



**GE Healthcare**

# **Technical Publication**

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**GE Healthcare**

**LOGIQ™<sub>α</sub> 100/LOGIQ™ 100 PRO**

**Basic Service Manual**

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# IMPORTANT PRECAUTIONS

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## LANGUAGE

### WARNING

- THIS SERVICE MANUAL IS AVAILABLE IN ENGLISH ONLY.
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**AVISO**

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- NO SE DEBERÁ DAR SERVICIO TÉCNICO AL EQUIPO, SIN HABER CONSULTADO Y COMPRENDIDO ESTE MANUAL DE SERVICIO.
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- ESTE MANUAL DE ASSISTÊNCIA TÉCNICA SÓ SE ENCONTRA DISPONÍVEL EM INGLÊS.
- SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEMS, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, É DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIÇOS DE TRADUÇÃO.
- NÃO TENHA TENTADO REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTÊNCIA TÉCNICA.
- O NÃO CUMPRIMENTO DESTA AVISO PODE POR EM PERIGO A SEGURANÇA DO TÉCNICO, OPERADOR OU PACIENTE DEVIDO A CHOQUES ELÉTRICOS, MECÂNICOS OU OUTROS.

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- IL PRESENTE MANUALE DI MANUTENZIONE È DISPONIBILE SOLTANTO IN INGLESE.
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- SI PROCEDA ALLA MANUTENZIONE DELL'APPARECCHIATURA SOLO DOPO AVER CONSULTATO IL PRESENTE MANUALE ED AVERNE COMPRESO IL CONTENUTO.
- NON TENERE CONTO DELLA PRESENTE AVVERTENZA POTREBBE FAR COMPIERE OPERAZIONI DA CUI DERIVINO LESIONI ALL'ADDETTO ALLA MANUTENZIONE, ALL'UTILIZZATORE ED AL PAZIENTE PER FOLGORAZIONE ELETTRICA, PER URTI MECCANICI OD ALTRI RISCHI.

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# Revision History

Revision	Date	Reason for change
A	Dec 22, 1995	Preliminary Release.
B	Jun 19, 1996	YMS Feedback
0	Sep 01, 1996	Production Release
1	Sep 06, 1996	PCB Assy FRU Updation
2	Oct 30, 1996	PCB Assy FRU Updation
3	Mar 03, 1997	FRU/Schematic Updation, Improved Assembly/Dis-assembly diagrams
4	May 15, 1997	Version 3.3 Software release & Plastic/Mettalic set FRU Updation
5	Apr 15, 1998	Version 4.0 Software and Two Probe Port release
6	Jan 24, 2000	Version 5.0 (MP) System release
7	Apr 04, 2000	Version 5.0A (MP) System release to fix B/B Bug.
8	Jul 02, 2000	Version 5.0A (MP) System release for Americas.
9	Dec 19, 2000	Version 5.06A (MP) System release for Component Obsolescence.
10	Oct 5, 2001	LOGIQ™ 100 PRO Release
11	Mar 13, 2002	ME Feedback and M3-M4 Changes of LOGIQ™ 100 PRO
12	Feb 25, 2005	Changes for introduction of New CPU for LOGIQ™ 100 PRO
13	Feb 20, 2007	Updated to incorporate New part numbers(mentiod with Megenta color), software, and service notes.

# List of Effected Pages

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**IN THIS MANUAL:**

*The sections which are relate to V7.0 or Above is applicable to V9.X.X or above systems.  
The sections which are relate to V5.0a & above is also applicable to V9.X.X or above systems.*

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# Chapter 1 Introduction

## Section 1-1 Overview

### 1-1-1 Overview

The LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO 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.

### 1-1-2 Purpose of Chapter 1

This chapter describes important issues related to safely servicing this ultrasound machine. The service provider must read and understand all the information presented here before installing or servicing a unit.

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Table 1-1 Contents in Chapter 1

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This Service Manual provides installation and service information for the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Ultrasound Scanning System and contains the following chapters:

- 1.) **Chapter 1, Introduction:** Contains a content summary and warnings.
- 2.) **Chapter 2, Pre Installation:** Contains any pre-installation requirements for the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO.
- 3.) **Chapter 3, Installation:** Contains installation procedure with installation checklist.
- 4.) **Chapter 4, Functional Checks:** Contains functional checks that must be performed as part of the installation, or as required during servicing and periodic maintenance.
- 5.) **Chapter 5, Theory:** Contains block diagrams and functional explanations of the electronics.
- 6.) **Chapter 6, Service Adjustments:** Contains instructions on how to make any available adjustments to the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO.
- 7.) **Chapter 7, Diagnostics/Troubleshooting:** Provides procedures for running and diagnostic or related routines for the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO

**1-1-3 Purpose of Service Manual (cont'd)**

- 8.) Chapter 8, Replacement Procedures: Provides disassembly procedures and reassembly procedures for all changeable FRU.
- 9.) Chapter 9, Replacement Parts: Contains a complete list of replacement parts for the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO.
- 10.) **Chapter 10, Quality Assurance:** Provides periodic maintenance procedures for the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO.

**1-1-4 Typical Users of the Basic Service Manual**

- Service Personnel (installation, maintenance, etc.).
- Hospital's Service Personnel
- Architects (Some parts of the Pre Installation Chapter)

**1-1-5 LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Models Covered by this Manual**

Part Number	Description	Comments
H41012LF H41112LF H41162LF H41282LF	LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO, 110V - 120V	LOGIQ™ $\alpha$ 100 LOGIQ™ $\alpha$ 100 LOGIQ™ $\alpha$ 100 MP LOGIQ™ 100 PRO
H41012LA-LE H41112LA-LE H41162LA-LE, LG H41282LA-LE, LG	LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO, 100 to 230V	LOGIQ™ $\alpha$ 100 LOGIQ™ $\alpha$ 100 LOGIQ™ $\alpha$ 100 MP LOGIQ™ 100 PRO

**Table 1-2 LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Models Covered in this Manual**

**1-1-6 Purpose of Operator Manual(s)**

The Operator Manual(s) should be fully read and understood before operating the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO and also kept near the unit for quick reference.

## Section 1-2 Important Conventions

### 1-2-1 Conventions Used in Book

#### Model Designations.

This manual covers the LOGIQ™α 100/LOGIQ™ 100 PRO scanners.  
(See “LOGIQ™α 100/LOGIQ™ 100 PRO Models Covered by this Manual” on page 1-2.)

#### Icons.

Pictures, or icons, are used wherever they will reinforce the printed message. The icons, labels and conventions used on the product and in the service information are described in this chapter.

#### Safety Precaution Messages.

Various levels of safety precaution messages may be found on the equipment and in the service information. The different levels of concern are identified by a flag word that precedes the precautionary message. Known or potential hazards are labeled in one of three ways:

 **DANGER** **DANGER IS USED TO INDICATE THE PRESENCE OF A HAZARD THAT WILL CAUSE SEVERE PERSONAL INJURY OR DEATH IF THE INSTRUCTIONS ARE IGNORED.**

 **WARNING** **WARNING IS USED TO INDICATE THE PRESENCE OF A HAZARD THAT CAN CAUSE SEVERE PERSONAL INJURY OR PROPERTY DAMAGE IF INSTRUCTIONS ARE IGNORED.**

 **CAUTION** **Caution is used to indicate the presence of a hazard that will or can cause minor personal injury and property damage if instructions are ignored.**

 **NOTICE** *Equipment Damage Possible*  
*Notice is used when a hazard is present that can cause property damage but has absolutely no personal injury risk.*

**NOTE:** *Notes provide important information about an item or a procedure. Information contained in a NOTE can often save you time or effort.*

**1-2-2 Standard Hazard Icons**

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

ELECTRICAL	MECHANICAL	RADIATION
		
LASER	HEAT	PINCH
		

**Table 1-3 Standard Hazard Icons**

Other hazard icons make you aware of specific procedures that should be followed.

AVOID STATIC ELECTRICITY	TAG AND LOCK OUT	WEAR EYE PROTECTION
		

**Table 1-4 Standard Icons Indicating a Special Procedure to be Used**

**1-2-3 Product Icons**

The following table describes the purpose and location of safety labels and other important information provided on the equipment.

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
Identification and Rating Plate	Manufacturer's name and address Date of manufacture Model and serial numbers Electrical ratings	Rear of console near power inlet
Type/Class Label	Used to indicate the degree of safety or protection.	
IP Code (IPX8)	Indicates the degree of protection provided by the enclosure per IEC 529. IPX8 indicates drip proof.	Footswitch
	Equipment Type BF (man in the box symbol) IEC 878-02-03 indicates B Type equipment having a floating applied part.	Probe connectors and PCG connector
	Equipment Type CF (heart in the box symbol) IEC 878-02-05 indicates equipment having a floating applied part having a degree of protection suitable for direct cardiac contact.	ECG connector and surgical probes
Device Listing/Certification Labels	Laboratory logo or labels denoting conformance with industry safety standards such as UL or IEC.	Rear of console
CAUTION - This unit weighs...Special care must be used to avoid..."	This precaution is intended to prevent injury that may result if one person attempt to move the unit considerable distances or on an incline due to the weight of the unit.	On the console where easily seen during transport?
"DANGER - Risk of explosion used in..."	The system is not designed for use with flammable anesthetic gases.	Rear of console

**Table 1-5 Product Icons**

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	"CAUTION" The equilateral triangle is usually used in combination with other symbols to advise or warn the user.	Various
	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.	Various
	"CAUTION - Dangerous voltage" (the lightning flash with arrowhead in equilateral triangle) is used to indicate electric shock hazards.	Various
	"Mains OFF" Indicates the power off position of the mains power switch.	Rear of system adjacent to mains switch
	"OFF/Standby" Indicates the power off/standby position of the power switch. <b>CAUTION</b> <b>This Power Switch DOES NOT ISOLATE Mains Supply</b>	Adjacent to On-Off/Standby Switch
	"Mains ON" Indicates the power on position of the mains power switch. "ON" Indicates the power on position of the power switch. <b>CAUTION</b> <b>This Power Switch DOES NOT ISOLATE Mains Supply</b>	
	"Protective Earth" Indicates the protective earth (grounding) terminal.	

Table 1-5 Product Icons

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	<p>"Equipotentiality" Indicates the terminal to be used for connecting equipotential conductors when interconnecting (grounding) with other equipment.</p>	<p>Rear of console</p>
	<p>"Non-Ionizing Radiation" indicates that the system applies RF energy.</p>	<p>Rear of console near power inlet</p>
	<p>This Symbol indicates that waste electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately. Please contact an authorised representative for manufacturer for information concerning the decomposition of your requirement.</p>	<p>Rear Panel</p>
	<p>Indicates the presence of hazardous substance(s) above the maximum concentration value. Maximum concentration values for electronic information products, as set by the People's Republic of China Electronic Industry Standard SJ/T11364-2006, include the hazardous substances of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE). "10" indicates the number of years during which the hazardous substance(s) will not leak or mutate so that the use of this product will not result in any severe environmental pollution, bodily injury, or damage to any assets.</p>	<p>Rear Panel</p>

Table 1-5 Product Icons

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	No hazardous substance, above the maximum concentration value, are present. Maximum concentration values for electronic information products, as set by the People's Republic of China Electronic Industry Standard SJ/T11364-2006, include the hazardous substances of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE).	Rear Panel

Table 1-5 Product Icons

## Section 1-3 Safety Considerations

### 1-3-1 Introduction

The following safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual, violates safety standards of design, manufacture and intended use of the equipment.



#### **WARNING CARE FULLY READ ALL THE WARNINGS LISTED BELOW.**

- 1.) Read the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Operator Manual thoroughly before operating the system and keep at hand for ready reference.
- 2.) Although the ultrasound energy transmitted from the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO transducer is within AIUM/NEMA standards, unnecessary exposure should be avoided. Only trained personnel should operate/service the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO.
- 3.) To avoid electrical shock, use only the supplied power cords and connect them to properly grounded power Sock et. 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 re move 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 LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO is operated.
- 7.) Concerning outside markings, refer to ILLUSTRATION 1-1 .
- 8.) The LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO 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 equip ment in an inappropriate environment may cause some electronic interference to radios and televi sions around the equipment. Proper handling of this equipment is required in order to avoid such trouble according to the operator and service manuals.*

### 1-3-2 Human Safety

Operating personnel must not remove the system covers.

Servicing should be performed by authorized personnel only.

Only personnel who have participated in a LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Training Seminar are authorized to service the equipment.

### 1-3-3 Mechanical Safety

 **WARNING** **ULTRASOUND PROBES ARE HIGHLY SENSITIVE MEDICAL INSTRUMENTS THAT CAN EASILY BE DAMAGED BY IMPROPER HANDLING. USE CARE WHEN HANDLING AND PROTECT FROM DAMAGE WHEN NOT IN USE. DO NOT USE A DAMAGED OR DEFECTIVE PROBE. FAILURE TO FOLLOW THESE PRECAUTIONS CAN RESULT IN SERIOUS INJURY AND EQUIPMENT DAMAGE.**

 **WARNING** **NEVER USE A PROBE THAT HAS FALLEN TO THE FLOOR. EVEN IF IT LOOKS OK, IT MAY BE DAMAGED.**

 **CAUTION** Always lock the Control Console in its parking (locked) position before moving the scanner around.

 **CAUTION** The LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO weights 10kg or more, depending on installed peripherals, (309 lbs, or more) when ready for use. Care must be used when moving it or replacing its parts. Failure to follow the precautions listed below could result in injury, uncontrolled motion and costly damage.

*NOTE: Special care should be taken when transporting the unit in a vehicle:*

- *Secure the unit in an upright position.*
- *Lock the wheels (brake)*
- *DO NOT use the Control Panel as an anchor point.*
- *Place the probes in their carrying case.*

### 1-3-4 Electrical Safety

To minimize shock hazard, the equipment chassis must be connected to an electrical ground. The system is equipped with a three-conductor AC power cable. This must be plugged into an approved electrical outlet with safety ground. If an extension cord is used with the system, make sure that the total current rating of the system does not exceed the extension cord rating.

The power outlet used for this equipment should not be shared with other types of equipment. Both the system power cable and the power connector meet international electrical standards.

1-3-5 Labels Locations

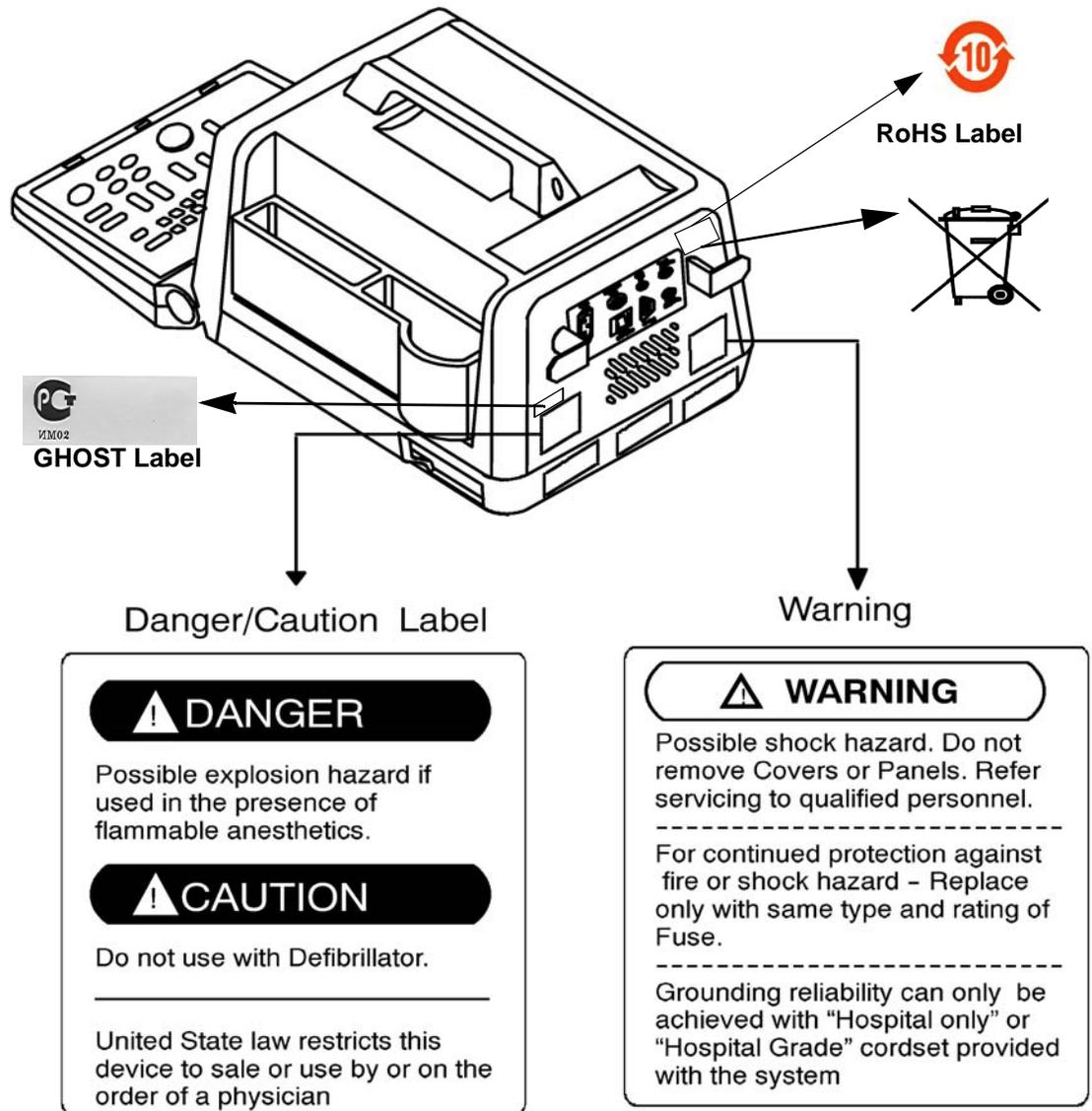


Figure 1-1 Warning Lables

1-3-5 Labels Locations (cont'd)

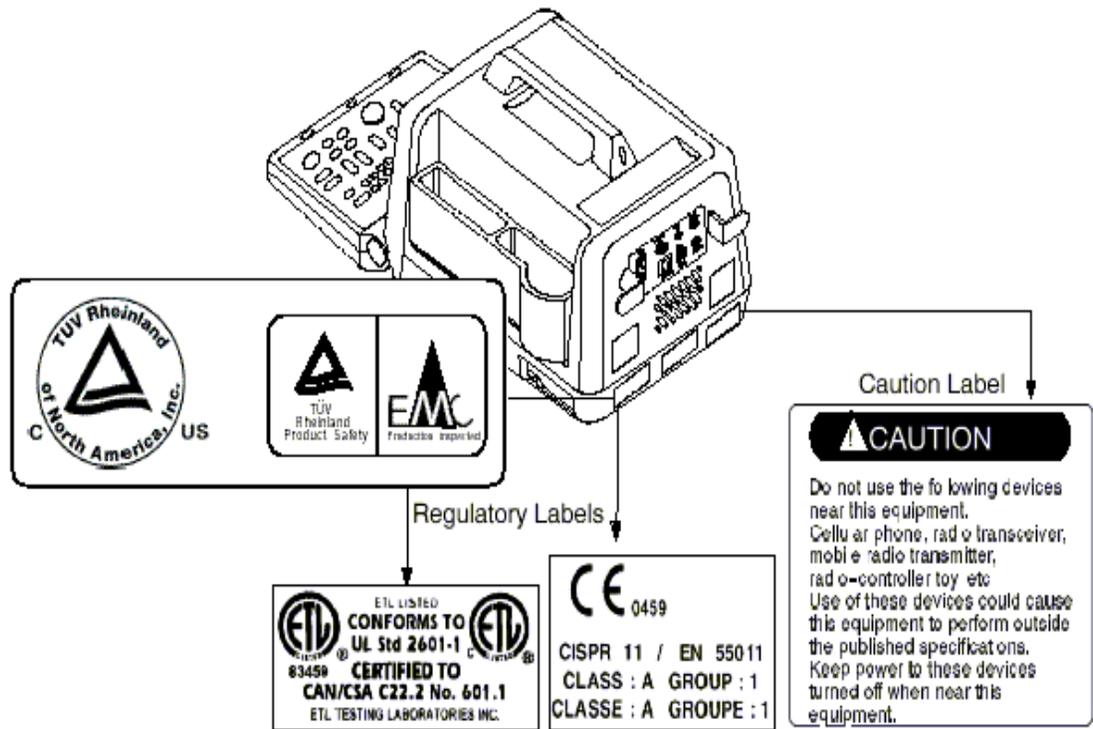


Figure 1-2 Warning Labels

1-3-5 Labels Locations (cont'd)

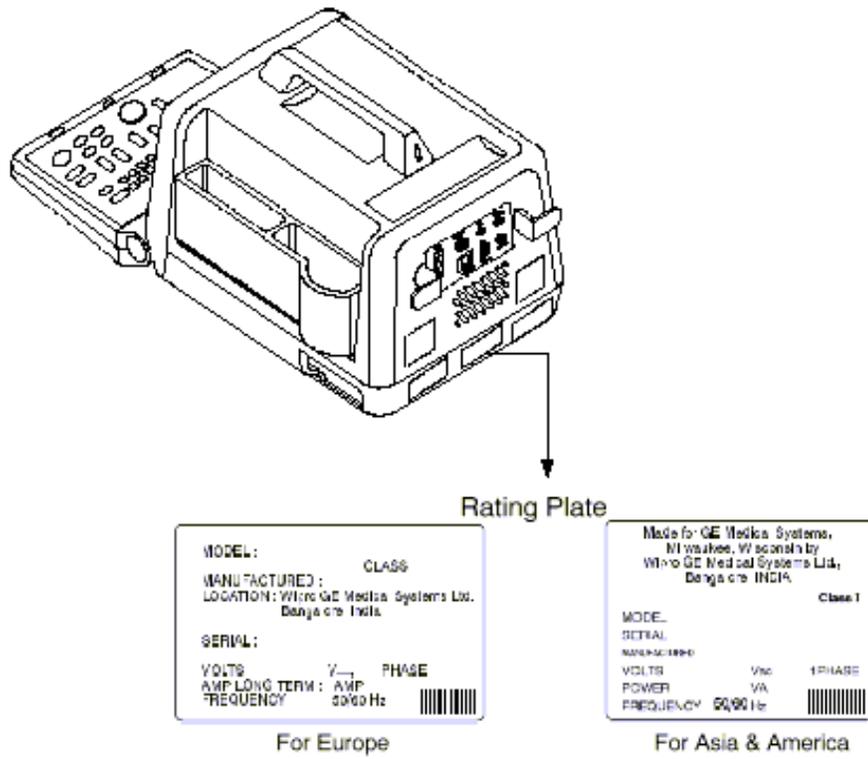


Figure 1-3 Warning Labels

1-3-5 Labels Locations (cont'd)

<p><b>⚠ WARNING</b></p> <p>Risque de choc électrique. Ne pas retirer les couvercles ou panneaux. Réparer les câbles à qualifications appropriées.</p> <p>For continued protection against fire or shock hazard • Replace only with same type and rating of fuse.</p> <p>Grounding reliability can only be assured with "Hospital only" or "Hospital grade" cordsets installed with the system.</p>	<p><b>⚠ AVERTISSEMENT</b></p> <p>Risque de décharge électrique. Ne pas retirer les couvercles ou panneaux. Réparer les câbles à qualifications appropriées.</p> <p>Pour assurer une protection continue contre les incendies et les décharges électriques, ne remplacer que par des fusibles du même type et de même courants nominaux.</p> <p>La fiabilité de mise à la terre ne peut s'assurer qu'avec le câblage pour hôpital ou "Hospital only" ou "Hospital grade" câblage avec le système.</p>	<p><b>⚠ AVISO</b></p> <p>Risco de Choque elétrico. Não remova tampas nem os painéis de proteção. Os cabos devem ser feitos por pessoal qualificado.</p> <p>Para uma proteção contínua contra o risco de incêndio ou de choques elétricos, substitua somente o fusível por outro do mesmo tipo e com a mesma voltagem.</p> <p>A confiabilidade na tomada com terra só é assegurada com o conjunto de fios "Hospital only" ou "Hospital grade" instalado com o sistema.</p>
<p><b>⚠ AVVERTENZA</b></p> <p>Risico di shock elettrico. Non togliere i copertoni o pannelli. Per le manutenzioni rivolgersi a personale specializzato.</p> <p>Per ottenere una protezione continua contro il rischio di incendio e di scariche elettriche, sostituire i fusibili solo con fusibili dello stesso tipo e avente la stessa corrente di funzionamento.</p> <p>È consigliabile accertarsi che la messa a terra del sistema "Hospital only" (solo ospedale) o "Hospital grade" (cavo ospedale) formi con il sistema.</p>	<p><b>⚠ AVISO</b></p> <p>Riesgo de descarga eléctrica. No retire los cubiertas ni los paneles. Consulte al personal de servicio cualificado.</p> <p>Como protección contra las descargas eléctricas y los incendios, use solo fusibles del mismo tipo y corriente nominal.</p> <p>La seguridad de la conexión a tierra se obtiene sólo con la toma "Solo hospital" o "Grado hospital" suministrada con el sistema.</p>	<p><b>⚠ WARNING</b></p> <p>Stromschlaggefahr. Haben oder Abdecken nicht anfragen. Überlassen Sie die Wartung qualifiziertem Personal.</p> <p>Esolver die die Sicherung für die Stromüberlastung sollte gegen "Solo hospital" oder "Hospital grade" Typ mit dem gleichen Wert.</p> <p>Die zuverlässige Erdung ist nur mit dem "Hospital only" oder "Hospital grade" Kabel gewährleistet, wenn mit dem System geliefert wird.</p>
<p><b>⚠ 警告</b></p> <p>電撃の危険あり。カバー(またはパネル)を取り除かないで、修理は資格のあるサービスセンターに依頼すること。</p> <p>火災の危険あり。 表示されたヒューズと交換のこと。</p> <p>この機器は「専用コンセント(接地マーク)」に接続したときのみ保護接地の信頼性が保証されます。</p>		

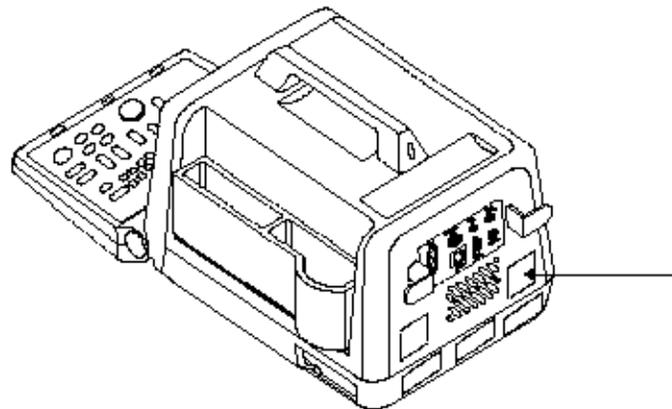


Figure 1-4 Warning Labels

1-3-5 Labels Locations (cont'd)

<p><b>CAUTION</b></p> <p>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.</p>	<p><b>ATTENZIONE</b></p> <p>Non usare i seguenti apparecchi in prossimità di questa apparecchiatura: cellulari, ricetrasmittitore radio, trasmettore 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.</p>	<p><b>CUIDADO</b></p> <p>Não utilize os dispositivos seguintes perto deste equipamento: Telefone celular, radiotransceiver, radiotransmissor móvel, brinquedos de controle remoto, etc. O uso destes dispositivos pode levar o equipamento a ter um desempenho outro que aquele publicado. Desligue estes dispositivos quando estiverem perto deste equipamento.</p>
<p><b>ATTENTION</b></p> <p>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 lorsqu'ils se trouvent à proximité du système.</p>	<p><b>VORSICHT</b></p> <p>Verwenden Sie folgende Geräte nicht in der Nähe der Anlage: Funktelefon, Funkempfänger, mobiler Funksender, funkgesteuertes Spielzeug usw. Bei Gebrauch dieser Geräte arbeitet die Anlage evtl. nicht entsprechend der veröffentlichten Angaben. Belassen Sie diese Geräte in der Nähe der Anlage ausgeschaltet.</p>	<p><b>CUIDADO</b></p> <p>Telefones 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 dispositivos cuando estén cerca del sistema.</p>

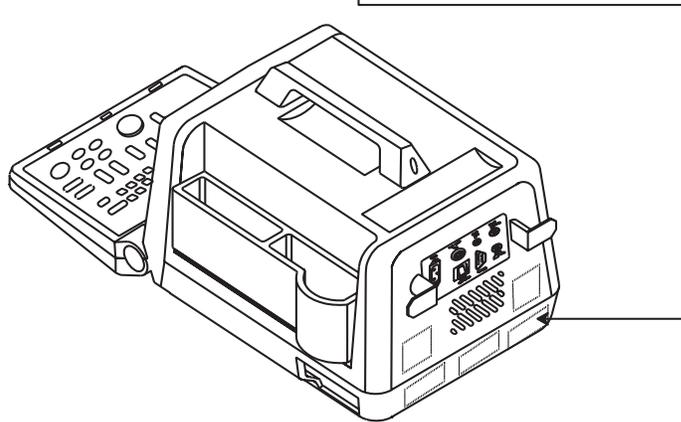


Figure 1-5 Warning Labels

1-3-5 Labels Locations (cont'd)

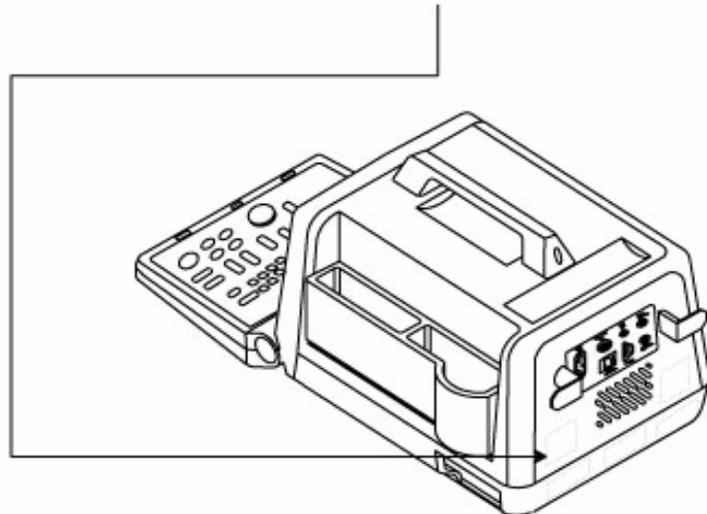


Figure 1-6 Warning Lables

### 1-3-6 Dangerous Procedure Warnings

Warnings, such as the example below, precede potentially dangerous procedures through our this manual. Instructions contained in the warnings must be followed.



DANGER

**DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT. USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.**



WARNING

**EXPLOSION WARNING: DO NOT OPERATE THE EQUIPMENT IN AN EXPLOSIVE ATMOSPHERE. OPERATION OF ANY ELECTRICAL EQUIPMENT IN SUCH AN ENVIRONMENT CONSTITUTES A DEFINITE SAFETY HAZARD.**



WARNING

**DO NOT SUBSTITUTE PARTS OR MODIFY EQUIPMENT: BECAUSE OF THE DANGER OF INTERDICTING ADDITIONAL HAZARDS, DO NOT INSTALL SUBSTITUTE PARTS OR PERFORM ANY UNAUTHORIZED MODIFICATION OF THE EQUIPMENT.**

### 1-3-7 Lockout/Tagout Requirements (For USA Only)

Follow OSHA Lockout/Tagout requirements by ensuring you are in total control of the plug.

### 1-3-8 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.

## Section 1-4 EMC, EMI, and ESD

### 1-4-1 Electromagnetic Compatibility (EMC)

Electromagnetic compatibility describes a level of performance of a device within its electromagnetic environment. This environment consists of the device itself and its surroundings including other equipment, power sources and persons with which the device must interface. Inadequate compatibility results when a susceptible device fails to perform as intended due to interference from its environment or when the device produces unacceptable levels of emission to its environment. This interference is often referred to as radio-frequency or electromagnetic interference (RFI/EMI) and can be radiated through space or conducted over interconnecting power of signal cables. In addition to electromagnetic energy, EMC also includes possible effects from electrical fields, magnetic fields, electrostatic discharge and disturbances in the electrical power supply.

### 1-4-2 CE Compliance

The LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO unit conforms to all applicable conducted and radiated emission limits and to immunity from electrostatic discharge, radiated and conducted RF fields, magnetic fields and power line transient requirements.

Applicable standards are: 47CFR Part 18, IEC 601–1–2, and 806–13.

**For CE Compliance, it is critical that all covers, screws, shielding, gaskets, mesh, clamps, are in good condition, installed tightly without skew or stress. Proper installation following all comments noted in this service manual is required in order to achieve full EMC performance.**

### 1-4-3 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 1-4-4, Notice upon Installation of Product.

In case of issues related to EMC, please follow procedures stated in 1-4-6, Countermeasures against EMC-related Issues.

### 1-4-4 Notice Upon Installation of Product

- 1.) 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 3 - INSTALLATION. The layout of the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO & other peripherals should be as per installation procedures described in Chapter 3 - INSTALLATION.

### 1-4-5 General Notice

- 1.) 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™ $\alpha$  100/LOGIQ™ 100 PRO 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)
- 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.

### 1-4-6 Countermeasures against EMC related Issues

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

- 1.) 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.
- 4.) Electromagnetic influence may be reduced by altering the path of power supply for other equipment.

### 1-4-7 Notice on Service

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



#### CAUTION

**Do not use the following devices near the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO 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™ $\alpha$  100/LOGIQ™ 100 PRO system to perform outside the published specifications. Keep power to these devices turned OFF when near the system. Medical staff in charge of the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO system is required to instruct technicians, patients and other people who may be around the system to fully comply with the above regulation**

## 1-4-8 Electrostatic Discharge (ESD) Prevention

**DO NOT TOUCH ANY BOARDS WITH INTEGRATED CIRCUITS PRIOR TO TAKING THE NECESSARY ESD PRECAUTIONS:**



WARNING

- 1.) *Always connect yourself, via an arm-wrist strap, to the advised esd connection point located on the rear of the scanner (to the right of the power connector).*
- 2.) *Follow general guide lined for handling of electrostatic sensitive equipment.*

## Section 1-5 Customer Assistance

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:

### 1-5-1 System Manufacture

WIPRO GE HEALTHCARE - INDIA
WIPRO GE HEALTHCARE ULTRASOUND GROUP.  PLOT # 4, KADUGODI INDUSTRIAL AREA, SADARAMANGALA,  BANGALORE 560067, INDIA  TEL: (91) 80-2845-2923 FAX:(91) 80-2845-2924

Table 1-6 System Manufacture

**1-5-2 Contact Information**

Location	Phone Number
<p><b>AMERICA:</b> GE Healthcare Ultrasound Service Engineering, 9900 Innovation Drive, Wauwatosa, WI 53226</p> <p>Customer Answer Center(US)</p>	<p>TEL: (1) 800-437-1171 FAX: (1) 414-721-3865</p> <p>TEL: (1) 877-800-6776</p>
<p><b>CANADA:</b> Customer Answer Center(CANADA)</p>	<p>TEL: (1) 262-524-5698</p>
<p><b>LATIN AMERICA:</b> GE Healthcare Ultrasound Service Engineering 9900 Innovation Drive Wauwatosa, WI 53226</p> <p>Customer Answer Center</p>	<p>TEL: (1) 262-524-5300</p> <p>TEL: (1) 262-524-5698</p>
<p><b>ASIA:</b> GE Ultrasound Asia (Singapore) Service Department - Ultrasound 298 Tiong Bahru Road #15-01/06 Central Plaza Singapore 169730</p> <p><b>JAPAN:</b> GE Yokogawa Medical Systems Customer Service Center</p>	<p>TEL: 65-291 8528 FAX: 65-272-3997</p> <p>TEL: (81) 426-48-2950 FAX: (81) 426-48-2902</p>
<p><b>EUROPE:</b> GE Ultraschall Deutschland GmbH &amp; Co. KG Beethovenstrasse 239 Postfach 11 05 60 D-42655 Solingen</p>	<p>TEL: 0130 81 6370 toll free TEL: (33) 130.831.300 FAX: (49) 212.28.02.431</p>

**Table 1-1 Service Contact Information**

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# Chapter 2 Pre Installation

## Section 2-1 Overview

### 2-1-1 Purpose of Chapter 2

This chapter provides the information required to plan and prepare for the installation of a LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO. Included are descriptions of the facility and electrical needs to be met by the purchaser of the unit. A checklist is also provided at the end of this section to help determine whether the proper planning and preparation is accomplished before the actual equipment installation is scheduled.

### CONTENTS IN CHAPTER 2

Section	Description	Page Number
2-1	Overview	2-1
2-2	General Console Requirements	2-1

Table 2-1 Contents in Chapter 2

## Section 2-2 General Console Requirements

### 2-2-1 Console Environmental Requirements

Operating temperature:	10 to 35 °C (50 to 95 °F)
Storage temperature:	-20 to 50 °C (- 4 to 122 °F)
Humidity:	35% to 75% rH non-condensing

Table 2-2 Environmental Specifications for LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Scanners

#### 2-2-1-1 Lighting

Bright light is needed for system installation, updates and repairs. However, operator and patient comfort may be optimized if the room light is subdued and indirect. Therefore a combination lighting system (dim/bright) is recommended. Keep in mind that lighting controls and dimmers can be a source of EMI which could degrade image quality. These controls should be selected to minimize possible interference.

## 2-2-2 Electrical Requirements

### 2-2-2-1 LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO Power Requirements

Electrical Specifications for LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO.

GEMS P/N	Voltage	Tolerances	Current	Frequency
H41012LF H41112LF H41162LF H41282LF	100-115 VAC	±10%	1.8 A Max.	50-60 Hz
H41012LA-LE H41112LA-LE H41162LA-LE, LG H41282LA-LE, LG	100-230 VAC	±10%	0.9 -1.8 A Max.	50-60 Hz

**Table 2-3 Electrical Specifications for LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO**

### 2-2-2-2 Site Circuit Breaker

It is recommended that the branch circuit breaker for the machine be readily accessible.



#### CAUTION

**POWER OUTAGE MAY OCCUR. The LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO requires a dedicated single branch circuit. To avoid circuit overload and possible loss of critical care equipment, make sure you DO NOT have any other equipment operating on the same circuit.**

### 2-2-2-3 Site Power Outlets

A dedicated AC power outlet must be within reach of the unit without extension cords. Other outlets adequate for the external peripherals, medical and test equipment needed to support this unit must also be present within 1 m (3.2 ft.) of the unit. Electrical installation must meet all current local, state, and national electrical codes.

### 2-2-2-4 Unit Power Plug

If the unit arrives without a power plug, or with the wrong plug, you must contact your GE dealer or the installation engineer must supply what is locally required.

### 2-2-2-5 Power Stability Requirements

#### Voltage drop-out

Max 10 ms.

#### Power Transients

(All applications)

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.

## 2-2-3 EMI Limitations

Ultrasound machines are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the air or wiring. They also generate EMI. The LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO complies with limits as stated on the EMC label. However there is no guarantee that interference will not occur in a particular installation.

Possible EMI sources should be identified before the unit is installed.

Electrical and electronic equipment may produce EMI unintentionally as the result of a defect. These sources include:

- medical lasers,
- scanners,
- cauterizing guns,
- computers,
- monitors,
- fans,
- gel warmers,
- microwave ovens,
- light dimmers
- portable phones.

The presence of a broadcast station or broadcast van may also cause interference. See Table 2-4 for EMI Prevention tips.

**2-2-3 EMI Limitations (cont'd).**

EMI Rule	Details
Be aware of RF sources	Keep the unit at least 5 meters or 15 feet away from other EMI sources. Special shielding may be required to eliminate interference problems caused by high frequency, high powered radio or video broadcast signals.
Ground the unit	Poor grounding is the most likely reason a unit will have noisy images. Check grounding of the power cord and power outlet.
Replace all screws, RF gaskets, covers, cores	After you finish repairing or updating the system, replace all covers and tighten all screws. Any cable with an external connection requires a magnet wrap at each end. Install the shield over the front of card cage. Loose or missing covers or RF gaskets allow radio frequencies to interfere with the ultrasound signals.
Replace broken RF gaskets	If more than 20% or a pair of the fingers on an RF gasket are broken, replace the gasket. Do not turn on the unit until any loose metallic part is removed.
Do not place labels where RF gaskets touch metal	Never place a label where RF gaskets meet the unit. Otherwise, the gap created will permit RF leakage. Or, if a label has been found in such a position, move the label.
Use GE specified harnesses and peripherals	The interconnect cables are grounded and require ferrite beads and other shielding. Also, cable length, material, and routing are all important; do not change from what is specified.
Take care with cellular phones	Cellular phones may transmit a 5 V/m signal; that could cause image artifacts.
Properly dress peripheral cables	Do not allow cables to lie across the top of the card cage or hang out of the peripheral bays. Loop the excess length for peripheral cables inside the peripheral bays. Attach the monitor cables to the frame.

**Table 2-4 EMI Prevention/abatement**

**2-2-4 Probes Environmental Requirements**

	ELECTRONIC	PAMPTE
Operation:	10 to 40 °C	5 to 42.7 °C
Storage:	-20 to 50 °C	-20 to 50 °C
Temperatures in degrees C, conversion to degrees F = °C*(9/5) + 32)		

**Table 2-5 Operation and Storage Temperatures for Probes.**

 **NOTICE: SYSTEMS AND ELECTRONIC PROBES ARE DESIGNED FOR STORAGE TEMPERATURES OF -20 TO + 50 deg C. WHEN EXPOSED TO LARGE TEMPERATURE VARIATIONS, THE PRODUCT SHOULD BE KEPT IN ROOM TEMPERATURE FOR 10 HOURS BEFORE USE.**

**2-2-5 Time and Manpower Requirements**

Site preparation takes time. Begin Pre installation checks as soon as possible, if possible, six weeks before delivery, to allow enough time to make any changes.

- 

**2-2-6 Checklist for Installation**

**2-2-6-1 Checklist for Installation**

Procedures	Paragraph	Initials
Observe Warnings	Section 3-1-3	
Unpack LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO	Section 3-2	
Assemble LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO	Section 3-4	
Perform Functional Checks	Chapter 4-3	
Perform Electrical Safety Tests	Chapter 10-7	

Table 2-6 Checklist for Installation

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# Chapter 3 Installation

## Section 3-1 Overview

### 3-1-1 Purpose of Chapter 3

This chapter contains information needed to install the unit. Included are references to a procedure that describes how to receive and unpack the equipment and how to file a damage or loss claim. How to prepare the facility and unit of the actual installation, and how to check and test the unit, probes, and external peripherals for electrical safety are included in this procedure. Also included in this section are guidelines for transporting the unit to a new site.

### CONTENTS IN CHAPTER 3

Table 3-1 Contents in Chapter 3

Section	Description	Page Number
3-1	Overview	3-1
3-2	Receiving and Unpacking the Equipment	3-3
3-3	Preparing for Installation	3-5
3-5	Completing the Installation	3-6
3-6	System Configuration	3-25
3-7	Paperwork	3-34

### 3-1-2 Average Installation Time

Description	Average Installation Time	Comments
Unpacking the scanner	20 Minutes	
Scanner wo/options	40 Minutes	Dependant on the configuration that is required

Table 3-2 Average Installation Time

### 3-1-3 Safety Reminders



**DANGER**

**WHEN USING ANY TEST INSTRUMENT THAT IS CAPABLE OF OPENING THE AC GROUND LINE (I.E., METER'S GROUND SWITCH IS OPEN), DON'T TOUCH THE UNIT!**



**CAUTION**

If the unit is very cold or hot, do not turn on its power until it has had a chance to acclimate to its operating environment.



**CAUTION**

To prevent electrical shock, connect the unit to a properly grounded power outlet. Do not use a three to two prong adapter. This defeats safety grounding.



**CAUTION**

Do NOT wear the ESD wrist strap when you work on live circuits and more than 30 V peak is present.



**CAUTION**

Do not use a 20 Amp to 15 Amp adapter on the 120 Vac unit's power cord. This unit requires a dedicated 20 A circuit and can have a 15A plug if the on board peripherals do not cause the unit to draw more than 14.0 amps.



**CAUTION**

Do not operate this unit unless all board covers and frame panels are securely in place. System performance and cooling require this.



**CAUTION**

#### **OPERATOR MANUAL(S)**

The User Manual(s) should be fully read and understood before operating the LOGIQ™α 100/LOGIQ™ 100 PRO and kept near the unit for quick reference.



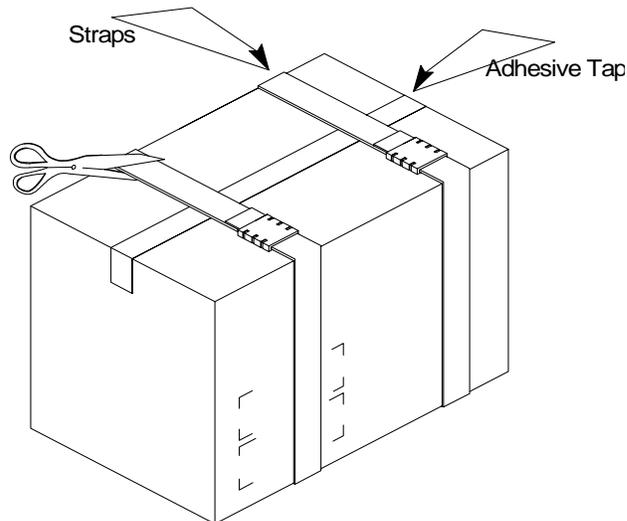
#### **ACOUSTIC OUTPUT HAZARD**

Although the ultrasound energy transmitted from the LOGIQ™α 100/LOGIQ™ 100 PRO probe is within AIUM/NEMA standards, avoid unnecessary exposure. Ultrasound energy can produce heat and mechanical damage.

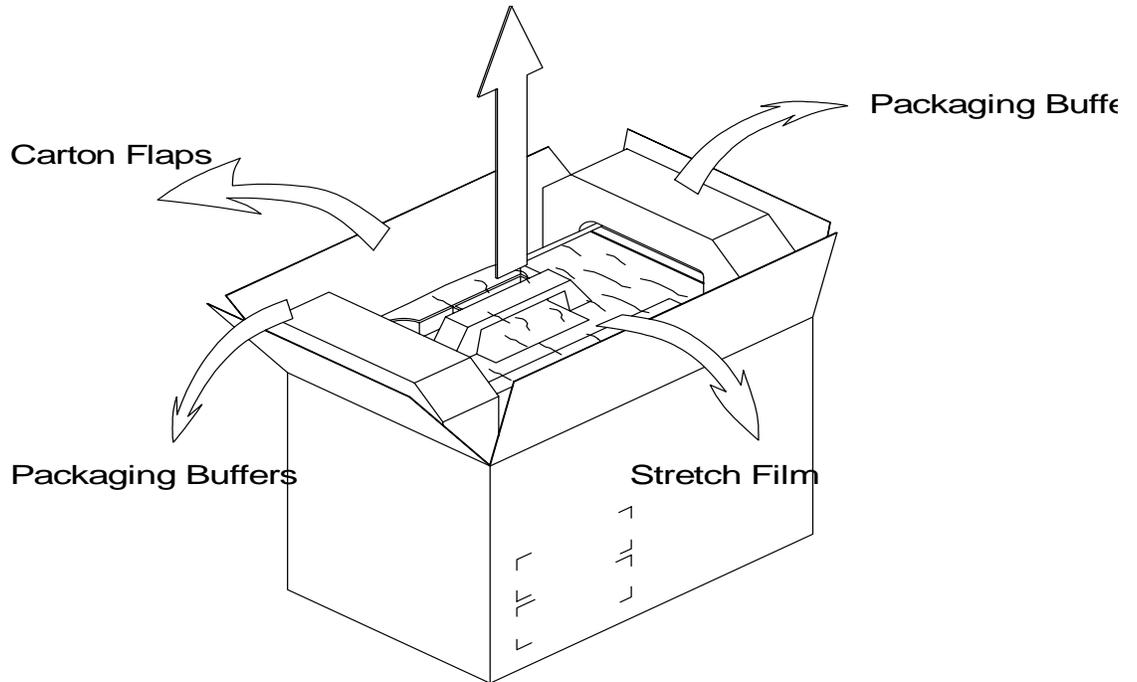
## Section 3-2 Receiving and Unpacking the Equipment

Please read that procedure before packing/unpacking the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO. We strongly advise you to store the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO packing material in undamaged condition in case of future transportation.

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

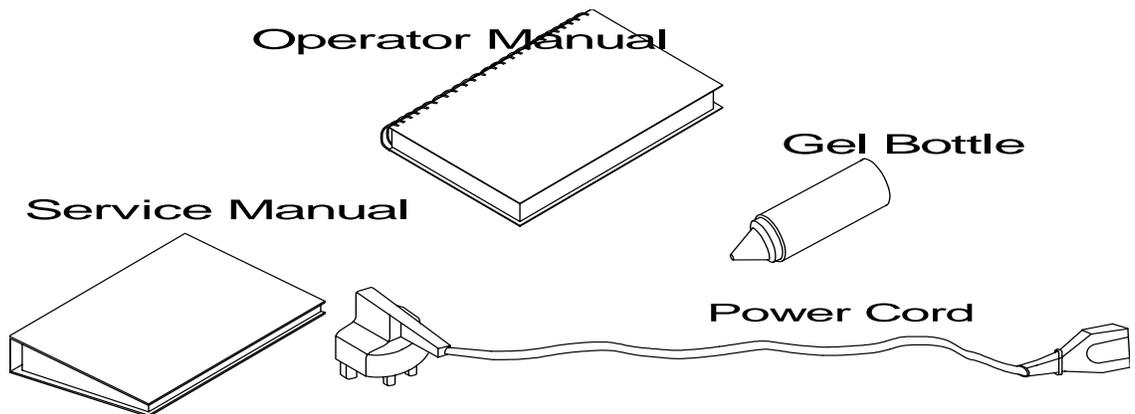


**Figure 3-1 Unpacking LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO**



**Figure 3-2 Unpacking LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO**

*Note: The Service Manual, Operator Manual, Gel Bottle and Power Cord are wrapped in bubble sheet and are kept along the sides of the corrugated carton box. Refer Illustration below for details*



**Figure 3-3 Unpacking LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO**

## Section 3-3 Preparing for Installation

### 3-3-1 Physical Inspection

#### 3-3-1-1 Systems Voltage Settings

- Verify that the scanner is set to the correct voltage.  
The Voltage settings for the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Scanner is found on a label on the rear of the system.



**WARNING** **CONNECTING A LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO SCANNER TO THE WRONG VOLTAGE LEVEL WILL MOST LIKELY DESTROY THE SCANNER.**

#### 3-3-1-2 Video Formats

Check that the video format is set to the locally used video standard, NTSC or PAL.

### 3-3-2 EMI Protection

This unit has been designed to minimize the effects of Electro Magnetic Interference (EMI). Many of the covers, shields, and screws are provided primarily to protect the system from image artifacts caused by this interference. For this reason, it is imperative that all covers and hardware are installed and secured before the unit is put into operation.

## Section 3-4 Assembling LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO



**CAUTION** **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.**

### 3-4-1 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
  - a.) Install probe connector on the receptacle guide pin until it touches the receptacle mating surface.
  - a.) 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™ $\alpha$  100/LOGIQ™ 100 PRO 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.



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

## Section 3-5 Assembling LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO (Contd.,)

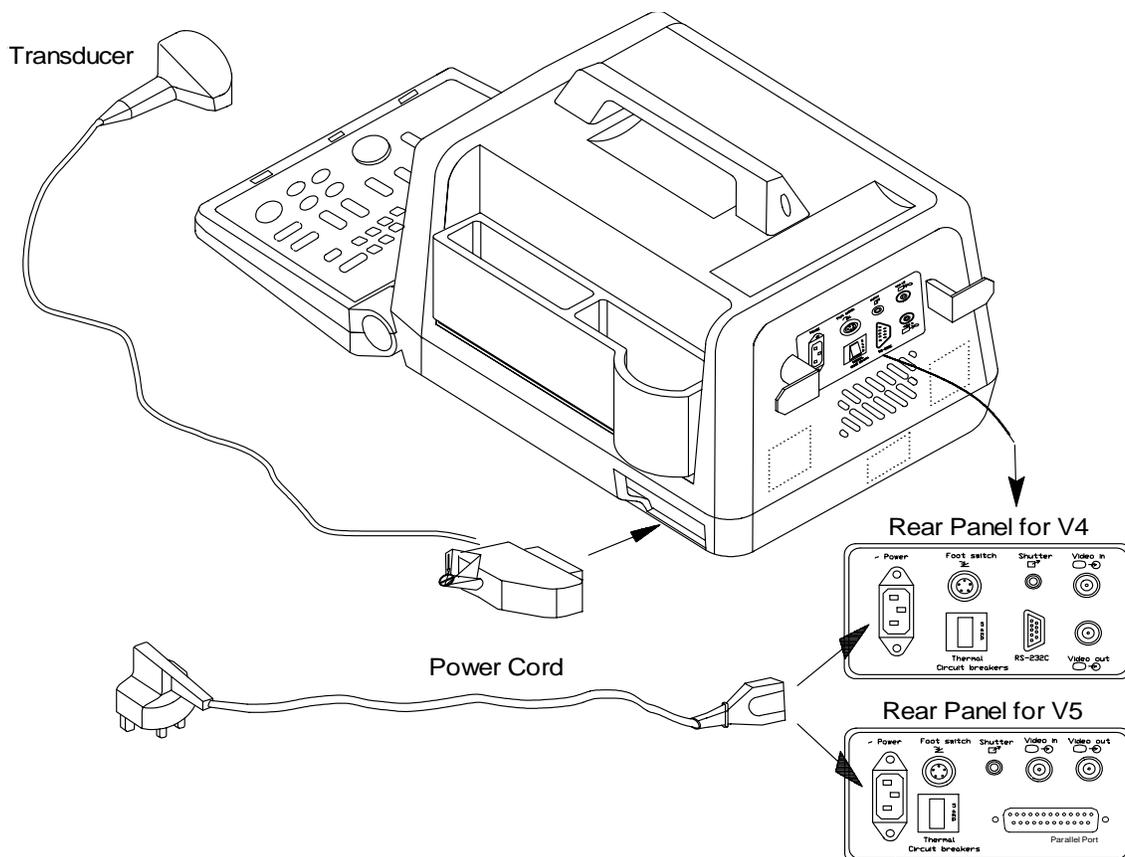


Figure 3-4 Assembling LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO

## Section 3-6 Completing the Installation

### 3-6-1 Transducer Connection

- 1.) Connect a transducer to transducer receptacle as follows:
  - A.) Ensure that the transducer twist lock lever points towards the 3 o'clock position.
  - B.) Insert the transducer connector on the receptacle guide pin until it touches the receptacle mating surface.
  - C.) Twist the transducer twist lock lever to the 12 o'clock position to lock it in place. Twist the lever to the 3 o'clock position to disconnect the transducer.

*Note:* It is not necessary to turn OFF power to connect or disconnect a transducer.

- 2.) Connect the main power cable to a hospital grade power receptacle with the proper rated voltage. Never use a three-to-two prong adapter; this defeats the safety ground.

## 3-6-2 Installation of LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO to PC Image Transfer Software

The image transfer software can be used to download images from the LOGIQ™ $\alpha$  100 MP \ LOGIQ™ 100 PRO parallel port to the PC. 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.

### 3-6-2-1 Pre-requisites

Hardware & Software requirements



#### **WARNING**

**Image Transfer should not be done while live scanning patients. Also, the image transfer cable also should not be attached to the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO during the scan.**

*For Europe Only:* All devices connected to the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO must be CE Marked

### 3.6.2.2 Hardware:

- 1.) The recommended PC for Image Transfer should be Compatible with **IEC 950 Standards** with a Minimum Configuration required for the PC is as below.
  - a.) Display resolution: 800X600
  - b.) Color: 16 bit
  - c.) Ram: 4MB
  - d.) Processor: 486
  - e.) Hard Disk Space Required: 20 MB of free space
  - f.) Parallel port Mode: SPP/EPP & Std. Bi-directional
- 2.) LA100 Version 5 & above
- 3.) Image Transfer Cable (2247461) **Only for LOGIQ™ $\alpha$  100 MP.**
- 4.) Any standard 25 Pin DSub Male to Male Cable for **LOGIQ™ 100 PRO** (To interface PC to LOGIQ™ 100 PRO)

### 3.6.2.3 Software :

#### **For V5.06a & below (LOGIQ™ $\alpha$ 100 MP)**

- 1.) Operating System: Windows 95 With MS Paint Installed
- 2.) Image Transfer Software (2 Floppy Disks) 2249732 Supplied by GE Medical Systems

#### **For V7.0x (LOGIQ™ 100 PRO)**

- 1.) Operating System: Windows 95 / 98 / ME / NT / 2000
- 2.) Image Transfer CD (2300243 for PAL Systems & 2323388 for NTSC Systems) Supplied by GE Medical Systems

#### **For V9.0x (LOGIQ™ 100 PRO)**

- 1.) Operating System: Windows 95 / 98 / ME / NT / 2000
- 2.) Image Transfer CD (5133746 for PAL & NTSC Systems) Supplied by GE Healthcare

### 3.6.2.4 PC Settings:

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

### 3.6.2.5 Software Installation

- 1.) Before starting to install the *Image Transfer* software, close all applications.
- 2.) For LOGIQ™ 100 PRO Systems Insert CD (2300243 for PAL Systems)/(2323388 for NTSC Systems) in the CD Drive for 7.x.x software installation **(or)** For LOGIQ™ 100 PRO Systems Insert CD (5133746 for PAL & NTSC Systems) in the CD Drive for 9.x.x software installation **(or)** For LOGIQ™<sub>α</sub> 100 MP Insert Floppy Disk1 in the Floppy Drive
- 3.) The Set Up will Automatically Start Up. If not execute Step 4 & step 5.
- 4.) Click *Start* and then click *Run* as shown below.

