GE Healthcare

Technical Publication

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Revision 5

GE Healthcare
LOGIQ™P5 Service Manual

Operating Documentation

Important Precautions

**WARNING
(EN)**

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

**AVERTISSEMENT
(FR)**

- CE MANUEL DE MAINTENANCE N'EST DISPONIBLE QU'EN ANGLAIS.
- SI LE TECHNICIEN DU CLIENT A BESOIN DE CE MANUEL DANS UNE AUTRE LANGUE QUE L'ANGLAIS, C'EST AU CLIENT QU'IL INCOMBE DE LE FAIRE TRADUIRE.
- NE PAS TENTER D'INTERVENTION SUR LES éQUIPEMENTS TANT QUE LE MANUEL SERVICE N'A PAS éTé CONSULTé ET COMPRIS.
- LE NON-RESPECT DE CET AVERTISSEMENT PEUT ENTRAîNER CHEZ LE TECHNICIEN, L'OPéRATEUR OU LE PATIENT DES BLESSURES DUES à DES DANGERS éLECTRIQUES, MéCANIQUES OU AUTRES.

**WARNUNG
(DE)**

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

AVISO
(ES)

- ESTE MANUAL DE SERVICIO SóLO EXISTE EN INGLéS.
- SI ALGúN PROVEEDOR DE SERVICIOS AJENO A GEHC SOLICITA UN IDIOMA QUE NO SEA EL INGLéS, ES RESPONSABILIDAD DEL CLIENTE OFRECER UN SERVICIO DE TRADUCCIóN.
- NO SE DEBERá DAR SERVICIO TéCNICO AL EQUIPO, SIN HABER CONSULTADO Y COMPRENDIDO ESTE MANUAL DE SERVICIO.
- LA NO OBSERVANCIA DEL PRESENTE AVISO PUEDE DAR LUGAR A QUE EL PROVEEDOR DE SERVICIOS, EL OPERADOR O EL PACIENTE SUFRAN LESIONES PROVOCADAS POR CAUSAS ELéCTRICAS, MECáNICAS O DE OTRA NATURALEZA.

ATENçÃO
(PT)

- ESTE MANUAL DE ASSISTêNCIA TéCNICA Só SE ENCONTRA DISPONíVEL EM INGLêS.
- SE QUALQUER OUTRO SERVIçO DE ASSISTêNCIA TéCNICA, QUE NãO A GEHC, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, é DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIçOS DE TRADUçãO.
- NãO TENTE REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTêNCIA TéCNICA.
- O NãO CUMPRIMENTO DESTE AVISO PODE POR EM PERIGO A SEGURANçA DO TéCNICO, OPERADOR OU PACIENTE DEVIDO A' CHOQUES ELéTRICOS, MECâNICOS OU OUTROS.

AVVERTENZA
(IT)

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

HOIATUS
(ET)

- KÄESOLEV TEENINDUSJUHEND ON SAADAVAL AINULT INGLISE KEELES.
- KUI KLIENDITEENINDUSE OSUTAJA NõUAB JUHENDIT INGLISE KEELEST ERINEVAS KEELES, VASTUTAB KLIENT TõLKETEENUSE OSUTAMISE EEST.
- äRGE üRITAGE SEADMEID TEENINDADA ENNE EELNEVALT KäESOLEVA TEENINDUSJUHENDIGA TUTVUMIST JA SELLEST ARU SAAMIST.
- KäESOLEVA HOIATUSE EIRAMINE VõIB PõHJUSTADA TEENUSEOSUTAJA, OPERAATORI VõI PATSIENDI VIGASTAMIST ELEKTRILööGI, MEHAANILISE VõI MUU OHU TAGAJäRJEL.

VAROITUS
(FI)

- TÄMÄ HUOLTO-OHJE ON SAATAVILLA VAIN ENGLANNIKSI.
- JOS ASIAKKAAN PALVELUNTARJOAJA VAATII MUUTA KUIN ENGLANNINKIELISTä MATERIAALIA, TARVITTAVAN KääNNöKSEN HANKKIMINEN ON ASIAKKAAN VASTUULLA.
- äLä YRITä KORJATA LAITTEISTOA ENNEN KUIN OLET VARMASTI LUKENUT JA YMMäRTäNYT TäMäN HUOLTO-OHJEEN.
- MIKäLI TäTä VAROITUSTA EI NOUDATETA, SEURAUKSENA VOI OLLA PALVELUNTARJOAJAN, LAITTEISTON KäYTTäJäN TAI POTILAAN VAHINGOITTUMINEN SäHKöISKUN, MEKAANISEN VIAN TAI MUUN VAARATILANTEEN VUOKSI.

ΠΡΟΕΙΔΟΠΟΙΗΣΗ
(EL)

- ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕΡΒΙΣ ΔΙΑΤΙΘΕΤΑΙ ΣΤΑ ΑΓΓΛΙΚΑ ΜΟΝΟ.
- ΕΑΝ ΤΟ ΑΤΟΜΟ ΠΑΡΟΧΗΣ ΣΕΡΒΙΣ ΕΝΟΣ ΠΕΛΑΤΗ ΑΠΑΙΤΕΙ ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕ ΓΛΩΣΣΑ ΕΚΤΟΣ ΤΩΝ ΑΓΓΛΙΚΩΝ, ΑΠΟΤΕΛΕΙ ΕΥΘΥΝΗ ΤΟΥ ΠΕΛΑΤΗ ΝΑ ΠΑΡΕΧΕΙ ΥΠΗΡΕΣΙΕΣ ΜΕΤΑΦΡΑΣΗΣ.
- ΜΗΝ ΕΠΙΧΕΙΡΗΣΕΤΕ ΤΗΝ ΕΚΤΕΛΕΣΗ ΕΡΓΑΣΙΩΝ ΣΕΡΒΙΣ ΣΤΟΝ ΕΞΟΠΛΙΣΜΟ ΕΚΤΟΣ ΕΑΝ ΕΧΕΤΕ ΣΥΜΒΟΥΛΕΥΤΕΙ ΚΑΙ ΕΧΕΤΕ ΚΑΤΑΝΟΗΣΕΙ ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕΡΒΙΣ.
- ΕΑΝ ΔΕ ΛΑΒΕΤΕ ΥΠΟΨΗ ΤΗΝ ΠΡΟΕΙΔΟΠΟΙΗΣΗ ΑΥΤΗ, ΕΝΔΕΧΕΤΑΙ ΝΑ ΠΡΟΚΛΗΘΕΙ ΤΡΑΥΜΑΤΙΣΜΟΣ ΣΤΟ ΑΤΟΜΟ ΠΑΡΟΧΗΣ ΣΕΡΒΙΣ, ΣΤΟ ΧΕΙΡΙΣΤΗ Ή ΣΤΟΝ ΑΣΘΕΝΗ ΑΠΟ ΗΛΕΚΤΡΟΠΛΗΞΙΑ, ΜΗΧΑΝΙΚΟΥΣ Ή ΑΛΛΟΥΣ ΚΙΝΔΥΝΟΥΣ.

FIGYELMEZTETÉS
(HU)

- EZEN KARBANTARTÁSI KÉZIKÖNYV KIZÁRÓLAG ANGOL NYELVEN ÉRHETŐ EL.
- HA A VEVŐ SZOLGÁLTATÓJA ANGOLTÓL ELTÉRŐ NYELVRE TART IGÉNYT, AKKOR A VEVŐ FELELŐSSÉGE A FORDÍTÁS ELKÉSZÍTTETÉSE.
- NE PRÓBÁLJA ELKEZDENI HASZNÁLNI A BERENDEZÉST, AMÍG A KARBANTARTÁSI KÉZIKÖNYVBEN LEÍRTAKAT NEM ÉRTELMEZTÉK.
- EZEN FIGYELMEZTETÉS FIGYELMEN KÍVÜL HAGYÁSA A SZOLGÁLTATÓ, MŰKÖDTETŐ VAGY A BETEG ÁRAMÜTÉS, MECHANIKAI VAGY EGYÉB VESZÉLYHELYZET MIATTI SÉRÜLÉSÉT EREDMÉNYEZHETI.

VIÐVÖRUN
(IS)

- ÞESSI ÞJÓNUSTUHANDBÓK ER EINGÖNGU FÁANLEG Á ENSKU.
- EF ÞJÓNUSTUAÐILI VIÐSKIPTAMANNS ÞARFNAST ANNARS TUNGUMÁLS EN ENSKU, ER ÞAÐ Á ÁBYRGÐ VIÐSKIPTAMANNS AÐ ÚTVEGA ÞÝÐINGU.
- REYNIÐ EKKI AÐ ÞJÓNUSTA TÆKIÐ NEMA EFTIR AÐ HAFA SKOÐAÐ OG SKILIÐ ÞESSA ÞJÓNUSTUHANDBÓK.
- EF EKKI ER FARIÐ AÐ ÞESSARI VIÐVÖRUN GETUR ÞAÐ VALDIÐ MEIÐSLUM ÞJÓNUSTUVEITANDA, STJÓRNANDA EÐA SJÚKLINGS VEGNA RAFLOSTS, VÉLRÆNNAR EÐA ANNARRAR HÆTTU.

VÝSTRAHA (CS)

- TENTO SERVISNÍ NÁVOD EXISTUJE POUZE V ANGLICKéM JAZYCE.
- V PříPADě, ŽE POSKYTOVATEL SLUŽEB ZÁKAZNÍKŮM POTřEBUJE NáVOD V JINéM JAZYCE, JE ZAJIŠTěNí PřEKLADU DO ODPOVíDAJíCíHO JAZYKA úKOLEM ZáKAZNíKA.
- NEPROVÁDĚJTE úDRŽBU TOHOTO ZAříZENí, ANIŽ BYSTE SI PřEčETLI TENTO SERVISNÍ NÁVOD A POCHOPILI JEHO OBSAH.
- V PříPADě NEDODRŽOVáNí TéTO VýSTRAHY MůŽE DOJíT ÚRAZU ELEKTRICKÁM PROUDEM PRACOVNíKA POSKYTOVATELE SLUŽEB, OBSLUŽNéHO PERSONáLU NEBO PACIENTů VLIVEM ELEKTRICKéHOP PROUDU, RESPEKTIVE VLIVEM K RIZIKU MECHANICKÉHO POŠKOZENÍ NEBO JINÉMU RIZIKU.

ADVARSEL (DA)

- DENNE SERVICEMANUAL FINDES KUN PÅ ENGELSK.
- HVIS EN KUNDES TEKNIKER HAR BRUG FOR ET ANDET SPROG END ENGELSK, ER DET KUNDENS ANSVAR AT SØRGE FOR OVERSÆTTELSE.
- FORSØG IKKE AT SERVICERE UDSTYRET MEDMINDRE DENNE SERVICEMANUAL ER BLEVET LÆST OG FORSTÅET.
- MANGLENDE OVERHOLDELSE AF DENNE ADVARSEL KAN MEDFØRE SKADE PÅ GRUND AF ELEKTRISK, MEKANISK ELLER ANDEN FARE FOR TEKNIKEREN, OPERATØREN ELLER PATIENTEN.

WAARSCHUWING (NL)

- DEZE ONDERHOUDSHANDLEIDING IS ENKEL IN HET ENGELS VERKRIJGBAAR.
- ALS HET ONDERHOUDSPERSONEEL EEN ANDERE TAAL VEREIST, DAN IS DE KLANT VERANTWOORDELIJK VOOR DE VERTALING ERVAN.
- PROBEER DE APPARATUUR NIET TE ONDERHOUDEN VOORDAT DEZE ONDERHOUDSHANDLEIDING WERD GERAADPLEEGD EN BEGREPEN IS.
- INDIEN DEZE WAARSCHUWING NIET WORDT OPGEVOLGD, ZOU HET ONDERHOUDSPERSONEEL, DE OPERATOR OF EEN PATIËNT GEWOND KUNNEN RAKEN ALS GEVOLG VAN EEN ELEKTRISCHE SCHOK, MECHANISCHE OF ANDERE GEVAREN.

BRĪDINĀJUMS (LV)

- šĪ APKALPES ROKASGRĀMATA IR PIEEJAMA TIKAI ANGĻU VALODĀ.
- JA KLIENTA APKALPES SNIEDZĒJAM NEPIECIEŠAMA INFORMĀCIJA CITĀ VALODĀ, NEVIS ANGĻU, KLIENTA PIENĀKUMS IR NODROŠINĀT TULKOŠANU.
- NEVEICIET APRĪKOJUMA APKALPI BEZ APKALPES ROKASGRĀMATAS IZLASĪŠANAS UN SAPRAŠANAS.
- ŠĪ BRĪDINĀJUMA NEIEVĒROŠANA VAR RADĪT ELEKTRISKĀS STRĀVAS TRIECIENA, MEHĀNISKU VAI CITU RISKU IZRAISĪTU TRAUMU APKALPES SNIEDZĒJAM, OPERATORAM VAI PACIENTAM.

**IŠPĖJIMAS
(LT)**

- ŠIS EKSPLOATAVIMO VADOVAS YRA IŠLEISTAS TIK ANGLŲ KALBA.
- JEI KLIENTO PASLAUGŲ TEIKĖJUI REIKIA VADOVO KITA KALBA – NE ANGLŲ, VERTIMU PASIRŪPINTI TURI KLIENTAS.
- NEMĖGINKITE ATLIKTI ĮRANGOS TECHNINĖS PRIEŽIŪROS DARBŲ, NEBENT VADOVAUTUMĖTĖS ŠIUO EKSPLOATAVIMO VADOVU IR JĮ SUPRASTUMĖTE
- NEPAISANT ŠIO PERSPĖJIMO, PASLAUGŲ TEIKĖJAS, OPERATORIUS AR PACIENTAS GALI BŪTI SUŽEISTAS DĖL ELEKTROS SMŪGIO, MECHANINIŲ AR KITŲ PAVOJŲ.

**ADVARSEL
(NO)**

- DENNE SERVICEHÅNDBOKEN FINNES BARE PÅ ENGELSK.
- HVIS KUNDENS SERVICELEVERANDØR TRENGER ET ANNET SPRÅK, ER DET KUNDENS ANSVAR Å SØRGE FOR OVERSETTELSE.
- IKKE FORSØK Å REPARERE UTSTYRET UTEN AT DENNE SERVICEHÅNDBOKEN ER LEST OG FORSTÅTT.
- MANGLENDE HENSYN TIL DENNE ADVARSELEN KAN FØRE TIL AT SERVICELEVERANDØREN, OPERATØREN ELLER PASIENTEN SKADES PÅ GRUNN AV ELEKTRISK STØT, MEKANISKE ELLER ANDRE FARER.

**OSTRZEŻENIE
(PL)**

- NINIEJSZY PODRĘCZNIK SERWISOWY DOSTĘPNY JEST JEDYNIE W JĘZYKU ANGIELSKIM.
- JEśLI FIRMA śWIADCZĄCA KLIENTOWI USłUGI SERWISOWE WYMAGA UDOSTęPNIENIA PODRęCZNIKA W JęZYKU INNYM NIŻ ANGIELSKI, OBOWIĄZEK ZAPEWNIENIA STOSOWNEGO TłUMACZENIA SPOCZYWA NA KLIENCIE.
- NIE PRóBOWAć SERWISOWAć NINIEJSZEGO SPRZęTU BEZ UPRZEDNIEGO ZAPOZNANIA SIę Z PODRęCZNIKIEM SERWISOWYM.
- NIEZASTOSOWANIE SIę DO TEGO OSTRZEŻENIA MOżE GROZIć OBRAŻENIAMI CIAłA SERWISANTA, OPERATORA LUB PACJENTA W WYNIKU PORAŻENIA PRĄDEM, URAZU MECHANICZNEGO LUB INNEGO RODZAJU ZAGROŻEń.

**ATENȚIE
(RO)**

- ACEST MANUAL DE SERVICE ESTE DISPONIBIL NUMAI ÎN LIMBA ENGLEZĂ.
- DACĂ UN FURNIZOR DE SERVICII PENTRU CLIENŢI NECESITĂ O ALTĂ LIMBĂ DECÂT CEA ENGLEZĂ, ESTE DE DATORIA CLIENTULUI SĂ FURNIZEZE O TRADUCERE.
- NU ÎNCERCAŢI SĂ REPARAŢI ECHIPAMENTUL DECÂT ULTERIOR CONSULTĂRII ŞI ÎNŢELEGERII ACESTUI MANUAL DE SERVICE.
- IGNORAREA ACESTUI AVERTISMENT AR PUTEA DUCE LA RĂNIREA DEPANATORULUI, OPERATORULUI SAU PACIENTULUI ÎN URMA PERICOLELOR DE ELECTROCUTARE, MECANICE SAU DE ALTĂ NATURĂ.

ОСТОРОЖНО!
(RU)

- Данное руководство по обслуживанию ПРЕДОСТАВЛЯЕТСЯ только на английском Языке.
- Если сервисноМУ ПЕРСОНАЛУ клиента необходимо руководство не на английском ЯЗЫКЕ, клиенту следует самостоЯтельно ОБЕСПЕЧИТЬ перевод.
- ПЕРЕД ОБСЛУЖИВАНИЕМ ОБОРУДОВАНИЯ ОБЯЗАТЕЛЬНО ОБРАТИТЕСЬ К ДАННОМУ РУКОВОДСТВУ И ПОЙМИТЕ ИЗЛОЖЕННЫЕ В НЕМ СВЕДЕНИЯ.
- НЕСОБЛЮДЕНИЕ УКАЗАННЫХ ТРЕБОВАНИЙ МОЖЕТ ПРИВЕСТИ К ТОМУ, ЧТО СПЕЦИАЛИСТ ПО ТЕХОБСЛУЖИВАНИЮ, ОПЕРАТОР ИЛИ ПАЦИЕНТ ПОЛУЧАТ УДАР ЗЛЕКТРИЧЕСКИМ ТОКОМ, МЕХАНИЧЕСКУЮ ТРАВМУ ИЛИ ДРУГОЕ ПОВРЕЖДЕНИЕ.

UPOZORNENIE
(SK)

- TÁTO SERVISNÁ PRÍRUČKA JE K DISPOZíCII LEN V ANGLIČTINE.
- AK ZÁKAZNÍKOV POSKYTOVATEĽ SLUŽIEB VYŽADUJE INÝ JAZYK AKO ANGLIČTINU, POSKYTNUTIE PREKLADATEĽSKÝCH SLUŽIEB JE ZODPOVEDNOSŤOU ZÁKAZNÍKA.
- NEPOKÚŠAJTE SA VYKONÁVAŤ SERVIS ZARIADENIA SKÔR, AKO SI NEPREČÍTATE SERVISNÚ PRÍRUČKU A NEPOROZUMIETE JEJ.
- ZANEDBANIE TOHTO UPOZORNENIA MôŽE VYÚSTIŤ DO ZRANENIA POSKYTOVATEĽA SLUŽIEB, OBSLUHUJúCEJ OSOBY ALEBO PACIENTA ELEKTRICKýM PRúDOM, PRÍPADNE DO MECHANICKéHO ALEBO INéHO NEBEZPEčENSTVA.

VARNING
(SV)

- DEN HÄR SERVICEHANDBOKEN FINNS BARA TILLGÄNGLIG PÅ ENGELSKA.
- OM EN KUNDS SERVICETEKNIKER HAR BEHOV AV ETT ANNAT SPRÅK ÄN ENGELSKA ANSVARAR KUNDEN FÖR ATT TILLHANDAHÅLLA ÖVERSÄTTNINGSTJÄNSTER.
- FÖRSÖK INTE UTFÖRA SERVICE PÅ UTRUSTNINGEN OM DU INTE HAR LÄST OCH FÖRSTÅR DEN HÄR SERVICEHANDBOKEN.
- OM DU INTE TAR HÄNSYN TILL DEN HÄR VARNINGEN KAN DET RESULTERA I SKADOR PÅ SERVICETEKNIKERN, OPERATÖREN ELLER PATIENTEN TILL FÖLJD AV ELEKTRISKA STÖTAR, MEKANISKA FAROR ELLER ANDRA FAROR.

DİKKAT
(TR)

- BU SERVİS KILAVUZU YALNIZCA İNGİLİZCE OLARAK SAĞLANMIŞTIR.
- EĞER MÜŞTERİ TEKNİSYENİ KILAVUZUN İNGİLİZCE DIŞINDAKİ BİR DİLDE OLMASINI İSTERSE, KILAVUZU TERCÜME ETTİRMEK MÜŞTERİNİN SORUMLULUĞUNDADIR.
- SERVİS KILAVUZUNU OKUYUP ANLAMADAN EKİPMANLARA MÜDAHALE ETMEYİNİZ.
- BU UYARININ GÖZ ARDI EDİLMESİ, ELEKTRİK ÇARPMASI YA DA MEKANİK VEYA DİĞER TÜRDEN KAZALAR SONUCUNDA TEKNİSYENİN, OPERATÖRÜN YA DA HASTANIN YARALANMASINA YOL AÇABİLİR.

警告
(JA)

このサービスマニュアルには英語版しかありません。

GEHC 以外でサービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。

このサービスマニュアルを熟読し理解せずに、装置のサービスを行わないで下さい。

この警告に従わない場合、サービスを担当される方、操作員あるいは患者さんが、感電や機械的又はその他の危険により負傷する可能性があります。

注意:
(ZH-CN)

本维修手册仅存有英文本。

非 GEHC 公司的维修员要求非英文本的维修手册时，客户需自行负责翻译。

未详细阅读和完全了解本手册之前，不得进行维修。

忽略本注意事项会对维修员，操作员或病人造成触电，机械伤害或其他伤害。

경고
(KO)

· 본 서비스 지침서는 영어로만 이용하실 수 있습니다.

· 고객의 서비스 제공자가 영어이외 언어를 요구할 경우, 번역 서비스 지침서를 제공하는 것은 고객의 책임입니다.

· 본 서비스 지침서를 지참했고 이해하지 않는 한은 해당 장비를 수리를 시도하지 마십시오.

· 이 경우에 유해하지 않은 전기쇼크, 기계상의 혹은 다른 위험으로부터 서비스 제공자, 운영자 혹은 환자에게 위험을 가할 수 있습니다.

DAMAGE IN TRANSPORTATION

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

CERTIFIED ELECTRICAL CONTRACTOR STATEMENT - FOR USA ONLY

All electrical Installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations and testing shall be performed by qualified GE Healthcare personnel. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE's electrical work on these products will comply with the requirements of the applicable electrical codes.

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

OMISSIONS & ERRORS

If there are any omissions, errors or suggestions for improving this documentation, please contact the GE Healthcare Global Documentation Group with specific information listing the system type, manual title, part number, revision number, page number and suggestion details. Mail the information to: Service Documentation, 9900 Innovation Drive (RP-2123), Wauwatosa, WI 53226, USA.

GE Healthcare employees should use the iTrak System to report all documentation errors or omissions.

SERVICE SAFETY CONSIDERATIONS

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

⚠ **WARNING** *Use all Personal Protection Equipment (PPE) such as gloves, safety shoes, safety glasses, and kneeling pad, to reduce the risk of injury.*

For a complete review of all safety requirements, see the Chapter 1, Safety Considerations section in the Service Manual.

LEGAL NOTES

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Revision History

Revision	Date	Reason for change
1	May 3, 2010	Initial Release
2	Nov 2, 2010	PHI Update
3	Mar 2, 2011	Software version update
4	May 16, 2011	Add Mitsubishi Printer (P95 series)
5	Aug 26, 2014	Correct revision on the header

List of Effected Pages(LOEP)

Pages	Revision	Pages	Revision	Pages	Revision
Title Page	5	4-1 to 4-54	5	10-1 to 10-30	5
Warnings i-3 to i-12	5	5-1 to 5-60	5	Back Cover	N/A
TOC i-13 to i-28	5	6-1 to 6-8	5		
1-1 to 1-19	5	7-1 to 7-37	5		
2-1 to 2-12	5	8-1 to 8-229	3		
3-1 to 3-26	5	9-1 to 9-23	5		

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Section 1-1
Overview

1-1-1   Purpose of Chapter 1

This chapter describes important issues related to safely servicing the LOGIQ™ P5 scanner. The service provider must read and understand all the information presented in this manual before installing or servicing a unit.

Table 1-1   Contents in Chapter 1

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1-1-2   Purpose of Service Manual

This Service Manual provides installation and service information for the LOGIQ™ P5 Ultrasound Scanning System and contains the following chapters:

1.) **Chapter 1 - Introduction:** Contains a content summary and warnings.

2.) **Chapter 2 - Pre-Installation:** Contains pre-installation requirements for the LOGIQ™ P5.

3.) **Chapter 3 - Installation :** Contains installation procedures.

4.) **Chapter 4 - Functional Checks:** Contains functional checks that are recommended as part of the installation, or as required during servicing and periodic maintenance.

5.) **Chapter 5 - Components and Functions (Theory) :** Contains block diagrams and functional explanations of the electronics.

6.) **Chapter 6 - Service Adjustments :** Contains instructions on how to make available adjustments to the LOGIQ™ P5.

7.) **Chapter 7 - Diagnostics/Troubleshooting :** Provides procedures for running diagnostic or related routines for the LOGIQ™ P5.

8.) **Chapter 8 - Replacement Procedures:** Provides disassembly procedures and reassembly procedures for all changeable Field Replaceable Units (FRU).

9.) **Chapter 9 - Renewal Parts:** Contains a complete list of field replaceable parts for the LOGIQ™ P5.

10.)**Chapter 10 - Care & Maintenance :** Provides periodic maintenance procedures for the LOGIQ™ P5.

1-1-3   Typical Users of the Basic Service Manual

- Service Personnel (installation, maintenance, etc.)
- Hospital's Service Personnel
- Contractors (Some parts of Chapter 2 - Pre-Installation)

1-1-4   LOGIQ™ P5 Models Covered by this Manual

Table 1-2   LOGIQ™ P5 Model Designation

Hcat#	Description
H44662LD	LP5 BT11 FOR USA
H44662LE	LP5 PRO BT11 FOR ASIA110V
H44662LF	LP5 PRO BT11 FOR KOREA
H44662LN	LOGIQ P5 OB KOREA
H44662LP	LP5 PRO BT11 FOR EUROPE
H44662LR	LP5 ADVANCED BT11 JAPAN
H44662LT	LP5 ADVANCED BT11 LATIN220
H44662LY	LP5 PREMIUM BT11 EUROPE
H44662LZ	LP5 PREMIUM BT11 FOR ASIA
H44672LA	LP5 PREMIUM BT11 ASEAN 220
H44672LB	LP5 PREMIUM BT11 ANZ 220
H44672LD	LP5 PREMIUM BT11 LATIN220
H44672LE	LP5 PREMIUM BT11 LATIN110
H44672LF	LP5 PREMIUM BT11 FOR USA
H44672LL	LOGIQ P5 OB for Japan
H44672LH	LOGIQ P5 OB for EMEA
H44672LJ	LOGIQ P5 Basic OB
H44672LK	LOGIQ P5 Premium OB

1-1-5   Purpose of Operator Manual(s)

The Operator Manual(s) should be fully read and understood before operating the LOGIQ™ P5 and also kept near the unit for quick reference.

Section 1-2
Important Conventions

1-2-1   Conventions Used in Book

Icons

Pictures, or icons, are used wherever they 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 following 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 AND 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.

Example: Disk drive will crash.

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.

Table 1-3   Standard Hazard Icons

ELECTRICAL	MECHANICAL	RADIATION
LASER	**HEAT**	**PINCH**

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

Table 1-4   Standard Icons Indicating a Special Procedure Be Used

AVOID STATIC ELECTRICITY	TAG AND LOCK OUT	WEAR EYE PROTECTION

1-2-3   Product Icons

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

Table 1-5   Product Icons
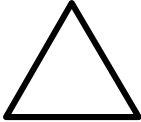
LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
Identification and Rating Plate	Manufacturer's name and address Date of manufacture Model and serial numbers Electrical ratings	Rear of console near power inlet Under monitor On each probe
Device Listing/Certification Labels	Laboratory logo or labels denoting conformance with industry safety standards such as UL or IEC.	Rear of console Under front of monitor
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 CF (heart in the box symbol) IEC 878-02-05 indicates equipment having a high degree of protection suitable for direct cardiac contact. IEC60601-2-27	ECG connector Surgical probes Defibrillator
	"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

Table 1-5   Product Icons

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	"OFF/Standby" Indicates the power off/ standby position of the power switch. **CAUTION** **This Power Switch DOES NOT ISOLATE Mains Supply**	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. **CAUTION** **This Power Switch DOES NOT ISOLATE Mains Supply**	Front Panel Switch
	"Protective Earth" Indicates the protective earth (grounding) terminal.	Internal
	Indicates an earth GROUND potential	Product schematics Peripherals

1-2-4 WEEE Label

The following table describes the meaning of WEEE label and its translation provided on the equipment.

Table 1-6 WEEE Label

LABEL/SYMBOL	LANGUAGE	PURPOSE/MEANING
	English	This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.
	Czech (CZE)	Tento symbol znamená, že díly elektrických nebo elektronických zařízení nesmí být likvidovány do netříděného odpadu, ale musí být likvidovány samostatně. Obraťte se prosím na autorizovaného představitele výrobce, který poskytne informace týkající se likvidace vašeho přístroje.
	Danish (DAN)	Dette symbol angiver, at elektrisk og elektronisk affald ikke må bortskaffes som usorteret brændbart affald, men skal indsamles særskilt. Kontakt venligst en autoriseret repræsentant for producenten for at få oplysninger om, hvordan dit udstyr skal bortskaffes.
	Dutch (DUT)	Dit symbool geeft aan dat het afval van elektrische en elektronische apparatuur niet ongescheiden mag worden meegegeven met het huisvuil, maar apart moet worden ingeleverd. Neem contact op met een erkende vertegenwoordiger van de fabrikant voor informatie over het inleveren van uw apparatuur.
	Catalan (CAT)	Aquest símbol indica que els residus dels equips elèctrics i electrònics s'han d'abocar per separat, no com a residus municipals no classificats. Contacteu amb un representant autoritzat del fabricant per obtenir informació sobre com desfer-vos del vostre equip.
	Chinese (CHN)	此符号表示电气和电子设备废弃物不能作为未分类的城市垃圾进行处置，必须另行回收。欲了解关于设备报废的信息，请与制造商授权代表联系。
	Estonian (EST)	See märk näitab, et tarbetuks muutunud elektri- ja elektroonikaseadmeid ei tohi ära visata sortimata olmejäätmetena, vaid need tuleb eraldi kokku koguda. Seadmete käitlemise kohta küsige lisateavet tootja volitatud esindajalt.

