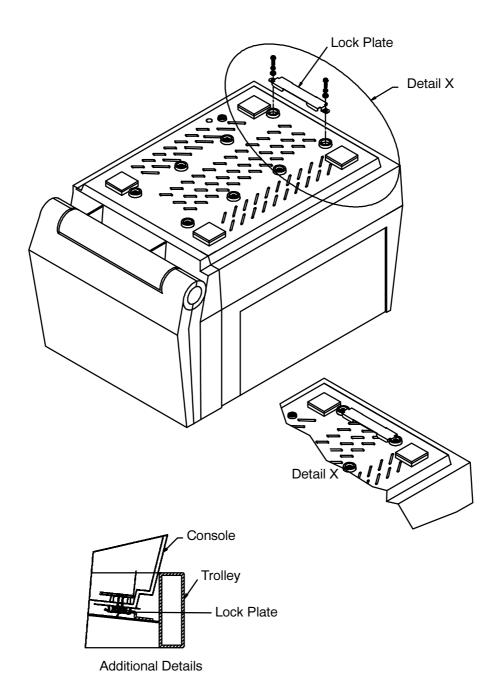
2-2-8. Installation of LOGIQ[™]α100 with Global Trolley or Modullar Trolley (continued)



Moduliar Trolley Assembly ILLUSTRATION 2-10

2-2-8. Installation of LOGIQ[™]α100 with Global Trolley or Modullar Trolley (continued)

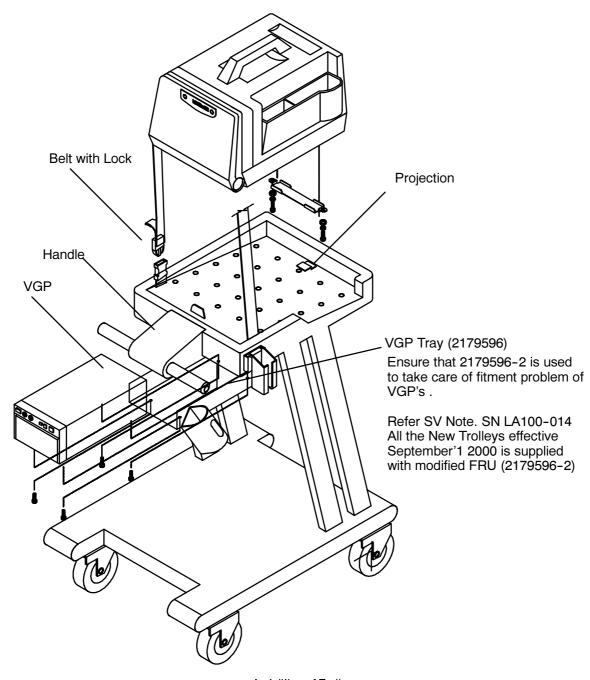
- 3. Remove two M4X10 screws from the base of LOGIQ™ α100 and fix lock plate. Refer ILLUSTRATION 2-11
- 4. Place the unit with lock plate fixed on Trolley, ensure that lock plate gets into the projection on the trolley. Refer ILLUSTRATION 2-11



Installation of Trolley ILLUSTRATION 2-11

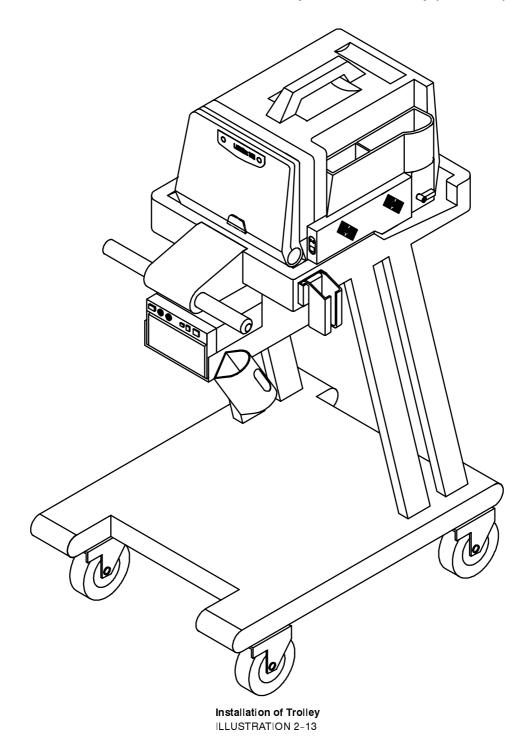
2-2-8. Installation of LOGIQ™ a100 with Global Trolley or Modullar Trolley (continued)

- 5. Take the belt (provided in the kit) over the unit and lock it. Refer ILLUSTRATION 2-12
- 6. Release the Keyboard by pressing the lock release and make it rest on the handle. Refer ILLUSTRATION 2-12
- 7. Insert the VGP inside the Printer Tray and fix from the bottom using M3X12 screw. Refer ILLUSTRATION 2-12



Installtion of Trolley
ILLUSTRATION 2-12

2-2-8. Installation of LOGIQ[™]α100 with Global Trolley or Modullar Trolley (continued)



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2-2-10 Adjustment of Monitor Contrast And Brightness

Turn ON the Machine and then adjust the monitor contrast and brightness. Monitor contrast and brightness should be adjusted according to the lighting in the room.

2-2-11 Adjustment of System Clock/Date; Hospital Name And OB Version

Press CTRL-S-1 ENTER, an 'Installation Setup window appears'. Set the system Clock/Date, Hospital Name and OB Version. These settings can be modified by using the CONTROL-S-1 key if required. Refer Section Control Keys of the User Manual for more details.



Functional checks in Chapter 4, to be carried out before handing over the system to the customer.

2-2-12 Product Locator Card

Fill out proper customer information on the Product Locator Installation Card. Refer to Illustration below. Mail this Installation Card "Product Locator" to the address corresponding to your pole.

Note

The Product Locator Installation Card shown in ILLUSTRATION 2-14 may not be same as the Product Locator card actually provided.

	Mailing Address		ct Loc Box 41 ukee,	ato 4 WI					
	DESCRIPTION		FDA	M	ODEL		F	REV	SERIAL NO.
USA	PREPARE FOR ORDERS THAT DO NOT HAVE A LOCATOR INSTALLATION REPORT			ſ	OCP	BS	ORD	DAT	E (MO-DA-YR)
PRINTED IN (DISCOUNTRY ROOM EMPLOYEE NO.			PLOYEE NO.	
NIN TE					CUSTOMER NO.				
	SYSTEM ID NUMBER] L					
NSTALLATION	INSTALLATION		-	DESTINATION	NAME	AND	ADDI	RESS	
 									
IST,									
<u> </u>									ZIP CODE

PRODUCT LOCATOR INSTALLATION CARD

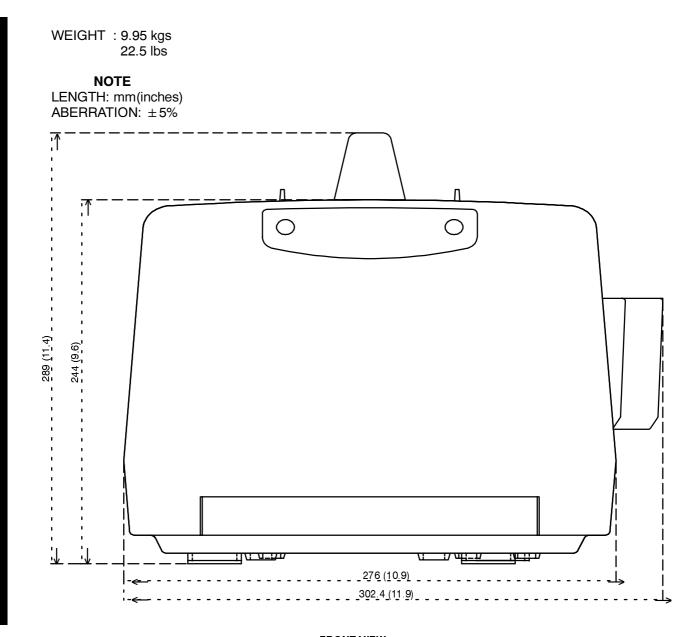
ILLUSTRATION 2-14

3-1 OVERVIEW

This chapter describes system configuration and specifications.

3-2 DIMENSIONS

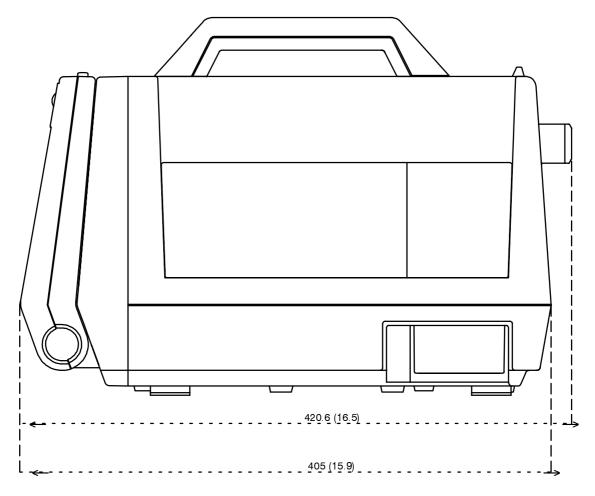
3-2-1 Front View



FRONT VIEW
ILLUSTRATION 3-1

REV 0 2139768

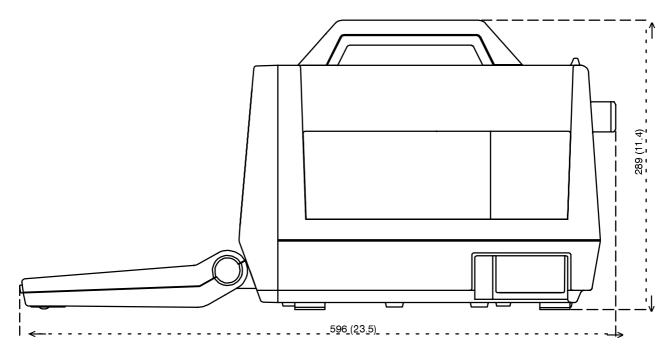
3-2-2 Side view (Keyboard closed)



SIDE VIEW (KEYBOARD CLOSED)
ILLUSTRATION 3-2

REV 0 2139768

3-2-3 Side view (keyboard open)



SIDE VIEW (KEYBOARD OPEN) ILLUSTRATION 3-3

3-3 ELECTRICAL SPECIFICATIONS

Electrical wiring, junction boxes, outlets, circuit breakers and switches should be in place before installing the LOGIQ $^{\text{\tiny{TM}}}\alpha$ 100 console.

3-3-1 Power Supply

Refer Page 2-3 of Installation for Power Line requirements of various countries.

3-3-2 Facility Power Socket

A separate power outlet with a 5 amp circuit breaker for 120/220 VAC is recommended. The specific power receptacle used depends on the country's power line standards.

This receptacle should have International Electrotechnical Commission (IEC) approval, or equivalent.

3-4 STORAGE AND OPERATION REQUIREMENTS

The LOGIQ[™]α100 is shipped in a single container excluding probes. Shipping weight is approximately 12 kgs. TABLE 3-1 provides a summary of temperature, atmospheric pressure, and humidity tolerances for shipping, installation and operation:

TABLE 3-1
STORAGE AND OPERATION REQUIREMENTS

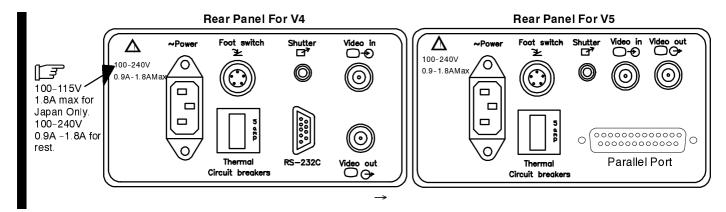
Parameter	Storage	Operation
Temperature (Deg.C) (Deg.F)	-10 to 60 14 to 140	10-40 50 to 104
Atmospheric Pressure (hPa)	700 to 1060	700 to 1060
Humidity (%) Non-condensing	30 to 95	30 to 75

3-5 OPTIONAL PERIPHERALS

LOGIQTM α 100 peripherals and accessories can be properly connected using the connectors on the rear panel of the LOGIQTM α 100 system.

Located on the panel are video input & output connectors, footswitch connector, shutter connector, power connector & control connections for Video Graphic Printer and MIC.

This section indicates pin assignment for each connector.



OPTIONAL PERIPHERALS ILLUSTRATION 3-4

Pin Assignment for Line Printer cable (For all systems of Version 4.0 and below)

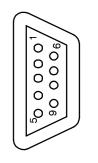
Connector: Male, D-Type, 9 Pin on the rear panel

Note

The 9 to 25 pin cable with D type connectors to be used for printer interface shall be as shown below.

TABLE 3-2
9-25 Pin Converter Cable

9 Pin Connector	25 Pin Connector
Pin1 - DCD	Pin 4 - RTS
Pin 2 – TXD	Pin 3 - RXD
Pin 3 - RXD	Pin 2 - TXD
Pin 4 - DTR	Pin 5 - CTS
Pin 5 - GND	Pin 7 - GND
Pin 6 - DSR	Pin 20 - DTR
Pin 7 - RTS	Pin 8 - CD
Pin 8 - CTS	Pin 20 - DTR
Pin 9 - NC	Pin 22 - RI (Optional)



D Type Connector

■ Pin Assignment for Parallel Port Connector (Only for V5 & above.)

Connector: Female, D-Type, 25 Pin on the rear panel



Parallel Port

TABLE 3-3 **25 pin connector details**

Pin Number	Signal
Pin1	STROBE\WRITE
Pin 2	DATA 1
Pin 3	DATA 2
Pin 4	DATA 3
Pin 5	DATA 4
Pin 6	DATA 5
Pin 7	DATA 6
Pin 8	DATA 7
Pin 9	DATA 8
Pin 10	ACKNLG
Pin 11	Busy
Pin 12	PE
Pin 13	SLCT
Pin 14	Not Connected
Pin 15	ERROR
Pin 16	INIT
Pin 17	SELECT-IN
Pin 18	GND
Pin 19	GND
Pin 20	GND
Pin 21	GND
Pin 22	GND
Pin 23	GND
Pin 24	GND
Pin 25	GND

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3-5-1 Footswitch Connection

The footswitch which is the remote **FREEZE** device is connected to the rear panel of the system. This Optional **FREEZE** switch is provided to enhance flexibility to freeze images when the system is not within reach of the user.

Pin Assignment of Connector for Footswitch

Connector: Round 5-pin connector

Pin No.	Signal
1	FOOTSWITCH +
2	GND
3	GND
4	GND
5	GND



3-5-2 Video Graphic Printer

Connect the Video Graphic printer (with BNC to BNC cable) Video IN to the Video OUT loc ated on the rear panel of the system, also establish shutter (with Mini Jack cable) if required.

Model: Sony UP-890 MD/MDG for 100V-120V, 50/60 Hz, 1.5A, Catalogue No. E8310KA

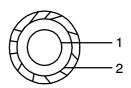
Sony UP-890 CE for 220V-240V, 50/60 Hz, 0.8A Catalogue No. E83101SL

Pin Assignment of Mini Jack Controlling Video Graphic Printer

Connector: Stereo Mini Jack

Pin No.	Signal
1	Shutter*
2	Signal GND





*Printer starts printing by receiving low pulses for more than 'x' minutes ('x' is selectable using CONTROL-S1 - Installation Setup command, x decides exposure time).

3-5-3 Video Cassette Recorder

Connect the VCR Sony SVO-9500MD (H4120SR) for NTSC and Sony SVO 9500MDP(E11801AA) for PAL System to the Video IN socket in the rear panel. Press the "EXT. VIDEO" button on the keyboard to enable an external video signal on the system monitor.

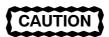
3-5-4 Probes

TABLE 3-4
PROBE DETAILS

Probe Type	Part No.	Catalog No.	Freq. in MHz	Radius of Curvature	FOV
C36	2107922	H45252CF	3.5	50mm	68°
C55	2107925	H45252CE	5.0	40mm	68°
E72	2107928	H45252MT	6.5	10mm	114°
L76	2107910	H45252HP	7.5	-	60mm
C31	2175994	H45252CS	3.5	13mm	85°
VE5	TLS355RV	H45252VE	5.0	-	60mm
CZB	-	H45202CZ	6.5	10mm	114°
LB	-	H46022LB	3.5	-	94mm

Note

CZB and LB probes are supported on version 5.0 & above. C31 and VE5 probes are supported on software version 4.0 and above only. C36, C55, E72 and L76 are supported in all software versions.



Use only approved probes, peripherals or accessories.