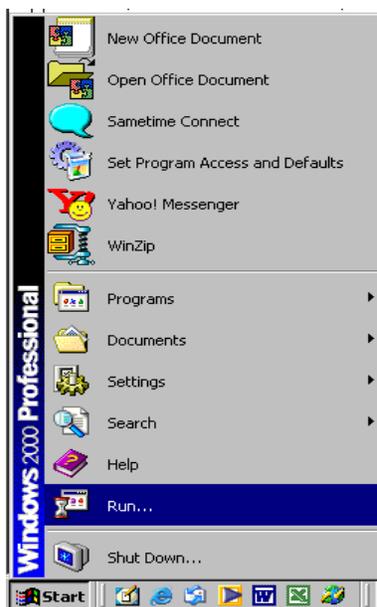


Figure 3-5 Start Window

- 5.) Now type *the Respective Drive Letter E.g. F:\ Setup.exe* as shown below and click *OK*.

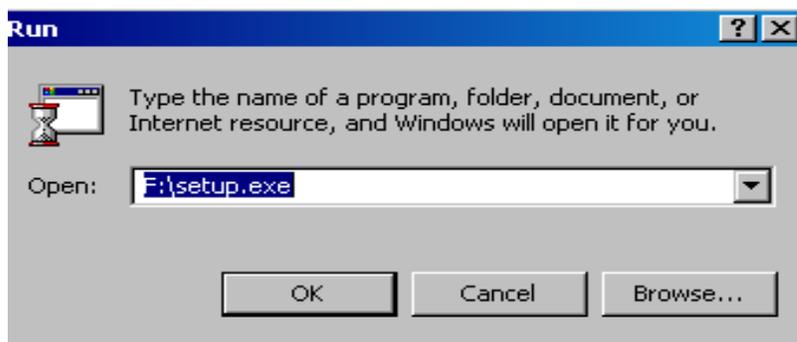


Figure 3-6 Run window

### 3.6.2.5 Software Installation(Cont'd)

- 6.) A welcome screen will appear and asking to close all other applications.



Figure 3-7 Wel Come Screen

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

### 3.6.2.5 Software Installation(Cont'd)

- 8.) Begin Installation screen appears. To change the directory click on Browse and select the desired directory. Click on the Next button to continue with Installation.

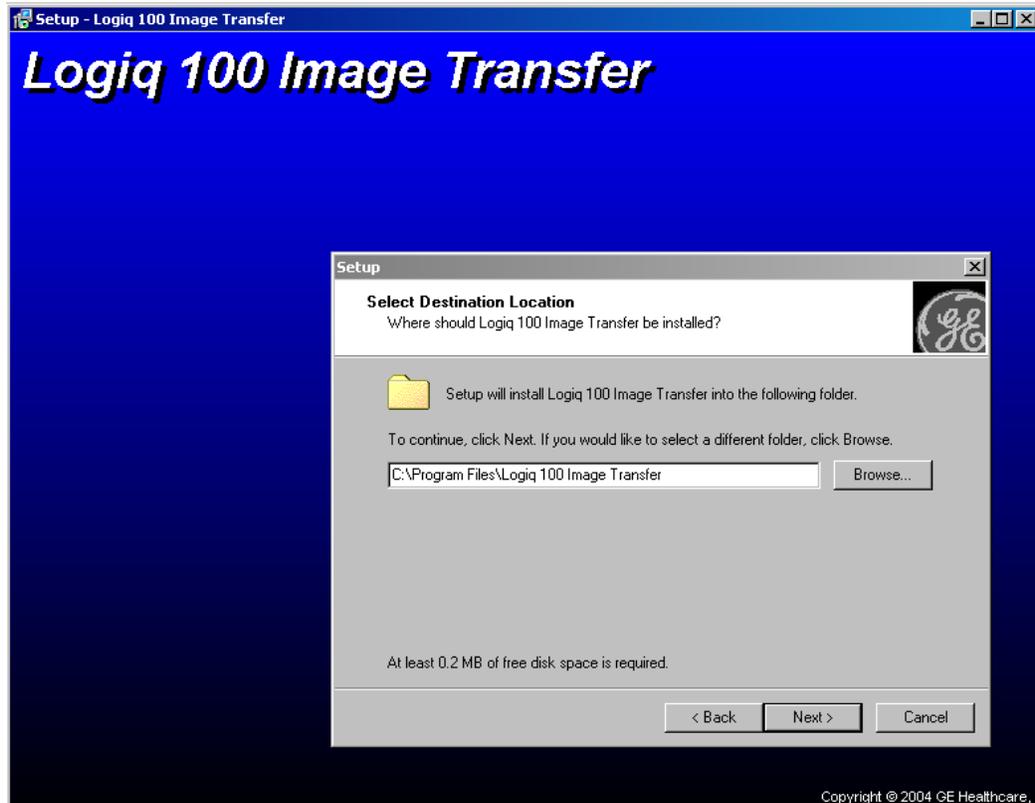


Figure 3-8 Installation Screen

### 3.6.2.5 Software Installation(Cont'd)

- 9.) Next you will get the following screen, From which you can select the mode of the Logiq 100 system( PAL or NTSC) . This information can be obtained from bottom right corner off the initial boot up screen for version 9.X.X and above , For versions Below contact your GE Sales Representative.

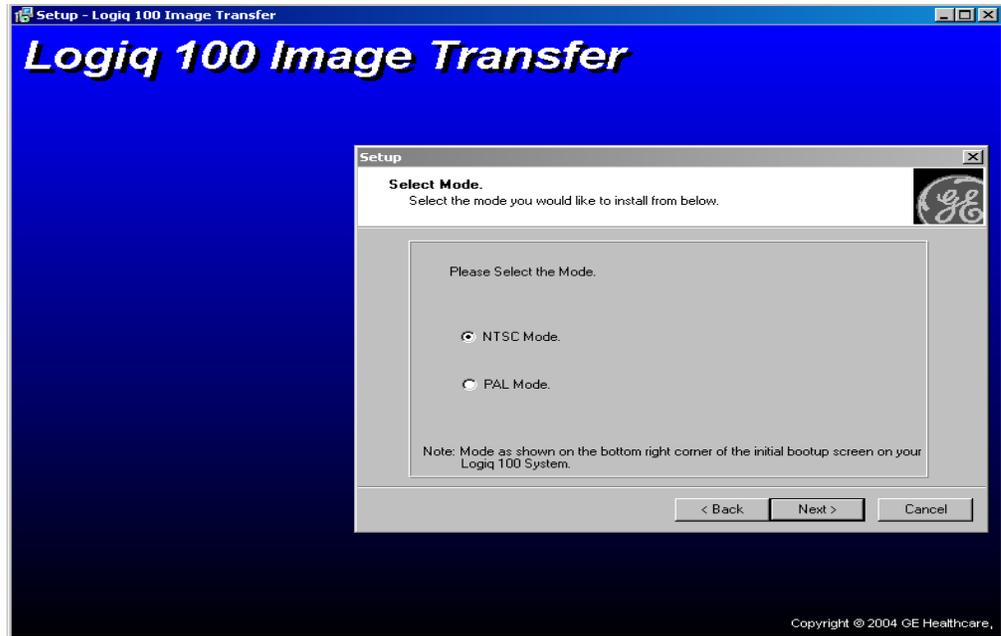


Figure 3-9 Mode Selection Screen

### 3.6.2.5 Software Installation(Cont'd)

- 10.) Next you will get the following screen. From which you can select the software version loaded on your Logiq 100 system. This information can be obtained from the bottom right corner of the initial boot up screen.

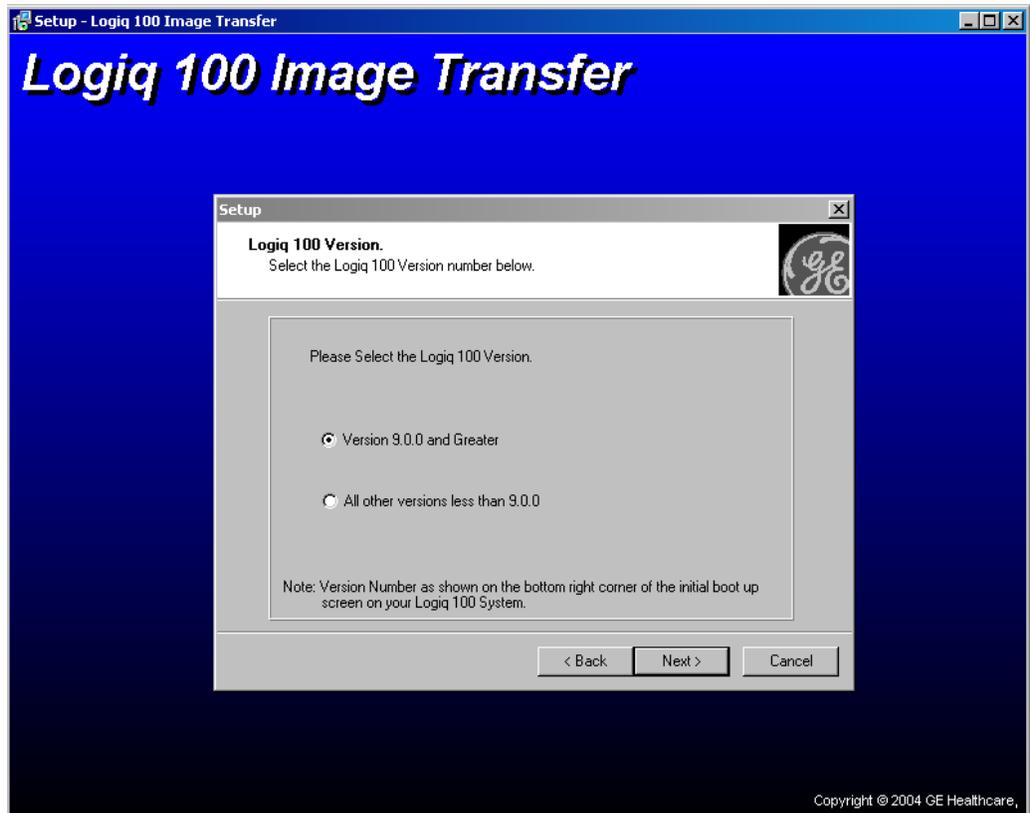


Figure 3-10 Software Selection Screen

### 3.6.2.5 Software Installation(Cont'd)

11.) The Following summary screen is displayed. To continue with the installation press Install or Else press Back to Go Back and make any changes to the already selected settings.



Figure 3-11 Installation Summary Screen

### 3.6.2.5 Software Installation(Cont'd)

- 12.) Next you will get the following screen indicating the completion of the installation. Click Finish to come out of the installation set-up.



Figure 3-12 Confirmation To Installation Set-Up

- 13.) Click on the Logiq 100 Image Transfer Icon or Start -> Program Files -> LOGIQ 100 Image Transfer. You may get the following message for the first time. Click OK.



Figure 3-13 Initialise Driver Screen

### 3.6.2.5 Software Installation(Cont'd)

14.) The software is fully installed and ready to use, Then you get the following screen

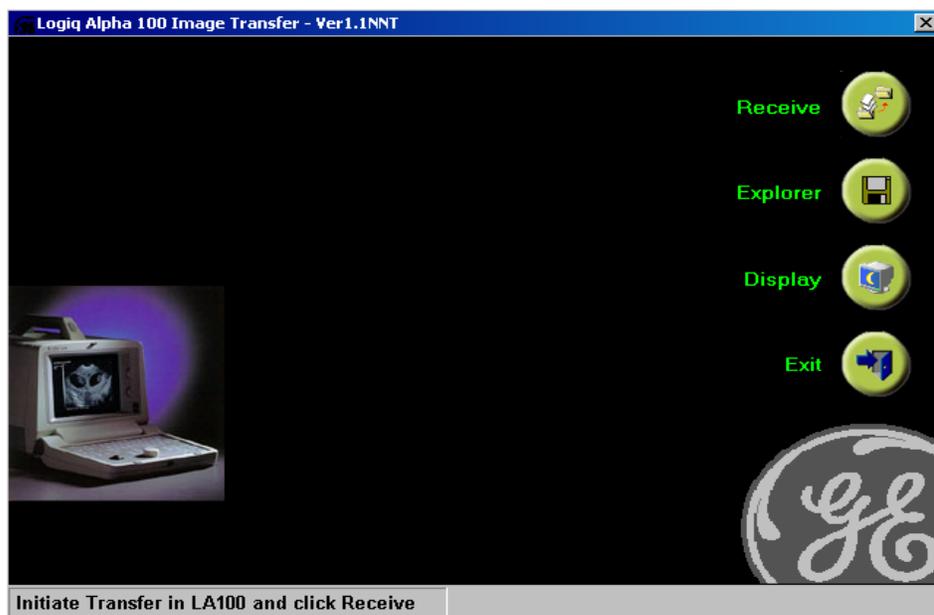


Figure 3-14 Logiq Alpha Image Transfer

### 3.6.2.6 Hardware Installation

Connect the LOGIQ™ $\alpha$  100 MP to the PC through the Image Transfer Cable -2247461.  
 Connect the LOGIQ™ 100 PRO to the PC through 25 Pin DSub Male to Male Cable.  
 This completes the total installation of the *Image Transfer* software.

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

### 3-6-3 Installation of Optional Accessories

- 1.) Unpack the foot switch and connect it to the connector on the rear panel. (Refer Figure 3-15)
- 2.) Connect the VCR to a suitable power outlet. Using the BNC to BNC cable connect the Video Out on the rear panel of LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO 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™ $\alpha$  100/LOGIQ™ 100 PRO to the Video IN of the VGP.

*Note:* The LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO has only one Video Out connection  
 Therefore either a VGP or a VCR only can be connected at a time

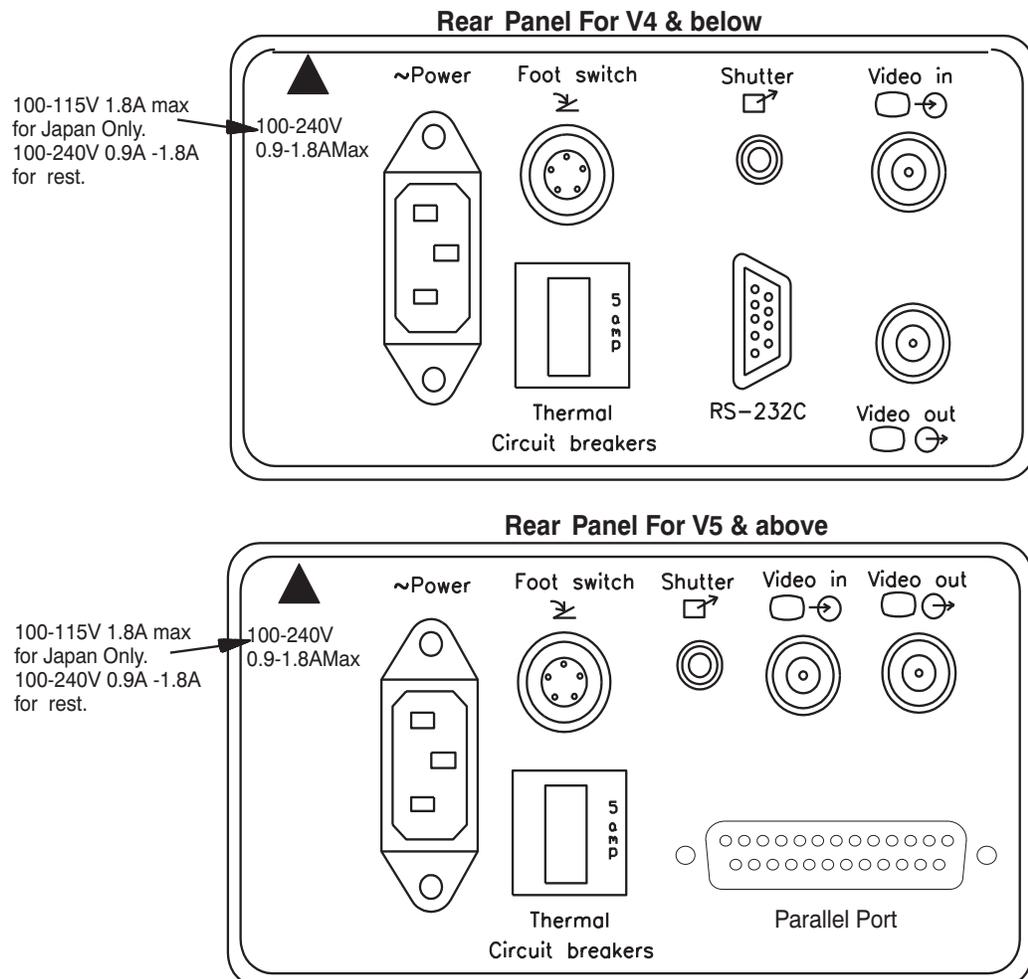
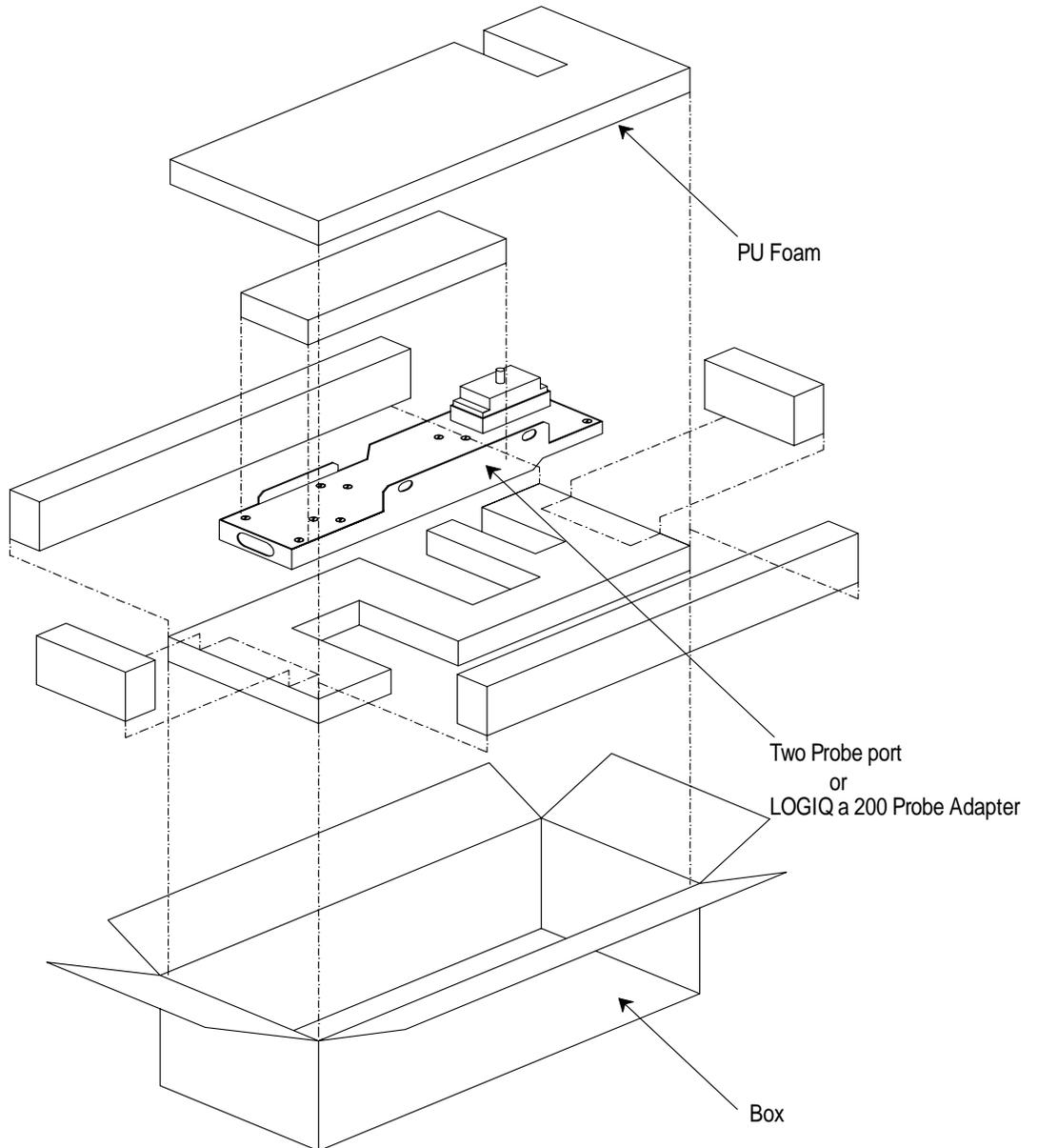


Figure 3-15 Installation of Accessories

### 3-6-4 Installation of Two Probe Adapter & LOGIQ $\alpha$ 200 Probe Adapter (Optional)

- 1.) Remove the adhesive tape to open the flaps of two probe port or LOGIQ  $\alpha$  200 Probe Adapter box
- 2.) Remove the PU Foams inside the two probe port or LOGIQ  $\alpha$  200 Probe Adapter box (Refer Figure 3-16)
- 3.) Take out the two probe port or LOGIQ  $\alpha$  200 Probe Adapter (Refer Figure 3-16)



**Figure 3-16 Unpacking Two Probe Adapter or LOGIQ  $\alpha$ 200 Probe Adapter**

*Note:* The two probe port or LOGIQ  $\alpha$  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.

### 3-6-4 Installation of Two Probe Adapter & LOGIQ $\alpha$ 200 Probe Adapter (Optional) (Con'td)

- 4.) Ensure that no probe is connected to the system. If connected remove it first.
- 5.) Remove the probe holder by lifting it vertically up
- 6.) Make sure that the two probe port or LOGIQ  $\alpha$  200 Probe Adapter lock points to the 12 o'clock position.
- 7.) Align the Two Probe Port or LOGIQ  $\alpha$  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  $\alpha$  200 Lock to the 3 o'clock position to secure the Two Probe Port or LOGIQ  $\alpha$  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.

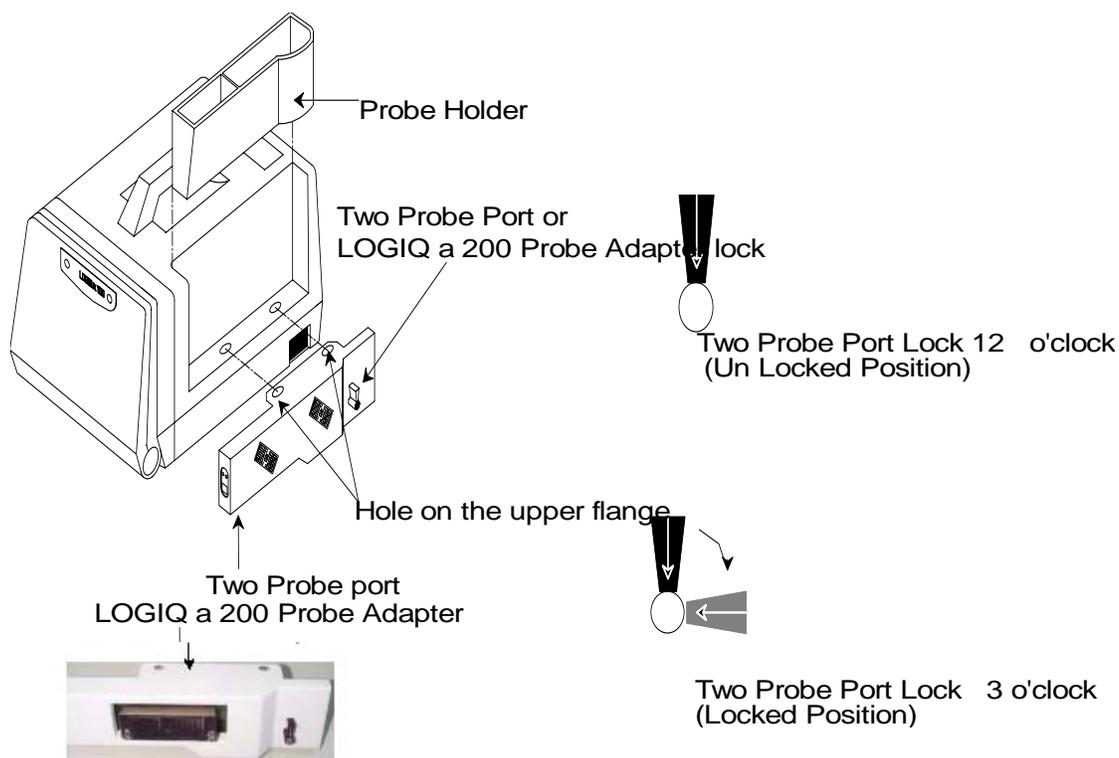


Figure 3-17 Installing Two Probe Port or LOGIQ 200 Probe Adapter

### 3-6-5 Installation of LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO with Global or Modular Trolley

*Note:* LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO 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 Figure 3-18 (trolley which is inside the box is seen in the diagram).

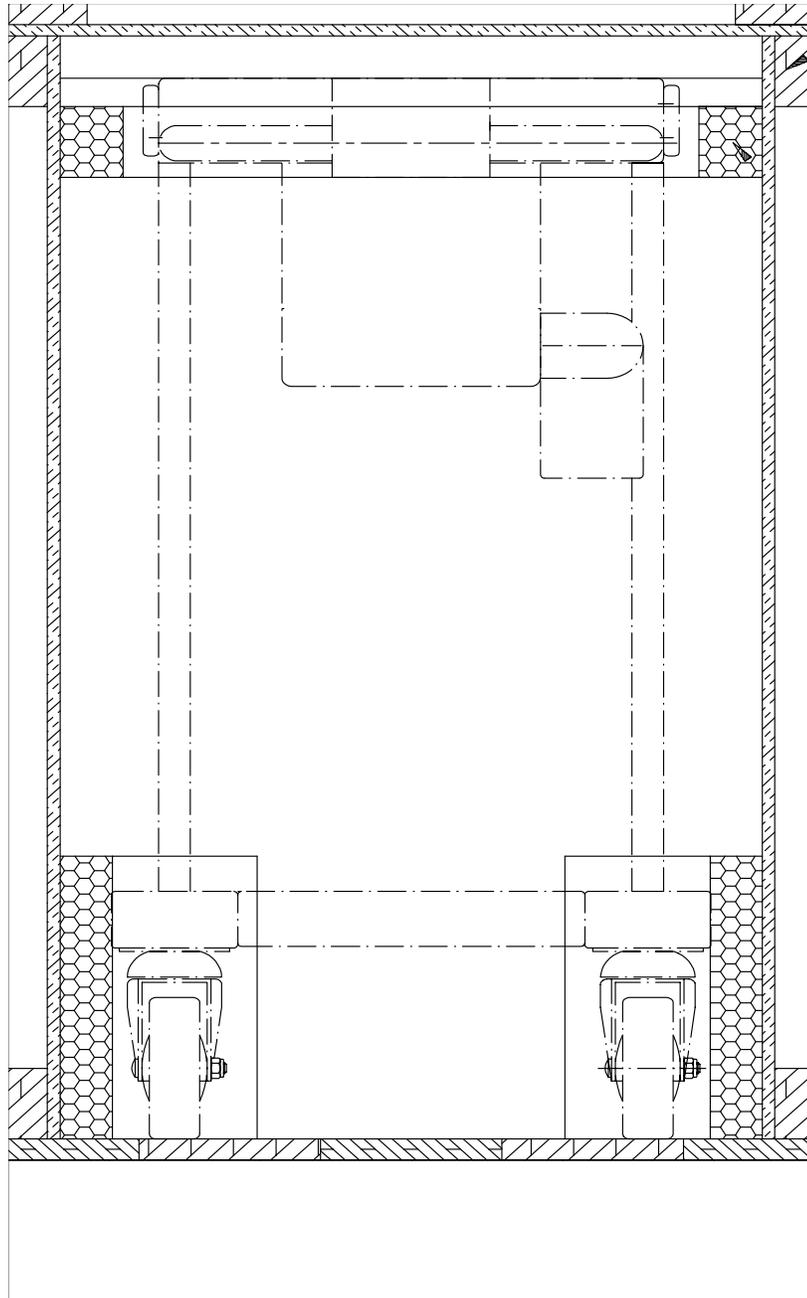


Figure 3-18 Global Trolley Unpacking

### 3-6-5 Installation of LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO with Global or Modular Trolley (Contd.,)

- 2.) Unpack the Modular Trolley packed in a box by opening the top cover, refer Figure 3-18

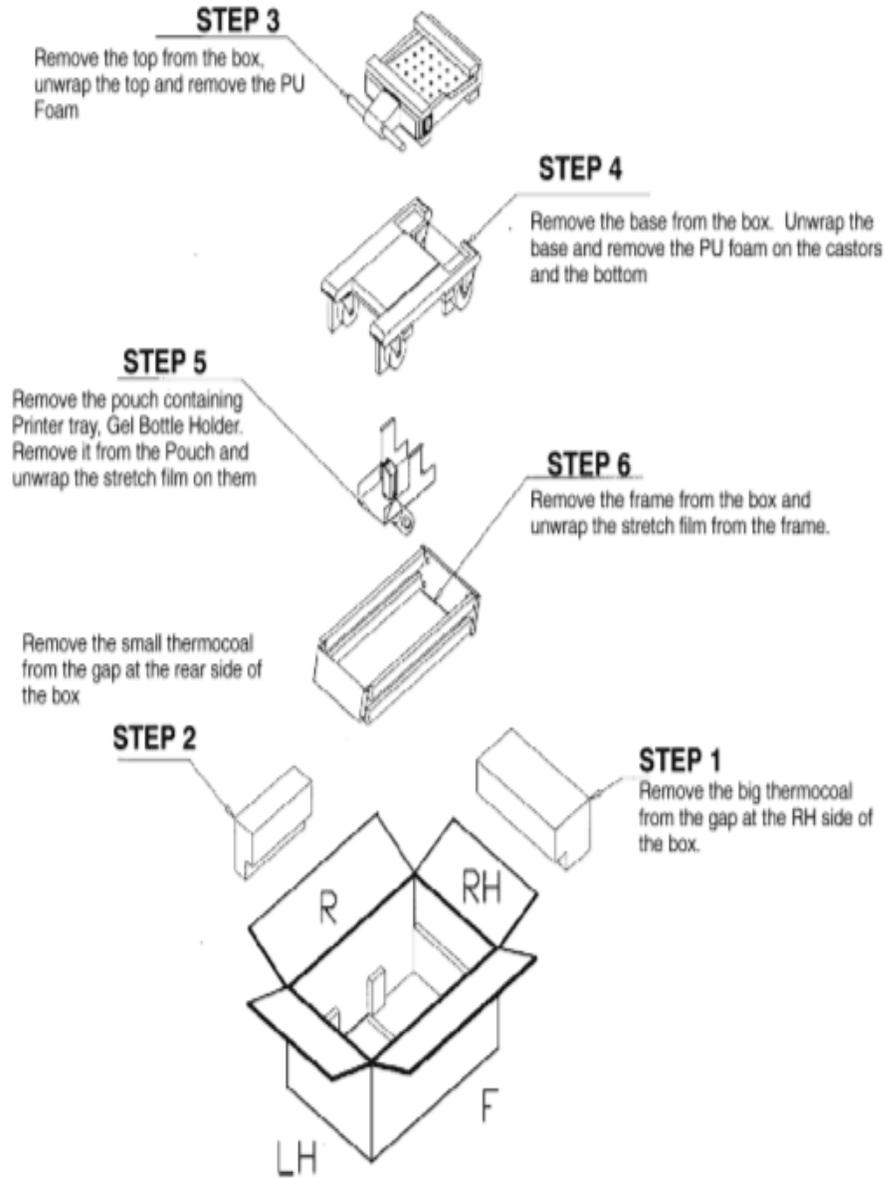


Figure 3-19 Modular Trolley Unpacking

### 3-6-5 Installation of LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO with Global or Modular Trolley (Contd.,)

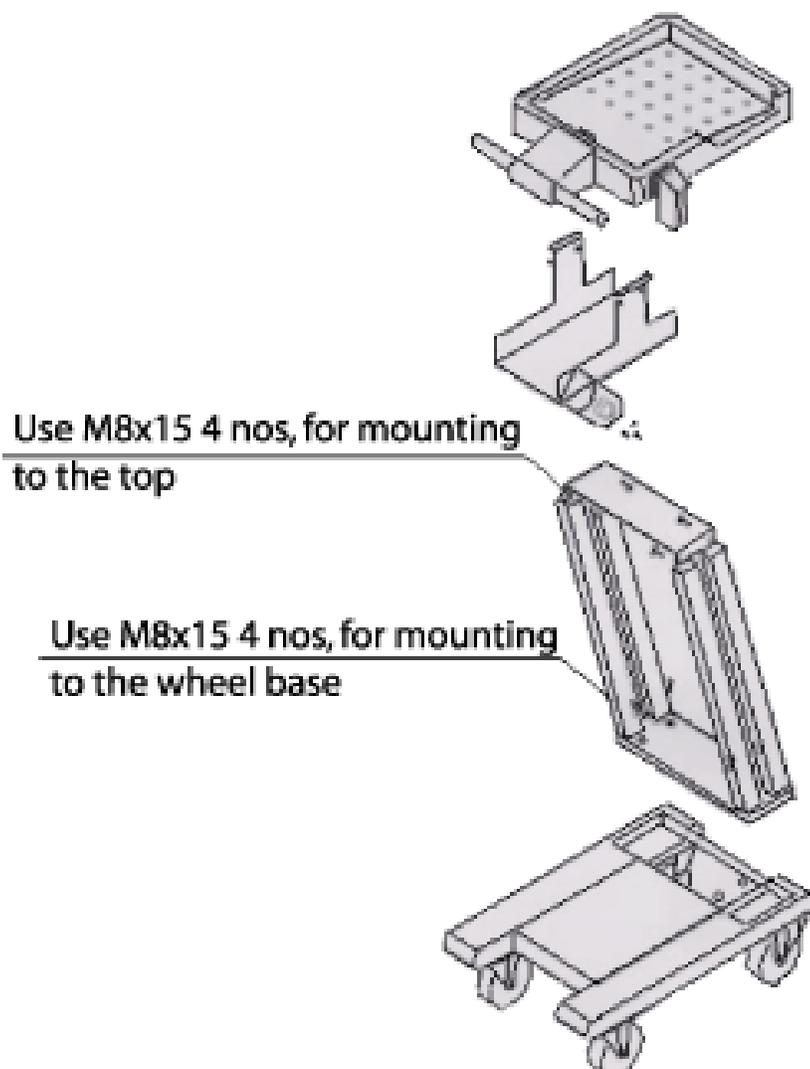


Figure 3-20 Modular Trolley Assembly

### 3-6-5 Installation of LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO with Global or Modular Trolley m (Contd.,)

- 3.) Remove two M4X10 screws from the base of LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO and fix lock plate. Refer Figure 3-21
- 4.) Place the unit with lock plate fixed on Trolley, ensure that lock plate gets into the projection on the trolley. Refer Figure 3-21

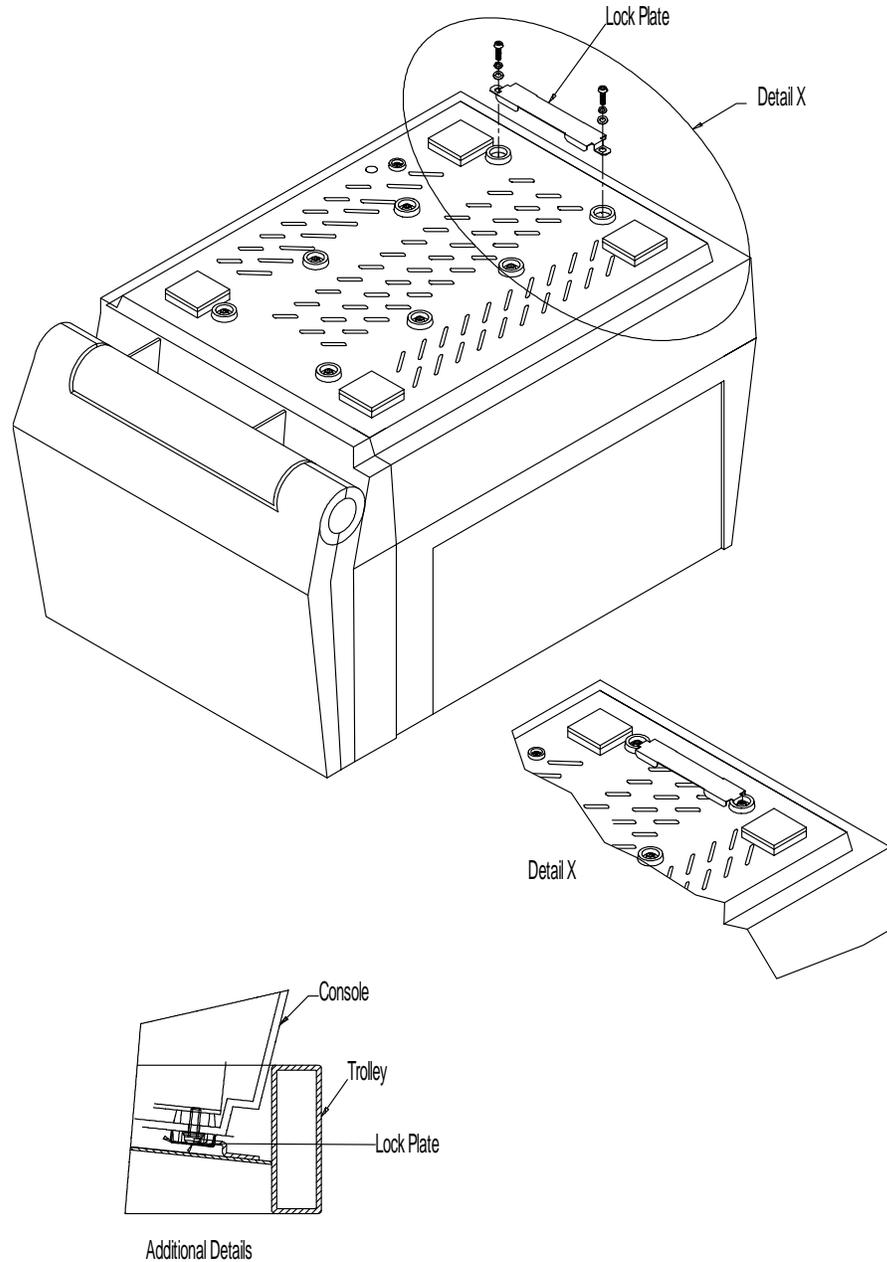


Figure 3-21 Installation of Trolley

### 3-6-5 Installation of LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO with Global or Modular Trolley (Contd.,)

- 5.) Take the belt (provided in the kit) over the unit and lock it. Refer Figure 3-22
- 6.) Release the Keyboard by pressing the lock release and make it rest on the handle. Refer Figure 3-22
- 7.) Insert the VGP inside the Printer Tray and fix from the bottom using M3X12 screw. Refer Figure 3-22

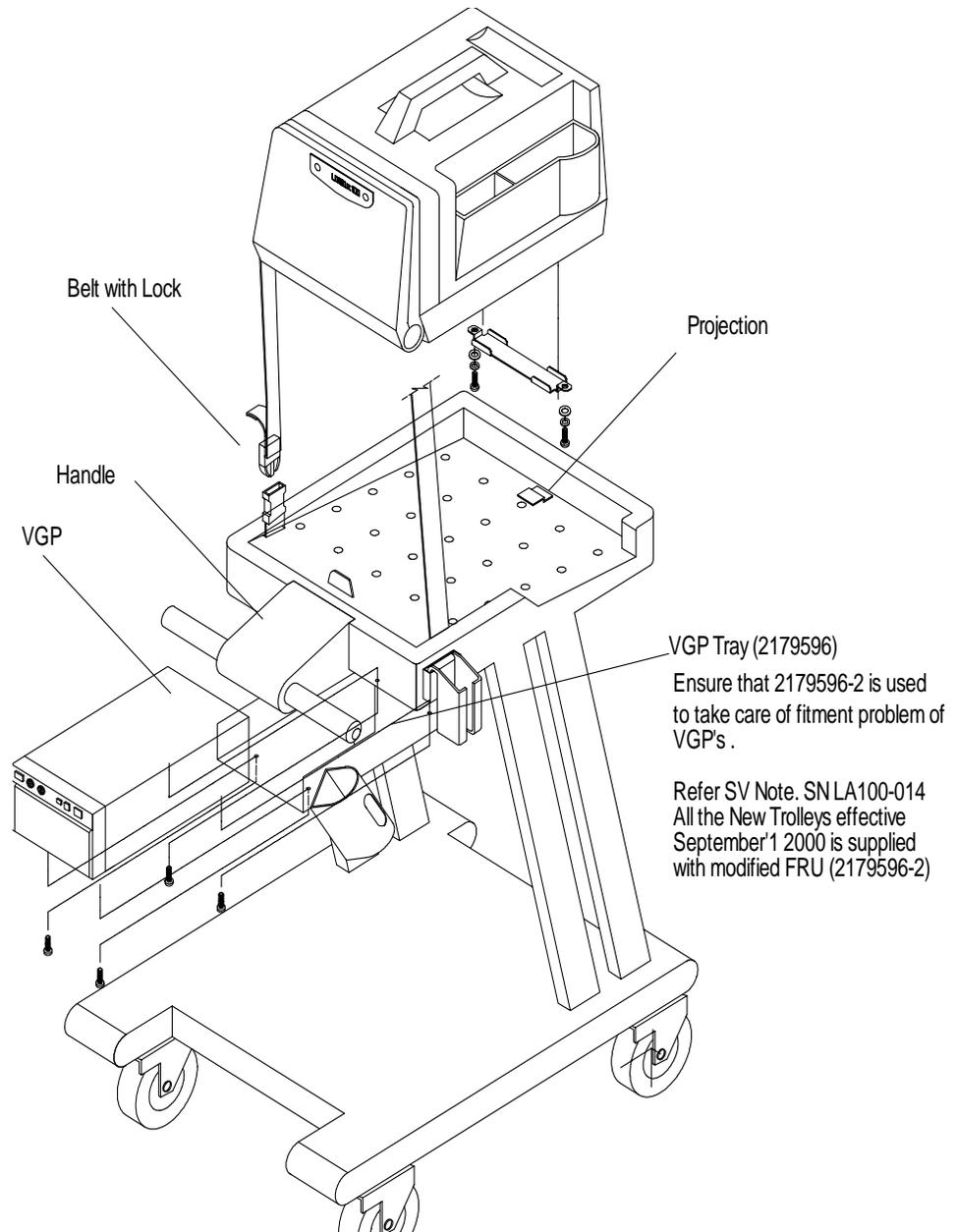
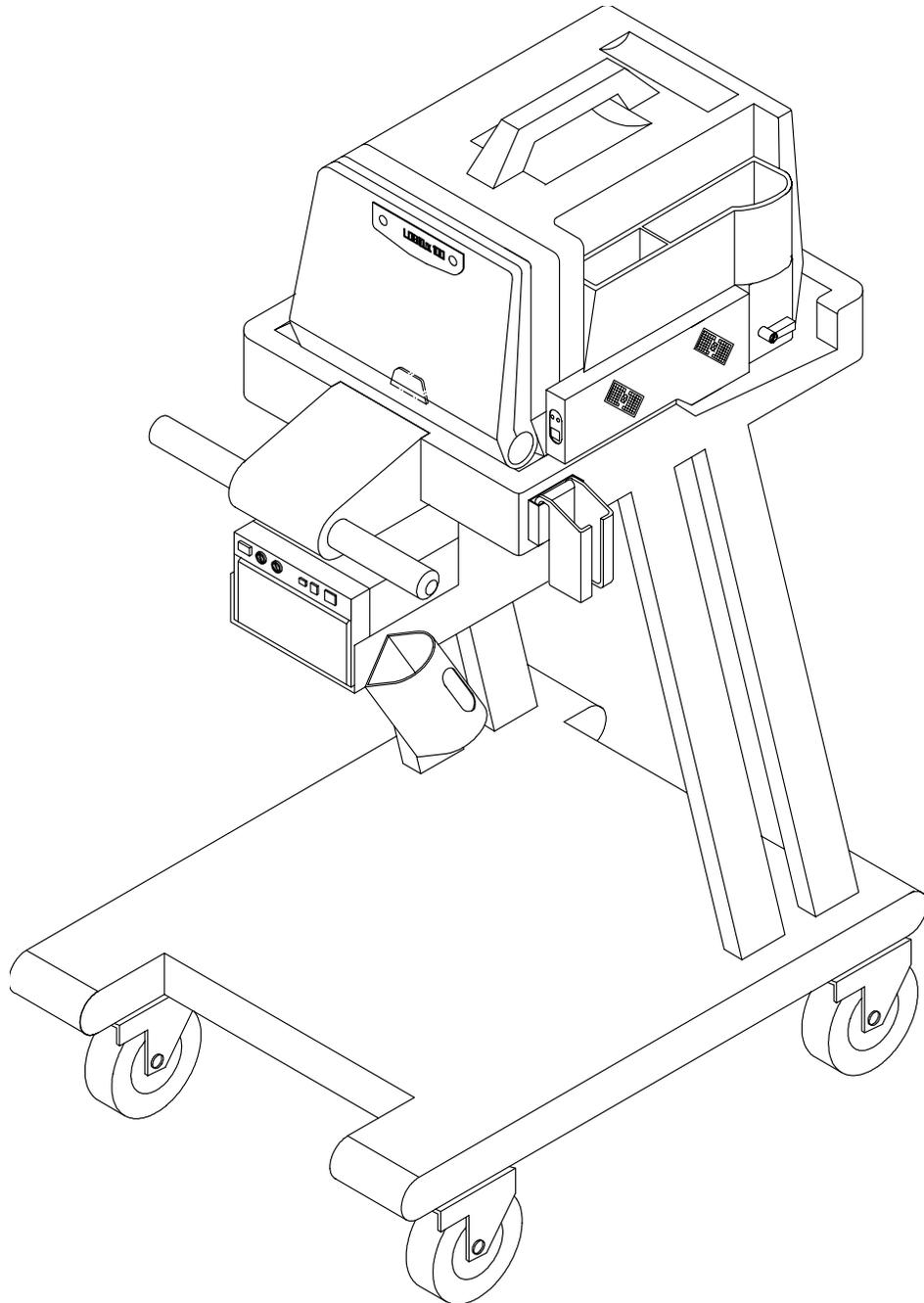


Figure 3-22 Installation of LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO with the Trolley

**3-6-5 Installation of LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO with Global or Modular Trolley (Contd.,)**



**Figure 3-23 Installation of LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO with Global or Modular Trolley**

### 3-6-6 Adjustment of Monitor Brightness & Contrast

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.

### 3-6-7 Adjustment of System Clock/Date, Hospital Name & 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



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

## Section 3-7 System Configuration

### 3-7-1 System Specifications

#### 3-7-1-1 Physical Dimensions

The physical dimensions of the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO unit are summarized in Table 3-2.

Height	Width	Depth	Unit
28.9	30.24	42.06	cm

Table 3-3 Physical Dimensions of LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO

3-7-1-2 Front View

WEIGHT : 9.95 kgs  
22.5 lbs

NOTE  
LENGTH: mm(inches)  
ABERRATION: "5%

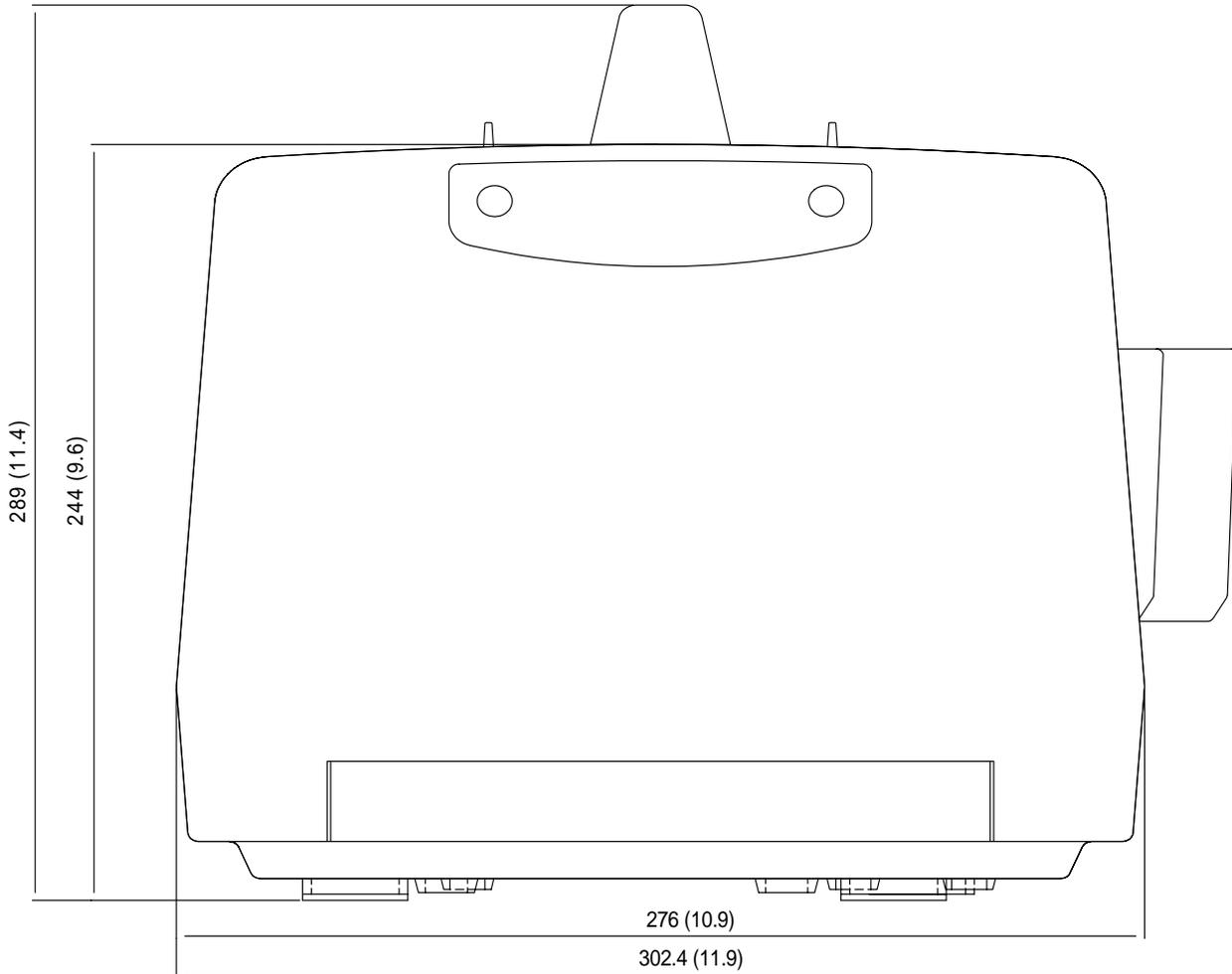


Figure 3-24 Front View

3-7-1-3 Side View (Keyboard Closed)

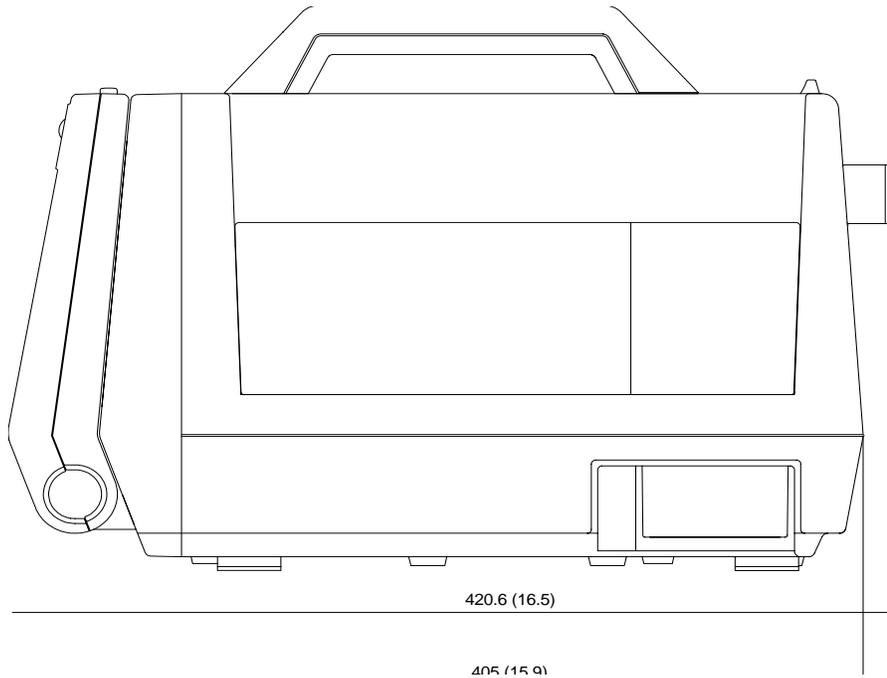


Figure 3-25 Side View (Keyboard Closed)

3-7-1-4 Side View (Keyboard Open)

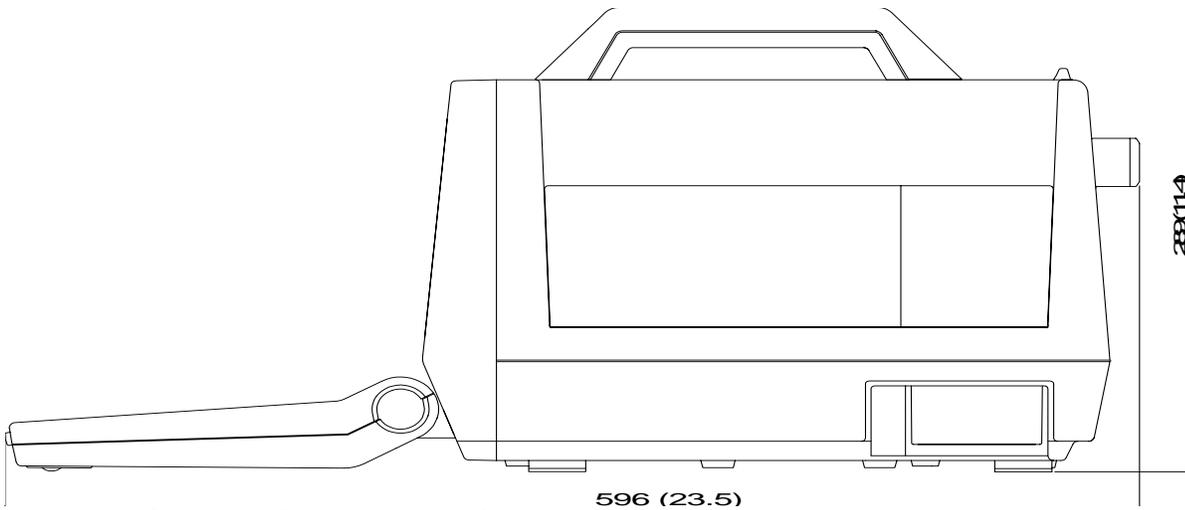


Figure 3-26 Side View (Keyboard Open)

**3-7-1-5 Weight without Peripherals**

The Weight of LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO without peripherals

Model	Weight [kg]	Weight [lbs]
LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO	9.95	22.5

**Table 3-4 Weight of LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO**

**3-7-2 Electrical Specifications**

Electrical Specifications for LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO.

GEMS P/N	Voltage	Tolerances	Current	Frequency
H41012LF H41112LF H41162LF H41282LF	100-115 VAC	±10%	1.8 A Max.	50-60 Hz
H41012LA-LE H41112LA-LE H41162LA-LE, LG H41282LA-LE, LG	100-230 VAC	±10%	0.9 -1.8 A Max.	50-60 Hz

**Table 3-5 Electrical Specifications for LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO**

**3-7-2-1 Power Supply**

The Following Power Line requirement should be monitored one week before Installation. We recommend that a Drantex model 605-3 Power line Monitor with options 101 to be used

**Table 3-6**

Parameter	Limits	
Voltage Range	USA, JAPAN Europe	100-115VAC ± 10% (90-127VAC) 200-240VAC ± 10% (198-264VAC)
Power	USA, JAPAN Europe	MAX 145VA MAX 175VA
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 periodic transients	
Decaying Oscillation	Less than 15% of Peak Voltage for less than 1 millisecond	

**3-7-2-2 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 Electro technical Commission (IEC) approval, or equivalent

**3-7-2-3 Storage & Operation Requirements**

The LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO is shipped in a single container excluding probes. Shipping weight is approximately 12 kgs. Table 3-7 Table provides a summary of temperature, atmospheric pressure, and humidity tolerances for shipping, installation and operation:

**Table 3-7 Storage & 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 90	35 to 75

**3-7-3 Optional Peripherals**

LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO peripherals and accessories can be properly connected using the connectors on the rear panel of the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO system.