Table 1-6   WEEE Label

LABEL/SYMBOL	LANGUAGE	PURPOSE/MEANING
	Finnish (FIN)	Tämä kuvatunnus ilmaisee, että sillä merkittyä sähkö- ja elektroniikkalaitetta ei saa hävittää lajittelemattomana yhdyskuntajätteenä vaan se on kerättävä talteen erikseen. Ota yhteyttä tuotteen valmistajan valtuuttamaan myyntiedustajaan ja kysy lisätietoja laitteen käytöstä poistosta.
	French- France (FRA)	Ce symbole indique que les déchets relatifs à l'équipement électrique et électronique ne doivent pas être jetés comme les ordures ménagères non-triées et doivent être collectés séparément. Contactez un repré sentant agréé du fabricant pour obtenir des informations sur la mise au rebut de votre équipement.
	German (GER)	Dieses Symbol kennzeichnet elektrische und elektronische Geräte, die nicht mit dem gewöhnlichen, unsortierten Hausmüll entsorgt werden dü rfen, sondern separat behandelt werden müssen. Bitte nehmen Sie Kontakt mit einem autorisierten Beauftragten des Herstellers auf, um Informationen hinsichtlich der Entsorgung Ihres Gerätes zu erhalten.
	Greek (GRE)	Αυτό το σύμβολο υποδηλώνει ότι τα απόβλητα ηλεκτρικού και ηλεκτρονικού εξ οπλισμού δεν πρέπει να απορρίπτονται ως κοινά απορρίματα, αλλά να συλλέγον ται ξεχωριστά. Παρακαλούμε επικοινωνήστε με έναν εξουσιοδοτημένο αντιπρό σωπο του κατασκευαστή για πληροφορίες σχετικά με την απόρριψη του εξοπλισ μού.
	Hungarian (HUN)	A szimbólum azt jelzi, hogy az elektromos és elektronikus készülék hulladékát tilos nem szelektív lakossági hulladékként kezelni, hanem elkülönítve kell gyű jteni. Kérjük, a berendezés leselejtezését illetőleg lépjen kapcsolatba a gyártó hivatalos képviseletével.
	Icelandic (ICE)	Merki þetta táknar að rafeindatækjum skal eytt á sérstakan máta, ekki m á losa rafeindatæki í hefðbundin sorphirðuílát sem óflokkað sorp. Vinsamlega hafið samband við umboðsmann framleiðanda fyrir upplý singar um hvernig tækinu skal eytt.

Table 1-6   WEEE Label

LABEL/SYMBOL	LANGUAGE	PURPOSE/MEANING
	Italian (ITA)	Questo simbolo indica che i rifiuti derivanti da apparecchiature elettriche ed elettroniche non devono essere smaltiti come rifiuti municipali indifferenziati e devono invece essere raccolti separatamente. Per informazioni relative alle modalità di smantellamento delle apparecchiature fuori uso, contattare un rappresentante autorizzato del fabbricante.
	Japanese (JPN)	このシンボルは、電気・電子機器の廃棄物を地方自治体の無分別廃棄物として処分してはならず、別個に回収しなければならないということを示しています。ご使用の機器の廃棄方法に関しては、製造元の認可を受けた販売業者にご連絡下さい。
	Latvian (LAT)	Šis apzīmējums norāda, ka no elektriskā un elektroniskā aprīkojuma atkritumiem nedrīkst atbrīvoties kā no nešķirotiem mājsaimniecības atkritumiem un tie ir jāsavāc atsevišķi. Lūdzu, sazinieties ar pilnvarotu raž otāja pārstāvi, lai saņemtu informāciju par aprīkojuma ekspluatācijas pā rtraukšanu.
	Lithuanian (LIT)	Šis simbolis nurodo, kad elektros ir elektroninės įrangos atliekos turi būti surenkamos atskirai ir negali būti šalinamos kaip nerūšiuotos savivaldybė s tvarkomos atliekos. Informacijos apie įrangos veikimo sustabdymą kreipkitės į įgaliotąjį gamintojo atstovą.
	Norwegian (NOR)	Dette symbolet angir at elektrisk og elektronisk utstyr ikke skal kastes som restavfall, men må leveres inn separat. Ta kontakt med en autorisert representant for produsenten hvis du vil ha informasjon om hvordan utstyret skal avhendes.
	Polish (POL)	Ten symbol oznacza, iż składowanie zużytych urządzeń elektrycznych i elektronicznych wraz z ogólnymi odpadami miejskimi jest zabronione. Informacji na temat miejsc składowania tego typu odpadów udziela producent sprzętu.
	Portuguese-Brazilian (POB)	Este símbolo indica que os resíduos do equipamento elétrico e eletrônico não devem ser descartados no sistema de coleta de lixo municipal, e sim coletados separadamente. Favor entrar em contato com um representante autorizado do fabricante para obter informações sobre como descartar seu equipamento.

Table 1-6   WEEE Label

LABEL/SYMBOL	LANGUAGE	PURPOSE/MEANING
	Romanian (ROM)	Acest simbol indică faptul că deşeurile de echipamente electrice şi electronice nu au voie să fie aruncate nediferenţiat ca gunoi menajer şi că ele trebuie colectate separat. Vă rugăm să luaţi legătura cu un reprezentant autorizat al producătorului pentru a obţine informaţii referitoare la eliminarea ecologică a echipamentului dumneavoastră.
	Russian (RUS)	Символ обозначает: недопустимо выбрасывать электрическое и электронное оборудование с неотсортированным бытовым мусором. Оно должно собираться отдельно. Для получения сведений об утилизации оборудования обратитесь к авторизованному представителю компании-производителя.
	Serbian (SCC)	Ovaj simbol označava da se otpad električne i elektronske opreme ne sme odlagati zajedno sa običnim gradskim smećem, već se mora pokupiti posebno. Molimo vas da kontaktirate ovlašćenog predstavnika proizvođača svoje opreme, kako bi ste se informisali o njenom pravilnom rashodu.
	Slovakian (SLK)	Tento symbol označuje, že odpad elektrického a elektronického materiálu sa nesmie vyhadzovať do netriedeného komunálneho odpadu, ale musí sa likvidovať oddelene. Viac informácií o likvidácii vášho zariadenia vám poskytne poverený zástupca výrobcu.
	Slovenian (SLN)	Ta simbol obeležava da se elektronski otpad in elektronska oprema ne sme odlagati skup z navadnim mesnim otpadom, ter se mora pobrat posebej. Prosimo vas da kontaktirate pooblaščenega prodajalca opreme, kako bi se informirali o njenem pravilnem rashodu.
	Spanish-Spain (SPA)	Este símbolo indica que el equipo eléctrico y electrónico no debe tirarse con los desechos domésticos y debe tratarse por separado. Contacte con el representante local del fabricante para obtener más información sobre la forma de desechar el equipo.
	Swedish (SWE)	Denna symbol anger att elektriska och elektroniska utrustningar inte får avyttras som osorterat hushållsavfall och måste samlas in separat. Var god kontakta en auktoriserad tillverkarrepresentant för information angående avyttring av utrustningen.

Table 1-6   WEEE Label

LABEL/SYMBOL	LANGUAGE	PURPOSE/MEANING
	Turkish (TUR)	Bu sembol, elektrikli ve elektronik ekipmanların sınıflandırılmamış çöp olarak atılmaması ve ayrı olarak toplanması gerektiğini belirtir. Lütfen ekipmanınızın imhasıyla ilgili olarak üreticinin yetkili temsilcisine baş vurun.
Pb/Cd/Hg	English	The symbol is affixed to a battery to advise the user or owner that it must be recycled or disposed of in accordance with local, state, or country laws. The letter below indicates the toxic element (Pb=Lead, Cd=Cadmium, Hg=Mercury) that is contained in the battery that may require special recycling or disposal method, Please contact a GEHC representative to facilitate servicing, removal and disposal options.

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.

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™ P5 Training are authorized to service the equipment.

1-3-3   Mechanical Safety

⚠ **WARNING**   *WHEN THE UNIT IS RAISED FOR A REPAIR OR MOVED ALONG ANY INCLINE, USE EXTREME CAUTION SINCE IT MAY BECOME UNSTABLE AND TIP OVER.*

⚠ **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 lower and center the Operator I/O Panel before moving the scanner.**

⚠ **CAUTION**   **The LOGIQ™ P5 weighs 75 kg or more, depending on installed peripherals, (165 lbs., or more) when ready for use. Care must be used when moving it or replacing its parts. Failure to follow the precautions listed could result in injury, uncontrolled motion and costly damage.**
ALWAYS:
Be sure the pathway is clear.
Use slow, careful motions.
Use two people when moving on inclines or lifting more than 16 kg (35 lbs).

⚠ **CAUTION**   **There is a pinch point in LCD monitor. Need care for injury on hands or fingers in flipping down the LCD monitor.**

1-3-3 Mechanical Safety (cont'd)

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.*
- *Eject DVD media from the system.*

⚠ **CAUTION** **Keep the heat venting holes on the monitor unobstructed to avoid overheating of the monitor.**

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.

⚠ **WARNING** *DO NOT SERVICE OR DISASSEMBLE PARTS UNDER FRU UNIT LEVEL AT ANY CIRCUMSTANCES.*

1-3-5   Label Locations
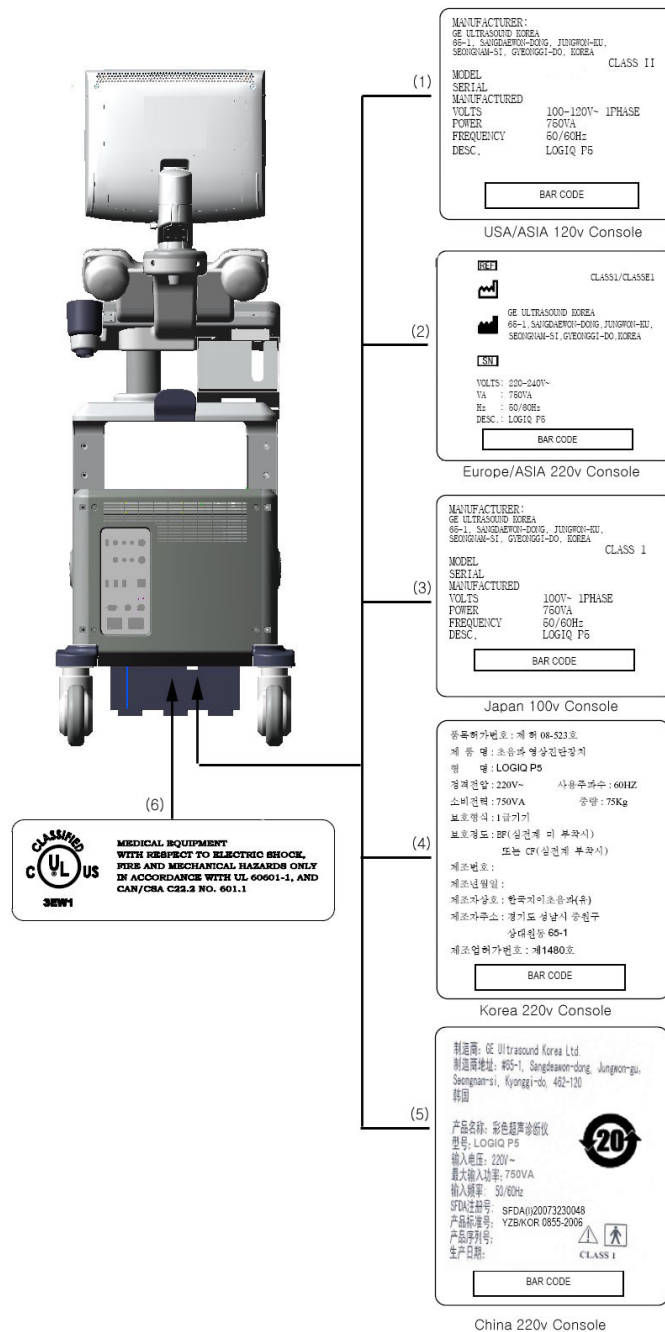
Figure 1-1   OUTSIDE MARKINGS OF LOGIQ™ P5 (Rear)

1.) Identification and Rating Plate - USA/Asia 120V Console

2.) Identification and Rating Plate - Europe/Asia/Latin America 220V Console

3.) Identification and Rating Plate - Japan 100V Console

4.) Identification and Rating Plate - Korea 220V Console

5.) Identification and Rating Plate - China 220V Console

6.) UL Label

1-3-5   Label Locations (cont'd)
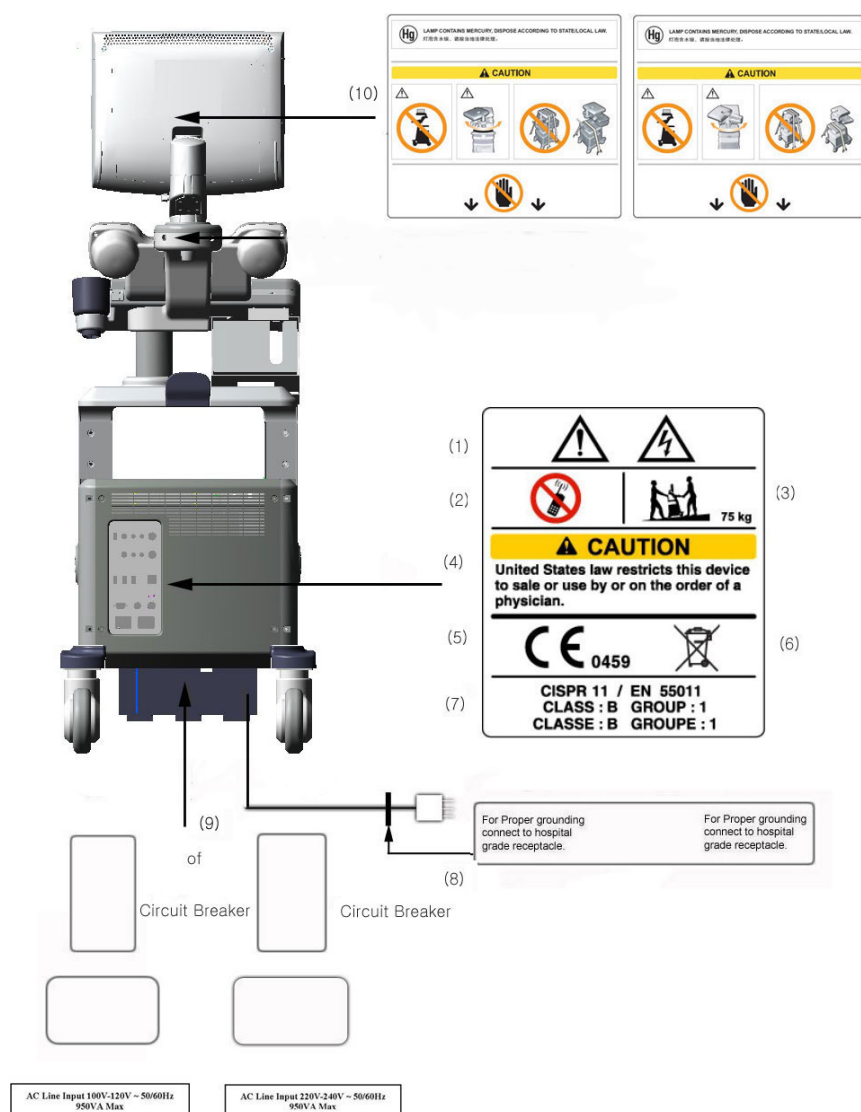
Figure 1-2   OUTSIDE MARKINGS OF LOGIQ™ P5

1.) Possible Shock Hazard

2.) Label -"Do not use the following devices near this equipment."

3.) Label - "The equipment weighs approximately 75kg.

4.) Prescription Devices

5.) CE Mark Label (Left), WEEE Label (Right)

6.) CISPR Label

7.) Grounding reliability Label

8.) Voltage Range Indication and Power indication Label

9.) Standard LCD Arm & flexible LCD Arm Option Label & Mercury Label

10.)LCD Arm Rotation Label

1-3-6   Dangerous Procedure Warnings

Warnings, such as the examples below, precede potentially dangerous procedures throughout 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 INTRODUCING 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 electrical Mains plug.

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 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™ P5 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.

For applicable standards refer to the Safety Chapter in the Basic User Manual.

NOTE: *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   Electrostatic Discharge (ESD) Prevention

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

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 GUIDELINES FOR HANDLING OF ELECTROSTATIC SENSITIVE EQUIPMENT.

Section 1-5
Customer Assistance

1-5-1 Contact Information

If this equipment does not work as indicated in this service manual or in the User Manual, or if you require additional assistance, please contact the local distributor or appropriate support resource, as listed below.

Prepare the following information before you call:

- System ID serial number.
- Software version.

Table 1-7   Phone Numbers for Customer Assistance

Location	Phone Number
USA/ Canada GE Medical Systems Ultrasound Service Engineering 4855 W. Electric Avenue Milwaukee, WI 53219 Customer Answer Center	1-800–437–1171 1-800-682-5327 1-262-524-5698 Fax: +1-414-647-4125
Latin America GE Medical Systems Ultrasound Service Engineering 4855 W. Electric Avenue Milwaukee, WI 53219 Customer Answer Center	1-262-524-5300 1-262-524-5698 Fax: +1-414-647-4125
Europe GE Ultraschall Deutschland GmbH& Co. KG BeethovenstraBe 239 Postfach 11 05 60, D-42665 Solingen Germany	Tel: +49 212 2802 208 +49 212 2802 207 Fax: +49 212 2802 431
Asia (Singapore/ Japan) GE Ultrasound Asia Service Department - Ultrasound 298 Tiong Bahru Road #15-01/06 Central Plaza Singapore 169730	Tel: +65 291-8528 +81 426-482950 Fax: +65 272-3997 +81 426-482902

1-5-2 System Manufacturer

Table 1-8   System Manufacturer

Manufacturer	FAX Number
GE Ultrasound Korea, Ltd. 9, Sunhwan-ro 214beon-gil, Jungwon-gu, Seongnam-si, Gyeonggi-do, Korea	82-31-740-6436

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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™ P5. 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.

Table 2-1   Contents in Chapter 2

Section	Description	Page Number
2-1	Overview	2-1
2-2	General Console Requirements	2-2
2-3	Facility Needs	2-7

Section 2-2
General Console Requirements

2-2-1   Console Environmental Requirements

Table 2-2   Environmental Requirements for LOGIQ™ P5 Scanners

	Operational	Storage	Transport
Temperature	10 - 30 °C 50 - 104 °F	-10 - 60 °C 14 - 140 °F	-40 - 60 °C -40 - 140 °F
Humidity	30 - 85% non-condensing	30 - 90% non-condensing	30 - 90% non-condensing
Pressure	700 - 1060hPa	700 - 1060hPa	700 - 1060hPa

Table 2-3   Environmental Requirements for an Ultrasound Room

Item	Values
Power Source	refer to Table 2-4 on page 2-3.
Current Rating	7.5A (100V-120V); 3.5A (220-240V)
Radiation Shielding	NONE REQUIRED for ULTRASOUND ENERGY
Temperature	20-26 DEG. C (68-79 DEG F) for PATIENT COMFORT
Humidity	50% to 70% for PATIENT COMFORT
Heat Dissipation	2000 BTU/Hr.
Floor Landing	Approximately 680 - 800 kg/m^2 without Accessories
Floor Condition	Gradient: WITHIN 5 degrees
Weight	75 kg (165lbs) without Accessories

2-2-1-1   Cooling

The cooling requirement for the LOGIQ™ P5 is 2000 BTU/hr. This figure does not include cooling needed for lights, people, or other equipment in the room. Each person in the room places an additional 300 BTU/hr. demand on the cooling system.

2-2-1-2   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 diameters can be a source of EMI which could degrade image quality. These controls should be selected to minimize possible interface.

2-2-2 Electrical Requirements

NOTE: *GE Medical Systems requires a dedicated power and ground for the proper operation of its Ultrasound equipment. This dedicated power shall originate at the last distribution panel before the system.*

Sites with a mains power system with defined Neutral and Live:

The dedicated line shall consist of one phase, a neutral (not shared with any other circuit), and a full size ground wire from the distribution panel to the Ultrasound outlet.

Sites with a mains power system without a defined Neutral:

The dedicated line shall consist of one phase (two lines), not shared with any other circuit, and a full size ground wire from the distribution panel to the Ultrasound outlet.

NOTE: *Please note that image artifacts can occur, if at any time within the facility, the ground from the main facility's incoming power source to the Ultrasound unit is only a conduit.*

2-2-2-1 LOGIQ™ P5 Power Requirements

The following power line parameters should be monitored for one week before installation. We recommend that you use an analyzer Dranetz Model 606-3 or Dranetz Model 626:

Table 2-4   Electrical Specifications for LOGIQ™ P5

PARAMETER	AREA	LIMITS
Voltage Range	100~120V	100~120 VAC ±10% (90-132 VAC)
	220~240V	220-240 VAC ±10% (198-264 VAC)
Power	All applications	MAX. 750 VA
Line Frequency	All applications	50/60Hz (±2Hz)
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.
Decaying Oscillation	All applications	Less than 15% of peak voltage for less than 1 millisecond.

2-2-2-2 Inrush Current

Inrush Current is not a factor to consider due to the inrush current limiting properties of the power supplies.

2-2-2-3 Site Circuit Breaker

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

⚠️ **CAUTION** **POWER OUTAGE MAY OCCURE.**

The LOGIQ™ P5 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.

2-2-2-4   **Site Power Outlets**

A desiccated 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.

2-2-2-5   **Unit Power Plug**

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

2-2-2-6   **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 transient in the air wiring. They also generate EMI. The LOGIQ™ P5 complies with limits as stated on the EMC label. However there is no guarantee that interface 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 defect.

These sources include:

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

The presence of broadcast station or broadcast van may also cause interference. See for EMI Prevention tips.

See Table 2-5 for EMI Prevention tips.

Table 2-5   EMI Prevention/abatement

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 interface with the ultrasound signals.
Replace broken RF gaskets	If more than 20% or a pair of fingers on the RF gaskets are broken, replace the gaskets. 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.

2-2-4   Scan Probe Environmental Requirements

Operation:10° to 30° C

Storage:--10° to 60° C

NOTE: *Temperature in degrees C. Conversion to Degrees F = (Degrees C * 9/5) + 32).*

⚠ **NOTICE** **SYSTEMS AND ELECTRONIC PROBES ARE DESIGNED FOR STORAGE TEMPERATURES OF -10 TO + 60 degrees C. WHEN EXPOSED TO LARGE TEMPERATURE VARIATIONS, THE PRODUCT SHOULD BE KEPT IN ROOM TEMPERATURE FOR 10 HOURS BEFORE USE.**

Section 2-3
Facility Needs

2-3-1   Purchaser Responsibilities

The work and materials needed to prepare the site is the responsibility of the purchaser. Delay, confusion, and waste of manpower can be avoided by completing pre installation work before delivery. User the Pre Installation checklist to verify that all needed steps have been taken,
Purchaser reasonability includes:

- Procuring the materials required.
- Completing the preparations before delivery of the ultrasound system.
- Paying the costs for any alternations and modifications not specifically provided in the sales contract.

NOTE: *All electrical installation that are preliminary to the positioning of the equipment at the site prepared for the equipment must be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, products involved (and the accompanying electrical installations) are highly sophisticated and special engineering competence is required. All electrical work on these product must comply with the requirements of applicable electrical codes. The purchaser of GE equipment must only utilize qualified personnel to perform electrical servicing on the equipment.*

The desire to use a non-listed or customer provided product or to place an approved product further from the system than the interface kit allows presents challenges to the installation team. To avoid delays during installation, such variances should be made known to the individuals or group performing the installation at the earliest possible date (preferable prior to purchase).
The ultrasound suite must be clean proof to delivery of the machine. Carpet is not recommended because it collects dust and creates static. Potential sources of EMI (electromagnetic interference) should also be investigated before delivery. Dirt, static, and EMI can negatively impact system.

2-3-2   Required Features

NOTE: *GE Medical Systems requires a dedicated power and ground for the proper operation of its Ultrasound equipment. This dedicated power shall originate at the last distribution panel before the system.*

Sites with a mains power system with defined Neutral and Live:

The dedicated line shall consist of one phase, a neutral (not shared with any other circuit), and a full size ground wire from the distribution panel to the Ultrasound outlet.

Sites with a mains power system without a defined Neutral:

The dedicated line shall consist of one phase (two lines), not shared with any other circuit, and a full size ground wire from the distribution panel to the Ultrasound outlet.

Please note that image artifacts can occur, if at any time within the facility, the ground from the main facility's incoming power source to the Ultrasound unit is only a conduit.

- Dedicated single branch power outlet of adequate amperage meeting all local and national codes which is located less than 2.5 m (8 ft.) from the unit's proposed location
- Door opening is at least 76 cm (30 in) wide
- Proposed location for unit is at least 0.3 m (1 ft.) from the wall for cooling
- Power outlet and place for any external peripheral are within 2 m (6.5 ft.) of each other with peripheral within 1 m of the unit to connect cables.

NOTE: *The LOGIQ™ P5 has two outlets outside the unit. Both are for on board peripherals.*

- Clean and protected space to store transducers (in their cases or on a rack)
- Material to safely clean probes (done with a plastic container, never metal)

2-3-3   Desirable Features

- Door is at least 92 cm (3 ft.) wide
- Circuit breaker for dedicated power outlet is easily accessible
- Sink with hot and cold water
- Receptacle for bio–hazardous waste, like used probe sheaths
- Emergency oxygen supply
- Storage for linens and equipment
- Nearby waiting room, lavatory, and dressing room
- Dual level lighting (bright and dim)
- Lockable cabinet ordered by GE for its software and proprietary manuals.

2-3-4   Recommended and Alternate Ultrasound Room Layout

Recommended standard floor plan and a minimal floor plan for ultrasound equipment:

A 14 by 17 foot Recommended Floor Plan
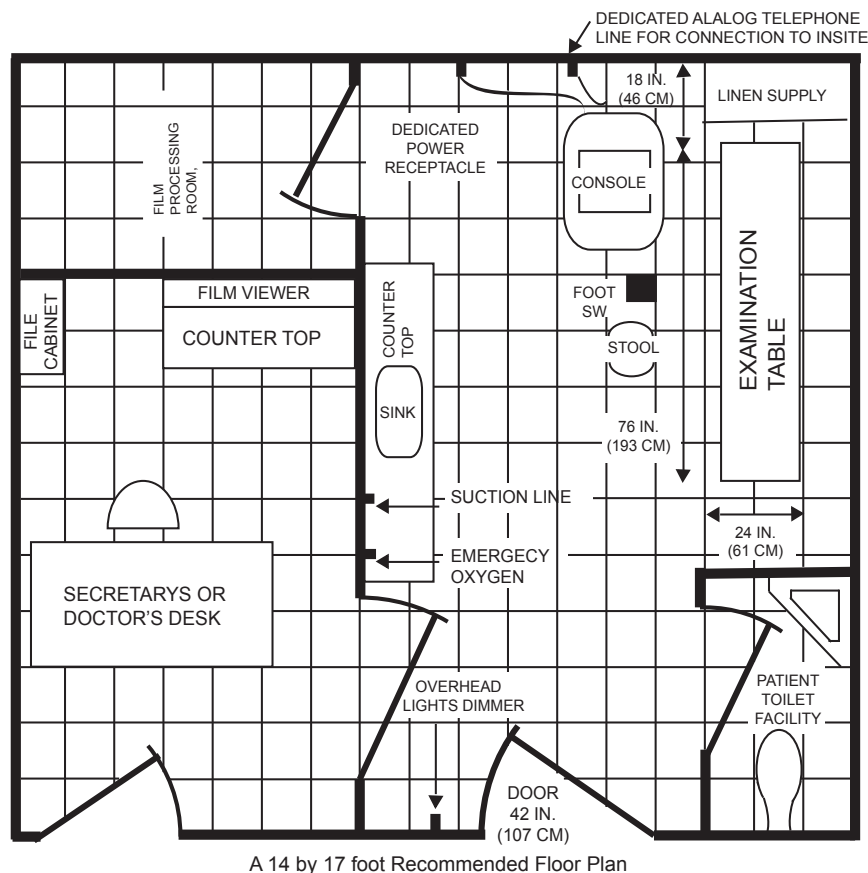
Scale : Each square equals one square foot

An 8 by 10 foot Minimal Floor Plan
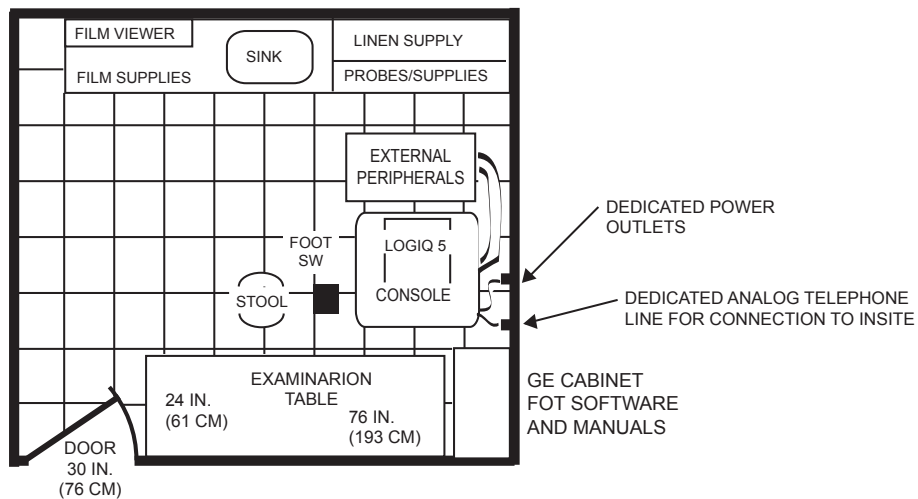
Figure 2-1   RECOMMENDED ULTRASOUND ROOM LAYOUT

2-3-5 Networking Pre-installation Requirements

2-3-5-1 Purpose of DICOM Network Function

DICOM services provide the operator with clinically useful features for moving images and patient information over a hospital network. Examples of DICOM services include the transfer of images to workstations for viewing or transferring images to remote printers. As an added benefit, transferring images in this manner frees up the on-board monitor and peripherals, enabling viewing to be done while scanning continues. With DICOM, images can be archived, stored, and retrieved faster, easier, and at a lower cost.