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3-6 LOGIQ[™]α100 MP Video Signal Specification

Gen	General				
SL	Parameter	NTSC	PAL		
1	Total Number of Horizontal Lines	525[Frame]	625[Frame]		
2	Vertical Field Frequency	60[Hz]	50[Hz]		
3	Horizontal Scanning Frequency	15.734[kHz]	15.625[KHz]		
4	Vertical Scanning Method	Interlaced	Interlaced		
5	Sync Input	Composite	Composite		
6	Pixel Clock	12.272715[MHz]	12.25[MHz]		
7	Display width and Height[pixel * line]	608 X 464	608 X 472		

Hori	Horizontal Timing & Video Amplitude				
SL	Parameter	NTSC	PAL		
1	Total H-Line Time	63.556[micro sec]	64.00[micro sec]		
2	H-Sync Pulse Width	4.725[micro sec]	4.68[micro sec]		
3	Back Porch	4.725[micro sec]	4.68[micro sec]		
4	Total Active H-line time	52.64[micro sec]	52.07[micro sec]		
5	Front Porch	1.46[micro sec]	1.49[micro sec]		
6	Video Amplitude (back porch to peak)	0.7Vpp	0.7Vpp		
7	Sync Amplitude (back porch to peak)	0.3Vpp	0.3Vpp		

Verti	Vertical Timing				
SL	Parameter	NTSC	PAL		
1	Total V-Line Time	262.5[H]	312.5[H]		
2	V-Sync Pulse Width	1st Field 3[lines]	1st Field 2.5[lines]		
3		2nd Field 3[lines]	2nd Field 2.5[lines]		
4	V-front porch	1st Field 7.5[lines]	1st Field 6.25[lines]		
5		2nd Field 7.5[lines]	2nd Field 6.25[lines]		
6	V-Blanking	1st Filed 30.5[lines]	1st Filed 32[lines]		
7		2nd Field 30.5[lines]	2nd Field 32[lines]		

4-1 OVERVIEW

This section provides procedures for quickly checking major functions of the LOGIQ $^{\text{TM}}\alpha$ 100, diagnostics by using the built-in service software and power supply adjustments. For remaining functional checks please refer to the LOGIQ $^{\text{TM}}\alpha$ 100 Operator's Manual.

4-2 FUNCTIONAL CHECK PROCEDURES

To perform these tests, you will need a micro-convex, linear or a convex probe. These procedures should be performed during installation. These procedures are also used as basic checks to use when service of the system is required.

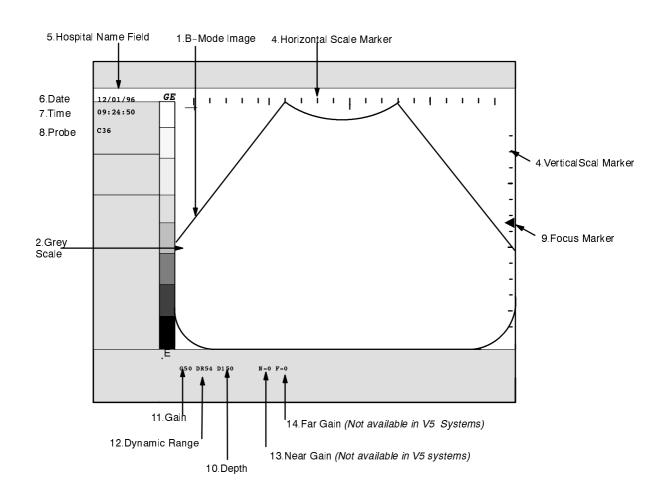
Turn "ON" the LOGIQ[™] α 100 system. The 2 LEDS, External Video and Freeze blink and go off. The system beeps once and runs a self test.

The Monitor displays the following. Refer ILLUSTRATION 4-1 on the next page.

- 1. B-Mode Image appears
- 2. Gray Scale Display
- 3. Horizontal Scale Marker
- 4. Vertical Scale Marker
- 5. Hospital Name (If previously entered)
- 6. Date
- 7. Time
- 8. Probe Type
- 9. Focus Marker on vertical scale
- 10. Depth (150mm)*
- 11. Gain (G50) *
- 12. Dynamic Range (D54) *
- 13. Near Gain 0 (Only for V4.0 & below Systems)
- 14. Far Gain 0 (Only for V4.0 & below systems)

^{*}Points 10-14 form a continuous code in the lower left hand corner of the monitor and they are factory default values.

4-2-1 Power Up Monitor Display (Convex Probe)



POWER UP MONITOR DISPLAY

ILLUSTRATION 4-1

4-2-2 Basic Controls

TABLE 4-1 describes basic controls which helps in checking the LOGIQ™ α100 during installation.

Connect the sector or convex transducer to connector on the right side of the base.

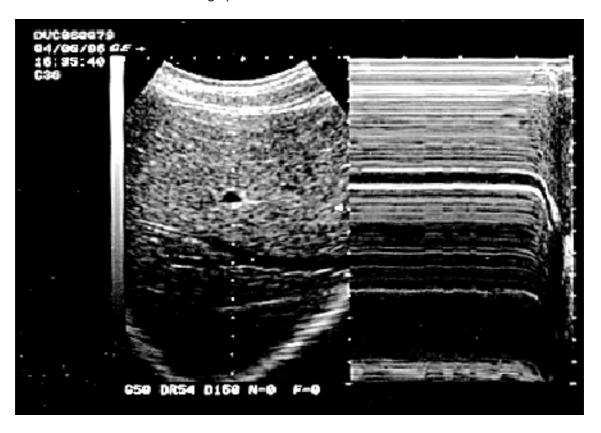
TABLE 4-1
BASIC CONTROLS

Check	Expected Result
Turn ' ON ' Power Switch	B-Mode screen as in ILLUSTRATION 4-1 should appear.
Press New Patient Key Press ID/Name	A pop-up window appears. Enter Patient Name/ID. It presets the system A pop-up window appears. Enter Patient Name/ID. It does not preset the system.
Press Dyn Range Up/Down	Image grows softer and harder depending on position.
Rotate Gain Knob	Image grows lighter and darker with rotation.
Press Near Up/Down (Only for V4.0 & below) Press Far Up/Down (Only for V4.0 & below)	The image grows darker or brighter in the near region The image grows darker or brighter in the far region.
Press Depth Up/Down	Depth of the image gets magnified or reduced.
Press Reverse Press Reverse a second time Press SHIFT + Reverse Press SHIFT+ Reverse a second time	The image will be displayed Left/Right The image will be displayed Right/Left. The image will be displayed Top/Bottom The image will be displayed Bottom/Top
Press M key	B/M Mode with M-line cursor appears. (Use trackball to move the M-line cursor). Refer ILLUSTRATION 4-2.
Roll Trackball	The M-Line cursor should follow the trackball movement and the real-time image varies on the M-Mode display.
Press M key a second time	Only M-Mode image appears on the screen.
Press Freeze key	The image will freeze.
CINE (for V5 & ablove) Press Freeze and Rotate B/M Gain/Cine Scroll	The Cine Gauge, menu and the Cine frame number appears at the bottom of the display. Rotate the Cine Scroll dial to move through the images in Cine Memory. Cine frame number is displayed on the left side of the screen.
Cine Menu:	
Press 1 (Start Frame)	Move the Cursor by rotating the Cine Scroll dial to the frame you want and press 1 again to select the Start frame.
Press 2 (End Frame)	Move the Cursor by rotating the Cine Scroll dial to the frame you want and press 2 again to select the End frame.
Press 3 (Cine Loop)	Enters into Cine loop within the selected Start & End frames.
Press 4 (Cine Gauge)	To toggle between the Cine Gauge display.

4-2-2 Basic Controls (Continued)

Check	Expected Result
Flash Memory(Image storage) (for V5 & above)	
Freeze the image Press Store	Comment column appears at the bottom of the display. Enter the comment in that and press Store again to Store the image.
Press Recall	Image Archive screen appears with option menu at the bottom. Select the image using the trackball (Use Dynamic Range to page up/down in the Image Archive screen). Press 1 to View the selected image. Press 2 to Clear the selected image. Press 3 to Clear All the stored images. Press 4 to Sort the images by name or date. To Exit Image Archieve, press Freeze .
TGC (for V5 & above)	The TGC is used to adjust the Gain at a specific depth. Slide the control to the right or left to increase or decrease gain. Gain is displayed in a range from +/- 20db.

Refer the User's Manual for the remaining operations.



B/M MODE DISPLAY
ILLUSTRATION 4-2

4-2-3 Phantom Check

RMI Phantom 403GS (Part No. 2113294) to be used to check image quality and proper functioning of the system.

4-3 DIAGNOSTICS

The LOGIQ[™]α 100 System service diagnostics comprises of:

- 1. Self test or power on diagnostics
- 2. Service diagnostic tools

The self test or power on diagnostics are run every time the system is booted. The service diagnostic tools include test procedures for testing the system at PCB level as well as block level. The diagnostic tools provides a pop-up menu to enable selection of various tests to test various blocks on the system.

4-3-1 Power on Diagnostics

The power on diagnostics or self tests are run every time the system is booted. This self tests include testing the validity of the system software through EPROM checksum test and testing the system RAM. It checks whether the keyboard and the trackball are properly interfaced to the system. It also initiates the self test of analog subsystem. The two LED's and the beeper are used to indicate error conditions.

Note

Power on Diagnostics works only when the system is in application (imaging) mode and not while on service diagnostics. This is controlled by DIP Switch SW1 - 6,7,8 on the CPU which is set to ON,OFF,OFF respectively which is the normal setting.

4-3-2 Service Diagnostics

Entering Service Software Program



In response, a pop-up menu appears as shown in Illustration 4-3

4-3-2 Service Diagnostics (Continued)

MAIN MENU

- 1. CPU BOARD TESTS
- 2. DSC BOARD TESTS
- 3. ANALOG BOARDS TEST
- 4. KEYBOARD TESTS
- **5. MONITOR TEST**
- 6. KEYBOARD OPERATION HISTORY
- 7. TRACKBALL SELECTION
- Q. Quit

ENTER THE CHOICE:

MAIN MENU ILLUSTRATION 4-3

Note

Option Q (Quit) can be used to come out of the diagnostic and enter the application mode.

4-3-3 CPU Board Tests

When this option is selected, the following menu will appear:

CPU Menu for V4

CPU BOARD TESTS

- 1. ALL TESTS
- 2. EPROM CHECKSUM TEST
- 3. R/W MEMORY TEST
- 4. GRAPHICS MEMORY TEST
- 5. DEBUG PORT TEST
- 6. GRAPHICS TEST
- 7. NVRAM TEST
- P. MAIN MENU
- Q. Quit

ENTER THE CHOICE:

CPU Menu for V5 & above

CPU BOARD TESTS

- 1. ALL TESTS
- 2. EPROM CHECKSUM TEST
- 3. R/W MEMORY TEST
- 4. GRAPHICS MEMORY TEST
- 5. DEBUG PORT TEST
- 6. GRAPHICS TEST
- 7. NVRAM TEST
- 8. FLASH MEMORY TEST
- P. MAIN MENU
- Q. Quit

ENTER THE CHOICE :

CPU BOARD TESTS

All Tests

This option is used to run all tests in the menu. Once all the tests are completed, press any key to exit.

EPROM Checksum Test

The validity of the software residing in the EPROM on the CPU Board is tested by performing the Checksum test. The word Checksum of the program is computed and its one's compliment is stored in the EPROM as the last word. In this test the contents of the memory are added wordwise and the computed sum is compared against zero. If the resulting sum is non-zero the test is reported to have failed.

Read/Write Memory Test

The Read/Write memory on the CPU Board is tested by filling the memory with test patterns and reading them back and validating the read data. If any of the memory byte does not contain the expected data it is declared as faulty.

Graphics Memory Test

The overlay or the graphics memory is tested in the same way as Read/Write memory.

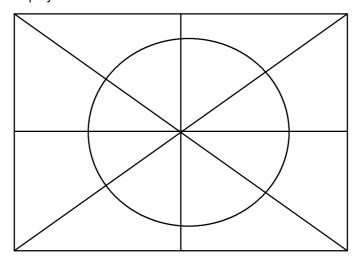
Debug Port Test

Internal Loop Back Test - In this test the port is programmed for internal loop back mode so that a byte transmitted can be received back.

4-3-3 CPU Board Tests (Continued)

Graphics Test

The pattern shown below is displayed on the monitor when this test is enabled.



GRAPHICS TEST
ILLUSTRATION 4-5

Press any key to exit the Graphics Test.

Note

Main Menu which was appearing after Graphics Test is put after NVRAM Test due to Ver4.0 Software introduction.

NVRAM Test

When this test is selected the following will appear

NVRAM Test for V4.0

NVRAM TEST

START OF NVRAM 0X400000 END OF NVRAM 0X403fff

ACTUAL TEST START FROM 0X40CFF (TOTAL 1k TEST)

WRITING TO NVRAM

.....

WRITING IS SUCCESSFUL READING FROM NVRAM

......

READING SUCCESSFUL

NVRAM Test for V5.0 & above

NVRAM TEST

START OF NVRAM 0X400000 END OF NVRAM 0X401fff

WRITING TO NVRAM

.....

READING FROM NVRAM

.....

NVRAM Test Passed

NVRAM TEST ILLUSTRATION 4-6

Note

WRITING SUCCESSFUL and READING SUCCESSFUL indicate NVRAM test is alright.

4-3-3 CPU Board Tests (Continued)

■ Flash Memory Test (for V5 & above)

The following menu is displayed

FLASH MEMORY TEST

- 1. ALL TESTS
- 2. TEST FLASH MEMORY BANKS
- 3. DETECT FLASH ASSY
- 4. UPDATE ARCHIEVE STATUS FROM FLASH ASSY
- 5. ERASE FLASH ASSY
- P. MAIN MENU
- Q. QUIT

ENTER THE CHOICE:

Choice 1: All Tests

This option is used to run all tests in the menu.

Choice 2: Test Flash memory banks

This test programs one image location in each bank and reads them back. This is done to check the functionality of all Image_select and Bank_select signals. The failure in any bank is indicated by the error message "FAILED" Else the message "OK" is displayed.

Choice 3: Detect Flash assy

This will check the presence of the Flash assy attachment and display the message "Flash assy card detected" or "Flash assy card not detected"

Choice 4: Update archive status from flash assy

This option has been provided to facilitate the interchange of Flash assy cards between CPU boards. The CPU software stores and keeps updating status information on all available flash image slots.

This status info is stored in the NVRAM. When a flash assy is inserted, the status info is stored in the NVRAM will not indicate the true status anymore. When we run this option, the CPU will check the Flash assy and update its status stored in NVRAM.

Note

This option must be run during the following instance without fail

- a. Whenever the CPU board or the Flash assy gets replaced in the field
 - b. When the NVRAM gets replaced during a debugging operation.

Choice 5: Erase Flash memory

When this option is run all the images stored in the flash assy is erased.

Main Menu

This option is used to return to the main menu.

Quit

This option is used to come out of the diagnostic and enter the application mode.

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4-3-4 DSC Board Tests

When this option is selected the following menu will appear:

DSC TESTS FOR V4

DSC BOARD TESTS

- 1. ALL TESTS
- 2. SELECT AAF FILTER
- 3. SELECT DIGITAL FILTER
- 4. DYNAMIC RANGE TEST
- 5. IMAGE MEMORY TEST
- P. MAIN MENU

Q. QUIT

ENTER THE CHOICE:

DSC TESTS FOR V5 & above

DSC BOARD TESTS

- 1. ALL TESTS
- 2. AAF FILTER TEST
- 3. SELECT DIGITAL FILTER
- 4. DYNAMIC RANGE TEST
- 5. IMAGE MEMORY TEST
- 6. CINE MEMORY
- P. MAIN MENU
- Q. QUIT

ENTER THE CHOICE: _

DSC BOARD TESTS ILLUSTRATION 4-7

All Tests

This option is used to run all tests in the menu.

AAF Filter Test

AAF filter test is done by scoping the signal at TP5 by feeding a particular signal at Con 4. (This test can't be done in field)

Select Digital Filter

Through this option the user can select one of the 14 available digital filters. Two character entry can be made.

Dynamic Range Test

In this test the memory block wherein the look-up-table containing dynamic range values is tested.

Image Memory Test

The image memory is tested in the same way as the memories on the CPU board.

Cine Memory Test

All the Cine Frames have been tested one by one by writing 4 test patterns and then reading the same.

Main Menu

This option is used to return to the main menu.

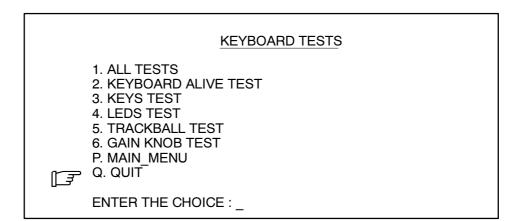
Quit

This option is used to come out of the diagnostic and enter the application mode.

4-3-5 Analog Board Test

When self test for the Analog board is selected, the DPRAM on the TRCTL Board will be written on and read back. Read data is checked for validity.