**External Optional Peripherals**

- VCR (Sony SVO-9500MD)
- VGP (Sony UP-890MD/CE/MDG or UP-895MDW/MD/SYN) / (Mitsubishi P91E)
- Parallel Printing through HP Laser Jet Printers with any standard Parallel Printer cable.  
HP Laser Jet Printer Series 4, 4MP, 5, 5MP, 6L Gold with 2MB RAM, 2200, 2200D, 2200DN, 2200DSE & 2200DTN, HP LASER JET 1015.



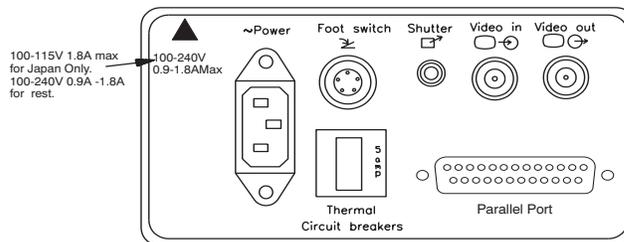
**WARNING**

Parallel Printing should not be done while live scanning patients. Also, the Printer cable should not be attached to the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO during the scan.

*For Europe Only:*

All devices connected to the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO must be CE Marked

Located on the panel are video input & output connectors, footswitch connector, shutter connector, power connector & control connections for Video Graphic Printer and Parallel Port (for V5.0 & above) Serial Port (for V4.0 & below).



**Figure 3-27 Optional Peripherals**

### 3-7-4 Peripherals Connections

This section indicates pin assignment for each connector

#### 3.7.4.1 Pin Assignment for Parallel Port (only for V5.0 & above systems)

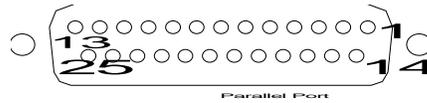


Figure 3-28 Connector: Female D type, 25 Pin on the Rear Panel

Pin Number	Signal
Pin1	$\overline{\text{STROBE}}/\text{WRITE}$
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	$\overline{\text{ACKNLG}}$
Pin 11	Busy
Pin 12	PE
Pin 13	SLCT
Pin 14	Not Connected
Pin 15	$\overline{\text{ERROR}}$
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

Table 3-8 Parallel Port (25 Pin Connector) Details

### 3.7.4.2 FootSwitch Connection

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

#### Pin Assignment of Foot Switch Connector

Pin No.	Signal
1	Foot Switch
2	GND
3	GND
4	GND
5	GND

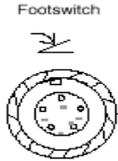


Figure 3-29 Foot Switch Connector (Round 5-pin connector)

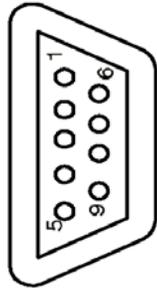
### 3.7.4.3 Pin Assignment for Line Printer cable (only for V4.0 & below systems)

**Connector:** Male, D-Type, 9 Pin on the rear pane;

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

### 3.7.4.4 Video Graphic Printer (VGP)

9 Pin Connector.	25 Pin Connector
Pin 1 - 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

Figure 3-30 Foot Switch Connector

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

Model: (Sony UP-890MD/CE/MDG or UP-895MDW/MD/SYN) / (Mitsubishi P91E)

### 3.7.4.5 Pin Assignment of Mini Jack controlling VGP

Pin No.	Signal
1	Shutter
2	Signal GND

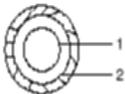


Figure 3-31 Foot Switch Connector

### 3.7.4.6 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.

### 3-7-5 Available Probes for LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO

See in Specifications in the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO User Manual for Probes and intended use.

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	2152422	H45202CZ	6.5	10mm	114°
*LB	P9601AQ	H46022LB	3.5	-	94mm

**Table 3-9 Available Probes**

\* This Probes are available only for LOGIQ™ $\alpha$  100 MP/LOGIQ™ 100 PRO with LOGIQ 200 Probe Adapter.



**CAUTION** Use only approved probes, peripherals or accessories

### 3-7-6 Video Specification

Video specifications may be needed to be able to connect laser cameras to the LOGIQ™ $\alpha$  100/ LOGIQ™ 100 PRO.

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
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
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]
		2nd Field 3[lines]	2nd Field 2.5[lines]
3	V-front porch	1st Field 7.5[lines]	1st Field 6.25[lines]
		2nd Field 7.5[lines]	2nd Field 6.25[lines]
4	V-Blanking	1st Filed 30.5[lines]	1st Filed 32[lines]
		2nd Field 30.5[lines]	2nd Field 32[lines]

## Section 3-8 Paperwork

*Note:* During and after installation, the documentation (i.e. User Manuals, Installation Manuals...) for the peripheral units must be kept as part of the original system documentation. This will ensure that all relevant safety and user informations are available during the operation and service of the complete system.

### 3-8-1 User Manual(s)

Check that the correct User Manual(s), per software (sw) revision, for the system is included.

### 3-8-2 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 Figure 3-32 may not be same as the Product Locator card actually provided.

		Mailing Address		GE Medical Systems Product Locator File P.O. Box 414 Milwaukee, WI 53201-0414		
DESCRIPTION		FDA	MODEL	REV	SERIAL NO.	
PREPARE FOR ORDERS THAT DO NOT HAVE A LOCATOR INSTALLATION REPORT		OCP		BS	ORD	DATE (MO-DA-YR)
SYSTEM ID NUMBER		DIS.-COUNTRY ROOM		EMPLOYEE NO.		
INSTALLATION		CUSTOMER NO.		DESTINATION NAME AND ADDRESS		
				ZIP CODE		

Figure 3-32 Product Locator Card

# Chapter 4 Functional Checks

## Section 4-1 Overview

### 4-1-1 Purpose of Chapter 4

This chapter provides procedures for quickly checking major functions of the LOGIQ™α 100/LOGIQ™ 100 PRO scanner, diagnostics by using the built-in service software, and power supply adjustments. For remaining functional checks please refer to the LOGIQ™α 100/LOGIQ™ 100 PRO Operator's Manual.

### CONTENTS IN CHAPTER 4

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4-1	Overview	4-1
4-2	General Procedures	4-2
4-3	Functional Check Procedures	4-4
4-4	Diagnostics	4-9
4-5	Software Configuration Checks	4-10
4-6	Peripheral Checks	4-10
4-7	Patient contact tools	4-11

Table 4-1 Contents in chapter 4

## Section 4-2 General Procedures

### 4-2-1 Power On/Boot Up

*Note:* After turning off the system, wait at least ten seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.



#### CAUTION SYSTEM REQUIRES ALL COVERS

Operate this unit only when all board covers and frame panels are securely in place. The covers are required for safe operation, good system performance and cooling purposes.

#### 4-2-1-1 System Boot-UP/Shutdown

Purpose: This is a description on how to Shut Down/Power-UP the system.

#### 4-2-1-2 Lockout/Tagout Requirements (For USA/Europe)

Follow OSHA Lockout/Tagout requirements by ensuring you are in total control of the plug.

#### 4-2-1-3 Power Up

- 1.) Connect the Power Cable at the rear of the System.
- 2.) Connect the Power cable to an appropriate mains power outlet

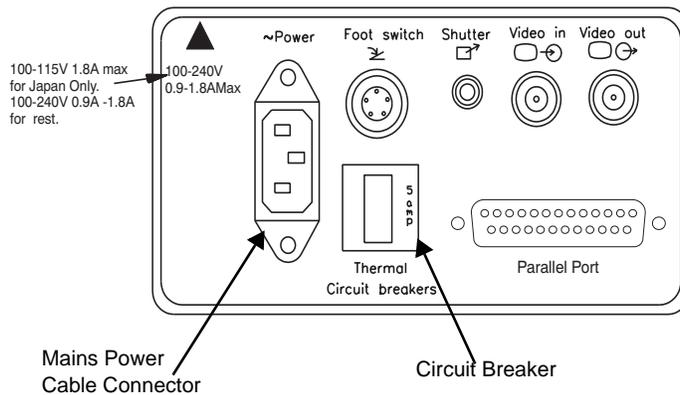
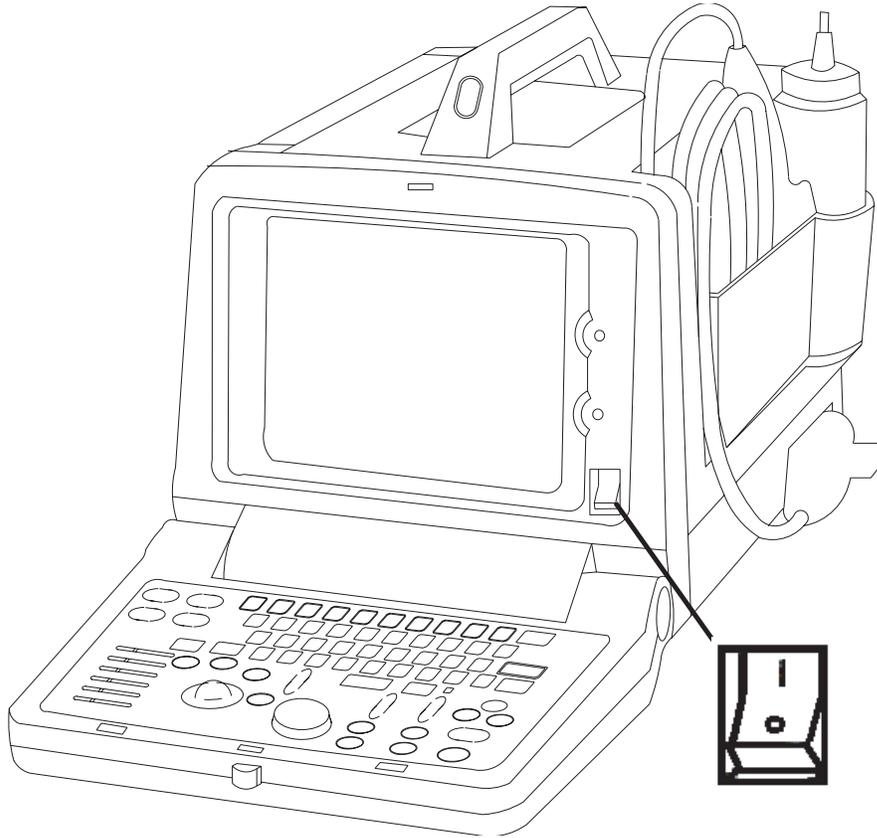


Figure 4-1 Mains Circuit Breaker and Mains Power Cable

**4-2-1-4 Front Panel ON/OFF**

Press the Front Panel ON/OFF key once. to Switch ON/OFF



**Figure 4-2 ON/OFF key on Front Panel**

When power is applied to the Scanner, Power is distributed to the Fan, Control panel, Monitor, Internal and External I/O's, Boards & Peripherals. Back End Processor starts and its software code is distributed to initiate the scanner.

Power Up Display Comes Up. Refer figure 4-3.

**4-2-1-5 Power Shutdown**

- 1.) Switch OFF the ON/OFF at the Front of the system.
- 2.) Disconnect the Mains Power Cable if needed.

## Section 4-3 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™ $\alpha$  100/LOGIQ™ 100 PRO 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 figure 4-3 for details.

- 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)
- 15.) Frequency Only For C36 Probe\*\*.

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

\*\* For Version 9.0.0 and above.

### 4-3-1 Power Up Monitor Display (Convex Probe)

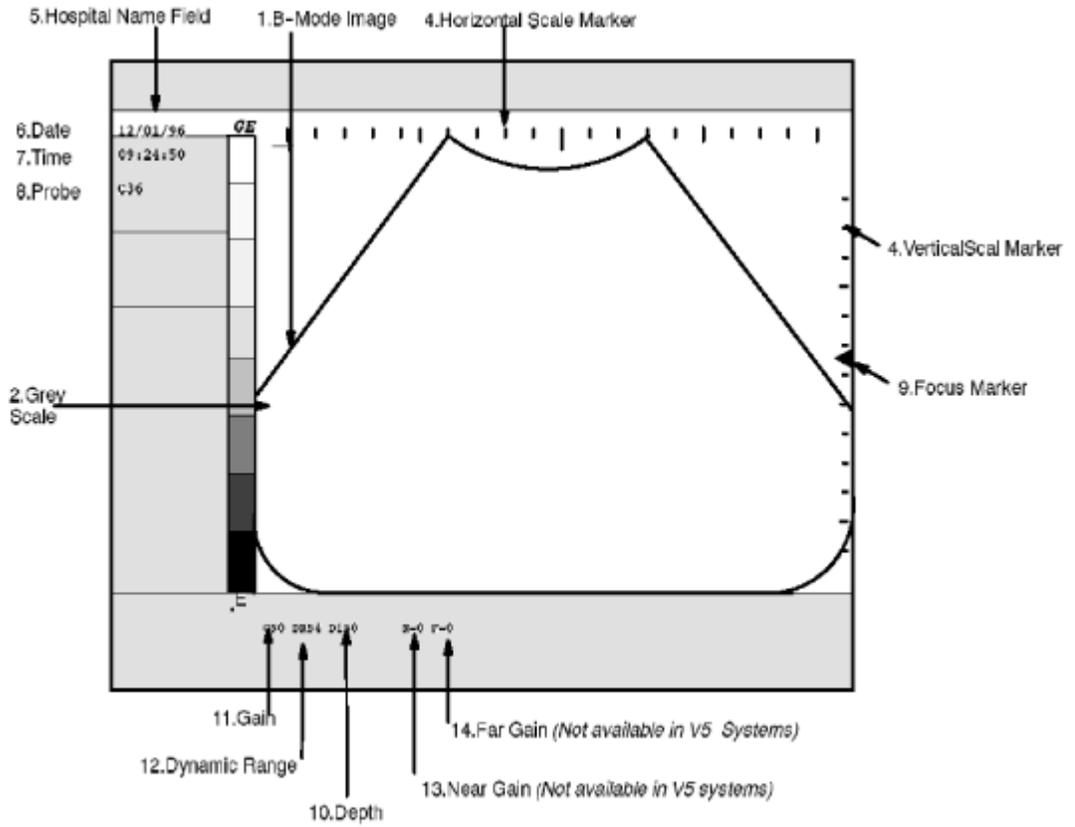


Figure 4-3 Power Up Monitor Display (Convex Probe)

### 4-3-2 Basic Controls

Table 4-2 describes basic controls which helps in checking the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO during installation.

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

TASK	Expected Result
Turn <b>ON</b> Power Switch	B-Mode screen as in figure 4-4 should appear
Press <b>New Patient Key</b>  Press <b>ID/Name</b>	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 <b>Dyn Range Up/Down</b>	Image grows softer and harder depending on position.
Rotate <b>Gain Knob</b>	Image grows lighter and darker with rotation.
Press <b>Reverse</b> Press <b>Reverse</b> a second time Press <b>SHIFT + Reverse</b> Press <b>SHIFT+ Reverse</b> 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 <b>Near</b> Up/Down Press <b>Far</b> 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 <b>M</b> key  Roll Trackball  Press <b>M</b> key a second time	B/M Mode with M-line cursor appears. (Use trackball to move the M-line cursor). Refer Figure 4-4  The M-Line cursor should follow the trackball movement and the real-time image varies on the M-Mode display. Only M-Mode image appears on the screen. Press B Mode Key to exit M-Mode.
Press <b>Freeze</b> key	The image will freeze.
Press <b>ATO</b> (only for LOGIQ™ 100 PRO)	ATO, Automatic Tissue Optimization, optimizes the image based upon a specified Region Of Interest (ROI) or anatomy within the display. ATO Gray scale map is available only in B-Mode.
Press <b>Zoom &amp; Freeze</b> (Only for LOGIQ™ 100 PRO)  Roll Trackball	Zoom is used to magnify an image. The magnification factor for zoom is fixed at 2.0. The system adjusts all imaging parameters accordingly.  To select the ROI for Zoom

Table 4-2 Basic Controls

TASK	Expected Result
<p><b>CINE (Only for V5.0 &amp; above)</b> Press Freeze and Rotate <b>B/M Gain/ Cine Scroll</b></p> <p><u>Cine Menu:</u></p> <p>Press 1 (<b>Start Frame</b>)</p> <p>Press 2 (<b>End Frame</b>)</p> <p>Press 3 (<b>Cine Loop</b>)</p> <p>Press 4 (<b>Cine Gauge</b>)</p>	<p>The Cine Gauge, menu and the Cine frame number appears at the bottom of the display.</p> <p>Rotate the <b>Cine Scroll</b> dial to move through the images in Cine Memory.</p> <p>Cine frame number is displayed on the left side of the screen.</p> <p>Move the Cursor by rotating the <b>Cine Scroll</b> dial to the frame you want and press 1 again to select the Start frame.</p> <p>Move the Cursor by rotating the Cine Scroll dial to the frame you want and press 2 again to select the End frame.</p> <p>Enters into Cine loop within the selected Start &amp; End frames.</p> <p>To toggle between the Cine Gauge display</p>
<p><b>Flash Memory (Image storage) (Only for V5.0 &amp; above)</b></p> <p>Freeze the image Press <b>Store</b></p> <p>Press <b>Recall</b></p>	<p>Comment column appears at the bottom of the display. Enter the comment in that and press <b>Store</b> again to Store the image.</p> <p><b>Image Archive</b> screen appears with option menu at the bottom.</p> <p>Select the image using the trackball (Use Dynamic Range to page up/down in the Image Archive screen).</p> <p>Press <b>1</b> to View the selected image.</p> <p>Press <b>2</b> to Clear the selected image.</p> <p>Press <b>3</b> to Clear All the stored images.</p> <p>Press <b>4</b> to Sort the images by name or date.</p> <p>To Exit Image Archive, press <b>Freeze</b>.</p>
<p><b>TGC (Only for V5.0 &amp; above)</b></p>	<p>The <b>TGC</b> 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.</p>

**Table 4-2 Basic Controls**

Refer User Manual for the Remaining Operations

### 4-3-3 Basic Controls (Continued)

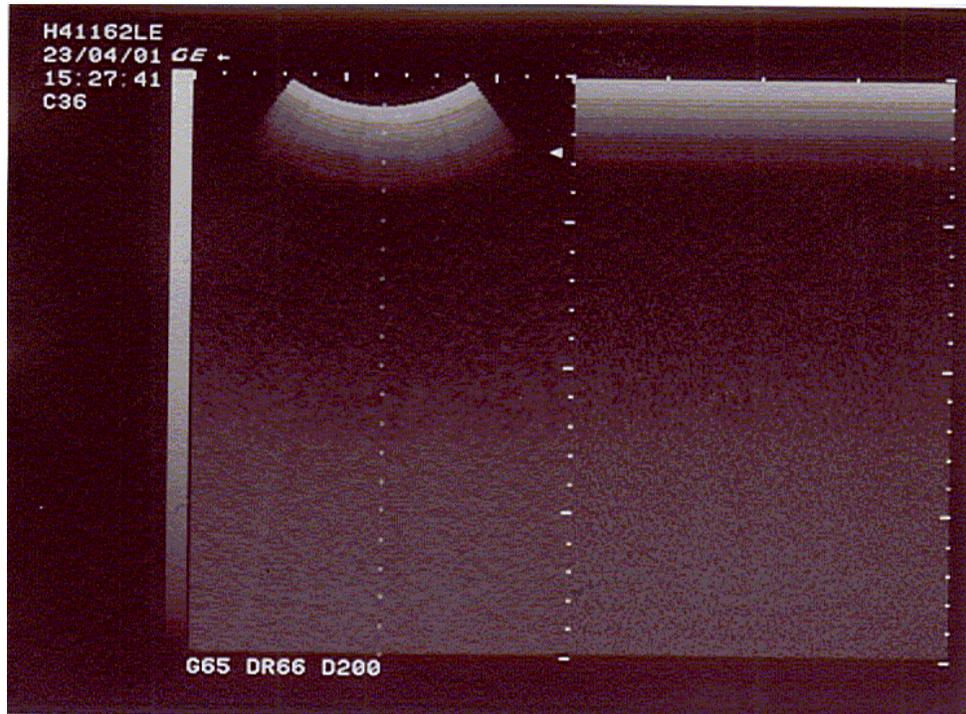


Figure 4-4 B/M Mode Display

### 4-3-4 Phantom Check

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

## Section 4-4 Diagnostics

The LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO 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.

### 4-4-1 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/SW3\* - 6,7,8 on the CPU which is set to ON,OFF,OFF respectively which is the normal setting.*

*\* SW1 for V5.0 & below systems & SW3 for V3.36a, V4.06a,V5.06a & above).*

For More Details on Switch Setting Refer Section 5-3-2-2.

### 4-4-2 Service Diagnostics

For More Details on Service Diagnostic refer Chapter 7.

## Section 4-5 Software Configuration Checks

Step	Check	Expected Result(s)	If Not Remedy
1.	Check Date and Time setting	Date and Time are correct	Adjust the Date and Time setting
2.	Check that Location (Hospital Name) is correct	Location Name is correct	Re-enter the correct Location Name

Table 4-3 Software Configuration Checks

## Section 4-6 Peripheral Checks

Check that peripherals work as described below..

Step	Check	Expected Result(s)	If Not Remedy
1.	Press Freeze Key	to stop image acquisition.	
2.	Press <u>RECORD</u> Key on the Control panel	The image displayed on the screen is printed on B&W Video Graphic Printer	
3.	Press <u>SHIFT + RECORD</u> Key on the Control Panel.	To image or report page displayed on the screen is printed on the Parallel Printer connected to the Parallel Port of the System	
4.	Press <u>SHIFT + STORE</u> Key on the Control Panel.	To start the Image Transfer Operation	
5.	Press <u>EXTERNAL VIDEO</u> Key on the Control Panel	Enables an External Video Input Playback on the LOGIQ™ <sub>α</sub> 100/LOGIQ™ 100 PRO monitor. Press once again to return to the scan mode	

Table 4-4 Peripheral checks

## Section 4-7 Patient contact tools

### 4-7-1 Probe/Connectors Check

Take the probes and check them as described below.:

Step	Check	Expected Result(s)	If Not Remedy
1.	To test each delivered Probe, Connect it to the System	It will display the probe name on the screen	
2.	<p>Hold the probe connector horizontally with the cable pointing Sideways.                      Turn the connector locking handle to the Vertical position.                      Align the connector with the probe port and carefully push into place.                      Rotate the locking handle to the full Horizontal position to lock in place.                      Position the probe cable so that it is not resting on the floor</p> <p><b>CAUTION:</b>                      Do not allow the probe head to hang freely. Impact to the probe head may result in irreparable damage.</p>	To connect a probe:	
3.	<p>Rotate the lock handle counter-clockwise to the Vertical position to unlock the connector.                      Remove the connector from the port                      Ensure that the probe head is clean before placing the probe in its storage case.</p>	<p><b>To disconnect probes:</b>  <i>The probes that are not connected to the unit should be stored in their storage case.</i></p>	
4.	To test the Two Probe Adapter, Connect it to the System	To connect to the probe port	
5.	<p>Hold the Two Probe Port connector horizontally                      Turn the connector locking handle to the Vertical position.                      Align the connector with the probe port and carefully push into place.                      Rotate the locking handle to the full Horizontal position to lock in place.</p>	To connect a probe:	
6.	Two Probes can be Switched by pressing the Key on the Two Probe Port	<p>The LED toggles to indicate the probe change &amp; a click is also heard to indicate change over                      The system initializes the new probe &amp; the image from the newly selected probe is displayed in the B-Mode</p>	
7.	<p>Presetting Parameters to a Probe, Select the desired probe &amp; adjust the desired parameters                      Press CTRL + W + Enter</p>	The Parameters selected will be set as Default Values	
8.	To test the LOGIQ PROBE ADAPTER, connect it to the system	Connect the Adapter to the Port	

Table 4-5 Probe and connectors check

Step	Check	Expected Result(s)	If Not Remedy
9.	Hold the probe connector horizontally with the cable pointing Sideways. Turn the connector locking handle to the Vertical position. Align the connector with the probe port and carefully push into place. Rotate the locking handle to the full Horizontal position to lock in place. Position the probe cable so that it is not resting on the floor  CAUTION: Do not allow the probe head to hang freely. Impact to the probe head may result in irreparable damage.	It will display the Probe name on the Screen	

**Table 4-5 Probe and connectors check**

 **WARNING** Probes can be connected at any time, whether the unit is on or off

 **WARNING** *Do NOT touch the patient and any of the connectors on the ultrasound unit simultaneously, including ultrasound probe connectors.*

# Chapter 5 Theory

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## Section 5-1 Overview

### 5-1-1 Purpose of Chapter 5

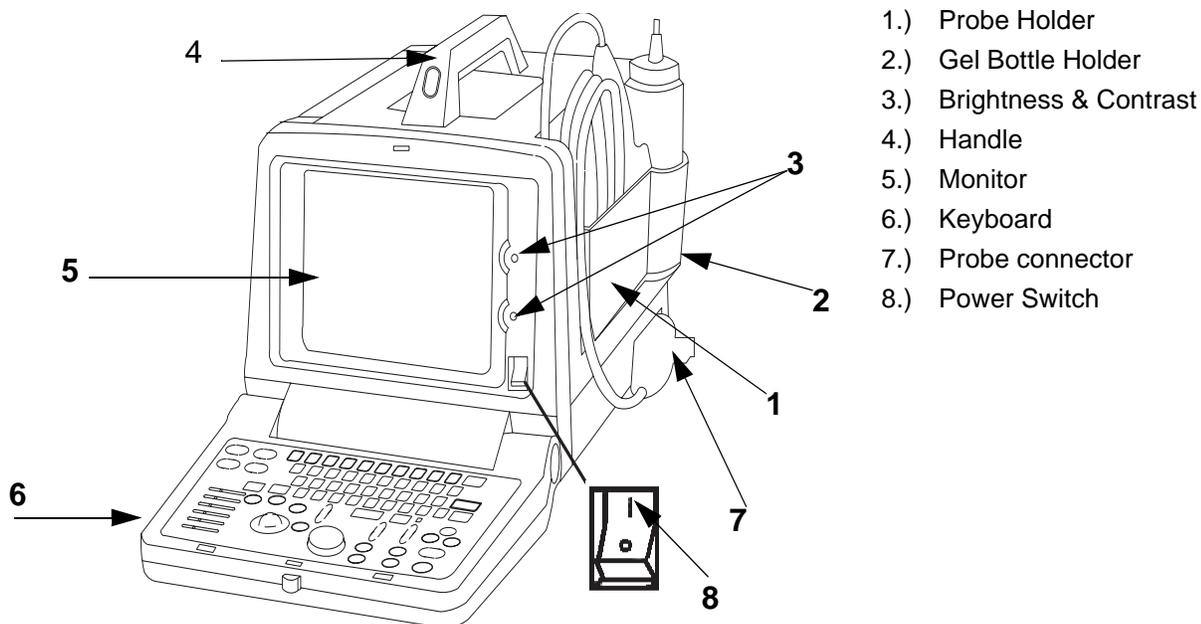
This chapter explains LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO's system concepts, component arrangement, and subsystem function. It also describes the Power Distribution System (PDS) and probes.

### CONTENTS IN CHAPTER 5

Section	Description	Page Number
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**Table 5-1 Contents in Chapter 5**

## Section 5-2 General Information



**Figure 5-1 LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Major Components**

- LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO is a portable ultrasound imaging scanner. It also has provisions for analog input sources like The system can be used for:
  - B-Mode Black and White imaging
  - M-Mode Black and White imaging
  - A-Mode Black and White imaging
  - Combinations of the above
- LOGIQ™ 100 PRO is a digital beam forming system and can handle up to 16 element linear probes by use of multiplexing.
- Signal flow from the Probe Connector to the Front End, then to the Mid Processors and Back End Processor and finally to the monitor and peripherals.
- System configuration is stored on EPROM and all necessary software is loaded when powered up.

### Section 5-3 Block Diagram

Block Diagram

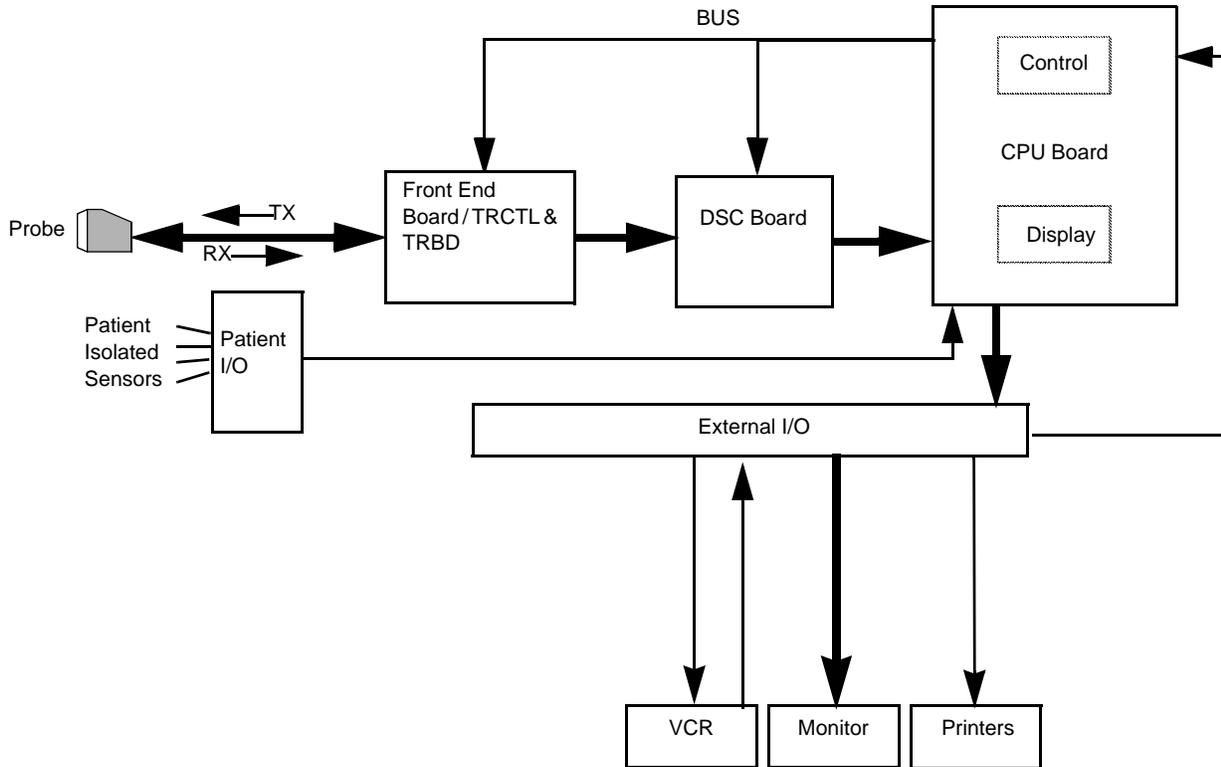


Figure 5-2 Block Diagram, LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO (General)

Section 5-3 Block Diagram (V5.0 & below)(Cont'd)

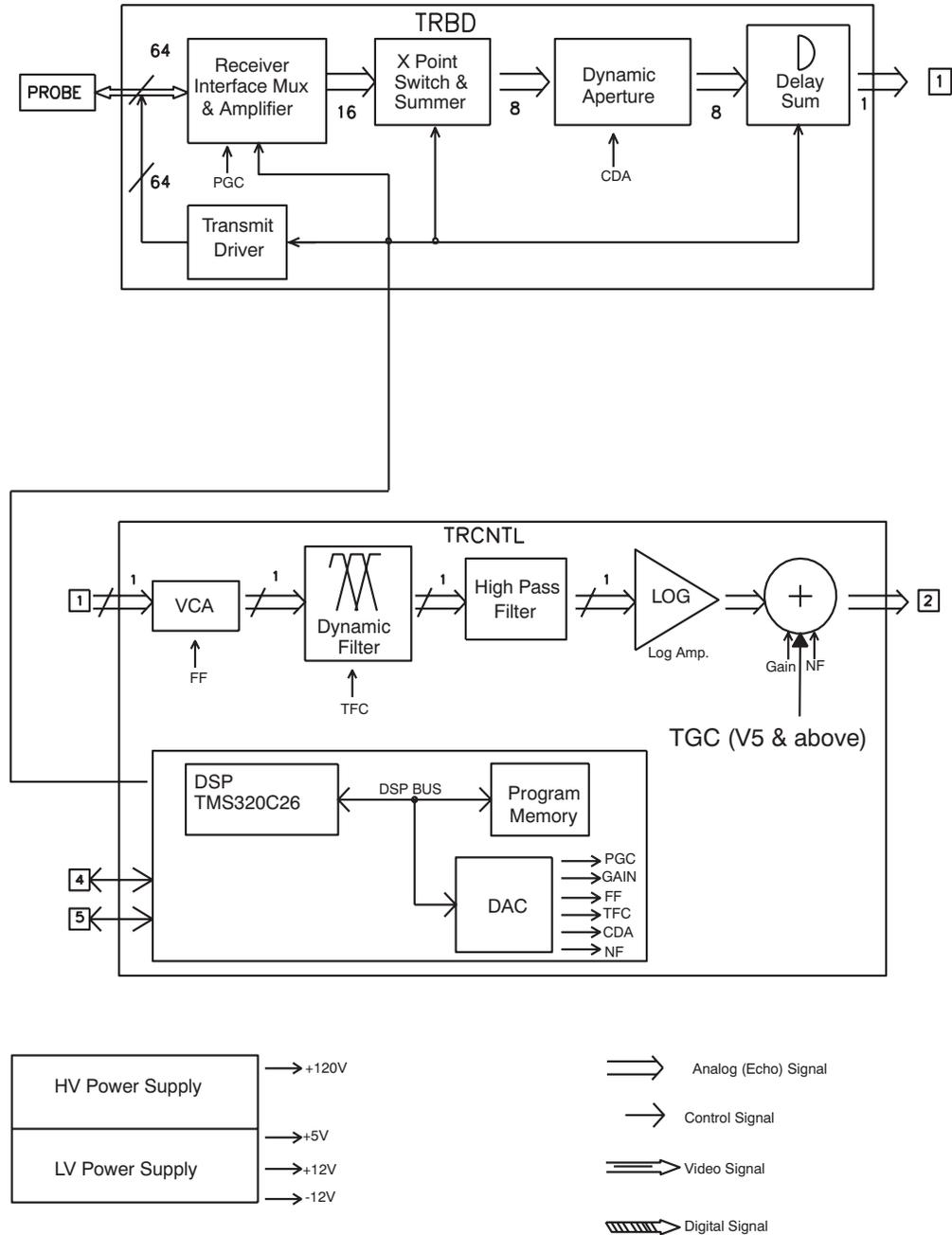


Figure 5-3 V5.0 & below Systems Block Diagram

Section 5-3 Block Diagram (V5.0 & below)(Cont'd)

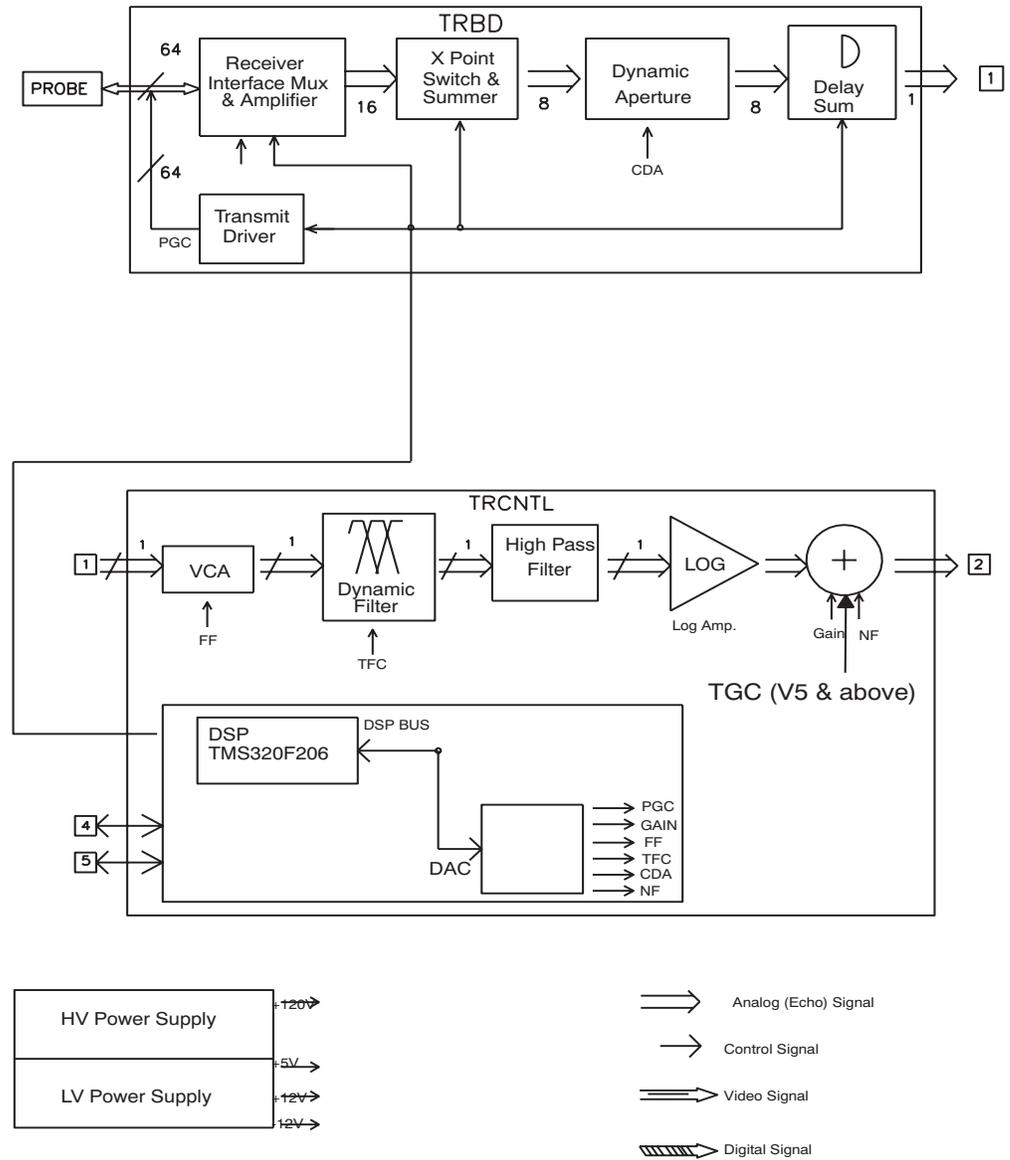


Figure 5-4 V5.06a Systems Block Diagram

Section 5-3 Block Diagram (V5.0 & below)(Cont'd)

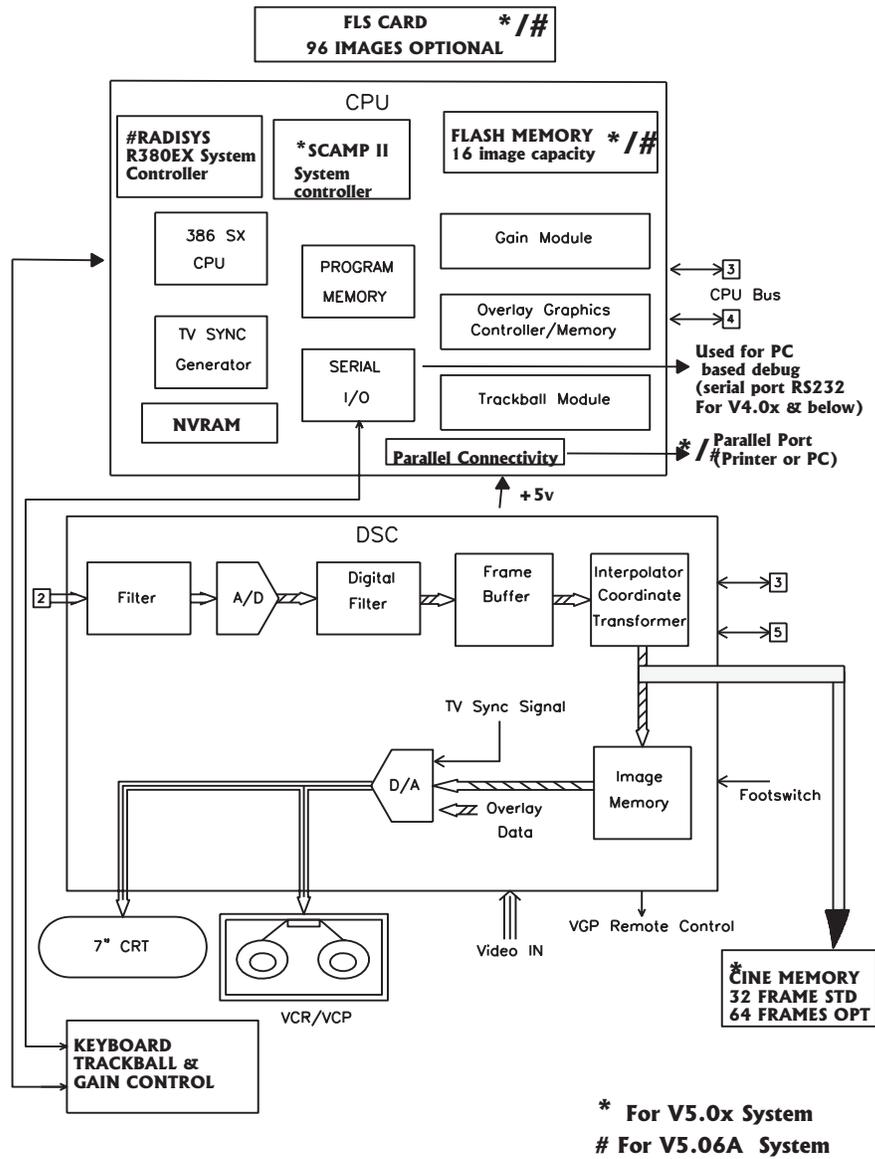
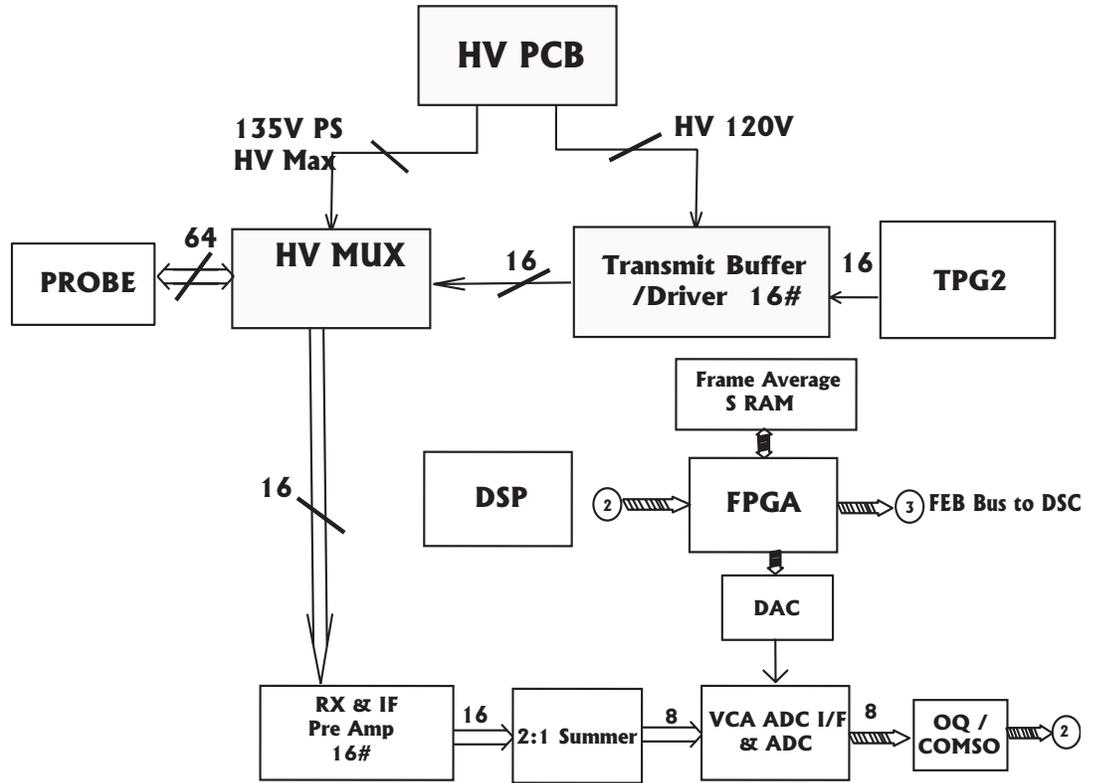
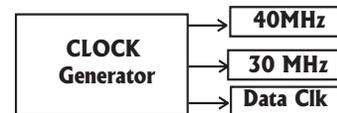


Figure 5-5 Block Diagram for V5.06a & below

Section 5-3 Block Diagram (V5.0 & below)(Cont'd)



OQCARD -> Octal Quad Channel Asic Receiving Delay  
 COMSO -> COMplex Mode Mid Proces5Or



**FEB Board**



Figure 5-6 Block Diagram LOGIQ™ 100 PRO V7.x.x or above  
 For Systems V9.X.X and Above:  
 SHV = +80V. THV = +65V

Section 5-3 Block Diagram (V5.0 & below)(Cont'd)

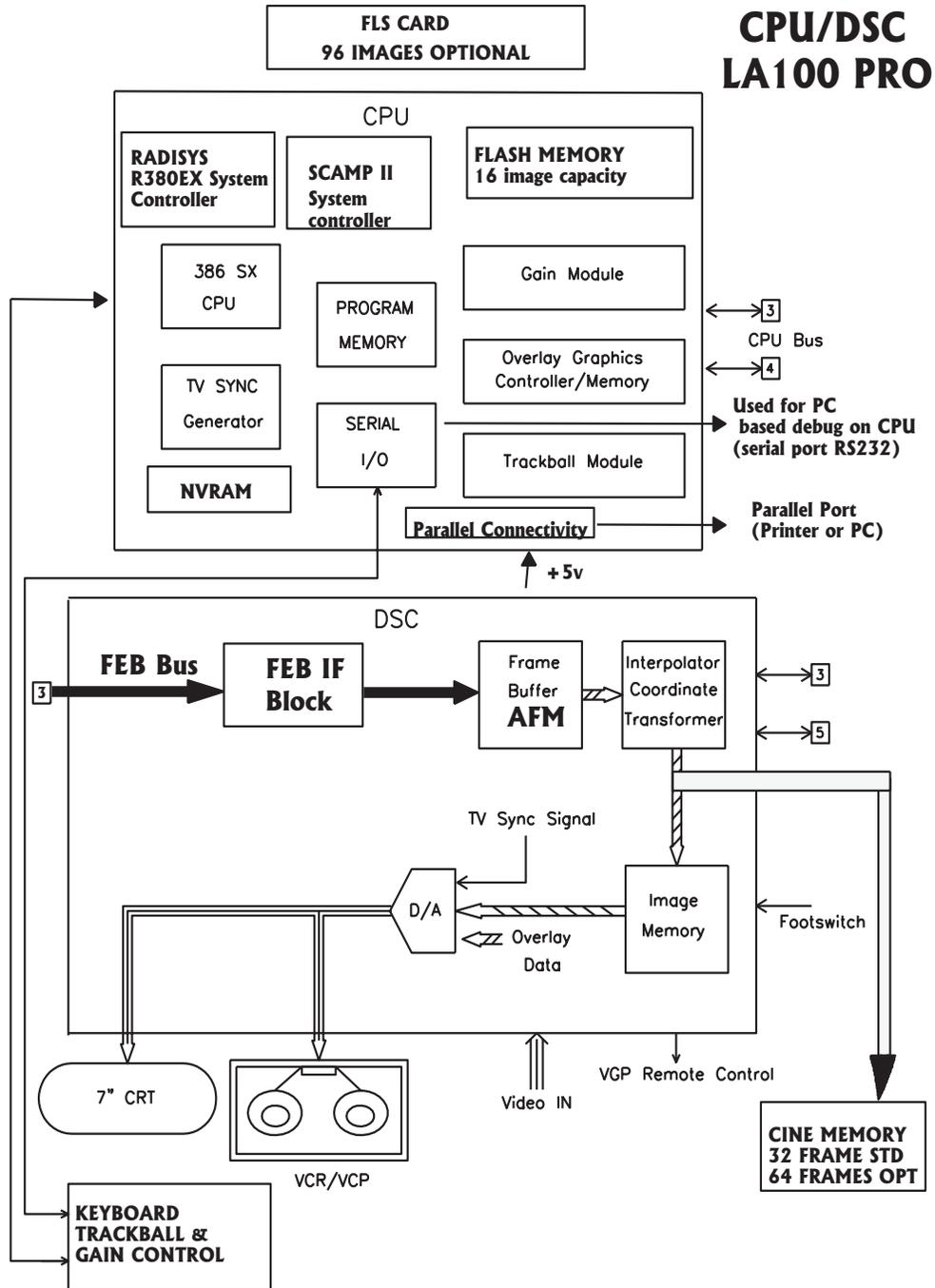


Figure 5-7 Block Diagram for LOGIQ™α 100/LOGIQ™ 100 PRO

Section 5-3 Block Diagram (V5.0 & below)(Cont'd)

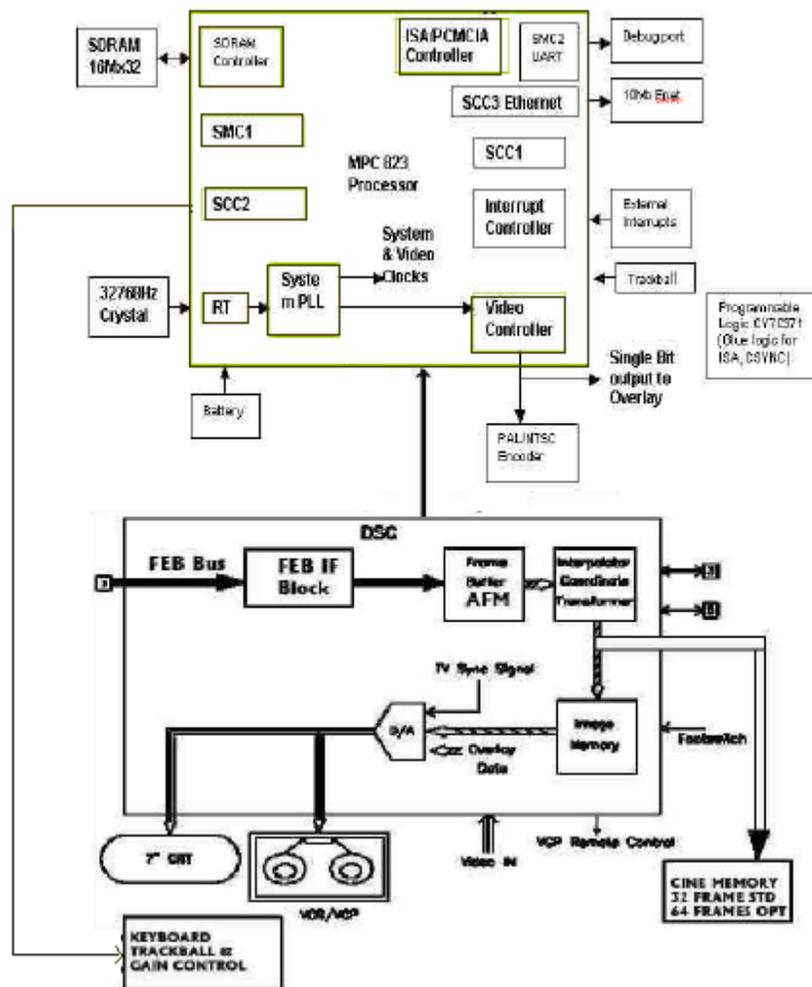


Figure 5-8 Block diagram for LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO

### 5-3-1 PCB Nomenclature

The following table lists the Circuit boards on LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO system.

Board Abbrev	Description	Remarks
TRCTL	Transmit Receive Control	For LOGIQ™ $\alpha$ 100 & MP (V5.06a & below)
TRBD	Transmit Receive Board	For LOGIQ™ $\alpha$ 100 & MP (V5.06a & below)
CPU	Central Processing Unit	For LOGIQ™ $\alpha$ 100, MP & PRO (All S/W Versions)
DSC	Digital Scan Converter	For LOGIQ™ $\alpha$ 100, MP & PRO (All S/W Versions)
KBD	Keyboard	For LOGIQ™ $\alpha$ 100, MP & PRO (All S/W Versions)
FEB	Front End Board	For LOGIQ™ 100 PRO (V7.x.x and above)
PDB	Power Distributor PCB	For LOGIQ™ $\alpha$ 100, MP & PRO (All S/W Versions)
HVPS	High Voltage Power Supply	For LOGIQ™ $\alpha$ 100, MP & PRO (All S/W Versions)

**Table 5-2 PCB Boards**

### 5-3-2 Dip Switch Setting

#### 5-3-2-1 TRCTL Board (Only for V5.0 & below)



**CAUTION**

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.

S1	1	Probe Type 0
	2	Probe Type 1
	3	Probe Type 2
	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 (Shutdown 1) 0: HV low (Not Used) 1: HV high (Not Used)

**Table 5-3**

5-3-2-1 TRCTL Board (Only for V5.0 & below) (Continued)

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

Table 5-4 Probe Code

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

5-3-2-2 CPU Board

Location	Switch No	Settings
SW1/ SW3#	2	0: STDOUT is LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO Display 1: STDOUT (Standard Output) AUX (PC)
	3	0: STDIN (Standard Input) is AUX (PC) 1: STDIN is LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO Keyboard*
	4	0: NTSC Setup 1: PAL Setup
	5	0: 2MB DRAM 1: 512KB DRAM
	6,7,8	000: Debug Monitor 100: Application (Ultrasound Mode) 001: Service Diagnostics

Table 5-5 CPU Board SW1/SW3

Note: This list is active only when 6,7,8 is in 000  
 # SW3 for S/W versions V3.36a, V4.06a, V5.06a & above & SW1 for S/W Version V3.3, V3.3a, V3.3D, V4.0a & V5.0.

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 Default Settings of SW1(SW3 for CPU Bare board 2290038 (V6))

Location	Switch No.	Settings
SW2 (V5 & above)	S1	0(OFF): Flash Assembly Enable 1 (ON): Flash Assembly Disable
	S2	0(OFF): Enable 64 Frame Cine 1(ON): Disable 64 Frame Cine
	S3 to S8	Don't Care

Table 5-7 Default Settings of SW2

Location	Switch No.	Settings
Sw3 # for 2300745-3 & Above	S1	0(OFF): Flash Assembly Enable-For 16 Images 1 (ON): Flash Assembly Disable-For 112 Images
	S4	0(OFF): NTSC Setup 1(ON): PAL Setup
Sw1 for 5131073 CPU	S5	0(OFF): Enable 64 Frame Cine 1(ON): Disable 64 Frame Cine
	S6 , S7	S6      S7 ON      OFF:Application(Image mode) OFF      ON :Service Diagnostics

Table 5-8 For Version 7.X.X & Above.

\* Applicable For version 9.0 also.