2-3-5-2 DICOM Option Pre-installation Requirements

To configure the LOGIQ™ P5 to work with other network connections, the site's network administrator must provide some necessary information.

Information must include:

- A host name, local port number, AE Title, IP address and Net Mask for the LOGIQ™ P5.
- The IP addresses for the default gateway and other routers at the site for ROUTING INFORMATION.
- The host name, IP address, port and AE Title for each device the site wants connected to the LOGIQ™ P5 for DICOM APPLICATION INFORMATION. A field for the make (manufacturer) and the revision of the device, is also included. This information may be useful for solving errors.

2-3-5-2   **DICOM Option Pre-installation Requirements** (cont'd)

LOGIQ™ P5
Host Name [   ]   **Local Port** [   ]   **IP Address** [   ] . [   ] . [   ] . [   ]

AE Title [   ]   **Net Mask** [   ] . [   ] . [   ] . [   ]

ROUTING INFORMATION

Destination IP Addresses   **GATEWAY IP Addresses**

                                                Default [   ] . [   ] . [   ] . [   ]

ROUTER1 [   ] . [   ] . [   ] . [   ]   [   ] . [   ] . [   ] . [   ]
ROUTER2 [   ] . [   ] . [   ] . [   ]   [   ] . [   ] . [   ] . [   ]
ROUTER3 [   ] . [   ] . [   ] . [   ]

DICOM APPLICATION INFORMATION

	NAME	MAKE/REVISION	AE TITLE	IP ADDRESSES	PORT
Store 1				[ ] . [ ] . [ ] . [ ]	[ ]
Store 2				[ ] . [ ] . [ ] . [ ]	[ ]
Store 3				[ ] . [ ] . [ ] . [ ]	[ ]
Store 4				[ ] . [ ] . [ ] . [ ]	[ ]
Store 5				[ ] . [ ] . [ ] . [ ]	[ ]
Store 6				[ ] . [ ] . [ ] . [ ]	[ ]
Worklist				[ ] . [ ] . [ ] . [ ]	[ ]
Storage Commit				[ ] . [ ] . [ ] . [ ]	[ ]
MPPS				[ ] . [ ] . [ ] . [ ]	[ ]

Figure 2-2   Worksheet for DICOM Network Information

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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.

Table 3-1   Contents in Chapter 3

Section 3-2
Installation Reminders

3-2-1   Average Installation Time

Table 3-2   Average Installation Time

Description	Average Installation Time	Comments
Unpacking the scanner	0.5 hour	
Scanner wo/options	0.5 hour	Dependant on the configuration that is required
DICOM Option	0.5 hour	Dependant on the amount of configuration
InSite Option	0.5 hour	

The LOGIQ™ P5 has been designed to be installed and checked out by an experienced service technician in approximately four hours. LOGIQ™ P5 consoles with optional equipment may take slightly longer.

3-2-2   Installation Warnings

1.) Since the LOGIQ™ P5 weighs approximately 75 kg.(165 lb.) without options, preferably two people should unpack it. Two people are also preferable for installing any additional bulky items.

2.) There are no operator serviceable components. To prevent shock, do not remove any covers or panels. Should problems or malfunctions occur, unplug the power cord. Only qualified service personnel should carry out servicing and troubleshooting.

NOTE: For information regarding packing labels, refer to LABELS ON PACKAGE.

3.) After being transported, the unit may be very cold or hot. If this is the case, allow the unit to acclimate before you turn it on. It requires one hour for each 2.5°C increment it's temperature is below 10°C or above 30°C.

⚠ **CAUTION** **Equipment damage possibility. Turning the system on without acclimation after arriving at site may cause the system to be damaged.**

Table 3-3   Acclimation Time

°C	60	55	50	45	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40
°F	140	131	122	113	104	96	86	77	68	59	50	41	32	23	14	5	-4	-13	-22	-31	-40
hrs	8	6	4	2	0	0	0	0	0	0	0	2	4	6	8	10	12	14	16	18	20

3-2-3 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** Two people should unpack the unit because of its weight. Two people are required whenever a part weighing 19kg (35 lb.) or more must be lifted.

⚠ **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™ P5 and kept near the unit for quick reference.

⚠ **CAUTION** ACOUSTIC OUTPUT HAZARD
Although the ultrasound energy transmitted from the LOGIQ™ P5 probe is within FDA limits, avoid unnecessary exposure. Ultrasound energy can produce heat and mechanical damage.
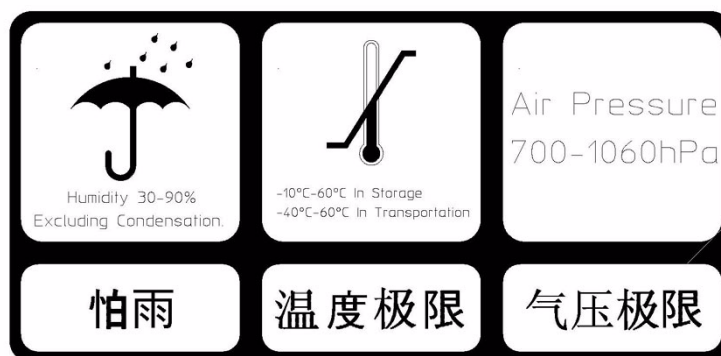
Figure 3-1   Environmental Labels

Section 3-3
Receiving and Unpacking the Equipment

When a new system arrives, check that any components are not damaged and are not in short supply. If shipping damage or shortage occurs, contact the address shown in Chapter 1.

⚠ **CAUTION** **Do not lift the unit by the Keyboard. Equipment damage may result.**

⚠ **CAUTION** **The crate with the LOGIQ™ P5 weighs approximately 75 kg. (165 lb.) Be prepared for a sudden shift of weight as the unit is removed from its base (pallet)**

1.) Cut the three PLASTIC BANDs.
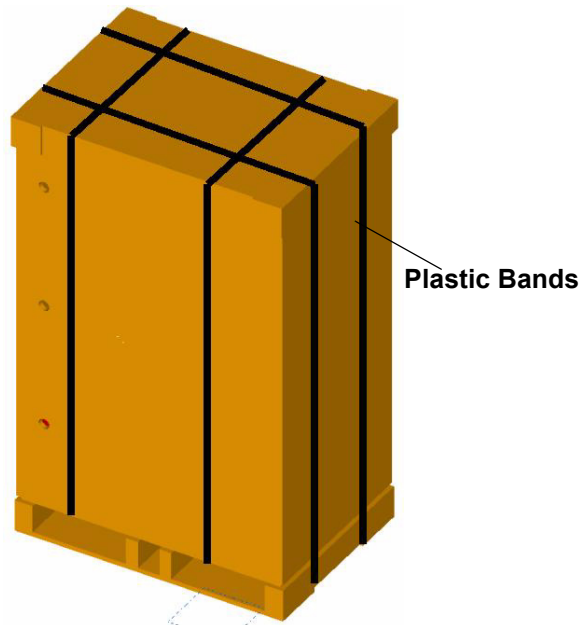
Plastic Bands

Figure 3-2   Cutting the Plastic Bands.

Section 3-3   Receiving and Unpacking the Equipment (cont'd)

2.) Lift the TOP COVER up and off.
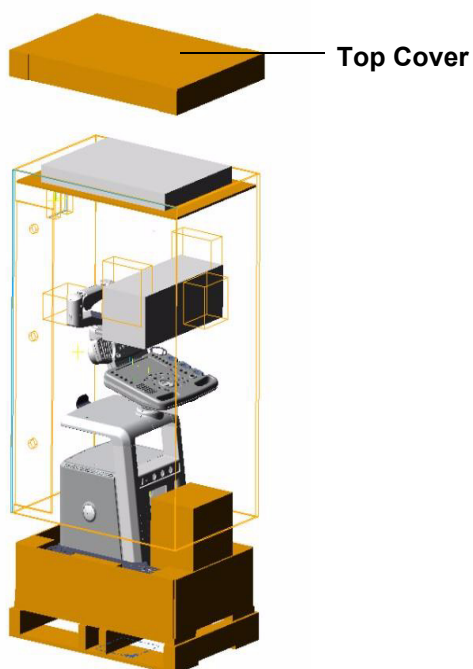
Figure 3-3   Removing the top Cover

Section 3-3   Receiving and Unpacking the Equipment (cont'd)

3.) Remove the Top Plate up and off..
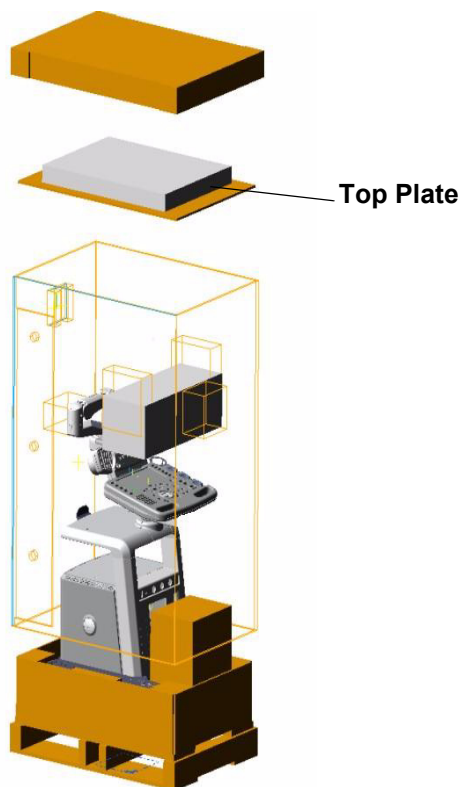
Figure 3-4   Removing the Top Plate

Section 3-3 Receiving and Unpacking the Equipment (cont'd)

4.) Remove the three PLASTIC JOINTs from the OUTER SLEEVE.

5.) Remove the OUTER SLEEVE.

Plastic Joint

Outer Sleeve

Palette Assy
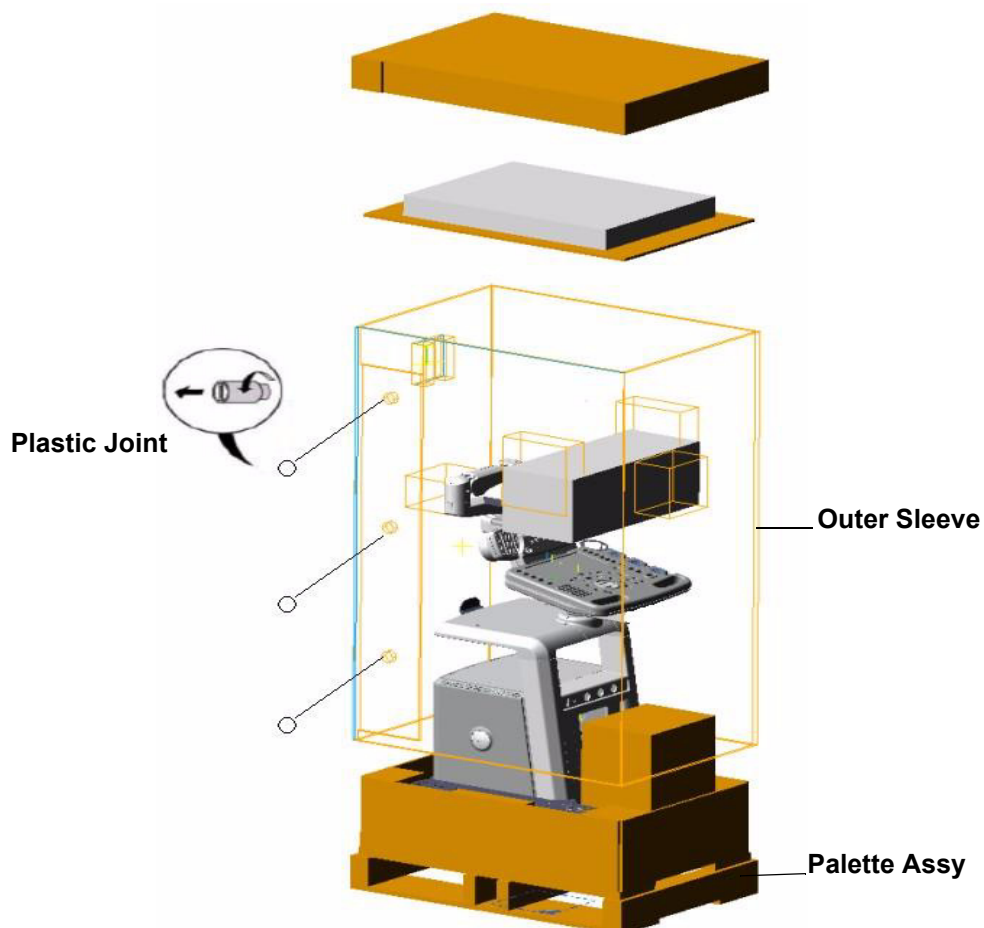
Figure 3-5   Removing Plastic Joints and Sleeves

Section 3-3   Receiving and Unpacking the Equipment (cont'd)

6.) Remove the MONITOR SUPPORTER and Option Box.

7.) Remove the PLASTIC BAG.

8.) Unlock the front caster and carefully put the console off the PALETTE.

Monitor Pad
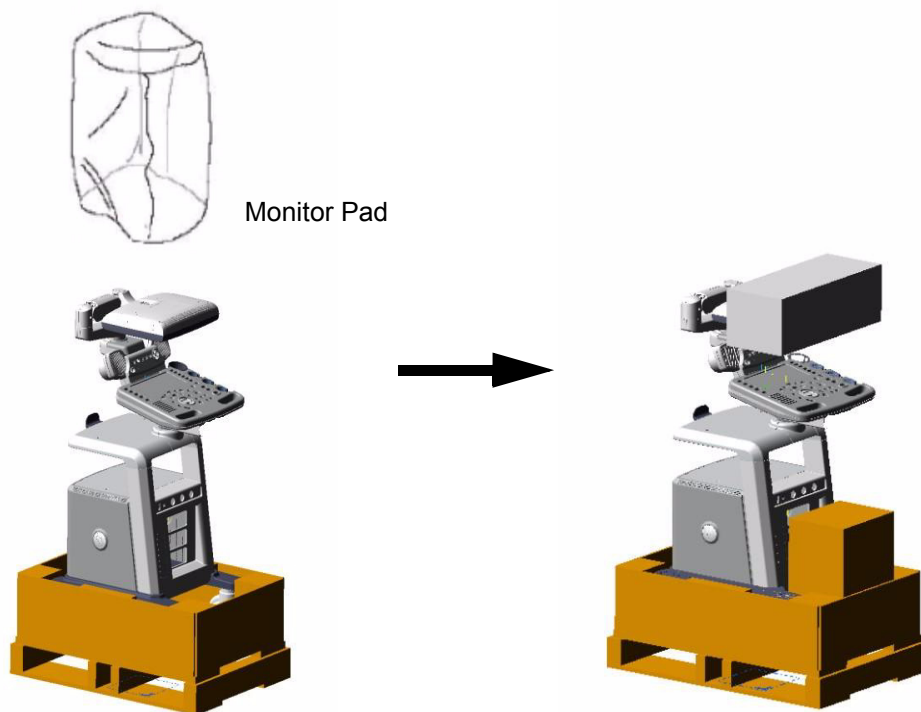
Figure 3-6   Moving the LOGIQ™ P5 from the crate

3-3-1   Moving into Position

⚠ **CAUTION** **Do not lift the unit by the Keyboard.**
Do not tilt the unit more than 5 degrees to avoid tipping it over.
To avoid injury by tipping over. Set the monitor to the lowest position before moving.

⚠ **CAUTION** **Equipment Damage Possibility. Lifting the console by holding covers may damage the covers.**
Do not lift the console by holding any covers.

In general, a single adult can move the LOGIQ™ P5 along an even surface with no steep grades. At least two people should move the machine when large humps, grooves, or grades will be encountered. (It is better to pull from the rear rather than push from the front of the unit). Before moving, store all loose parts in the unit. Wrap transducers in soft cloth or foam to prevent damage.

Although LOGIQ™ P5 is a compact and mobile machine, two people should move it over rough surfaces or up and down grades.

3-3-2   Adjusting System Clock

Set the system clock for the LOGIQ™ P5 to the local time. For procedure of adjusting the system clock, refer to section 3-6-1-1 on page 16.

Fill out proper customer Information the Product Locator Installation Card. Mail this Installation Card "Product Locator" to the address corresponding to your pole.

3-3-3   Product Locator Installation Card

NOTE: *The Product Locator Installation Card shown may not be same as the provided Product Locator card.*

Figure 3-7   Product Locator Installation Card

Section 3-4
Preparing for Installation

3-4-1 Verify Customer Order

Compare items received by the customer to that which is listed on the delivery order. Report any items that are missing, back ordered or damaged.

3-4-2 Physical Inspection

3-4-2-1 System Voltage Settings

Verify that the scanner is set to the correct voltage.
The Voltage settings for the LOGIQ™ P5 Scanner is found on a label to the right of the Power switch and External I/O, on the rear of the system.

⚠ **WARNING** *Connecting a LOGIQ™ P5 scanner to the wrong voltage level will most likely destroy the scanner.*

3-4-2-2 Video Formats

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

3-4-3 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 3-5Completing the Installation

3-5-1   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.*

3-5-1-1   Scanner Power On

1.) Connect the Main Power Cable at the rear of the System.

⚠ **WARNING** ***Protective earth must be taken when connecting AC power cable (200V) without its plug to wall outlet.***

2.) Connect the Main Power cable to an appropriate mains power outlet.
3.) Switch ON the Main Circuit Breaker at the rear of the System.
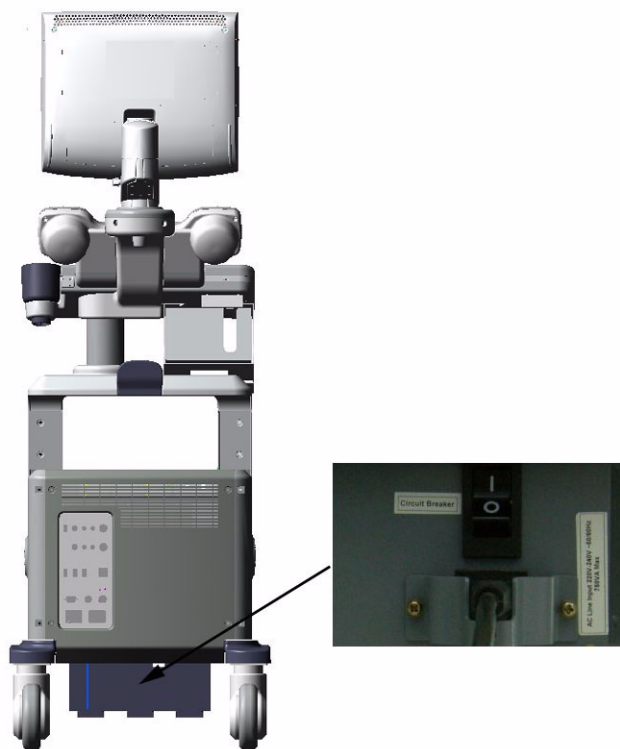
Figure 3-8   Circuit Breaker

When power is applied to the Scanner, and the Rear Circuit breaker is turned ON, Power is distributed to the DC Power supply unit and power control assy in the AC power assy. When the Power ON/OFF key is pressed once, the DC power supply is enabled and feed each DC power to board assemblies. and system run the software.

4.) Press the **ON/OFF** key at the front of the System once.

3-5-1-1   **Scanner Power On** (cont'd)

Figure 3-9   Power On/Off Switch Location

3-5-1-2 **Power Up Sequence**

1.) The Start Up Screen will be shown on the Monitor display when the system is turned ON.

Figure 3-10   Start Up Screen Display

2.) After initialization is complete, all lighted buttons on the Control Panel light and the default B-Mode screen or Patient screen (no probes are connected) is displayed on the monitor display.

3-5-1-3 **Power Up Sequence**

NOTE: *To enter the Maintenance Mode, select Maintenance button.*

NOTE: *Figure 3-11 on page 3-13 displays when Service Dongle inserted in Rear Panel.*
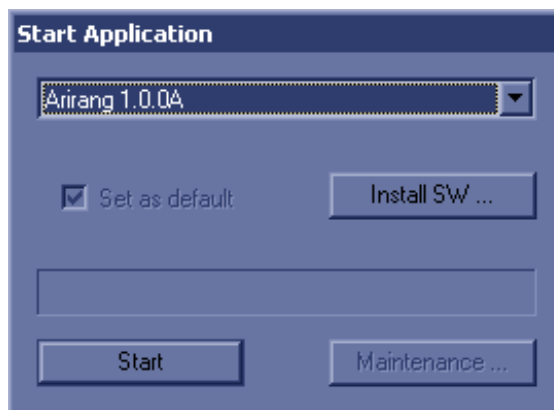
Figure 3-11   Start Application Window

NOTE: *Start is selected automatically when it time out.*

NOTE: *In case the system is locked with task manager, use **arirang** as a password to unlock the system.*

3-5-2   Power Off/ Shutdown

NOTE: *After turning off a 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.*

3-5-2-1   Power Shutdown

1.) Press the **ON/OFF** key at the front of the System. refer to Figure 3-9 on page 3-12 .

2.) Click the shutdown icon in the shutdown dialog box and wait until the system shutdown.

3.) Switch OFF the Main Circuit Breaker at the rear of the system refer to Figure 3-8 on page 3-11 .

4.) Disconnect the Main Power Cable is necessary. *For example : Relocating the scanner.*

3-5-3   Transducer Connection

1.) Connect a transducer to one of the three rightmost transducer receptacle as follows:

A.) Ensure that the transducer twist lock lever to the horizontal 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 horizontal position to lock it in place. Twist the lever to the vertical position to disconnect the transducer.

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

Section 3-6
System Configuration

3-6-1   System Specifications

3-6-1-1   System Settings

Table 3-1   System Configuration

Configuration Category	Description
Settings	Enables the user or service personnel to set the date, time, unit, language, basic information about the organization such as the institution name and department.

1.) Press Insert key on the A/N keyboard to enter the utility menu.

2.) Select **Utility > System > General.**

3.) Set the **Hospital name, Department, Date and Time, Language,** and **Units.**
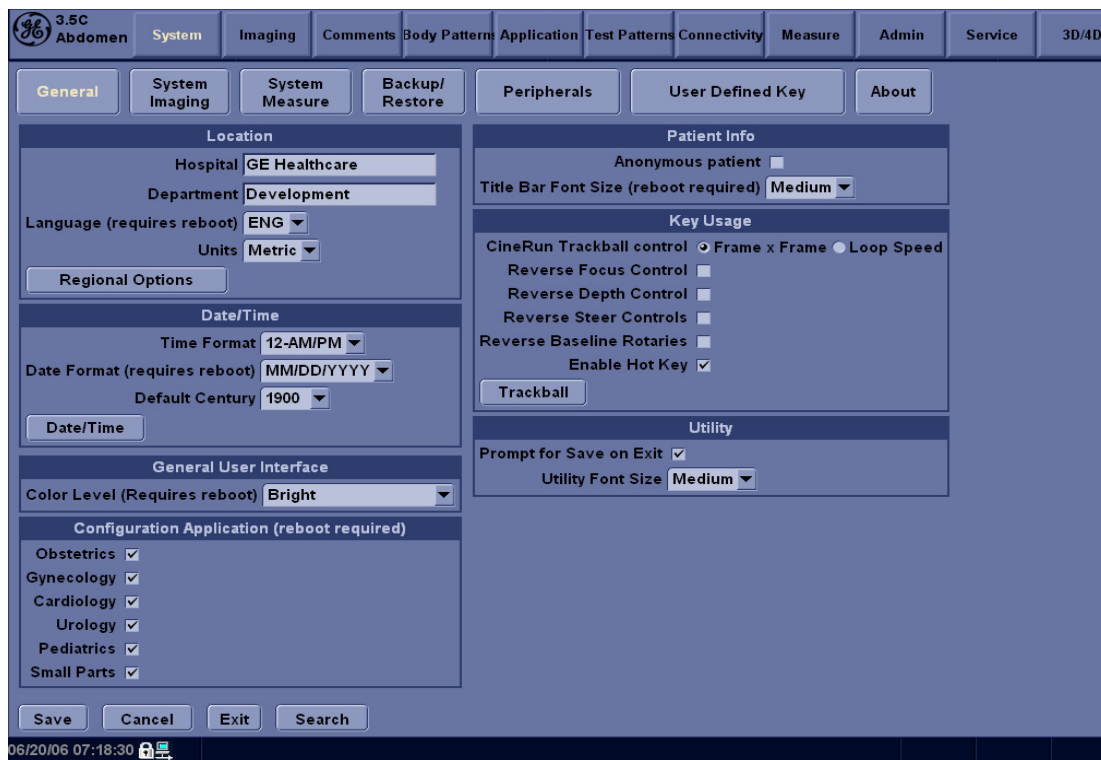
Figure 3-12   Setting Display

4.) Click on **Exit** to terminate the utility function.

3-6-1-2   **Physical Dimensions**

The physical dimensions of the LOGIQ™ P5 unit are summarized in Table 3-2 on page 3-17 .
The Size of LOGIQ™ P5, with monitor and peripherals

Table 3-2   Physical Dimensions of LOGIQ™ P5

Height	Width	Depth	Unit
135/141	43.0	64.0	cm
53.15 - 55.50	16.97	25.2	inches

WEIGHT : 75Kg (165bs)
         including Monitor
NOTE : Length is in mm
         Variation +/- 10%

430

640

1350 / 1410

840 / 900
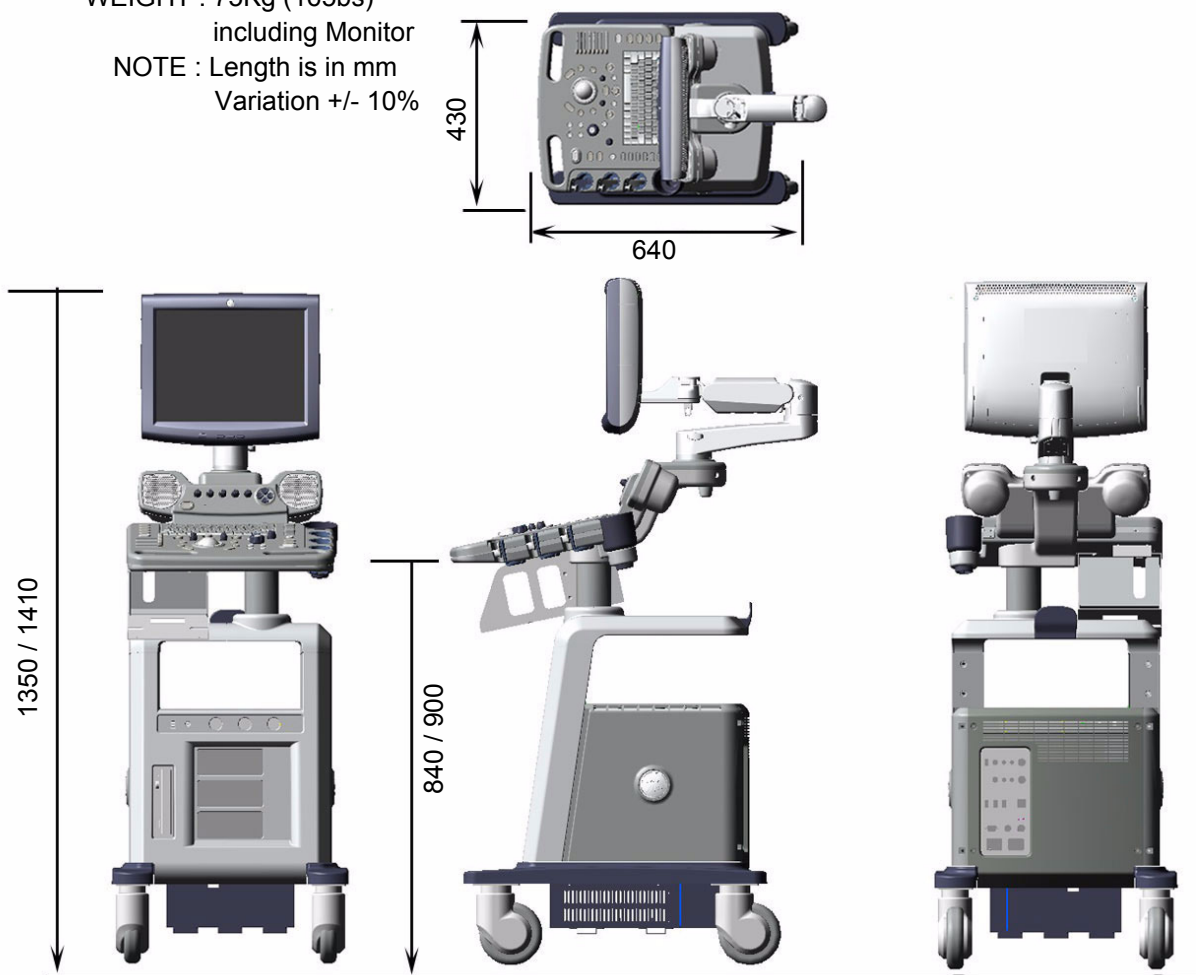
Figure 3-13   Overall Dimensions

3-6-1-3 **Weight without Monitor and Peripherals**

Table 3-3   Weight of LOGIQ™ P5 With Monitor and Without Other Peripherals

Model	Weight [kg]	Weight [lbs]
LOGIQ™ P5	Approximately 75	Approximately 165

3-6-1-4 **Acoustic Noise Output:**

Less than 70dB (A) according to DIN 45635 - 19 - 01 - KL2.