4-3-6 Keyboard Tests



KEYBOARD TESTS
ILLUSTRATION 4-8

All Tests

This option is used to run all tests in the menu.

Keyboard Alive Test

In this test, keyboard alive condition is tested by interacting with the keyboard firmware directly.

Kevs Test

In this test, all the keys in the keyboard can be tested. The user is prompted to press the keys on the keyboard and the pressed keys are highlighted on the screen. (This is a toggle operation).



During Keys Test Press "Ext. Video" at the last. Pressing "Ext. Video" key interrupts the test and return to main keyboard Tests Menu.

LEDs Test

During this test *FREEZE* field and *EXTERNAL VIDEO* field will be displayed on the monitor. The *FREEZE* and *EXTERNAL VIDEO* LEDs blink for a while sequentially and the corresponding field gets highlighted.

Trackball Test

A cursor is displayed on the monitor and the user can move the trackball and move the cursor over the screen.

Gain Knob Test

In this test, the user can check for the operation of the gain knob. The current gain value is displayed on the screen.

4-3-6 Keyboard Tests (Continued)

Main Menu

This option is used to return to the main menu.

Quit

This option is used to come out of the diagnostic and enter the application mode.

4-3-7 Monitor Test

The following test patterns are displayed on the monitor when this test is enabled. The Gain Knob is used for selection of patterns 1-8. To exit out of any pattern and return to the main menu, press *EXTERNAL VIDEO*.

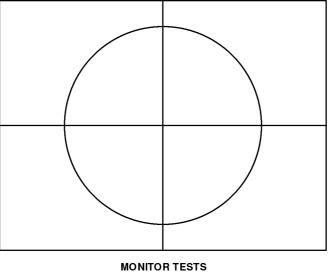
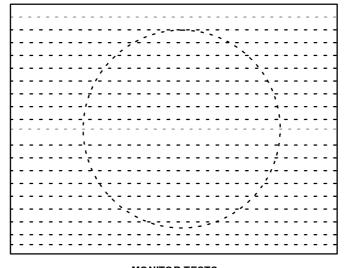
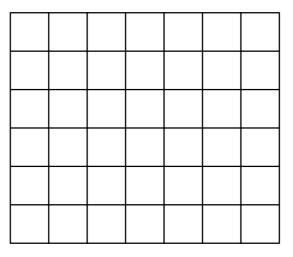


ILLUSTRATION 4-9

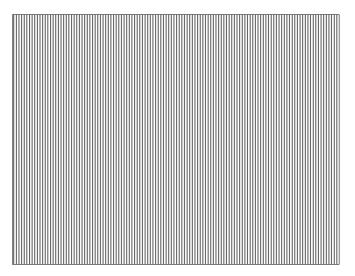


MONITOR TESTS
ILLUSTRATION 4-10

4-3-7 Monitor Test (Continued)



MONITOR TESTS
ILLUSTRATION 4-11

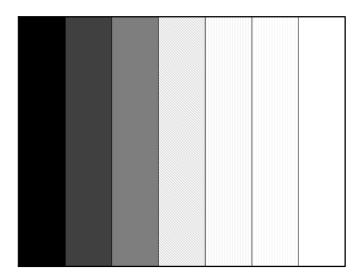


MONITOR TESTS
ILLUSTRATION 4-12

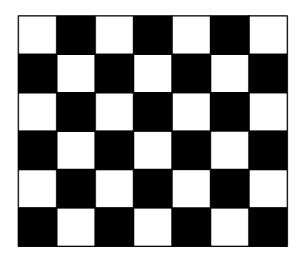
Note

Illustrations 4-8, 4-9, 4-10 are also available in reverse video.

4-3-7 Monitor Test (Continued)

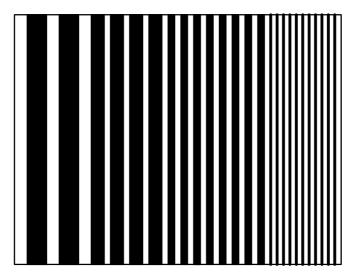


MONITOR TESTS
||LLUSTRAT||ON 4-13 (a)



MONITOR TESTS
|LLUSTRATION 4-13 (b)

4-3-7 Monitor Test (Continued)



MONITOR TESTS
|LLUSTRATION 4-13 (c)

Note

The patterns in ILLUSTRATION 4-9 to ILLUSTRATION 4-12 are written on the overlay where as the pattern in ILLUSTRATION 4-13 is written on the image memory.

4-3-8 Key Operation History

When this option is selected from the Main Menu the following appears indicating a maximum of 32 keys last activated.

	KEY OPERATION HISTORY	
KEY OPERATED		KEY OPERATED
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15.		17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32.
PRE	ESS EXT_VIDEO TO QUIT	

KEY OPERATION HISTORY
ILLUSTRATION 4-14

4-3-9 Trackball Selection (Version 3.3 System onwards)

When this option is selected the following menu appears,

MICRO TRACKBALL SELECTION

SELECT THE MICRO TRACKBALL (1: ALPS, 2: HOSIDEN): _

TRACKBALL SELECTION ILLUSTRATION 4-15

Select 1 for ALPS Trackball or Optical Trackball and 2 for Hosiden Trackball based on trackball used.

4-4 SERVICE ADJUSTMENTS

The LOGIQTM α 100 does not contain service adjustable parts. In case of failure of any module like the Power Supply, it is recommended to replace the power supply unit instead of trying to adjust the potentiometer or replacing the fuse.

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5-1 OVERVIEW

 $\mathsf{LOGIQ}^\mathsf{TM}\alpha$ 100 is a portable ultrasound scanner. It meets the routine needs of both Obstetrics and Gynecology investigations. Support of wide range of probes, gives the system added benefits to meet the diverse applications.

5-2 LOGIQ[™] α 100 SYSTEM

The LOGIQ $^{\text{TM}}\alpha$ 100 System can be divided into 3 sections the Analog Section (TRBD/TRCTL), the Digital Section (consisting of the DSC and the CPU) and the keyboard which serves as the user interface.

The Analog Section is responsible for generation of transmit pulses, reception of echo signals and overall control of real time scanning. The Digital section is responsible for conversion of analog echo into digital signal for further processing to display on the monitor with the necessary TV signals. It is also responsible for overall control of this system. Refer ILLUSTRATION 5-1 (a, b).

5-3 SYSTEM BLOCK DIAGRAM

For V5.0 & below Systems

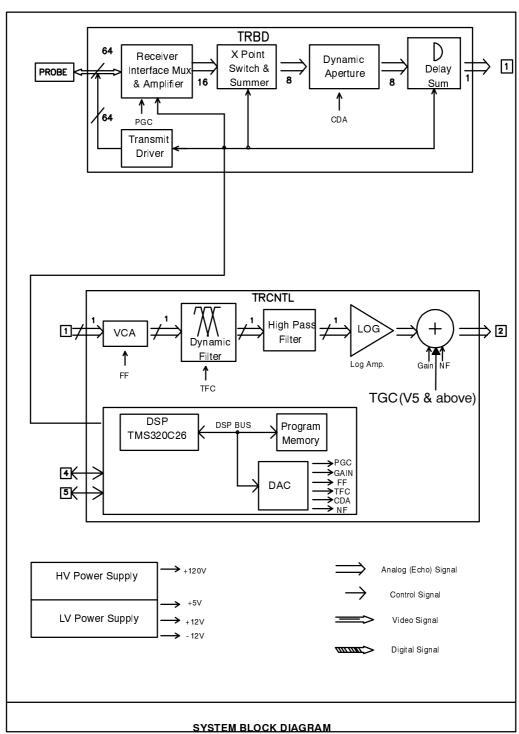


ILLUSTRATION 5-1 (a)

5-3 SYSTEM BLOCK DIAGRAM

For V5.06A & above Systems

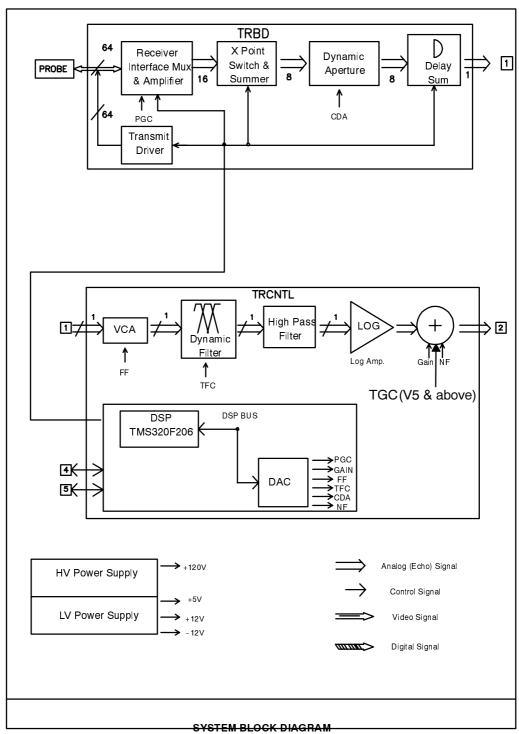
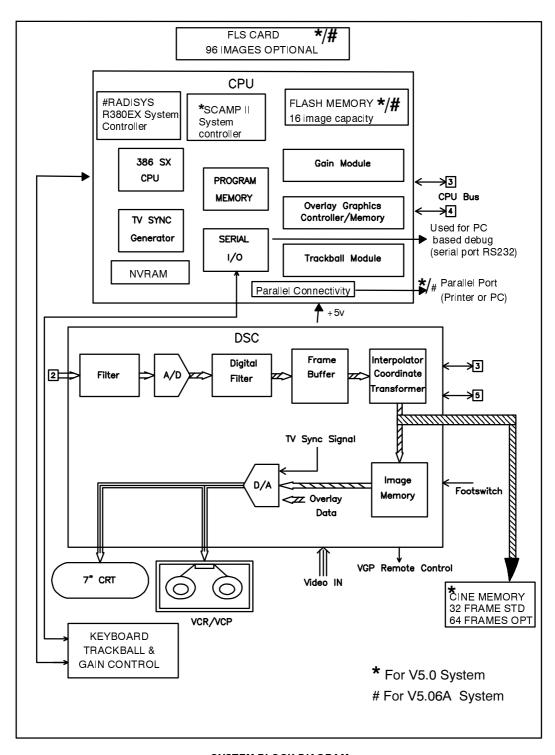


ILLUSTRATION 5-1 (b)

5-3 SYSTEM BLOCK DIAGRAM (Continued)



SYSTEM BLOCK DIAGRAM

ILLUSTRATION 5-1 (c)

5-4 CIRCUIT BOARD NOMENCLATURE

The following table lists the circuit boards on LOGIQTM α 100 system.

TABLE 5-1
CIRCUIT BOARD NOMENCLATURE

LOGIQ™α 100 PC BOARDS									
TRBD Transmit Receive Board									
TRCTL	Transmit Receive Control Board								
DSC	Digital Scan Converter								
CPU	Central Processing Unit								
KBD	Keyboard								

5-5 DIP SWITCH SETTING

5-5-1 TRCTL Board



The settings are valid only when jumper JP1 and JP20 are in Test mode and is used for PCB testing in the production line. The equipment at the customer site should have JP1 and JP20 in normal mode which makes DIP switch S1 ineffective.

TABLE 5-2
TRCNTL BOARD

	1	Probe Type0
	2	Probe Type1
	3	Probe Type2
S1	4	Probe Type 3
	5	Probe Type 4
	6	Probe Type 5
	7	SDO (Shutdown 0) 0: Enables probe type indicator (indicates probe is connected) 1: Disables probe type indication (indicates probe is disconnected)
	8	SD1 (Shutdown1) 0: HV low (Not used) 1: HV high (Not used)

5-5-1 TRCNTL Board (Continued)

TABLE 5-3
PROBE CODE

Probe Name	PT5-PT0	Frequency
Convex (C36)	010111 (17)	3.5 MHz
Convex (C55)	010110 (16)	5.0 MHz
Sector (TV) (E72)	010000(10)	6.5 MHz
Linear (L76)	101101(2D)	7.5 MHz
Microconvex (C31)	010101(15)	3.5 MHz
Linear (VE5)	101110(2E)	5 MHz
Convex (CZB)	111100(3C)	6.5MHz
Linear (LB)	101111(2F)	3.5MHz

Note

CZB and LB are supported on software version 5.0 only. C31 and VE5 probes are supported on software version 4.0 and above only. C36, C55, E72 and L76 are supported in all software versions.

5-5-2 CPU Board

TABLE 5-4
CPU BOARD

	2	0 :STDOUT is LOGIQ™α100 Display 1 :STDOUT (Standard Output) AUX (PC)
	3	0 :STDIN (Standard Input) is AUX (PC) 1 :STDIN LOGIQ™α100 Keyboard *
SW1	4	0 : NTSC Setup 1 : PAL Setup
	5	0 : 2 MB DRAM 1 : 512KB DRAM
	6, 7, 8	000 : Debug Monitor 100 : Application (Ultrasound Mode) 001 : Service Diagnostics

* Note

This list is active only when 6,7,8 is in 000

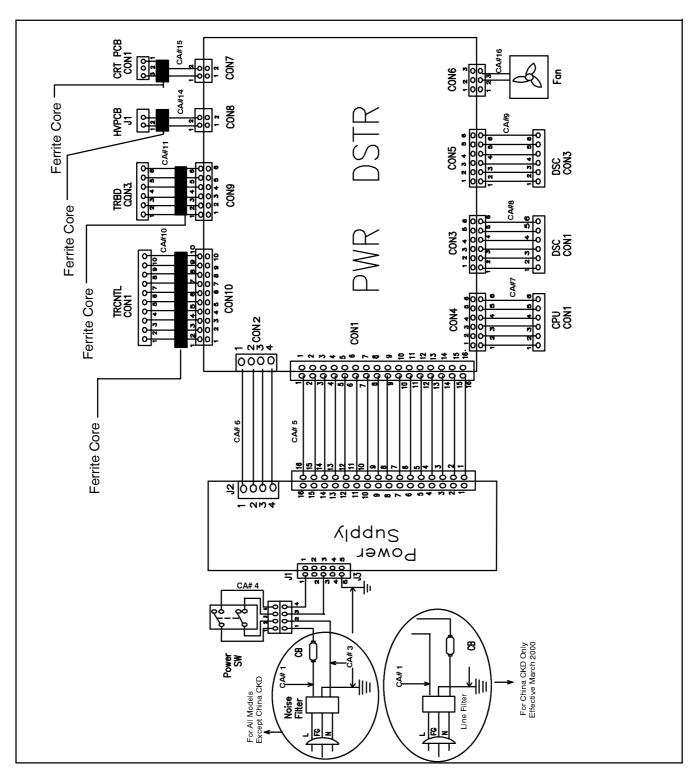
TABLE 5-5 **DEFAULT SETTINGS SW1**

SW1	1	2	3	4	5	6	7	8
PAL	0	0	0	1	0	1	0	0
NTSC	0	0	0	0	0	1	0	0

TABLE 5-6 CPU BOARD

0)4/0		0 (OFF) : Flash Assembly Enable 1 (ON) : Flash Assembly Disable
SW2 (V5 only)		0 : Enable 64 Frame Cine 1 : Disable 64 Frame Cine
	S3 to S8	Don't Care