## Section 5-4 Wiring Diagrams

### 5-4-1 Power Distributor/Power Supply Wiring Diagram

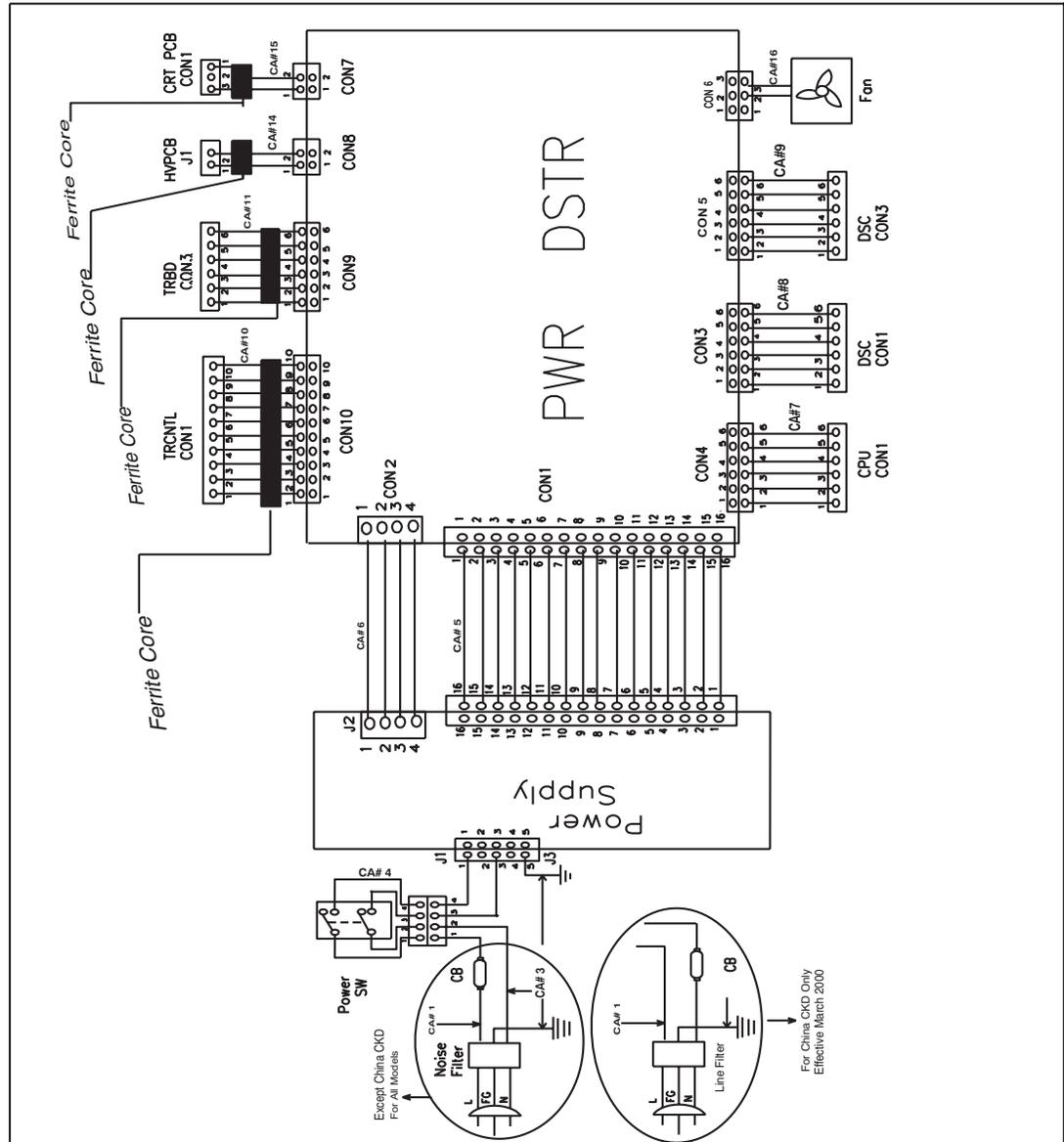


Figure 5-9 Power Distributor/Power Supply Wiring Diagram (V5.06a & below)



**5-4-1 Power Distributor/Power Supply Wiring Diagram(cont'd)**

Connector	Pin No.	Voltage	Connector	Pin No.	Voltage	Connector	Pin No.	Voltage	
PWR DSTR CON 1	1	12V	PWR DSTR CON4 to CPU CON1	1	GND	PWR DSTR CON10 to TRCTL CON1	1	5V	
	2	12V		2	GND		2	5V	
	3	-12V		3	GND		3	GND	
	4	-12V		4	5V		4	GND	
	5	12V		5	5V		5	-12V	
	6	12V		6	GND		6	-12V	
	7	GND	PWR DSTR CON5 to DSC CON3	1	5V		7	GND	
	8	GND		2	GND		8	GND	
	9	GND		3	-12V		9	12V	
	10	GND		4	GND		10	12V	
	11	GND		5	12V				
	12	GND		6	GND				
	PWR DSTR CON2	1-16	5V	PWR DSTR CON6 to FAN	1	-			
			GND		2	12V			
			5V		3	GND			
			5V	PWR DSTR CON7 to CRT	1	GND			
GND	2	12V							
PWR DSTR CON3 to DSC CON1	1-6	5V	PWR DSTR CON8 to HV	1	GND				
		GND		2	12V				
		GND	PWR DSTR CON9 to TRBD CON3	1	-12V				
		5V		2	-12V				
		5V		3	GND				
		5V		4	GND				
				5	12V				
	6	12V							

**Table 5-9 Power Distributor Connector Voltages for V5.06a & below**

**5-4-1 Power Distributor/Power Supply Wiring Diagram(Cont'd)**

Connector	Pin No.	Voltage	Connector	Pin No.	Voltage	Connector	Pin No.	Voltage
CON 1 Power Supply to PDB	1	NC	PWR DSTR CON4 to CPU CON1	1	GND	PWR DSTR CON Monitor to CRT	1	GND
	2	NC		2	GND		2	12V
	3	D GND		3	GND			
	4	NC		4	5V			
	5	C GND		5	5V			
	6	12V		6	GND			
	7	C GND	PWR DSTR CON DSC to DSC CON3	1	5V			
	8	NC		2	GND			
	9	NC		3	-12V			
	10	12V		4	GND			
	11	NC		5	12V			
	12	- 12V		6	GND			
	13	NC	PWR DSTR CON FAN to FAN	1	-			
	14	NC		2	12V			
	15	D GND		3	GND			
	16	A GND	PDB to FEB	1	-9V			
	17	A GND		2	GND			
	18	NC		3	-5V			
	19	5V		4	GND			
	20	5V		5	GND			
PWR DSTR CON 2	1	5V		6	GND			
	2	GND		7	12V			
	3	5V		8	GND			
	4	GND		9	9V			
PWR DSTR CON 3 to DSC CON1	1	GND		10	GND			
	2	GND		11	5V			
	3	GND	12	GND				
	4	5V	13	5V				
	5	5V	14	GND				
	6	5V	15	3.3V				
			16	3.3V				

**Table 5-10 Power Distributor Connector Voltages for LOGIQ™ 100 PRO**

5-4-2 Cable Assembly Diagrams

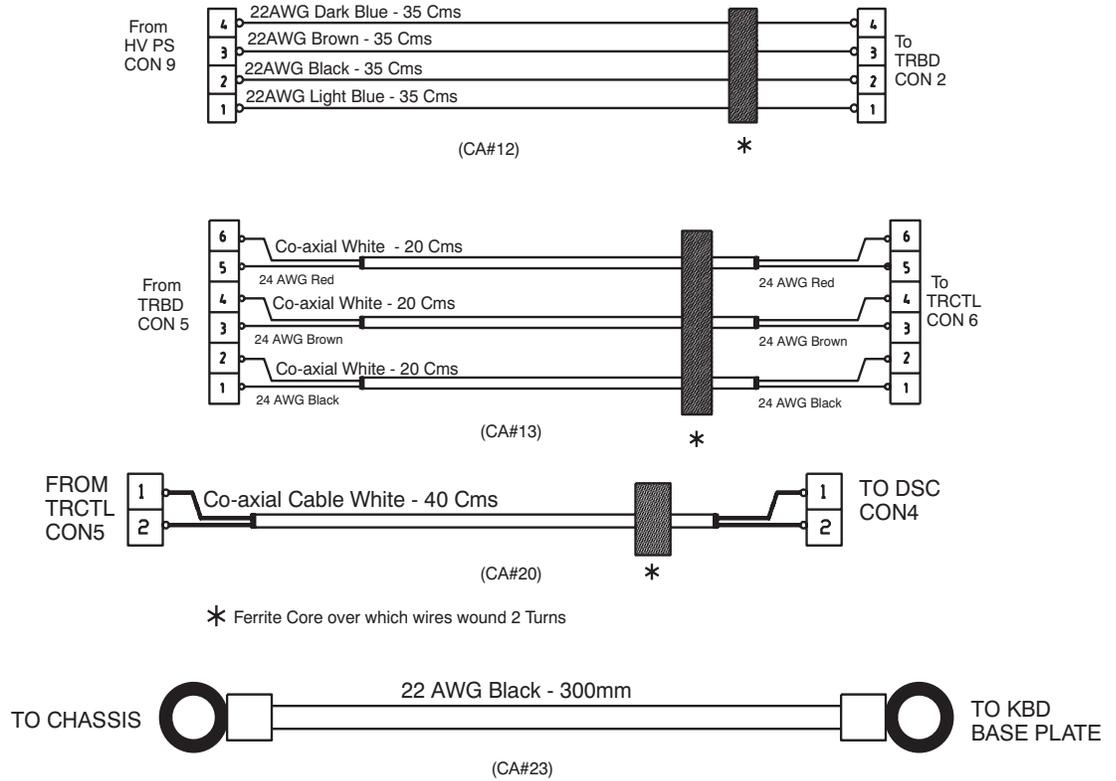


Figure 5-11 Cable Assembly Wiring Diagram

Note: Cable Assemblies CA10, CA13, CA12 & CA20 not available in LOGIQ™ 100 PRO (V7 and above)

5-4-2 Cable Assembly Diagrams(Continued)

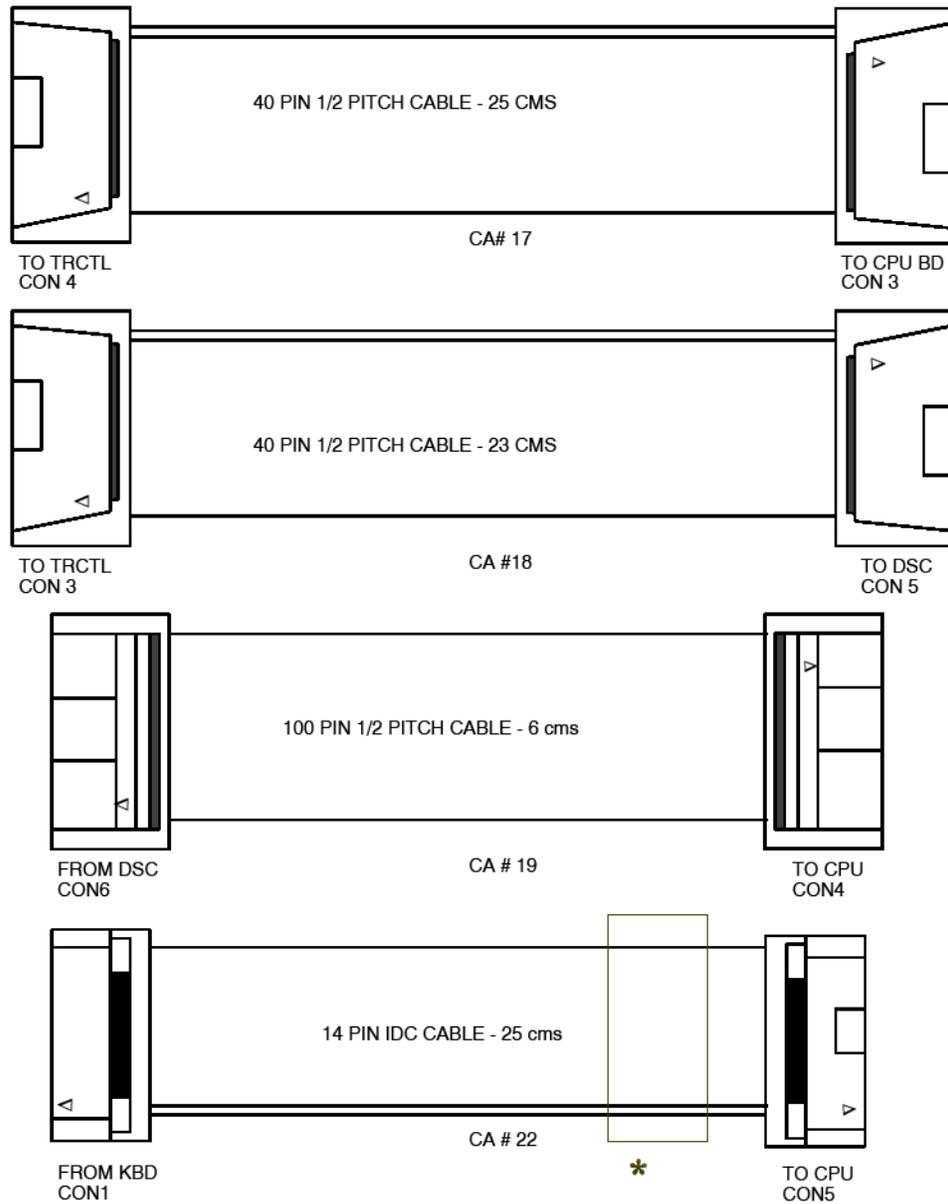


Figure 5-11 Cable Assembly Diagram

5-4-2 Cable Assembly Diagrams(Continued)

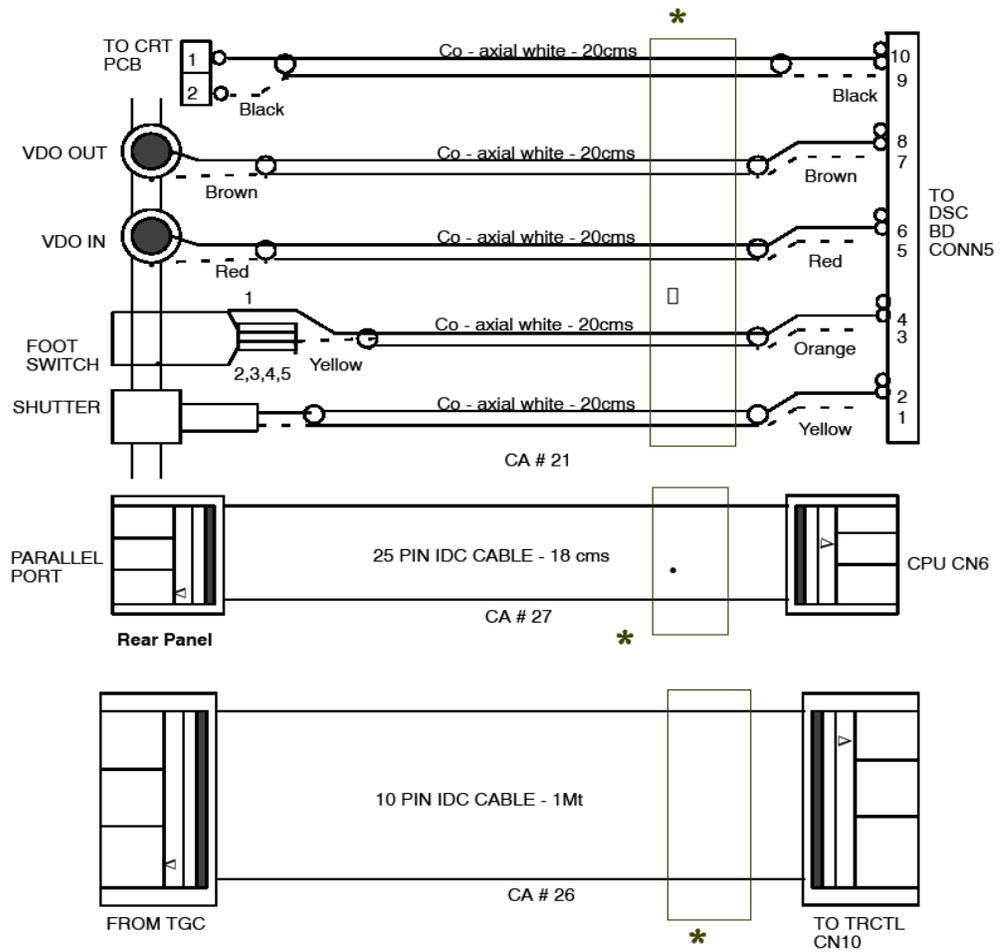


Figure 5-11 Cable Assembly Diagrams

\* Ferrite Core Over which wires wound 2 Turns

## Section 5-5 Functional Subsystems

### 5-5-1 Front End Board (Only for V7 and above)

The Front End generates the strong transmit bursts, transmitted by the probes as ultrasound into the body. It also receives weak ultrasound echoes from blood cells and body structure, amplifies the signals and convert them to a 16 bit digital signal.

The digital representation of the signal is presented to DSC.

### 5-5-2 DSC Board

DSC (Digital Scan Converter) function is to convert analog data to digital data and stores in AFM (Acoustic Frame Memory), then the Acoustic Frame Memory is transformed to X-Y plane memory (XYM). While doing transformation from Acoustic Frame Memory to X-Y plane memory, it does Quad point interpolation.

This also houses the electronics to display the plane memory data on NTSC or PAL TV monitor.

### 5-5-3 CPU Board

CPU Board Controls the overall system function including man-machine interface. It also has an Overlay graphics controller which generates Overlay Graphics/Text for the screen. The Overlay data output goes to the DSC Block.

The CPU performs the following functions:

- 1.) 80386 SX micro-processor and VL82C315 PC AT system controller for overall control of the system (for V5.0 & below)
- 2.) 80386EX micro- processor and Radisys R380EX system controller for overall control of the system (for V5.06A)
- 3.) RTC for time and date
- 4.) DRAM for intermediate data storage
- 5.) EPROM for program memory
- 6.) Address Decoder for control signals
- 7.) DUART for Serial Communication with PC and Keyboard (Not available for systems above V5.0)
- 8.) Gain Encoder
- 9.) Overlay Graphics Controller and memory for overlay text data storage and manipulation
- 10.) TV Sync Generator for generating Sync and blank signal for composite video
- 11.) It interfaces with Analog subsystem through DPRAM on TRCTL Board
- 12.) It interfaces with Digital Scan Converter
- 13.) NV RAM for System Preset Parameters Storage
- 14.) Flash memory for storing upto 16 images. The CPU also interfaces with the Flash board (Optional Module) which can increase the storage capacity to 112 images. The Back End Processor grabs the data from the Image Port, stores it in a memory, performs scan.

## 5-5-4 CPU Board for V 9.0 and Above

The Major aim of the CPU redesign program is to address the risk of obsolescence in CPU based on i386EX.

The new CPU board uses the MPC823 chip that contains a PowerPC 32 bit core which replaces all the functions of the i80386EX chip.

The Major functionalities & corresponding implementation is described below.

### 1.) System RAM-16Mb/64Mb SDRAM interface.

The MPC 823 features an on chip programmable memory controller that can be suitably programmed control any kind of RAM like SDRAM ,Flash. The new CPU board upgrades the existing 4MB EDO DRAM to 16MB SDRAM.This increased memory is necessary to accommodate the larger LINUX KERNEL, A RAMDISK for temporary data storage, an in-memory Video Frame Buffer and provides additional memory for the application Program.The V7 board supports upto a maximum of 64MB SDRAM by means of shortening the plugs. UPM controller A of memory controller controls this interface.

### 2.) Flash Interface( Boot code/Kernel/Application software+16 images archive)-2M X 32 flash

The flash memory is interfaced using GPMC of memory controller. Boot CSO signal is connected to flash CS pin . This flash is partitioned into four regions as described below.

- A.) Region 0-(0Xfff00000-0xfffffff)-Region containing PPC boot software.
- B.) Region 1-(0Xff800000-0xff8C0000)-Region containing Linux Kernel.
- C.) Region 2-(0Xff800000-0xffAC0000)-Region containing RAM DISK file system.
- D.) Region 3-(0XffAC0000-0xffc00000)-Region allocated for 16 image archive.

The 8M X 8 Flash has been upgraded to a 2MX32 configuration that provides much faster access times. this also supports currently supported 16 image archive image feature.

### 3.) Keyboard interface(Ultrasound keyboard i/f, PS 2 trackball interface, Gain Controller interface). Ultrasound Keyboard is interfaced to SCC2 of MPC823.The serial communication is at 9600 baud rate. Optical Trackball TB\_CLK is connected to MPC823 IP\_B7 & PA7 . TB\_DATA is connected to MPC823 PB 28. Ps2-customized driver handles Ps2 controller functionality.Gain controller interface GAIN\_CCW is connected to IP\_B6. GAIN\_CW is connected to IP\_B5.Gain customized driver handles Gain encoder functionality& debouncing.

### 4.) Overlay data & video sync generation-MPC823 video controller generates all necessary signals required to generate a PAL/NTSC TV signal.The video controller uses a part of System RAM for the Video Frame Buffer.Individual bits of frame buffer are used as individual planes by driver & application software. Software handles the graphics & Overlay Planes generation and functionality. VD7 output bit of Video controller contains the single bit overlay output of CPU board, which is synchronized to to DOTCLK. PAL/NTSC timings for signals HSYNC,VSYNC,BLANK,CSYNC,FIELD are programmed by kernel software driver.

## 5-5-4 CPU Board for V 9.0 and Above(Cont'd)

### 5.) ISA Interface-

PCMCIA controller of MPC823 has been reprogrammed to function as an ISA controller. The PLD Provides the GLUE logiq for the additional ISA signals that are not generated by the PCMCIA controller. Five ISA memory address region have defined in the driver software to map the various devices in these regions.

- \* 8 bit IO region -Starting address E2000000h size-16MB, This regions covers all 8 bit IO registers in DSC ,DPRAM of FEB & other registers.
- \* 16 bit IO region-Starting address E3000000h Size-16MB-This region covers 16 bit CRDTF registers programmed by CPU.
- \* 8 bit memory region-Starting address E0000000h Size-16MB-This region currently unused.
- \* 16 bit memory region-starting address E1000000h size -16 MB- this region covers DSC XY memory,Cine memory.
- \* 16 bit memory region for addon flashcard- starting address E6000000h size-16MB- This region is for the addon flash card which providesadditional 96 images archive facility to CPU card.

### 6.) Parallel port interface-

Centronics unidirectional parallel port interface is provided in CPU board similar to previous implmentation. This parallel port address space is part of 8 bit IO region of ISA. The processor writes to this region are latched using AHCT16373 & this data is connected to GPIO pins of processor.6 images, 2 images+report page or individual images, report pages printout can be taken on GE recommended parallel printer. Parallel port also supports image transfer to PC in BMP format.

- 7.) I2C interface for image Preset- Preset data is stored in EEPROM supporting I2C interface & is connected to MPC 823 I2C controller.MPC 823 I2C master controls these interface timings.
- 8.) Dipswitch Interface-One 8 bit dipswitch interface is provided in the new CPU Board.This is interfaced to MPC823 GPIO using CPLD GLUE Logic.
- 9.) RTC & System PLL-4.095MHz oscillator is connected to EXTCLK input pin of the processor.At power on MODCLK[1..0] are pulled up to select EXTCLK as input to System PLL.RTC clock is generated using 32.768 KHz crystal connected between pins XTAL & EXTAL pins of processor.KAPWR power supply to RTC is connected to 3.6V battery.PLL multiplication factor is set to 12 to generate 49.052 MHz as SYSCLK frequency.
- 10.) Console Interface-MPC823 SMC2 is connected to MAX3232 that interfaces to console serial port in RS232 mode. The debug messages are printed by software during Boot up & while running applications.

Additional Features, Which will be available on new CPU , are 10 Mbps Ethernet port that is mainly used for system development to download the code to SDRAM.System software upgrade can also be done by using Ethernet Port.

**5-5-5 TRBD (Only for V5.06a & below)**

TRBD provides transmit and receive analog interface to 64 element CONVEX/LINEAR PROBE and it interacts with TRCTL board.

**5-5-6 TRCTL (Only for V5.06a & below)**

TRCTL board controls/monitors the transmit and receive interface to the 64 element LINEAR/ CONVEX probe. It makes use of a DSP TMS320C26(for V5.0 & below) or TMS320F206 (for V5.06a) for the control/monitoring. It also has a MID PROCESS block which further processes the combined ultrasound signal received from the TRBD. This processed signal is fed to the DSC board.

**5-5-7 Peripherals**

VCR, Black & White Video Graphic Printer and Printer (Parallel Printer - for V5.0 & above, Serial Printer for V4 & below) can be connected to the scanner. For more details on recommended peripherals refer Chapter 3.

**Section 5-6 Video Specifications**

Refer to Section 3-6-6 for more details about the Video Specifications.

**Section 5-7Rear Panel Signal List**

Refer to Section 3-6-4 for more details about the rear panel signal list.

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# Chapter 6 Service Adjustments

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## Section 6-1 Overview

### 6-1-1 Service Adjustments Available in LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO

The LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO 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.

**NOTE: No Potentiometer adjustments recommended for CRT monitor.**

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# Chapter 7 Diagnostics/Troubleshooting

## Section 7-1 Overview

### 7-1-1 Purpose of Chapter 7

This section describes how to setup and run the tools and software that help maintain image quality and system operation. Very basic host, system and board level diagnostics are run whenever power is applied. Some Service Tools may be run at the application level.

The LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO 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.

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Table 7-1 Contents in Chapter 7

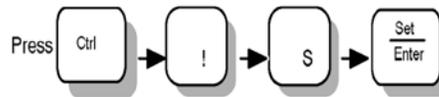
## Section 7-2 Power On Diagnostics

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 on the keyboard (Freeze & Ext. Video) 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. The application mode is controlled by DIP Switch SW1/SW3\* - 6,7,8 on the CPU which is set to ON, OFF, OFF respectively. For more details refer section 5-3-2-2 .*

### 7-2-1 Service Diagnostics

Check the S/W Version of your System prior to start of the service diagnostics. The S/W version can be known during the power up Sequence.



Press (CTRL + ! + S + Enter) keys on the keyboard to enter the service diagnostics. In response, a pop-up menu appears as shown in Table 7-1

MAIN	MAIN
1. CPU BOARD TESTS	1. CPU BOARD TESTS
2. DSC BOARD TESTS	2. DSC BOARD TESTS
3. ANALOG BOARDS TEST	3. FRONT END BOARD TEST
4. KEYBOARD TESTS	4. KEYBOARD TESTS
5. MONITOR TEST	5. MONITOR TEST
6. KEYBOARD OPERATION HISTORY	6. KEYBOARD OPERATION HISTORY
7. TRACKBALL SELECTION	Q. QUIT

For V5.06a & Below

For V7.0 & Above

**Figure 7-1 Main Menu For (V5.06a & Below)**

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

## 7-2-2 CPU Board Tests

When this test is select the following screen will appear.

CPU MENU for V4 &	CPU MENU for V5 &
1. ALL TESTS	1. ALL TESTS
2. EPROM CHECK SUM TEST	2. EPROM CHECK SUM TEST
3. R/W MEMORY TEST	3. R/W MEMORY TEST
4. GRAPHICS MEMORY TEST	4. GRAPHICS MEMORY TEST
5. DEBUG PORT TEST	5. DEBUG PORT TEST
6. GRAPHICS TEST	6. GRAPHICS TEST
7. NVRAM TEST	7. NVRAM TEST
P. MAIN_MENU	8. FLASH MEMORY TEST

Figure 7-2 CPU Board Tests

### 7-2-2-1 All Tests

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

### 7-2-2-2 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 word wise and the computed sum is compared against zero. If the resulting sum is non-zero the test is reported to have failed.

### 7-2-2-3 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.

### 7-2-2-4 Graphics Memory Test

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

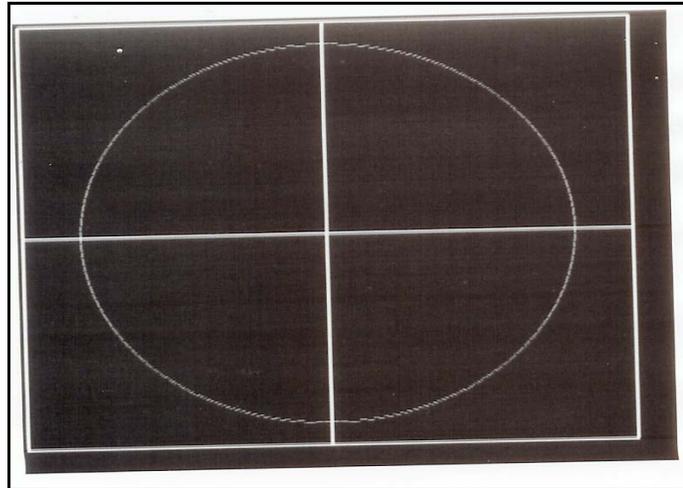
### 7-2-2-5 Debug Port Test

*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.

## 7-2-2 CPU Board Tests (Contd.,)

### 7-2-2-6 Graphics Test

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



**Figure 7-3 Graphics Test**

Press any key to exit the Graphics Test

### 7-2-2-7 NVRAM Test

When this test is selected the following will appear

NVRAM Test for V4	NVRAM Test for V5 & above
NVRAM TEST	NVRAM TEST
START OF NVRAM 0X400000	START OF NVRAM 0X400000
END OF NVRAM 0X403fff	END OF NVRAM 0X401fff
ACTUAL TEST START FROM 0X40CFF (TOTAL 1k TEST)	WRITING TO NVRAM
WRITING TO NVRAM	.....
.....	READING FROM NVRAM
WRITING IS SUCCESSFUL	NVRAM Test Passed
READING FROM NVRAM	
.....	
READING SUCCESSFUL	

**Figure 7-4 NVRAM TEST**

*Note: WRITING SUCCESSFUL and READING SUCCESSFUL indicate NVRAM test is Passed.*

## 7-2-2 CPU Board Tests (Contd.,)

### 7-2-2-8 Flash Memory Test (Only for V5.0 & above systems)

The Following Menu is Displayed

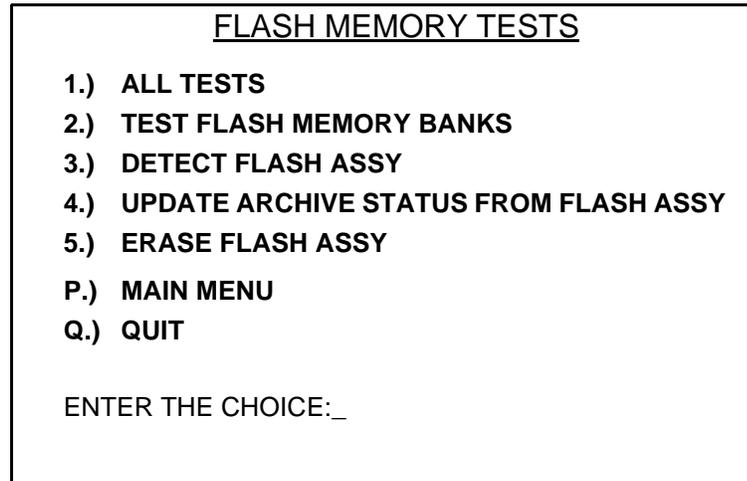


Figure 7-5 FLASH MEMORY TESTS

#### 7-2-2-8-1 All Tests

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

#### 7-2-2-8-2 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.

#### 7-2-2-8-3 Detect Flash Assembly

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

#### 7-2-2-8-4 Update archive status from flash assy

This option has been provided to facilitate the interchange of Flash assy cards between CPU boards. The CPU soft ware 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.

## 7-2-2 CPU Board Tests (Contd.,)

### 7-2-2-8-5 Erase Flash memory

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

### 7-2-2-8-6 Main Menu

This option is used to return to the main menu.

### 7-2-2-8-7 Quit

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

## 7-2-3 DSC Board Tests

When this Option is selected following menu appears

DSC Tests for V4	DSC Tests for V5	DSC Tests for V7 and above
<pre>1.) ALL TESTS 2.) AAF FILTER TEST 3.) SELECT DIGITAL    FILTER 4.) DYNAMIC RANGE TEST 5.) IMAGE MEMORY TEST P.  MAIN MENU Q.  QUIT  ENTER THE CHOICE: _</pre>	<pre>1.) ALL TESTS 2.) AAF FILTER TEST 3.) SELECT DIGITAL FILTER 4.) DYNAMIC RANGE TEST 5.) IMAGE MEMORY TEST 6.) CINE MEMORY TEST P.  MAIN MENU Q.  QUIT  ENTER THE CHOICE: _</pre>	<pre>1.) ALL TESTS 2.) IMAGE MEMORY TEST 3.) CINE MEMORY TEST P.  MAIN MENU Q.  QUIT  ENTER THE CHOICE: _</pre>

Figure 7-8 DSC Board Tests

### 7-2-3-1 All Tests

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

### 7-2-3-2 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)

### 7-2-3-3 Select Digital Filter

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

### 7-2-3-4 Dynamic Range Test

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

## **7-2-3 DSC Board Tests (Cont'd)**

### **7-2-3-5 Image Memory Test**

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

### **7-2-3-6 Cine Memory Test**

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

### **7-2-3-7 Main Menu**

This option is used to return to the main menu.

### **7-2-3-8 Quit**

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

## **7-2-4 Analog Board Test (for V5.0 & below)**

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.

## **7-2-5 FEB Test for LOGIQ™ 100 PRO (V7 and above)**

When self test for the FEB is selected, the DPRAM on the FEB Board will be written on and read back. Read data is checked for validity. This will prove the communication between FEB & CPU boards.

## 7-2-6 Keyboard Tests

When this Option is selected following Menu appears

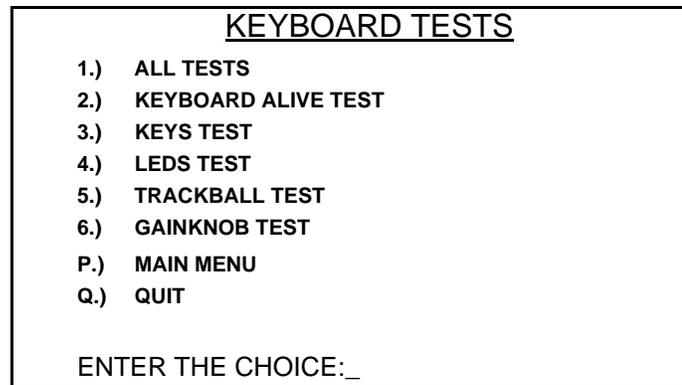


Figure 7-9 Keyboard Tests

### 7-2-6-1 All Tests

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

### 7-2-6-2 Keyboard Alive Test

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

### 7-2-6-3 Keys 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).

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

### 7-2-6-4 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.

### 7-2-6-5 Trackball Test

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

### 7-2-6-6 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.

### 7-2-6-7 Main Menu

This option is used to return to the main menu.

### 7-2-6-8 Quit

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

### 7-2-7 Monitor Test

The following test patterns are displayed on the monitor when this test is enabled. Please match the patterns displayed on your monitor with the given patterns figures 7-10 to 7-16. The Gain Knob is used for selection of patterns 1-10. To exit out of any pattern and return to the main menu, press *EXTERNAL VIDEO*.

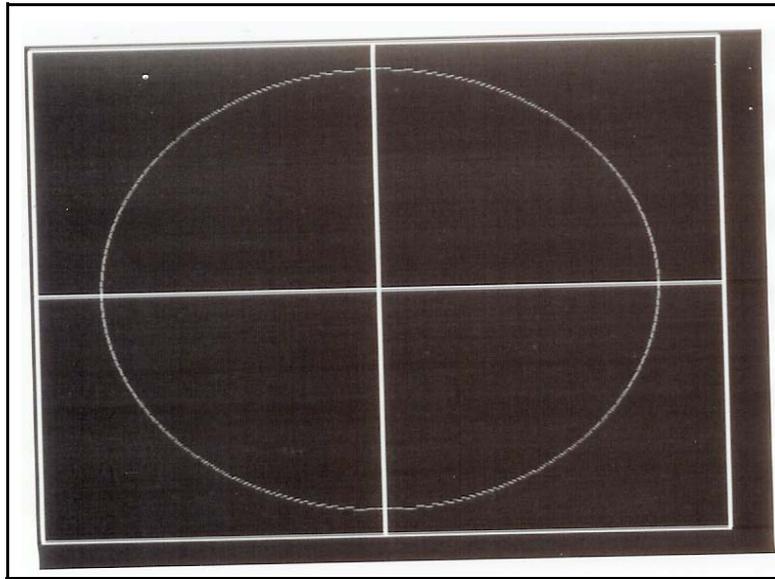


Figure 7-10 Monitor Test

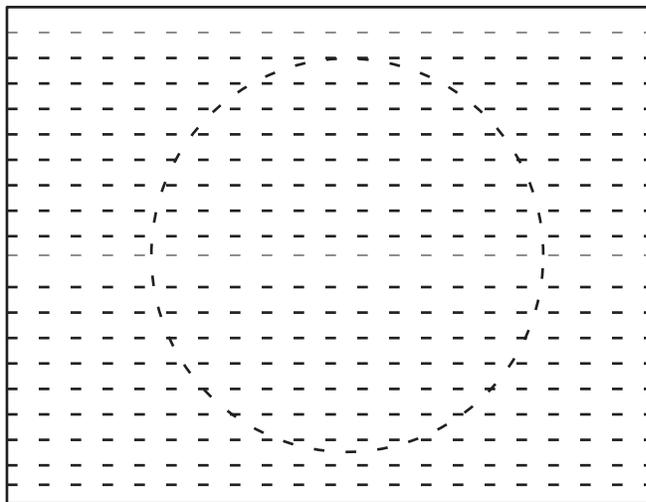


Figure 7-11 Monitor Test

7-2-7 Monitor Test(Contd.,)

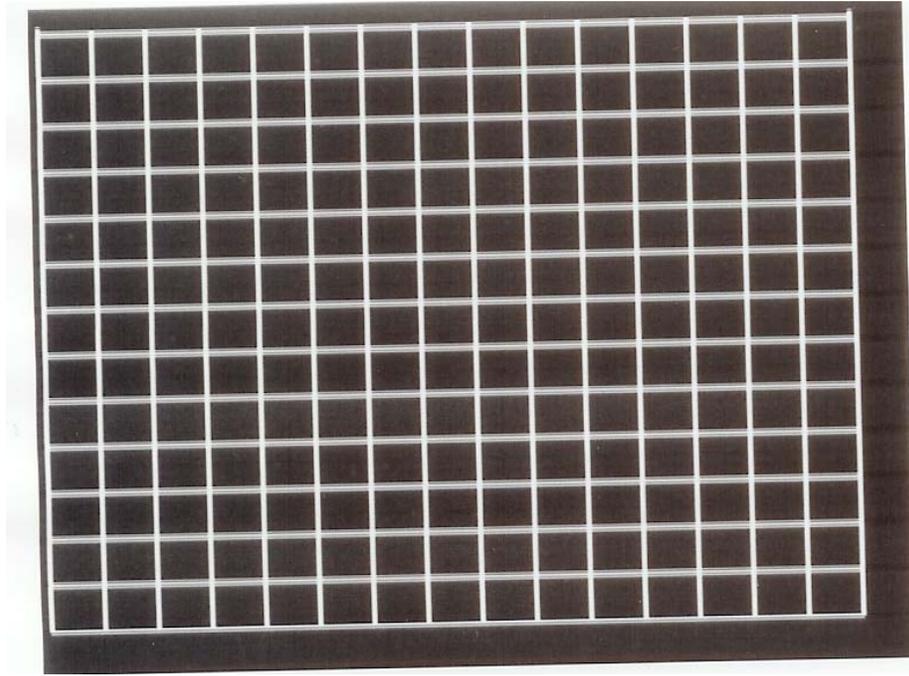


Figure 7-12 Monitor Test

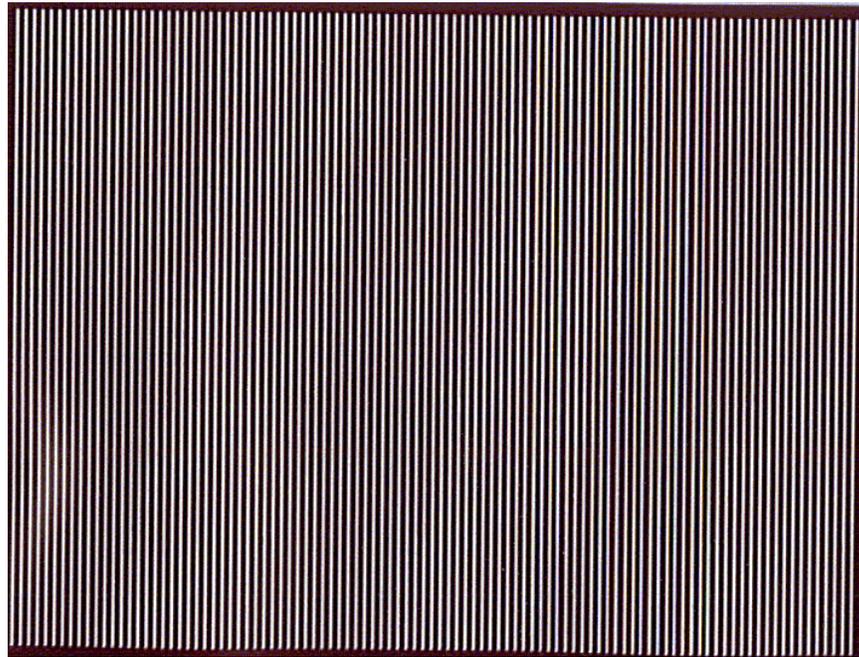


Figure 7-13 Monitor Test

7-2-7 Monitor Test(Contd.,)

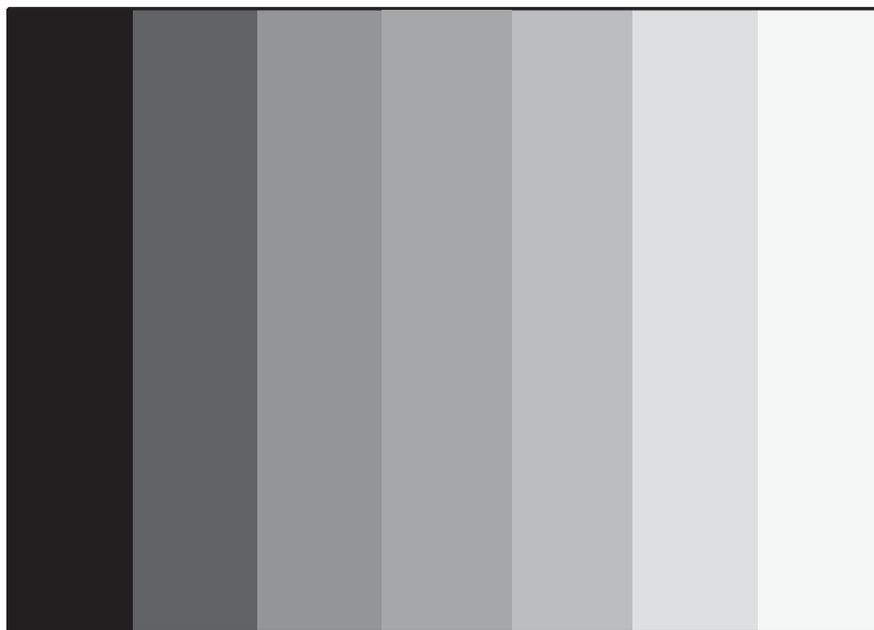


Figure 7-14 Monitor Test

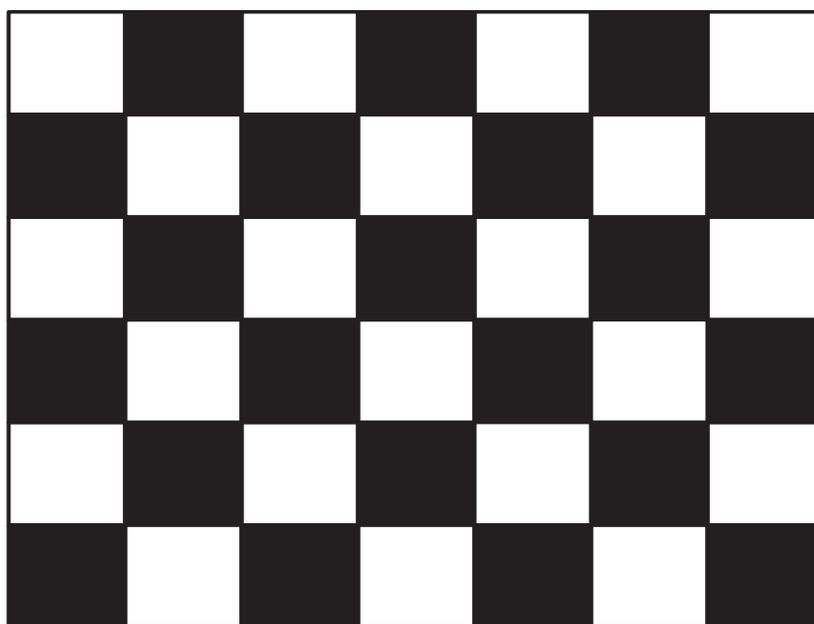
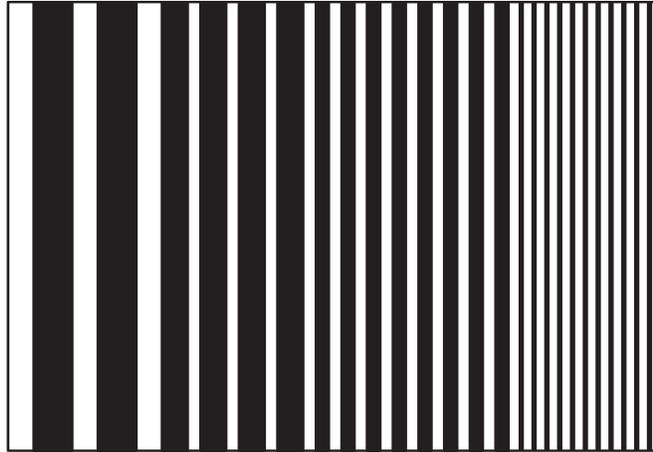


Figure 7-15 Monitor Test

### 7-2-7 Monitor Test(Contd.,)



**Figure 7-16 Monitor Test**

*Note:* The patterns in 7-10 to 7-13 are written on the overlay where as the pattern in 7-14 to 7-16 is written on the image memory.

7-10 to 7-12 are also available in reverse video

### 7-2-8 Key Operation History

When this option is selected from the Main Menu the following appears indicating a maximum of 32 keys last activated. The history of keys used is stored even after powered off.

<u>KEY OPERATION HISTORY</u>	
KEY OPERATED	KEY OPERATED
1.	17.
2.	18.
3.	19.
4.	20.
5.	21.
6.	22.
7.	23.
8.	24.
9.	25.
10.	26.
11.	27.
12.	28.
13.	29.
14.	30.
15.	31.
16.	32.

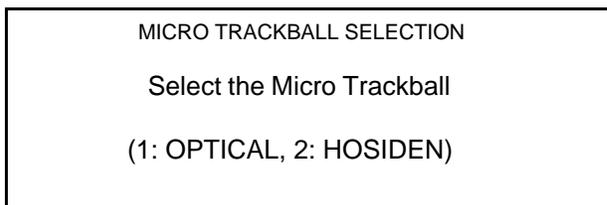
PRESS EXT\_VIDEO TO QUIT

**Figure 7-17 Key Operation History**

## 7-2-9 Trackball Selection

**ONLY FOR V5.0 & BELOW SYSTEMS. NOT APPLICABLE FOR V5.06A & ABOVE**

When this option is selected the following menu appears,



**Figure 7-18 Trackball Selection**

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

## Section 7-3 Error Reporting

The following are the error messages available:

Errors	Remarks
"THE EVEN CHECKSUM FAILED"	This Message comes up during the diagnostics of the CPU Board. When the Eprom checksum (even) test for the CPU board fails, this message is displayed.
"THE ODD CHECKSUM FAILED"	This Message comes up during the diagnostics of the CPU Board. When the Eprom checksum (odd) test for the CPU board fails, this message is displayed.
"THE RAM TEST FAILED"	This Message comes up during the diagnostics of the CPU Board. When the R/W memory test for the CPU board fails, this message is displayed.
"THE GRAPHICS MEMORY TEST FAILED"	This Message comes up during the diagnostics of the CPU Board. When the Graphics memory test for the CPU board fails, this message is displayed.
"NVRAM TEST FAILED"	This Message comes up during the diagnostics of the CPU Board. When the NVRAM test for the CPU board fails, this message is displayed.
"TESTING FLASH BANK 0 ---- FAILED"	This Message comes up during the diagnostics of the CPU Board. When the Flash memory Bank test for the Flash memory fails, this message is displayed.
"NO FLASH ASSY CARD DETECTED"	This Message comes up during the diagnostics of the CPU Board. When the Detect Flash Assy test for the Flash memory fails, this message is displayed.
"TESTING CINE DEVICE U3E1S -- FAILED"	This Message is displayed during the diagnostics of the DSC board. When the cine memory test for the DSC board fails, this message is displayed. U3E1S may be different depending on the name of the cine device.
"THE IMAGE MEMORY TEST FAILED "	This Message is displayed during the diagnostics of the DSC board. When the image memory test for the DSC board fails, this message is displayed.
"THE KEYBOARD SUBSYSTEM FAILED TO RESPOND"	This Message is displayed during the diagnostics of the Keyboard. When the keyboard firmware is not alive, this message is displayed.
"WARNING -- INCOMPATIBLE TRCTL BOARD"	This message is displayed when there is incompatibility in the TRCTL board during system boot up. This is applicable only for V5.06a & below systems.
"KEYBOARD NOT CONNECTED"	If the keyboard is not connected then this message is displayed during system boot up.
"NO DSC FRAME FREEZE ACKNOWLEDGE"	This message is displayed during system boot up when the DSC is failed.
"NO SCBF FRAME FREEZE ACKNOWLEDGE"	This message is displayed during system boot up when TRCTL (V5.06a & below) / FEB (V7) is failed.
"SCAMP MOUSE CONTROLLER SELF TEST ERROR"	This message is displayed during system boot up when CPU is failed.
"TRACKBALL INTERFACE ERROR"	This message is displayed during system boot up and the trackball interface to keyboard is not proper.
"NO TRACKBALL ACKNOWLEDGEMENT"	This message is displayed during system boot up and keyboard connection is not there.
"NO SCBF SYSTEM MODE ACKNOWLEDGE"	This message is displayed when the system boots up in the normal mode. when TRCTL (V5.06a & below) / FEB (V7) is failed.
"NO SCBF SCAN MODE ACKNOWLEDGE"	This message is displayed during system boot up when TRCTL (V5.06a & below) / FEB (V7) is failed.
"CINE HARDWARE NOT PRESENT" CINE HARDWARE DIAGNOSTICS FAILED"	This message is displayed during system boot up and cine hardware is not present or some error is there. Only for V5.0 & above
"NO CINE HARDWARE TO SUPPORT 64 FRAMES" CINE HARDWARE SUPPORTS 32 FRAMES ONLY"	This message comes up during the system boot up, when the DIP Switch is set for 64 frames and cine hardware for only 32 frames are connected. Only for V5.0 & above
"PLEASE POWER OFF AND RESTART THE SYSTEM! "	This message is displayed when the system boots up in the normal mode and any error which needs the system to be restarted comes up.
"PRINTER IS BUSY"	This message comes up when shift + record is pressed without connecting the printer. Only for V5.0 and above

Table 7-2 Error Messages

Errors	Remarks
"PRINTER ERROR"	This message comes up when an error occurs in the printing process. Only for V5.0 and above
"PRINTING ABORTED"	This message is displayed during Printing & due to printer error. Only for V5.0 and above
"WARNING: THIS WILL ERASE ALL IMAGES! 1:YES 2:NO"	This message is displayed when the '3 '(Clear ALL) is pressed after going to the recall screen. Only for V5.0 and above
"ARCHIVE FULL "	This message is displayed when the store key is pressed while the archive is full. Only for V5.0 and above
"PC TRANSFER STARTS.PRESS 'CLEAR' TO ABORT"	This message is displayed when the PC Transfer is initiated. Only for V5.0 and above
"PC IS NOT READY"	This message is displayed when shift + store is pressed without connecting the PC. Only for V5.0 and above
"PC TRANSFER ERROR"	This message is displayed when some error occurs in the PC transfer process. Only for V5.0 and above

**Table 7-2 Error Messages**

## Section 7-4 Service Notes

### 7-4-1 SN73017: LOGIQ™ 100 PRO Introduction

**INTRODUCTION** Introduction of LOGIQ™ 100 with Digital Front End & additional features of ATO & ZOOM

**MODIFICATIONS:** The following are the modifications done on LOGIQ™ 100 MP to LOGIQ™ 100 PRO.

Sl. No.	Part No.	Description	Remarks
1	2300743	Front End Board	This PCB will Replace TRCTL\TRBD PCB
2	2300744	DSC	New DSC matching to FEB.
3	2300745	CPU	S/W modified to incorporate ATO/Zoom features
4	2300757	HV PCB	New HV with Dual Output
5	2300762	Power Distributor	New PDB for PRO
6	2308912	Cable Set	CA28,29,30 Introduced 31,32. (CA 10, 12, 13, 20 removed.)
7	2307427	Keyboard Assembly	ATO/ZOOM Keys Base plate Modified
8	2307428	Keyboard PCB Assembly	ATO/Zoom key switches added
9	2315611	Key sheet with base plate	ATO/ZOOM Keys Base plate Modified
10	2302803	Keyboard Logo	New Logo for LOGIQ™ 100 PRO
11	2302804	Front Panel Logo	New Logo for LOGIQ™ 100 PRO
12	2152467-3	Plastic Set	New For LOGIQ™ 100 PRO with Keyboard Logo & Front Panel Logo changed.
13	2139768 Rev11	Service Manual	LOGIQ™ 100 PRO Models added
14	2300747	Basic User Manual	New Manual for LOGIQ™ 100 PRO
15	2300243	Image Transfer CD for PAL System	New for LOGIQ™ 100 PRO
16	2323388	Image Transfer CD for NTSC System	New for LOGIQ™ 100 PRO

**Table 19 Changes for LOGIQ™ 100 PRO**

**SOLUTION:** Refer to **2139768 Rev 11** Service Manual & **2300747 -100 Rev 0** Basic User Manual For more Information.

The Following are the Models for **LOGIQ™ 100 PRO**

Sl. No.	H-Cat No.	Console No.	Region
1	H41282LA	2302111	220-240VAC, 50/60Hz, PAL, GEMS-A, V7.0. - INDIA
2	H41282LB	2306690	220-240VAC, 50/60Hz, PAL, GEMS-A/AM, V7.0. - CHINA, ANZ, SE-ASIA, MEXICO
3	H41282LC	2306691	100-115VAC, 50/60Hz, NTSC, GEMS-A/AM, V7.0. - CANADA, TAIWAN
4	H41282LD	2306692	220-240VAC, 50/60Hz, NTSC, GEMS-A/AM, V7.0. - CHILE, KOREA
5	H41282LE	2306693	220-240VAC, 50/60Hz, PAL, GEMS-E, V7.0 - EUROPE
6	H41282LF	2306695	100-115VAC, 50/60Hz, NTSC, GEMS-A, V7.0. - JAPAN
7	H41282LG	2306694	100-115VAC, 50/60Hz, NTSC, GEMS-AM, V7.0. - US OF A, BRAZIL

**Table 20 MODELS for LOGIQ™ 100 PRO**

**7-4-1-1 Error Reporting**

The following are the error messages available:

Errors	Remarks
"THE EVEN CHECKSUM FAILED"	This Message comes up during the diagnostics of the CPU Board. When the Eprom checksum (even) test for the CPU board fails, this message is displayed.
"THE ODD CHECKSUM FAILED"	This Message comes up during the diagnostics of the CPU Board. When the Eprom checksum (odd) test for the CPU board fails, this message is displayed.
"THE RAM TEST FAILED"	This Message comes up during the diagnostics of the CPU Board. When the R/W memory test for the CPU board fails, this message is displayed.
"THE GRAPHICS MEMORY TEST FAILED"	This Message comes up during the diagnostics of the CPU Board. When the Graphics memory test for the CPU board fails, this message is displayed.
"NVRAM TEST FAILED"	This Message comes up during the diagnostics of the CPU Board. When the NVRAM test for the CPU board fails, this message is displayed.
"TESTING FLASH BANK 0 ---- FAILED"	This Message comes up during the diagnostics of the CPU Board. When the Flash memory Bank test for the Flash memory fails, this message is displayed.
"NO FLASH ASSY CARD DETECTED"	This Message comes up during the diagnostics of the CPU Board. When the Detect Flash Assy test for the Flash memory fails, this message is displayed.
"TESTING CINE DEVICE U3E1S -- FAILED"	This Message is displayed during the diagnostics of the DSC board. When the cine memory test for the DSC board fails, this message is displayed. U3E1S may be different depending on the name of the cine device.
"THE IMAGE MEMORY TEST FAILED "	This Message is displayed during the diagnostics of the DSC board. When the image memory test for the DSC board fails, this message is displayed.

**Table 21 Error Messages**

Errors	Remarks
"THE KEYBOARD SUBSYSTEM FAILED TO RESPOND"	This Message is displayed during the diagnostics of the Keyboard. When the keyboard firmware is not alive, this message is displayed.
"WARNING -- INCOMPATIBLE TRCTL BOARD"	This message is displayed when there is incompatibility in the TRCTL board during system boot up. This is applicable only for V5.06a & below systems.
"KEYBOARD NOT CONNECTED"	If the keyboard is not connected then this message is displayed during system boot up.
"NO DSC FRAME FREEZE ACKNOWLEDGE"	This message is displayed during system boot up when the DSC is failed.
"NO SCBF FRAME FREEZE ACKNOWLEDGE"	This message is displayed during system boot up when TRCTL (V5.06a & below) / FEB (V7) is failed.
"SCAMP MOUSE CONTROLLER SELF TEST ERROR"	This message is displayed during system boot up when CPU is failed.
"TRACKBALL INTERFACE ERROR"	This message is displayed during system boot up and the trackball interface to keyboard is not proper.
"NO TRACKBALL ACKNOWLEDGEMENT"	This message is displayed during system boot up and keyboard connection is not there.
"NO SCBF SYSTEM MODE ACKNOWLEDGE"	This message is displayed when the system boots up in the normal mode. when TRCTL (V5.06a & below) / FEB (V7) is failed.
"NO SCBF SCAN MODE ACKNOWLEDGE"	This message is displayed during system boot up when TRCTL (V5.06a & below) / FEB (V7) is failed.
"CINE HARDWARE NOT PRESENT" "CINE HARDWARE DIAGNOSTICS FAILED"	This message is displayed during system boot up and cine hardware is not present or some error is there
"NO CINE HARDWARE TO SUPPORT 64 FRAMES" "CINE HARDWARE SUPPORTS 32 FRAMES ONLY"	This message comes up during the system boot up, when the DIP Switch is set for 64 frames and cine hardware for only 32 frames are connected
"PLEASE POWER OFF AND RESTART THE SYSTEM! "	This message is displayed when the system boots up in the normal mode and any error which needs the system to be restarted comes up.
"PRINTER IS BUSY"	This message comes up when shift + record is pressed without connecting the printer.
"PRINTER ERROR"	This message comes up when an error occurs in the printing process.
"PRINTING ABORTED"	This message is displayed during Printing & due to printer error
"WARNING: THIS WILL ERASE ALL IMAGES! 1:YES 2:NO"	This message is displayed when the '3 '(Clear ALL) is pressed after going to the recall screen.
"ARCHIVE FULL "	This message is displayed when the store key is pressed while the archive is full.
"PC TRANSFER STARTS.PRESS 'CLEAR' TO ABORT"	This message is displayed when the PC Transfer is initiated.
"PC IS NOT READY"	This message is displayed when shift + store is pressed without connecting the PC.
"PC TRANSFER ERROR"	This message is displayed when some error occurs in the PC transfer process.