3-6-2   Electrical Specifications

Table 3-4   Electrical Specifications for LOGIQ™ P5

System	Voltage	Current	Frequency
1	110 ~ 120 VAC	7 ~ 9A	50~60Hz
2	220 ~ 240 VAC	3.5 ~ 4.5A	50~60Hz

3-6-3   On-Board Optional Peripherals

Table 3-5   List of Recording Devices

Device	Manufacturer	Model	Video Signal
B/W Video Printer	Mitsubishi SONY	P93D/P95DW/P95D/P95DE/P95DW-N/P95DW-B UP-D895/UP-D897	N/A (* USB Interface)
Video Cassette Recorder	Mistubishi	HS-MD3000U HS-MD3000E	NTSC/PAL (USB Interface)
DVD Video Recorder	Panasonic	LQ-MD800	NTSC/PAL (USB Interface)
A6 Color Video Printer	Mitsubishi SONY	CP30DW/CP30DW-Z UP-D23MD/UP-D25MD	N/A (* USB Interface)

See each option installation instructions for installation and connection procedures.

NOTE: *There are no external peripheral options for the LOGIQ™ P5.*

3-6-4   External I/O Connector Panel

Located on the rear panel are video input and output connectors, audio input and output, USB, footswitch connector power connector and control connections for VCR or DVD Recorder, printer, and service tools.

This section indicates the pin assignment for each connector.

Figure 3-14   Rear Connector Panel

NOTE: *Each outer (case) ground line of peripheral/accessory connectors are protectively grounded. Signal ground lines are not isolated, except the Service port (3). All of signal lines (include signal GND) of the Service port are isolated.*

3-6-4-1 **External I/O Pin Outs**

Pin No.	Signal	Pin No.	Signal
1	RED	9	N/A
2	GREEN	10	SGND
3	BLUE	11	N/A
4	N/A	12	N/A
5	GND	13	HSYNC
6	RGND	14	VSYNC
7	GGND	15	N/A
8	BGND		

Table 3-6   Pin Assignments of DB15 connector for External VGA

Pin No.	Signal	Pin No.	Signal
1	+5 VDC	3	DATA +
2	DATA -	4	GND

Table 3-7   Pin Assignments of USB

Pin No.	Signal	Pin No.	Signal
1	TX+	5	NC
2	TX-	6	RX-
3	RX+	7	NC
4	NC	8	NC

Table 3-8   Pin Assignments of Ethernet

3-6-5   Video Specification

Video specifications may be needed to be able to connect the VCR or DVD Video Recorder to the LOGIQ™ P5.

Table 3-9   Video Specifications

Timing Parameter	NTSC	PAL	640x480 60Hz	800x600 60Hz	800x600 75Hz	1024x768 60Hz
Horizontal Rate [kHz]	60.02	31.25	31.47	37.88	46.88	48.36
Horizontal Period [μs]	16.66	32.00	31.78	26.40	21.33	20.68
Pixel Clock [MHz]	78.75	29.50	24.55	40.00	49.50	65.00
H Blank Width [μs]	3.66	5.97	5.70	6.40	5.17	4.92
H Sync Width [μs]	1.22	2.34	2.36	3.20	1.62	2.09
H Front Porch [μs]	0.20	0.75	0.73	1.00	0.32	0.37
Active Horizontal Period [μs]	13.00	26.03	26.07	20.00	16.16	15.75
Vertical Rate [Hz]	75.03	50.00	59.94	60.32	75.00	60.00
Vertical Period [ms]	13.33	20.00	16.68	16.58	13.33	16.67
V Sync Width [lines=ms]	32=0.53	49=1.57	45=1.43	28=0.74	25=0.53	38=0.79
V Front Porch [lines=μs]	3=50.00	5=160.00	6=190.70	4=105.60	3=64.00	6=124.10
Equalization Gate [lines=μs]	1=16.66	5=160.0	6=190.7	1=26.4	1=21.3	3=62.00
Lines: Field/Frame	800	625/625	525/525	628	625	806
Active Lines/Frame	768	576	480	600	600	768

3-6-6   Setting VCR (Mitsubishi MD3000) USB Interface

1.) Turn off the Power of the VCR.

2.) Open the rear panel of the VCR.

3.) Set dip switches. Off 1~6 pins, On 7 pin, and Off 8 pin.

NOTE: *7 Pin ON = USB Interface, OFF = RS232C Interface.*
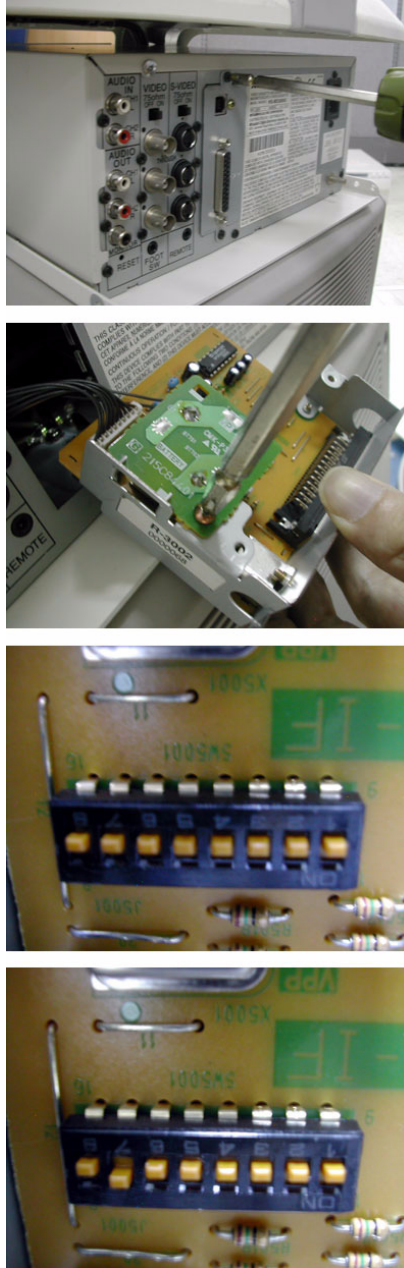
Figure 3-15   Setting VCR USB Interface

Section 3-7
Available Probes

See Specifications in the LOGIQ™ P5 User Manual for probes and intended use.

See *Chapter 9*, for part numbers to be used when ordering new or replacement probes.

Section 3-8
Software/Option Configuration

refer to the LOGIQ™ P5 Basic User Manual, Chapter 16, Customizing Your System for information on configuring items like Hospital, Department, Language, Units (of measure), Date, Time and Date Format.

For information on configuring Software Options, refer to the LOGIQ™ P5 Basic User Manual, Chapter 16, Customizing Your System.

For information on configuring DICOM Connectivity, refer to the LOGIQ™ P5 Basic User Manual, Chapter 16, Customizing Your System.

Section 3-9
Connectivity Installation Worksheet

Site System Information

Site:

Dept:

LOGIQ SN: **Type:**

Floor:

Room:

REV:

Comments:

CONTACT INFORMATION

Name	Title	Phone	E-Mail Address

TCP/IP Settings

Name - AE Title:

IP Settings

IP Address:

Subnet Mask:

Default Gateway:

Remote Archive Setup

Remote Archive IP:

Remote Archive Name:

Services (Destination Devices)

	Device Type	Manufacturer	Name	IP Address	Port	AE Title
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Section 3-10
Insite IP Address Configuration

This information needed to facilitate the OnLine Center engineers in connecting to the system is found in the InSite Installation Manual.

Section 3-11
Loading Base System Software

3-11-1 Loading Base system Software

For more information on loading base system software, refer to Chapter 8.

Section 3-12
Warnings

3-12-1 Warnings

3-12-1-1 USB HDD

External USB type Hard drive may be used to back up the data. But not all kinds of USB type can be supported.

Never use USB types which require additional power source.

3-12-1-2 Starting Echoloader in Maintenance mode

If Echoloader never started once, starting Echoloader in the maintenance mode will not work. In other words, in order to be able to start Echoloader in maintenace mode, Echoloader should have been started at least once.

Section 3-13
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 information is available during the operation and service of the complete system.*

3-13-1   Product Locator Installation

NOTE: *The Product Locator Installation Card shown may not be same as the provided Product Locator card.*

Figure 3-16   Product Locator Installation Card

3-13-2   User Manual(s)

Check that the correct User Manual(s) for the system and software revision, is included with the installation. Specific language versions of the User Manual may also be available. Check with your GE Sales Representative for availability.

3-13-2-1   Reference off-board peripherals and options

None.

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™ P5 scanner diagnostics by using the built-in service software, and power supply adjustments.

Table 4-1   Contents in Chapter 4

Section	Description	Page Number
4-1	Overview	4-1
4-2	Required Equipment	4-1
4-3	General Procedure	4-2
4-4	Software Configuration Checks	4-25
4-5	Peripheral Checks	4-26
4-6	Monitor Function Checks	4-27
4-7	Keyboard Function Checks	4-29
4-8	Mechanical Function Checks	4-34
4-9	Board Function Checks	4-41
4-10	Site Log	4-54

Section 4-2
Required Equipment

- An empty (blank) DVD-R or CD-R Disk.
- At least one transducer.

Section 4-3
General Procedure

⚠ **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.

⚠ **NOTICE** Lockout/Tagout Requirements (For USA only)

Follow OSHA Lockout/Tagout requirements by ensuring you are in total control of the Power Cable on the system.

4-3-1 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.*

4-3-1-1 Scanner Power On

1.) Connect the Main Power cable to an appropriate mains power outlet.

2.) Switch ON the Main Circuit Breaker at the rear of the System.

Figure 4-1   Circuit Breaker

When power is applied to the Scanner, and the Rear Circuit breaker is turned ON, Power is distributed to the DC Power supply unit and power control assy in the AC power assy. When the Power ON/OFF key is pressed once, the DC power supply is enabled and feed each DC power to board assemblies. and system run the software

4-3-1-1   Scanner Power On (cont'd)

3.) Press the **ON/OFF** key at the front of the System once.

Figure 4-2   Power On/Off Standby Switch Location

4-3-2   Power Off / Shutdown

NOTE: After turning off a 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.

4-3-2-1   Scanner Shutdown

1.) Press the On/Off **Key at the front of the System** once to display the SYSTEM - EXIT menu.

2.) Select Shutdown from the SYSTEM - EXIT menu.
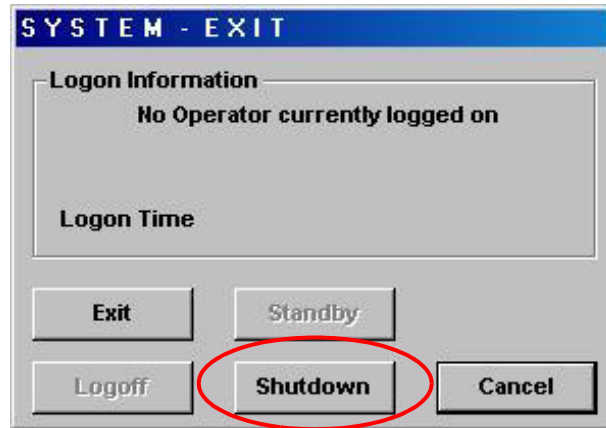
Figure 4-3   System Exit Menu for Power Down

4-3-2-2   Switch off the System

1.) Switch OFF the Circuit Breaker at the back of the scanner.

2.) Unplug the power cord if necessary. For example : Servicing or relocating the scanner.

4-3-3   System Features

4-3-3-1   Control Panel for LOGIQ™ A5
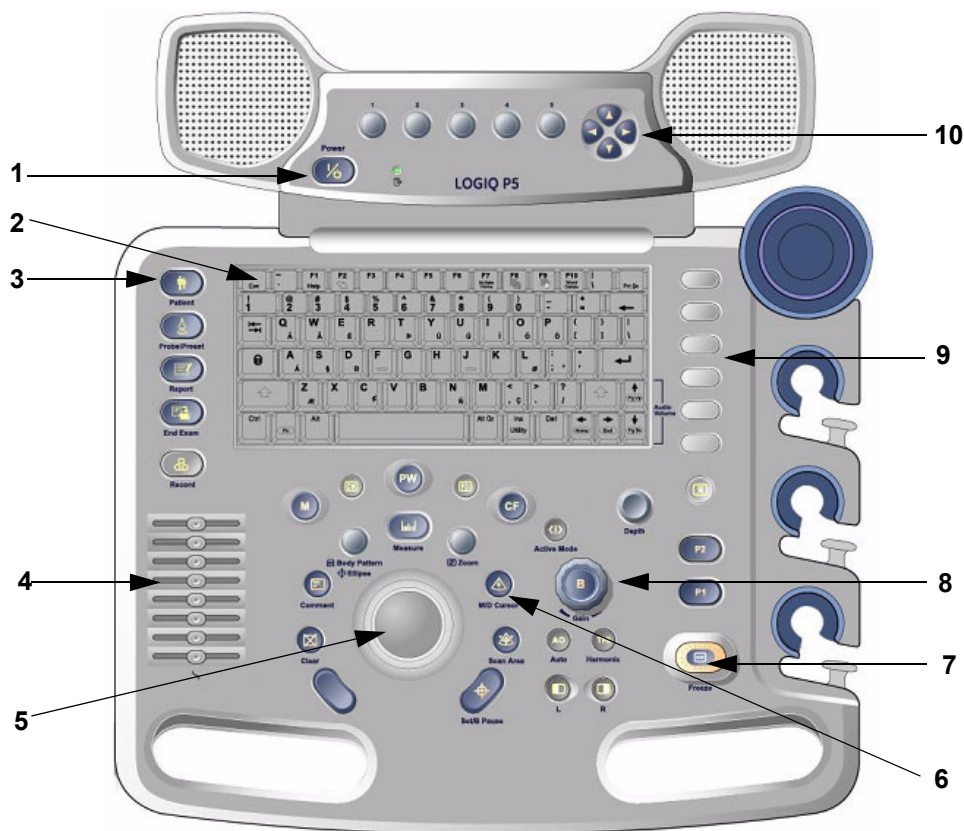
Figure 4-4   Control Panel Tour LOGIQ™ A5

1.) Power on/off switch
2.) Alpha Numeric key
3.) Patient Key
4.) TGC
5.) Track Ball
6.) Function Select key
7.) Freeze Key
8.) Gain Knob
9.) User Define Key

4-3-3-2   Control Panel for LOGIQ™ A5/LOGIQ™ A5Pro
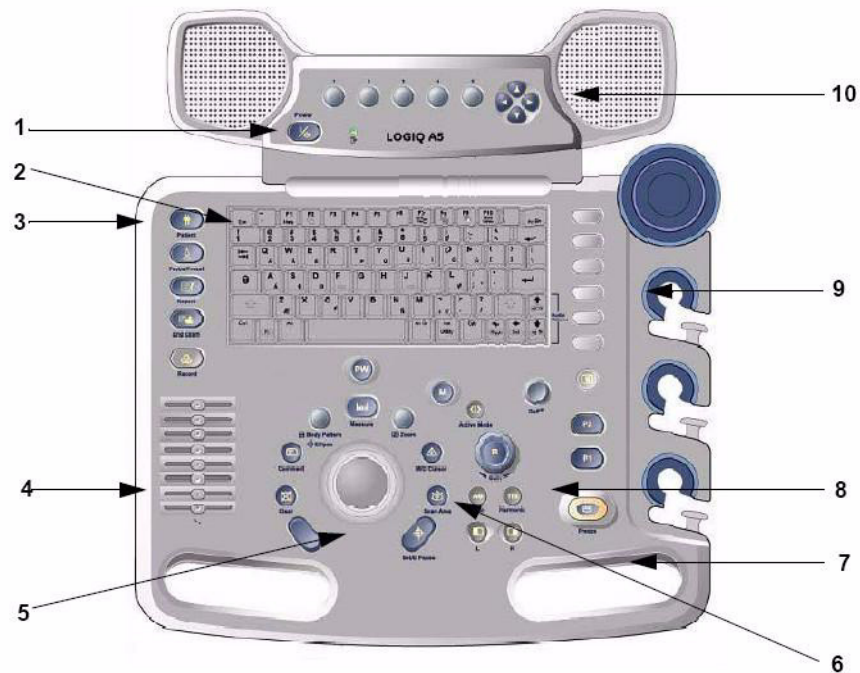
Figure 4-5   Control Panel Tour LOGIQ™ A5/ LOGIQ™ A5Pro

1.) Power on/off switch
2.) Alpha Numeric key
3.) Patient Key
4.) TGC
5.) Track Ball
6.) Function Select key
7.) Freeze Key
8.) Gain Knob
9.) User Define Key

NOTE: *If the LOGIQ™ A5 have been upgrade with Color Upgrade kit, LOGIQ™ A5 have same keyboard as LOGIQ™ A5.*

NOTE: *LOGIQ™ A5Pro has the same control panel of LOGIQ™ A5, but PW Mode button is not enabled.*

4-3-3-3 Monitor Display for LOGIQ™ A5
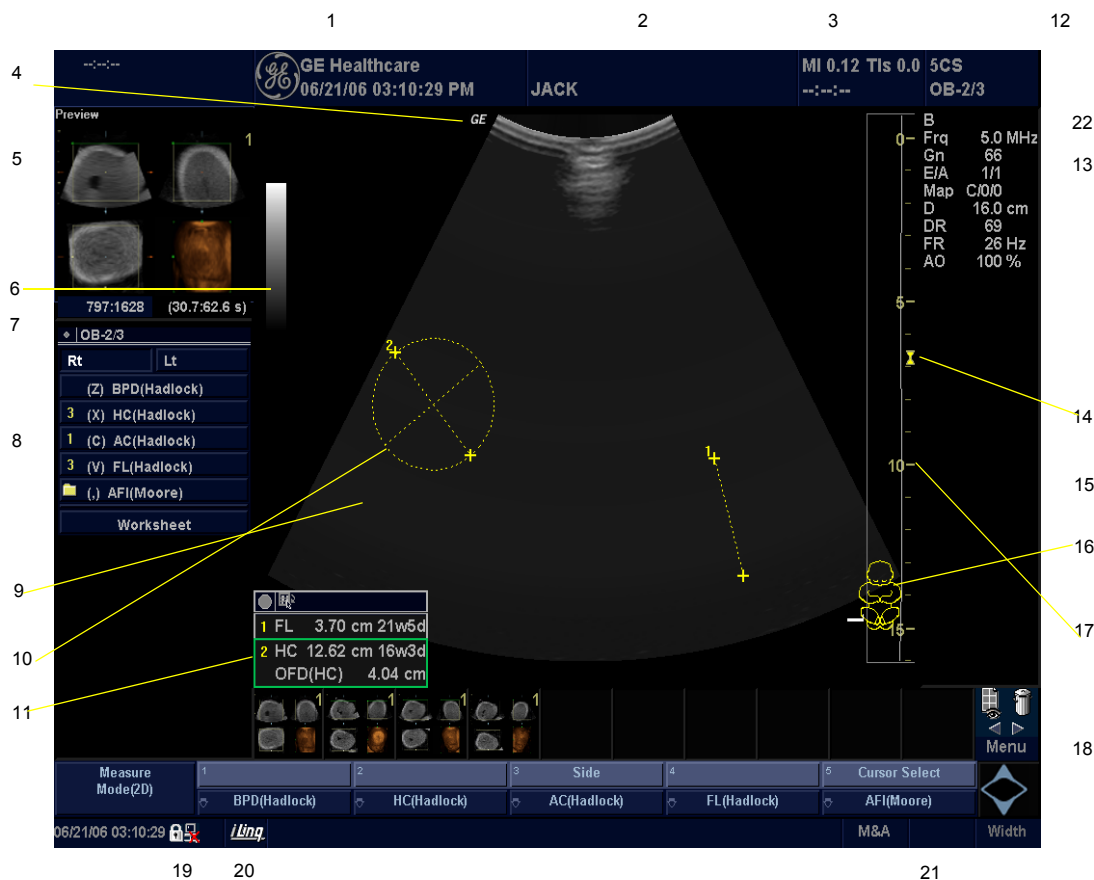
Figure 4-6   P5 Monitor Display Tour

1. Institution/Hospital Name, Date, Time, Operator Identification.
2. Patient Name, Patient Identification.
3. Power Output Readout
4. GE Symbol: Probe Orientation Marker.
5. Image Preview.
6. Gray/Color Bar.
7. Cine Gauge.
8. Measurement Summary Window.
9. Image.
10. Measurement Calipers.
11. Measurement Results Window.
12. Probe Identifier. Exam Preset.

13. Imaging Parameters by Mode.
14. Focal Zone Indicator.
15. TGC.
16. Body Pattern.
17. Depth Scale.
18. Top Menu
19. Caps Lock: Lit when On.
20. Service Interface icon (wrench), iLinq icon, and system messages display (not shown on image)
21. Trackball Functionality Status: Scroll, M&A (Measurement and Analysis), Position, Size, Scan Area Width and Tilt.
22. Sub Menu

4-3-4   System B/M-Mode Checks

For a basic functional check of the system's different modes, the Quick Guide will familiarize you with image optimization for **B-Mode**, **M-Mode**, **Color Flow**, and **Doppler**.

Table 4-2   B/M-Mode Functions

Power Output (Acoustic Power)	Optimizes image quality and allows user to reduce beam intensity. 2% increments between 0-100%.
Dynamic Range	Dynamic Range controls how echo intensities are converted to shades of gray, thereby increasing the adjustable range of contrast.
Focus Number and Position	Increases the number of transmit focal zones or moves the focal zone(s) so that you can tighten up the beam for a specific area. A graphic caret corresponding to the focal zone position(s) appears on the right edge of the image.
Rejection	Selects a level below which echoes will not be amplified (an echo must have a certain minimum amplitude before it will be processed).
Edge Enhance	Edge Enhance brings out subtle tissue differences and boundaries by enhancing the gray scale differences corresponding to the edges of structures. Adjustments to M Mode's edge enhancement affects the M Mode only.
Frame Average	Temporal filter that averages frames together. This has the effect of presenting a smoother, softer image.
Colorize	Enables gray scale image colorization. To deactivate, reselect a Gray Map.
Gray Map	Determines how the echo intensity levels received are presented as shades of gray.
Rotation (Up/Down)	Rotates the image by selecting the value from the pop up menu.
Frequency	Multi Frequency mode lets you downshift to the probe's next lower frequency or shift up to a higher frequency.
Frame Rate/Resolution	Optimizes B Mode frame rate or spatial resolution for the best possible image.
B Flow	Provides intuitive representation of non-quantitative hemodynamics in vascular structures.
Sensitivity/PRI	Adjusts the sample rate for the flow signal.
Background On/Off	Background On lets you view the anatomy roadmap; Background Off lets you view just flow information.
Sweep Speed	Changes the speed at which the timeline is swept.

4-3-5   System CFM and PWD Checks

Table 4-3   CFM and PWD Functions

Baseline	Adjusts the baseline to accommodate faster or slower blood flows to eliminate aliasing.
PRF/Wall Filter	Velocity scale determines pulse repetition frequency. If the sample volume gate range exceeds single gate PRF capability, the system automatically switches to high PRF mode. Multiple gates appear, and HPRF is indicated on the display.
Angle Correct	Estimates the flow velocity in a direction at an angle to the Doppler vector by computing the angle between the Doppler vector and the flow to be measured
Threshold	Threshold assigns the gray scale level at which color information stops.
Map	Allows a specific color map to be selected. After a selection has been made, the color bar displays the resultant map.
Invert	Allows blood flow to be viewed from a different perspective, i.e. red away (negative velocities) and blue toward (positive velocities). The real-time or frozen image can be inverted.
Packet Size	Controls the number of samples gathered for a single color flow vector.
Quick Angle Correct	Quickly adjusts the angle by 60 degrees
Doppler Display Formats	Display layout can be preset to have B-Mode and Time-motion side-by-side or over-under. In the side-by-side layout, there are three display alternatives defined: equal priority, time-motion priority or time-motion with B-Mode reference. In the over-under layout, there are three display alternatives defined: time-motion priority, B Mode priority or equal priority.
Sample Volume Gate Length	Sizes the sample volume gate
Scan Area	Slants the B-Mode or Color Flow linear image left or right to get more information without moving the probe

4-3-6 Basic Measurements

NOTE: *The following instructions assume that you first scan the patient and then press **Freeze**.*

4-3-6-1 Distance and Tissue Depth Measurements

1.) Press **MEASURE** once an active caliper displays.

2.) To position the active caliper at the start point (distance) or the most anterior point (tissue depth), move the **TRACKBALL**.

3.) To fix the start point, press *Set*. The system fixes the first caliper and displays a second active caliper.

4.) To position the second active caliper at the end point (distance) or the most posterior point (tissue depth), move the **TRACKBALL**.

5.) To complete the measurement, press **SET**. The system displays the distance or tissue depth value in the measurement results window.

Before you complete a measurement:

To toggle between active calipers, press **MEASURE**.

To erase the second caliper and the current data measured and start the measurement again, press **CLEAR** once.

NOTE: *To rotate through and activate previously fixed calipers, turn **CURSOR SELECT**.*

NOTE: *After you complete the measurement, to erase all data that has been measured to this point, but not data entered onto worksheets, press **CLEAR**.*

4-3-6-2 Circumference/Area (Ellipse) Measurement

1.) Press **MEASURE** once; an active caliper displays.

2.) To position the active caliper, move the **TRACKBALL**.

3.) To fix the start point, press **SET**. The system fixes the first caliper and displays a second active caliper.

4.) To position the second caliper, move the **TRACKBALL**.

5.) Turn the **ELLIPSE** control; an ellipse with an initial circle shape appears.

NOTE: *Be careful not to press the Ellipse control as this activates the Body Pattern.*

6.) To position the ellipse and to size the measured axes (move the calipers), move the **TRACKBALL**.

7.) To increase the size, turn the **ELLIPSE** control in a clockwise direction. To decrease the size, turn the **ELLIPSE** control in a counterclockwise direction.

8.) To toggle between active calipers, press **MEASURE**.

9.) To complete the measurement, press **SET**. The system displays the circumference and area in the measurement results window.

Before you complete a measurement:

- To erase the ellipse and the current data measured, press **CLEAR** once. The original caliper is displayed to restart the measurement.

- To exit the measurement function without completing the measurement, press **CLEAR** a second time.

4-3-6-3   Worksheets

Measurement/Calculation worksheets are available to display and edit measurements and calculations. There are generic worksheets as well as Application specific worksheets.

4-3-7 Probe/Connectors Usage

4-3-7-1 Connecting a probe

1.) Place the probe's carrying case on a stable surface and open the case.
2.) Carefully remove the probe and unwrap the probe cable.
3.) DO NOT allow the probe head to hang free. Impact to the probe head could result in irreparable damage.
4.) Turn the connector locking handle counterclockwise.
5.) Align the connector with the probe port and carefully push into place.
6.) Turn the connector locking handle clockwise to secure the probe connector.
7.) Carefully position the probe cable in the probe cord holder spot so it is free to move, but not resting on the floor.

4-3-7-2 Activating the probe

Select the appropriate probe from the probe indicators on the monitor screen. The probe selection screen will be come up when the application key is enabled.

The probe activates in the currently-selected operating mode. The probe's default settings for the mode and selected exam are used automatically.

4-3-7-3 Deactivating the probe

When deactivating the probe, the probe is automatically placed in standby mode.

1.) Press the *Freeze* key.
2.) Gently wipe the excess gel from the face of the probe. (refer to the Basic User Manual for complete probe cleaning instructions.)
3.) Carefully slide the probe around the right side of the keyboard, toward the probe holder. Ensure that the probe is placed gently in the probe holder.

4-3-7-4 Disconnecting the probe

Probes can be disconnected at any time. However, the probe should not be selected as the active probe.

1.) Move the probe locking handle counterclockwise. Pull the probe and connector straight out of the probe port.
2.) Carefully slide the probe and connector away from the probe port and around the right side of the keyboard. Ensure the cable is free.
3.) Be sure that the probe head is clean before placing the probe in its storage box.

4-3-8   Using Cine

4-3-8-1   Activating CINE

Press **FREEZE**, then roll the **TRACKBALL** to activate CINE. To start CINE Loop playback, press Run/Stop. To stop CINE Loop playback. press Run/Stop.

4-3-8-2   Quickly Move to Start/End Frame

Press FIRST to move to the first CINE frame; press LAST to move to the last CINE frame.

4-3-8-3   Start Frame/End Frame

Turn the **START FRAME** dial to the left to move to the beginning of the CINE Loop. Turn the dial to the right to move forward through the CINE Loop.