5-6 WIRING DIAGRAMS

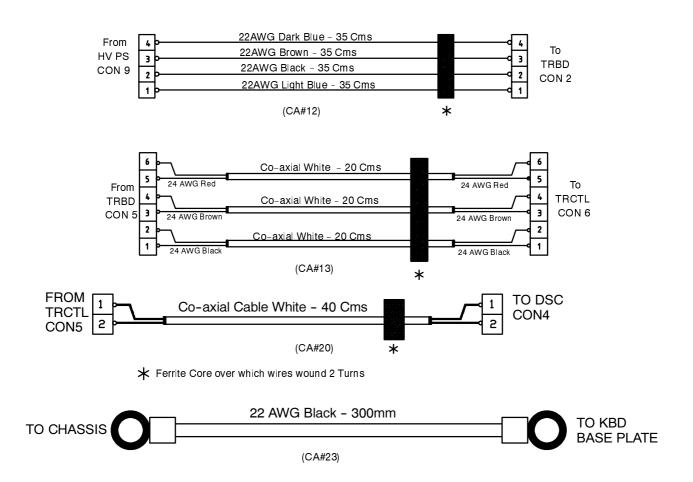


WIRING DIAGRAM ILLUSTRATION 5-2

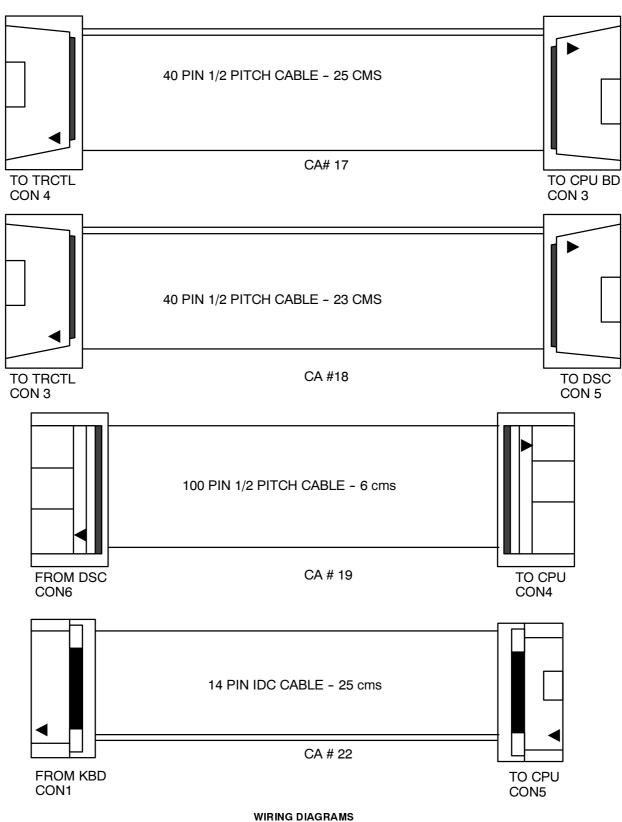
TABLE 5-7
PWR DSTR Connector Voltages

Connector	Pin No.	Voltage	Connector	Pin No.	Voltage	Connector	Pin No.	Voltage
	1	12V		1	GND		1	5V
	2	12V	PWR DSTR	2	GND		2	5V
	3	-12V	CON4	3	GND		3	GND
	4	-12V	to	4	5V	PWR DSTR	4	GND
	5	12V	CPU CON1	5	5V	CON10	5	-12V
	6	12V		6	GND	to	6	-12V
PWR DSTR	7	GND		1	5V	TRCTL	7	GND
CON 1	8	GND	PWR DSTR	2	GND	CON1	8	GND
	9	GND	CON5	3	-12V		9	12V
	10	GND	to	4	GND		10	12V
	11	GND	DSC CON3	5	12V			
	12	GND		6	GND			
	13	5V	PWR DSTR	1	_			
	14	5V	CON6	2	12V			
	15	5V	to FAN	3	GND			
	16	5V	PWR DSTR	1	GND			
	1	5V	CON7	2	12V			
PWR DSTR	2	GND	to CRT					
CON 2	3	5V	PWR DSTR	1	GND			
	4	GND	CON8	2	12V			
	1	GND	to HV					
PWR DSTR	2	GND		1	-12V			
CON 3	3	GND	PWR DSTR	2	-12V			
to	4	5V	CON9	3	GND			
DSC CON1	5	5V	to	4	GND			
	6	5V	TRBD CON3	5	12V			
				6	12V			

5-6 WIRING DIAGRAMS (Continued)

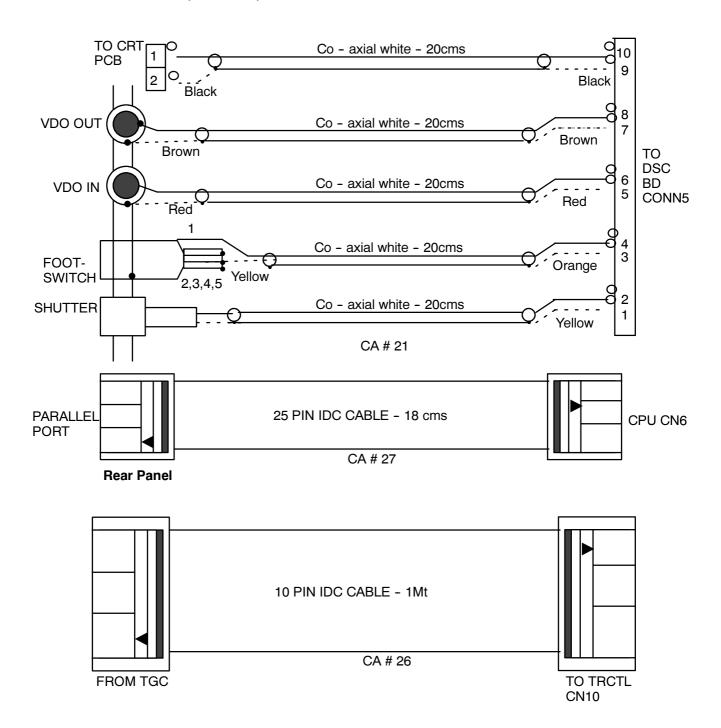


WIRING DIAGRAMS
ILLUSTRATION 5-3



WIRING DIAGRAMS ILLUSRATION 5-4

5-6 WIRING DIAGRAMS (Continued)



WIRING DIAGRAMS
ILLUSTRATION 5-5

REV 0 2139768



Turn OFF power to the system and wear a wrist strap before you remove the circuit boards to avoid failure of components due to electrostatic discharge. Do not unplug the power cord to keep ground continuity.

ESD work station (2109715) and ESD wrist controller (2109714) should be used for ESD protection of CMOS devices.



ONLY QUALIFIED SERVICE PERSONNEL SHOULD REMOVE ANY COVERS OR PANELS.
ELECTRICAL HAZARDS EXISTS AT SEVERAL POINTS INSIDE. BECOME THOROUGHLY FAMILIAR WITH ALL HAZARDOUS VOLTAGES AND HIGH CURRENT LEVELS TO AVOID ACCIDENTAL CONTACT.

MATERIAL LIST-Console Ver3.3A & below

PART NAME	PART NO.							Q	ΓY.				DESCRIPTION
Operator CSL Assy	2154471	1											220-240VAC, 50/60Hz, PAL, GEMS-A, V3.3A.
	2156692		1										220-240VAC, 50/60Hz, PAL, GEMS-A/AM, V3.3A.
	2156693			1									100-115VAC, 50/60Hz, NTSC, GEMS-A/AM, V3.3A.
	2156694				1								220-240VAC, 50/60Hz, NTSC,GEMS-A/AM, V3.3A.
	2156695					1							220-240VAC, 50/60Hz, PAL, GEMS-E, V3.3A.
	2172903						1						100-115VAC, 50/60Hz, NTSC, GEMS-A V3.3A.
Power Cord (Indian Type)	2139759	1											220/240VAC, 50/60Hz
Power Cord (American Type)	2148714			1			1						100/115VAC, 50/60Hz
Power Cord (European Type)	2148713		1		1	1							220/240VAC, 50/60Hz
Probe Pad	2150887	4	4	4	4	4	4						
Aquasonic Gel	2139760	1	1	1	1	1	1						
Mini Plug Cable	P9509BC	1	1	1	1	1	1						
BNC Cable	P9509BD	1	1	1	1	1	1						
Trackball Cleaning Kit	2172304	1	1	1	1	1	1						
Foot Switch (Option)	2152089	1	1	1	1	1	1						H41062A
Mobile Trolley (option)	2196004	1	1	1	1	1	1						H41052LA
Modular Trolley (Option)	2240994	1	1	1	1	1	1						H41052LC
Two Probe Port (Option)	2208220	1	1	1	1	1	1						H41072A
9 to 25 Pin Converter Cable (Option)	2215679	1	1	1	1	1	1						
E72 Probe Holder (Option)	2184039	1	1	1	1	1	1						
H41012LA INDIA													
H41012LB CHINA, ANZ, SE	-ASIA, MEXICO)]									
H41012LC US of A, CANNA	DA, BRAZIL, TA	IWA	N										
H41012LD CHILE, KOREA													
H41012LE EUROPE													
H41012LF JAPAN													

MATERIAL LIST-Console Ver4.0

PART NAME	PART NO.							Q	TY.				DESCRIPTION
Operator CSL Assy	2215602	1											220-240VAC, 50/60Hz, PAL, GEMS-A, V4.0.
	2215669		1										220-240VAC, 50/60Hz, PAL, GEMS-A/AM, V4.0.
	2215670			1									100-115VAC, 50/60Hz, NTSC, GEMS-A/AM, V4.0.
	2215671				1								220-240VAC, 50/60Hz, NTSC,GEMS-A/AM, V4.0.
	2215672					1							220-240VAC, 50/60Hz, PAL, GEMS-E, V4.0
	2215673						1						100-115VAC, 50/60Hz, NTSC, GEMS-A, V4.0.
Power Cord (Indian Type)	2139759	1											220/240VAC, 50/60Hz
Power Cord (American Type)	2148714			1			1						100/115VAC, 50/60Hz
Power Cord (European Type)	2148713		1		1	1							220/240VAC, 50/60Hz
Probe Pad	2150887	4	4	4	4	4	4						
Aquasonic Gel	2139760	1	1	1	1	1	1						
Mini Plug Cable	P9509BC	1	1	1	1	1	1						
BNC Cable	P9509BD	1	1	1	1	1	1						
Trackball Cleaning Kit	2172304	1	1	1	1	1	1						
Foot Switch (Option)	2152089	1	1	1	1	1	1						H41062A
Mobile Trolley (option)	2196004	1	1	1	1	1	1						H41052LA
Modular Trolley (Option)	2240994	1	1	1	1	1	1						H41052LC
Two Probe Port (Option)	2208220	1	1	1	1	1	1						H41072A
9 to 25 Pin Converter Cable (Option)	2215679	1	1	1	1	1	1						
E72 Probe Holder (Option)	2184039	1	1	1	1	1	1						
H41112LA INDIA													•
H41112LB CHINA, ANZ, SE-AS	IA, MEXICO		_										
H41112LC US of A, CANNADA,	BRAZIL, TAIWA	N											
H41112LD CHILE, KOREA					•						'		
H41112LE EUROPE						-					-		
							-	1					

MATERIAL LIST-Console Ver5.0

PART NAME	PART NO.							Q	ΓY.			DESCRIPTION	
Operator CSL Assy	2244609	1										220-240VAC, 50/60Hz, PAL,	
	2247333		1									GEMS-A, V5.0. 220-240VAC, 50/60Hz, PAL, GEMS-A/AM, V5.0.	
	2247334			1								100-115VAC, 50/60Hz, NTSC GEMS-A/ V5.0.	,
	2247335				1							220-240VAC, 50/60Hz, NTSC,GEMS-A/AM, V5.0	
	2247336					1						220-240VAC, 50/60Hz, PAL, GEMS-E, V5.0	
	2247337						1					100-115VAC, 50/60Hz, NTSC GEMS-A V5.0	,
	2272413							1				100-115VAC, 50/60Hz, NTSC GEMS-AM V5.0	,
Power Cord (Indian Type)	2139759	1										220/240VAC, 50/60Hz	
Power Cord (American Type)	2148714			1			1	1				100/115VAC, 50/60Hz	
Power Cord (European Type)	2148713		1		1	1						220/240VAC, 50/60Hz	
Probe Pad	2150887	4	4	4	4	4	4	1					
Aquasonic Gel	2139760	1	1	1	1	1	1	1					
Mini Plug Cable	P9509BC	1	1	1	1	1	1	1					
BNC Cable	P9509BD	1	1	1	1	1	1	1					
Trackball Cleaning Kit	2172304	1	1	1	1	1	1	1				Not Available for V5.06A	
Foot Switch (Option)	2152089	1	1	1	1	1	1	1				H41062A	
PC Image Tansfer Software	2249732	1	1	1	1	1	1	1					
PC Image Transfer Cable	2247461	1	1	1	1	1	1	_				Not Applicable for GEMS-AM	
Mobile Trolley (option)	2196004	1	1	1	1	1	1	1				H41052LA	
Modular Trolley (Option)	2240994	1	1	1	1	1	1	1				H41052LC	
Two Probe Port (Option)	2208220	1	1	1	1	1	1	1				H41072A	
E72 Probe Holder (Option)	2184039	1	1	1	1	1	1	1					
Cine-Additional 32 Frames (Option)	2246910	1	1	1	1	1	1	1				H41172LA	
Flash Memory Additional 96 Images	2246910	1	1	1	1	1	1	1				H41182A (Option)	
HP Laserjet Printers (Option)	-	1	1	1	1	1	1	1				HP6LGold, HP1100, HP2100	
PC Image Tansfer Isolated Cable	(TBD)							1				Only for GEMS-AM	
H41162LA INDIA	•												
H41162LB CHINA, ANZ, SE-A	ASIA,MEXIC)	•										
H41162LC TAIWAN, PHILIPIN	ES			-									
H41162LD CHILE, KOREA					-								
H41162LE EUROPE						•							
H41162LF JAPAN							_						
H41162LG US of A, CANNADA	A,BRAZIL,							•					

6-1 TOP COVER

■ 6-1-1 Disassembly/Assembly of Top Cover

Follow the steps below and refer Illustration 6-1.

- 1. Disconnect the power cord from the mains and remove from the system.
- 2. Remove Probe, which is at the right side of the base.
- 3. Remove the probe holder.
- 4. Remove two screws (a,b) at the side of the probe holder.
- 5. Move the unit to the edge of the table and remove two screws (e,f) from the bottom of the unit.
- 6. Remove the handle cap by pulling upward and remove the handle screws (c,d).
- 7. Slide the top cover backward by holding the handle.
- 8. For assembly follow the reverse order.

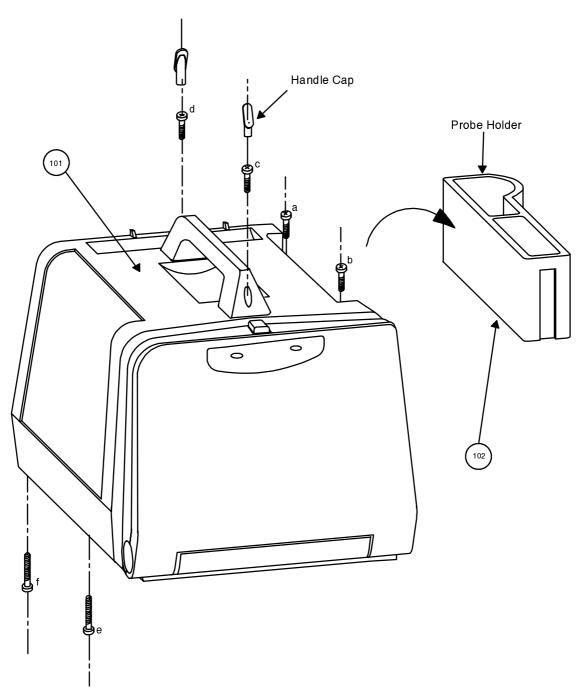
MATERIAL LIST - Top Cover

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

TABLE 6-1
TOP COVER

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
101	Top Cover Assembly	2139794	1	2	
102	Probe Holder	2139720	1	1	



TOP COVER ASSEMBLY ILLUSTRATION 6-1

6-2 KEYBOARD

6-2-1 Detaching the Keyboard

Follow the steps below and refer Illustration 6-2.

- Remove Top Cover. Refer section 6-1.
- 2. Remove 14-pin connector (CON 5) from the CPU.
- 3. Remove the black ground cable coming from the keyboard along with the 14 pin flat cable connected to the chassis.
- 4. Place a rubber mat below the unit and tilt the unit upward. Remove two screws (a,b) from the bottom hinge of the keyboard and remove the bottom hinge cover refer Illustration 6-2.
- 5. Press the lock release and turn the keyboard 90°. Move the keyboard downward and carefully pull out the cable with the connector
- 6. Remove the 2 ring bushes refer Illustration 6-2.
- 7. For assembly follow the reverse order.