**Table 21 Error Messages**

**7-4-1-2 M3 to M4 Changes**

The 316 pilot systems shipped in Q4'2001 will have the following known issues.

Sl.#	Items	Remark	Status	What needs to be done if complaint received from field
1	Scroll of the image results in a white line in the near region	Fixed Through Software	Fixed*	Change the socket mounted Altera Configuration Device on FEB at location U1

**Table 22 M3 to M4 Changes**

Sl.#	Items	Remark	Status	What needs to be done if complaint received from field
2	A/B Measurement do not match with that of User's documentation (issue is true in MP as well)	Reviewed with Application group and decided to match with that of Users documentation	Fixed*	Change socket mounted CPU EPROM's at location U2D & U2E
3	B->L->R->Freeze->L-> NP keeps the previous right image and make the left image live	True in MP as well and reviewed with Application group for implementation	Fixed*	Same as above
4	L76, Depth 50mm, Scroll Up leaves a line next to gray scale	This is extension of depth 50 to 75 change leaving a line next to gray scale which is solved	Fixed*	Same as above
5	Zoom window on the left corner, very careful movement of ROI above window and move it down the ROI and zoom would overlap	Happens only with a very careful movement	Fixed*	Same as above
6	B/M mode archive and recall has the double M-line effect in the recalled image	This is resultant effect of archiving the overlay, don't look at M-line alone, look in general overlay archive	Fixed*	Same as above
7	NTSC Zoom window goes outside image area by 2-3mm, also a careful movement of ROI it can get inside the zoom window itself	Fix through software	Fixed*	Same as above
8	L76 probe - in depth 50, if we press Preset leaves a line next to gray scale	Fix through software	Fixed*	Same as above
9	'Archive Full Message' if we run 'Update Archive from Flash assy on a normal working system	Update archive from Flash Assy is done just to update the NVRAM on CPU with stored/empty information for the images on Flash, so running this any number of times should not have any impact on the system performance	Fixed*	Same as above

Table 22 M3 to M4 Changes

Sl.#	Items	Remark	Status	What needs to be done if complaint received from field
10	2PP connection to both the port works fine, also connection to port B alone works fine, while connecting to port A alone boot up/power on okay however if we press the change port switch results in improper operation like change to B? Mark back okay but again back to A still the?	Any customer complaint on this calls for cable change	Fixed*	Change Cable Assembly 29 between PS and PDB
11	With Two Probe Port - C55 and L76 show white band in fixed SLN at higher gain	Suspected bare board	Unresolved	Low Severity impact as per Marketing, issue to be analyzed, cleared for M4 signoff

**Table 22 M3 to M4 Changes**

Note: \* All Fix are validated & confirmed to be OK for M4 Release

**7-4-1-3 Effectivity**

The following are the effectivity list of the 316 systems.

Effectivity List for H41282LG:-

65630WM6, 65632WM2, 65631WM4, 65633WM0, 65634WM8, 65635WM5, 65636WM3, 65637WM1, 65638WM9, 65639WM7, 65770WM0, 65640WM5, 65641WM3, 65642WM1, 65643WM9, 65644WM7, 65645WM4, 65646WM2, 65647WM0, 65648WM8, 65649WM6, 65657WM9, 65658WM7, 65656WM1, 65660WM3, 65661WM1, 65662WM9, 65663WM7, 65664WM5, 65665WM2, 65666WM0, 65667WM8, 65668WM6, 65669WM4, 65670WM2, 65671WM0, 65672WM8, 65673WM6, 65674WM4, 65675WM1, 65650WM4, 65651WM2, 65652WM0, 65653WM8, 65654WM6, 65655WM3, 65676WM9, 65677WM7, 65678WM5, 65679WM3, 65680WM1, 65681WM9, 65682WM7, 65771WM8, 65818WM7, 65740WM3, 65683WM5, 65684WM3, 65685WM0, 65686WM8, 65687WM6, 65688WM4, 65689WM2, 65690WM0, 65691WM8, 65692WM6, 65693WM4, 65694WM2, 65695WM9, 65696WM7, 65697WM5, 65699WM1, 65700WM7, 65701WM5, 65702WM3, 65703WM1, 65704WM9, 65705WM6, 65706WM4, 65708WM0, 65721WM3, 65722WM1, 65723WM9, 64889WM9, 65871WM6, 70216WM7, 70217WM5, 70218WM3, 70219WM1, 70220WM9, 70221WM7, 70235WM7, 70030WM2, 70031WM0, 70032WM8, 70033WM6, 70034WM4, 70035WM1, 70036WM9, 70037WM7, 70038WM5, 70039WM3, 70040WM1, 70041WM9, 70042WM7, 70043WM5, 70044WM3, 70045WM0, 70046WM8, 70047WM6, 70048WM4, 70049WM2, 70050WM0, 70051WM8, 70052WM6, 70053WM4, 70054WM2, 70055WM9, 70056WM7, 70057WM5, 70058WM3, 70059WM1, 70060WM9, 70061WM7, 70062WM5, 70063WM3, 70064WM1, 70081WM5, 70082WM3, 70083WM1, 70084WM9, 70085WM6, 70086WM4, 70087WM2, 70222WM5, 70223WM3, 70224WM1, 70225WM8, 70226WM6, 70227WM4, 70228WM2, 70229WM0, 70230WM8, 70231WM6, 70232WM4, 70233WM2, 70234WM0, 70236WM5, 70237WM3, 70238WM1, 70239WM9, 70240WM7, 65624WM9, 65625WM6, 65627WM2, 65628WM0, 65629WM8.

Effectivity List for H41282LE:-

65730WM4, 65739WM5, 65745WM2, 65748WM6, 65750WM2, 65751WM0, 65753WM6, 65754WM4, 65755WM1, 65757WM7, 65761WM9, 65762WM7, 65763WM5, 65764WM3, 65765WM0, 65766WM8, 65767WM6, 65768WM4, 65769WM2, 65742WM9, 65743WM7, 65749WM4, 65774WM2, 65775WM9, 65776WM7, 65777WM5, 65778WM3, 65779WM1, 65780WM9, 65773WM4, 65797WM3, 65800WM5, 65801WM3, 65802WM1, 65803WM9, 65752WM8, 65784WM1, 65785WM8, 65786WM6, 65787WM4, 65789WM0, 65790WM8, 65791WM6, 65792WM4, 65794WM0, 65795WM7, 65796WM5, 65798WM1, 65799WM9, 65807WM0, 65812WM0, 65813WM8, 65814WM6, 65822WM9, 65823WM7, 65100WM0, 65101WM8, 65102WM6, 65103WM4, 65104WM2, 65105WM9, 65106WM7, 65107WM5, 65808WM8, 65809WM6, 65810WM4, 65811WM2, 65819WM5, 65820WM3, 65821WM1, 65781WM7, 65740WM3, 65741WM1, 65744WM5, 65746WM0, 65747WM8, 65756WM9, 65759WM3, 65760WM1, 65772WM6, 65782WM5, 65783WM3, 65788WM2, 65793WM2, 65804WM7, 65806WM2, 65815WM3, 65816WM1, 65817WM9, 65707WM2, 65758WM5, 65805WM4, 69304WM4, 69305WM1, 69306WM9, 69307WM7, 69308WM5, 69309WM3, 69310WM1, 69311WM9, 69312WM7, 69313WM5, 69324WM2, 69325WM9, 69326WM7, 69327WM5, 69328WM3, 69329WM1, 69330WM9, 69331WM7, 69332WM5, 69333WM3, 69334WM1, 69335WM8, 69336WM6, 69337WM4, 69339WM0, 69354WM9, 69356WM4, 69357WM2, 69359WM8, 69360WM6, 69361WM4, 69362WM2, 69363WM0, 69364WM8, 69322WM6, 69323WM4, 69338WM2, 69340WM8, 69341WM6, 69342WM4, 69343WM2, 69344WM0, 69345WM7, 69346WM5, 69347WM3, 69348MW1, 69349WM9, 69350WM7, 69351WM5, 69352WM3, 69353WM1, 69355WM6, 69358WM0, 69365WM5, 65724WM7, 65725WM4, 65726WM2, 65727WM0, 65728WM8, 65729WM6, 65731WM2, 65732WM0, 65733WM8, 65734WM6, 65735WM3, 65736WM1, 65737WM9, 65738WM7,

#### 7-4-2 SN\_73018: LOGIQ 100 Periodic Maintenance Requirements

**EFFECTIVITY:** All LOGIQ 100 Systems.

**PROBLEM:** Reliability of the LOGIQ 100 Ultrasound systems has increased since the initial manufacturing release. Engineering has determined that Zero periodic maintenance procedure, per year, is required to maintain the system to a fully operational level.

**SOLUTION:** As of the release of this Service Note, the periodic maintenance requirements for the LOGIQ 100 Systems is reduced to zero per year. Future service documentation for the LOGIQ 100 will reflect this change.

#### 7-4-3 SN\_73019: LOGIQ 100 MP/PRO Changes

**EFFECTIVITY:** LOGIQ 100 MP/PRO Systems

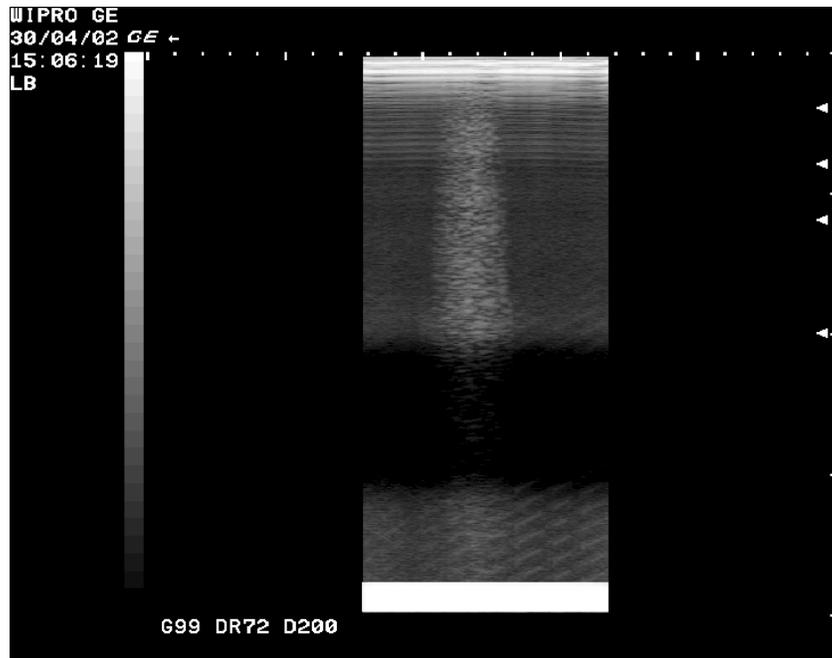
**PROBLEM:** The HP LaserJet Printer 4/4M/5/5M and 6L gold models have become Obsolete, Hence new models of HP Laserjet Printers are introduced. The HP Laserjet Printer models introduced are HP 2200 series (HP2200, 2200D, 2200DTN, 2200DN, 2200DSE) and HP1200 Series (HP1200N and HP1200SE).

**SOLUTION:** As of the release of this Service Note, this will regularize the introduction of HP 1200 Series (HP 1200N and HP 1200SE) Laserjet Printers. Future Service Documentation will reflect this change. HP Laserjet Printers HP2200 series Introduction are captured in Service manual 2139768 Rev 11.

*Note:* Introduction of HP Laserjet Printer 2200/1200 series does not require any changes in the Logiq 100 MP/PRO Hardware and software.

**7-4-4 SN\_73020: LOGIQ 100 PRO Changes**

- PROBLEM:**
- 1.) White Band in the bottom of the Image seen under the following Conditions. Refer Figure 1
    - a.) When LB Probe is used with L200 Probe Adapter and Last two TGC pots are at Minimum at depth of 150mm or 200mm.



**Figure 8 White Band**

**EFFECTIVITY:** LOGIQ 100 PRO Systems

**SOLUTION:** DSP Programming modified in FEB and Implemented in forward Production from March 2002. The New FEB Assy Part No. is 2300743 Rev 2

- PROBLEM:** 2.) Image Overlap (Jerkiness)  
a.) In Combi focus on movement of probe the image gets unstable and shaky
- EFFECTIVITY:** 69435wm6, 69436wm4, 69437wm2, 69438wm0, 69439wm8, 69440wm6, 69441wm4, 69442wm2, 69443wm0, 69371wm3, 69372wm1, 69373wm9, 69374wm7, 69375wm4, 69376wm2, 69377wm0, 69378wm8, 69379wm6, 69380wm4, 69381wm2, 70796wm8, 70797wm6, 70798wm4, 70799wm2, 70800wm8, 70801wm6, 70802wm4, 69382wm0, 70803wm2, 70804wm0, 70805wm7, 70806wm5, 69370wm5, 65959wm9, 65960wm7, 65966wm4, 65961wm5, 65962wm3, 65963wm1, 65965wm6, 65967wm2, 65969wm8, 65964wm9, 65968wm0, 69428wm1, 69429wm9, 69430wm7, 69431wm5, 69432wm3, 69433wm1, 66364wm1, 65628wm0, 65629wm8, 65970wm6, 65972wm2, 70807wm3, 70808wm1, 70809wm9, 70811wm5, 70812wm3, 70813wm1, 70814wm9, 70815wm6, 70816wm4, 70817wm2, 70818wm0, 70819wm8, 70820wm6, 70821wm4, 70810wm7, 69427wm3, 70822wm2, 70823wm0, 70824wm8, 70825wm5, 70826wm3, 70827wm1, 70828wm9, 70829wm7, 70830wm5, 70831wm3, 70832wm1, 70833wm9, 70834wm7, 70835wm4, 70836wm2, 70837wm0, 70838wm8, 70839wm6, 70840wm4, 70841wm2, 70842wm0, 70843wm8, 70844wm6, 70845wm3, 70847wm9, 70848wm7, 70849wm5, 70850wm3, 70851wm1, 66365wm8, 66366wm6, 66367wm4, 66368wm2, 66369wm0, 66370wm8, 66371wm6, 66372wm4, 66373wm2, 66374wm0, 70065wm8, 70066wm6, 70067wm4, 70068wm2, 70069wm0, 70070wm8, 70071wm6, 70072wm4, 70073wm2, 70074wm0, 70075wm7, 70076wm5, 70077wm3, 70078wm1, 70079wm9, 70080wm7, 70266wm2, 70267wm0, 70268wm8, 70269wm6, 70270wm4, 70271wm2, 70272wm0, 70275wm3, 70027wm8, 70274wm6, 70276wm1, 70277wm9, 70278wm7, 70279wm5, 70282wm9, 70283wm7, 70284wm5, 70289wm4, 70290wm2, 70292wm8, 70294wm4.
- SOLUTION:** Socket Mounted Altera Device Programming modified in FEB and implemented in forward Production from 29th April 2002. The New FEB Assy Part No. is 2300743 -2 Rev 0.
- PROBLEM:** In LOGIQ 100 PRO Optical Trackball Assembly, the Bracket used is of LOGIQ 100 MP, which needed to be modified for use.
- EFFECTIVITY:** LOGIQ 100 PRO Systems
- SOLUTION:** New Optical Trackball Assembly Bracket introduced. The New Part No of LOGIQ 100 PRO Optical Trackball Assembly is 2341518.

**7-4-5 SN\_73021:LOGIQ 100 MP & below**

**EFFECTIVITY:** LOGIQ 100 MP and below Systems

**PROBLEM:** Cables coming out from the PDB leading to System Failures (DOA).

- SOLUTION:**
- 1.) Two Connectors were changed in the Power Distributor Board - 2139788 at CON9 & 10.
  - 2.) Cable Assy 10 and 11 changed to suit the mating connectors at one end..
  - 3.) If PDB 2139788 Fails, replace it with 2336937 and Cable assy 10 and 11.
  - 4.) If Cable assy 10 or 11 fails then replace PDB with the supplied PDB(2336937) and cable 11, 10 respectively.
  - 5.) Cable set part No. for LOGIQ MP, V4 & below is changed. Refer the Table below.

Sl. No	Old Part No.	New Part No.	Description	Qty	FRU
1	2139788	2336153	Power Distributor Board Assy	1	1
2	2141778-2	2336938	Cable Assy 10	1	1
3	2141779-2	2336939	Cable Assy 11	1	1
4	2154472-3	2336940	Cable set for MP	1	1
5	2154472-2	2336941	Cable Set for V4 and below	1	1

**Table 9**

*Note:* PDB Assy (2336153) is supplied along with PDB(2336937), Cable Assy 10 (2336938) and Cable Assy 11(2336939).

The New PDB(2336937), New Cable Assy 10 (2336938) and New Cable Assy 11(2336939) are not backward compatible.

All the above changes are addressed in Service Manual 2139768 Rev 11.

**7-4-6 SN\_73022: LOGIQ 100 MP / MP VET / PRO**

**EFFECTIVITY:** LOGIQ 100 MP/MP VET/PRO Systems

**PROBLEM:** Image Transfer Software for LOGIQ 100 MP/MP VET/PRO Systems supporting Windows 98, Windows Me, Windows NT & Windows 2000.

**SOLUTION:**

- 1.) Image Transfer Software 2300243-2/2323388-2 released with enhanced feature for supporting Windows 98, Windows Me, Windows NT, Windows 2000 & **Windows XP** for both NTSC and PAL Systems.
- 2.) Image Transfer Software CD is FRU - 1 for MP /MP VET/PRO
- 3.) The LOGIQ 100 MP/MPVET/PRO customers opting for CD should order as per the Part No. listed below.

Sl. No	Old Part No.	New Part No.	Description	Qty	FRU
1	2300243	2300243-2	Image Transfer Software CD - PAL	1	1
2	2323388	2323388-2	Image Transfer Software CD - NTSC	1	1

**Table 10**

**7-4-7 SN\_73023: LOGIQ 100 PRO/MP**

**EFFECTIVITY:** LOGIQ 100 PRO/MP Systems

**PROBLEM:**

- 4.) CPU PCB has RS232 interface circuit(9 pin D type connector/Max 241L and Capacitors) . This Provides an option to connect LOGIQ 100 PRO/MP to PC through Serial Port to reun terminal emulation program like Hyper term for debugging CPU. Since this is used during Design and rarely used later. The LOGIQ 100 MP/PRO supports parallel port and RS232 serial interface circuit is not available for customers hence this is removed.
- 5.) Additional 32 Frames Cine Upgrade Kit (H41172LA) delisted, hence SOJ socket (4 Nos) is not required to be mounted in the DSC boards.

**SOLUTION:**

- 1.) Removal of RS232 Interface Circuit in CPU PCB Assy of LOGIQ 100 PRO/MP .
- 2.) DSC boards without SOJ sockets in LA100 PRO/MP .

Sl. No	Old Part No.	New Part No.	Description	Qty	FRU
1	2290037	2290037-2	CPU for LOGIQ 100 MP	1	1
2	2300745-2	2300745-3	CPU for LOGIQ 100 PRO	1	1
3	2300744	2300744-2	DSC for LOGIQ 100 PRO (32 Frames)	1	1
4	2245200-3	2245200-4	DSC for LOGIQ 100 MP (32Frames)	1	1

**Table 11 FRU Changes**

**7-4-8 SN\_73024: LOGIQ 100 PRO**

**EFFECTIVITY:** LOGIQ 100 PRO Systems.

**PROBLEM:**

- 1.) Faint White band seen in air scan image with 2PP (Dual Probe Port) when Probe is connected.
- 2.) DIP Switch SW2 is integrated to SW3 for cost productivity in CPU Board.

**SOLUTION:**

- 1.) Capacitors 100  $\mu$ f/35V & 0.01 $\mu$ f/50V are mounted in parallel between pin 5 & 6 of Power Supply Connector (PWR\_CON) in FEB Board.
- 2.) Software Modified (V7.0H) to allow Dip Switch SW2 removal and enabling Cine and Flash settings in DipSwitch SW3.

Sl. No	Old Part No.	New Part No.	Description	Qty	FRU
1	2300743-2	2300743-3	FEB Assy for LOGIQ 100 PRO	1	1
2	2300745-2	2300745-3	CPU Assy for LOGIQ 100 PRO	1	1

**Table 12 FRU Changes**

**DIP SWITCH SETTINGS IN CPU BOARD (ONLY WITH SW3 MOUNTED WITH SOFTWARE VERSION 7.0H)**

Location	Switch No	Settings
SW3	S1	0(OFF): Flash Assembly Enable 1 (ON): Flash Assembly Disable
	S2	0: STDOUT is LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO Display 1: STDOUT (Standard Output) AUX (PC)
	S3	0: STDIN (Standard Input) is AUX (PC) 1: STDIN is LOGIQ™ $\alpha$ 100/LOGIQ™ 100 PRO Keyboard*
	S4	0: NTSC Setup 1: PAL Setup
	S5	0: Enable 64 Frame Cine 1: Disable 64 Frame Cine
	S6,S7	00: Debug Monitor 10: Application (Ultrasound Mode) 01: Service Diagnostics
	S8	0: Dip Switch (SW2) is also present (mounted) 1: Only Dip Switch (SW3) is present (mounted)

**TABLE 13 DIP SWITCH SETTING IN CPU (ONLY WITH SW3 MOUNTED WITH SOFTWARE VERSION 7.0H)**

**DIP SWITCH SETTINGS IN CPU BOARD ( WITH BOTH SW3 & SW2 MOUNTED )**

Location	Switch No	Settings
SW3	S1	Don't Care
	S2	0: STDOUT is LOGIQ™α 100/LOGIQ™ 100 PRO Display 1: STDOUT (Standard Output) AUX (PC)
	S3	0: STDIN (Standard Input) is AUX (PC) 1: STDIN is LOGIQ™α 100/LOGIQ™ 100 PRO Keyboard*
	S4	0: NTSC Setup 1: PAL Setup
	S5	0: 2MB DRAM 1: 512KB DRAM
	S6, S7, S8	000: Debug Monitor 100: Application (Ultrasound Mode) 010: Service Diagnostics

**Table 14 Dip Switch SW3 Setting in CPU (with both SW3 & SW2 mounted)**

Note: \*This list is active only when 6,7,8 is in 000

**DIP SWITCH SETTINGS OF SW2.**

Location	Switch No.	Settings
SW2	S1	0(OFF): Flash Assembly Enable 1 (ON): Flash Assembly Disable
	S2	0: Enable 64 Frame Cine 1: Disable 64 Frame Cine
	S3 to S8	Don't Care

**Table 15 Dip Switch SW2 Setting in CPU Board**

**7-4-9 SN\_73025:LOGIQ 100 Version 4 & CL**

**EFFECTIVITY:** LOGIQ 100 Version 4 & CL Systems.

**PROBLEM:** The below known software bugs are fixed in the LOGIQ 100 V4 & CL (V4.06b and V4.26C).

- 3.) Hip Dysplasia measurement only in PAL systems shows a difference of ~5 Degree when VGP print out is taken and measured.
- 4.) A/B ratio gives NM even though measurements are made.
- 5.) RTC bug, (only in V4 CPU using V6 electronics) for eg.,if date is 30th Aug then on the next day the date will be shown as 1st Sept. The date 31st Aug is skipped)
- 6.) Control sequence bug. Pressing Control D,A then backspace and then pressing characters like U,L displays some junk text.

**SOLUTION:**

- 1.) CPU Program Changed to solve the above bugs
- 2.) New CPU PCB Assy is backward Compatible.

- 3.) Forward Production systems (LOGIQ 100 V4 & CL) from 15 Jul 2002, will have the above mentioned problems fixed.

Sl. No	Old Part No.	New Part No.	Description	Qty	FRU
1	2290619	2290619-2	CPU PCB Assembly for Version 4	1	1
2	2290620	2290620-2	CPU PCB Assembly for V4 India.(CL)	1	1

**Table 16 FRU Changes**

**7-4-10 SN\_73026: LOGIQ™ $\alpha$  100 MP VET Introduction**

**INTRODUCTION** Introduction of LOGIQ™ 100 for Veterinary Applications

**MODIFICATIONS:** The following are the modifications done on LOGIQ 100 MP to LOGIQ™ 100.

Sl. No.	Part No.	Description	Remarks
1	2354989	TRCTL Board	Hardware changes
2	2354990	DSC	Hardware Changes
3	2354988	CPU	S/W modified to incorporate V5L & V7L Probes
4	2356081	Keyboard Assembly For VET	KBD Assy with VET Logo
5	2356082	Front Panel Assy for VET	FPNL Assy with VET Logo
6	2355490	Keyboard Logo	New Logo for LOGIQ™ 100 PRO
7	2355491	Front Panel Logo	New Logo for LOGIQ™ 100 PRO
8	2356083	Plastic Set	New For LOGIQ™ 100 PRO with Keyboard Logo & Front Panel Logo changed.
9	2354122-100	User Manual Addendum	-
10	2356085	Key Board Bottom (Emblem 2355490 mounted )	-
11	2356084	Front Panel (Emblem 2355491 mounted)	-

**Table 1 Changes for LOGIQ™ 100**

**Available Probes for LOGIQ™α 100 MP VET**

See in Standard Specifications in the LOGIQ™α 100MP VET User Manual Addendum (2354122-100) for Probes and intended use.

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	2152422	H45202CZ	6.5	10mm	114°
*LB	P9601AQ	H46022LB	3.5	-	94mm
V5L	2349849	H40392LN	5.0	-	64mm
V7L	2349850	H40392LP	7.5	-	60mm

**Table 2 Available Probes**

\* This Probes are supported for LOGIQ™α 100 MP VET with LOGIQ 200 Probe Adapter (H41192LA)



**CAUTION** Use only approved probes, peripherals or accessories

The Following are the Models for LOGIQ™ 100

Sl. No.	H-Cat No.	Console No.	Region
1	H41162LH	2351330	220-240VAC, 50/60Hz, PAL, GEMS-E, V5.06B. - Europe

**Table 3 MODEL for LOGIQ™ 100**

**7-4-11 SN\_73027: LOGIQ 100 PRO**

**EFFECTIVITY:** LOGIQ 100 PRO Systems.

**PROBLEM:** 4.) Faint White band seen in air scan image with 2PP (Dual Probe Port) when L76 & E72 Probe is connected in depths of 100mm & 150mm with high gain.

**SOLUTION:**

- 1.) Capacitors 100 µf/35V & 0.01µf/50V are mounted in parallel between pin 5 & 6 of Power Supply Connector (PWR\_CON) in FEB Board.
- 2.) Modified by cutting the track between Connector J1 pin6 to Probe Connector pin K5 and adding a jumper wire connecting Capacitor C277 (100mfd.25v) on solder side to Probe Connector pin K5
- 3.) New FEB PCB Assy is backward Compatible.

Sl. No	Old Part No.	New Part No.	Description	Qty	FRU
1	2300743-3	2300743-4	FEB Assy for LOGIQ 100 PRO	1	1

**Table 4 FRU Changes**

**7-4-12 SN\_73028:LOGIQ 100 Version 4 & CL**

**EFFECTIVITY:** LOGIQ 100 Version 4 & CL Systems.

**PROBLEM:** The below known software bugs are fixed in the LOGIQ 100 V4 & CL (V4.06c and V4.26d).

- 4.) RTC bug (only in V4 CPU using V6 electronics) fix resulted in junk values displayed in real time mode.

**SOLUTION:**

- 1.) CPU Program Changed to solve the above bugs
- 2.) New CPU PCB Assy is backward Compatible.
- 3.) Forward Production systems (LOGIQ 100 V4 & CL) will have the above mentioned bug fixed.

Sl. No	Old Part No.	New Part No.	Description	Qty	FRU
1	2290619-2	2290619-3	CPU PCB Assembly for Version 4	1	1
2	2290620-2	2290620-3	CPU PCB Assembly for V4 India.(CL)	1	1

**Table 5 FRU Changes**

**7-4-13 SN\_73029:LOGIQ 100 PRO**

**EFFECTIVITY:** LOGIQ 100 PRO Systems.

**PROBLEM:** The Following Bugs/ Modification is made on V7.0H software

- 1.) E72 Frame Rate Issue.
- 2.) Freeze Sequence Bug - Press Freeze-> Zoom--comment--Unfreeze System Hangs.
- 3.) After System Boot up and Recall is pressed (with no images stored in the archive) and Dynamic Range key is pressed, then DR doesn't work. The system Just beeps.
- 4.) In L76 probe at the depth of 50mm, scroll 35mm and change the Focus --> Increase Gain image starts to Flicker.
- 5.) Freeze -- Zomm --Comment --Clear junk image appears on the Zoom window.
- 6.) In Zoom function, when keys like Depth, Focus, DR (no function to take place) is pressed beep sound is not heard.
- 7.) In Zoom -- press Recall -- press clear, system goes into Live mode
- 8.) Edit the user table - measure user table 1 & table 2 menus - go to Report page system hangs
- 9.) With CZB probe at depth 50mm after scroll of 90mm, junk appears on the image
- 10.)With L76 probe in Combi Focuss at scroll depth of 15 if gain is changed only some part of the image gets updated
- 11.)The text " Clearing image Archive Message X" (Which appears at the bottom of the screen when the user switches off the system while clear all operation is in progress and then switches on the system) is modified to display " Clearing image Archive X. This will take 20 to 30 seconds, Please wait.." or "Clearing image archive X. This will take 3 to 4 minutes, Please wait.. ." for standard/additional flash card configurations respectively

**SOLUTION:** 1.) Software Modified (V7.0i) to fix all the bugs mentioned above.

Sl. No	Old Part No.	New Part No.	Description	Qty	FRU
1	2300745-3	2300745-4	CPU Assy for LOGIQ 100 PRO	1	1

**Table 6 FRU Changes**

**7-4-14 SN\_73030:LOGIQ 100 MP/MP VET**

**EFFECTIVITY:** LOGIQ 100 MP/MP VET Systems.

**PROBLEM:** The Following Bugs/ Modification is made on V5.06a (MP) software

- 2.) RTC Bug
- 3.) A/B ratio gives N.M even after doing any number of measurements.
- 4.) The HIP Dysplasia measurements, shown by the system n PAL mode is 5 degree more than that measured manually after taking VGP Printout.
- 5.) After pressing some particular control sequence (like control S, Control A..) then backspace, and then some character like U,L etc., some junk test is appearing on the top of the control sequence text.
- 6.) Dynamic range won't work if the user presses recall key when the system is switched on the no images are there in the archive.
- 7.) Flash is detected even if additional card is not connected but dip switch is changed.
- 8.) If 'Update Archive status from Flash Assembly' test is done from Service Diagnostic menu and the user tries to store more images, the system shows " Archive Full" message even though the archive is not full.
- 9.) Image Overlay and measurements on top left portion of the screen are not stored.
- 10.) The Text ' Clearing Image Archive Message X' is modified to display " Clearing Image Archive X..' This will take 20 to 30 seconds. Please wait.. "/" Clearing Image Archive X.. This will take 3 to 4 minutes . Please wait. ' For standard/addition flash card configurations respectively.
- 11.) C36 probe band issue.(if 5, 10 scroll is done and preset is pressed a band of junk data appears. This happens in combi focus only).
- 12.) L76, E72, CZB, VE5 at depth 50 after scroll 9-, change focus and then change depth, some junk image in the background.

The Following Bugs/ Modification is made on V5.06C(MP VET) software

- 1.) C36 probe band issue. .(if 5, 10 scroll is done and preset is pressed a band of junk data appears. This happens in combi focus only).
- 2.) V7L, V5L, L76, E72,CZB, VE5 at depth 50 after scroll 90, change focus and then change depth, some junk image in the background.

**SOLUTION:** 1.) Software Modified (V5.06a to V5.06a2 & V5.06c to V5.06d) to fix all the bugs mentioned above.

Sl. No	Old Part No.	New Part No.	Description	Qty	FRU
1	2290037-2	2290037-3	CPU Assy for LOGIQ 100 MP (V5.06a2)	1	1
2	2354988-2	2354988-3	CPU Assy for LOGIQ 100 MP VET (V5.06D)	1	1

**Table 7 FRU Changes**

**7-4-15 SN\_73031:LOGIQ 100 MP/MP VET & PRO**

**EFFECTIVITY:** LOGIQ 100 MP/MP VET & PRO Systems.

**PROBLEM:** The Modification is made on FEB / TRCTL / CPU / KBD(Con1) & TGC Connectors for compatibility of the Cable Connectors

**SOLUTION:** 1.) The modification on connectors as shown below will solve the connector compatability Issue. by breaking the Connector Notch in FEB / TRCTL / CPU / KBD(Con1) & TGC Board. Refer Figure 1-1 to 1-5 for Location of Connectors & Figure 1-6 for the location of connector notch to be broken..



**Figure 1-1 FEB PCB**

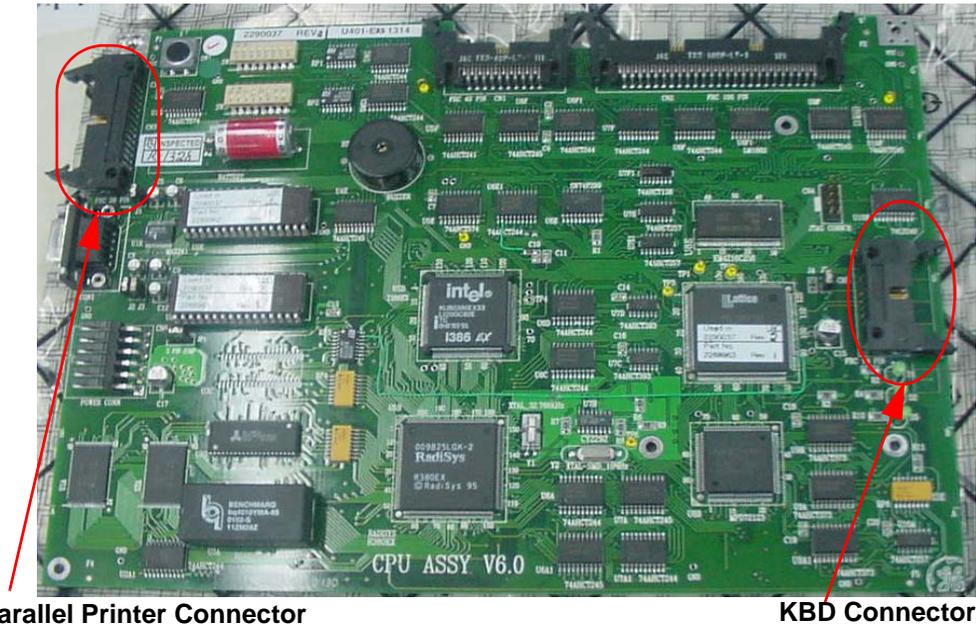


Figure 1-2 CPU PCB

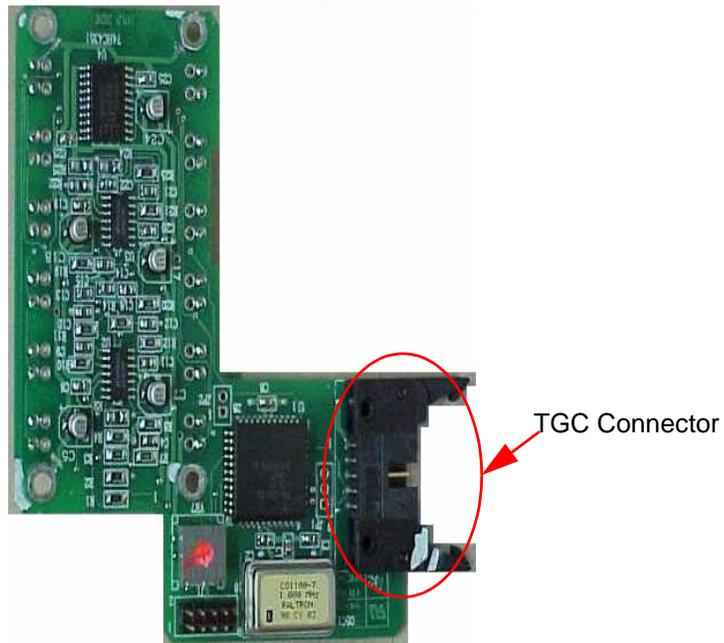


Figure 1-3 TGC PCB

TGC Connector in TRCTL Board

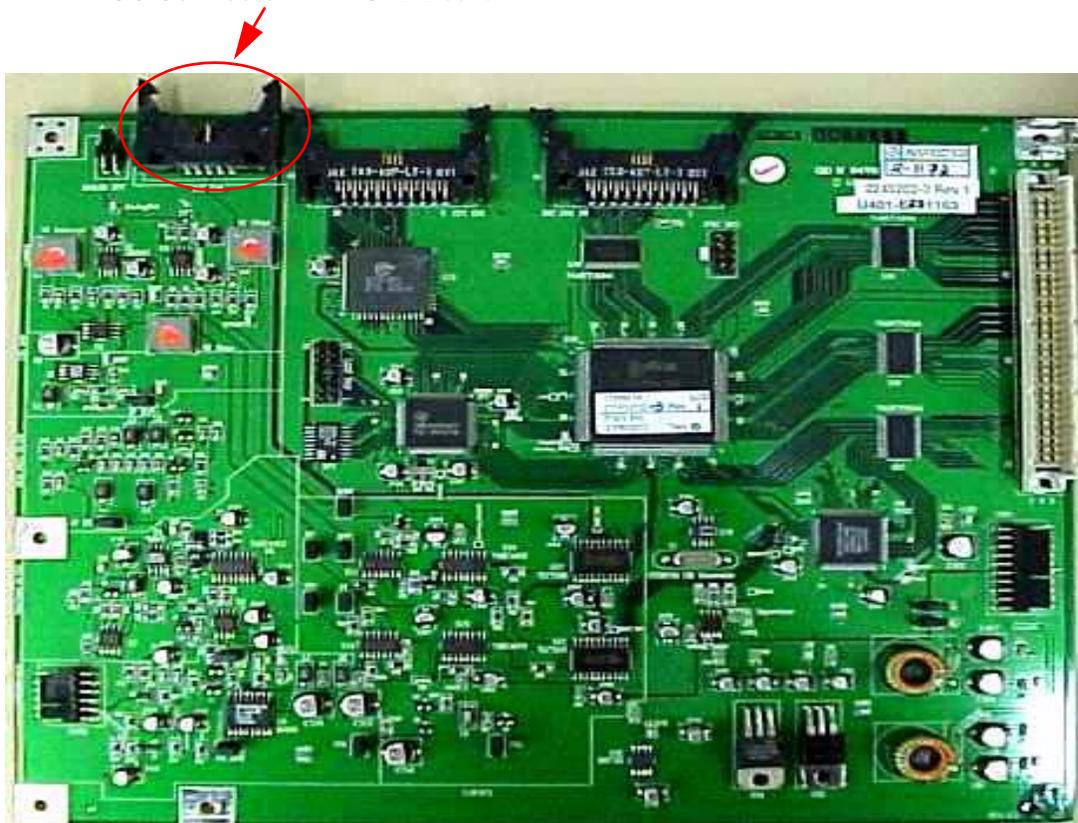
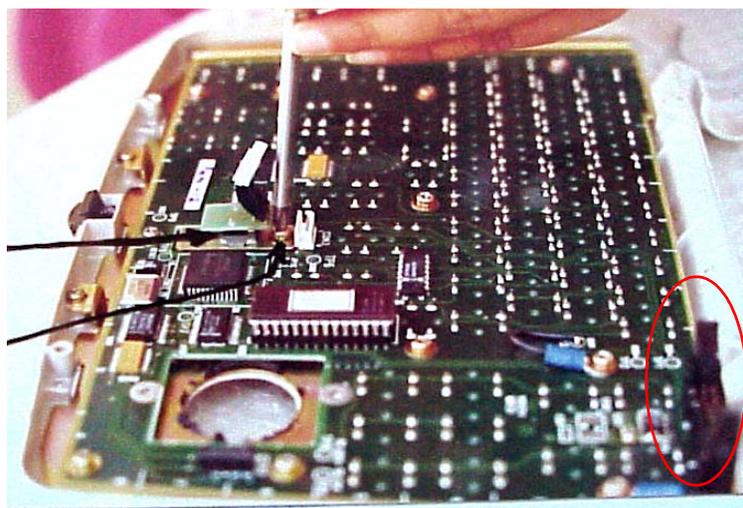
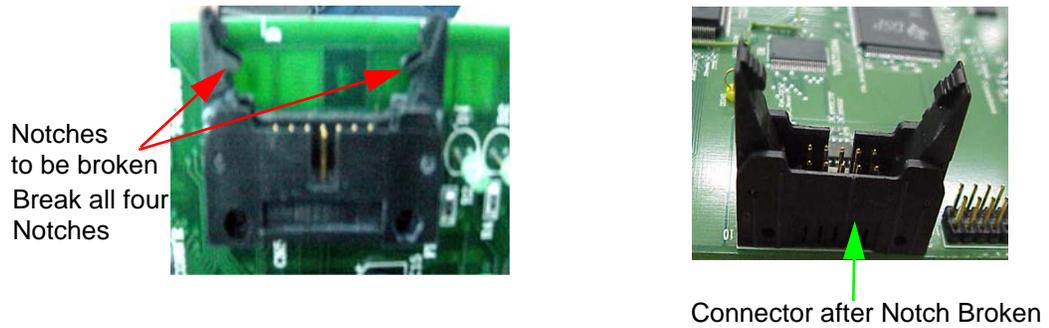


Figure 1-4 TRCTL PCB



KBD Connector

Figure 1-5 KBD PCB



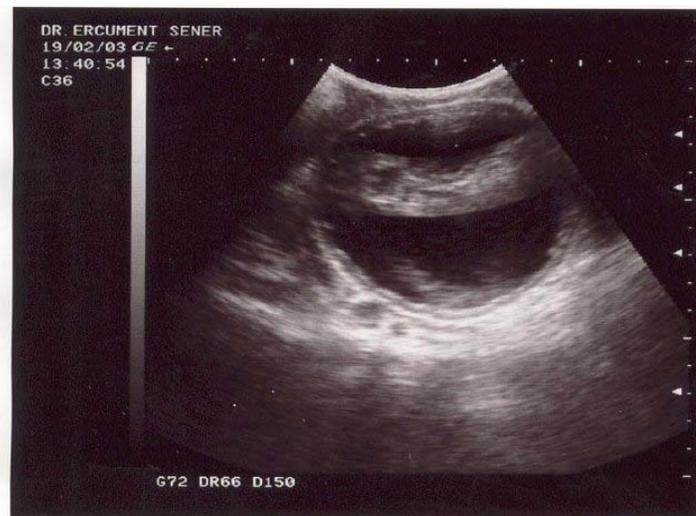
**Figure 1-6 Connectors Before & After Rework**

*Note:* There is no change in the PCB Assembly Part No.

**7-4-16 SN\_73032:LOGIQ 100 PRO - Combi Focus Artifact**

**APPLIESTO:** LOGIQ 100 PRO Systems.

**PROBLEM:** In Combi Focus mode, image reflection is seen during the scanning of fluid filled organs (Bladder). This problem is not seen in the single focus mode



**Figure 1-7 Image of UB Reflection in Combi Focus**

**SOLUTION:** This is a technology limitation of the LOGIQ 100 System.

No Solution exists to resolve this system limitation. Only work around exist for this problem.

**PROCEDURE: Section 7-8 Workaround**

- 1.) Adjust the image by using the TGC on the scanner to minimize the artifact.
- 2.) Use Single focus mode as an alternative to combi focus mode to eliminate image reflection while scanning Fluid filled organs

**7-4-17 SN\_73033:LOGIQ 100 PRO**

**EFFECTIVITY:** LOGIQ 100 PRO Systems

**PROBLEM:** The Following Modification is made on V7.0J software.

- 1.) Printing images on HP LaserJet1200 Parallel Printer had issue due to memory.
- 2.) Cine should be inactive in measurement mode
- 3.) ATO\* marks were not stored along with the image.
- 4.) CPU boot hang issue during system power ON/OFF.

**The following low severity bugs are fixed in V7.011**

- 5.) If the user does some measurements (e.g.: C&A) and then go to recall screen and recall any image and then come back to image screen and again do the measurement, then sometimes the calculated values shown will be 0.
- 6.) If some cardiac measurement is done and then it is cleared and the image is stored, then during recall the cardiac measurement menu will appear though it was cleared before storing. Also when new patient is pressed (after doing some cardiac measurements) and the image is stored and then recalled, the recalled image will show the cardiac menu.
- 7.) ATO marks were not disappearing when diagnostic category was changed though the ATO effect goes off.
- 8.) During Freeze mode, if the diagnostic category is changed to the same diagnostic category (if original diagnostic category was 1 then press CTRL-D and select 1 again), then the image is unfrozen though the system is in freeze state. Routine is modified to make the image also in the freezed mode.
- 9.) After doing some measurements, if diagnostic category is changed to the same diagnostic category (if original diagnostic category was 1 then press CTRL-D and select 1 again), then the values shown on the left side of the image disappears. This should disappear only if the diagnostic category is changed to a different one compared to the original category.
- 10.) After doing two sets of volume measurements (from the general measurement menu) in Urology Category, store the image. Then recall the stored image and go to report page. The image's report page won't show the 2 volumes. Only the first volume will be there in the report page.

- SOLUTION:**
- 1.) LOGIQ 100 PRO Software Version V7.011 Release
  - 2.) To support HP Laser Jet Printer 1200, additional DRAM is added to CPU board.
  - 3.) Changes are made to the software and the hardware to resolve the CPU boot hang issue during system power ON/OFF.

The new CPU assy is backward compatible.

#	Old Part No.	New Part No.	Description	Qty
1	2300745-5 Rev 1	2300745-6 Rev 0	CPU Assy for LA100 PRO	1

*Note:* The version naming of the software is changed from V7.0X to 7.X.X as per Global Standard.

**7-4-18 SN\_73038:LOGIQ 100 PRO**

**EFFECTIVITY:** LOGIQ 100 PRO Systems - 108 Systems.

The System Serial Numbers of the affected systems are as below.

1968WS7, 1967WS9, 1971WS1, 1970WS3, 1969WS5, 1199WS9, 1200WS5, 1201WS3,  
1202WS1, 1203WS9, 1204WS7, 1205WS4, 1259WS1, 1258WS3, 1257WS5, 1972WS9,  
1973WS7, 1974WS5, 2292WS1, 2293WS9, 2294WS7, 2295WS4, 2475WS2, 2476WS0,  
2477WS8, 2478WS6, 2479WS4, 2480WS2, 2481WS0, 2296WS2, 2297WS0, 2298WS8,  
2299WS6, 2300WS2, 2301WS0, 1990WS1, 1991WS9, 1993WS5, 1992WS7, 1994WS3,  
1995WS0, 1996WS8, 1997WS6, 1998WS4, 1999WS2, 2000WS8, 2007WS3, 2008WS1,  
2009WS9, 2001WS6, 2002WS4, 2003WS2, 2004WS0, 2005WS7, 2006WS5, 2302WS8,  
2304WS4, 2305WS1, 2306WS9, 2307WS7, 2308WS5, 2309WS3, 2310WS1, 2311WS9,  
2312WS7, 2313WS5, 2314WS3, 2315WS0, 2316WS8, 2317WS6, 2318WS4, 2319WS2,  
2320WS0, 2321WS8, 2322WS6, 2323WS4, 2324WS2, 2325WS9, 2326WS7, 2327WS5,  
2331WS8, 2328WS3, 2329WS1, 2330WS9, 2332WS5, 2333WS3, 1980WS2, 1981WS0,  
1982WS8, 1983WS6, 1984WS4, 1985WS1, 1986WS9, 1987WS7, 1988WS5, 1989WS3,  
2290WS5, 2291WS3, 66431WM8, 66432WM6, 66433WM4, 66426WM8, 66427WM6,  
66428WM4, 66429WM2, 66430WM0, 66425WM0, 66424WM3,

**PROBLEM:** 1.) When system is powered on Continuous beep/double beep in L100PRO systems is heard.

**SOLUTION:** 1.) LOGIQ 100 PRO Software Version V7.012 will solve this problem.  
The new CPU assy is backward compatible

#	Old Part No.	New Part No.	Description	Qty
1	2300745-6 Rev 0	2300745-7 Rev 0	CPU Assy for LA100 PRO	1

**7-4-19 SN\_73039:LOGIQ™ $\alpha$  100 PRO VET Introduction**

**INTRODUCTION** Introduction of LOGIQ™ 100 for Veterinary Applications

**MODIFICATIONS:** The following are the modifications done on LOGIQ 100 PRO to LOGIQ™ 100.

Sl. No.	Part No.	Description	Remarks
1	2391359	FEB	DSP Software Modified to Incorporate V5L & V7L Probes
2	2391357	CPU	S/W modified to incorporate V5L & V7L Probes, Support Additional Vet Marks, VET OB
3	2394679	Keyboard Assembly For VET	KBD Assy with VET Logo
4	2394687	Front Panel Assy for VET	FPNL Assy with VET Logo
5	2391360	Keyboard Logo	New Logo for LOGIQ™ 100
6	2391362	Front Panel Logo	New Logo for LOGIQ™ 100
7	2394684	Plastic Set	New For LOGIQ™ 100 with Keyboard Logo & Front Panel Logo changed.
8	2391364-100	User Manual Addendum	-
9	2394685	Key Board Bottom (Emblem 2391360 mounted )	-
10	2394686	Front Panel (Emblem 2391362 mounted)	-

**Table 1 Changes for LOGIQ™ 100**

**Available Probes for LOGIQ™ $\alpha$  100 PRO VET**

See in Standard Specifications in the LOGIQ™ $\alpha$  100 PRO VET User Manual Addendum (2391364-100) for Probes and intended use.

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	2152422	H45202CZ	6.5	10mm	114°
*LB	P9601AQ	H46022LB	3.5	-	94mm
V5L	2349849	H40392LN	5.0	-	64mm
V7L	2349850	H40392LP	7.5	-	60mm

**Table 2 Available Probes**

\* This Probes are supported for LOGIQ™ $\alpha$  100 PRO VET with LOGIQ 200 Probe Adapter (H41192LA)



**CAUTION** Use only approved probes, peripherals or accessories

The Following are the Models for **LOGIQ™ 100**

Sl. No.	H-Cat No.	Console No.	Region
1	H41162LJ	2391352	220-240VAC, 50/60Hz, PAL, GEMS-E, V8.0.0. - Europe

**Table 3 MODEL for LOGIQ™ 100**

**7-4-20 SN\_73054: LOGIQ™ ALPHA100 New Printer Introduction**

**EFFECTIVITY:**

**EFFECTIVITY:**

The printers HP4, HP4M, HP5, HP5M, HP6 and the 2200 series have become obsolete. These printers, used on the LOGIQ™ a100 are now not available.

**SOLUTION:**

The Printer HP LJ1015 can be used instead of the above printers. These printers have been tested and found to be compatible with the LOGIQ™ a100.

**7-4-21 SN\_73065: L100 PRO**

**APPLIESTO:** All LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Systems.

**PROBLEM:** Obsolescence of LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO parts.

**SOLUTION:**

The Following parts of the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO are being replaced because of Obsolescence of older parts.

Old Part	New Part	Description	Reason for Change	Old Part Compatibility	New Part Compatibility
2307427	5132892	KEYBOARD ASSY FOR LA100PRO	Obsolescence of Optical Trackball 2245196	Forward Compatible	Backward / Forward Compatible
2300743-5	2300743-6	FEB ASSEMBLY FOR L100 PRO	Change of FEB Software	Forward Compatible	Backward / Forward Compatible
2300745-8	2300745-10	CPU FRU FOR LOGIQ 100 PRO	Obsolescence of the Intel i386EX processor	Forward Compatible	Forward Compatible
2315682	2139701-2	KEY BOARD BOTTOM	Change of Keyboard Assembly from 2307427 to 5132892	Not Forward Compatible - Replace Keyboard Assembly	Forward Compatible
2323801	2139699	KEY BOARD TOP	Change of Keyboard Assembly from 2307427 to 5132892	Not Forward Compatible - Replace Keyboard Assembly	Forward Compatible

**Table 3-1 Changes in FRUs for LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO**

From a user perspective, there has been no change in the functionality for the system.

- 1.) The FRU 2300745-10 will contain the following three parts
  - 1.) 5131073 - CPU Assembly with MPC823 For LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO
  - 2.) 5133746 - PC Transfer CD for LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO. The New Transfer CD is compatible with the Older CPU (2300745-8 and Below)
  - 3.) 5135266 - PC Transfer Software Installation Instructions

**7-4-22 SN\_73069:L100 PRO**

**APPLIESTO:** All LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Systems with software version below 7.0.13 and using CZB probe.

**PROBLEM:** Biopsy Guidelines are appearing incorrectly on the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO, when using the CZB Probe. Refer to iTrak report # 13012872

**SOLUTION:** On the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO, with software versions below 7.0.13, if the Customer connects the CZB probe and turns on the Biopsy mode, the biopsy guide displayed is incorrect. This issue has been reviewed by the Global Safety and Regulatory Team, and the issue was found to be of a medium severity, low probability of occurrence with priority code of 3.

This has been corrected with the software 7.0.13. The software is available as FMI 73056, which has been released for the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO. This is a **Mandatory On Request** FMI.

A Customer letter has been created and approved by the Legal team. This letter has been sent to all Customers traced in CARES / GIB. Also a copy of this letter is available in this service note on the next page.

If there are any other LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Customers in your region, please print this customer letter and give it to them.

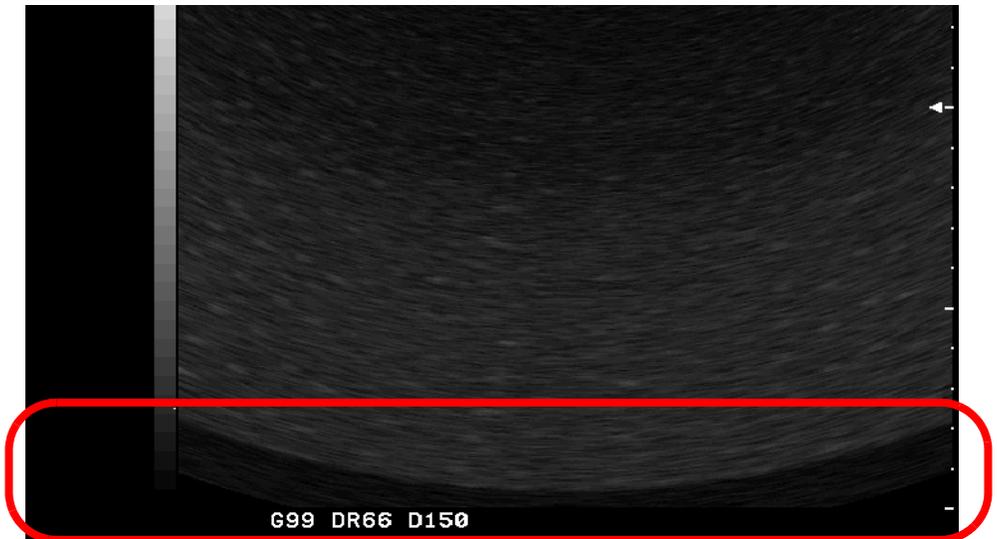
**7-4-23 SN\_73070:L100 PRO**

**APPLIES TO:-**

All LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Systems with Software Version V9.0.5 and V9.0.6.

**Observations:-**

- 1.) At the edges, some Characters seem slightly bent. This does NOT happen on the imaging area, only on the edges. This does NOT effect the image displayed on screen. This also does not appear in printouts taken.
- 2.) When scrolling with different depths, intermittently, the image in the lower portion of the screen will be relatively darker. This Phenomenon will be observed on the following probes - C31, C36, C55 and LB. This does not affect the imaging area and the images are distinctly visible. Refer to figure below.



**Figure 7-1 Dark Section Seen during Scrolling**

- 3.) While system is booting without probe, if the probe is inserted before the complete boot up & imaging screen is seen, junk image is observed intermittently. As soon as the Probe is disconnected and reconnected, this junk image is cleared. This Junk image is easily recognizable and will not cause any interference during diagnosis. The best method to avoid this is to connect the probe and then boot the system.
- 4.) The system takes up to 28 seconds to boot up. This is normal with the software Versions 9.0.5 and 9.0.6.
- 5.) When testing the DSC, in diagnostic test of "All test" an image appears very briefly before the test starts. This is normal operation.
- 6.) When Printers are not connected to the system and the "Paper Eject" command is given by pressing "Ctrl+J", the system gives a message "Printer is Busy". This will not affect the diagnostics or the functionality of the system in any way. This is seen only in systems with software Version 9.0.5. This has been fixed in Version 9.0.6.