Turn the **END FRAME** dial to the right to move to the end of the CINE Loop. Turn the dial to the left to move backward through the CINE Loop.

4-3-8-4   Adjusting the CINE Loop Playback Speed

Turn the **LOOP SPEED** dial right/left to increase/decrease the CINE Loop playback speed.

4-3-8-5   Disconnecting B-Mode CINE from Timeline CINE

To review the B-Mode CINE Loop only, press CINE MODE SELECTION and select B ONLY.

To review the Timeline CINE Loop only, press CINE MODE SELECTION and select TL ONLY.

To return to linked B-Mode and Timeline CINE Loop review, press CINE MODE SELECTION and select B/TL.

4-3-8-6   Moving through a CINE Loop Frame By Frame

Turn **FRAME BY FRAME** to move through CINE memory one frame at a time.

4-3-9 Image Management (QG)

For Image Management functionality refer to the LOGIQ™ P5 Quick Guide. It talks about several topics:

- Clipboard
- Printing Images
- Browsing and Managing an Exam's Stored Image
- Connectivity, and Dataflow Concept and Creation
- Starting an Exam
- Configuring Connectivity
- TCP/IP
- Services (Destinations)
- Buttons
- Views

Verifying and Pinging a Device

4-3-10   Using the DVD-R

4-3-10-1   Using the DVD-R

⚠ **NOTICE**   **Never move the unit with a disk in the DVD-R because the drive actuator will not be locked and the DVD-R could break.**

1.) Go to the Utility->Connectivity->Removable Media.

2.) Insert CD/DVD media.

3.) Press Verify

4.) The properties will be like below.

      a.) Capacity, Free space depends on media type.

      b.) Formatted / Finalized : No
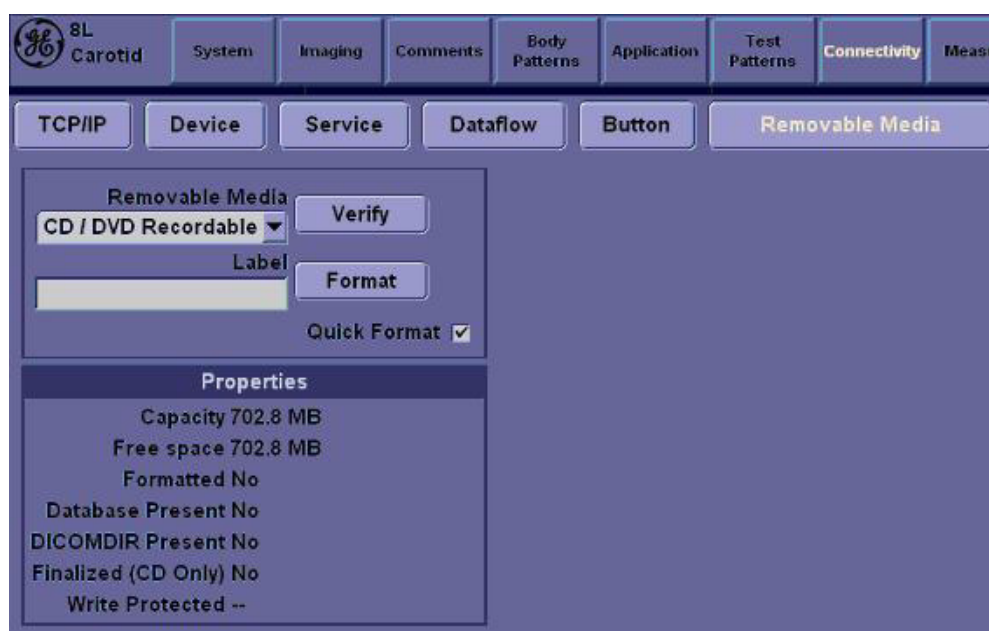
Figure 4-7   Removable Media

5.) Go to Patient.

6.) Press Data Transfer (located at the upper-left side of Patient screen)

7.) Select Export task.

4-3-10-1 Using the DVD-R (cont'd)

8.) Select the type of Removable CD/DVD on the [To] combo box.

9.) It will do auto-formatting.

Figure 4-8 Formatting

10.)After auto-formatting, select some patients on the upper list area and then press the [Transfer] button.

11.)it will do transferring to CD/DVD.
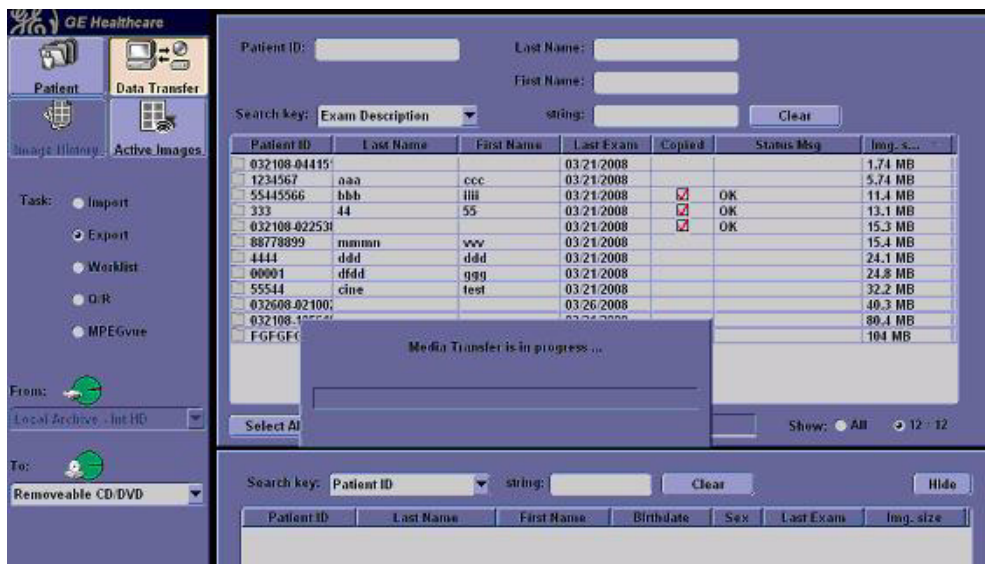
Figure 4-9 Transferring

4-3-10-1   Using the DVD-R (cont'd)

12.)The selected data is transferred correctly.

Figure 4-10   Transfer

13.)Press F3 and select the [Yes and Verify files].

14.)It will do finalizing.

Figure 4-11   Finalizing

4-3-10-1 **Using the DVD-R** (cont'd)

15.)It will do Verifying.

Figure 4-12   Verifying

16.)It will eject the CD/DVD and Go to Utility and reinsert the CD/DVD.

17.)Go to Utility->Connectivity->Removable Media.

Figure 4-13   Removable Media

18.)Press Verify

19.)The properties will be like below.

    a.) Capacity is the size of transferred data.

    b.) Free space is 0.

    c.) Formatted / Database Present / Finalized : Yes

       (DICOMDIR Present : depends on setting)

⚠ **NOTICE** **Avoid mechanical ejection whenever possible. Mechanical ejection leaves the actuator unlocked. If forced to use this method, reboot the system, then insert and eject a known good disk using one of the other methods.**

4-3-11 Backup and Restore Database, Preset Configurations and Images

NOTE: *When upgrading from R1.0.x or R2.0.x to R3.0.x or R4.0.x ,preset cannot be transferred. Refer to the table below.*

Table 4-4   LP5 BT11(R4.x.x) compatibility

Preset	Compatibility		
	R1.x.x	R2.x.x	R3.x.x
Patient Archive	Yes	Yes	Yes
Report Archive	Yes	Yes	Yes
Imaging Presets	No	No	Yes
Connectivity Configuration	No	No	Yes
Measurement Configuration	No	No	Yes
Comment/Body Pattern Libraries	No	No	Yes
Report Templates (Same Software Version Only)	No	No	No
3D/4D	No	No	Yes
Key Macro	No	No	Yes
All Others	No	No	Yes

4-3-11-1 Formatting Media

1.) To format the backup media, CD-R or DVD-R, select the UTILITY key on the Front Panel.
2.) Select CONNECTIVITY, then RERNOVABLE MEDIA. Properly label and Insert the backup media.
3.) Select the media type from the drop down menu.
4.) Enter the label for the media as shown in Figure 4-14. It is best to use all capital letters with no

spaces or punctuation marks.
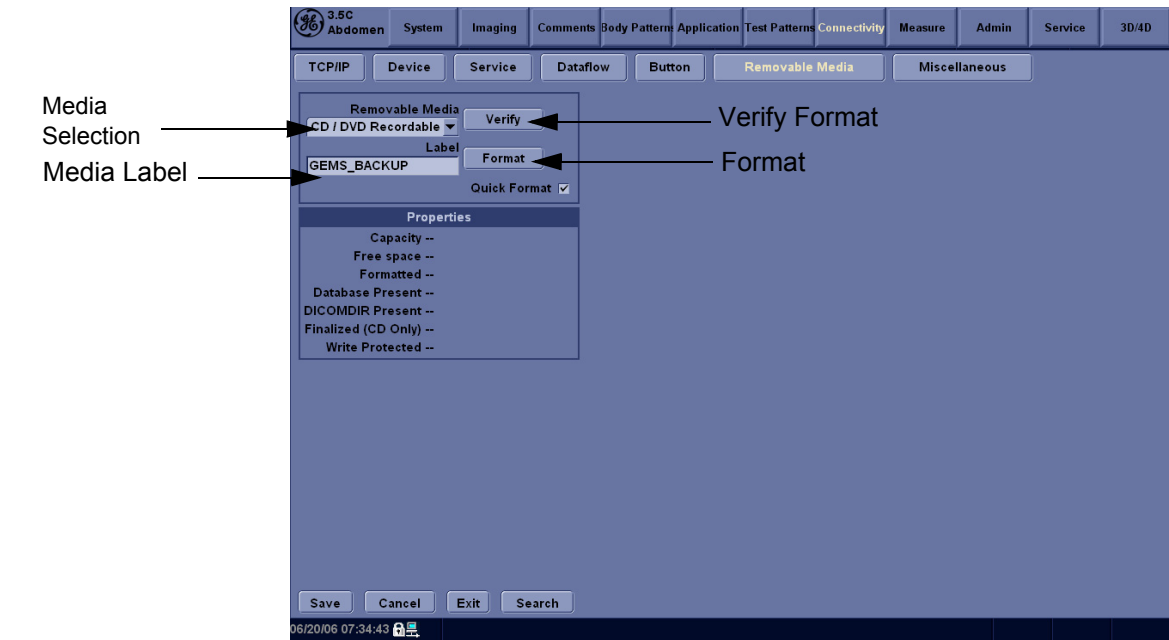
Figure 4-14   Format and Verify Media

5.)   The Ultrasound system displays a pop-up menu, as shown in Figure 4-15. When the formatting has been completed, press OK to continue.

6.)   If desired, verify that the format was successful by returning to *Utility > Connectivity > Removable Media* and selecting VERIFY as shown in Figure 4-12.

Figure 4-15   Format Successful Pop-up Menu

4-3-11-2   Backup System Presets and Configurations

NOTE: *Always backup any preset configurations before a software reload. This ensures that if the presets need to be reloaded, after the software update, they will be the same ones the customer was using prior to service.*

1.) Insert a formatted CD-R or DVD-R into the drive.

2.) Press UTILITY key

3.) Select SYSTEM. on the monitor screen

4.) On the monitor display, select BACKUP/RESTORE.

5.) In the Backup list, select Patient Archive, Report Archive, User Defined Configuration.

6.) In the Media field, select DVD-R.

7.) Select BACKUP.

The system performs the backup. As it proceeds, status information is displayed on the Backup/Restore screen.

Check here to
backup presets
and configurations

Figure 4-16   Backup/Restore Menu

4-3-11-3 Restore System Presets and Configurations

⚠ **CAUTION** The restore procedure **overwrites** the existing database on the local hard drive. Make sure to insert the correct CD-R or DVD-R.

1.) Insert the Backup/Restore CD-R or DVD-R into the drive.
2.) Press the UTILITY. key
3.) Select SYSTEM.menu on the monitor screen
4.) On the monitor display, select BACKUP/RESTORE.
5.) In the Restore list, select Patient Archive, Report Archive, User Defined Configuration.
6.) In the Media field, select the Backup/Restore DVD-R.
7.) Select RESTORE.
   d.) The system performs the restore. As it proceeds, status information is displayed on the Backup/Restore screen.
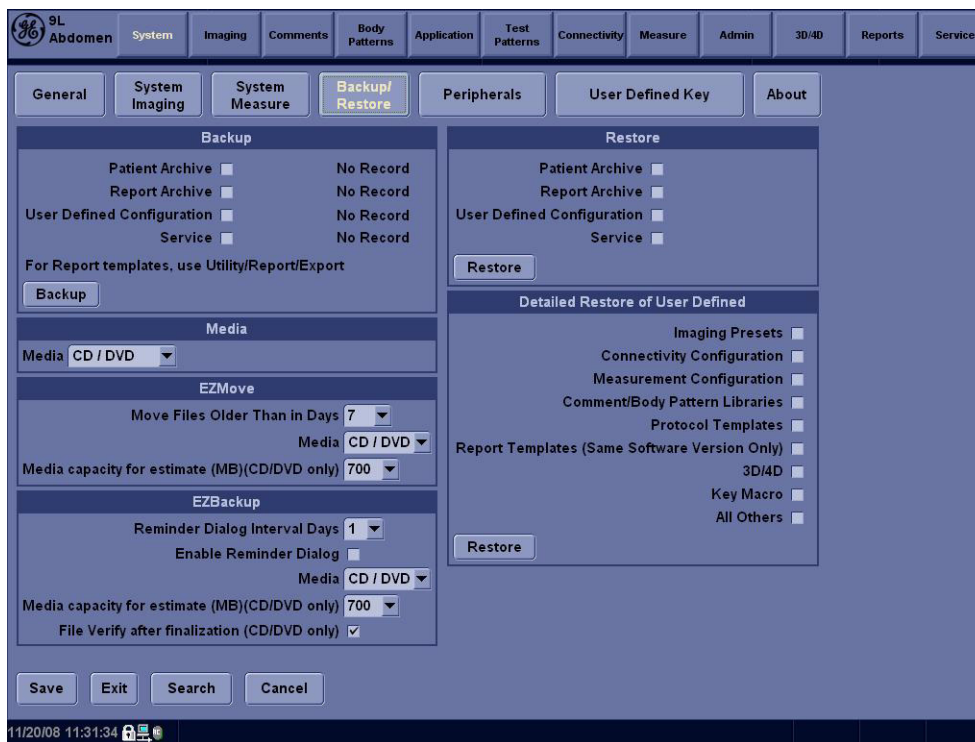
Figure 4-17   Backup/Restore Menu

4-3-11-4   Archiving Images

To export an exam(s) to a compatible Ultrasound system:

1.) Format the removable media (CD-ROM/DVD-R). Label the removable media. Answer Yes/OK to the messages.Press Patient. Deselect any selected patient(s) in the search portion of the Patient screen. Press Exam Data Transfer (located at the upper, left-hand corner of the Patient menu).
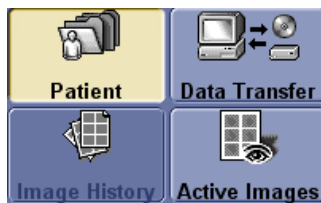
Figure 4-18   Exam Data Transfer

2.) Select Export task Button.

Figure 4-19   Task button

3.) The [From] combo box is not active. It displays Local Archive. The [To] combo box is active. Select the type of removable media CD R/DVD-R. Then please wait until the patient list is visible.

Figure 4-20   To Combo Box

4-3-11-4   **Archiving Images** (cont'd)

4.) In the patient list at the top of the Patient menu, select the patient(s) you want to export. You can use Windows commands to select more than one patient. To select a consecutive list of patients, click the cursor on the first name, move the cursor to the last name, then press and hold down the Shift+right Set key to select all the names. To select a non-consecutive list of patients, click the cursor at the first name, move the cursor to the next name, then press and hold down the Ctrl+right Set key, move the cursor to the next name, then press and hold down the Ctrl+right Set key again, etc. You can also search for patients via the Search key and string. Or, Select All Button from the Patient Menu:

Figure 4-21   Source Section

NOTE: *You need to use your best judgment when moving patients' images. If there are lots of images or loops, then only move a few patients at a time.*

5.) Once you have selected all of the patients to export, press Transfer Button as shown in Figure 4-18 from the Patient Menu.

6.) The progress bar appears as the copy is taking place. Once transfer completed, the exported patient list will be shown as Figure 4-22.

Figure 4-22   Destination Section of Patient Screen

7.) Press F3 to eject the media. Specify that you want to finalize the CD-ROM.

4-3-12 ECG Check Out

Connect the ECG Harness and check:

Table 4-5   ECG Harness Check

Step	Task to do	Expected Result(s)
1.	Connect the ECG at the Connector on the Front of the scanner.	It will display a curve along the bottom edge of the image sector

Section 4-4
Software Configuration Checks

Table 4-6   Software Configuration Checks

Step	Task to do	Expected Result(s)
1.	Check Date and Time setting	Date and Time are correct
2.	Check that Location (Hospital Name) is correct	Location Name is correct
3.	Check Language settings	Desired Language is displayed
4.	Check assignment of Printer Keys and User Define Keys	Print1, 2 Keys and User define Keys are assigned as desired by the customer
5.	Check that all of the customer's options are set up correct	All authorized functions are enabled

Section 4-5
Peripheral Checks

Check that peripherals work as described below:

Table 4-7   Peripheral Checks

Step	Task to do	Expected Result(s)
1.	Press (**FREEZE**)	Stop image acquisition.
2.	Press (**P1**) or (**P2**) on the Keyboard	The image displayed on the screen is printed on B&W or Color printer, depending on the key assignment configuration
3.	Press **RECORD** on the Keyboard.	To start the video counter at a different point:
4.	Press **UPDATE MENU** in the Trackball area.	The *Video Set Counter / Search Dialog window* is displayed
5.	Use the **alphanumeric keyboard** to enter the counter number in the counter field.	Number appears
6.	Press **SET COUNTER** to save the change.	Number is saved
7.	Press **RECORD** on the KEYBOARD	to return to the scanning mode
8.	Press **REC/PAUSE** icon on the screen	to Start Recording A red dot is displayed in the *VCR status area* on the *Title bar* to indicate that recording has begun
9.	Press **REC/PAUSE** icon on the screen.	To Stop recording The video status icon is changed to (Pause)
10.	Press **RECORD** on the KEYBOARD and the assignable play	To start, Play back an examination
11.	Use the **Assignable keys** on the *Control Panel*	to perform actions on the recorded session, such as stop, pause, rewind or fast forward. The video status icon in updated accordingly.
12.	While in playback mode, use the **TRACKBALL** to adjust the video playback speed and scroll through the record.	To search on the tape
13.	Press the assignable **PAUSE**	to stop the tape at the desired frame.
14.	When playing back an examination	part of it can be stored on the computer's memory as a cineloop.The cineloop enables the user to perform further operations on the stored section (see for further information on cineloop operation).
15.	Press (**FREEZE**) while playing back a recorded session.	**To store a recorded sequence as a cineloop. The** last few seconds are stored as a cineloop.

Section 4-6Monitor Function Checks

4-6-1   15" LCDMON II Assy & LCD Panel with filter Function Validation Procedure

1.) Turn on the system.

2.) Select "Utility Key" on the Key board and then choose "Test Pattern" and "Resolution" marked in the figure below.

Figure 4-23   15" LCDMON Assy Function Check

3.) All the Numbers from 0 to 100 on the figure above should be easily distinguished.

4-6-2   15" OSD Key Assy Function Validation Procedure

1.) Turn on the system.

2.) Select "OSD Button" and "Lamp Button" marked below in the figure below.
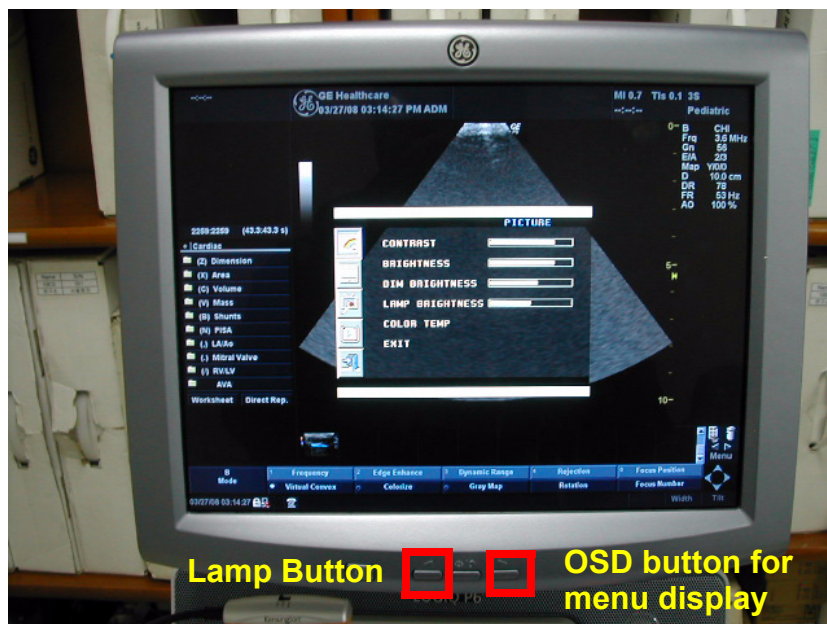
Figure 4-24   Select OSD Button & Lamp Button

3.) OSD Menu should be displayed within 5sec and the Lamp should be turned on as soon as Lamp Button is pushed.

4.) Select "OSD Button" marked below in the figure below and check that contrast value is changed as soon as the button pushed.
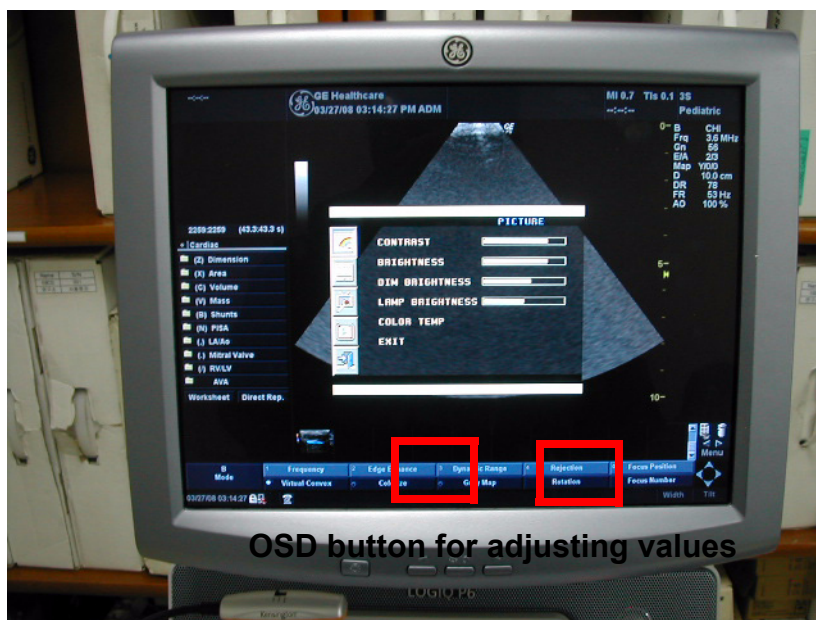
Figure 4-25   Select OSD Button

5) Displayed value should be changed as soon as the button pushed.

Section 4-7 Keyboard Function Checks

4-7-1 Main Keyboard Assy Function Validation Procedure

1.) Boot up the system.

2.) Insert the Service Dongle and go to the maintenance mode.

3.) Click 'Start' and go to 'Run'.

Figure 4-26 Start and run

4.) Click the Run and then you can get the 'Run' dialog box.

5.) Write the 'cmd 'command into 'Run' dialog box and press 'OK' button to display command prompt.
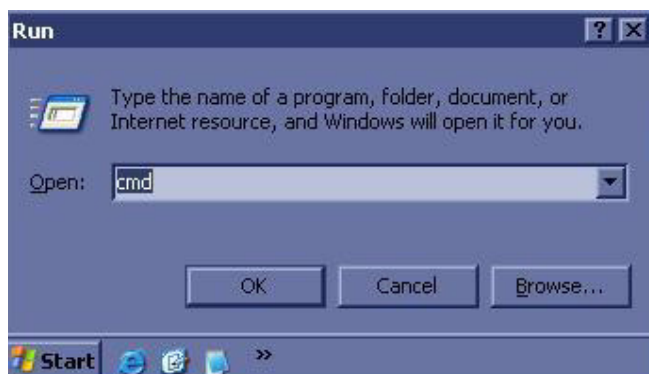
Figure 4-27 Run dialog box
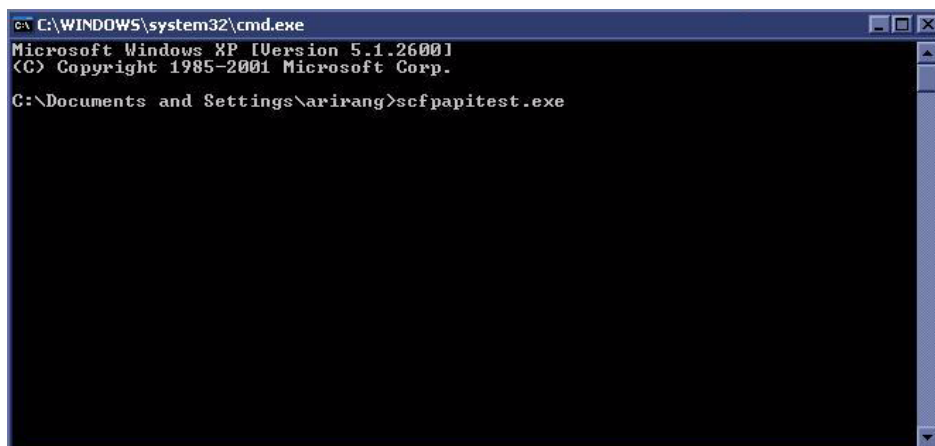
Figure 4-28 command prompt

4-7-1 **Main Keyboard Assy Function Validation Procedure** (cont'd)

6.) Write the 'scfpapitest.exe' on the command prompt and press 'Enter' button to pop up the scfpapitest program.
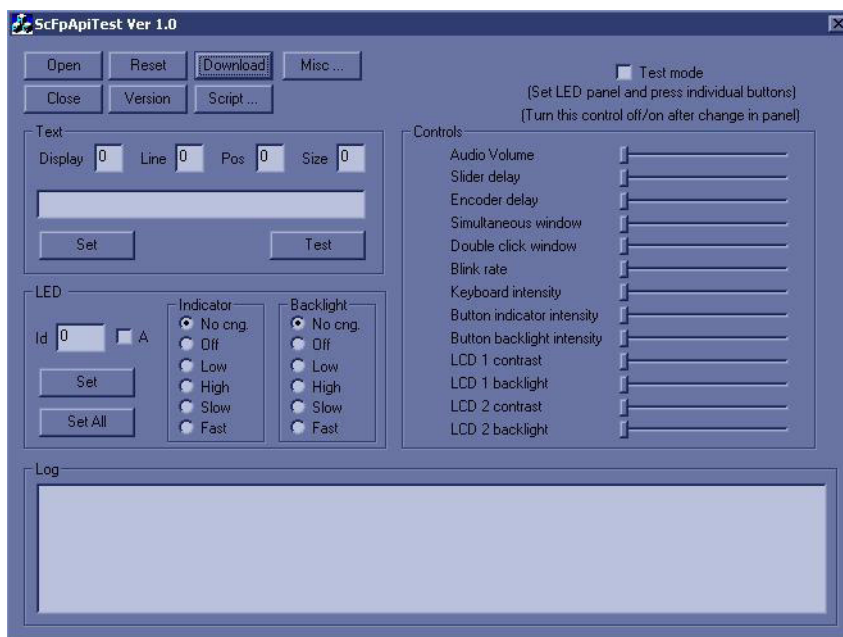
Figure 4-29   scfpapitest program

7.) Press the keyboard button and rotate rotary button. When you press or rotary keys, Log dialog box displays the key log. Button name and displaying log name is like the table.

Table 4-8   Button and Rotaty Table

Button or Rotary Name	The Name displayed in Log	Button or Rotary Name	The Name displayed in Log
Patient	New Patient Button	Active Mode	Active Mode Button
Probe/Preset	Probe Button	CF	CFM PushEncoder Button
Report	Report Button	PDI	PDI Button
End Exam	End Exam Button	Dept (Button)	Depth PushEncoder Button
Record	Record button	Dept (Rotary)	Depth PushEncoder Rotary
P1	Print or record button1	PW	PWD PushEncoder Button
P2	Print or record button2	CW	CW Button
Reverse	Reverse Button	M	M Mode PushEncoder
Userdefine 1	Userdefine 1 Button	Scan Area	ScanArea Button
Userdefine 2	Userdefine 2 Button	M/D Cursor	MD Cursor Button
Userdefine 3	Userdefine 3 Button	Zoom (Button)	Zoom/Size PushEncoder Button
Userdefine 4	Userdefine 4 Button	Zoom (Rotary)	Zoom/Size PushEncoder Rotary
Userdefine 5	Userdefine 5 Button	Measure	Measure Button
L (Left)	Left Button	BodyPattern/Ellipse (Button)	BodyPattern/Ellipse PushEncoder Button

Table 4-8   Button and Rotaty Table

Button or Rotary Name	The Name displayed in Log	Button or Rotary Name	The Name displayed in Log
R (Right)	Right Button	BodyPattern/Ellipse (Rotary	BodyPattern/Ellipse PushEncoder Rotary
THI	Harmonics Button	Comment	comment Button
AO	Auto Right Button	Clear	Clear Button
B (Button)	B PushEncoder Button	TGC Slide	Slider : n=8 s1 ~ s8
B (Rotary)	B PushEncoder Rotary		

⚠ **NOTICE** When you can check the name displayed in log as you press or rotate keys, the main keyboard assy was replaced correctly.