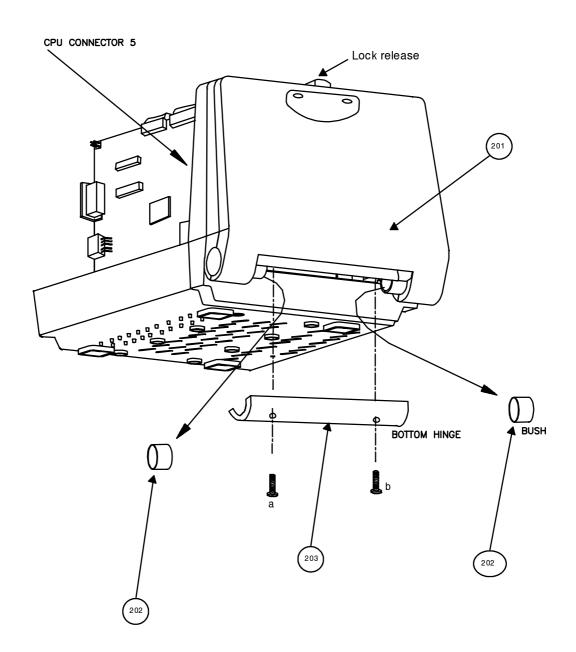
MATERIAL LIST - Keyboard Assembly

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

TABLE 6-2
KEYBOARD ASSEMBLY

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
201	Keyboard Assembly (with cable) for V4.0 & below	2291098 (With Optical Track Ball)	1	2	Contains Keyboard assembly and instruction (simillar to section 4-3-9) for configuring trackball
201	Keyboard Assemby (With Cable) for V5 Systems.	2245193 (With Optical Track Ball)	1	2	Contains Keyboard assembly and instruction (simillar to section 4-3-9) for configuring trackball
202	Bush	2139702	2	2	Two plastic bushes of keyboard
203	Bottom Hinge	2139713	1	2	



DETACHING THE KEYBOARD

ILLUSTRATION 6-2

6-2-2 Keyboard Disassembly/Assembly

Follow steps below and refer Illustration 6-3

- 1. Remove Top Cover. Refer section 6-1.
- 2. Detach the keyboard. Refer section 6-2-1
- 3. Remove the spacer pad (refer FRU NO. 308 in the diagram) which is near the lock release.
- 4. Remove four screws a,b,c,d (b, is not visible in diagram).
- 5. Remove keyboard top with PCB assembly.
- 6. Remove the eight fixing screws (e to l) on the base plate.
- 7. Remove the Gain knob (use allen key for M2.6 grub screw)
- 8. Remove trackball mounting by removing two screws (m,n) and take out the trackball (In case of Hosiden trackball a sticker containing GPN 2186627 will be stuck on the trackball).
- 9. Remove the TGC connector from the TRCTL.
- 10. Pull out the FPC (Flexible Printed Circuit) cable from the trackball.
- 11. Remove Gain Encoder connector.
- 12. Remove the two screws (o,p) holding the Gain Encoder Unit.
- 13. Remove eleven screws (q x 11 Nos.) holding the keyboard PCB to the base plate to separate the keyboard PCB.
- 14. For assembly follow the reverse order.

Note

When assembling the PCB to the base plate, M3x6 screws **only** should be used because a wrong screw used will pierce the keysheet.

6-2-2 Keyboard Disassembly/Assembly(Contd..)

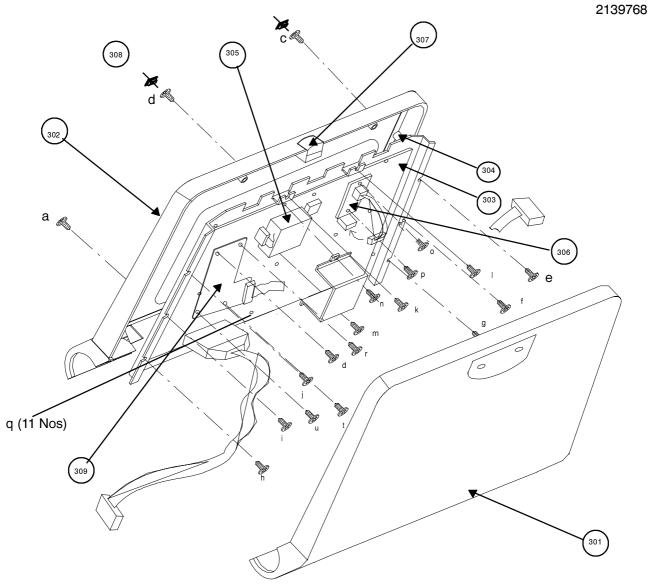
MATERIAL LIST - Keyboard

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

TABLE 6-3 **KEYBOARD**

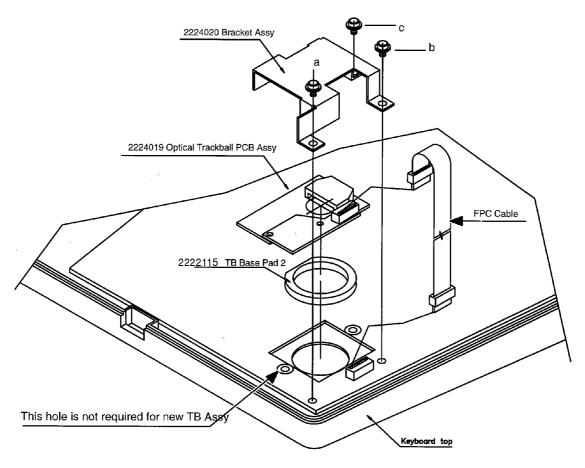
FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
301	Keyboard Bottom	2139701	1	2	
302	Keyboard Top	2139699-2	1	2	
303	Keyboard PCB	2139784	1	1	For V4.0 & below
303	Keyboard PCB	2245195	1	1	For V5.0 & above Systems
304	Key Sheet with Base Plate	2152580	1	2	
304	Key Sheet with Base Plate	2247236	1	2	For V5.0 & above Systems
305	Trackball Assembly	2245196 (Optical Track Ball)	1	2	Includes bracket, screws, FPC cable and instruction (simillar to section 4-3-9) to con- figure trackball
306	Gain Knob + Encoder	2139703	1	2	Not seen in Illustration 6-3
307	Lock Release with Spring (2 Nos.)	2139697	1	2	Keyboard and front panel latch
308	Spacer Pad	2139704	2	2	
309	TGC Assy	2245203	1	1	For V5 & above Systems



KEYBOARD ASSEMBLY ILLUSTRATION 6-3

6-2-3 Optical Trackball Assembly

- 1. Assemble TB Base Pad 2 (2222115) on the trackball refer ILLUSTRATION 6-4
- 2. Assemble Optical Trackball PCB Assembly (2224019) refer ILLUSTRATION 6-4
- 3. Assemble Trackball bracket assembly (2224020) refer ILLUSTRATION 6-4
- 4. Fix screws a,b & c at the location A,B & C in keyboars base plate.
- 5. Fix the FPC cable as shown in ILLUSTRATION 6-4



Optical Trackball ASSEMBLY
ILLUSTRATION 6-4

6. For assembly the keybaord PCB follow the reverse order of section 6-2-2.

Note

When assembling the PCB to the base plate, M3x6 screws **only** should be used because a wrong screw used will pierce the keysheet.

7. For initializing the Optical Trackball Select Alps Trackball from the Trackball Selection Menu in Service Diagnostics

6-3 FRONT PANEL/MONITOR

6-3-1 Disassembly/Assembly of Front Panel

Follow steps below and refer Illustration 6-4

- 1. Remove Top Cover. Refer section 6-1.
- 2. Lock the Keyboard before removing the front panel.
- 3. Remove the keyboard connector from the CPU.
- 4. Remove the black ground cable coming from the keyboard along with the 14 pin flat cable connected to the chassis.
- 5. Remove Brightness and Contrast connector from the Brightness and Contrast PCB. (Refer Detail 2 in the Illustration 6-4)
- 6. Remove two screws (e,f) and detach the bottom hinge of the keyboard.
- 7. Remove two screws (a,b) from the base along the rib.
- 8. Remove two screws (c,d) from the support plate on the chassis.
- 9. Disconnect the connector coming from the POWER ON Switch.
- 10. Slide the front panel and keyboard sub-assembly together.
- 11. For assembly follow the reverse order.

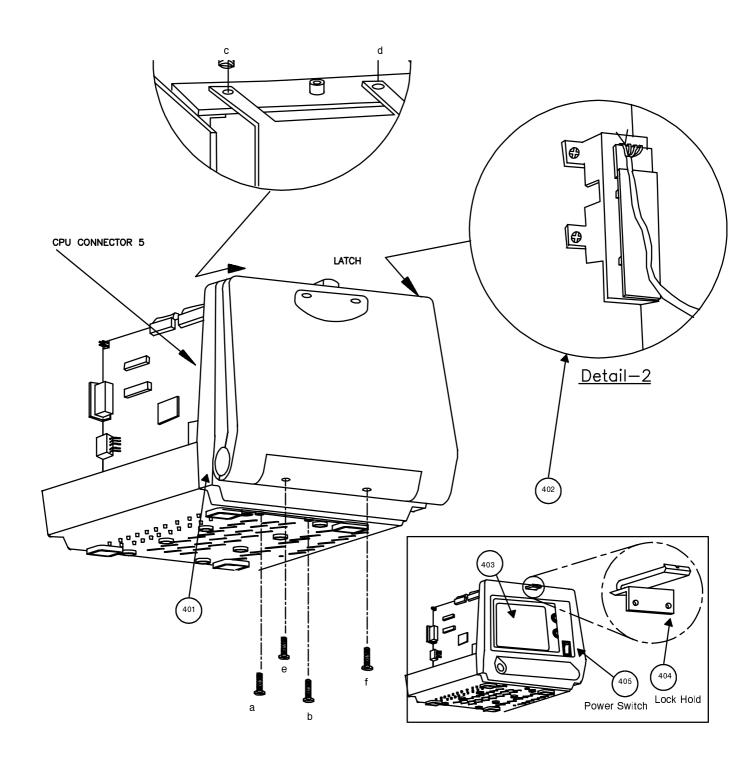
MATERIAL LIST- Front Panel

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

TABLE 6-4
FRONT PANEL

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
401	Front Panel Assembly (Lock Hold, Power Switch, CRT filter)	2139792	1	1	
402	Brightness Contrast Assembly	2141771	1	2	
403	CRT Filter	2139706	1	2	
404	Lock Hold	2139710	1	2	
405	Power Switch	2139677	1	1	



FRONT PANEL ASSEMBLY
ILLUSTRATION 6-5

6-3-2 Disassembly/Assembly of Monitor

Follow steps below and refer Illustration 6-5

- 1. Remove Top Cover. Refer section 6-1.
- 2. Remove Front Panel. Refer section 6-3-1
- Disconnect the communication cables between the Analog and Digital circuits.
- 4. Remove Shield Plate.
- 5. Remove the communication cable VIDEO IN (b), Brightness/Contrast (i,j) and the power cable (a) on the CRT PCB.
- 6. Remove the 2 screws (c,d) holding the CRT drive PCB to the chassis.
- 7. Remove 4 screws (e,f,g,h) holding the CRT Assy connected to the chassis.
- 8. Move the CRT forward along with CRT driver PCB assembly.
- 9. For assembly follow the reverse order.

NOTE

Ensure that the monitor switch (all the four) near Fly Back Transformer is set to PAL side in case of PAL systems and to NTSC side in case of NTSC systems.

MATERIAL LIST-Monitor

OPERATOR CONSOLE ASSY

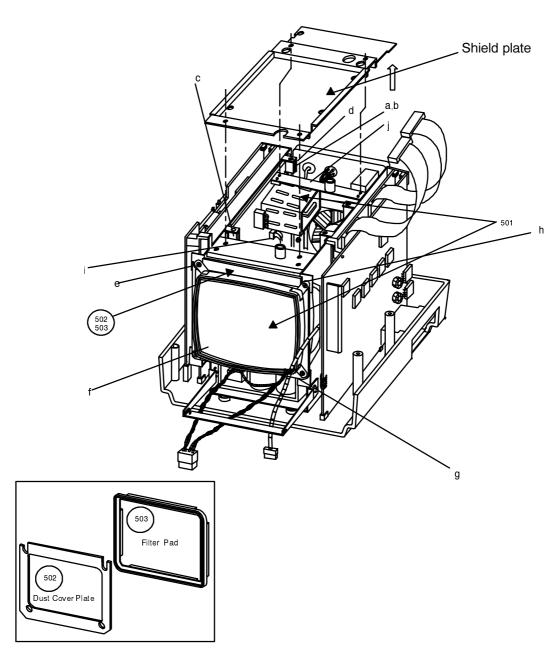
2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

TABLE 6-5

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
501	Monitor Assembly (CRT+PCB) with cable assy 15 -PAL/NTSC	2237917	1	1	
502	Dust Cover Plate	2150693	1	2	
503	Filter Pad	2139708	1	2	

Note

If CRT fails replace along with PCB



MONITOR ASSEMBLY
ILLUSTRATION 6-6

6-4 PCBs

6-4-1 Disassembly/Assembly of DSC/CPU/FLASH

Follow steps below and refer Illustration 6-6

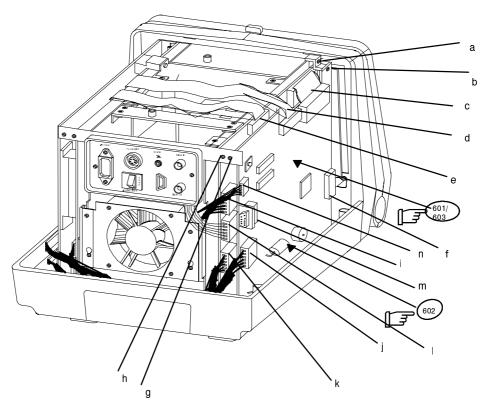
- 1. Remove Top Cover. Refer section 6-1.
- 2. For disassembling both CPU and DSC Boards together, remove all communications and power cables from the CPU and DSC board. (Cables c,d,e,f,i,j,k,l and n(only for V5 Systems))
- 3. Remove three screws (two on the rear g,h and one screw a, in the front) to detach the PCB Assembly from the chassis.
- 4. Pull the DSC & CPU boards upward.
- 5. For DSC Board only, remove cables c, e i, k, I and four screws (two from rear g,h, and two in the front a,b) and detach the DSC board separately.

NOTE

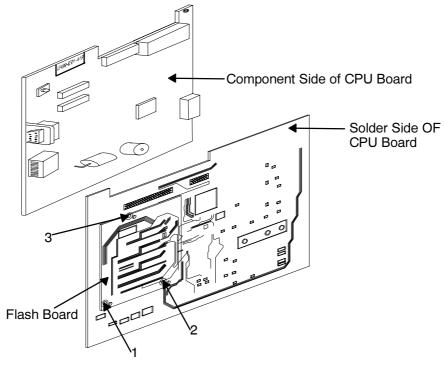
Ensure that the Jumper JP1 on DSC assy is set to PAL side for PAL consoles and to NTSC side for NTSC consoles, prior to replacing the PCB assy. Refer ILLUSTRATION 6-9 for details.

Ensure that the Switch 3 (SW3) 4th switch of CPU Assy is set to NTSC or PAL.. If ON it is PAL, if OFF it is NTSC. Refer ILLUSTRATION 6-10 & Section 5-5-2. for more details

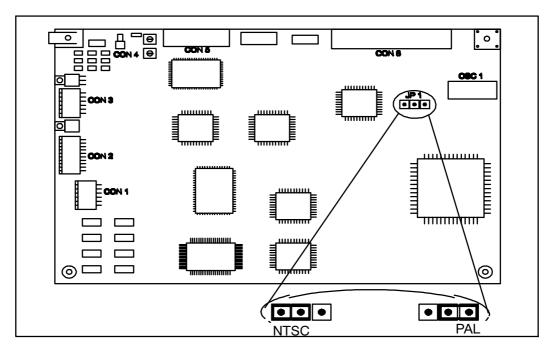
- For CPU only, remove screw g, on the rear of the system and screw b, at the front. Remove Connectors c,d, f, n and ther pull the CPU pcb upward.
- 7. Flasy Board is fixed at the Solder Side of the CPU. Refer ILLUSTRATION 6-8 for details.
- 8. For Disassembling the Flash Board, remove the three screws(1,2,&3) which is fixing the Flash Board to the CPU Board.
- 9. For assembly follow the reverse order.



ASSEMBLY OF PCs (CPU/DSC)
ILLUSTRATION 6-7

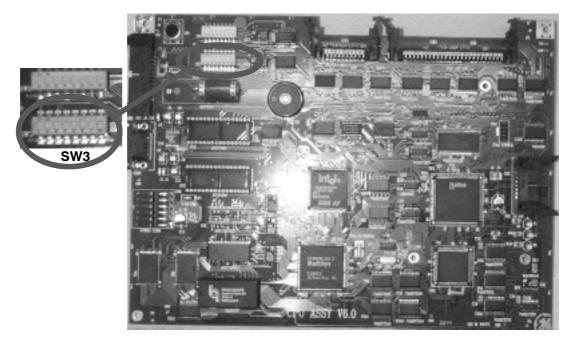


FLASH Board DisAssembly ILLUSTRATION 6-8



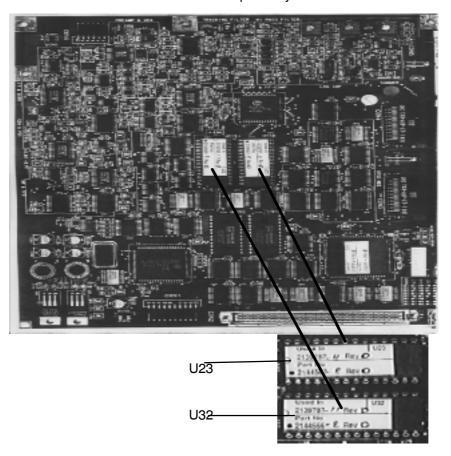
DSC Assy Jumper Setting for PAL and NTSC for V4.0 | ILLUSTRATION 6-9

Ensure that the DIP Switch 3 (SW3) 4th switch of CPU Assy is set to NTSC or PAL.. If ON it is PAL, if OFF it is NTSC



CPU Assy DIP Switch Setting for PAL and NTSC. $\label{eq:llustration} \mbox{ILLUSTRATION 6-10}$

While Replacing CPU 2290792, Replace TRCTL EPROM with the supplied EPROM's (2144567-9) & (2144566-9) of 2139787-13 at location U23 & U32 respectively.