7-4-23 SN\_73070:L100 PRO(Cont'd)

- 7.) If service diagnostic tests are performed immediately after doing a series of vertical scroll operations and if you quit the service diagnostics, the system will reboot and after booting give Junk Image. This image will be cleared if the depth is changed. This Junk image is easily recognizable. This will not interfere during diagnosis. The best way to avoid this is to restart the system by turning off and then turning on the system after service diagnostics are performed. Refer to attached Figure.

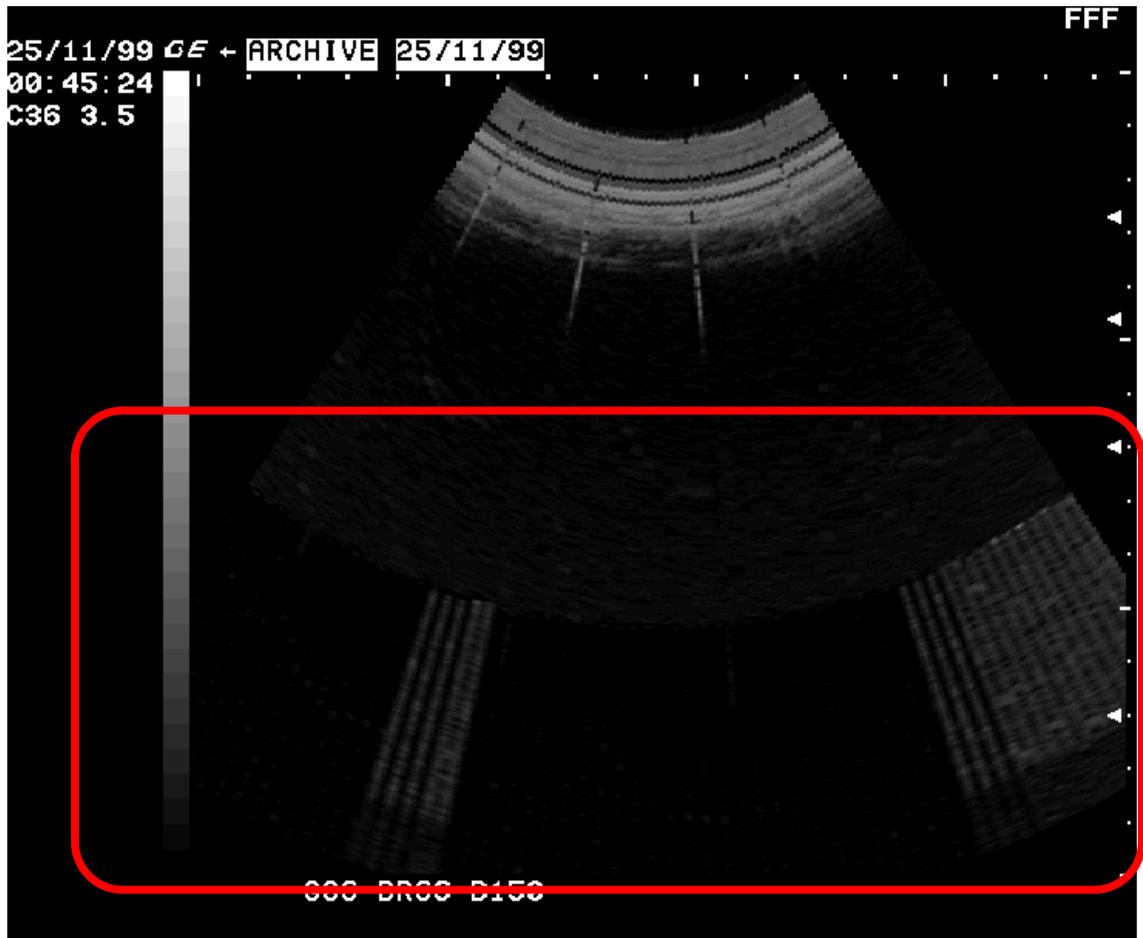


Figure 7-2 Junk Image Seen After Diagnostics

**7-4-23 SN-73071: Introduction Of FMI-73067 For LOGIQ 100 PRO**

**APPLIESTO:** LOGIQ 100 PRO with Software Version 9.0.5

**PROBLEM:** 1.) **LOGIQ 100 PRO Measurement updation issue on Report Page:**  
Old measurements are not getting erased when New Patient is selected. When we measure AC and HC, derived parameters TAD and OFD gets calculated automatically. But when we press the New Patient key, the AC and HC measurements are erased, but TAD and OFD are still present, whereas all the measurements attributed to the previous patient should have been erased.

2.) **LOGIQ 100 PRO Heart Rate not getting updated in Report Page:**  
Heart Rate is not getting updated in the report page.

**SOLUTION:** The above-mentioned problems have been resolved in the new software version 9.0.6. The New software version 9.0.6 can be loaded into the LOGIQ 100 PRO system by ordering the FMI-73067 Kit: Part Number is **5144244**  
In the event of the FMI not being successful, please contact your POLE OLC for further guidance.

**7-23-24 SN-73044: LOGIQ 100 PRO-Biopsy Guideline Error**

**EFFECTIVITY:** LOGIQ 100 PRO Systems - Manufactured as of FW37'2003.

**PROBLEM:** 1.) Biopsy guideline error when CZB probe biopsy kit is used.

**SOLUTION:** 1.) Replacing the CPU PCB assembly will solve this issue.  
The new CPU assy is backward compatible

SL.No.	old part No	new part#	QTY	Note
1.	2300745-7	2300745-8	1	

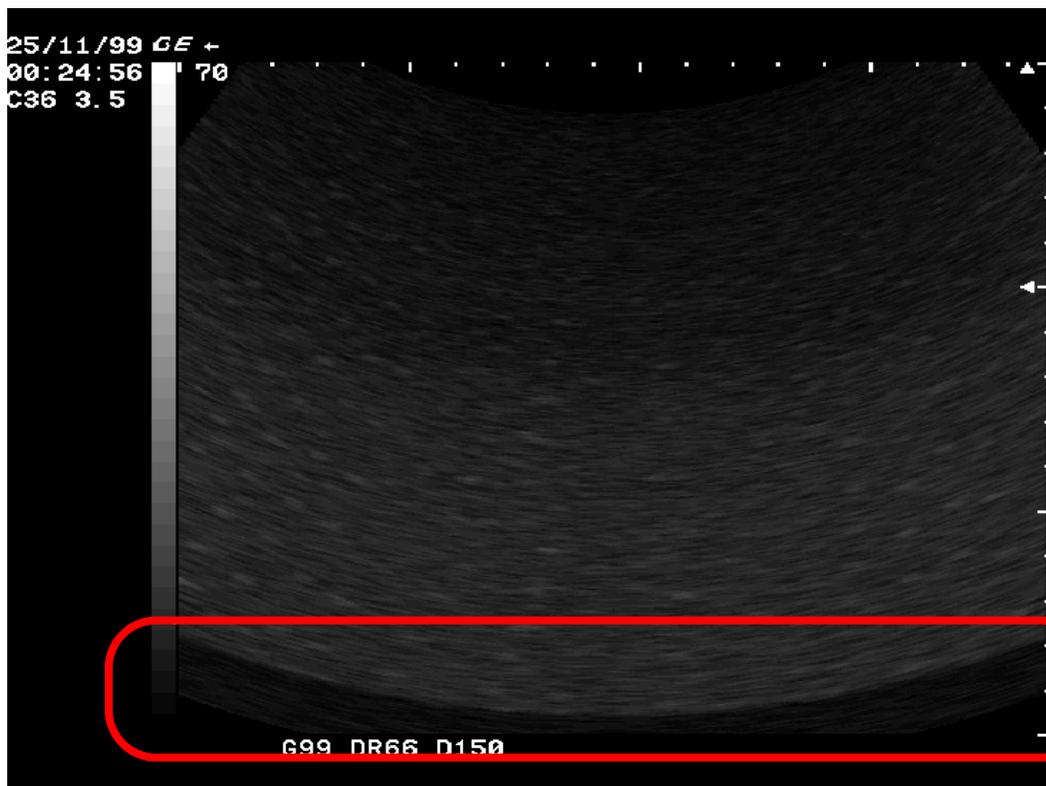
7-23-25 SN\_73072: L100 PRO VET S/W 10.0.1 Introduction

**APPLIES TO:-**

All LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO Systems with Software Version V10.0.1.

**Observations:-**

- 1.) At the edges, some Characters seem slightly bent. This does NOT happen on the imaging area, only on the edges. This does NOT effect the image displayed on screen. This also does not appear in printouts taken.
- 2.) When scrolling with different depths, intermittently, the image in the lower portion of the screen will be relatively darker. This Phenomenon will be observed on the following probes - C31, C36, C55 and LB. This does not affect the imaging area and the images are distinctly visible. Refer to figure below.



**Figure 7-3 Dark Section Seen during Scrolling**

- 3.) While system is booting without probe, if the probe is inserted before the complete boot up & imaging screen is seen, junk image is observed intermittently. As soon as the Probe is disconnected and reconnected, this junk image is cleared. This Junk image is easily recognizable and will not cause any interference during diagnosis. The best method to avoid this is to connect the probe and then boot the system.
- 4.) The system takes up to 28 seconds to boot up. This is normal with the software Versions 10.0.1.
- 5.) When testing the DSC, in diagnostic test of "All test" an image appears very briefly before the test starts. This is normal operation.

- 6.) If service diagnostic tests are performed immediately after doing a series of vertical scroll in quick successions and if you quit the service diagnostics, the system will reboot and after booting give Junk Image. This image will be cleared if the depth is changed. This Junk image is easily recognizable. This will not interfere during diagnosis. The best way to avoid this is to restart the system by turning off and then turning on the system after service diagnostics are performed. Refer to attached Figure.

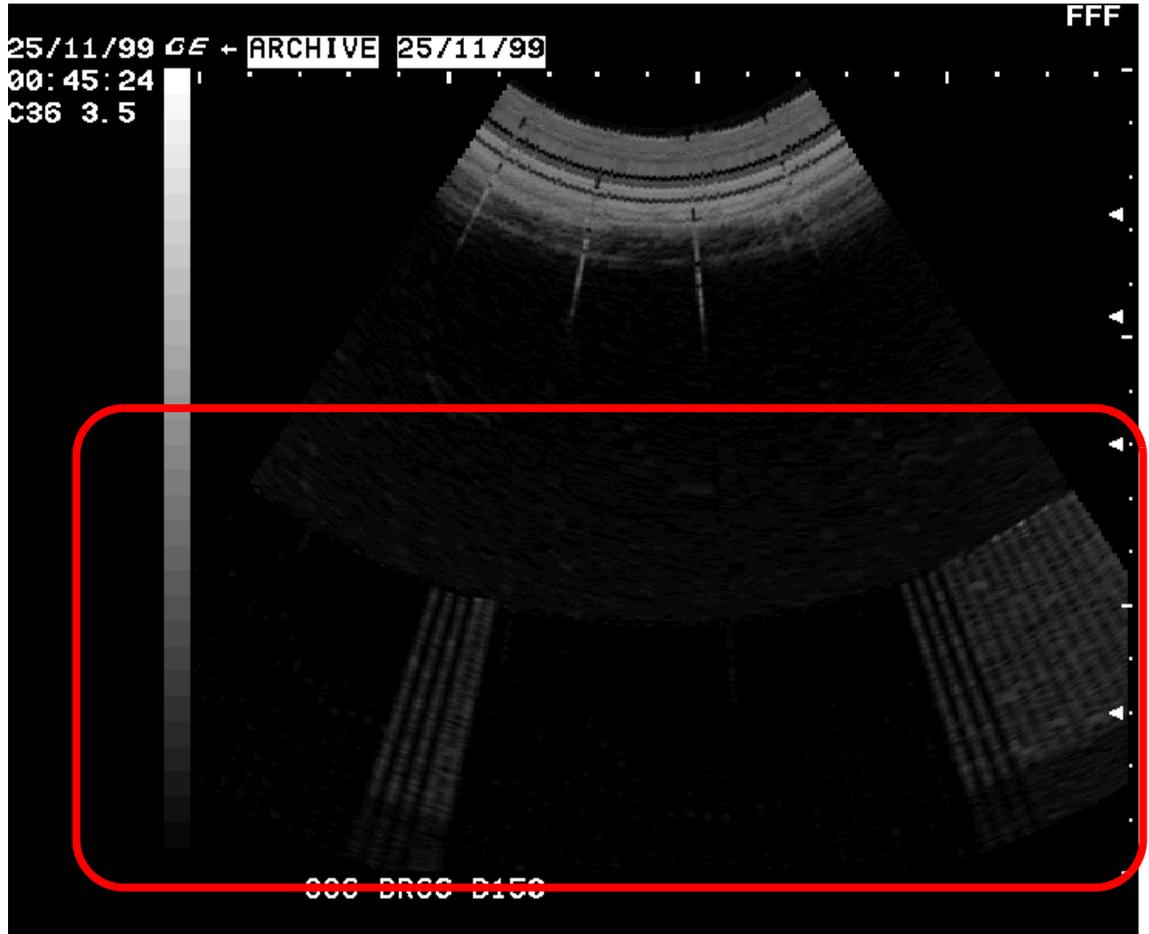


Figure 7-4 Junk Image Seen After Diagnostics

## Section 7-24 Troubleshooting

The following table is provided to help the service engineer during corrective maintenance.

### TROUBLESHOOTING

Problem Faced	Cause	Solution
No Display, total black out	No AC Power Circuit Breaker tripping  Brightness/Contrast knobs may be at end limit No video signal to the monitor  Monitor may be defective Power Supply to the Monitor may be bad (12 Volts) TRCTL (for V5.06a & below) / FEB (for V7) may be defective DSC may be defective	Ensure power cable is ok and there is power at the wall outlet Power Supply or PCB may be loading. Replace the defective power supply or the PCB Turn the knobs to the suitable position  Ensure video cable connection from the DSC to the monitor pcb is intact Feed an external video signal to confirm Set right the same  Replace the same Replace the same
"No trackball Acknowledgement" or "Trackball Interface error" - Error message	Trackball or the cable maybe defective  Keyboard or CPU or interface cable may be defective	Replace appropriately. Contact your local service representative or OLC for further information on this. Replace appropriately
"Keyboard not connected" - Error message	Keyboard to CPU interface cable maybe defective Keyboard may be defective	Replace the same  Replace the same
"No System Mode Acknowledgement" - Error message	TRCTL (For V5.06a & below) / FEB (for V7), CPU interface may not be proper	Replace 40 pin cable interfacing the TRCTL/ FEB to CPU Replace TRCTL or CPU pcb <b>NOTE:</b> TRIG LED on TRCTL blinks if the TRCTL is ok (Not Applicable for V7) H-SYNC LED on CPU blinks if the CPU is ok (Not Applicable for V5.06a & above)
No Text	CPU may be defective	Replace the CPU
No Image and Gray Scale but text is there	DSC may be defective	Replace the DSC
No Echoes otherwise system is ok	HV Power Supply maybe defective TRBD (For V5.06a & below) / FEB (for V7) maybe defective	Replace the HV Power Supply Replace the TRBD <b>NOTE:</b> If Gain works ok it means TRCTL is ok, the problem is with TRBD
System does not respond to Gain variation	Cable interfacing CPU and KBD maybe defective CPU or TRCTL (For V5.06a & below) / FEB (for V7) maybe defective If overlay updated then CPU is good Gain Encoder may be defective	Replace the same  Replace appropriately Replace Keyboard Assembly
Garbled Text Display	CPU overlay problem  Cable Interfacing CPU to DSC maybe defective	Replace CPU  Replace 100 pin cable connecting CPU to DSC

Table 7-1 Trouble Shooting

Problem Faced	Cause	Solution
Junk Image Display	DSC, TRCTL interface cable maybe defective	Replace the same
	DSC maybe defective	Replace the same
System Resets intermittently	5 Volt power supply or CPU maybe defective	First check for the 5V DC supply to the CPU board & ensure Proper Voltage. If the voltage is not at required level, Proceed to check if the power supply is a problem or the CPU board. If the voltage is ok then most likely the CPU board is defective. Replace appropriately
Display shrinks and/or shakes	Problem maybe with monitor or power supply to the monitor	Replace appropriately
Image blooming	If only image area (Problem maybe with HV Power supply or TRBD (For V5.06a & below) / FEB (for V7))	Replace appropriately
	If problem is with full monitor display	Replace the monitor
Ring artefacts on the monitor	Due to pickup signal when the probe is not connected	Connect the probe
Low Frequency moving artefacts	AC line interference	Change the AC input
Video-In/Video Out not working	Connection on the rear panel not ok	Set right the same
	DSC maybe defective	Replace the same
Foot switch not working	Connection on the rear panel not ok	Set right the same
	DSC may be defective	Replace the same
	CPU maybe defective	Replace the same
Remote Control not working	KBD or CPU maybe defective	Replace appropriately
	Connection on the rear panel not OK	Replace appropriately
CINE 64 Frames not set. Only for V5.0 and above	Dip Switch setting in CPU may not be OK	Check Dip Switch 2 - S2 On for 32 frames Off for 64 frames

**Table 7-1 Trouble Shooting**

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# Chapter 8 Replacement Procedures

## Section 8-1 Overview

### 8-1-1 Purpose of Chapter 8

This chapter holds replacement procedures for the following modules/subsystems.

### CONTENTS IN CHAPTER 8

Section	Description	Page Number
8-1	Overview	8-1
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8-5-1	Disassembly/Assembly of DSC/CPU/FLASH (FRU 601/603/604/1433)	8-14
8-5-2	Disassembly/Assembly of TRCTL/TRBD for LOGIQ™α 100 MP & Below. (FRU 701/702)	8-18
8-5-3	Disassembly/Assembly of FEB for LOGIQ™α 100/LOGIQ™ 100 PRO (FRU 703)	8-19
8-6	Fan Assembly (FRU 901)	8-20
8-7	Power Supply/Distributor PCB (FRU 801/802)	8-21
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8-9	HV Assembly (FRU 1101)	8-23
8-10	Chassis (FRU 1201)	8-24

**Table 8-1 Contents in Chapter 8**

## Section 8-2 Top Cover

### 8-2-1 Disassembly/Assembly of Top Cover

Follow the steps below and refer Figure 8-1, For FRU Details refer 9-1-2

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

8-2-1 Disassembly/Assembly of Top Cover (Cont'd.)

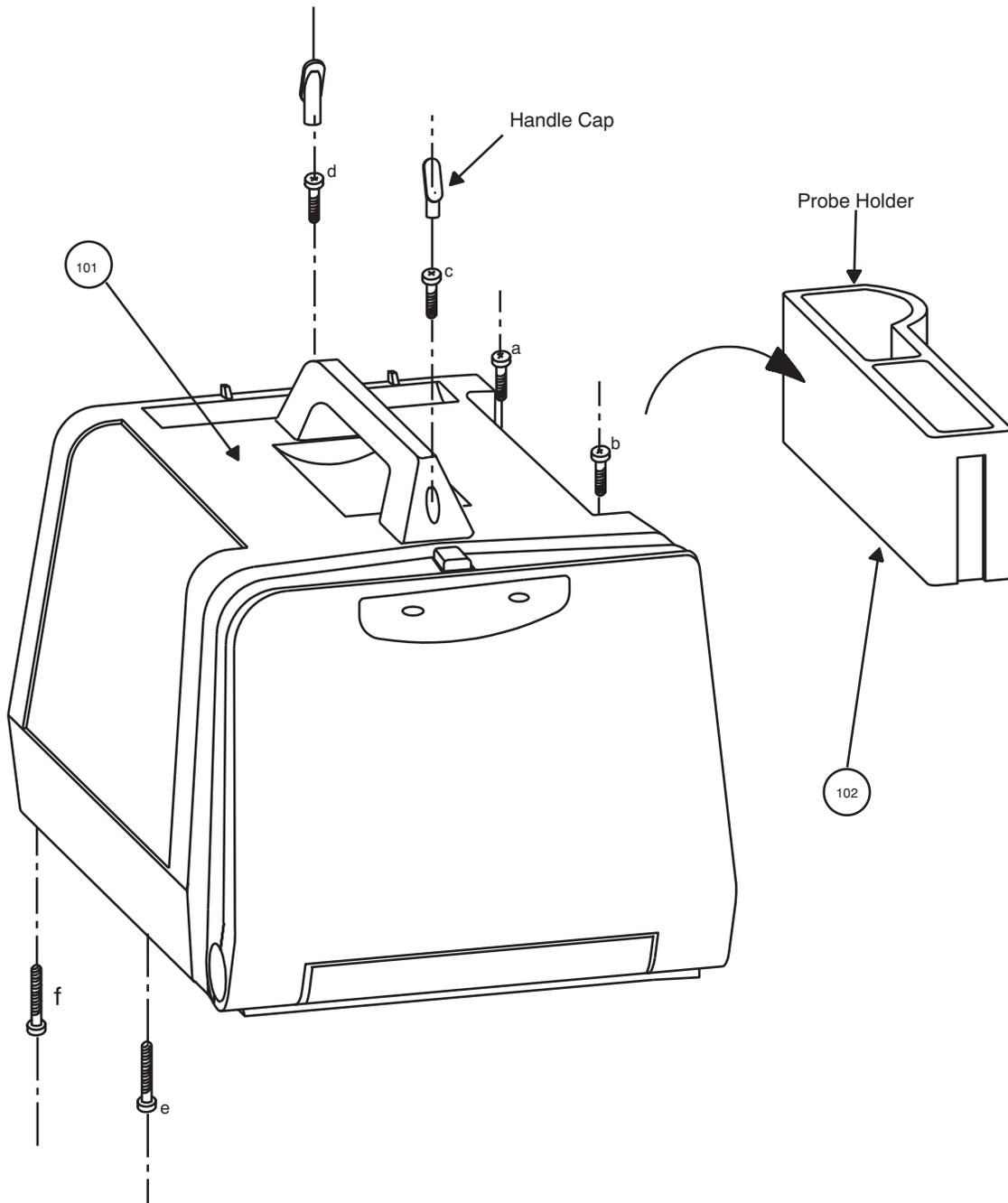


Figure 8-1 Disassembly/Assembly of Top Cover

## Section 8-3 KEYBOARD

### 8-3-1 Detaching the Keyboard

Follow the steps below and refer Figure 8-2. For FRU Details refer 9-1-3

- 1.) Remove Front Panel. Refer 8-4-1.
- 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.) Remove the TGC connector from the FEB (for LOGIQ™ 100 PRO)/TRCTL (For V5.06a & Below) not shown in the Figure 8-2.
- 5.) 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 Figure 8-2.
- 6.) Press the lock release and turn the keyboard 90°. Move the keyboard downward and carefully pull out the cable with the connector.
- 7.) Remove the 2 ring bushes refer Figure 8-2.
- 8.) For assembly follow the reverse order.

8-3-1 Detaching the Keyboard (Cont'd.)

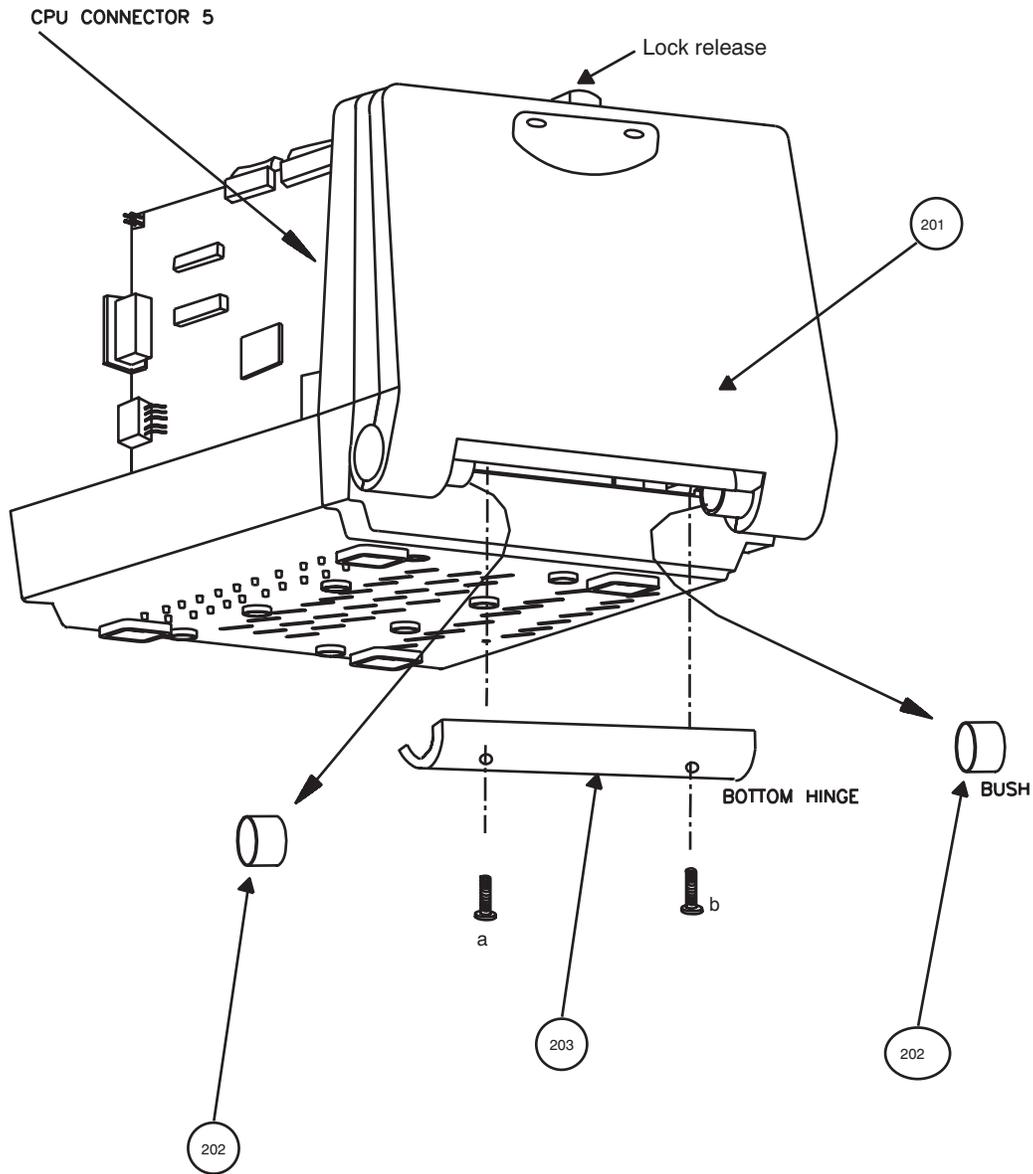


Figure 8-2 Detaching the Keyboard

## 8-3-2 Keyboard Disassembly/Assembly

Follow steps below and refer Figure 8-3 . For FRU Details refer 9-1-4

- 1.) Remove Top Cover. Refer 8-2.
- 2.) Detach the keyboard. Refer 8-3-1.
- 3.) Remove the spacer pad (refer FRU NO. 308 in the 8-7) 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 (man) and take out the trackball.
- 9.) Remove the TGC connector from the FEB (for LOGIQ™<sub>α</sub> 100/LOGIQ™ 100 PRO (V7 & above) )/TRCTL (For V5.06a & Below)
- 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 key sheet.

8-3-2 Keyboard Disassembly/Assembly (Cont'd.)

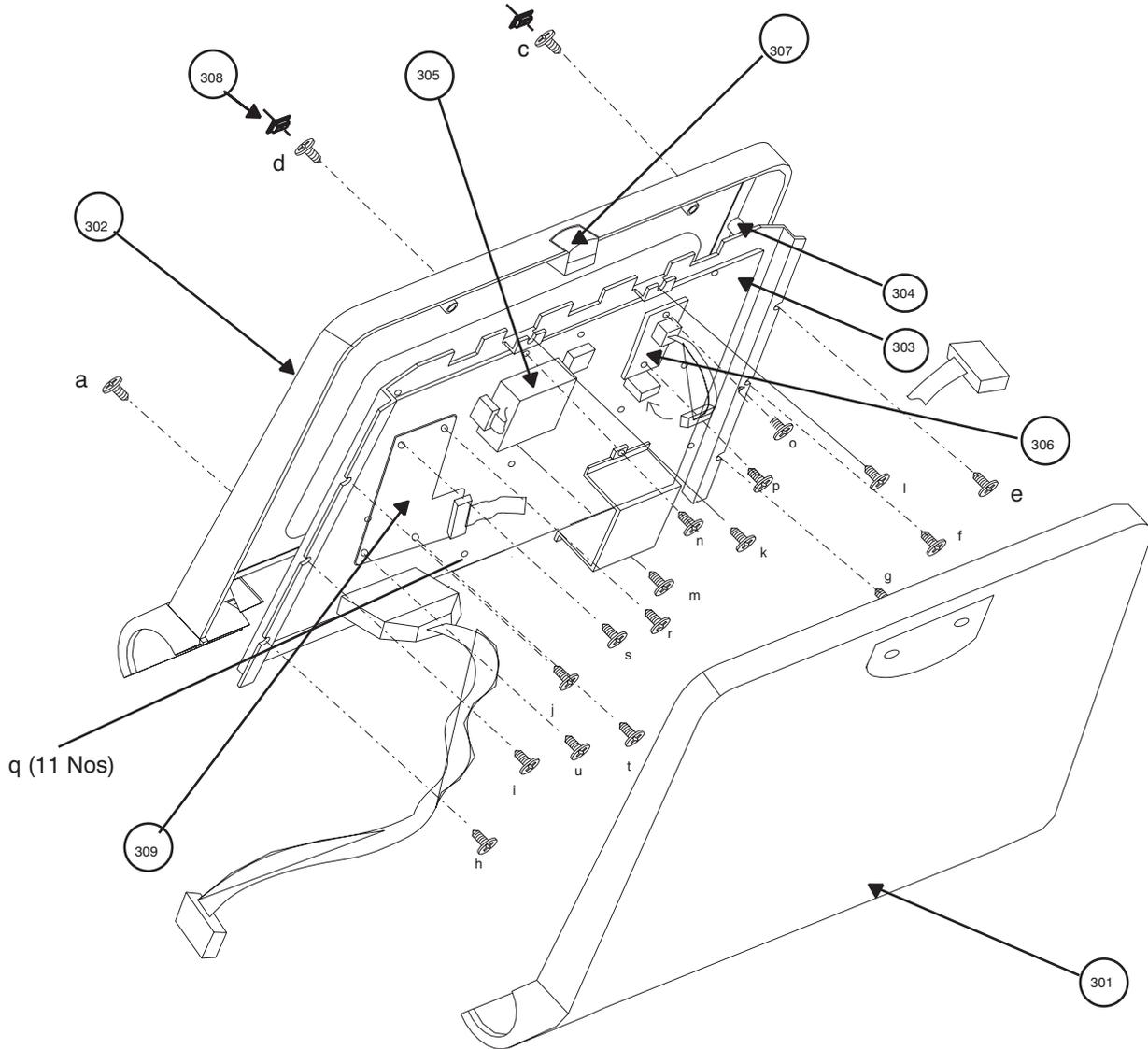


Figure 8-3 Keyboard Disassembly

### 8-3-2-1 Optical Trackball Assembly

Procedure for LOGIQ™α 100/LOGIQ™ 100 PRO V5.06a & above

- 1.) Assemble TB Base Pad 2230750 (x). Refer Figure 8-4
- 2.) Assemble Optical Trackball PCB Assembly 2224019 (y) refer Figure 8-4
- 3.) Ensure that Trackball alignment is OK on the Key sheet.
- 4.) Assemble Trackball bracket assembly 22244032 (z) refer Figure 8-4
- 5.) Fix screws a,b & c at the location A,B & C in keyboard base plate.
- 6.) Fix the FPC cable 2139504 (D) as shown in Figure 8-4
- 7.) For assembly the keyboard PCB follow the reverse order of Section 8-3-2.

Note:

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

- 8.) For initializing the Optical Trackball Select Alps Trackball from the Trackball Selection Menu in Service Diagnostics

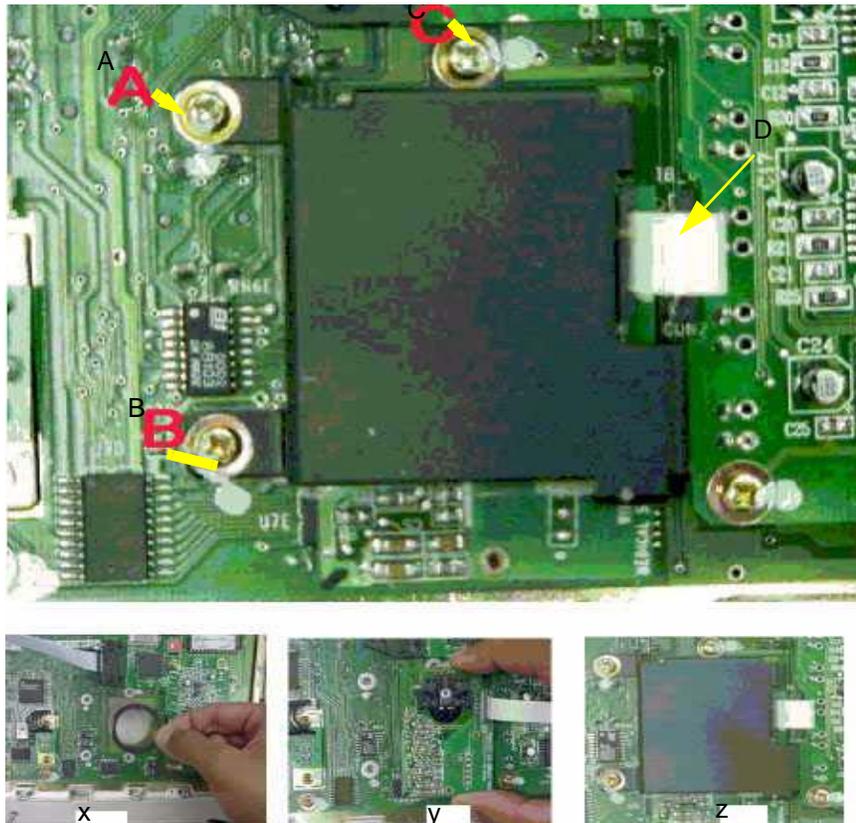


Figure 8-4 Optical Trackball Assembly

### 8-3-2-1 Optical Trackball Assembly (Cont'd)

Procedure for LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO V5.0 & below.

- 1.) Assemble TB Base Pad2 2222115. Refer Figure 8-5
- 2.) Assemble Optical Trackball PCB Assembly 2224019 refer Figure 8-5
- 3.) Ensure that Trackball alignment is OK on the Key sheet.
- 4.) Assemble Trackball bracket assembly 2224020 refer Figure 8-5
- 5.) Fix screws a,b & c at the location a, b & C in keyboard base plate.
- 6.) Fix the FPC cable 2139504 (C) as shown in Figure 8-5
- 7.) For assembly the keyboard PCB follow the reverse order of Section 8-3-2.

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

- 8.) For initializing the Optical Trackball Select Alps Trackball from the Trackball Selection Menu in Service Diagnostics

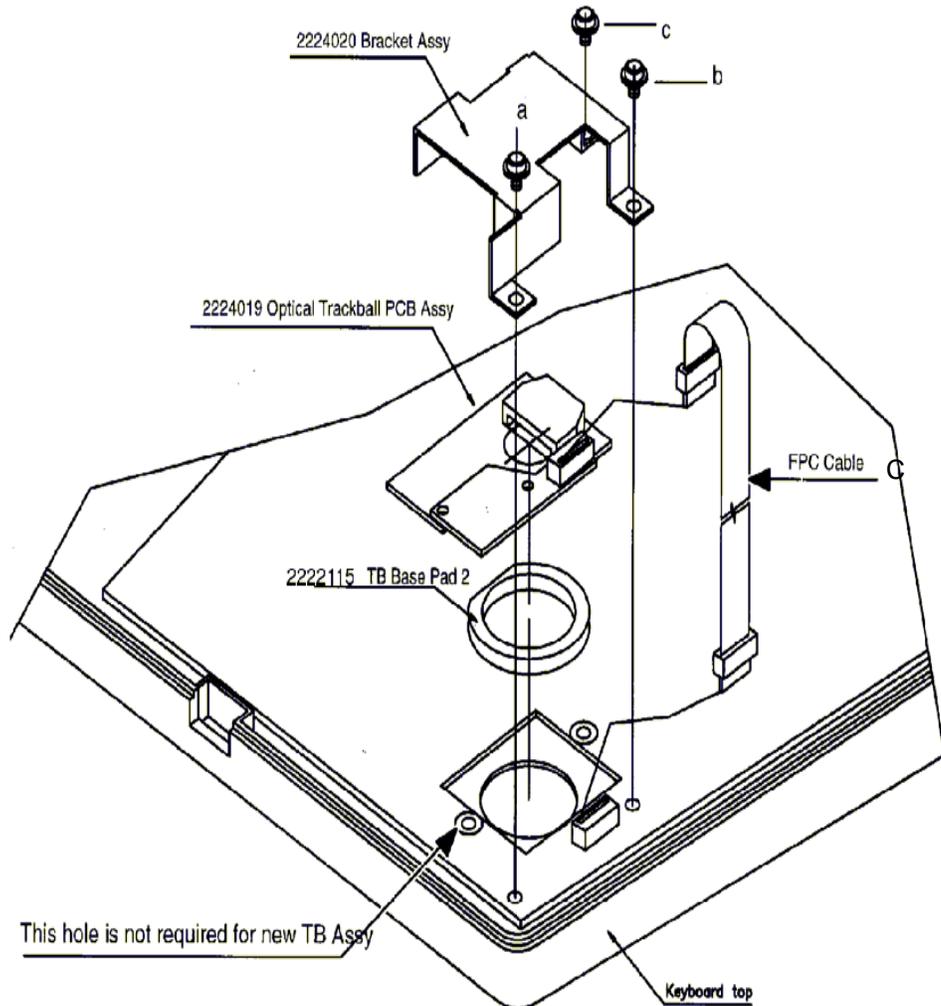


Figure 8-5 Optical Trackball Assembly for V 5.0& below

## Section 8-4 FRONT PANEL/MONITOR

### 8-4-1 Disassembly/Assembly of Front Panel

Follow steps below and refer Figure 8-6 For FRU Details refer 9-1-5

- 1.) Remove Top Cover. Refer 8-2
- 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 8-11)
- 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.

8-4-1 Disassembly/Assembly of Front Panel (Cont'd.)

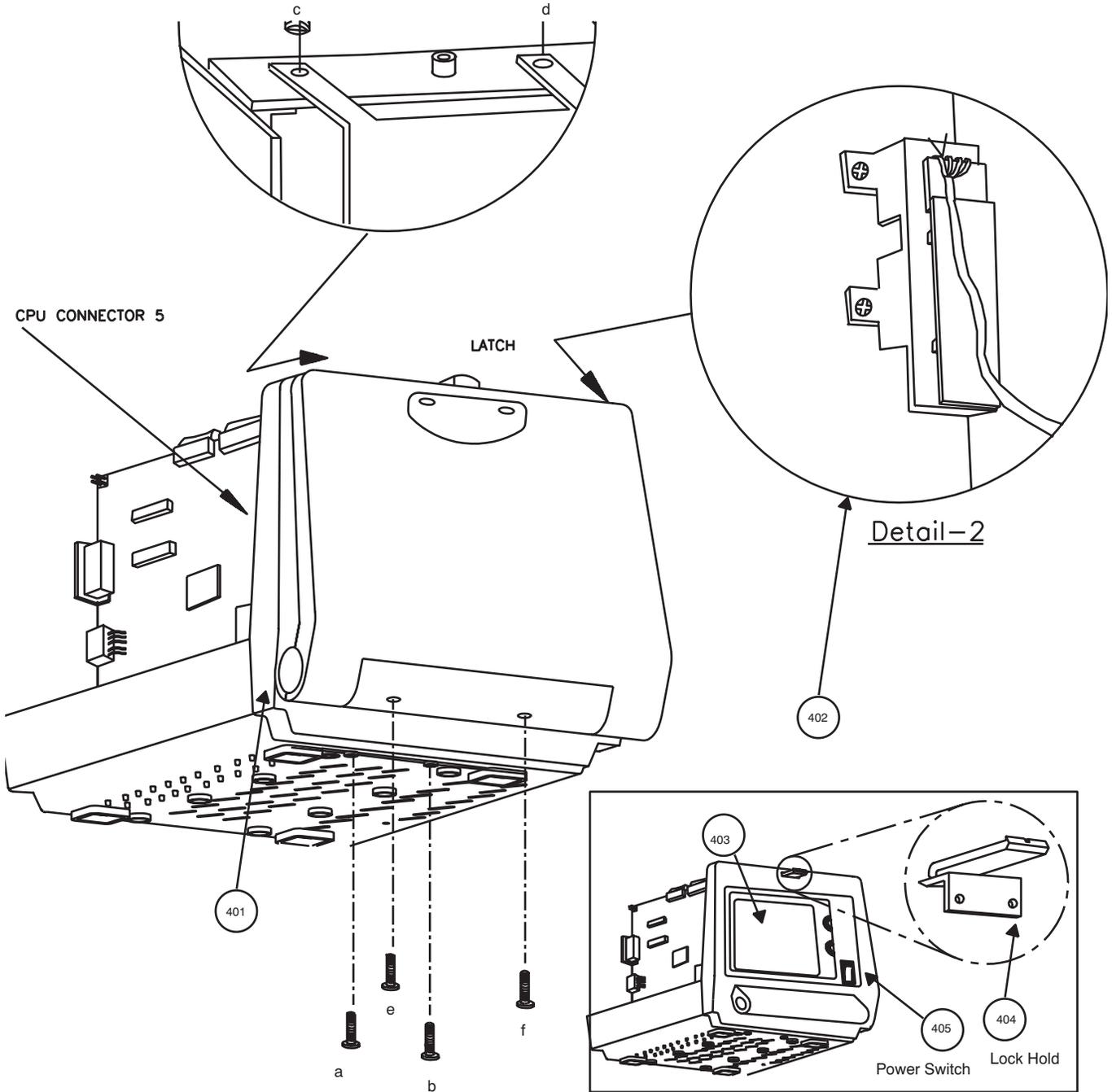


Figure 8-6 Assembly & Disassembly of Front Panel

## 8-4-2 Disassembly/Assembly of Monitor

Follow steps below and refer Figure 8-7. For FRU Details refer 9-1-6

- 1.) Remove Top Cover. Refer 8-2
- 2.) Remove Front Panel. Refer 8-4-1
- 3.) 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.*

*Note: If CRT fails replace along with PCB*

8-4-2 Disassembly/Assembly of Monitor(Cont'd)

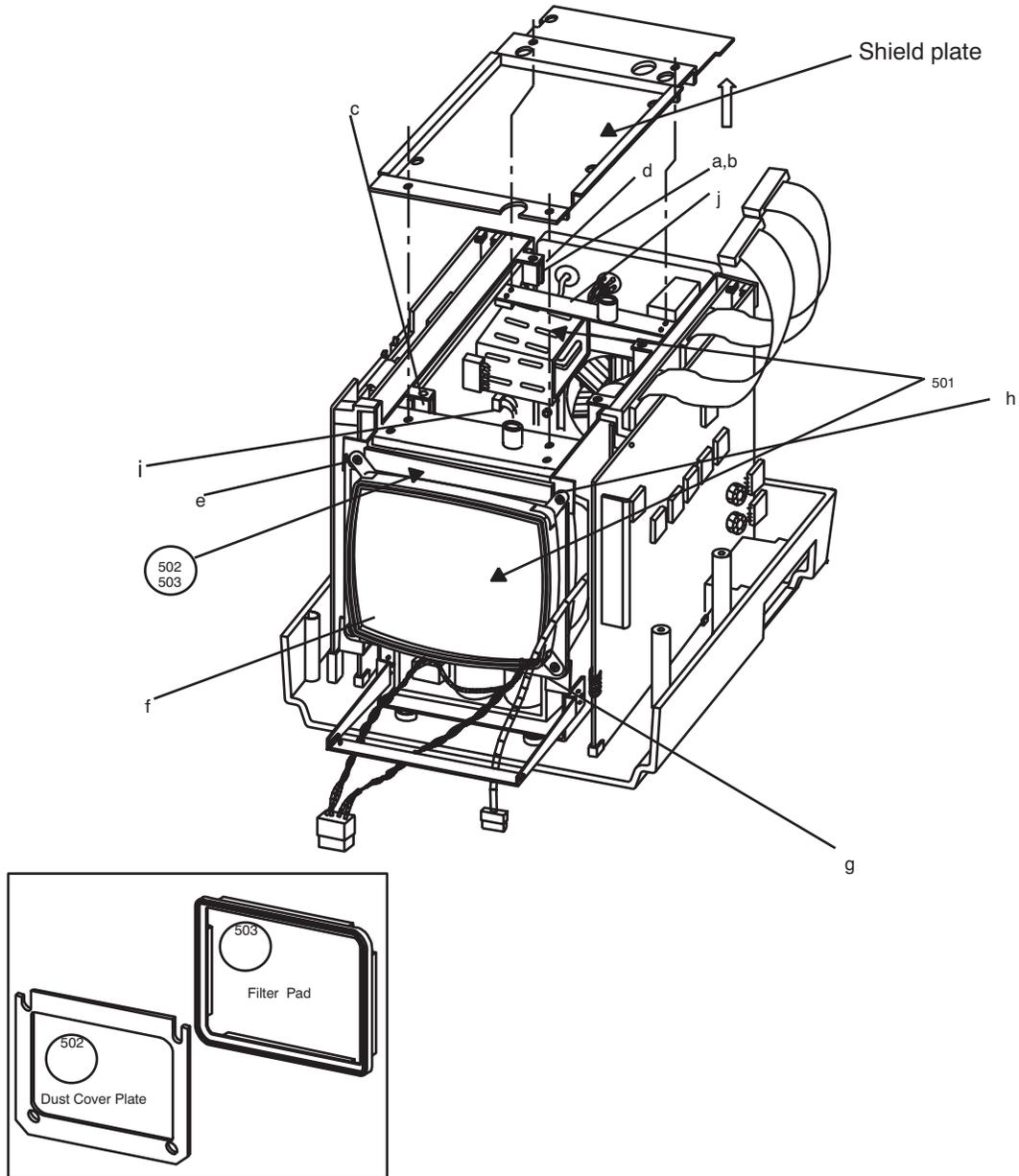


Figure 8-7 Disassembly/Assembly of Monitor

## Section 8-5PCBs

### 8-5-1 Disassembly/Assembly of DSC/CPU/FLASH

Follow steps below and refer

- 1.) Remove Top Cover. Refer 8-2. For FRU Details refer 9-1-7 to 9-1-9
- 2.) For disassembling both CPU and DSC Boards together, remove all communications and power cables from the CPU and DSC board.
- 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, l 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 8-10 (V4.0) 8-11 (V5.0 & above) 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 8-12 for more details*

- 6.) 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 then pull the CPU pcb upward.
- 7.) Flash Board is fixed at the Solder Side of the CPU. Refer 8-9 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.

8-5-1 Disassembly/Assembly of DSC/CPU/FLASH (Cont'd.)

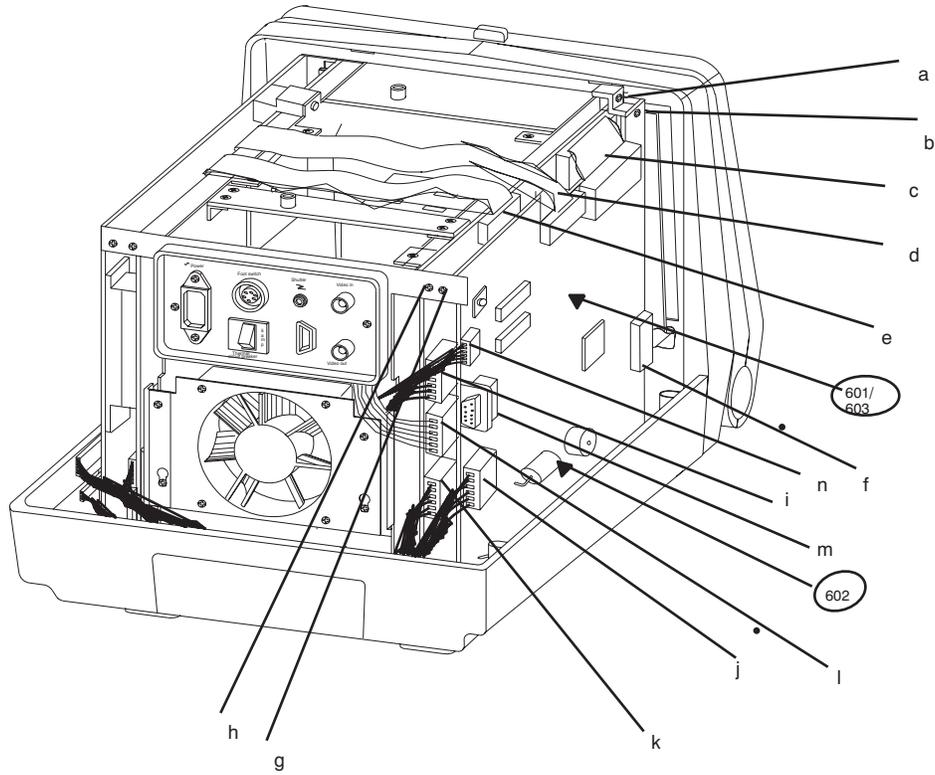


Figure 8-8 Disassembly/Assembly of CPU, DSC & Flash PCB's

### 8-5-1 Disassembly/Assembly of DSC/CPU/FLASH (Cont'd.)

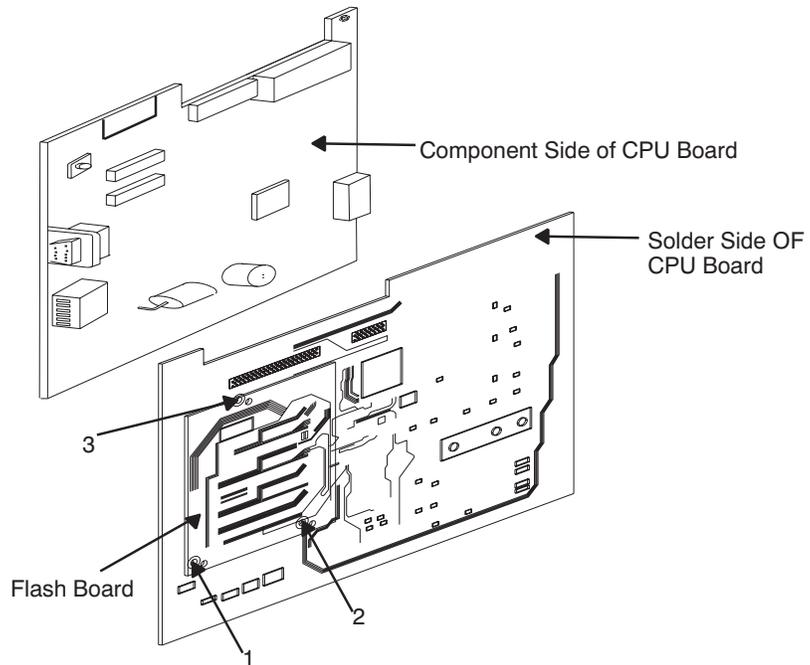


Figure 8-9 Flash Board Disassembly

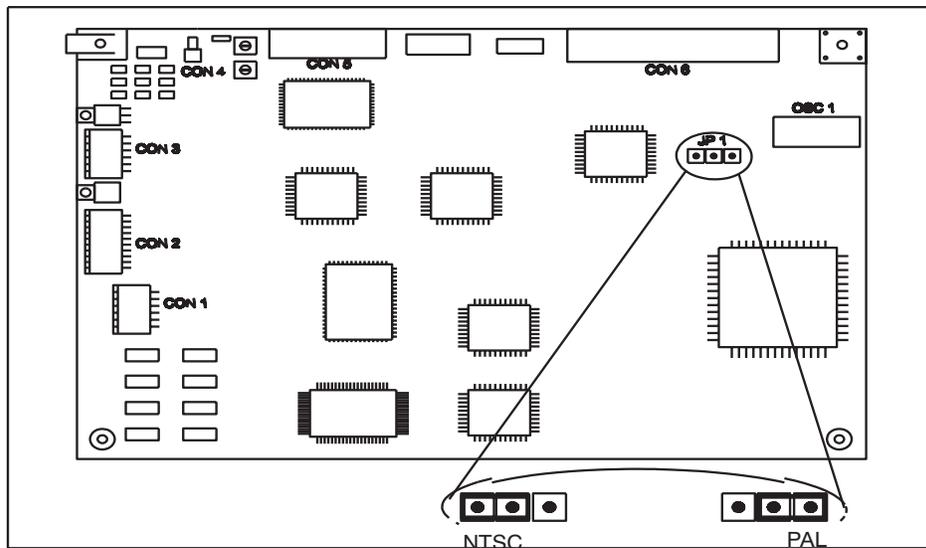


Figure 8-10 DSC Jumper setting for PAL/NTSC - V4.0 & below

8-5-1 Disassembly/Assembly of DSC/CPU/FLASH (Cont'd.)

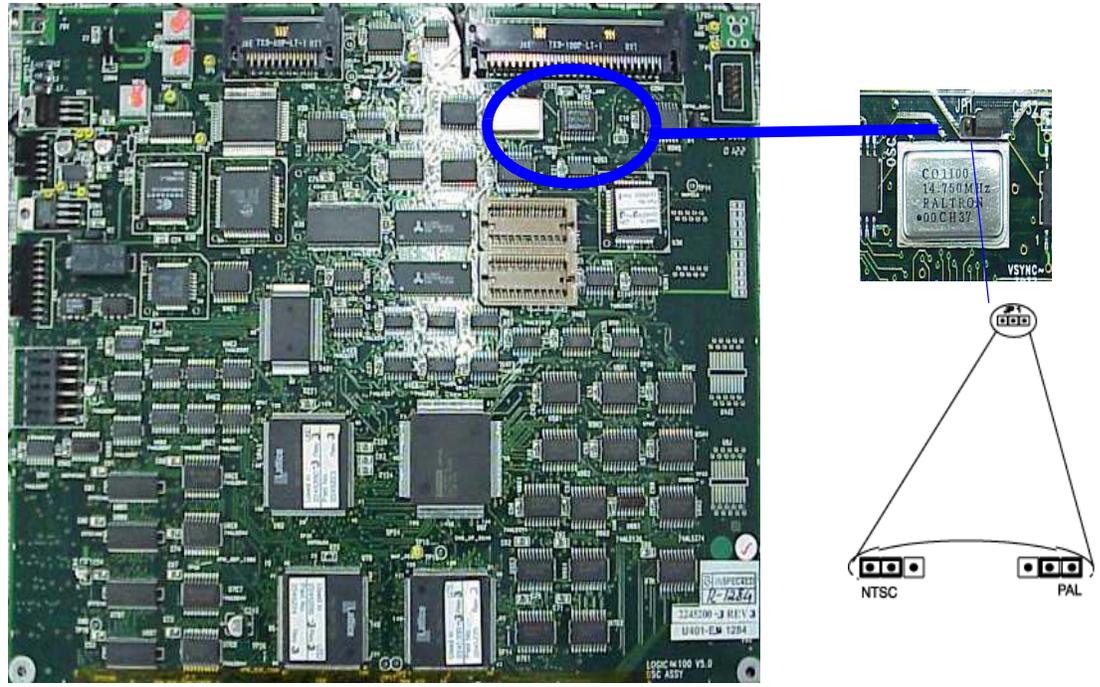


Figure 8-11 DSC Jumper setting for PAL/NTSC - V5.0 & above.