8.) Check the 'Fast' radio button into Indicator box on scfpapitest program and press 'Set All' button.
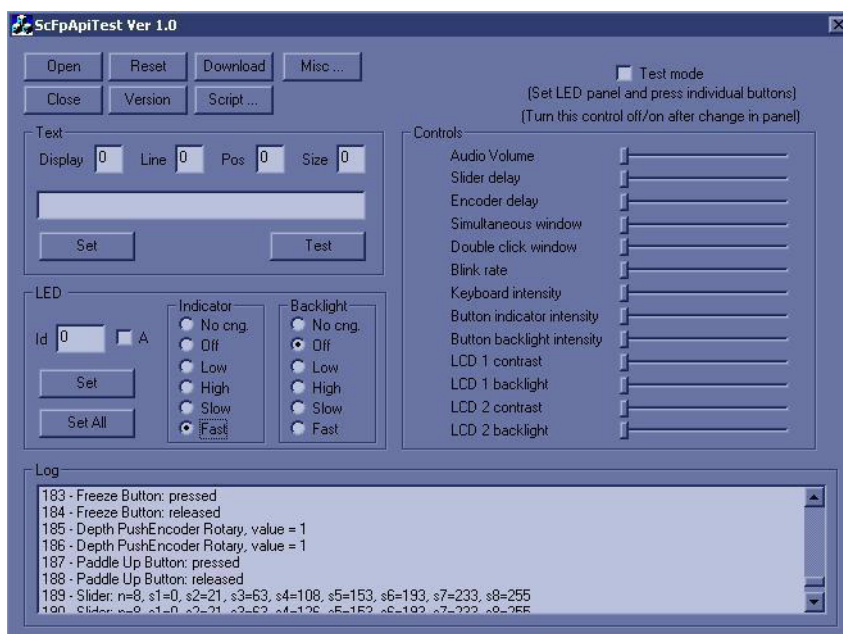
Figure 4-30   Fast button

⚠ **NOTICE** After pressing Fast radio button, indicators should be blanked on the frontpanel.

4-7-2   Sub Keyboard Assy Function Validation Procedure

1.) Boot up the system and run the scfpapitest program.

⚠ **NOTICE**   Follow up the procedure 4-7-1 "Main Keyboard Assy Function Validation Procedure" on page 4-29 to run the scfpapitest program.

2.) Press and Rotary sub keyboard, and Paddle (up/down, right/left) button.

3.) Check the log dialog box in scfpapitest program

Table 4-9   Button and Rotary Table

Button or Rotary Name	The Name displayed in Log
1 (Button/Rotary)	PushEncoder 1 of Touchpanel Button/Rotary
2 (Button/Rotary)	PushEncoder 2 of Touchpanel Button/Rotary
3 (Button/Rotary)	PushEncoder 3 of Touchpanel Button/Rotary
4 (Button/Rotary)	PushEncoder 4 of Touchpanel Button/Rotary
5 (Button/Rotary)	PushEncoder 5 of Touchpanel Button/Rotary
Up	Paddle Up Button
Down	Paddle Down Button
Left	Paddle Left Button
Right	Paddle Right Button

4-7-3   Trackball Assy validation

1.) Boot up the system.
2.) Press the measurement button.
3.) Move the Trackball.

When you move the trackball in measurement mode, the cursor should be moved.

4-7-4   A/N Key assy validation

1.) Boot up the system.
2.) Press 'Comment' button.
3.) Press A/N keyboard.

Each key should be displayed on the monitor display.

4-7-5   Freeze key validation

1.) Follow up the procedure 4-7-1 "Main Keyboard Assy Function Validation Procedure" on page 4-29 to run the scfpapitest program.

2.) Press Freeze button and check up the Log dialog box if the freeze key was release.

⚠ **NOTICE**   After pressing Freeze button, Freeze button message should be displayed into Log dialogbox on scfpapitest program.

4-7-6   **TGC key assay / TGC Knob Set validation**

1.) Follow up the procedure to run the scfpapitest program.

2.) Slide TGC pot and check up the value.

⚠ **NOTICE**   While sliding TGC pot, TGC message should be displayed.

4-7-7   **Sub Keyboard Encoder Knob Set validation**

Follow up .

Section 4-8 Mechanical Function Checks

4-8-1   Cover Parts Function Validation

Table 4-10   Cover parts of the FRU

No	Item
1	Right and Left cover
2	Front cover
3	Rear cover
4	Middle cover
5	Top cover
6	Top bottom cover
7	Pole cover
8	Neck front cover
9	Neck rear cover
10	Dummy cover L/R
11	EMI cover L/R
12	LCD Std Arm with cover
13	Rear handle
14	Rear hook
15	ECG cable hook
16	Cable Arm hook
17	LP5/LA5 Monitor Cover set

• Check if the FRU parts are assembled tightly by naked eye and hands.
• Check if there are dents, scratches, or cracks on the FRU parts.
• Check if screws are in place.

4-8-2 LCD plastic filter Function Validation Procedure

Check if LCD plastic filter is fastened so that it won't move.

Figure 4-31   Check the LCD Plastic Filter

4-8-3 Air filter set Function Validation Procedure

Check if the air filter is placed deep inside.
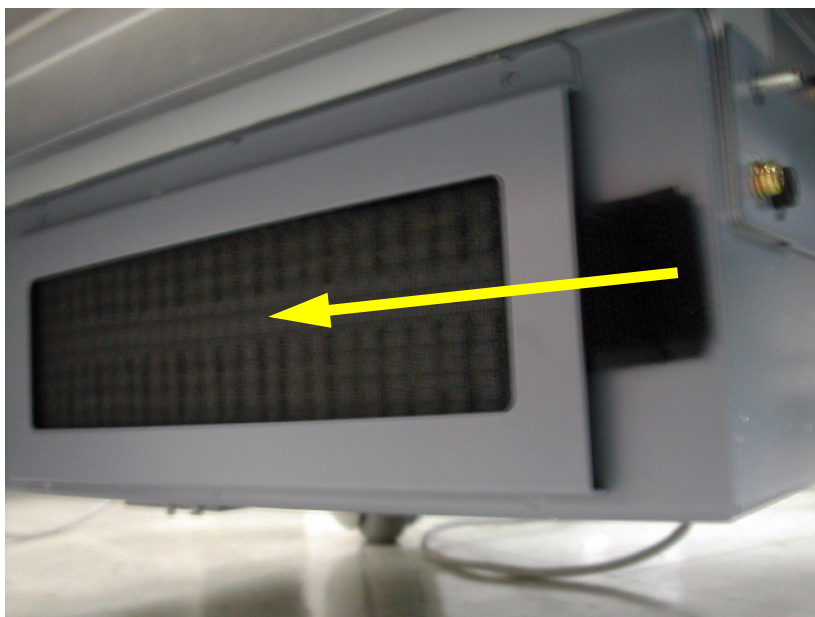
Figure 4-32   Check the air filter

4-8-4 TGC key assy/TGC Knob Set, Sub keyboard encoder Knob Set, Keycap set, Main Keyboard Encoder Knob set Function Validation Procedure

• Check if the each button operates properly.

• Check if encoder knobs are in the center.

• Check if the keycap set can not be removed easily.

Figure 4-33   Check the each button

4-8-5 Cup holder Function Validation Procedure

Check if the cup holder can not be removed easily.

Figure 4-34   Check the cup holder

4-8-6   Front caster/Rear caster Function Validation Procedure

- In case of Bi break caster, check all caster locks and caster swivel locks for proper operation.
- In case of front caster, check caster locks for proper operation.
- In case of rear caster, check caster's motion for proper operation.
- Check if screws are in place.

Figure 4-35   Check the caster

4-8-7 Probe holder Function Validation Procedure

Check if the probe holders are assembled tightly by naked eye and hands.

Check if the probe holder can not be removed easily.

Figure 4-36   Check the probe holder

4-8-8 Flexible LCD Arm Function Validation Procedure

- Check if the flexible arm operates properly.(Up-down, rotation and tilting mechanism)
- Check if the flexible arm cover parts can not be removed easily.Check if the lock operates properly.
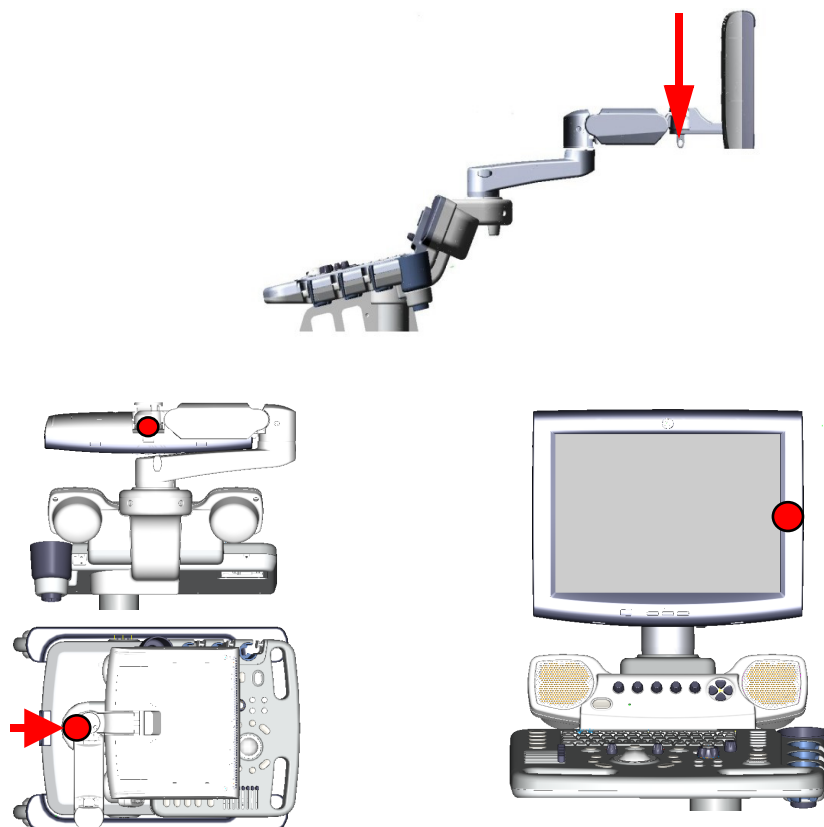
Figure 4-37   Check the Flexible LCD Arm

Section 4-9Board Function Checks

4-9-1 CL1TRX Assy / BL1TRX Assy Function Validation Procedure

⚠ **WARNING** *When Service Login for FRU Diagnostic, scan mode must be B-mode. After Diagnostic is completed, the system should be rebooted.*

⚠ **WARNING** *Diagnostics should be performed with probes which have 128 or more elements.*

1.) Turn on the system and check the completion of Echoloader loading.

2.) Do the Service Login. Refer to the .

3.) Select 'Diagnostics' => 'LOGIQ P5 Diagnostics' => 'FRU Test' => 'CL1TRX Assy / BL1TRX overall'.

4.) Execute the diagnostic test.

5.) 5)All diagnostic test item of CL1TRX Assy / BL1TRX should be passed.
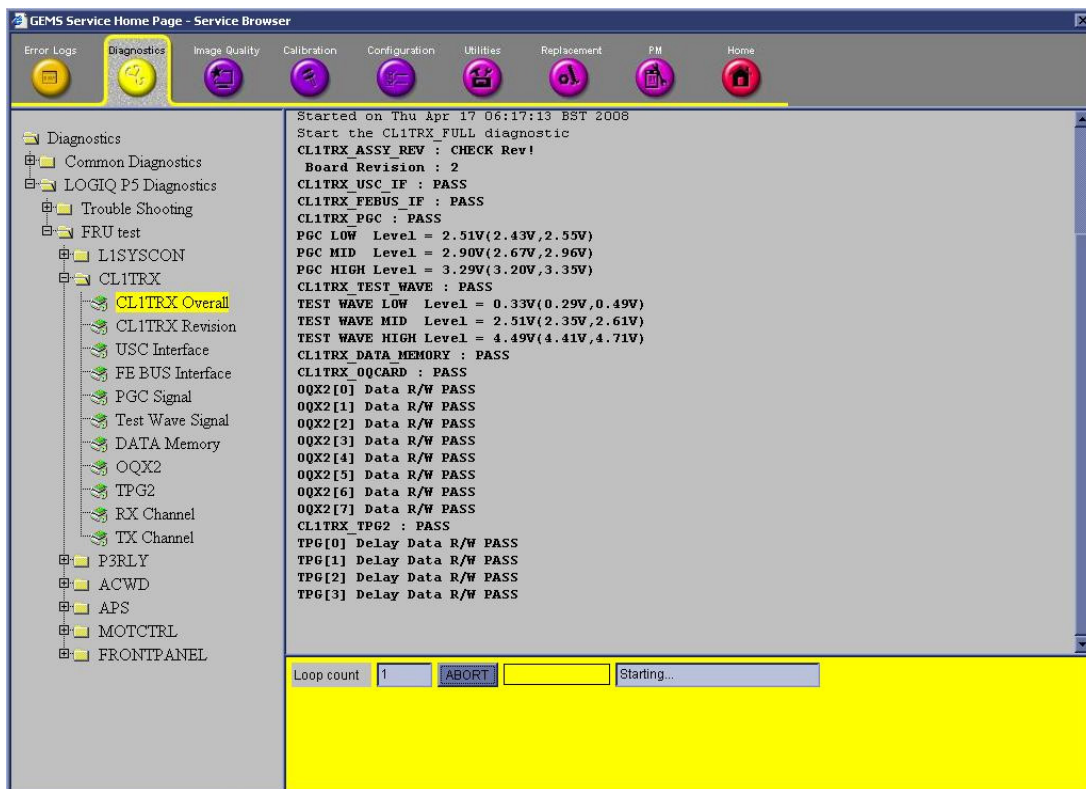
Figure 4-38   CL1TRX Diagnostic test

6.) Shut down the system.

7.) Restart the system

8.) Check the basic function of system's different modes. Refer to and refer to .

4-9-2 ACWD Assy Function Validation Procedure

1.) Insert the Sector probe in probe port.

2.) Turn on the system.

3.) Press Virtual Convex button to enable Virtual Convex if not already enabled.

1 Frequency	2 CrossBeam #	3 Dynamic Range	4 SRI HD	5 Focus Position
Virtual Convex	CrossBeam	Gray Map	Rotation	Focus Number

Figure 4-39   Virtual Convex Enabled
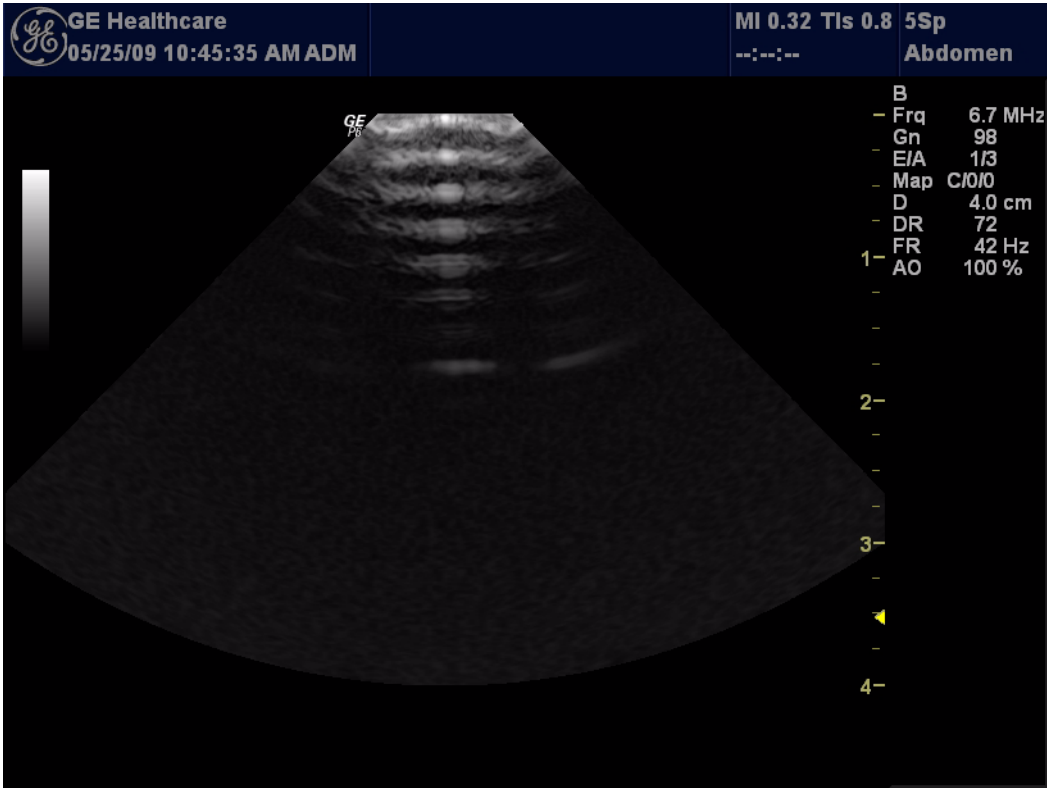
Figure 4-40   Virtual Convex

4.) Press "CW" button to start CWD Mode.
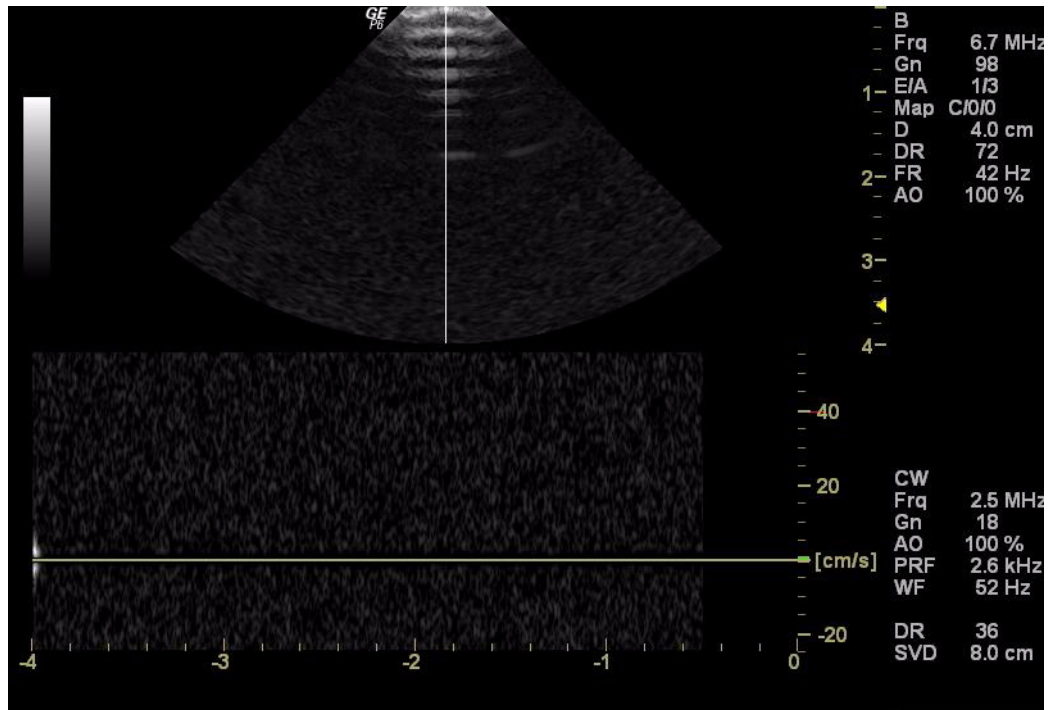
Figure 4-41   CW mode

5.) Scan in CWD mode (with Virtual Convex enabled).

6.) Press "B" button to scan in "B" mode.

7.) Press Virtual Convex button to disable Virtual Convex if not already disabled.

Figure 4-42   Virtual Convex Disabled.

8.) Press "CW" button to start CWD Mode.

9.) Scan in CWD mode (with Virtual Convex disabled)

10.)Compare the CWD (with Virtual Convex enabled) sensitivity and CWD (with Virtual Convex disabled).

11.)Pass if two modes have the same sensitivity.

12.)Do the service login. Refer to .

13.)Select "Diagnostics" => "LOGIQ P5 Diagnostics" => "FRU Test".

14.)Select "ACWD" => "ACWD Overall"

15.)After All diagnostic function check of ACWD should be Passed. Refer to Table 7-5, "FRU Test,

ACWD Diagnostics Menu," on page 18.Reboot up the system.
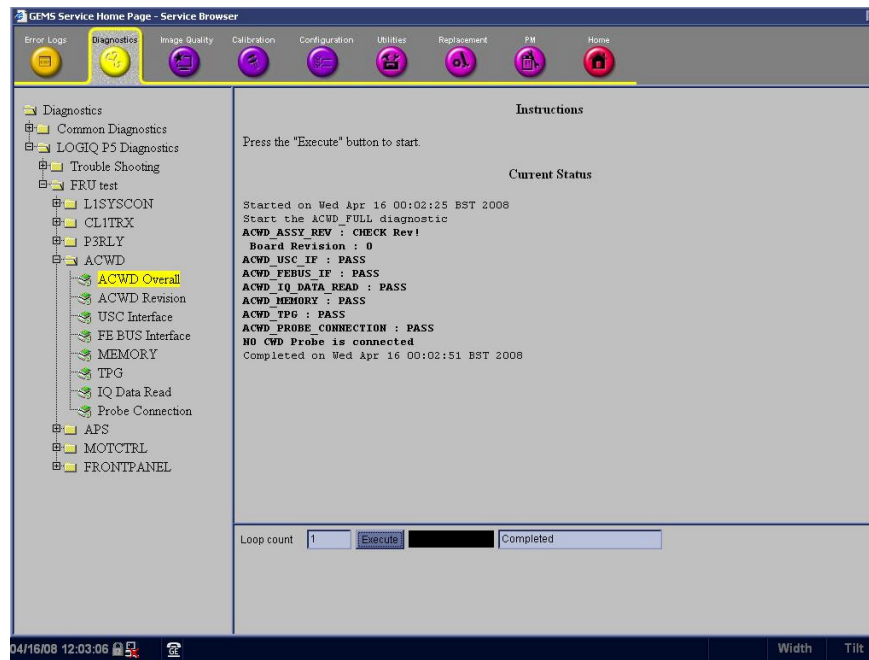
Figure 4-43   ACWD Diagnostic Test

16.)Reboot up the system.

17.)Insert Probe in Probe port (Sector or Pencil Probe).

18.)After system boot up, enter the CWD mode.

19.)Check the display Image. Refer to Section 10-5 "System Maintenance" on page 10-7 and 4-3-5 "System CFM and PWD Checks" on page 4-9.

4-9-3   Probe Assessment Diagnostic Test Validation Procedure

NOTE: *This diagnostic test does not represent the result as Passed or Failed.*

1.) Clean probe surface that you want to assess and connect the probe to the 1st probe slot of the system.

2.) Turn on the system and check the completion of Echoloader loading.

3.) Do the Service Login.

4.) Select 'Diagnostics' => 'LOGIQ P5 Diagnostics' => 'FRU Test' => 'Probe' => 'Probe Assesement'.

5.) Execute the diagnostic test.

6.) The test shows bar-graph designating the signal strength of each of the testing probe's elements including the probe code, name and the number of elements.
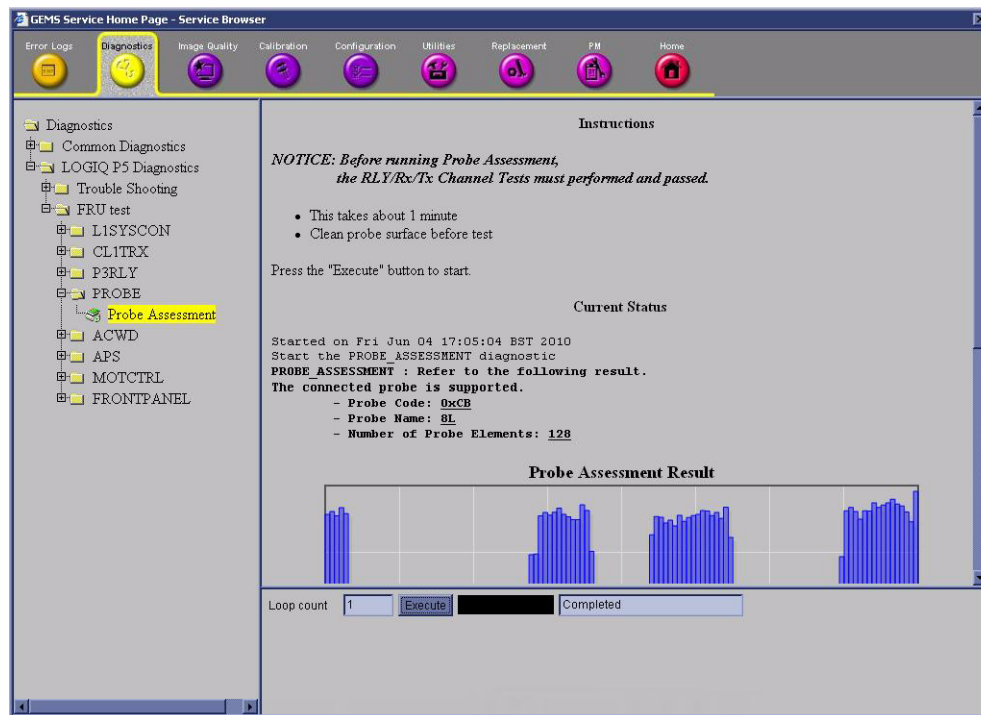
Figure 4-44   Probe Assessment Diagnostic Test

4-9-3   **Probe Assessment Diagnostic Test Validation Procedure** (cont'd)

7.) If the test is executed without probe connection, the test shows the following result.
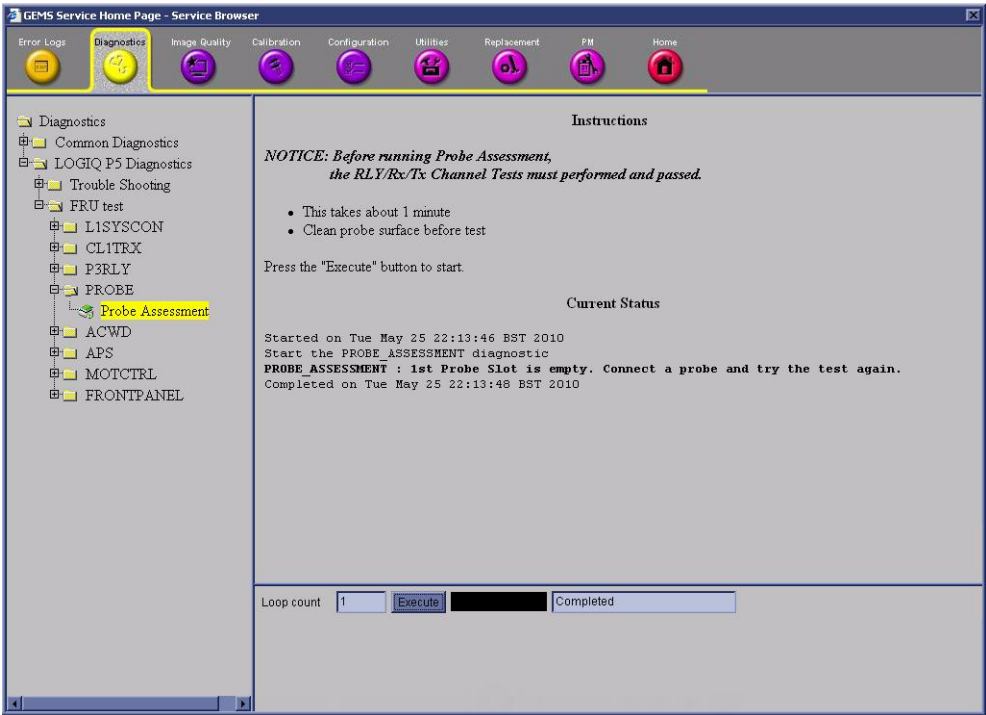
Figure 4-45   Probe Assessment Diagnostic Test

8.) After finishing the test, shut down the system.

4-9-4 SYSCONML Assy Function Validation Procedure

4-9-4-1 L1SYSCON diagnostic Test

1.) Turn on the system and check the completion of echoloader loading.

2.) Do the Service Login. Refer to 5-10-2-2 "Service Login" on page 5-41.

3.) Select 'Diagnostics' => 'LOGIQ P5 Diagnostics' => 'FRU test' => 'L1SYSCON' => 'L1SYSCON Overall'.

4.) Execute the diagnostic test.