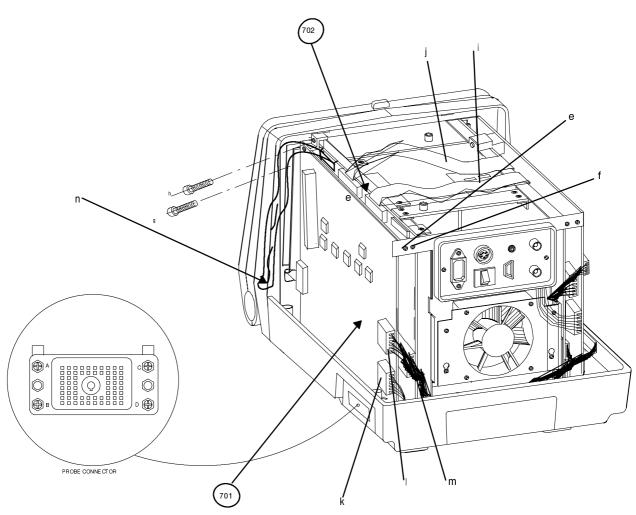


TRCTL EPROM Location for Replacement during Replacing CPU 2290792 | LLUSTRATION 6-11

6-4-2 Disassembly/Assembly of TRBD/TRCTLBD

Follow steps and refer ILLUSTRATION 6-12

- 1. Remove Top Cover. Refer section 6-1.
- 2. Remove two screws (e,f) fixing the TRCNTL and TRBD PCBs to the Rear panel bracket.
- 3. Remove four screws (A,B,C,D) from the probe connector.
- 4. Remove one screw (h) fixing TRBD/TRCTL assemblies to the chassis in the front.
- 5. Disconnect the 40 pin cables (i,j) interfacing TRCTL to CPU/DSC.
- 6. Remove 2 pin co-axial cable connecting TRCTL analog output to DSC and remove power supply cables (k,l,m) on the rear of the system.
- 7. Remove the TGC cable (n).
- 8. Hold both the TRCNTL and TRBD PCB's together and pull upward.
- 9. Separate the boards carefully by removing three screws holding the PCB's together, detaching the 96 pin euro connector and removing co-axial interface cable between the two PCB's.
- 10. For assembly follow the reverse order.



ASSEMBLY OF PCBs (TRBD/TRCTLBD)
ILLUSTRATION 6-12

6-4-3 MATERIAL LIST PCB'S - CPU

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

Table below explains the CPU and its compatibility with software versions.

TABLE 6-6

CPU PCB

I	FRU NO	PCB NAME	PART NO.	QTY	FRU	DESCRIPTION
Ī	601	CPU	2290792	1	1	For Console with S/W Ver 3.1 to 3.3D
		Assy* PAL/NTSC	2290619	1	1	For Console with S/W Ver 4.0
			2290037	1	1	For Console with S/W Ver 5.0

NOTE

- 1. *CPU is common for PAL & NTSC, Only dip switch setting has to be changed for the required type. Refer ILLUSTRATION 6-10
- 2. While Replacing CPU 2290792, Replace TRCTL EPROM with the supplied EPROM's (2144567-9) & (2144566-9) of 2139787-13 at location U23 & U32 respectively. Refer ILLUSTRATION 6-11 for details
- 3. Replace The User manual with V4.0A User Manual

6-4-4 MATERIAL LIST - LITHIUM BATTERY

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

TABLE 6-7 **LITHIUM BATTERY**

FRU NO	PART NAME	PART NO.	QTY	FRU	DESCRIPTION
602	Lithium Battery - 3.6V	2139251	1	1	Refer Illustration 6-6

6-4-5 MATERIAL LIST PCB - FLASH

OPERATOR CONSOLE ASSY

2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

Table below explains the FLASH PCB and its compatibility with software versions.

TABLE 6-8 FLASH PCB Assy

FRU NO	PCB NAME	PART NO.	QTY	FRU	DESCRIPTION
1433	FLASH Assy	2246446	1		Flash Assy is an Optional 96 image storage board used for console with Software Ver 5 along with Standard 16 images storage of CPU Assy 2245201/2245360

6-4-6 MATERIAL LIST PCB'S - DSC

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

Table below explains the DSC PCB's and their compatibility with software versions.

TABLE 6-9 **DSC PCB**

FRU NO	PCB NAME	PART NO.	QTY	FRU	DESCRIPTION
603	DSC Assy	2217052-2	1	1	For Console with S/W Ver 3.1 to 3.3D & 4.0
	NTSC/PAL	2245200-2	1	1	For Console with S/W Ver 5.0

NOTE

- 1. 2217052-2, 2245200-2 & 2220991 are common for PAL/NTSC system, while replacing at field jumper JP1 needs to be set as per ILLUSTRATION 6-9 depending on PAL or NTSC console
- 2. For Ver 3.3A and below consoles while replacing DSC Assy 2217052, change the jumper setting JP1 to (PAL/NTSC) appropriately & upgrade CPU to 3.3D software by replacing EPROM's U3B(2174446-5) & U4B1(2174445-4).
- 3. 2245200-2(with standard 32 Frame CINE) is used for Console with Software Ver 5
- 4. 2220991(with additional 32 Frame option along with standard 32 Frame CINE) is used for console with Version 5.
- 5. 2245200/2220991 is not backward compatible with earlier versions of DSC Assy.

6-4-7 MATERIAL LIST PCB'S - TRBD & TRCTL

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

Table below explains the TRBD and TRCTL PCB's and their compatibility with software versions.

TABLE 6-10 TRBD & TRCTL PCB's

FRU NO	PCB NAME	PART NO.	QTY	FRU	DESCRIPTION
701	TRBD Assy	2139786-7	1	1	For Console with S/W Ver 3.1, 3.3 & 3.3A,3.3D, 4.0 , 5.0 & above
702	TRCTL	2139787-14	1	1	For Console with S/W Ver 3.1 to 3.3D & V4.0
	Assy	2245202 -3	1	1	For Console with S/W Ver 5.0

NOTE

- 6. TRBD Assys 2139786-7 is backward compatible with earlier versions of TRBD Assys.
- 7. TRCTL Assys. 2139787-14 is backward compatible with earlier version of TRCTL assys.
- 8. TRCTL Assy 2245202 is not backward compatible with earlier version of TRCTL assys.

6-5 POWER SUPPLY/DISTRIBUTOR PCB

6-5-1 Disassembly/Assembly of Power Supply/Distributor PCB

Follow steps below and refer ILLUSTRATION 6-13

- 1. Remove Top Cover. Refer section 6-1.
- 2. Remove Front Panel. Refer section 6-3-1
- 3. Remove dust filter.
- 4. Remove two screws (e,f) holding the power supply unit to the chassis.
- 5. Remove four screws (c,d,g,h) to remove cross member.
- Remove the fan. Refer section 6-6-1.
- 7. Remove all connections on the Power Supply Distributor.
- 8. Remove screws (a,b) holding the Power Supply to the chassis.
- 9. Remove two screws (i,k) and loose the other two screws (i,l) and remove the dust filter plate.
- 10. Slide the power supply forward (CRT may have to be lifted up to remove the power supply)
- 11. Remove six screws holding the Power Supply Distributor PCB to the power supply rear bracket.
- 12. Remove the Power Distributor PCB upward after disconnecting the cable connector between power supply and power distributor pcb.
- 13. For assembly follow the reverse order.

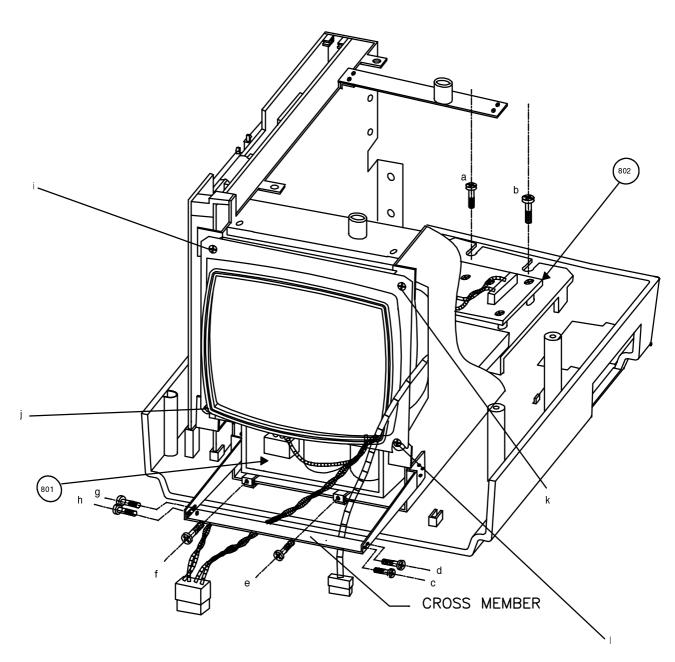
MATERIAL LIST-Power Supply/Distributor PCB

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

TABLE 6-11
POWER SUPPLY/DISTRIBUTOR PCB

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
801	Power Supply (Low Voltage) Assembly	2139739	1	1	
801	Power Supply Assembly with shield	2237916	1	1	
802	Power Distributor PCB Assembly	2139788	1	1	



POWER SUPPLY ASSEMBLY ILLUSTRATION 6-13

■ REV 9 2139768

6-6 FAN

■ 6-6-1 Disassembly/Assembly of Fan

Follow steps below and refer ILLUSTRATION 6-14

- Remove Top Cover. Refer section 6-1.
- 2. Remove 2 screws (a,d) and loosen screws b,c from the chassis.
- 3. Remove the connector (e) on the power distributor board which is connected to the fan.
- 4. Remove Fan assembly from the unit.
- 5. For assembly follow the reverse order.

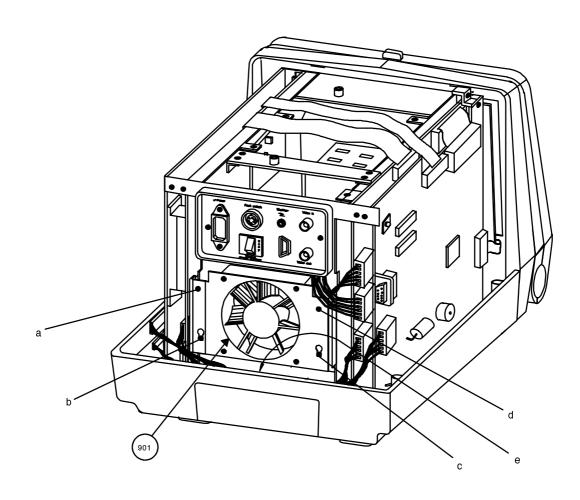
MATERIAL LIST-Fan Assembly

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

TABLE 6-12
FAN ASSEMBLY

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
901	Fan Assembly	2139738	1	1	Fan with bracket



FAN ASSEMBLY
ILLUSTRATION 6-14

■ REV 9 2139768

6-7 REAR PANEL

■ 6-7-1 Disassembly/Assembly of Rear Panel

Follow steps below and refer ILLUSTRATION 6-15

- 1. Remove Top Cover. Refer section 6-1.
- 2. Remove Noise filter by removing screws (c,j) then disconnect the power cables from the noise filter.
- 3. Remove 2 screws (b,i) from the rear panel.
- 4. Remove the connectors from the DSC board and CRT PCB.
- 5. Remove the connections to the circuit breaker.
- Remove the rear panel from the chassis.
- 7. For assembly follow the reverse order.

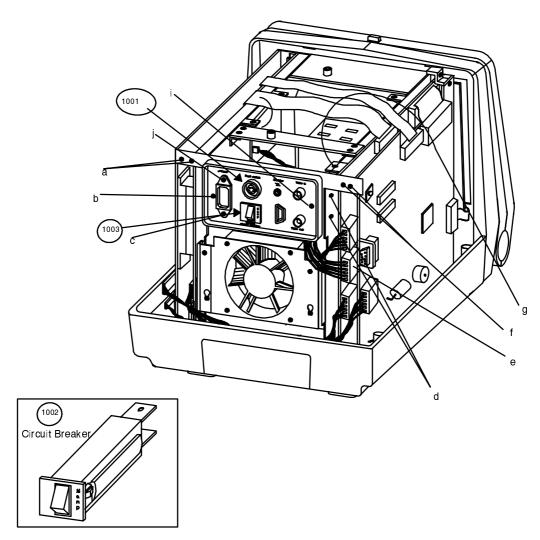
MATERIAL LIST-Rear Panel

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

TABLE 6-13

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
1001	Rear Panel Assembly	2224132	1	1	For V4 Operator Consoles of 100-240VAC 2215602, 2215669, 2215670, 2215671, 2215672
		2165420	1	1	For V4 Operator Consoles of 100-115VAC 2215673
1001	Rear Panel Assembly	2245199	1	1	Only for V5 Console of 100-240VAC 2244690, 2247333, 2247334, 2247335, 2247336
		2247378	1	1	Only for V5 Console of 100-115VAC 2247337
1002	Circuit Breaker	2139672	1	2	



■ REV 9 2139768

6-8 HV POWER SUPPLY

■ 6-8-1 Disassembly/Assembly of HV Power Supply

Follow steps below and refer ILLUSTRATION 6-16

- 1. Remove Top Cover. Refer section 6-1.
- 2. Remove the Shield Plate.
- 3. Remove all cables (a) to the HV Power Supply.
- 4. Remove 2 screws (b,d) on the clamp.
- 5. Pull the HV PCB upward (cables e,f may have to be removed).
- 6. For assembly follow the reverse order.

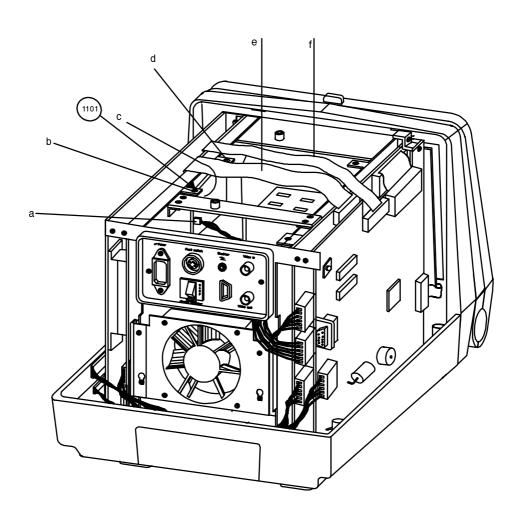
MATERIAL LIST-HV Power Supply Assembly

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

TABLE 6-14 **HV POWER SUPPLY ASSEMBLY**

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
1101	HV Power Supply Assembly	2139791	1	1	



HV POWER SUPPLY

■ REV 9 2139768

6-9 CHASSIS

Follow steps below and refer ILLUSTRATION 6-17

- 1. Remove Top Cover. Refer section 6-1.
- 2. Remove Front Panel. Refer section 6-3-1
- 3. Remove Monitor Assembly. Refer section 6-3-2
- 4. Remove PCBs. Refer section 6-4
- 5. Remove the fan. Refer section 6-6-1.
- 6. Remove the rear panel. Refer section 6-7-1.
- 7. Remove Power Supply. Refer section 6-5
- 8. Remove HV Power Supply. Refer section 6-8
- 9. Remove the chassis by removing eight screws (a,b,c,d,e,f,g,h) on the base.
- 10. For assembly follow the reverse order.

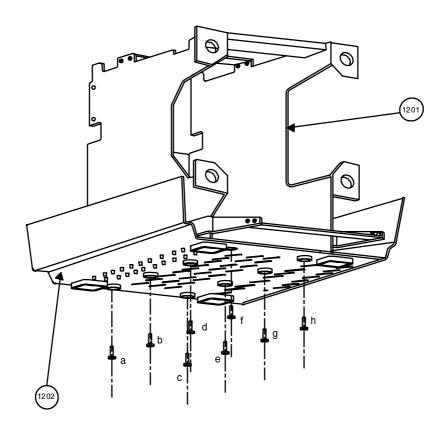
MATERIAL LIST-Chassis

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413.