Note: 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. For more details refer section 5-3-2-2

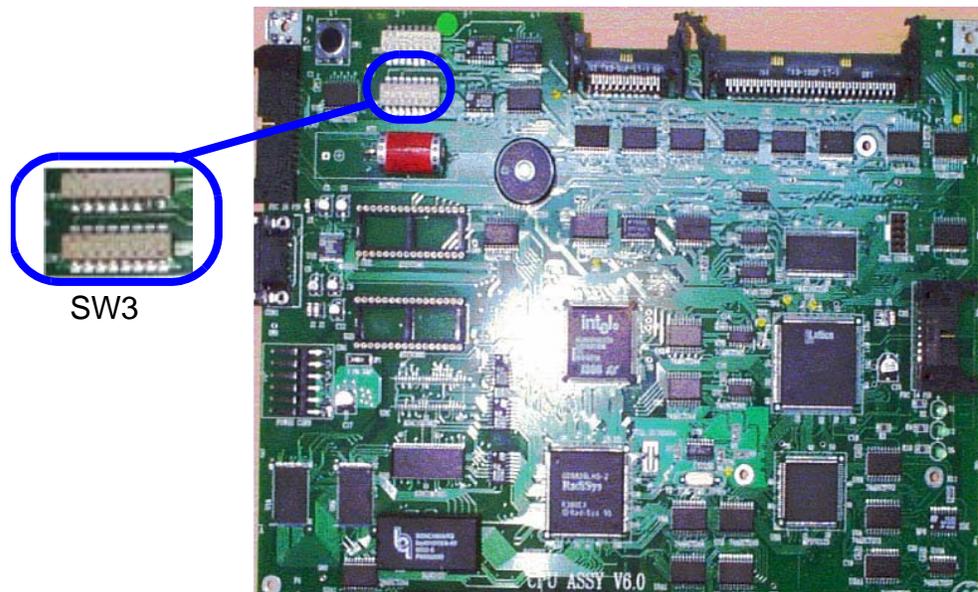


Figure 8-12 CPU Dip Switch Setting for NTSC & PAL for V5.06a & above

## 8-5-2 Disassembly/Assembly of TRCTL/TRBD for LOGIQ™ $\alpha$ 100 MP & Below.

Follow steps and refer

- 1.) Remove Top Cover. Refer 8-2. For FRU Details refer 9-1-10
- 2.) Remove two screws (e,f) fixing the TRCTL & TRBD PCB to the Rear panel bracket.
- 3.) Remove four screws (A,B,C,D) from the probe connector.
- 4.) Remove one screw (h) fixing TRCTL/TRBD 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 (not shown in the Figure) 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 TRCTL & TRBD together and pull upward.
- 9.) Separate the boards carefully by removing three screws holding the PCB's together, detaching the 96 pin euro connector & removing Co-axial interface cable between the two PCB's.
- 10.) For assembly follow the reverse order.

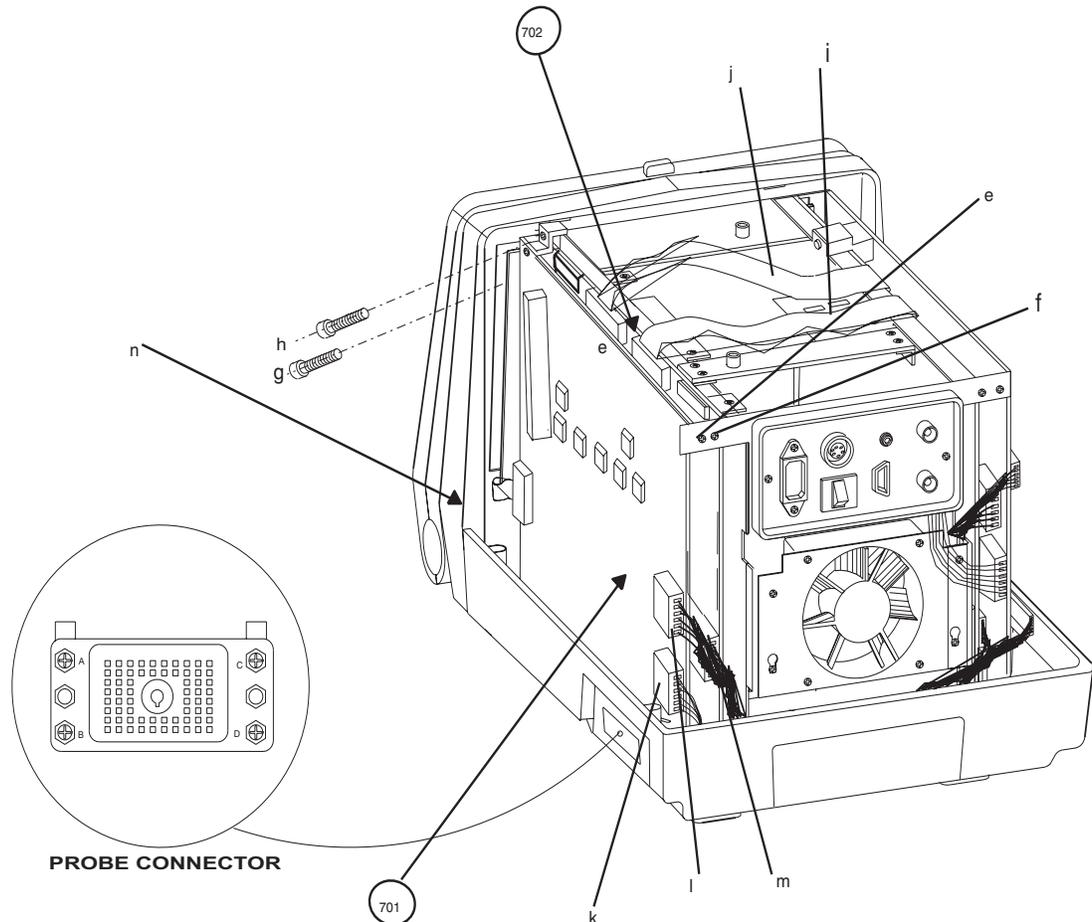


Figure 8-13 Disassembly/Assembly of TRBD/TRCTL

### 8-5-3 Disassembly/Assembly of FEB for LOGIQ™a 100/LOGIQ™ 100 PRO

Follow steps and refer

- 1.) Remove Top Cover. Refer 8-2. For FRU Details refer 9-1-10
- 2.) Remove screw (e) fixing the FEB PCB to the Rear panel bracket.
- 3.) Remove four screws (a,b,c,d) from the probe connector.
- 4.) Remove one screw (f) fixing FEB to the chassis in the front.
- 5.) Disconnect the 40 pin cables (i) interfacing FEB to DSC.
- 6.) Remove cables (j,l) on the rear of the system.
- 7.) Remove the TGC cable (k).
- 8.) Hold FEB and pull upward.
- 9.) For assembly follow the reverse order.

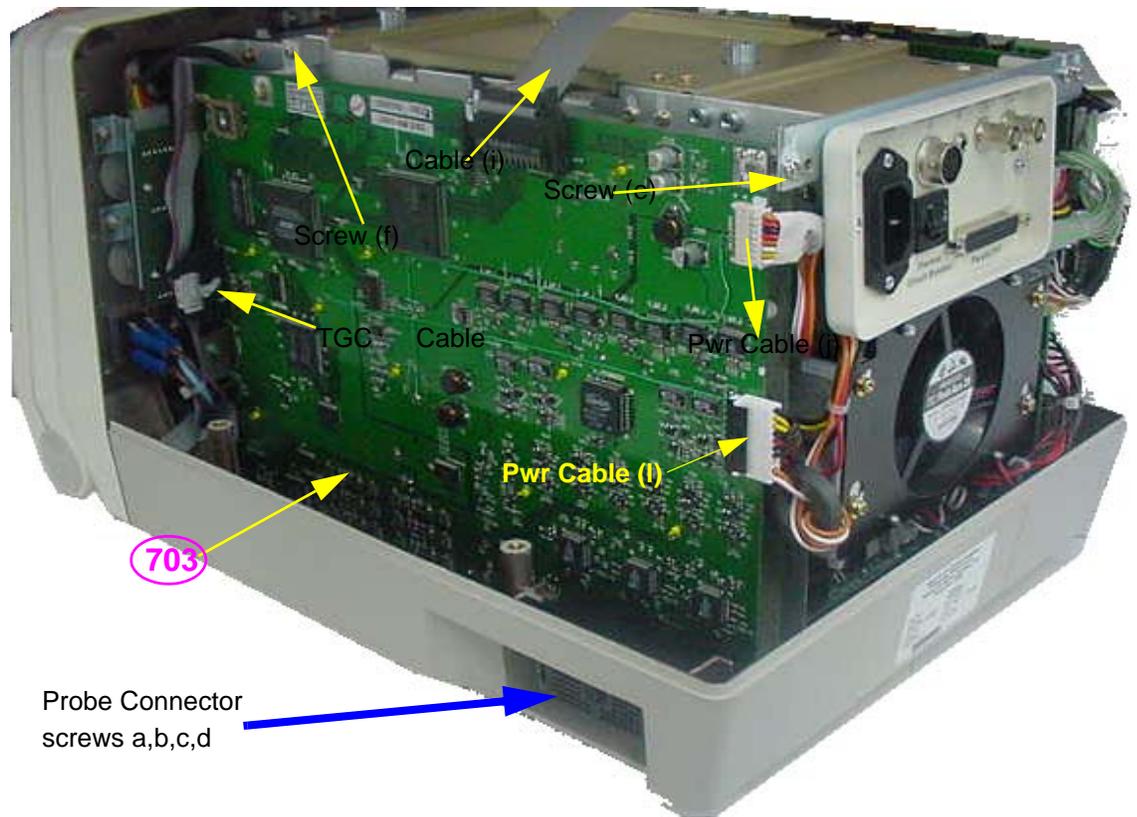


Figure 8-14 Disassembly/Assembly of FEB

## Section 8-6 Fan Assembly

### 8-6-1 Disassembly/Assembly of Fan

Follow steps below and refer Figure 8-15. For FRU Details refer 9-1-12

- 1.) Remove Top Cover. Refer 8-2.
- 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.

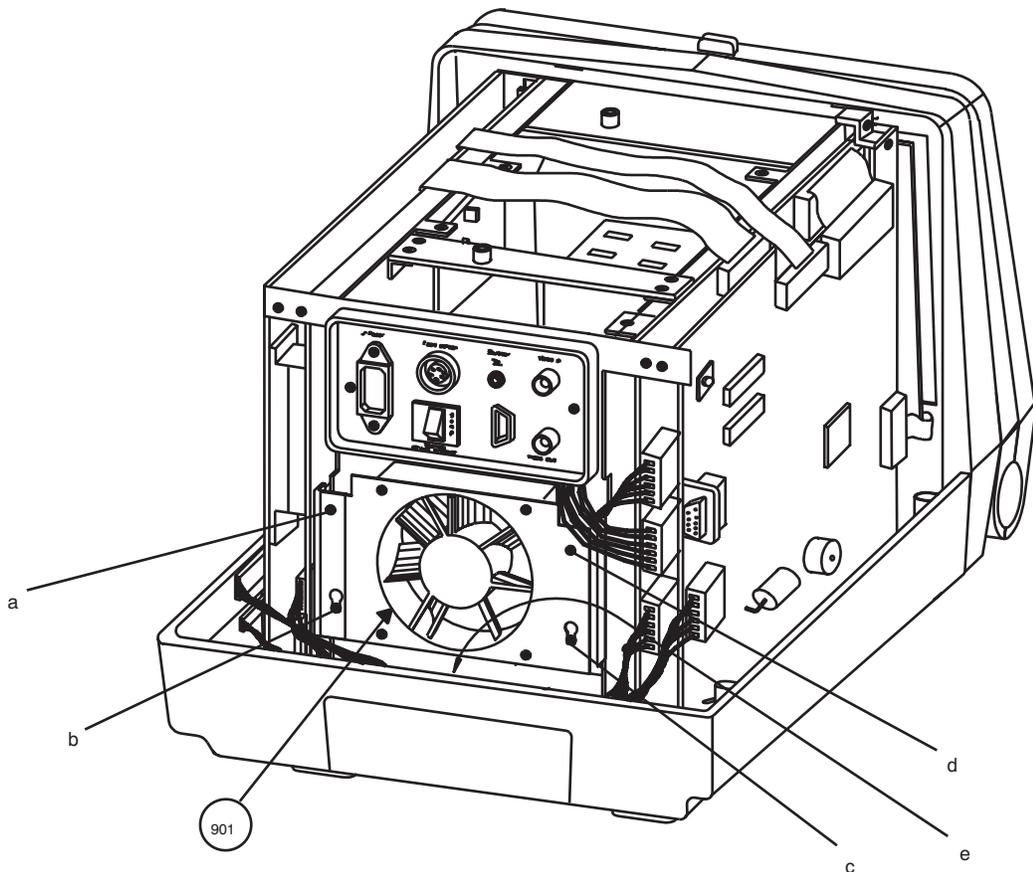


Figure 8-15 Disassembly/Assembly of Fan

## Section 8-7 Power Supply/Distributor PCB

### 8-7-1 Disassembly/Assembly of Power Supply/Distributor PCB

Follow steps below and refer 8-16

- 1.) Remove Top Cover. Refer 8-2. For FRU Details refer 9-1-11
- 2.) Remove Front Panel. Refer 8-4-1
- 3.) Remove dust filter (m).
- 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.
- 6.) Remove the fan. Refer 8-6-1.
- 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 (j,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. (not shown in figure)
- 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.

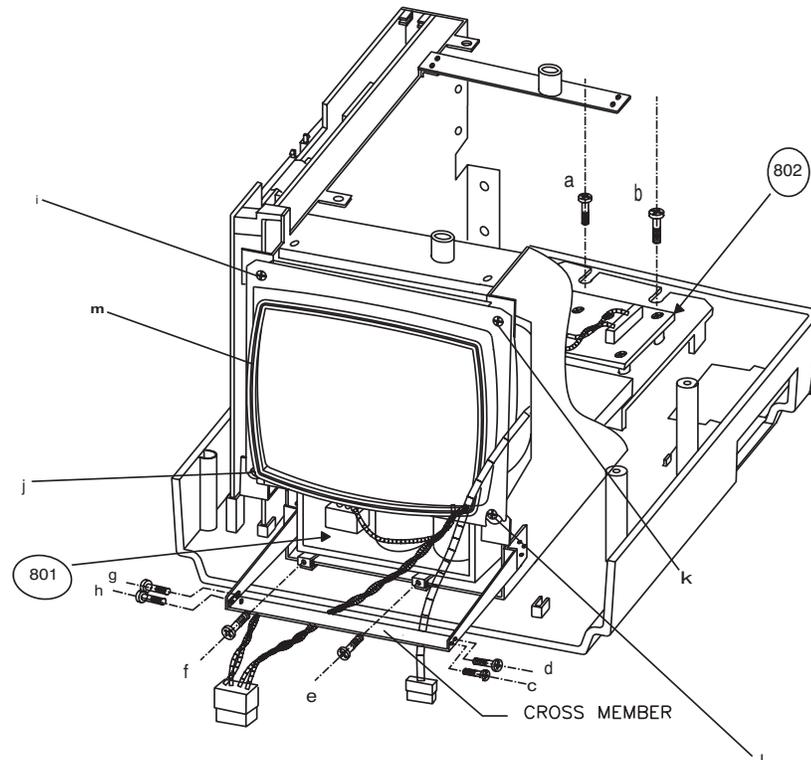


Figure 8-16 Disassembly/Assembly of Power Supply/Distributor PCB

## Section 8-8Rear Panel

### 8-8-1 Disassembly/Assembly of Rear Panel

Follow steps below and refer 8-17

- 1.) Remove Top Cover. Refer 8-2. For FRU Details refer 9-1-13
- 2.) Remove Noise filter by removing screws (c,d) then disconnect the power cables from the noise filter.
- 3.) Remove 2 screws (a,b) from the rear panel.
- 4.) Remove the connectors from the DSC, CPU board and CRT PCB.
- 5.) Remove the connections to the circuit breaker.
- 6.) Remove the rear panel from the chassis.
- 7.) For assembly follow the reverse order.

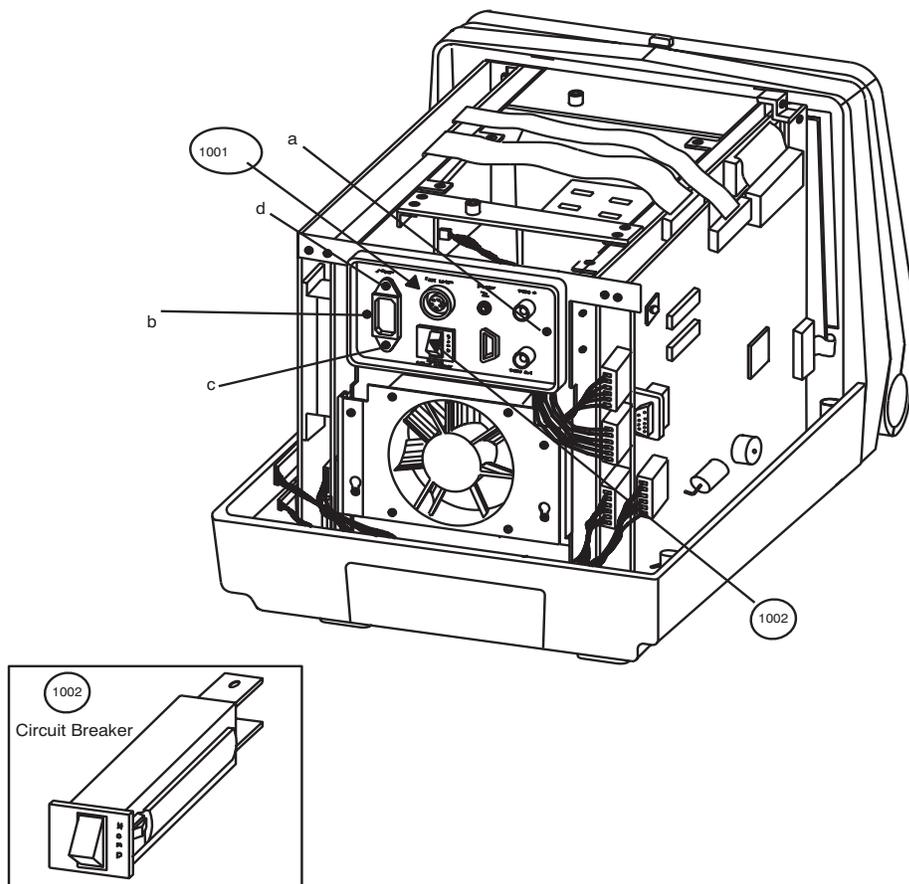


Figure 8-17 Disassembly/Assembly of Rear Panel

## Section 8-9HV Assembly

### 8-9-1 Disassembly/Assembly of HV Assembly

Follow steps below and refer 8-18

- 1.) Remove Top Cover. Refer.8-2. For FRU Details refer 9-1-14
- 2.) Remove the Shield Plate.
- 3.) Remove all cables (a, b) 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.

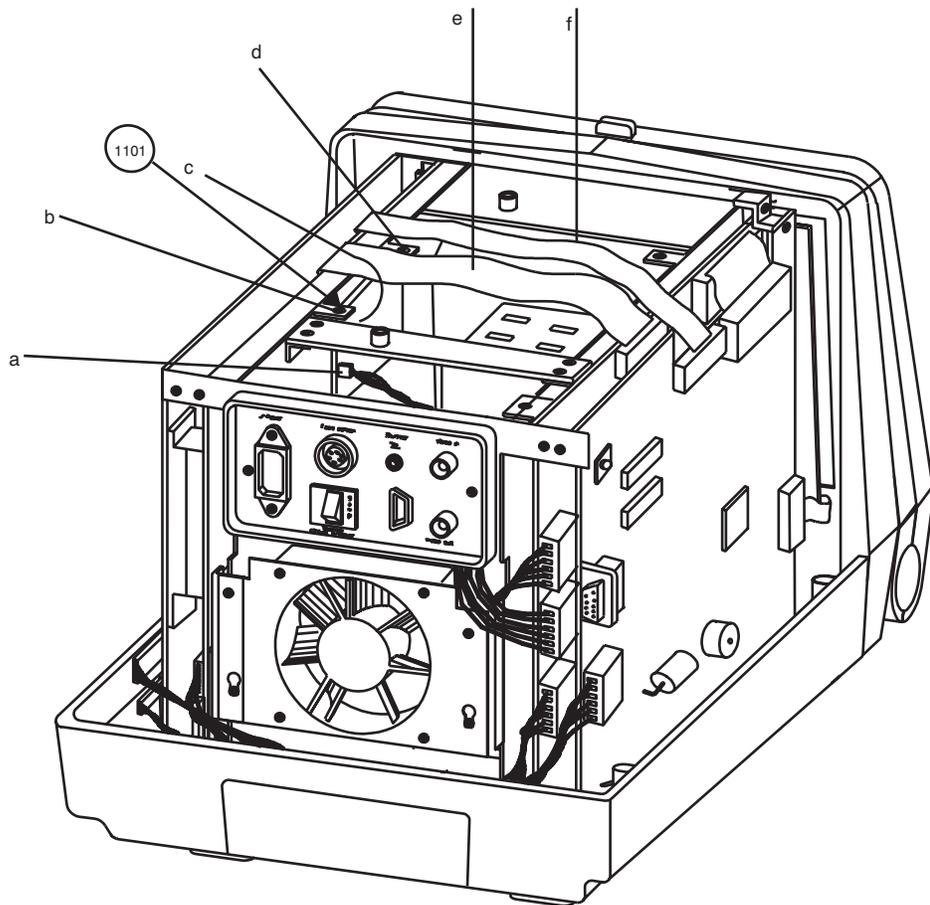


Figure 8-18 Disassembly/Assembly of HV Assembly

## Section 8-10 Chassis

### 8-10-1 Disassembly/Assembly of Chassis.

Follow steps below and refer 8-19

1. Remove Top Cover. Refer 8-2. For FRU Details refer 9-1-15
2. Remove Front Panel. Refer 8-4-1
3. Remove Monitor Assembly. Refer 8-4-2
4. Remove PCBs. Refer 8-5
5. Remove the fan. Refer 8-6.
6. Remove the rear panel. Refer 8-8
7. Remove Power Supply. Refer 8-7-1
8. Remove HV Power Supply. Refer 8-9
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.

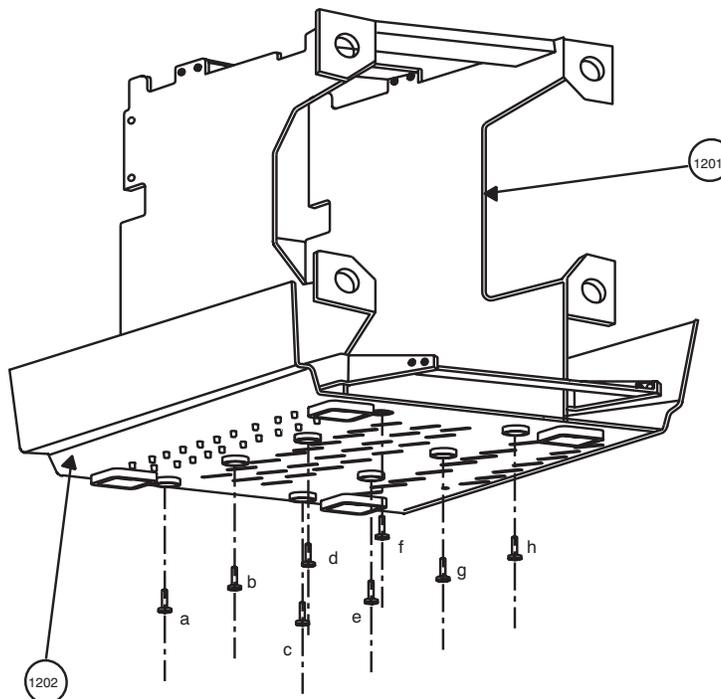


Figure 8-19 Disassembly/Assembly of Chassis

# Chapter 9 Replacement Parts

## Section 9-1 Overview

### 9-1-1 Purpose of Chapter 9

This chapter gives you an overview of Spare Parts for LOGIQ™α 100/LOGIQ™ 100 PRO.

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**Table 9-1 Contents in chapter 9**

**MATERIAL LIST - LOGIQ™α 100 (VER3.3A & BELOW)**

Part Name	Part No.	QTY.							Description
Operator Console Assembly	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	6	6	6	6	6	6		
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, CANADA, BRAZIL, TAIWAN									
H41012LD CHILE, KOREA									
H41012LE EUROPE									
H41012LF JAPAN									

**MATERIAL LIST - LOGIQ™α 100 (VER4.0)**

Part Name	Part No.	QTY.										Description
Operator Console Assembly	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	6	6	6	6	6	6					
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				
E72 Probe Holder (Option)	2184039	1	1	1	1	1	1	1				
Foot Switch (Option)	2152089	1	1	1	1	1	1	1				H41062A
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
9 to 25 Pin Converter Cable (Option)	2215679	1	1	1	1	1	1	1				
H41112LA	INDIA											
H41112LB	CHINA, ANZ, SE-ASIA, MEXICO											
H41112LC	US OF A, CANADA, BRAZIL, TAIWAN											
H41112LD	CHILE, KOREA											
H41112LE	EUROPE											
H41112LF	JAPAN											

**MATERIAL LIST - LOGIQ™α 100 MP (VER 5.0)**

Part Name	Part No.	QTY.								Description
Operator Console Assembly	2215602	1								220-240VAC, 50/60Hz, PAL, GEMS-A, V5.0.
	2215669		1							220-240VAC, 50/60Hz, PAL, GEMS-A/AM, V5.0.
	2215670			1						100-115VAC, 50/60Hz, NTSC, GEMS-A/AM, V5.0.
	2215671				1					220-240VAC, 50/60Hz, NTSC, GEMS-A/AM, V5.0.
	2215672					1				220-240VAC, 50/60Hz, PAL, GEMS-E, V5.0
	2215673						1			100-115VAC, 50/60Hz, NTSC, GEMS-A, V5.0.
	2272413							1		100-115VAC, 50/60Hz, NTSC, GEMS-A/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	6	6	6	6	6	6	6		
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		
Foot Switch (Option)	2152089	1	1	1	1	1	1	1		H41062A
PC Image Transfer Software	2249732	1	1	1	1	1	1	-		
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
9 to 25 Pin Converter Cable (Option)	2215679	1	1	1	1	1	1	1		
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	2246911	1	1	1	1	1	1	1		H41182LA (Option)
HP Laser jet Printers (Option)	-	1	1	1	1	1	1	1		HP Laser jet with any standard Parallel Printer cable
HP 4, 4M, 5, 5M, 6L Gold with 2 MB RAM, 2200, 2200D, 2200DN, 2200DSE and 2200DTN										
LOGIQ 200 Probe Adapter (Option)	2246444	1	1	1	1	1	1	1		H41192LA
PC Image Transfer Cable	2249732	1	1	1	1	1	1	-		
H41162LA	INDIA									
H41162LB	CHINA, ANZ, SE-ASIA, MEXICO									
H41162LC	US OF A, CANADA, BRAZIL, TAIWAN									
H41162LD	CHILE, KOREA									
H41162LE	EUROPE									
H41162LF	JAPAN									
										H41162LG US of A, CANADA, BRAZIL

**MATERIAL LIST - LOGIQ™ 100 PRO (VER 7.0)**

Part Name	Part No.	QTY.								Description
Operator Console Assembly	2302111	1								220-240VAC, 50/60Hz, PAL, GEMS-A, V7.0.
	2306690		1							220-240VAC, 50/60Hz, PAL, GEMS-A/AM, V7.0.
	2306691			1						100-115VAC, 50/60Hz, NTSC, GEMS-A/AM, V7.0.
	2306692				1					220-240VAC, 50/60Hz, NTSC, GEMS-A/AM, V7.0.
	2306693					1				220-240VAC, 50/60Hz, PAL, GEMS-E, V7.0
	2306695						1			100-115VAC, 50/60Hz, NTSC, GEMS-A, V7.0.
	2306694							1		100-115VAC, 50/60Hz, NTSC, GEMS-AM, V7.0.
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	6	6	6	6	6	6			
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		
Foot Switch (Option)	2152089	1	1	1	1	1	1	1		H41062A
PC Image Transfer Software PAL	2300243	1	1	-	-	1	-	-		
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
9 to 25 Pin Converter Cable (Option)	2215679	1	1	1	1	1	1	1		
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	2246911	1	1	1	1	1	1	1		H41182LA (Option)
HP Laser jet Printers (Option)	-	1	1	1	1	1	1	1		HP Laser jet with any standard Parallel Printer cable.
HP 4, 4M, 5, 5M, 6L Gold with 2MB RAM, 2200, 2200D, 2200DN, 2200DTN										
LOGIQ 200 Probe Adapter (Option)	2246444	1	1	1	1	1	1	1		H41192LA
PC Image Transfer Software NTSC	2323338			1	1			1	1	
H41282LA	INDIA									
H41282LB	CHINA, ANZ, SE-ASIA, MEXICO									
H41282LC	CANADA, TAIWAN									
H41282LD	CHILE, KOREA									
H41282LE	EUROPE									
H41282LF	JAPAN									
										H41282LG US of A, BRAZIL

9-1-2 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, 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.

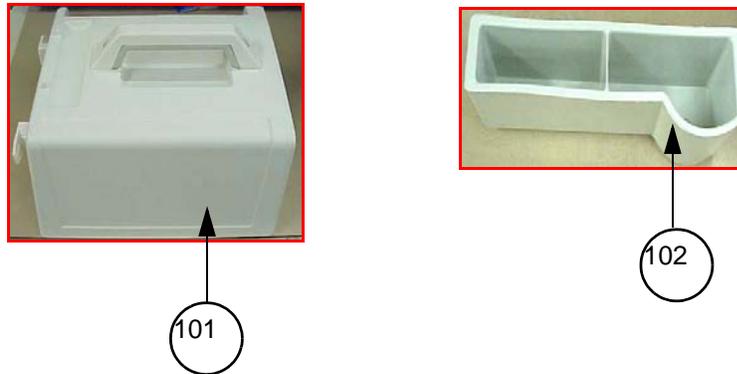


Figure 9-1 Top Cover

Table 9-1 Top Cover

Item	Part Name	Part No.	Description	Qty	FRU
101	Top Cover Assembly	2139794-2		1	2
102	Probe Holder	2139720		1	2

9-1-3 MATERIAL LIST - KEYBOARD

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 22724132302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.

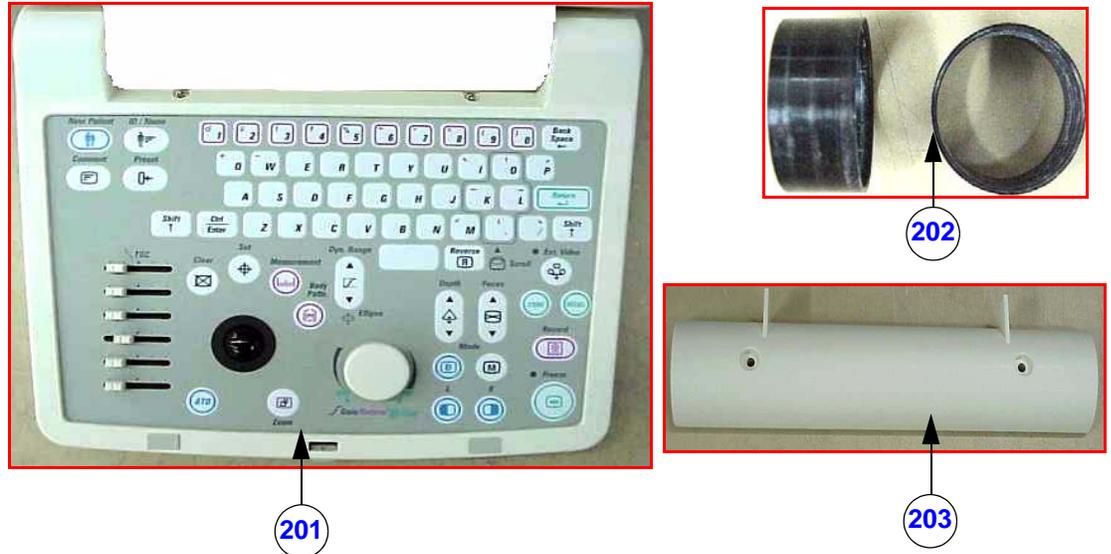


Figure 9-2 Keyboard

Table 9-2 Keyboard

Item	Part Name	Part No.	Description	Qty	FRU
<b>201</b>	Keyboard Assembly	2291098	For V4.0 & below (With Optical Trackball)	1	2
		2245193	For V5.0 & above (With Optical Trackball)	1	2
		5132892	For V7.0 (LOGIQ™ 100 PRO)	1	2
		5131077	For V9.x.x or Above	1	1
<b>202</b>	Bush	2139702	Two plastic bushes of key board	2	2
<b>203</b>	Bottom Hinge	2323805		1	2

9-1-4 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 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.

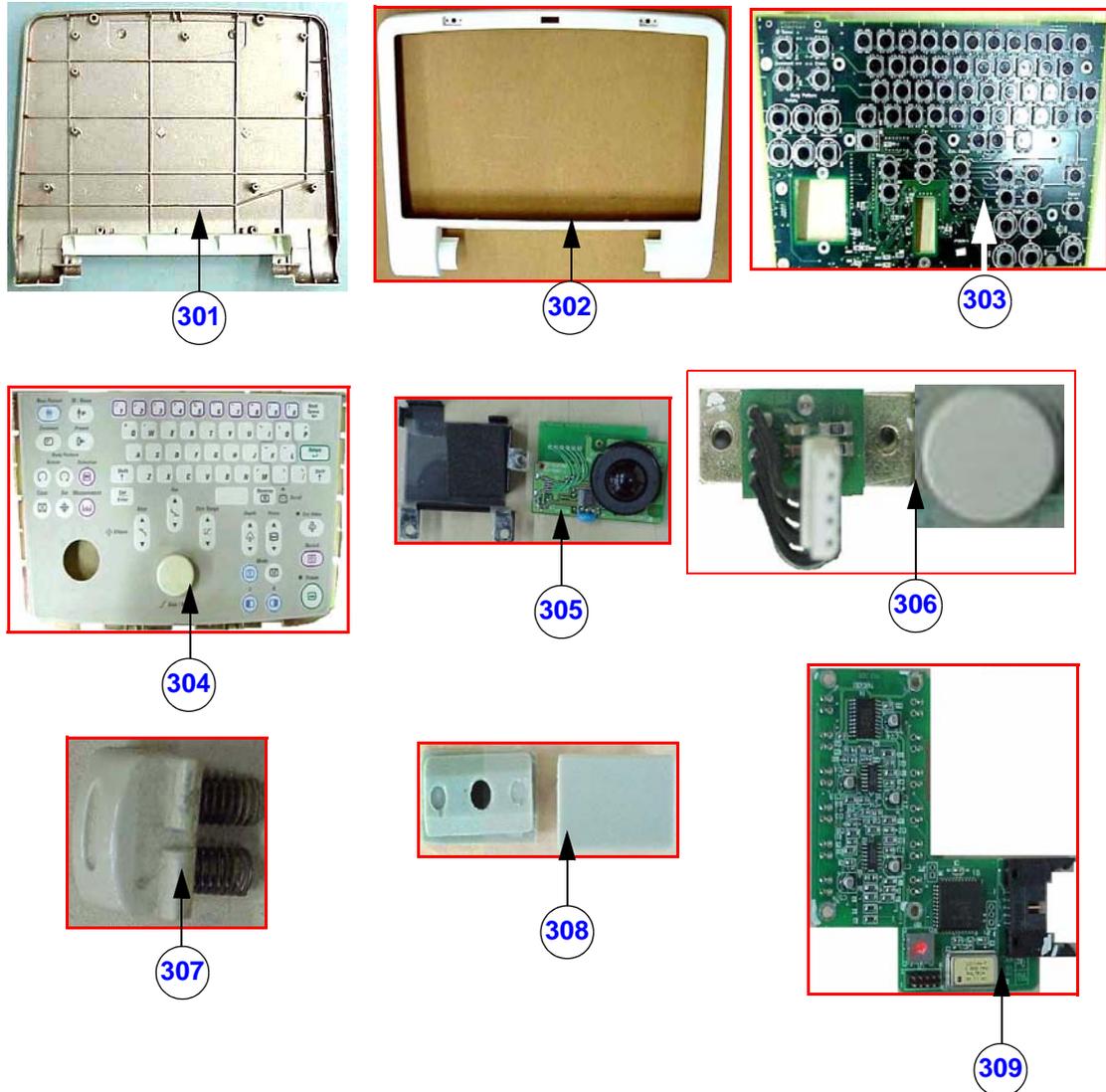


Figure 9-3 Keyboard Assy

**Table 9-3 Keyboard Assembly**

Item	Part Name	Part No.	Description	Qty	FRU
301	Keyboard Bottom	2337063	For V4.0 & below (LOGIQ™ $\alpha$ 100)	1	2
		2315681	For V5.0x Systems (LOGIQ™ $\alpha$ 100 MP)	1	2
		2139701-2	For V7.0x Systems (LOGIQ™ 100 PRO)	1	2
302	Keyboard Top	2139699		1	2
303	Keyboard PCB	2139784	For V4.0 & below	1	1
		2245195	For V5.0	1	1
		5131077	For V7.0 (LOGIQ™ 100 PRO)	1	1
304	Keysheet With Base Plate	2152580	For V4.0 & below	1	2
		2247236	For V5.0	1	2
		5135264	For V7.0 (LOGIQ™ 100 PRO)	1	2
305	Trackball Assembly	5133534	Includes bracket, screws, FPC cable & instruction. For V5.0 & above (Optical Trackball)	1	2
		2224146-2	Includes bracket, screws, FPC cable & instruction For V4.0 & below (Optical Trackball)	1	2
306	Gain Knob + Encoder	2139703	Not seen in Figure 8-3 of chapter 8	1	2
307	Lock Release with Spring (2 Nos.)	2139697	Keyboard and front panel latch	1	2
308	Spacer Pad	2139704		1	2
309	TGC Assembly	2245203	Only for V5.0 & above systems	1	1

9-1-5 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 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.

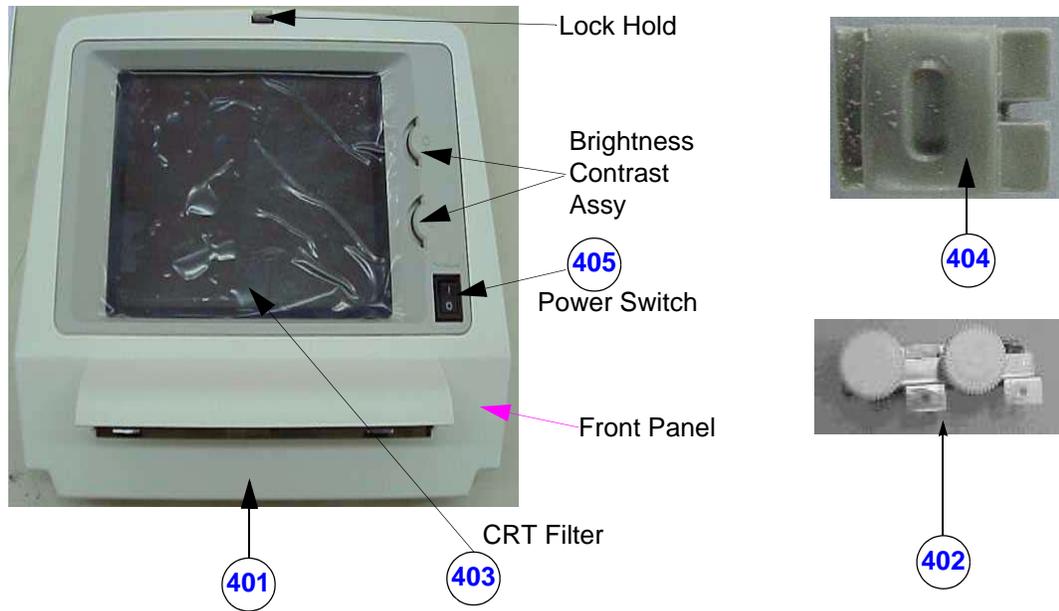


Figure 9-4 Front Panel

Table 9-4 Front Panel

Item	Part Name	Part No.	Description	Qty	FRU
401	Front Panel Assembly (Lock Hold, Power Switch, CRT Filter)	2139792	For V4.0 & below (LOGIQ™ $\alpha$ 100)	1	1
		2337066	For V5.0 (LOGIQ™ $\alpha$ 100 MP)	1	1
		2337067	For V7.x.x, V9.x.x or above (LOGIQ™ 100 PRO)	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

9-1-6 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 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.

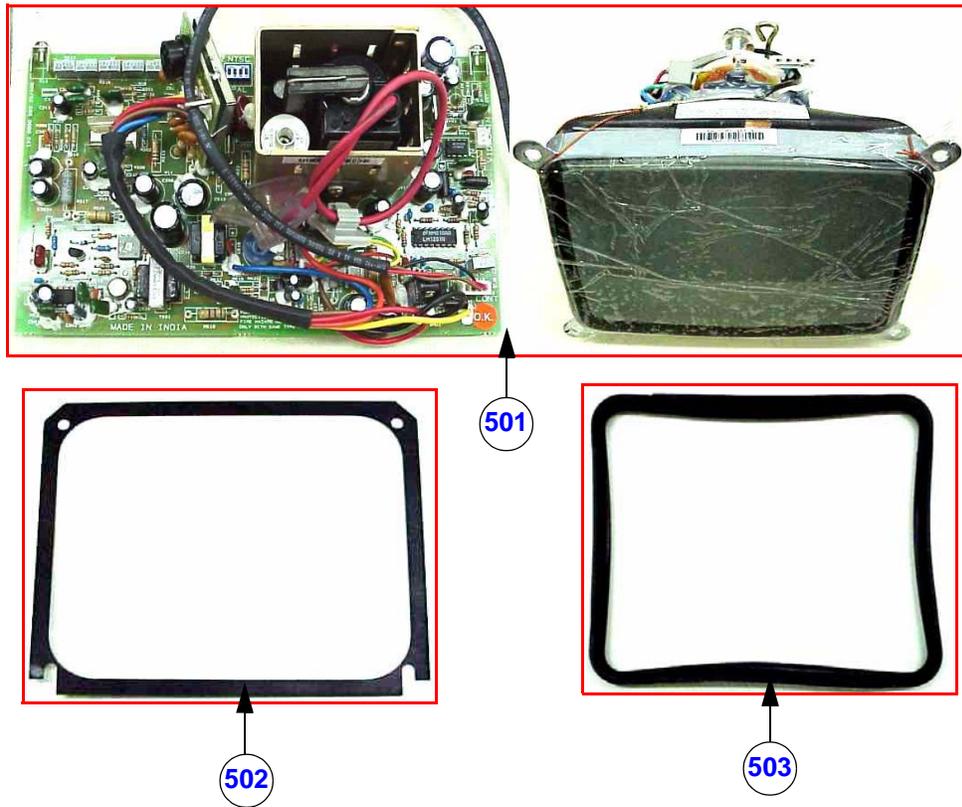


Figure 9-5 Monitor

Table 9-5 Monitor

Item	Part Name	Part No.	Description	Qty	FRU
501	Monitor Assembly (CRT+PCB) with Cable Assy 15 - PAL/NTSC	2139789-2		1	1
502	Dust Cover Plate	2150693		1	2
503	Filter Pad	2139708		1	2

9-1-7 MATERIAL LIST - CPU

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413, 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.



Figure 9-6 CPU

Table 9-6 CPU

Item	Part Name	Part No.	Description	Qty	FRU
601	CPU Assy (PAL/NTSC)	2290792	For Console with S/W Ver 3.1 to 3.3D	1	1
		2290619	For Console with S/W Ver 4.0	1	1
		2290037	For Console with S/W Ver 5.0 to 5.06a (LOGIQ™ $\alpha$ 100 MP)	1	1
		2300745-10	For Console with S/W Ver 7.0 (LOGIQ™ 100 PRO)	1	1
		5131073-3	For S/W Ver 9.X.X (LOGIQ™ 100 PRO)	1	1
602	Lithium Battery - 3.6V	2139521	For All Console Assy	1	1

- 1.) CPU is common for PAL & NTSC, Only dip switch setting has to be changed for the required type. Refer
- 2.) While Replacing CPU 2290792, Replace TRCTL EPROM with the supplied EPROM's (2144567--9) & (2144566--9) of 2139787--14 at location U23 & U32 respectively. Refer for details
- 3.) While Replacing CPU 2290792, Replace the User Manual with V4.0 A User Manual

9-1-8 MATERIAL LIST - FLASH

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.



Figure 9-7 Flash Assembly

Table 9-7

Item	Part Name	Part No.	Description	Qty	FRU
1433	Flash Assembly	2246446	Flash Assy is an Optional 96 image storage board used for console with Software Ver 5 & above, along with Standard 16 images storage of CPU Assy	1	2

9-1-9 MATERIAL LIST - DSC

OPERATOR CONSOLE ASSY

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413, 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.

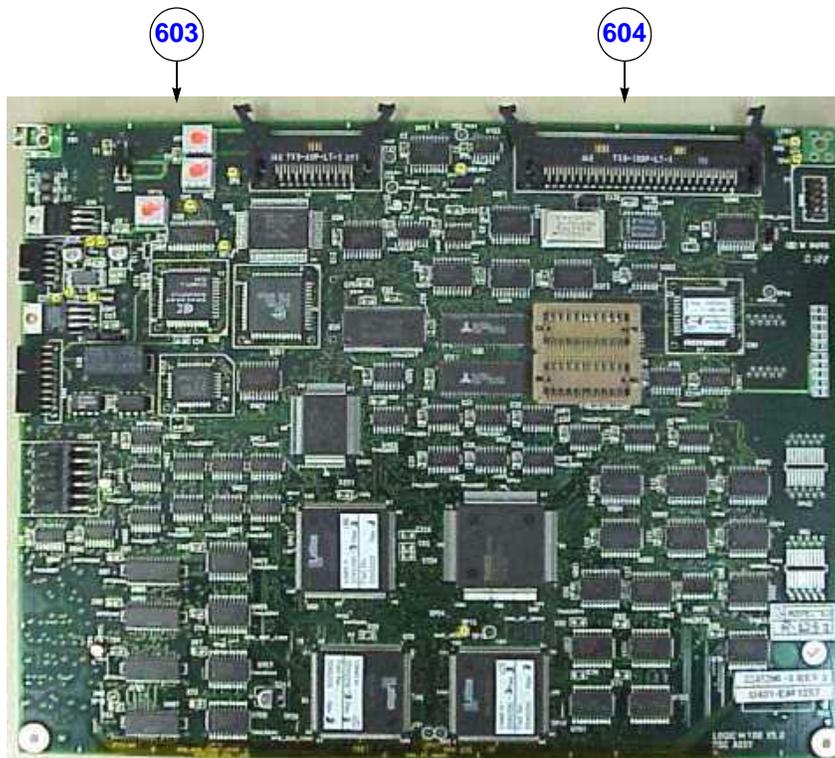


Figure 9-8 DSC Assembly

Table 9-8 DSC Assembly

Item	Part Name	Part No.	Description	Qty	FRU
603	DSC Assy (PAL/NTSC)	2217052-4	For Console with S/W Ver 3.1 to 3.3D, V4.0	1	1
		2245200-3	For Console with S/W Ver 5.0 to 5.06a (LOGIQ™ $\alpha$ 100 MP)	1	1
		2300744-3	For Console with S/W Ver 7.X.X, V9.X.X or above (LOGIQ™ 100 PRO)	1	1
604	DSC Assy (PAL/NTSC)	2220991-3	With additional 32 Frame Cine Option for S/W Ver 5.0 to 5.06a (LOGIQ™ $\alpha$ 100 MP)	1	1
		2315614	With additional 32 Frame Cine Option For Console with S/W Ver 7.0 (LOGIQ™ 100 PRO)	1	1

## 9-1-9 Material List - DSC (Continued)

- 1.) 2217052--4, 2245200--3 & 2220991-3 are common for PAL/NTSC system, while replacing at field jumper JP1 needs to be set as per Figure 8-11 on Chapter 8 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 as per Figure 8-10 on Chapter 8 & upgrade CPU to 3.3D software by replacing EPROM's U3B(2174446--5) & U4B1(2174445--4).
- 3.) 2245200/2220991 is not backward compatible with earlier versions of DSC Assy.
- 4.) 2300744/2315614 is not backward compatible with earlier versions of DSC Assy.

9-1-10 MATERIAL LIST - TRCTL, TRBD & FEB

OPERATOR CONSOLE ASSY

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

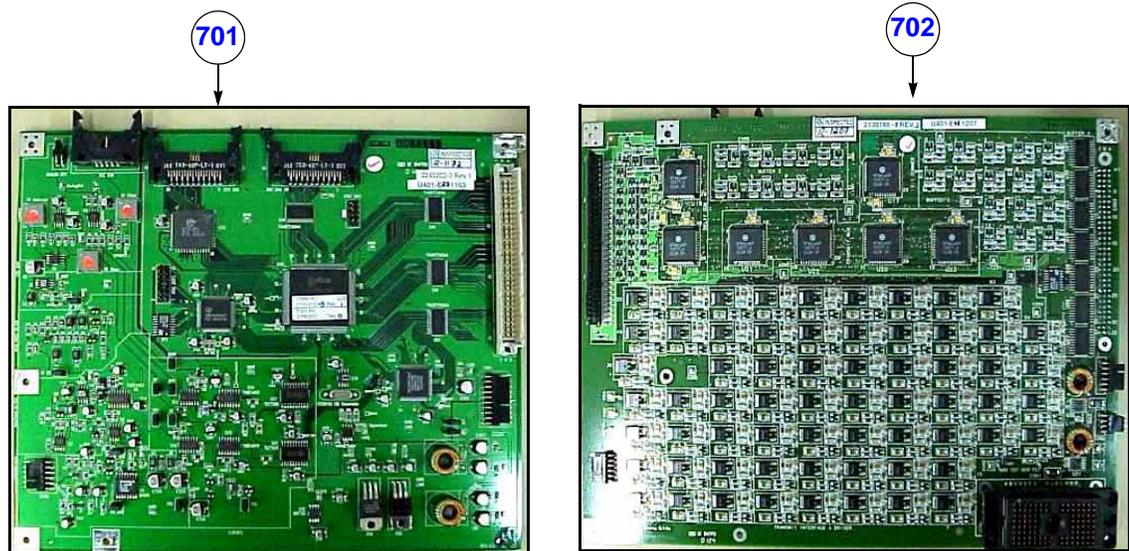


Figure 9-9 TRCTL & TRBD Assembly

Table 9-9 TRCTL & TRBD Assembly

Item	Part Name	Part No.	Description	Qty	FRU
701	TRBD Assembly	2139786-7	For V5.06a & below	1	1
702	TRCTL Assembly	2139787-14	For Console with S/W Ver 3.1 to 3.3D, V4.0 (LOGIQ™ $\alpha$ 100)	1	1
		2245202-3	For Console with S/W Ver 5.0 to 5.06a (LOGIQ™ $\alpha$ 100 MP)	1	1

9-1-10 Material List - TRCTL, TRBD & FEB

OPERATOR CONSOLE ASSY

2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695

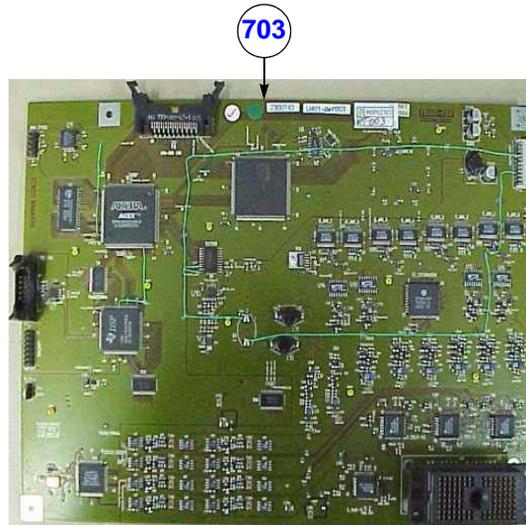


Figure 9-10 FEB Assembly

Table 9-10 FEB Assembly

Item	Part Name	Part No.	Description	Qty	FRU
703	FEB Assy	2300743-7	For Console with S/W Ver 7.X.X , V9.X.X or above (LOGIQ™ 100 PRO)	1	1

- Note:*
- 1.) TRCTL/TRBD is replaced by FEB board in LOGIQ™ 100 PRO (S/W Ver 7.0 or above)
  - 2.) TRBD Assy 2139786--7 is backward compatible with earlier versions of TRBD Assys.
  - 3.) TRCTL Assy 2139787--14 is backward compatible with earlier versions of TRCTL assys.
  - 4.) TRCTL Assy 2245202 is not backward compatible with earlier versions of TRCTL assys.

**9-1-11 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, 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.

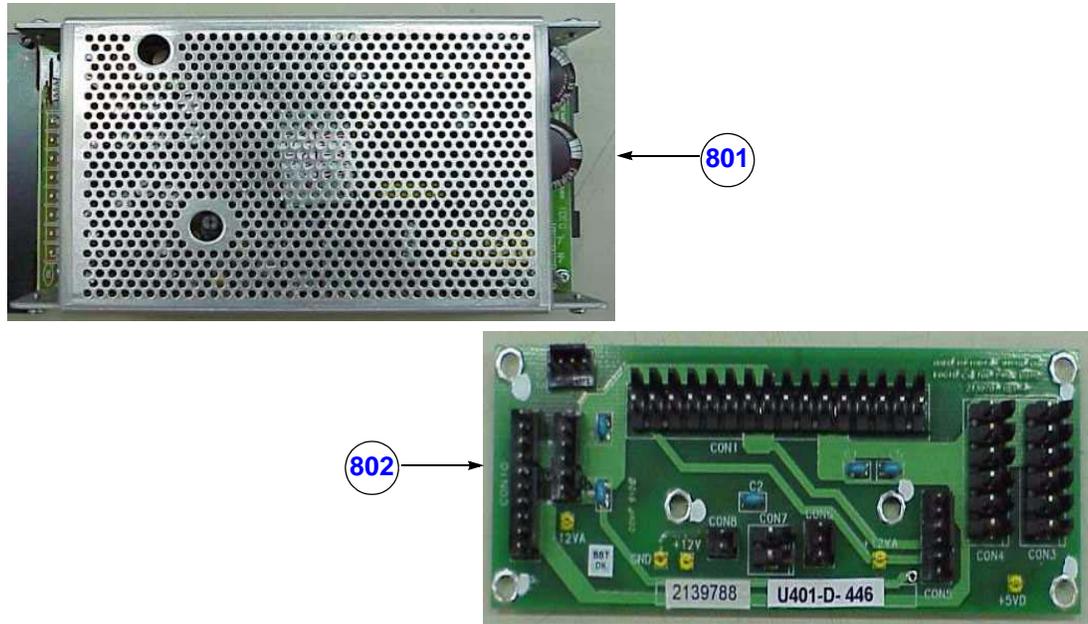


Figure 9-11 Power Supply/Distributor PCB

Table 9-11 Power Supply/Distributor PCB

Item	Part Name	Part No.	Description	Qty	FRU
801	Power Supply Assembly with shield	2237916		1	1
802	Power Distributor PCB Assembly	2336153	For V5.06a & below	1	1
		2300762	For LOGIQ™ 100 PRO (V7.X.X,V9.X.X or above)	1	1

Note: Replace Cable Assy 10(2336938) & 11(2336939) when replacing Power Distributor PCB Assembly 2336153.

**9-1-12 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, 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.

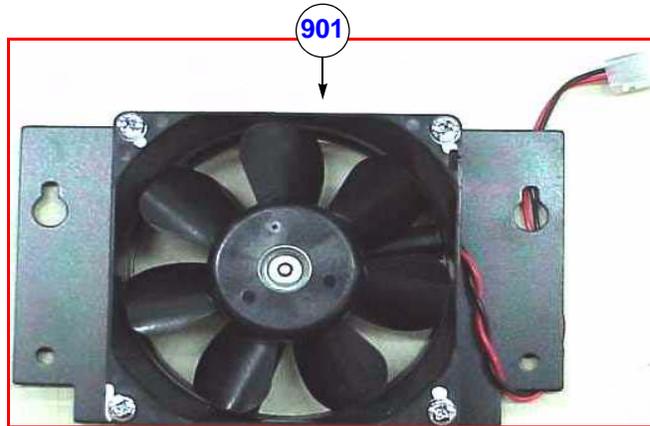


Figure 9-12 FAN Assembly

Table 9-12 Fan Assembly

Item	Part Name	Part No.	Description	Qty	FRU
901	Fan Assembly	2139798	Fan with Bracket	1	1

9-1-13 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, 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.

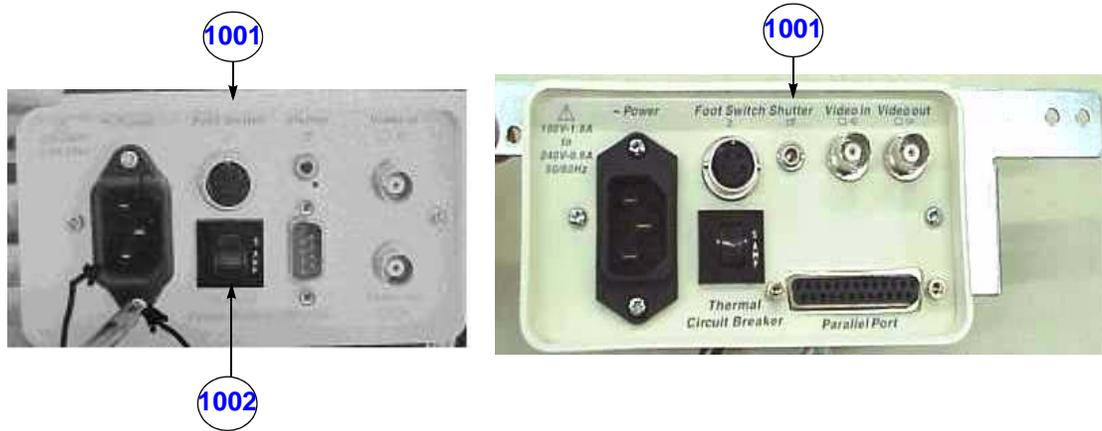


Figure 9-13 Rear Panel Assembly

Table 9-13 Rear Panel Assy

Item	Part Name	Part No.	Description	Qty	FRU
1001	Rear panel Assembly	2224132	For V4 & below Consoles of 100-240VAC	1	1
		2165420	For V4 & below Consoles of 100-115VAC	1	1
1001	Rear panel Assembly	2245199	For V5 & above Consoles of 100-240VAC	1	1
		2247378	For V5 & above Consoles of 100-115VAC	1	1
1002	Circuit Breaker	2139672		1	1

9-1-14 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, 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.