5.) All diagnostic test item of L1SYSCON should be passed.
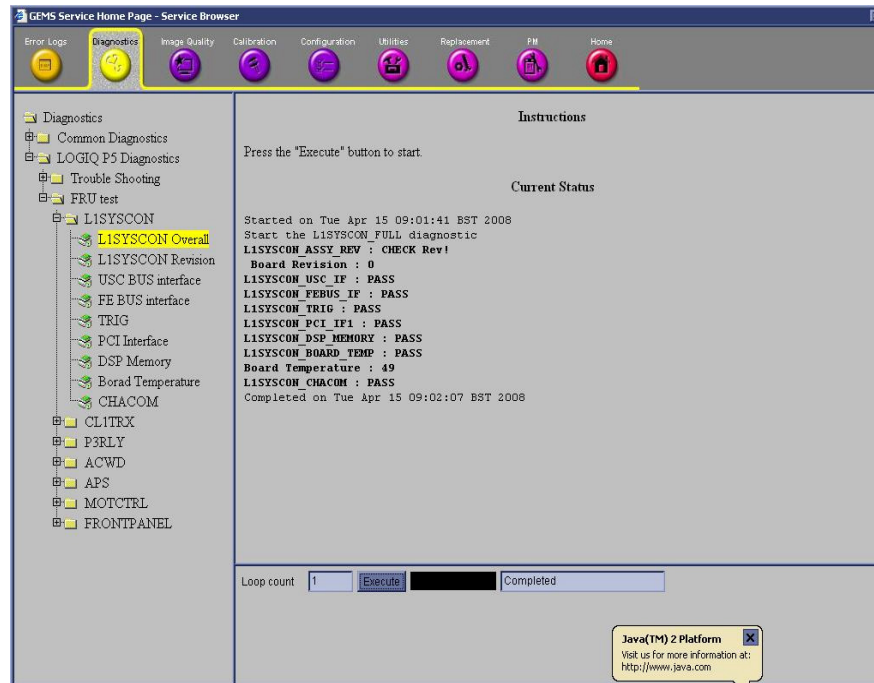
Figure 4-46   L2SYSCON Diagnostic Test

6.) Shut down the system.

7.) Restart the system

8.) Check the basic function of system's different modes. Refer to 4-3-4 "System B/M-Mode Checks" on page 4-8 and refer to 4-3-5 "System CFM and PWD Checks" on page 4-9.

4-9-4-2 Peripheral Test

Refer to Section 4-5 "Peripheral Checks" on page 4-26.

4-9-5   APS/APS Pro Assy PCB Function Validation Procedure

NOTE: *HVL+ and HVL- are not available for APS PRO.*

1.) Turn on the system.

2.) Do the Service Login. Refer to 5-10-2-2 "Service Login" on page 5-41.

3.) Select 'Diagnostics' => 'LOGIQ P5 Diagnostics' => 'FRU test' => 'APS' => 'APS Overall'.

4.) Execute the diagnostic test.

5.) All diagnostic test item of APS/APS Pro should be passed.
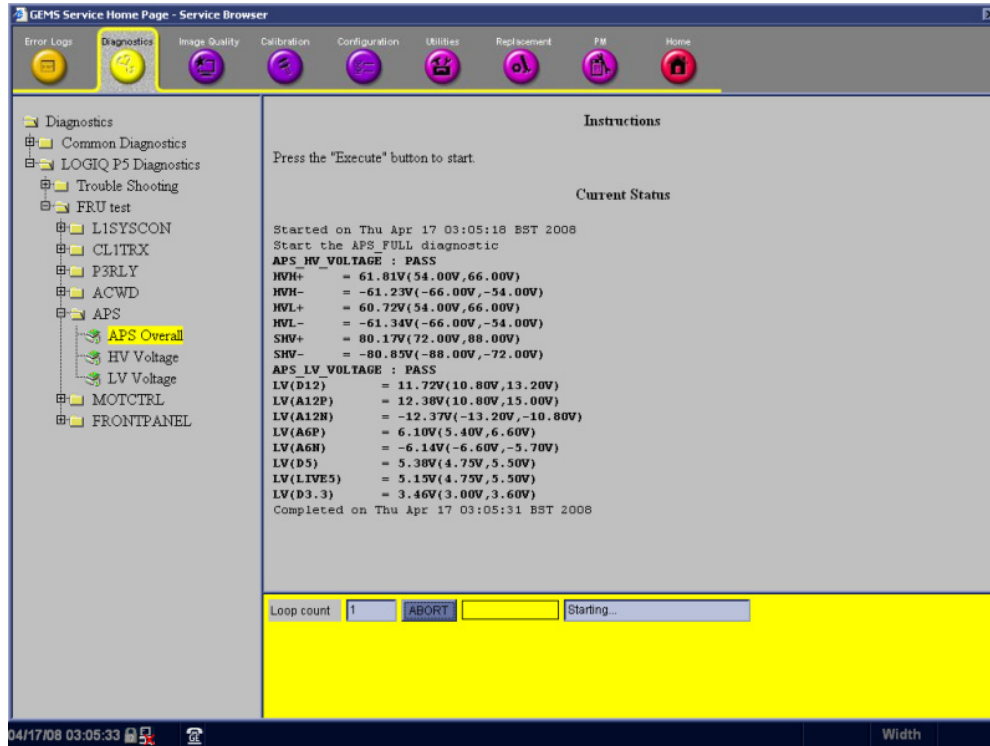
Figure 4-47   APS/APS Pro Diagnostic Test

6.) Shut down the system.

7.) Restart the system

4-9-6 P3RLY,P2RLY and P2RLY with Dummy Assy function check procedure

1.) Turn on the system.

2.) After completion of echoloader loading, connect probe on port 1. Refer to 4-3-7-1 "Connecting a probe" on page 4-12.

3.) Log into "Service Login". Refer to 5-10-2-2 "Service Login" on page 5-41.

4.) Click "Diagnostics" on top menu.

5.) On left folder window, select 'LOGIQ P5 Diagnostics' => 'FRU test' => 'P3RLY'

6.) Select 'P3RLY Overall' and execute test

7.) All diagnostic test items must be passed.
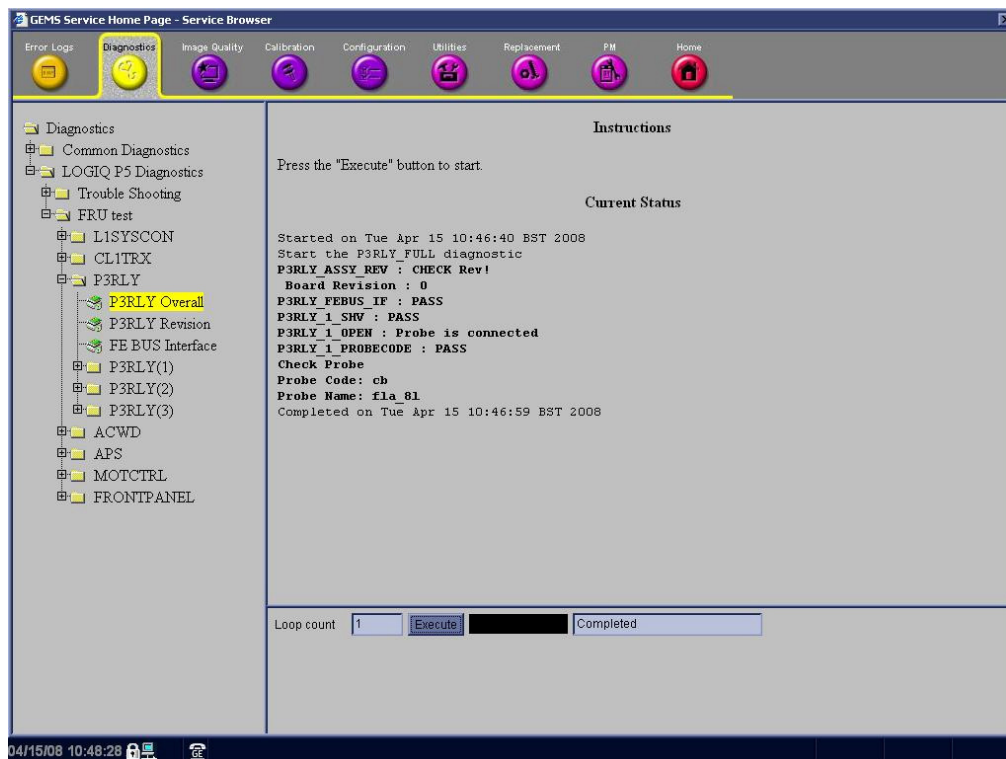
Figure 4-48   P3RLY diagnostic test

8.) Shut down the system.

9.) Restart the system

10.)Activate probe. Refer to 4-3-7-2 "Activating the probe" on page 4-12.

11.)Check the system basic functions. Refer to 4-3-4 "System B/M-Mode Checks" on page 4-8 and refer to 4-3-5 "System CFM and PWD Checks" on page 4-9.
   - For LA5 system, omit CFM test

12.)Disconnect probe. Refer to 4-3-7-4 "Disconnecting the probe" on page 4-12.

13.)Connect probe on port 2 and repeat step 8) ~ 10)

14.)Connect probe on port 3 and repeat step 8) ~ 10)
   - For LA5 system, omit port 3 test

15.)All basic functions must show correct operation as described.

4-9-7   SOM Function Validation Procedure

1.) Turn on the system.

2.) Press the 'del' key in A/N key within 3 sec. to enter BIOS setting mode.

3.) Set the system time and the system Date.

4.) Check the SOM version (HW version & BIOS version)
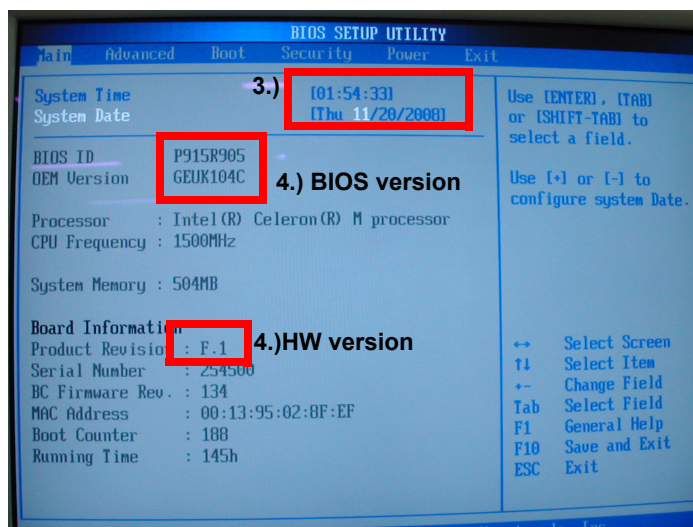
Figure 4-49   Set the system time and the system Date and Check SOM version on BIOS setting mode

5.) Press the 'F10' key to save configuration changes and exit bios mode. The system will restart.

6.) Check the basic function of system's different modes. Refer to 4-3-4 "System B/M-Mode Checks" on page 4-8 and refer to 4-3-5 "System CFM and PWD Checks" on page 4-9.

4-9-8   ASIG Assy Function Validation Procedure

1.) Turn on the system

2.) Check the basic function of system's different modes.

Refer to 4-3-4 "System B/M-Mode Checks" on page 4-8 and Refer to Section 10-5 "System Maintenance" on page 10-7.

4-9-9   BackPlane Assy Function Validation Procedure

1.) Turn on the system

2.) All of attached ASSY should be tested.

3.) Refer to the 4-9-4 "SYSCONML Assy Function Validation Procedure" on page 4-47.

4.) Refer to the 4-9-7 "SOM Function Validation Procedure" on page 4-50.

5.) Refer to the 4-9-1 "CL1TRX Assy / BL1TRX Assy Function Validation Procedure" on page 4-41.

6.) Refer to the 4-9-6 "P3RLY,P2RLY and P2RLY with Dummy Assy function check procedure" on page 4-49.

7.) Refer to 4-9-5 "APS/APS Pro Assy PCB Function Validation Procedure" on page 4-48.

8.) Refer to 4-9-2 "ACWD Assy Function Validation Procedure" on page 4-42.(Optional)

4-9-10   Nest fan Function Validation Procedure

1.) After replace Nest fan assy, turn on the system. Refer to 3-5-1 "Power On/Boot Up" on page 3-11.

2.) Confirm the fan rotating with naked eye and check the fan operating by rotating sound. No strange sound should be heard.
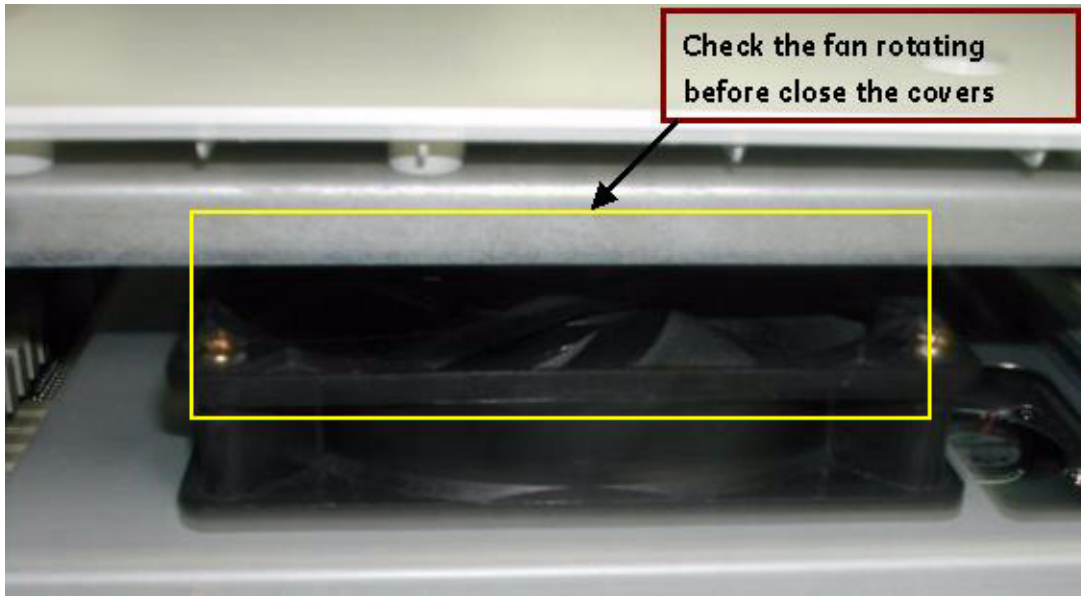
Figure 4-50   Checking Nest fan rotating

NOTE: *Do not close the right EMI bracket and right plastic cover before check the fan operation.*

4-9-11   Transbox Function Validation Procedure

1.) Turn on the system. Refer to 3-5-1 "Power On/Boot Up" on page 3-11 for power up sequence to check Transbox Assy function. The system must show correct operation as described on sequence.

2.) Check the peripheral operation. Refer to Section 4-5 "Peripheral Checks" on page 4-26 to confirm the peripheral operation. All peripheral must work correctly as described Section 4-5.

4-9-12   ACPC Assy set Function Validation Procedure

1.) Turn on the system. Refer to 3-5-1 "Power On/Boot Up" on page 3-11 for power up sequence to check Transbox Assy function. The system must show correct operation as described on sequence.

2.) Check the peripheral operation. Refer to Section 4-5 "Peripheral Checks" on page 4-26 to confirm the peripheral operation. All peripheral must work correctly as described Section 4-5.

4-9-13   Transbox Assy Function Validation Procedure

1.) Turn on the system. Refer to 3-5-1 "Power On/Boot Up" on page 3-11 for power up sequence to check AP950 Assy function. The system must show correct operation as described on sequence.

2)Check the peripheral operation. Refer to Section 4-5 "Peripheral Checks" on page 4-26 to confirm the peripheral operation. All peripheral must work correctly as described Section 4-5.

4-9-14   Fuse set Function Validation Procedure

1.) Turn on the system. Refer to 3-5-1 "Power On/Boot Up" on page 3-11 for power up sequence to check Transbox Assy function. The system must show correct operation as described on sequence.

2.) Check the peripheral operation. Refer to Section 4-5 "Peripheral Checks" on page 4-26 to confirm the peripheral operation. All peripheral must work correctly as described Section 4-5.

4-9-15   ARP Assy Function Validation Procedure

1.) ARP Assy function can be validated by the result of 'Peripheral Test'. Once ARP Assy is replaced, do peripheral test in order to confirm the successful installation. Refer to the Section 4-5 "Peripheral Checks" on page 4-26.

4-9-16   ASIG ASSY Function Validation Procedure

1.) Turn on the system. R

2.) Check the basic function of system's different modes. Refer to 4-3-4 "System B/M-Mode Checks" on page 4-8 and Refer to 10-5-2-1 "System Checks" on page 10-8.

Section 4-10
Site Log

Table 4-11   Site Log

Date	Service person	Problem	Comments

Chapter 5
Components and Functions (Theory)

Section 5-1
Overview

5-1-1   Purpose of Chapter 5

This chapter explains system concepts, component arrangement, and subsystem function of LOGIQ™ P5 and LOGIQ™ A5. It also describes the Power Distribution System (PDS) and probes.

Table 5-1   Contents in Chapter 5

Section	Description	Page Number
5-1	Overview	5-1
5-2	General Information	5-2
5-3	Block Diagram	5-3
5-4	Main Board Detail	5-9
5-5	Top Console	5-26
5-6	ARP (Rear Panel)	5-30
5-7	Power Diagrams	5-32
5-8	Cable Connection	5-35
5-9	Filters	5-39
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5-12	Machine RFS	5-56
5-13	Fast Polling	5-59

Section 5-2
General Information

LOGIQ™ P5/A5/A5Pro is a phased and linear array ultrasound imaging scanner. It has provisions for analog input sources like ECG. A Doppler probe may also be connected and used.

The LOGIQ™ P5 can be used for:

- 2D Gray Scale and 2D Color Flow Imaging
- M-Mode Gray Scale Imaging
- Color M-Mode
- Doppler
- Different combinations of the above modes
- 4D(Optional)

And the LOGIQ™ A5 can be used for:

- 2D Gray Scale Imaging
- M-Mode Gray Scale Imaging
- Doppler
- Different combinations of the above modes
- 2D Color Flow Imaging(Optional)

LOGIQ™ P5 and LOGIQ™ A5 is a digital beamforming system.

Signal flow travels from the Probe Connector Panel to the Front End Electronics, to the Back-End Processor, and finally displayed on the monitor and peripherals. System configuration is stored on the hard drive and all necessary software is loaded from the hard drive on power up.

Monitor

Speaker

Keyboard

DVD R Drive
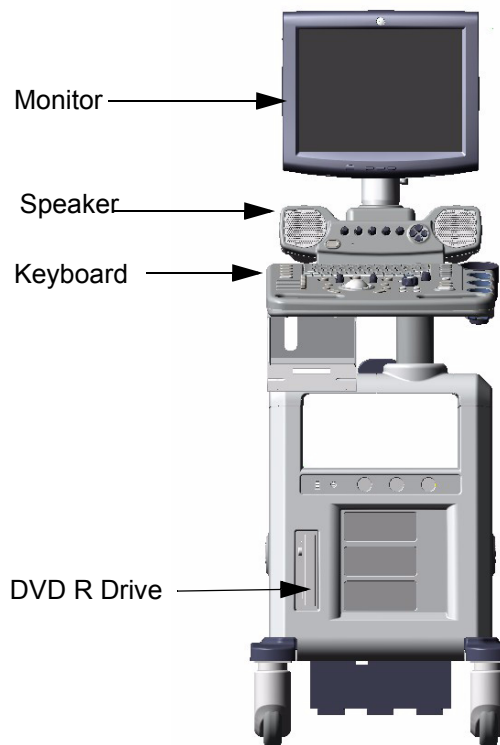
Figure 5-1   LOGIQ™ P5/A5/A5Pro Major Components

Section 5-3
Block Diagram

5-3-1 LOGIQ™ P5 Block Diagram

Figure 5-2   LOGIQ™ P5 System Block Diagram

5-3-1   LOGIQ™ P5 Block Diagram (cont'd)
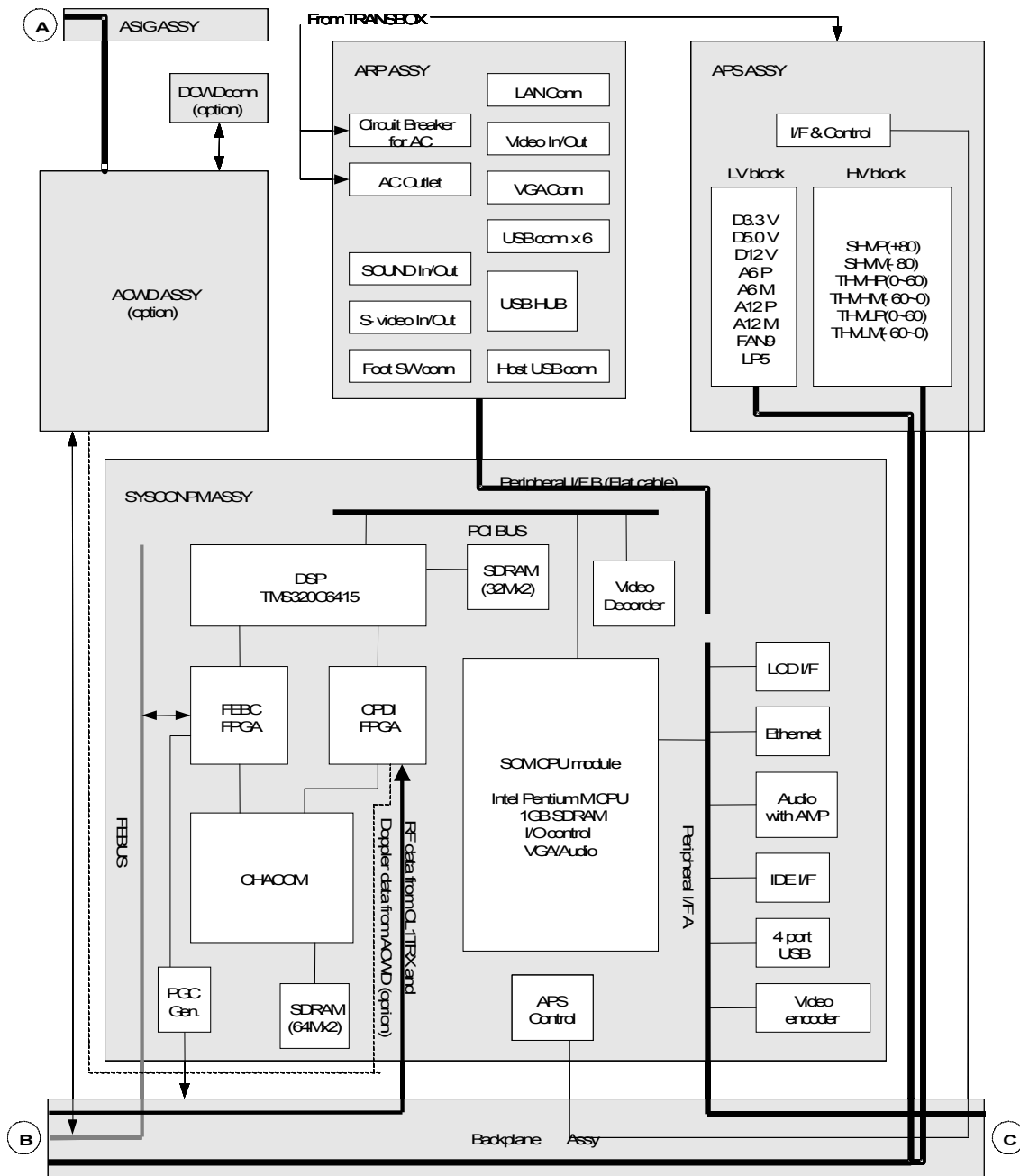
Figure 5-3   LOGIQ™ P5 System Block Diagram (cont'd)

5-3-1   LOGIQ™ P5 Block Diagram (cont'd)
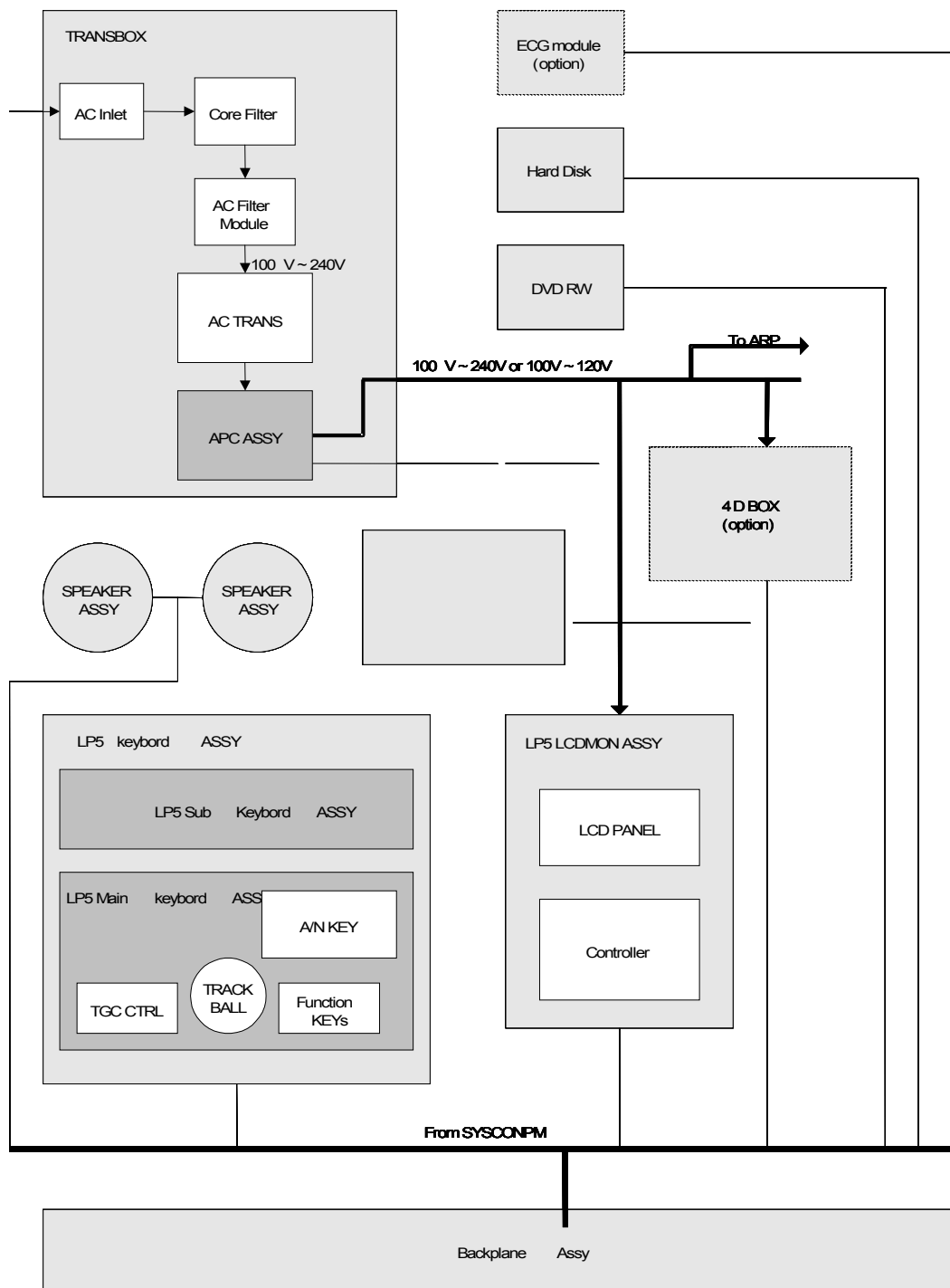
Figure 5-4   LOGIQ™ P5 System Block Diagram (cont'd)

5-3-2 LOGIQ™ A5 Block Diagram

Differences between LOGIQ™ P5 and LOGIQ™ A5 are followings :

- CPU Module : LOGIQ™ P5 is Pentium M and LOGIQ™ A5 Celeron M
- Transmit pulse driver circuit : LOGIQ™ P5 is dual puse driver for CFM mode, but LOGIQ™ A5 is single pulse driver. So LOGIQ™ A5 circuit is more simple and cheap then LOGIQ™ P5.
- Keyboard : LOGIQ™ A5 keyboard doesn't have CFM and PDI, CWD button.
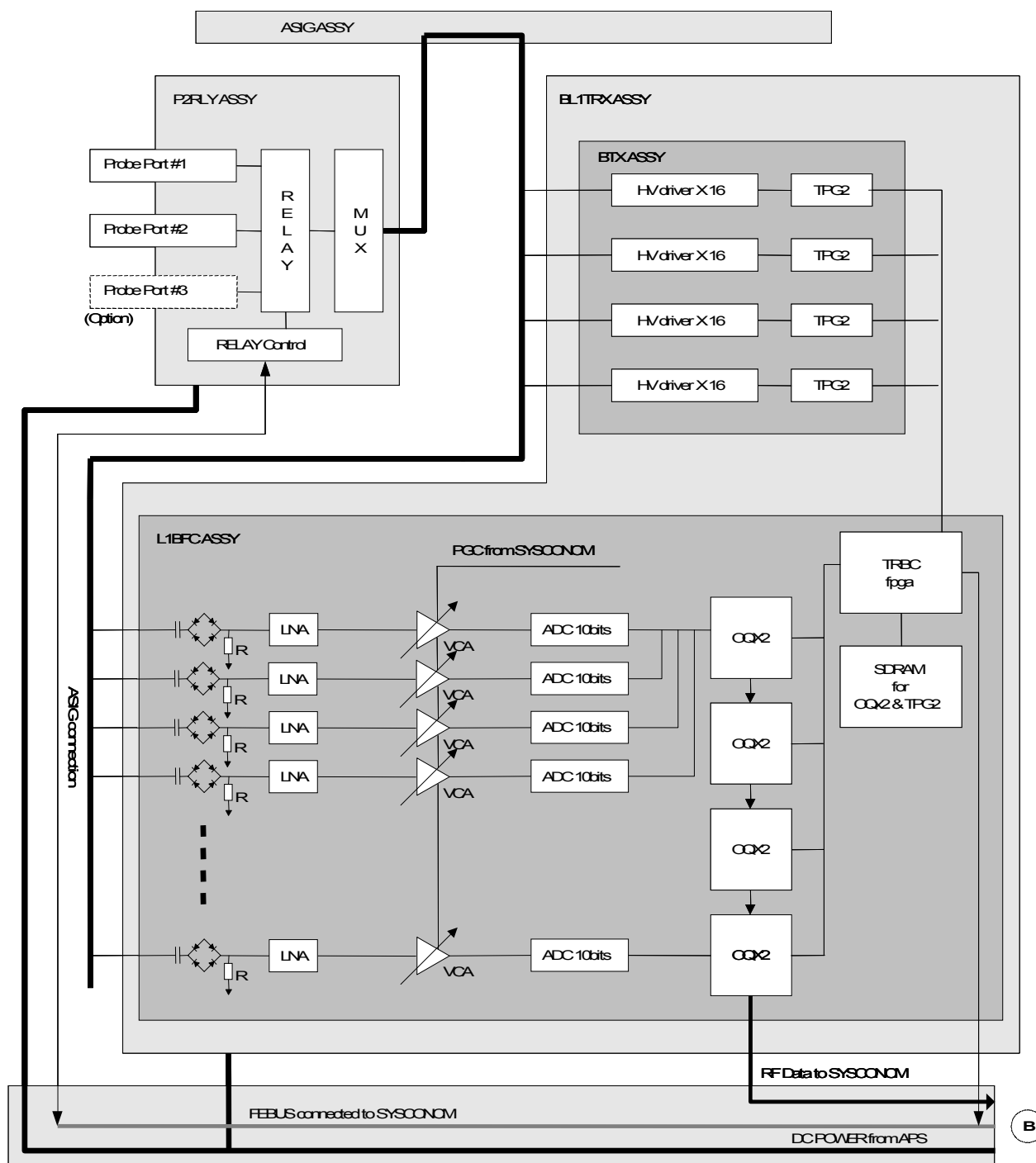
Figure 5-5   LOGIQ™ A5 System Block Diagram