TABLE 6-15 CHASSIS

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
1201	Chassis with Mylar sheet	2155099	1	2	
1202	Base	2139721	1	2	



chassis ILLUSTRATION 6-17

6-10 CABLE Assy

MATERIAL LIST- Cable Assembly

TABLE 6-16
CABLE ASSEMBLY

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
1301	LOGIQ™α100 Cable Set	2154472-3	1	1	Cable Assy for LOGIQ [™] α100

LOGIQ[™] α100 Cable Set (2154472-3) comprises of:

Part Name	Part Number	Qty.	Description
Cable Assy 1	2141765	1	Cable between power line noise filter and circuit breaker
Cable Assy 3	2169303-2	1	Cable used for interfacing mains power, low voltage power supply, noise filter and power switch Contains, apart from cable, Core Support Clamp and associated Screws and Nuts
Cable Assy 4	2141768	1	Cable Assembly for power switch
CableAssy 5	2141769-2	1	Cable Assembly between low voltage power supply and power distributor PCB
Cable Assy 6	2141770	1	Cable Assembly for 5V sense between power distributor and Condor power supply
Cable Assy 7	2141775	1	Cable Assembly for power supply to CPU Assembly
Cable Assy 8	2141776	1	Cable Assembly for power supply to DSC Assembly
Cable Assy 9	2141777	1	Cable Assembly for power supply to DSC Assembly
Cable Assy10	2141778-2	1	Cable Assembly for power supply to TRCTL Assembly
Cable Assy 11	2141779-2	1	Cable Assembly for power supply to TRBD Assembly
Cable Assy12	2141780	1	Cable Assembly for HV power supply to TRBD Assembly
Cable Assy13	2141781	1	Analog interface cable for TRBD & TRCTL Assembly
Cable Assy14	2141782-2	1	Cable between power distributor and HV power supply
Cable Assy15	2141783-2	1	Cable Assembly between power distributor and monitor
Cable Assy17	2141785	1	CPU-TRCTL Interface cable
Cable Assy18	2141786	1	TRCTL-DSC Interface cable
Cable Assy19	2141787	1	CPU-DSC Interface cable
Cable Assy20	2141788	1	Analog Communication cable between TRCTL and DSC
Cable Assy22	2141790	1	CPU-KBD interface cable
Cable Assy24	2150785	1	CPU - Rear Panel RS232 cable(for Console V4.0 and below)
Cable Assy26	2245205	1	TGC - TRCTL interface cable(for V5.0 & above)
Cable Assy27	2245206	1	CPU - Rear Panel Parallel Port cable(for V5.0 & above)

Note

- 1. Cable Assembly 2 (2141766) is part of Cable Assembly 3
- 2. Cable Assembly 16 (2141784) comes with fan
- 3. Cable Assembly 21 (2141789) and 24 (2150785) are part of Rear Panel Assembly
- 4. Cable Assembly 23 (2150784) is part of Keyboard Assembly
- 5. Cable Assembly 25 (2150786) is part of Gain Encoder Assembly
- 6. Depending on V5, V4 Systems Cable to be used.

6-11 General

6-11-1 Metallic Set

MATERIAL LIST-Metallic Set

TABLE 6-17 METALLIC SET

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
1501	LOGIQ™α100 - metallic set	2152465-3	1	2	Metallic parts of LOGIQ™α100

LOGIQ[™] α 100 Metallic Set (2152465-3) comprises of:

Part Name	Part Number	Quantity	Description
Base Plate	2139690	1	For V4.0 Systems and below
Base Plate	2244025	1	For V5.0 & above Systems
Trackball Bracket	2139692	1	For V4.0 Systems and below
Trackball Bracket	2244032	1	For V5.0 & above Systems
Gain Control Bracket	2139693	1	
Helical Spring Coil	2139698	2	
Support Plate	2139707	1	
Z Plate	2139709	1	
R - Plate	2139711	1	
L - Plate	2139723	1	
Probe Connector Cover	2139724	1	
PCB Spacer	2139725	2	
Power Supply Shield	2139726	1	
Fan Bracket	2139730	1	
L - Bracket	2139731	2	
Handle Bracket Front	2139732-2	1	
Handle Bracket Rear	2139733	1	
Rear Panel Bracket	2139734	1	For V4.0 Systems & below
Rear Panel Bracket	2244036	1	For V5.0 & above Systems
Analog PCB Front Clamp	2139736	1	
Digital PCB Front Clamp	2139737	1	
Hinge Bracket Right	2147018	1	
Hinge Bracket Left	2147019	1	
Cross Member	2147020	1	
Cable clamp lever	2150263	2	
Edging	2150264	0.52 m	
Chassis Front Bracket	2150646	1	

■ 6-11-1 Mettalic Set Continued

Part Name	Part Number	Quantity	Description
Power Supply Rear Bracket	2150648	1	
Power Supply Front Bracket	2150647	1	
Dust Cover Plate	2150693	1	
Back Plate	2152182	1	
Cable Clamp small	2154086	2	
Chassis with mylar sheet	2155099	1	
Core Support Clamp	2168285	1	
Shield Plate	2168362	1	
Cable clamp (big)	2150262	2	

6-11-2 Plastic Set

MATERIAL LIST-Plastic Set

TABLE 6-18
PLASTIC SET

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
1601	LOGIQ™α100 - Plastic set	2152467-2	1	2	Plastic parts of LOGIQ™α100

LOGIQ™ α100 Plastic Set (2152467-2) comprises of:

Part Name	Part Number	Quantity	Description
Rear Panel Sticker (100/115 V)	2165411	1	For V4.0 Systems & below
Rear Panel Sticker (220/240 V)	2139265	1	For V4.0 Systems & below
Rear Panel Sticker (100/115 V)	2244038	1	For V5.0 & above Systems
Rear Panel Sticker (220/240 V)	2244037	1	For V5.0 & above Systems
Key Sheet	2139691	1	
TB Ring Pad	2139694	1	
TB Base Pad	2139695	1	
Lock Release	2139697	1	
Key Board Top*	2139699	1	
End Cap	2139700	2	
Key Board Bottom* (Emblem 2152508 mounted on this)	2139701	1	For V4.0 Systems & below

■ 6-11-2 Plastic Set Continued

Part Name	Part Number	Quantity	
Key Board Bottom* (Emblem 2152508 mounted on this)	2245216	1	For V5.0 & above Systems
Ring Bush	2139702	2	
Gain Knob	2139703	1	
Spacer Pad	2139704	2	
Front Panel* (Emblem 2152507 mounted)	2139705	1	For V4.0 Systems & below
Front Panel* (Emblem 2152507 mounted)	2245215	1	For V5.0 & above Systems
CRT Filter	2139706	1	
Filter Pad	2139708	1	
Lock Hold	2139710	1	
Knob	2139712	2	
Bottom Hinge*	2139713	1	
Handle Top	2139714	1	
Handle Bottom	2139715	1	
Top Cover*	2139716	1	
Cable Hook - Right	2139717	1	
Cable Hook - Left	2139718	1	
Handle Cap	2139719	2	
Probe Holder	2139720	1	
Base	2139721	1	
Support Pad	2139722	4	
Rear Panel	2139735	1	For V4.0 Systems & below
Rear Panel	2244035	1	For V5.0 & above Systems
Protective Earth Label	2150261	1	
TGC Caps	2244034	6	For V5.0 & above systems

^{*} The following Plastic items are painted with Copper Paint. This parts can be mixed with the earlier Silver Painted Parts.

- 1. Top cover 2139716,
- 2. Bottom Hinge 2139713,
- 3. Front panel 2139705 for V4 systems & 2245215 for V5 systems
- 4. Keyboard Top 2139699-2,
- 5. Keyboard Bottom 2139701 for V4 systems & 2245216 for V5 systems
- 6. Base 2139721

6-11-3 Fastener Set

MATERIAL LIST-Fastener Set

TABLE 6-19
FASTENER SET

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
1701	LOGIQ™α100 - Fastener set	2152468	1	1	Fastener set of LOGIQ™α100

LOGIQ™ α100 Fastener Set (2152468) comprises of:

Part Name	Part Number	Quantity
STR Screw (Condor)	2139727	8
Chrome STR. Screw M3 x 16	2139743	5
Chr. str.Scr. M3 x 8+ Buil in SPR + PLNWAS	2160612	4
Chrome Str. Screw M4 x 40	2139747	2
STR.Scr. M3 x 6+ Built in SPR + PLNWAS	2139749	15 for V4.0 & below 19 for V5.0 & above
Str. Screw M3 x 6	2139750	12
Csk Screw M3 x 8	2160652	11
Str.Scrm 3 x 8 + Built in SPR + PLNWAS	2139752	46
Grub Screw M2.6 x 3	2139758	1
Str. Screw M3 x 20	2141214	4
Chr.Plt Str.SC M3 x 12	2150266	8
K15 Clamp + M 3.5 x 8 Screw	2150773	8
Chrome Str. Screw M3 x 20	2153241	1
Chrstr.Scrm 4 x 10 + Built in SPR + PLNWA	2153244	12
Chr. Str. Scr M3 x 25 + Plain Washer + SPR Washer	2160611	2
Serated Washer for Condor PS	2153418	8
Chrome Star Screw M4 x 30	2154087	4
Chr. Str. Scr. M3 x 12 + Built in Washer	2160653	2
Chr Str. Scr M4 x 6 + Serrated Washer	2173752	3
Hexagonal Nut M3	2139748	1
Tap Tight Screws M3 x 8	2169307	11
Self Tap Screws M3 x 6	2169305	6

6-11-4 Trackball Maintenance Kit

MATERIAL LIST-Trackball Maintenance Kit (Only for Mechanical Trackball) OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673,

TABLE 6-20
TRACKBALL MAINTENANCE KIT

FRU NO.	PART NAME	PART NO.	QTY.	FRU	DESCRIPTION
1801	Trackball Cleaning Kit	2172034	1	1	

Trackball Cleaning Kit (2172034) comprises of:

Part Name	Part Number	Quantity
Trackball Tool	2166241	12
Cotton Bud	2166731	12
TCF Dry Cleaner	2166732	12

NOTE

1. Optical Trackball Doesnot Require Cleaning.

7-1 OVERVIEW

This Chapter contains periodic maintenance procedures. Periodic maintenance helps in reducing equipment down-time, service cost and operational hazards.

7-2 PERIODIC MAINTENANCE

Periodic Maintenance consists of visual inspections, system performance checks, periodic cleaning of certain critical parts and Electrical Safety Tests. Perform these procedures at six months interval to ensure smooth functioning of the system. The schedule of maintenance is based on an estimated equipment usage of 40 hours per week.

7-3 PROCEDURES

7-3-1 Visual Inspection

- a. Check cables for cracks, nicks and abrasions of their insulation.
- b. Check that cables sheath are securely clamped in cable glands/connector clamps where applicable.
- c. Check that cables are correctly routed and secured.
- d. Check that all screws are in place and not missing.
- e. Check that all detachable cable connectors are fully home in their sockets.
- f. Check that all equipment covers and fixing are in place and undamaged.
- g. Check that the keyboard keys and trackball have correct function and no mechanical damage.
- h. Check the probe and probe cable for cracks or deterioration.
- i. Check probes for damages.
- j. Check for mechanical problems, or keyboard problems.
- k. Check the equipment for loose or missing hardware.
- I. Check the operation of the cooling fan and make sure that air flow path is clear.

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7-3-2 Cleaning

All external parts may be cleaned using a soft cloth lightly moistened with warm water. If necessary, use mild soap solution. Do not use alcohol based solutions, solvents or abrasive cleaners.

System

- a. Prior to cleaning the system, turn OFF the system and start the cleaning operation.
- b. Clean CRT filter.
- c. Clean the fan and the body of the LOGIQ $^{\text{TM}}\alpha 100$ with a vacuum cleaner and bristled brush.
- d. Clean around the unit and the system cabinet.
- e. Clean the display monitor. Use a soft, slightly moistened cloth. If the monitor is still soiled, use a slightly moistened cloth with detergent. Then clean with a soft cloth.
- f. Use a soft, slightly moistened cloth to clean the keyboard controls.
- g. Clean the foot switch with a soft, non-abbrasive, slightly moistened cloth.
- h. Clean the VCR with a soft clean dry cloth. Clean the record and playback heads with a soft non-abrasive cleaning system.
- i. Clean the Video Graphic Printer with a soft dry cloth.

Note:

Do not spray any liquid directly into the system. When cleaning the monitor, make sure not to scratch the monitor.

Probes

Clean the probe lens, cable and casing thoroughly. Check for any crack which will allow liquid to enter the probe. If any such damage is found do not use the probe till replaced.

- a. Remove the coupling gel from the probe by wiping with a soft cloth or rinsing with flowing water.
- b. The probe can also be washed with lukewarm water and mild soap with a soft sponge, gauze or cloth, removing all visible residue. Detergent or abrasive cleaners should not be used.
- c. Wash thoroughly with distilled water to remove all soap residue.
- d. Dry the probe with a soft cloth or by exposing it to Air.
- e. Do not use Mineral Oil, Oil based couplants or other non-approved materials because they may damage the probe (eg. lotions are oil based couplants)
- f. Do not immerse or soak any part of the probe in any cleaning material and do not attempt to sterilize the probe with autoclave, ultraviolet, gamma radiation, gas, or dry-heat sterilization techniques.
- g. Properly immerse the probe in a suitable commercial germicide. Use an EPA registered germicide intended for use on plastic medical instruments. Follow the germicide manufacturer's instructions regarding concentration, time of contact, storage and disposal.

REV 0 2139768

- h. 2% Glutaraldehyde type solutions without surfactants are recommended (such as Cidex ®).
- i. Do not use alcohol or alcohol based solutions.
- j. Thoroughly rinse all residue from the probe with sterile distilled water after removal from the germicide.

7-3-3 Measurement

- a. Make sure that electrical outlet of hospital should provide the proper power output. (Refer to Chapter 2, Installation).
- b. Ensure that all power supply voltages are within tolerance. Refer Chapter 4, Functional Checks for service adjustment procedure.
- c. Perform electrical safety tests on the following components :
 - Hospital outlet (Facility power wiring test)
 - All transducers (Transducer source leakage current test)
 - Console and peripherals (Chassis source leakage current test and ground continuity test)

■ 7-4 TRACKBALL MAINTENANCE (Only for Mechanical Trackballs not applicable for Optical Trackball)

The trackball needs to be kept clean in order to operate smoothly. When dirt sticks inside the trackball, it's operation can be erratic or impaired. Regularly clean the trackball according to the following procedure.

Obtain the following items for cleaning the trackball,

The Trackball Maintenance Kit (2172034) comprises of:

Trackball Tool (Opener) Cotton Bud (impregnated) TFC Dry Cleaner

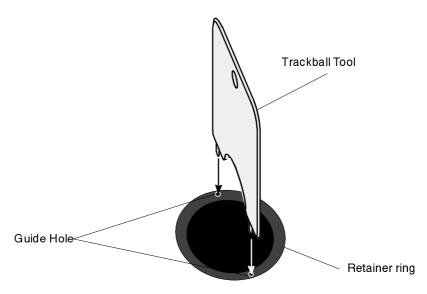
OR

Trackball Tool (Opener)

Cotton Bud, Ethanol, isopropyl alcohol or VCR head cleaner and dry cloth.

7-4-1 Removal of the Retainer Ring

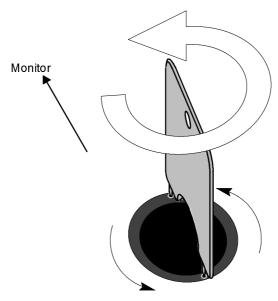
- a. Turn OFF the system, and unplug the unit.
- Insert the projected end of the trackball tool into the guide hole of the retainer ring (2 places). Refer ILLUSTRATION 7-1 (a).



REMOVAL OF THE RETAINER RING | ILLUSTRATION 7-1 (a)

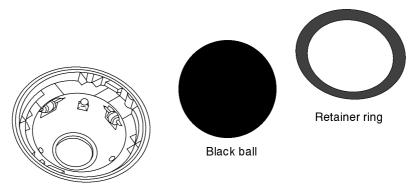
7-4-1 Removal of the Retainer Ring (Continued)

c. Rotate the trackball tool in a counterclockwise direction smoothly. Refer ILLUSTRATION 7-1 (b)



REMOVAL OF THE RETAINER RING (CONT'D)
ILLUSTRATION 7-1 (b)

- d. Remove the Retainer ring from the keyboard.
- e. Take out the black ball. Refer Illustration 7-1(c).



REMOVAL OF THE RETAINER RING (CONT'D)
| ILLUSTRATION 7-1 (c)

REV 2 2139768

7-4-2 Cleaning the Trackball

f. Wipe any oil and dust from the black ball using the TFC Dry Cleaner of the maintenance kit or a dry cloth.

Note

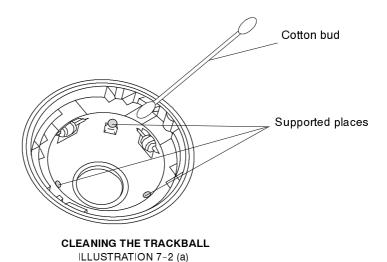
Set the retainer ring and black ball on a flat surface to avoid losing these parts.

g. Wipe any oil and dust from the 3 places that support the black ball (a small spherical ball) with a cotton bud. Refer ILLUSTRATION 7-2 (a).