Figure 9-14 HV Power Supply Assembly

Table 9-14 HV Power Supply Assembly

Item	Part Name	Part No.	Description	Qty	FRU
1101	HV Power Supply Assembly	2139791	For V5.06a & below	1	1
1102	HV Power Supply Assembly	2300757-2	For V7.X.X ,V9.X.X or above (LOGIQ 100 PRO)	1	1

**9-1-15 MATERIAL LIST - Chassis Assembly**

**OPERATOR CONSOLE ASSY**

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413, 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.

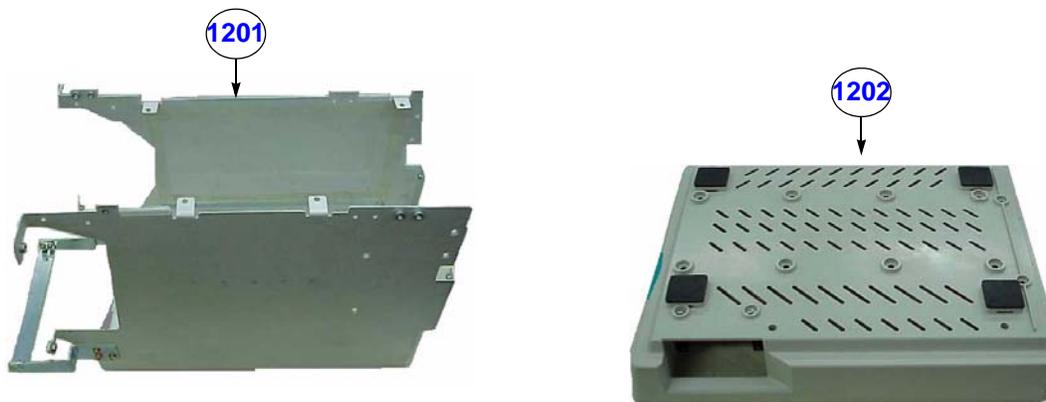


Figure 9-15 Chassis Assembly

Table 9-15 Chassis Assembly

Item	Part Name	Part No.	Description	Qty	FRU
1201	Chassis with Mylar Sheet	2155099		1	2
1202	Base	2323803		1	2

**9-1-16 MATERIAL LIST - Cable Assembly**

**OPERATOR CONSOLE ASSY**

2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, 2244609, 2247333, 2247334, 2247335, 2247336, 2247337, 2272413, 2302111, 2306690, 2306691, 2306692, 2306693, 2306694 & 2306695.

FRU No.	PART NAME	PART NO.	QTY	FRU	DESCRIPTION
1301	LOGIQ™ $\alpha$ 100 Cable Set	2336941	1	1	For V4 & below Consoles
1301	LOGIQ™ $\alpha$ 100 MP Cable Set	2336940	1	1	For V5.0 Consoles
1301	LOGIQ™ 100 PRO Cable Set	2308912	1	1	For V7.X.X , V9.X.X or above Consoles

Table 9-2 Cable Assembly

LOGIQ™α 100 Cable Set (2336941/2336940) 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
Cable Assy 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	2336938	1	Cable Assembly for power supply to TRCTL Assembly
Cable Assy 11	2336939	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 only)
Cable Assy26	2245205	1	TGC - TRCTL interface cable - for LOGIQ™α 100 MP (V5.0)
Cable Assy27	2245206	1	CPU - Rear Panel Parallel Port cable - for LOGIQ™α 100 MP (V5.0)

**Table 9-3 Cable Set for 2336941/2336940**

- 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.
  - 7.) Replace Power Distributor Assy(PDB) with the supplied PDB 2336937, when replacing Cable Assy 10 & 11
  - 8.) Replace Power Distributor Assy(PDB) with the supplied PDB 2336937 & Cable Assy 11 with the supplied CA11 (2336939), when replacing Cable Assy 10
  - 9.) Replace Power Distributor Assy(PDB) with the supplied PDB 2336937 & Cable Assy 10 with the supplied CA11 (2336938), when replacing Cable Assy 11

LOGIQ™ 100 PRO Cable Set (2308912) 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
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 Assy 15	2141783-2	1	Cable Assembly between power distributor and monitor
Cable Assy 19	2141787	1	CPU-DSC Interface cable
Cable Assy 22	2141790	1	CPU-KBD interface cable
Cable Assy 26	2245205	1	TGC - TRCTL interface cable (for V5.0 & above)
Cable Assy 27	2245206	1	CPU - Rear Panel Parallel Port cable (for V5.0 & above)
Cable Assy 28	2302818	1	Power Distributor (PDB) to FEB
Cable Assy 29	2302819	1	Power Supply to Power Distributor (PDB)
Cable Assy 30	2302820	1	Power Distributor (PDB) to HV Power Supply
Cable Assy 31	2319839	1	DSC-FEB Interface cable
Cable Assy 32	2319840	1	CPU-DSC Interface cable

**Table 9-4 Cable Set for 21308912**

- 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

**9-1-17 MATERIAL LIST - Metallic Set**

FRU No.	PART NAME	PART NO.	QTY	FRU	DESCRIPTION
1501	LOGIQ™ <sub>α</sub> 100 Metallic Set	2152465-2	1	2	For V4 & below Consoles
1501	LOGIQ™ <sub>α</sub> 100 MP Metallic Set	2152465-3	1	2	For V5.0 Consoles
1501	LOGIQ™ 100 PRO PRO Metallic Set	2152465-4	1	2	For V7.X.X or Above Consoles

**Table 9-5 Metallic Set**

LOGIQ™<sub>a</sub> 100/LOGIQ™ 100 PRO Metallic Set (2152465-2/2152465-3/2152465-4) comprises of:

Part Name	Part Number	QTY.	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	
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	

**Table 9-6 Metallic Set (2152465-2/2152465-3/2152465-4)**

Part Name	Part Number	QTY.	Description
Core Support Clamp	2168285	1	
Shield Plate	2168362	1	
Cable clamp (big)	2150262	2	

**Table 9-6 Metallic Set (2152465-2/2152465-3/2152465-4)**

**9-1-18 MATERIAL LIST - Plastic Set**

FRU No.	PART NAME	PART NO.	QTY	FRU	DESCRIPTION
1601	LOGIQ™ <sub>α</sub> 100 Plastic Set	2152467	1	2	For V4 & below Consoles
1601	LOGIQ™ <sub>α</sub> 100 MP Plastic Set	2152467-2	1	2	For V5.0 Consoles
1601	LOGIQ™ 100 PRO Plastic Set	2152467-3	1	2	For V7.0 Consoles Or Above

**Table 9-7 Plastic Set**

The following Plastic items are painted with Copper Paint. This parts can be mixed with the earlier Silver Painted Parts & are backward compatible.

- 1.) Top cover
- 2.) Bottom Hinge
- 3.) Front panel
- 4.) Keyboard Top
- 5.) Keyboard Bottom
- 6.) Base

LOGIQ™<sub>a</sub> 100/LOGIQ™ 100 PRO Plastic Set (2152467/2152467-2/2152467-3) comprises of:

Part Name	Part Number	QTY.	Description
Rear Panel Sticker (100/115 V)	2165411	1	For V4.0 & below Systems (LOGIQ™ <sub>α</sub> 100)
Rear Panel Sticker (220/240 V)	2139265	1	For V4.0 & below Systems (LOGIQ™ <sub>α</sub> 100)
Rear Panel Sticker (100/115 V)	2244038	1	For V5.0 & above Systems (LOGIQ™ <sub>α</sub> 100 MP / PRO)
Rear Panel Sticker (220/240 V)	2244037	1	For V5.0 & above Systems (LOGIQ™ <sub>α</sub> 100 MP / PRO)
Key Sheet	2139691	1	For V4.0 & below Systems (LOGIQ™ <sub>α</sub> 100)
Key Sheet	2244024	1	For V5.0 Systems (LOGIQ™ <sub>α</sub> 100 MP)
Key Sheet	2307430	1	For V7.0 Systems (LOGIQ™ 100 PRO)
TB Ring Pad	2139694	1	
TB Base Pad	2139695	1	
Lock Release	2139697	1	
Key Board Top	2323801	1	
End Cap	2139700	2	
Key Board Bottom (Emblem 2152508 mounted on this)	2337063	1	For V4.0 Systems & below (LOGIQ™ <sub>α</sub> 100)
Key Board Bottom (Emblem 2245216 mounted on this)	2315681	1	For V5.0 Systems (LOGIQ™ <sub>α</sub> 100 MP)
Key Board Bottom (Emblem 2302803 mounted on this)	2315682	1	For V7.0 Systems (LOGIQ™ 100 PRO)
Ring Bush	2139702	2	
Gain Knob	2139703	1	
Spacer Pad	2139704	2	
Front Panel (Emblem 2152507 mounted)	2337064	1	For V4.0 Systems & below (LOGIQ™ <sub>α</sub> 100)
Front Panel (Emblem 2245215 mounted)	2315684	1	For V5.0 Systems (LOGIQ™ <sub>α</sub> 100 MP)
Front Panel (Emblem 2302844 mounted)	2315685	1	For V7.0 Systems (LOGIQ™ 100 PRO)
CRT Filter	2139706	1	
Filter Pad	2139708	1	
Lock Hold	2139710	1	
Knob	2139712	2	
Bottom Hinge	2323805	1	
Handle Top	2139714	1	
Handle Bottom	2139715	1	
Top Cover	2323806	1	
Cable Hook - Right	2139717	1	
Cable Hook - Left	2139718	1	
Handle Cap	2139719	2	
Probe Holder	2139720	1	
Base	2323803	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

**Table 9-8 Plastic Set (2152467/2152467-2/2152467-3)**

9-1-18 MATERIAL LIST - Plastic Set (cont'd)



Figure 9-16 Plastic Set

9-1-18 MATERIAL LIST - Plastic Set (cont'd)

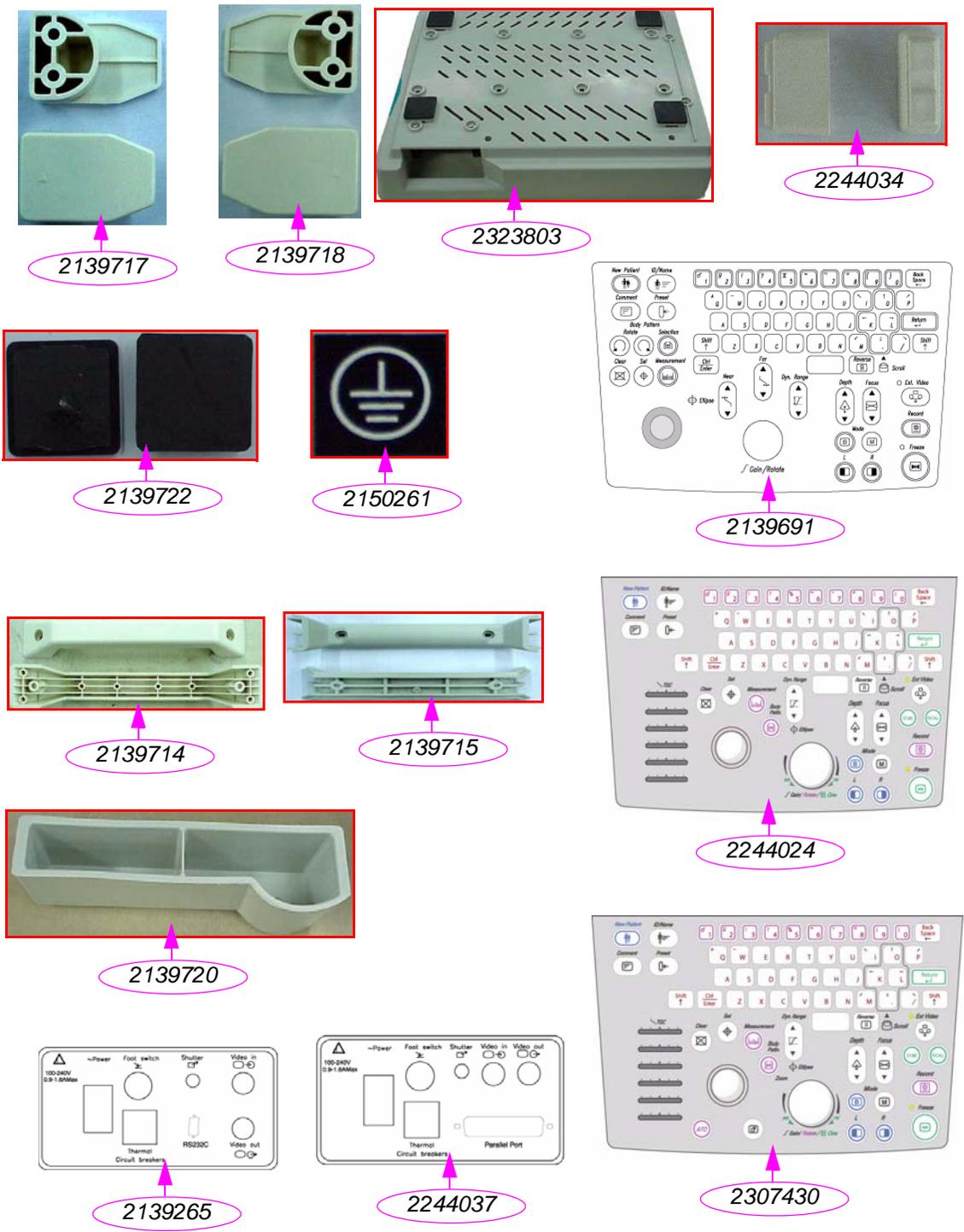


Figure 9-16 Plastic Set

**9-1-19 MATERIAL LIST - Fastener Set**

**FASTENER SET**

FRU No.	PART NAME	PART NO.	QTY	FRU	DESCRIPTION
1601	LOGIQ™ <sub>α</sub> 100/LOGIQ™ 100 PRO Fastener Set	2152468	1	2	For all Versions

**Table 9-9 Fastener Set**

LOGIQ™<sub>α</sub> 100/LOGIQ™ 100 PRO Fastener Set (2152468) comprises of:

Part Name	Part Number	QTY.	Description
STR Screw (Condor)	2139727	8	
Chrome STR. Screw M3 x 16	2139743	5	
Chr. str.Scr. M3 x 8+ Built in SPR + PLNWAS	2160612	4	
Chrome Str. Screw M4 x 40	2139747	2	
STR.Scr. M3 x 6+ Built in SPR + PLNWAS	2139749	19*	*15 Nos. for V4.0 & below 19 Nos. 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.Plit 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	
Serrated 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	

**Table 9-10 Fastener Set for 2152468**

**9-1-20 MATERIAL LIST - Trackball Maintenance Kit (Only for Mechanical Trackball)**

**OPERATOR CONSOLE ASSY**

**2154471, 2156692, 2156693, 2156694, 2156695, 2172903, 2215602, 2215669, 2215670, 2215671, 2215672, 2215673, TRACKBALL CLEANING KIT**

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

**Table 9-11 Cable Assembly**

Trackball Cleaning Kit (2172034) comprises of:

Part Name	Part Number	QTY.	Description
Trackball Tool	2166241	12	
Cotton Bud	2166731	12	
TCF Dry Cleaner	2166732	12	

*Note:* 1. Optical Trackball Doesn't Require Cleaning.

**9-1-21 New Parts For L100 PRO System with 9.X.X or Above Software**

The following are the new parts for L100 PRO system.

Part Name	Part Number	Description
Key Board	5131077	Keyboard PCB assembly with 4 layers, new optical trackball support for L100 pro
FEB	2300743-7	FEB assembly for L100 PRO
DSC	2300744-3	DSC ASSY L100PRO
CPU	5131073-3	CPU PCB assembly with MPC823 for L100 Pro with software version V9.0.7
PDB	2300762	POWER DISTRIBUTOR ASSY FOR LA100PRO
HVPS	2300757-2	HVPS ASSY FOR LOGIQ 100PRO
Cable Set	2308912	L100 Pro Cable set for software version 9.X.X or above.

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# Chapter 10 Quality Assurance

## Section 10-1 Overview

### 10-1-1 Purpose of Chapter 10

This chapter describes Quality Assurance & Periodic Maintenance (PM) on the scanner and its peripherals. These PM procedures are intended to maintain the quality of the ultrasound systems performance. Read this chapter completely and familiarize yourself with the procedures before starting a PM.

### CONTENTS IN CHAPTER 10

Section	Description	Page Number
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10-3	Periodic Maintenance Schedule	10-2
10-4	Tools Required	10-4
10-5	System Periodic Maintenance	10-7
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10-7	Electrical Safety Tests	10-11
10-8	When There's Too Much Leakage Current...	10-21
	PM Inspection Certificate	10-29

Table 10-1 Contents in Chapter 10

***Practice good ESD prevention. Wear an anti-static strap when handling electronic parts and even when disconnecting/connecting cables.***

**THERE ARE SEVERAL PLACES ON THE REAR PANEL THAT ARE DANGEROUS. BE SURE TO DISCONNECT THE SYSTEM POWER PLUG AND OPEN THE MAIN CIRCUIT BREAKER BEFORE YOU REMOVE ANY PARTS. BE CAUTIOUS WHENEVER POWER IS STILL ON AND COVERS ARE REMOVED.**

***Do not pull out or insert circuit boards while power is ON.***

***Do not operate this unit unless all board covers and frame panels are securely in place. System performance and cooling require this.***

## Section 10-2 Why do Periodic Maintenance

### 10-2-1 Keeping Records

It is good business practice that ultrasound facilities maintain records of periodic and corrective maintenance. The Ultrasound Periodic Maintenance Inspection Certificate provides the customer with documentation that the ultrasound scanner is maintained on a periodic basis.

A copy of the Ultrasound Periodic Maintenance Inspection Certificate should be kept in the same room or near the scanner.

### 10-2-2 Quality Assurance

In order to gain accreditation from organizations such as the American College of Radiology (USA), it is the customer's responsibility to have a quality assurance program in place for each scanner. The program must be directed by a medical physicist, the supervising radiologist/physician or appropriate designee.

Routine quality control testing must occur regularly. The same tests are performed during each period so that changes can be monitored over time and effective corrective action can be taken. Testing results, corrective action and the effects of corrective action must be documented and maintained on the site.

Your GE service representative can help you with establishing, performing and maintaining records for a quality assurance program.

## Section 10-3 Periodic Maintenance Schedule

### 10-3-1 How often should PMs be performed?

The Periodic Maintenance Schedule specifies how often your LOGIQ™<sub>a</sub> 100/LOGIQ™ 100 PRO should be serviced and what items need attention. It is the customer's responsibility to ensure the LOGIQ™<sub>a</sub> 100/LOGIQ™ 100 PRO periodic maintenance is performed as scheduled in order to retain its high level of safety, dependability and performance.

Your GE Service Representative knows your LOGIQ™<sub>a</sub> 100/LOGIQ™ 100 PRO best and can provide competent, efficient service. Please contact us for further information and to schedule GE Medical Systems Ultrasound to perform this service for you.

The services and intervals shown in the maintenance schedule assumes that you use your LOGIQ™<sub>a</sub> 100/LOGIQ™ 100 PRO for an average patient load (10-12 per day).

If conditions exist which exceed typical usage and patient load, then it is recommended to increase the periodic maintenance frequencies.

Service at Indicated Time	Daily	Weekly	Monthly	Annually	Notes
Clean Probes	●*				* or before each use
Clean Probe Holders	●				
Inspect AC Mains Cable			●		Mobile Unit Check Weekly
Inspect Cables and Connectors			●		
Clean Console			●		
Clean Monitor and Touch Panel			●		
Check Control Panel Movement			●		Mobile Unit Check Daily
Console Leakage Current Checks				●	also after corrective maintenance or as required by your facilities QA program
Peripheral Leakage Current Checks				●	also after corrective maintenance or as required by your facilities QA program
Surface Probe Leakage Current Checks				●	also after corrective maintenance or as required by your facilities QA program
Endocavity Probe Leakage Current Checks					<b>Twice Annually</b>
Transesophageal Probe Leakage Current Checks					<b>As Prescribed in probe manual</b>
Surgical Probe Leakage Current Checks					<b>As Prescribed in probe manual</b>
Measurement Accuracy Checks				●	also after corrective maintenance or as required by your facilities QA program
Probe/Phantom Checks				●	also after corrective maintenance or as required by your facilities QA program

**Table 10-2 Periodic Maintenance Schedule**

## Section 10-4 Tools Required

### 10-4-1 Standard GE Tool Kit

The following is a description of the "Standard" GE tool kit in the USA. Not all tools are required for PMs.

Tool ID	Description	Tool ID	Description
9-45358	Pliers Retaining Ring	9-XL9971MM	Xcelite-hex Blade 1.27mm
9-4078	Scribe	9-XL9972MM	Xcelite-hex Blade 1.5mm
9-44572	Wrench Open End 3/8 - 7/16	9-XL9973MM	Xcelite-hex Blade 2 mm
9-44579	Wrench Open End 1/2 - 9/16	9-XL9974MM	Xcelite-hex Blade 2.5mm
9-44579	Wrench Open End 1/2 - 9/16	9-XL9975MM	Xcelite-hex Blade 3mm
9-45385	Pliers, Arc Joint 7 inch	9-XL9976MM	Xcelite-hex Blade 4mm
9-45378	Pliers, Slip Joint	9-XL9977MM	Xcelite-hex Blade 5mm
9-4518	Pliers, Long Nose, Miniature	9-XL991CM	Handle
9-4518	Pliers, Long Nose, Miniature	C2356E	Screw starter - Kedman Quick Wedge
9-44776	Ignition Wrench Set, 10 pc.	BLBO	Box - 18 Compartment
9-44601	Wrench, Adj., 4 inch	DWL4283T	Box - 5 Compartment
9-4151	Screwdriver, Blade, Stubby	9-41322	Pickup Tool, Claw type
9-41421	Screwdriver, Blade, Pocket clip	9-6757	6 pc Needle File Set
9-41594	Screwdriver, Blade 1/8 in. x 4 in.	9-9487	Utility Knife
9-41581	Screwdriver, Blade 3/16 in. x 4 in.	9-45341	Pliers Vice Grip 10 inch
9-39451	20' Steel Tape, locking Spring load	9-3001	Xacto Pen Knife
9-GH807	Ratchet, Offset, Slotted	9-HT62002	Solder Aid, Fork and Hook
68-412	Ratchet, Offset, Phillips	9-4099	Mirror, Round, Telescoping
9-GH130	Tapered Reamer	9-GH3001	Steel Rule Decimal 6 inch
9-41584	Screwdriver, slotted 1/4 in.X 6 in.	9-GH300ME	Steel Rule Metric 6 inch
9-4118	Screwdriver, Phillips #2, Stubby	9-XL9920	Xcelite-hex Blade.050 inch
9-41293	Screwdriver, Phillips #0	9-XL9921	Xcelite-hex Blade 1/16 inch
9-41294	Screwdriver, Phillips #1	9-XL9922	Xcelite-hex Blade 5/16 inch
9-41295	Screwdriver, Phillips #2	9-XL9923	Xcelite-hex Blade 3/32 inch
9-46677	Hex Keys, 20 pc., Metric	9-XL9924	Xcelite-hex Blade 1/8 inch
9-34701	1/4 in. Standard.Socket set (19 pc)	9-XL9925	Xcelite-hex Blade 5/32 inch
9-43499	1/2 inch Socket 1/4 inch drive	9-XL9926	Xcelite-hex Blade 3/16 inch

**Table 10-3 Overview of GE-1 Tool Kit Contents**

Tool ID	Description	Tool ID	Description
9-4355	Flex Spinner	9-XL99764	Xcelite-hex Blade 7/64
9-43523	Breaker	9-XL99964	Xcelite-hex Blade 9/64
9-43531	6 inch Ext.	9-XLM60	Mini-screwdriver kit
9-65283	Case 8.5 in. x 4.5 in. x 2 in. Deep	9-45072	Pliers 6 inch Diagonal
9-46696	Hex Keys	9-XL100X	Wire Stripper/Cutter 5 inch - 100X
9-39829	Torpedo Level, Magnetic	9-XL87CG	Pliers - very fine needle nose-87CG
9-38461	Hammer, Ball Peen, 4 oz	9-WEWDT-07	Weller-Soldering-Replacement Tip(1)
9-4280	Universal Joint 1/4 inch	9-WS175-E	Wiss - Surgical Scissors
9-WEW60P3	Weller - Soldering Iron, 3 wire	KH174	Hemostat 5 inch Straight
9-WECT5B6	Weller - Soldering Iron Tip	KH175	Hemostat 5 inch curved
9-WEWDP12	Weller - Desoldering Pump	9-Z9480121	Alignment tool (red)
93383	Flashlight Mini-Mag Lite (AAA Bat.)		
9-GH408	Tweezers		
21576	Brush - Bristle		
9-4516	Pliers 4 1/4 inch Diagonal		

**Table 10-3 Overview of GE-1 Tool Kit Contents (Continued)**

GE-2 Sears Kit (#99034)			
Tool ID	Description	Tool ID	Description
9-45381	Pliers, Arc Joint 9 1/2 inch	9-44067	Socket 1 1/16 in. for 1/2 in. drive
9-45092	Pliers, Linesman 8 1/2 inch	9-42679	Socket 10MM Hex for 1/2 in. drive (2273333)
9-42882	Punch, Pin 3/32 inch	9-44262	Extension 10 inch for 1/2 in. drive (2273405)
9-42884	Punch, Pin 5/32 inch	9-4258	3/8 inch to 1/2 inch Adapter
9-42886	Punch, Pin 1/4 inch	9-34374	3/8 inch Metric Socket Set - 12 PT
9-42973	Cold Chisel 1/2 inch	9-44311	16mm Socket 12 pt.
9-GH77	Center Punch Automatic	9-33485	Metal Socket Tray
9-GH890	File Handle, Adj.	9-33484	Metal Socket Tray
9-31276	File, Round, Bastard 8 inch	9-33484	Metal Socket Tray
9-31277	File, Half Round, Bastard 8 inch	9-52068	Tap and Drill Set
9-31263	File, Flat Mill 8 inch	9-52722	#6 Tap

**Table 10-4 Overview of GE-2 Tool Kit Contents**

GE-2 Sears Kit (#99034)			
Tool ID	Description	Tool ID	Description
21045C	Close Quarter Saw	9-52723	#8 Tap
9-44604	Wrench, Adj 10 inch		High Speed Drill Set
9-41587	Screwdriver 5/16 inch x 8 inch		#36 Drill
9-41586	Screwdriver, Stubby 5/16 inch		#29 Drill
9-GH19512	Countersink 1/2 inch	9-44046	3/8 inch Socket Set
9-44741	12 PC Combination Wrench Set		

Table 10-4 Overview of GE-2 Tool Kit Contents (Continued)

## 10-4-2 Special Tools, Supplies and Equipment

### 10-4-2-1 Specific Requirements for Periodic Maintenance

See Chapter 7

Tool	Part Number	Comments
Digital Volt Meter (DVM)		
Electric Safety Analyzer DALE 600	46-285652G1	For 120V Unit
Electric Safety Analyzer DALE 600E	46-328406G2	For 220V Units
Leakage Current Ultrasound Kit	2113015	For 120V and 220V Units
Anti Static Kit	46-194427P231 46-194427P279 46-194427P369 46-194427P373 46-194427P370	Kit includes anti-static mat, wrist strap and cables for 200 to 240 V system 3M #2204 Large adjustable wrist strap 3M #2214 Small adjustable wrist strap 3M #3051 conductive ground cord
Anti Static Vacuum Cleaner	46-194427P278 46-194427P279	120V 230V
Safety Analyzer	46-285652G1	DALE 600 KIT (or equivalent) for electrical tests
SVHS VCR Cassette	E7010GG E7010GF	60 minute 120 minute
SVHS VCR Head Cleaner		See VCR user manual for requirements
QIQ Phantom	E8370RB	RMI Grayscale Target Model 403GS
B/W Printer Cleaning Sheet		See printer user manual for requirements
Disposable Gloves		

Table 10-5 Overview of Requirements for Periodic Maintenance

## Section 10-5 System Periodic Maintenance

### 10-5-1 Preliminary Checks

The preliminary checks take about 15 minutes to perform. Refer to the system user documentation whenever necessary.

Step	Item	Description
1	Ask & Listen	Ask the customer if they have any problems or questions about the equipment.
2	Paperwork	Fill in the top of the Periodic Maintenance (PM) Inspection Certificate. Note all probes and system options.
3	Power up	Turn the system power on and verify that all fans and peripherals turn on. Watch the displays during power up to verify that no warning or error messages are displayed.
4	Probes	Verify that the system properly recognizes all probes.
5	Displays	Verify proper display on the monitor.
6	Presets	Take printout of all customer presets as a backup.

**Table 10-6 System Preliminary Checks**

## 10-5-2 Functional Checks (See Also Chapter 4)

The functional checks take about 30 minutes to perform. Refer to the system user documentation whenever necessary.

### 10-5-2-1 System Checks

÷	Step	Description
	B-Mode	Verify basic B-Mode (2D) operation. Check the basic system controls that affect this mode of operation.
	M-Mode	Verify basic M-Mode operation. Check the basic system controls that affect this mode of operation.
	System Diagnostic	Perform the Automatic Tests, see <i>section 7-2 on page 7-2</i> , to verify that all boards function according to specifications.
	Control Panel Test	Perform the Control Panel Test Procedure, see <i>section 7-2-6 on page 7-8</i> , to verify that all keyboard controls are OK. This is performed by the internal PC (backend processor) which does a normal keyboard run through.
	Monitor	Verify basic Monitor display functions. Refer to Chapter 3 of the User Manual.
	Measurements	Scan a gray scale phantom and use the measurement controls to verify distance and area calculation accuracy. Refer to the User Manual, Chapter 18, for measurement accuracy specifications.

**Table 10-7 System Functional Checks**

**10-5-2-2 Peripheral/Option Checks**

If any peripherals or options are not part of the system configuration, the check can be omitted. Refer to the User Manual for a list of approved peripherals/options.

Step	Item	Description
1	VCR	Verify record/playback capabilities of the VCR. Clean heads and covers if necessary.
2	VGP Printer	Verify hardcopy output of the video graphic printer. Clean heads and covers if necessary.
3	B/W Printer	Verify hardcopy output of the B/W printer. Clean heads and covers if necessary.
4	Footswitch	Verify that the footswitch is functioning as programmed. Clean as necessary.

**Table 10-8 GE Approved Peripheral/Hardware Option Functional Checks**

**10-5-3 Input Power**

**10-5-3-1 Mains Cable Inspection**

Step	Item	Description
1	Unplug Cord	Disconnect the mains cable from the wall and system.
2	Inspect	Inspect it and its connectors for damage of any kinds.
3	Verify	Verify that the LINE, NEUTRAL and GROUND wires are properly attached to the terminals, and that no strands may cause a short circuit.
4	Verify	Inlet connector retainer is functional.

**Table 10-9 Mains Cable Inspection**

**10-5-4 Cleaning**

**10-5-4-1 General Cleaning**

Step	Item	Description
1	Console	Use a fluid detergent in warm water on a soft, damp cloth to carefully wipe the entire system. Be careful not to get the cloth too wet so that moisture does not enter the console.
2	Probe Holder	Clean probe holders. (they may need to be soaked to remove excess gel).

**Table 10-10 General Cleaning**

## 10-5-5 Physical Inspection

Step	Item	Description
1	Labeling	Verify that all system labeling is present and in readable condition.
2	Scratches & Dents	Inspect the console for dents, scratches or cracks.
3	Control Panel	Inspect keyboard and control panel. Note any damaged or missing items.
4	Control Panel Movement	Verify ease of control panel (Operator I/O Panel) movement in all acceptable directions. Ensure that it latches in position as required.
5	Cables & Connectors	Check all internal cable harnesses and connectors for wear and secure connector seating. Pay special attention to footswitch assembly and probe strain or bend reliefs.
6	Shielding & Covers	Check to ensure that all EMI shielding, internal covers, air flow panels and screws are in place. Missing covers and hardware could cause EMI/RFI problems while scanning.
7	External I/O	Check all connectors for damage and verify that the labeling is good.

**Table 10-11 Physical Checks**

## 10-5-6 Probe Maintenance

### 10-5-6-1 Probe Related Checks

Step	Item	Description
1	Probe Holder	Clean probe holders. (they may need to be soaked to remove excess gel).
2	Probes	Thoroughly check the system probe connectors and remove dust from inside the connector sockets if necessary. Visually check for bent, damaged or missing pins

**Table 10-12 Probe Related Checks**

### 10-5-6-2 Basic Probe Care

The system user manuals and various probe handling cards provide a complete description of probe care, maintenance, cleaning and disinfection. Ensure that you are completely familiar with the proper care of GE probes.

Ultrasound probes can be easily damaged by improper handling. See the User Manual and probe care cards for more details. Failure to follow these precautions can result in serious injury and equipment damage. Failure to properly handle or maintain a probe may also void its warranty.

Any evidence of wear indicates the probe cannot be used.

Do a visual check of the probe pins and system sockets before plugging in a probe.

TEE and Interoperative probes often have special considerations and individual probe user manuals. For TEE and Interoperative probes also refer to their separate user manuals.

### 10-5-6-3 Basic Probe Cleaning

Refer to the User's Manual for details on probe cleaning.

*NOTE: To help protect yourself from blood borne diseases, wear approved disposable gloves. These are made of nitrile derived from vegetable starch to prevent allergic latex reactions.*

Failure to follow the prescribed cleaning or disinfection procedures will void the probe's warranty. DO NOT soak or wipe the lens with any product not listed in the User Manual. Doing so could result in irreparable damage to the probe. Follow care instructions that came with the probe.

*Disinfect a defective probe before you return it. Be sure to tag the probe as being disinfected.*

## Section 10-6 Using a Phantom

See the Basic User Manual "Customer Maintenance" for information on using a phantom and quality assurance tests.

## Section 10-7 Electrical Safety Tests

### 10-7-1 Safety Test Overview

The electrical safety tests in this section are based on and conform to NFPA 99 (For USA) and IEC 60601-1 Medical Equipment Safety Standards. They are intended for the electrical safety evaluation of cord-connected, electrically operated, patient care equipment. If additional information is needed, refer to the NFPA 99 (For USA) and IEC 60601-1 documents.

**THE USER MUST ENSURE THAT THE SAFETY INSPECTIONS ARE PERFORMED AT LEAST EVERY 12 MONTHS ACCORDING TO THE REQUIREMENTS OF THE PATIENT SAFETY STANDARD IEC-EN 60601-1. ONLY TRAINED PERSONS ARE ALLOWED TO PERFORM THE SAFETY INSPECTIONS MENTIONED ABOVE.**

*To avoid electrical shock, the unit under test must not be connected to other electrical equipment. Remove all interconnecting cables and wires. The unit under test must not be contacted by users or patients while performing these tests.*

*Possible risk of infection. Do not handle soiled or contaminated probes and other components that have been in patient contact. Follow appropriate cleaning and disinfecting procedures before handling the equipment.*

Test the system, peripherals and probes for leakage current. Excessive leakage current can cause injury or death in sensitive patients. High leakage current can also indicate degradation of insulation and a potential for electrical failure. Do not use probes or equipment having excessive leakage current.

To minimize the risk that a probe may shock someone the customer should:

- Not use a probe that is cracked or damaged in any way
- Check probe leakage current:
  - \* once a year on surface probes
  - \* twice a year on endocavitary probes
  - \* whenever probe damage is suspected

## 10-7-2 GEMS Leakage Current Limits

The following limits are summarized for NFPA 99 (For USA) and IEC 60601-1 Medical Equipment Safety Standards. These limits are GEMS standards and in some cases are lower than the above standards listed.

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

**Table 10-13 Chassis Leakage Current Limits—Accessible Metal Surfaces**

Country	Normal Condition	Open Ground	Reverse Polarity	Open Neutral	*Mains Applied
USA	0.05 mA	0.05 mA	0.05 mA	0.05 mA	N/A
Other	0.1 mA	0.5 mA	0.5 mA	0.5 mA	5.0 mA

**Table 10-14 Type BF Applied Part Leakage Current Limits - Non-Conductive (Floating) Surface and Cavity Probes**

Country	Normal Condition	Open Ground	Reverse Polarity	Open Neutral	*Mains Applied
USA	0.01 mA	0.05mA	0.05 mA	N/A	0.025 mA
Other	0.01 mA	0.05 mA	0.05 mA	0.05 mA	0.05 mA

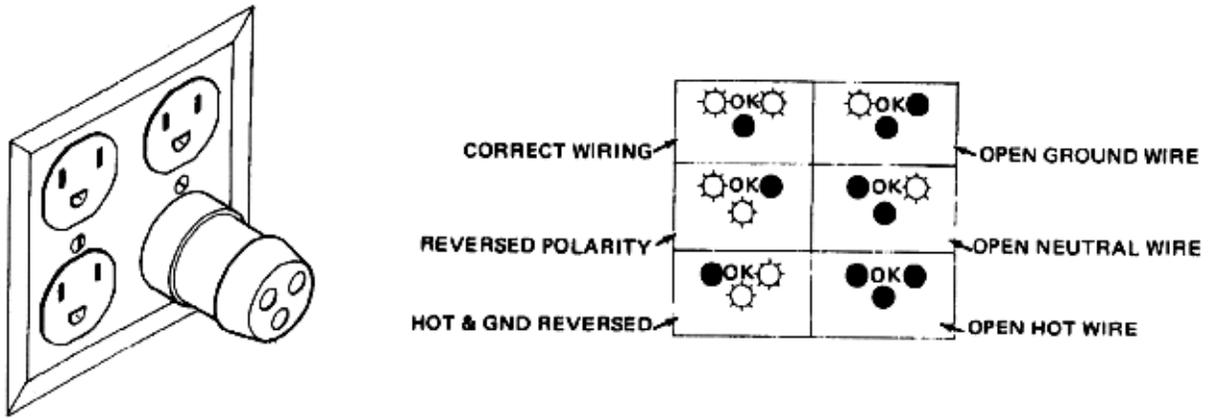
**Table 10-15 Type CF Applied Part Leakage Current Limits - Surgical Probes and ECG Connections**

*\*Mains Applied refers to the sink leakage test where mains (supply) voltage is applied to the part to determine the amount of current that will pass (or sink) to ground if a patient contacted mains voltage.*

The following tests are performed at the factory and should be performed at the site. These tests are: grounding continuity, chassis leakage current, probe leakage current, and ECG leakage current. All measurements are made with an electrical safety analyzer Model 600/600E built by Dale Technology Corporation or equivalent device.

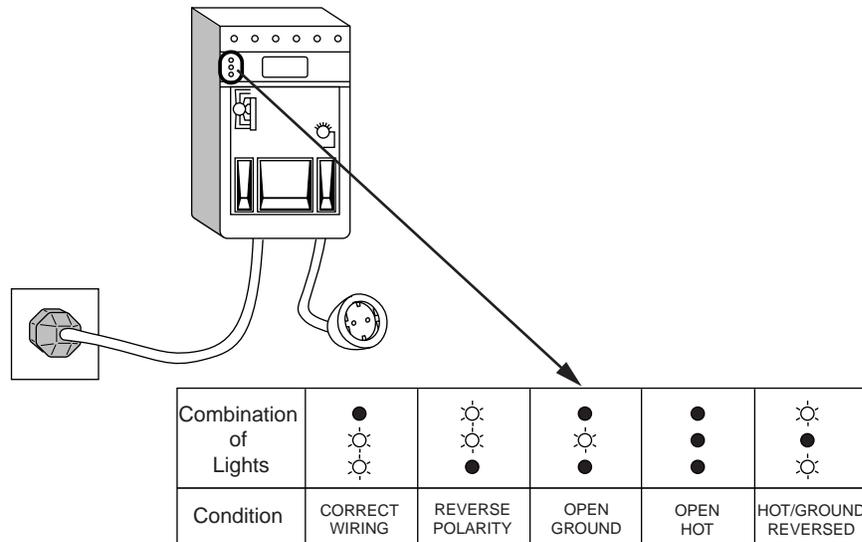
### 10-7-3 Outlet Test - Wiring Arrangement - USA & Canada

Test all outlets in the area for proper grounding and wiring arrangement by plugging in the neon outlet tester and noting the combination of lights that are illuminated. Any problems found should be reported to the hospital immediately and the receptacle should not be used.



**Figure 10-1 Typical Alternate Outlet Tester**

The Dale 600 has self-contained lamps designed for testing the outlet wiring arrangement. Plug the Dale 600 into each outlet to be tested comparing the lamp status.



**Figure 10-2 Dale 600 Outlet Test**

**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.

## 10-7-4 Grounding Continuity

**Electric Shock Hazard. The patient must not be contacted to the equipment during this test**

Measure the resistance from the third pin of the attachment plug to the exposed metal parts of the case. The ground wire resistance should be less than **0.2** ohms. Reference the procedure in the IEC 601-1.1.

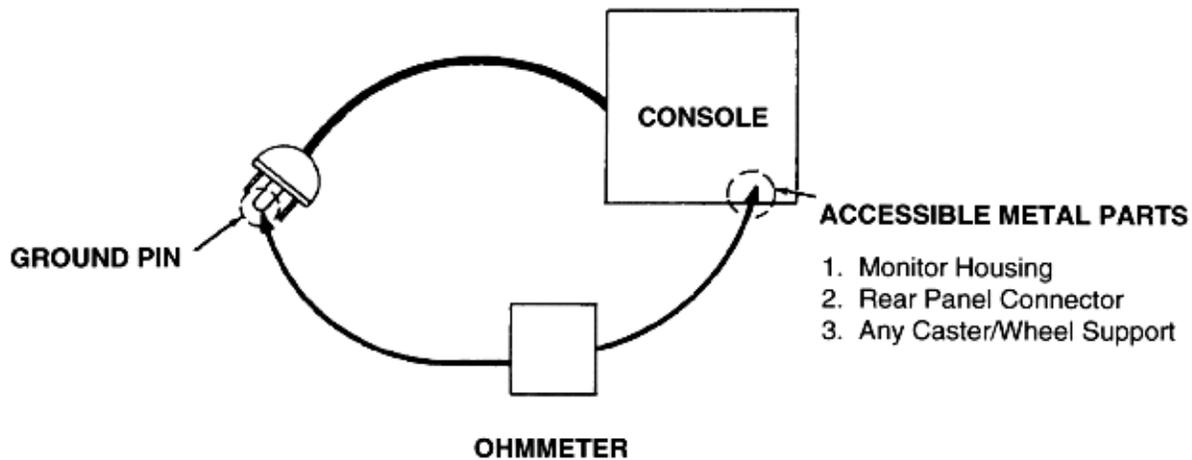


Figure 10-3 Ground Continuity Test

### 10-7-4-1 Meter Procedure

Follow these steps to test the ground wire resistance.

- 1.) Turn the LOGIQ™<sub>α</sub> 100/LOGIQ™ 100 PRO unit OFF.
- 2.) Plug the unit into the meter, and the meter into the tested AC wall outlet.
- 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™<sub>α</sub> 100/LOGIQ™ 100 PRO unit.
- 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 and record the ground wire resistance.

## 10-7-5 Chassis Leakage Current Test

### 10-7-5-1 Definition

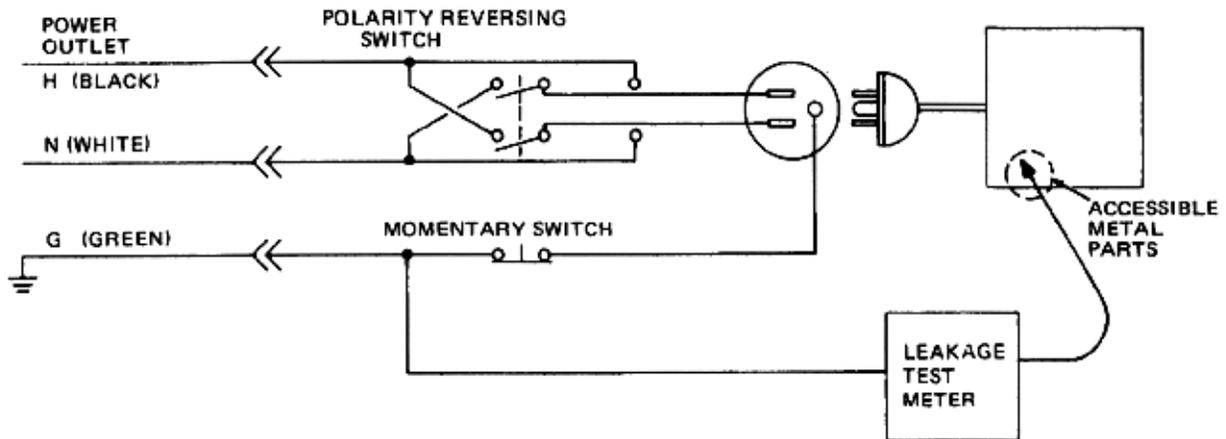
This test measures the current that would flow in a grounded person who touched accessible metal parts of the bedside station if the ground wire should break. The test verifies the isolation of the power line from the chassis. The meter is connected from accessible metal parts of the case to ground. Measurements should be made with the unit On and Off, with the power line polarity Normal and Reversed. Record the highest reading.

**Electric Shock Hazard. When the meter's ground switch is OPEN, don't touch the unit!**

**Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.**

### 10-7-5-2 Generic Procedure

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.



**Figure 10-4 Set Up for Chassis Source Leakage Current, IEC 601-1 Clause 19 - Continuous Leakage Currents and Patient, Auxiliary Currents**

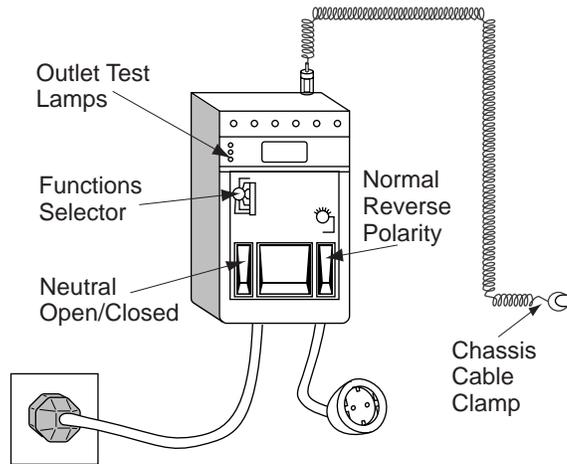
When using the Microguard or a similar test instrument, its power plug may be inserted into the wall outlet and the equipment under test is plugged into the receptacle on the panel of the meter. This places the meter in the grounding conductor and the current flowing from the case to ground will be indicated in any of the current ranges. The maximum allowable limit for chassis source leakage is shown in Table 10-13.

**10-7-5-3 Dale 600 Meter Procedure**

When measuring system chassis currents with the Dale 600, always use the CHASSIS selection of the external/chassis function switch. This requires the ground clip lead and changing the meters switches in accordance with the IEC 601-1.1. Refer to the Dale 600 Instruction Manual for meter self-test and operation. Record the highest leakage current measured.

Follow these steps to test the unit for leakage current.

- 1.) Turn the LOGIQ™α 100/LOGIQ™ 100 PRO unit OFF.
- 2.) Plug the unit into the meter, and the meter into the tested AC wall outlet
- 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™α 100/LOGIQ™ 100 PRO.
- 4.) Set the tester's "FUNCTION" switch to CHASSIS position.



**Figure 10-5 Ground and Chassis Leakage Current Test**

- 5.) Follow the test conditions described for respective test points shown in Table 10-16.

TEST	CONDITION
1	Mounting screw for probe receptacle
2	Wheel support
3	Mounting screw for peripheral plugged into unit
4	Mounting screw for other peripheral powered by unit

**Table 10-16 Chassis Leakage Current Test Condition**

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

**10-7-5-4 Data Sheet for Chassis Source Leakage Current**

The test passes when all readings measure less than the value shown in Table 10-13. Record all data on the PM Inspection Certificate.

Unit Power	Tester Polarity Switch	Tester Neutral or Ground Switch	Test 1 Probe Connector Screw	Test 2 Rear Panel	Optional Test 4	Optional Test 5
Enter Name of tested peripheral here:						
ON	NORM	OPEN				
ON	NORM	CLOSED				
ON	REV	OPEN				
ON	REV	CLOSED				
OFF	NORM	OPEN				
OFF	NORM	CLOSED				
OFF	REV	OPEN				
OFF	REV	CLOSED				

**Table 10-17 Typical Data Sheet for Chassis Source Leakage Current**

## 10-7-6 Probe Leakage Current Test

### 10-7-6-1 Definition

This test measures the current that would flow to ground from any of the probes through a patient who is being scanned and becomes grounded by touching some other grounded surface.

### 10-7-6-2 Generic Procedure

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.

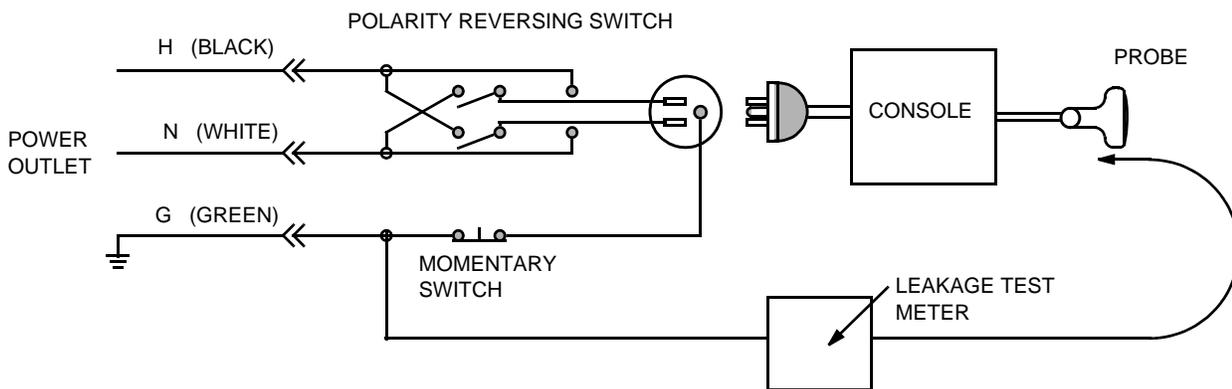


Figure 10-6 Set Up for Probe Leakage Current

**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.

### 10-7-6-3 Meter Procedure Using Probe Adapter

The Dale 600/600E provides a method for testing probes independently from the system. The meter utilizes a probe adapter to apply a test potential commonly 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 probe users manual. 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 transducer for leakage current.

- 1.) Turn the LOGIQ™<sub>α</sub> 100/LOGIQ™ 100 PRO unit OFF.
- 2.) Plug the unit into the test meter, and the meter into the tested AC wall outlet.
- 3.) Connect the probe for test with the meter's appropriate adapter.
- 4.) Plug the saline probe into the meter's "CHASSIS" connector.
- 5.) Plug the probe adapter into the meter's connector marked "EXTERNAL".

10-7-6-3 Meter Procedure Using Probe Adapter (cont'd)

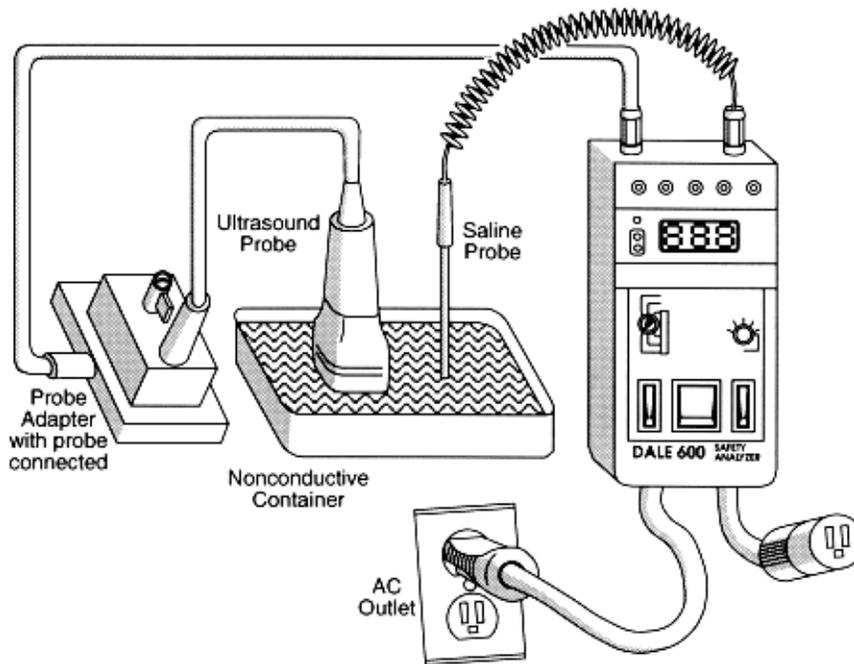


Figure 10-7 Transducer Source Leakage Current Test

- 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 10-18 for every transducer.
- 11.) Keep a record of the results with other hand copies of PM data.

10-7-6-4 General procedure

Follow these steps to test each transducer for leakage current.

- 1.) Turn the LOGIQ™ $\alpha$  100/LOGIQ™ 100 PRO 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 (Dale 600) "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.) Add the saline probe and the imaging area of the probe into the saline bath.
- 7.) Have unit power ON for the first part; turn it OFF for the second half.
- 8.) Depress the ISO TEST rocker switch and record the highest current reading.
- 9.) Follow the test conditions described in Table 10-18 for every transducer.
- 10.) Keep a record of the results with other hand copies of PM data.

**10-7-6-5 Data Sheet for Transducer Source Leakage Current**

The test passes when all readings measure less than the values shown in Table 10-14 and Table 10-15. Record all data on the PM Inspection Certificate.

***Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged***

Transducer Tested:			
Unit Power	Tester Power Polarity Switch	Tester GROUND or NUETRAL 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	

**Table 10-18 Typical Data Sheet For Transducer Source Leakage Current**

## Section 10-8 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. Ensure star washers are under all ground studs.

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

Test the wall outlet; verify it is grounded and is free of other wiring abnormalities. Notify the user or owner to correct any deviations. As a work around, check the other outlets to see if they could be used instead.

*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

Test the probe in another connector to isolate if the fault lies with the probe or the scanner.

*Each probe will have some amount of leakage, 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. The maximum allowable leakage current for body surface contact probe differs from inter-cavity probe. Be sure to enter the correct probe type in the appropriate space on the check list.*

If excessive leakage current is slot dependent, inspect the system connector for bent pins, poor connections, and ground continuity.

If the problem remains with the probe, replace the probe.

### PERIPHERAL FAILS

Tighten all grounds. Ensure star washers are under all ground studs.

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

### STILL FAILS

If all else 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 can not be corrected, submit a Safety Failure Report to document the system problem. Remove unit from operation.

**PM INSPECTION CERTIFICATE**

Customer Name:		System ID:	Dispatch Number / Date Performed:	Warranty/Contract/HBS
System Type		Model Number:	Serial Number:	Manufacture Date:
Probe 1:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 2:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 3:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 4:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 5:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 6:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 7:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 8:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 9:	Frequency:	Scan Format*:	Model Number:	Serial Number:

\* Scan Format: Phased Array, Linear Array, Curved Array, Mechanical Array or Other

**FUNCTIONAL CHECKS PHYSICAL INSPECTION AND CLEANING**

Functional Check (if applicable)	OK? or N/A	Physical Inspection and Cleaning (if applicable)	Inspect	Clean
B-Mode Function		Console		
M-Mode Function		Monitor		
Control Panel		Cables and Connectors		
Monitor		GE Approved Peripherals (VCR, VGP)		
Applicable Software Options		Probe Holders		
Applicable Hardware Options		External I/O		
Measurement Accuracy				
GE Approved Peripherals				

**COMMENTS:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**ELECTRICAL SAFETY**

Electrical Test Performed	Max Value Allowed	Value Measured	OK?	Comments
<b>Outlet (correct ground &amp; wiring config.)</b>				
System Ground Continuity				
Chassis Source Leakage Current - Probe				
Patient Lead Source Leakage (Lead to Ground)				
Patient Lead Source Leakage (Lead to Lead)				
Patient Lead Source Leakage (Isolation)				
Peripheral 1 Leakage Current				
Peripheral 1 Ground Continuity				
Peripheral 2 Leakage Current				
Peripheral 2 Ground Continuity				
Peripheral 3 Leakage Current				
Peripheral 3 Ground Continuity				

**PROBES**

Probe Number (from previous page)	Max Value Allowed	Max Value Measured	OK?	Comments
Probe 1:				
Probe 2:				
Probe 3:				
Probe 4:				
Probe 5:				
Probe 6:				
Probe 7:				
Probe 8:				
Probe 9:				

Final Check. All system covers are in place. System scans with all probes as expected.  
 Accepted by: \_\_\_\_\_

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