Note

When cleaning the trackball housing, make sure not to spill or spray any liquid into the trackball housing (system/keyboard). Use either ethanol, isopropyl alcohol or VCR head cleaner to clean the trackball assembly.

Avoid other solvents that may damage the rubber and mechanical parts of the trackball assembly.



7-8

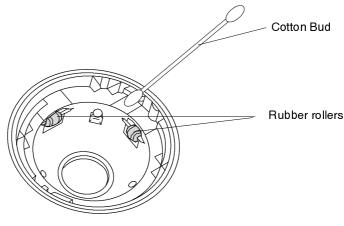
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7-4-2 Cleaning the Trackball (Continued)

h. Wipe any oil and dust from the 2 rubber rollers with a cotton bud (impregnated) dipped in alcohol or cotton bud with ethanol, isopropyl alcohol or VCR head cleaner. Refer ILLUSTRATION 7-2 (b).

Note

When cleaning the rubber rollers do not use excessive force. If the rubber rollers anchoring location is damaged, rollers can slip and, it will hinder the smooth operation of the trackball.

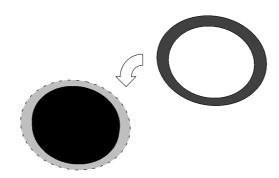


CLEANING THE TRACKBALL (CONT'D)

ILLUSTRATION 7-2 (b)

7-4-3 Fixing the Trackball and Retainer Ring

- i. Insert the black ball.
- j. Insert the retainer ring.



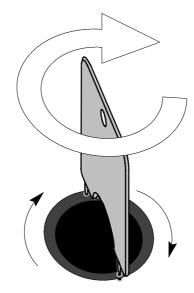
FIXING THE TRACKBALL AND RETAINER RING ILLUSTRATION 7-3 (a)

7-4-3 Fixing the Trackball and Retainer Ring (Continued)

k. Insert the trackball tool from the maintenance kit into the guide holes (2 places on the retainer ring), and rotate the trackball tool in a clockwise direction to lock the retainer ring. Refer ILLUSTRATION 7-3 (b).

Note

When installing the retainer ring, do not use excessive force to lock the retainer ring. Excessive force will damage the retainer ring and trackball tool.



FIXING THE TRACKBALL AND RETAINER RING (CONT'D) | ILLUSTRATION 7-3 (b)

Note

To request additional trackball maintenance kits or information, contact the local Applications, Sales or Service Representative.

7-5 ELECTRICAL SAFETY TESTS

The following tests are performed at the factory and should be repeated at the site as part of periodic maintenance. These tests are: grounding continuity, chassis leakage current, probe leakage current. All measurements are made with an Electrical Safety Analyzer Model Dale 600/600E built by Dale Technology Corporation or equivalent device.

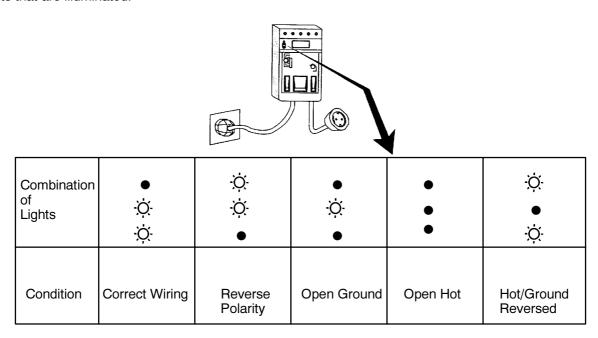
Recommended Tool

TABLE 7-1 **RECOMMENDED TOOL**

Part Number Name		Description
46-285652G1	Electrical Safety Analyzer DALE 600	For 120V Units
46-328406G2	Electrical Safety Analyzer DALE 600E	For 220V Units
2113015	Leakage Current Ultrasound Kit	For 120V and 220V Units

7-5-1 Outlet Test Wiring Arrangement

Test all outlets in the area for proper wiring arrangement by plugging in the Dale 600/600E and noting the combination of lights that are illuminated.



OUTLET TESTILLUSTRATION 7-4

Note

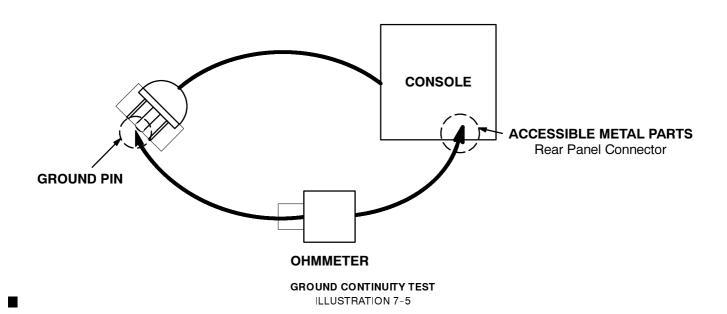
No outlet tester can detect the condition where the Neutral (grounded supply) conductor and the Grounding (protective earth) conductor are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

7-5-2 Ground Continuity



The patient must not be contacted to the equipment during this test because it may cause electric shock.

Measure the resistance from the third pin of the attachment plug to the exposed metal parts of the case (See ILLUSTRATION 7-5), this should be less than **0.2** ohms.



Meter Procedures

Follow these steps to test the ground wire resistance.

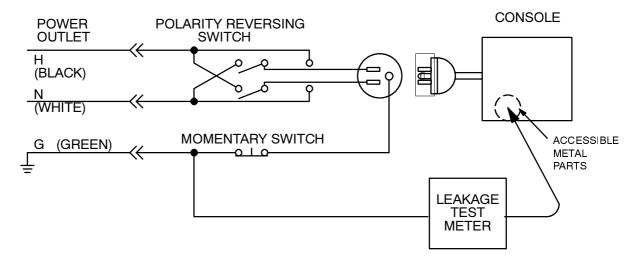
- 1. Turn the LOGIQ[™]α100 unit OFF.
- 2. Plug the unit into the meter, and the meter into the tested AC wall outlet. (Refer ILLUSTRATION 7-5).
- 3. Plug the black chassis cable into the meter's 'CHASSIS' connector and attach the black chassis cable clamp to an exposed metal part of the LOGIQ $^{\text{\tiny{M}}}\alpha$ 100 (Refer ILLUSTRATION 7-5).
- 4. Set the meter's 'FUNCTION' switch to the RESISTANCE position.
- 5. Set the meter's 'POLARITY' switch to the OFF (Center) position.
- 6. Measure the ground wire resistance and keep a record of the results with other hard copies of Preventive Maintenance (PM) data kept on site.

7-5-3 Chassis Leakage Current Test

Definition

Leakage current is the electrical current that could flow through the patient or sonographer should a ground wire break. The unit, the probes and all external peripherals must be tested.

The test verifies the isolation of the power line from the chassis. The testing meter is connected from accessible metal parts of the case to ground. Measurements should be made with the unit ON and OFF, with the power line polarity Normal and Reversed. **Record the highest reading of current.**



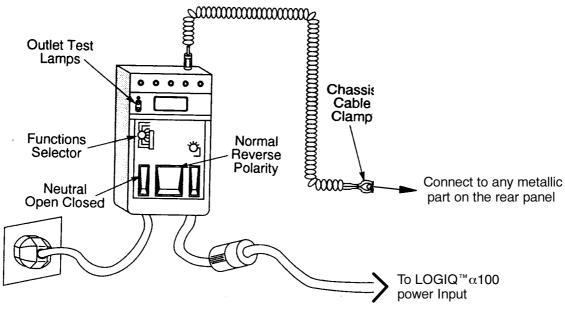
SETUP FOR CHASSIS SOURCE LEAKAGE CURRENT ILLUSTRATION 7-6

7-5-3 Chassis Leakage Current Test (Continued)

Meter Procedures

Follow these steps to test the unit for leakage current.

- 1. Turn the LOGIQ™α100 unit OFF.
- 2. Plug the unit into the meter, and the meter into the tested AC wall outlet.



GROUND AND CHASSIS LEAKAGE CURRENT TEST ILLUSTRATION 7-7

- 3. Plug the black chassis cable into the meter's 'CHASSIS' connector and attach the black chassis cable clamp to an exposed metal part of the LOGIQ $^{\text{\tiny{M}}}\alpha$ 100 unit. (Refer ILLUSTRATION 7-7).
- 4. Set the tester's 'FUNCTION' switch to CHASSIS position.
- 5. Take readings for various locations as mentioned in TABLE 7-3.

TABLE 7-2
CHASSIS LEAKAGE CURRENT TEST CONDITIONS

Test	Location	
1	Mounting screw for probe receptacle	
2	Rear Panel	
3	Mounting screw on the handle	
4 Mounting screw for peripheral plugged into unit		

6. Keep a record of the results with other hard copies of PM data kept on site.

7-5-3 Chassis Leakage Current Test (Continued)

Data Sheet for Chassis Source Leakage Current

Follow the foregoing test procedure. The test passes when all readings measure less than the value shown in TABLE 7-3 below.

TABLE 7-3
MAXIMUM ALLOWANCE LIMIT FOR CHASSIS SOURCE LEAKAGE CURRENT

Country	Normal Condition	Open Ground	Reverse Polarity	Open Neutral
USA	N/A	0.3mA	0.3mA	N/A
Others	0.1mA	0.5mA	0.5mA	0.5mA



When the meter's ground switch is OPEN, do not touch the unit to avoid possible electric shock.

TABLE 7-4

DATA SHEET FOR CHASSIS SOURCE LEAKAGE CURRENT

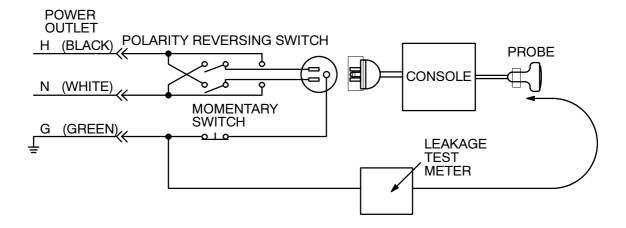
Unit Power	Tester POLARITY Switch	Tester NEU- TRAL Switch	Test 1 Probe Connector	Test 2 Rear Panel	Test 3 Mounting screw on the handle
Enter name of te	sted peripheral h	ere:			
ON	NORM	OPEN			
ON	NORM	CLOSED			
ON	REV	OPEN			
ON	REV	CLOSED			
OFF	NORM	OPEN			
OFF	NORM	CLOSED			
OFF	REV	OPEN			
OFF	REV	CLOSED			

7-5-4 Probe Leakage Current Test

Description

This test measures the current that would flow to the ground from any of the probes through a patient who is being scanned when he comes into contact with the ground surface.

Measurements should be made with the ground open and closed, with power line polarity normal and reversed and with the unit OFF and ON. For each combination, the probe must be active to find the worst case condition.



SETUP FOR PROBE LEAKAGE CURRENT ILLUSTRATION 7-8

Note

Each probe will have some amount of leakage current, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement.

7-5-4 Probe Leakage Current Test (Continued)

Meter Procedure using Probe Adapter and Saline Bath

The Dale 600/600E provides a method for testing probes independently from the system. The meter utilizes a probe adapter to apply common test potential to all connector pins.

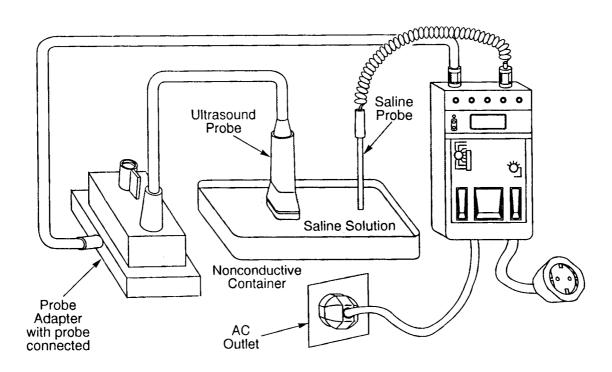
The probe's imaging area is immersed in a saline solution along with a grounding probe from the meter to complete the current path. Saline solution is a mixture of water and salt. The salt adds a free ion to the water, making it conductive. Normal saline solution is 0.9% salt or 1/2 gram salt per 1 liter of water. If saline is not available, a mixture of 1 quart water with one or more grams of table salt, mixed thoroughly, will substitute.



To avoid probe damage and possible electric shock, do not immerse probes into any liquid beyond the level indicated in the operators manual (Chapter 1). Do not touch the probe, conductive liquid or any part of the unit under test while the ISO TEST switch is depressed.

Follow these steps to test each probe for leakage current.

- 1. Turn the LOGIQ™α100 unit OFF.
- 2. Plug the unit into the test meter, and the meter into the tested AC wall outlet.
- 3. Connect the probe to be tested to the meter's appropriate adapter. (Refer ILLUSTRATION 7-8)
- 4. Plug the saline probe into the meter's 'CHASSIS' connector. (Refer ILLUSTRATION 7-8)



TRANSDUCER SOURCE LEAKAGE CURRENT TEST
ILLUSTRATION 7-9

7-5-4 Probe Leakage Current Test (Continued)

- 5. Plug the probe adapter into the meter's connector marked 'EXTERNAL'.
- 6. Set the meter's 'FUNCTION' switch to EXTERNAL position.
- 7. Add the saline probe and the imaging area of the probe into the saline bath.
- 8. Have unit power ON for the first part; turn it OFF for the second half.
- 9. Depress the ISO TEST rocker switch and record the highest current reading.
- 10. Follow the test conditions described in TABLE 7-6 for every probe.
- 11. Keep a record of the results with other hand copies of PM data.

General Procedure

Follow these steps to test each probe for leakage current.

- 1. Turn the LOGIQ™α100 unit OFF.
- 2. Plug the unit into the test meter, and the meter into the tested AC wall outlet.
- 3. Plug the external probe into the meter's 'EXTERNAL' connector.
- 4. Set the meter's 'FUNCTION' switch to 'EXTERNAL' position.
- 5. Connect the probe for test with the connector of the console.
- 6. Apply a liberal amount of gel to the probe's lens.
- 7. Wrap the probe in aluminium foil, making sure there is good contact with its acoustic aperture.
- 8. Either suspend the probe by its cable or place it on an insulated surface.
- 9. Have unit power ON for the first part; turn it OFF for the second half.
- 10. Hold the external probe against the aluminium foil on the probe when the unit is ready to scan.
- 11. Depress the ISO TEST rocker switch and record the highest current reading.
- 12. Follow the test conditions described in the TABLE 7-6 for every probe
- 13. Keep a record of the results with other hand copies of PM data.

7-5-4 Probe Leakage Current Test (Continued)

Data Sheet for Transducer Source Leakage Current

Follow the foregoing test procedure for every probe. The test passes when all readings measure less than the value shown in the table below:

TABLE 7-5 MAXIMUM ALLOWANCE LIMIT FOR PROBE LEAKAGE CURRENT

Type BF Applied Part Leakage Current Limits [Non-conductive (floating) Surface and Intracavitary probes]

Country	Normal Condition	Open Ground	Reverse Polarity	Open Neutral
USA	0.05mA	0.05mA	0.05mA	0.05mA
Others	0.1mA	0.5mA	0.5mA	0.5mA

TABLE 7-6 **DATA SHEET FOR PROBE SOURCE LEAKAGE CURRENT**

probe tested:

LOGIQ™α100 Unit Power	Test Power Polarity	Tester Ground Switch	Measurement
ON	NORM	OPEN	
ON	NORM	CLOSED	
ON	REV	OPEN	
ON	REV	CLOSED	
OFF	NORM	OPEN	
OFF	NORM	CLOSED	
OFF	REV	OPEN	
OFF	REV	CLOSED	

7-5-5 When There's Too much Leakage Current....

Chassis Fails

Check the ground on the power cord and plug for continuity. Ensure the ground is not broken, frayed, or intermittent. Replace any defective part.

Tighten all grounds.

Inspect wiring for bad crimps, poor connections, or damage.

Test the wall outlet and verify if it is grounded. Notify the user or owner to correct any deviations. Check the other outlets to see if they could be used instead.

Note

No outlet tester can detect the condition where the white neutral wire and the green grounding wire are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

Probe Fails

Replace the probe and try again.

Peripherals Fail

Tighten all ground connection screws.

Inspect wiring for bad crimps, poor connections, loose screws or damage.

Still Fails

Begin isolation by removing the probes, external peripherals, then the on board ones, one at a time while monitoring the leakage current measurement.

New Unit

If the leakage current measurement tests fail on a new unit and if situation cannot be corrected, submit a Safety Failure Report to document the system problem. Remove the unit from operation.