5-3-2 LOGIQ™ A5 Block Diagram (cont'd)
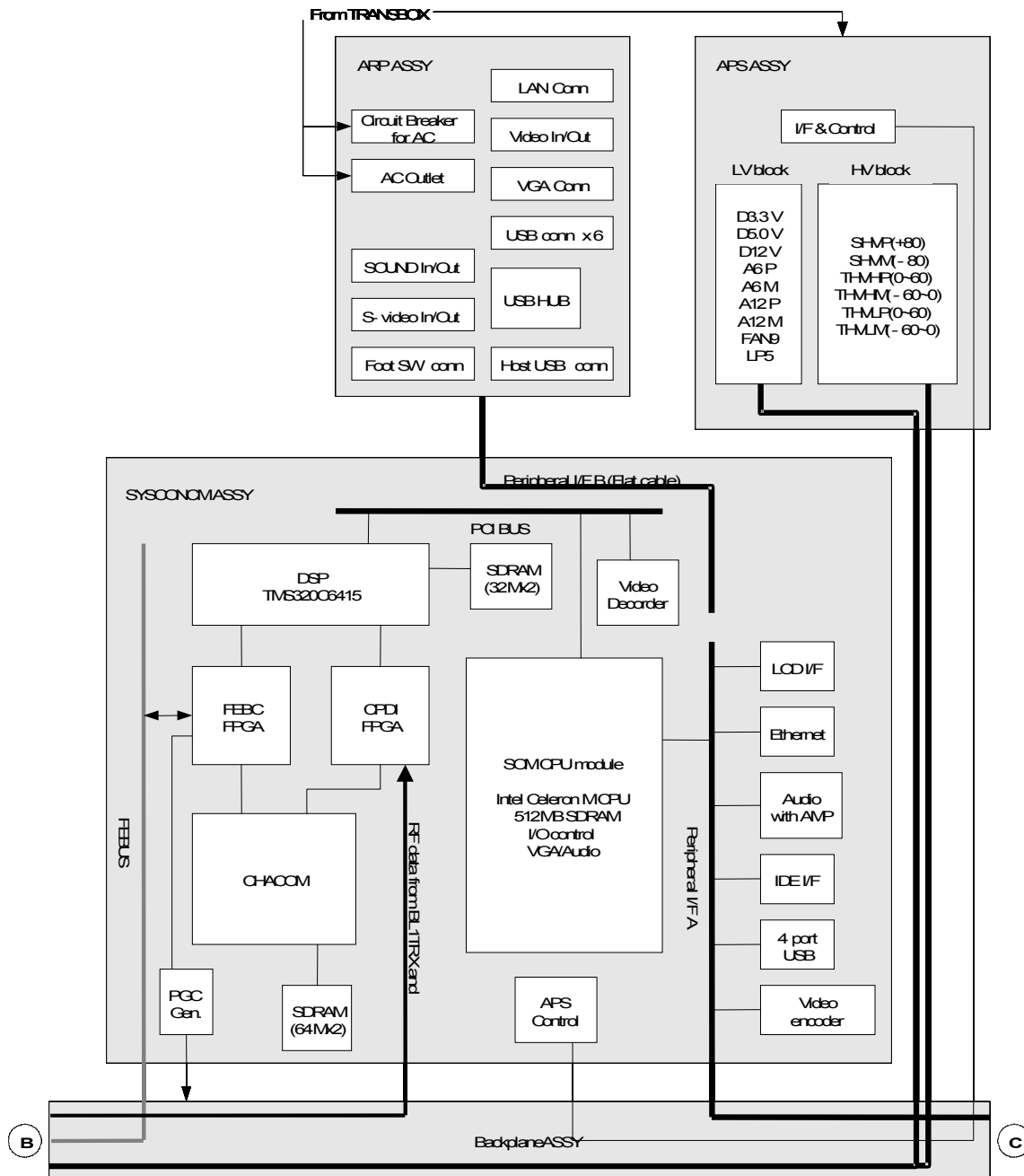
Figure 5-6   LOGIQ™ A5 System Block Diagram

5-3-2   LOGIQ™ A5 Block Diagram (cont'd)

Figure 5-7   LOGIQ™ A5 System Block Diagram

Section 5-4
Main Board Detail
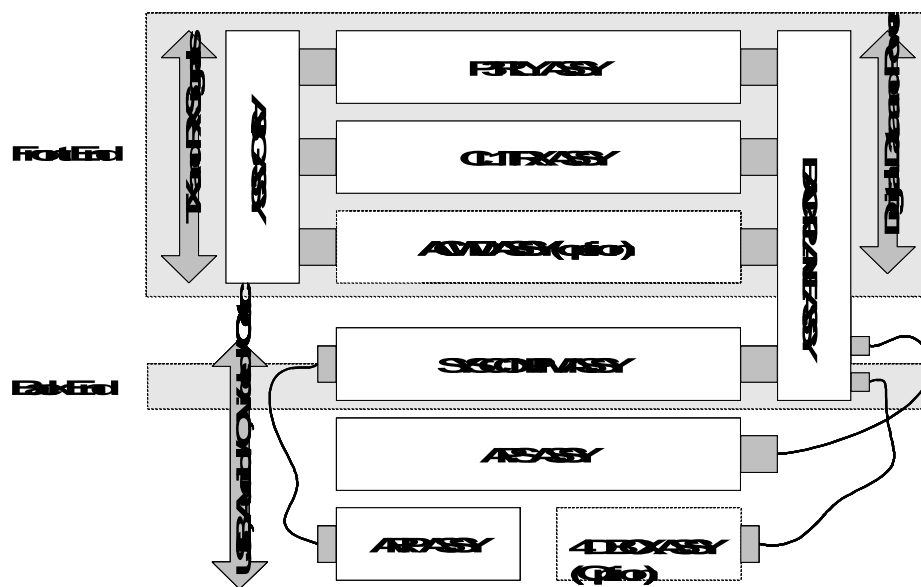
Figure 5-8   LOGIQ™ P5 Main board Structure
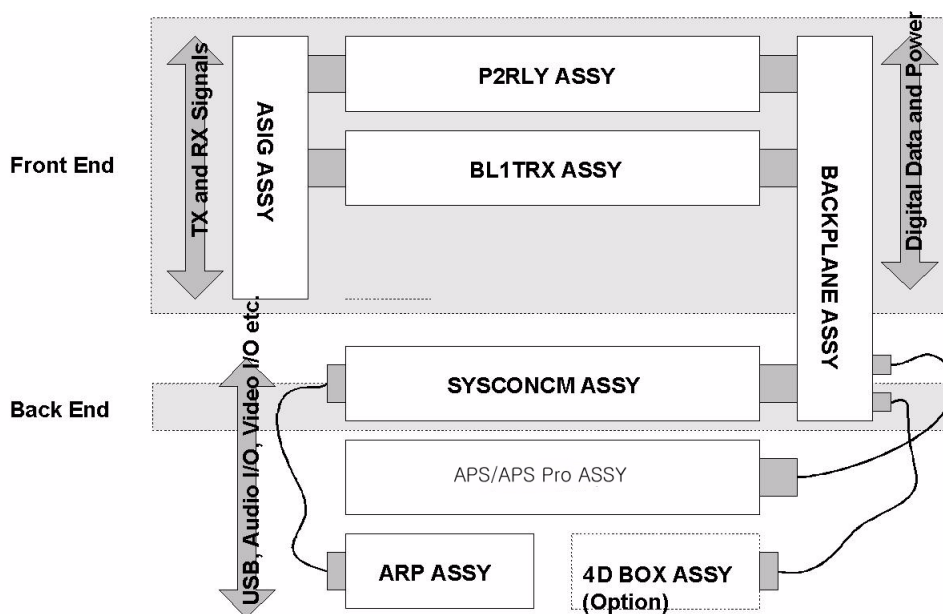
Figure 5-9   LOGIQ™ A5 Main board Structure

The Front End generates the strong burst transmitted by the probes as ultrasound into the body. It also receives weak ultrasound echoes from blood cells and body structure, amplifies these signals and converts them to an digital signal.

Section 5-4   Main Board Detail (cont'd)

The digital representation of this signal is presented to the Mid Processor section.

- P3RLY (Relay) : This P3RLY is for LOGIQ™ P5 or LOGIQ™ A5 with 3port upgrade kit. P3RLY Assy contains 3 connectors for probe interface and arrays of relays for switchable connection. High voltage multiplexer provide connection between 128 signal of probe and selectable 64 channels transmit/receive signals.

- P2RLY(Relay) : This P2RLY is for LOGIQ™ A5. P2RLY Assy contains 2 connectors for probe interface and arrays of relays for switchable connection. High voltage multiplexer provide connection between 128 signal of probe and selectable 64 channels transmit/receive signals

- CL1TRX (Color single acquisition Tx and Rx) : This board is for LOGIQ™ P5 and LOGIQ™ A5 with Color upgrade. This consists of two main board, L1BFC(Single acquisition Beam Forming Control) and CTX(Color TX) ASSY. L1BFC has transmit/receiving switch to isolate rx signal circuit from transmit pulse. The preamplifier on L1BFC amplifies 64 small echo signals. The amplified receiving signals are converted to digital and sent to the delayed summing block. CTX board has 64 channel Transmit pulse generator, bipolar pulse drivers and delay controller.

- SYSCONPM (System Control board with Pentium M module): SYSCONPM is for LOGIQ™ P5 or LOGIQ™ A5 with color upgrade kit. SYSCONPM controls scan operation and transfer the scan parameters to other boards like P3RLY, CL1TRX, ACWD(option). Proper signal processing for tissue and Doppler are done in SYSCONPM.

- SYSCONCM (System Control board with Celeron M module): SYSCONCM is for LOGIQ™ A5. SYSCONPM controls scan operation and transfer the scan parameters to other boards like P2RLY, BL1TRX. Proper signal processing for tissue and Doppler are done in SYSCONCM.

- APS/APS Pro(Advanced Power Supply) : Includes Low voltage power and High voltage power in one module. It generates 3.3V, 5V, and 12V for digital parts and 6V, -6V, 12A, -12V for analog parts. Additionally, It generate THV(Transmit High Voltage) and SHV(Static High Voltage) for transmit pulse driver and High voltage MUX.

- ASIG(Signal) : Transfers the TX pulse signals from CL1TRX(BL1TRX) to the probe port on P3RLY(P2RLY). Receives echo signals from P3RLY(P2RLY) are transfer to CL1TRX(BL1TRX) through this ASIG. For ACWD, the pre-amplified received signals go to the ACWD though ASIG.

5-4-1   P3RLY and P2RLY
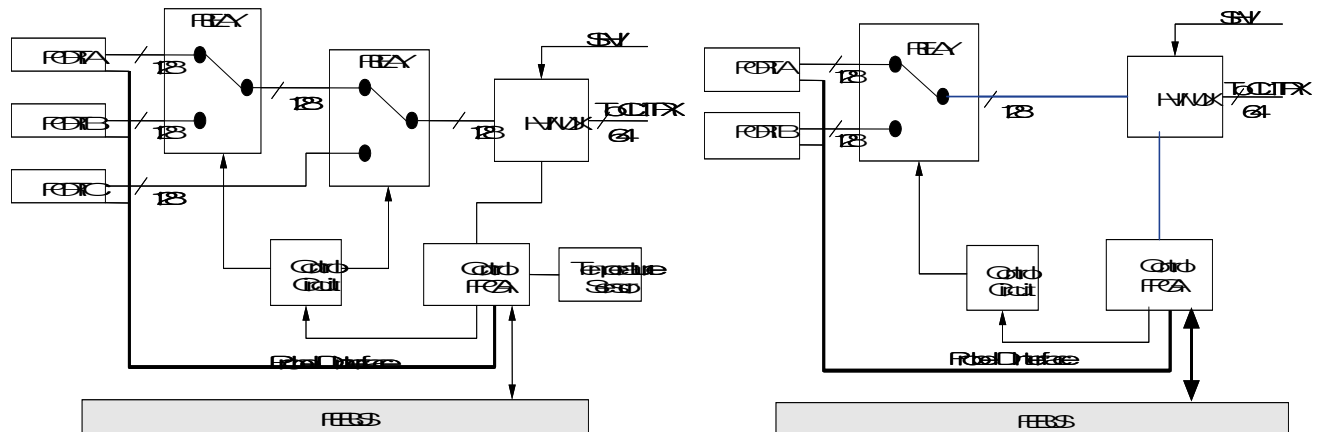
Figure 5-10   P3RLY & P2RLY Block Diagram

P3RLY ASSY contains of 3 probe connectors and provides switchable connection between probes and 64ch transmitters/receivers. P2RLY contains 2 probe connector

The main function of P3RLY ASSY and P2RLY ASSY is as follows.

- 3-to-1 selectors with three probe ports for P3RLY board.
- 2 to 1 selector with two probe ports for P2RLY board
- Interface with FEBUS (control bus)
- Supply/Cut control and failure detection of supply voltage for Mux circuit in a Probe.
- Device: Mechanical Relay.

5-4-1-1   Interface to Probe
- Probe Status detection
  - Detects whether or not a probe is connected.(POPEN)
  - Detects ID code of a connected probe.(PCODE)
- Mux Interface
  - Transfers control data of Mux to a probe.(CONSYS,CONSTA)
  - Enables/Disables control of data.
  - Detects whether Mux data setting is finished or not.
- Power Supply for Mux
  - Supply/Cut control:
    +5V and +12V on a connector are supplied while a probe is connected to the connector.

    +/-SHV are supplied only while a probe is selected.

- LED Blinking
  - The LED in a probe blinks when the probe is selected.

5-4-2 CL1TRX and BL1TRX

5-4-2-1 Overview

CL1TRX have two PWAs. Both are CTX PWA and L1BFC PWA. CTX generates the TX pulse and L1BFC receives the echo signal to amplify it and convert the amplified echo signal into digital signal. These RF digital signals delayed and summed by beam-forming in OQx2 ASICs.

BL1TRX have also two PWAs, BTX PWA and L1BFC PWA. The difference between BTX and CTX is trasntmit pulse firver circuit. BTX have single pulse driver per each channel, but the CTX have dual pulse driver circuit per each channel for high performance in B/CFM mode

The CL1TRX ASSY or BL1TRX ASSY is located in the Nest box

5-4-2-2 Limiter in CL1TRX and BL1TRX
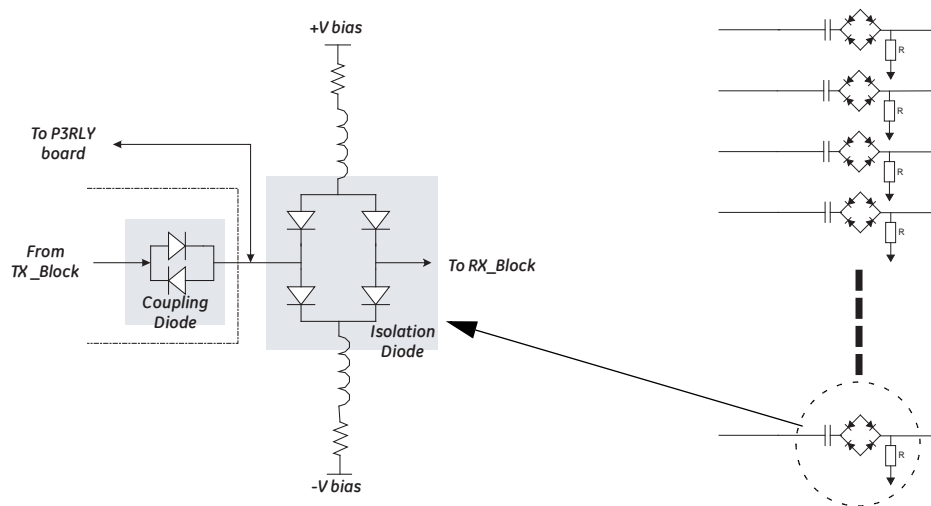
Figure 5-11   LMT Block Diagram

The main functions are as follows.

•   64ch transmit/receiving switches protect a Pre-amp from a high voltage transmit pulse

5-4-2-3   **Preamp in CL1TRX/BL1TRX**
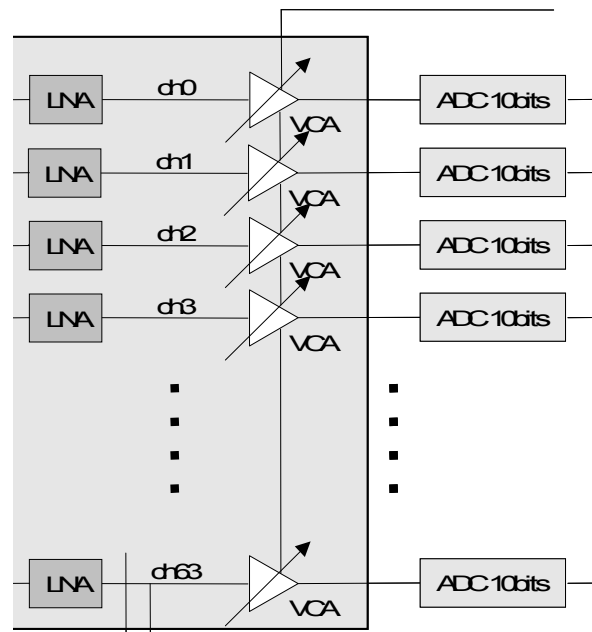
Figure 5-12   Pre Amp Block Diagram For a Channel

The Pre-Amplifier receives and amplifies each 64 echo signals. Then, all 64 echo signals (from 0 to 63ch) are outputted to the Analog to Digital converter to delay and sum. Following 32 echo signals (from 32 to 63ch) are simultaneously outputted to the ACWD ASSY via the ASIG ASSY.

The preamp module have main three blocks: Pre-amp and Gain Control and Mode control block.

The preamp module amplifies the echo signals. The mode control block selects a maximum gain code via dedicated control signals from SYSCONPM(SYSCONCM). The analog signal provided by Gain Control block gives total amplified gain. The block diagram above of the preamp module for a received signal is given. Actually, there are 64 channels equivalent to figure above for a preamp module.

The Pre-amp block consists of Low Noise Amplifier (LNA) and Variable Gain Amplifier (VGA). A

received signal is amplified by LNA (fixed gain), then amplified by VGA (variable gain).

5-4-2-4   Delayed Sum Module
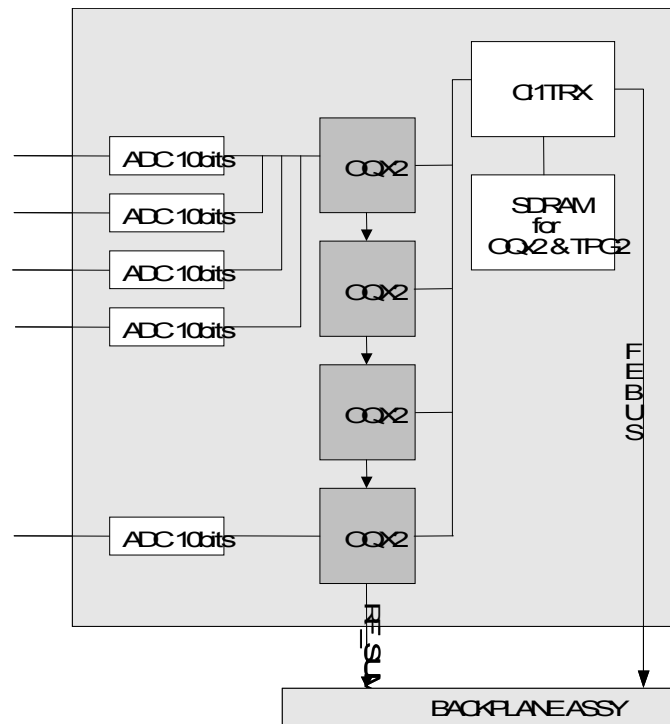
Figure 5-13   DELAYED SUM Block Diagram

The Delayed Sum is the receive beam former and consist of 4 OQx2 ASICs. Each OQx2 ASIC has 16 receiving channels. The each digital beamforming output data of the OQx2 transferred to the next OQx2 and the output of final OQx2 transferred to the SYSCONPM(SYSCONCM)to make it into image data through some digital signal processing.

Delay control data for receive beam forming are contained in SDRAM. Typically only 1 selected probe data are saved in SDRAM. If new probe is connected, additional probe data will be downloaded from HDD to SDRAM.

Main items are

•   TRBC FPGA : Provide interfaces with SYSCONPM(SYSCONCM)through FE Bus. This FPGA control all OQx2 asic for receive beamforming. All of parameter information for ASIC operation are loaded into OQX2 ASIC from SYSCONPM(SYSCONCM) through this FPGA.

•   OQX2 :Digital receive beamforming ASIC. Each OQX2 have capability of 16 channel receiving data inputs. Each input data can be 12 bits. Operation clock is 40 MHz. 4 OQX2 ASICs are used in a Delayed Sum module and each OQX2 summed output are cascaded to next OQX2 ASIC. So, the last summed output of the last OQX2 are transferred to SYSCONPM(SYSCONCM) to make a meaningful image data. The receive beamforming control logic in OQX2 ASIC need delay information data for each channel's control logic. This delay information data are downloaded into ASIC from SDRAM by TRBC FPGA.

•   SDRAM(TD and RD Memory) : SDRAM keeps the receive delay data for OQX2 ASIC. During scan time, these data are downloaded into OQX2 ASIC by TRBC FPGA. Memory capacity is 32Mbytes for a probe.

5-4-2-5   Transmit Pulse Generation Block
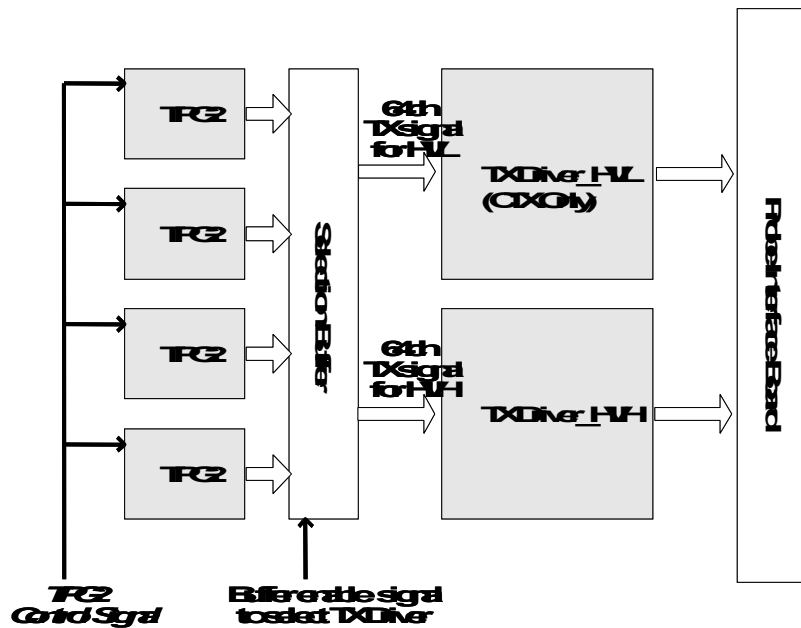
Figure 5-14   Tx pulse Generation Block Diagram

The CTX in CL1TRX generate bipolar transmit pulse and have dual driver for each scan mode, for example, low voltage driver for PWD or CFM and high voltage for B. This board has 64 channels transmit signal drivers, Transmit Pulse Generator ASIC, control FPGA and so on. Transmit pulse are generated by TPG2 ASIC. Each TPG2 ASIC makes 16 channels signals, so total 4 ASIC are used in CTX in CL1TRX. All of control informations for pulse generation, pulse width, time delay of each channel are come from SYSCONPM(SYSCONCM) in real time via Backplane. The control FPGA, TRBC FPGA provide interface between SYSCONPM(SYSCONCM) and TPG2 ASICs and control operation condition of CTX in CL1TRX Main items are

*   TPG2 ASIC: A TPG2 ASIC can generate 16 channels logic level transmit pulse signal. This ASIC use 2 phase 40MHz clocks for transmit delay control and pulse generation. 40Mhz operation clocks are come from L1SYSCON assy via Backplane.

*   Transmit Pulse Driver : TPG2 ASIC generated logic level signal for transmit pulse. So this signal need to be expanded to high voltage signal. Driver circuit make logic level signal to high voltage level signal.

*   THV Switch : LOGIQ™ P5 system use dual transmit high voltage for transmit driver because B mode and CFM mode use different voltage level of transmit pulse. So in duplex of triplex mode, B/CFM or B/DOP, Low THV and High THV are switched in CTX in CL1TRX in real time.

*   TRBC FPGA : This FPGA is located on L1BFC board interfacing with SYSCONPM(SYSCONCM) and updating the TPG data in real time.

5-4-3   SYSCONPM(SYSCONCM)
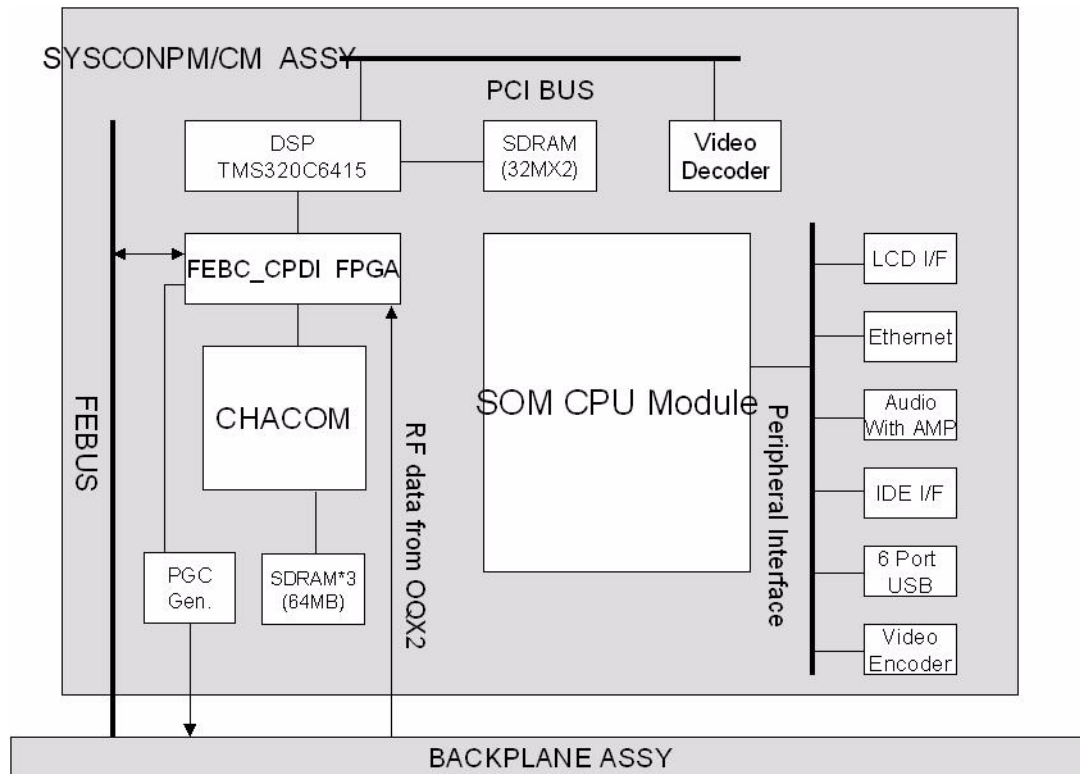
Figure 5-15   SYSCONPM(SYSCONCM) Block Diagram

5-4-3-1   Overview

SYSCONPM(SYSCONCM) ASSY includes Mid processor and Back End Processor. DSP generate the scan control data and the FEBC FPGA adjust the time and manipulate the FEBUS to control Front End boards and APS/APS Pro. CPDI transfer the Image or Doppler data to the Image Ring buffer through DSP. Finally the data goes to the SOM module to make displaying image or sound.

5-4-3-2   SYSTEM ON MODULE(SOM)

The SYSCONPM(SYSCONCM) Assy has System On Module PC(SOM) and PWA which is able to dock SOM. In LOGIQ™ P5 system and LOGIQ™ P5 system, PWA is used the same one. But the System On Module, which computes received Scan data, and interfaces the external peripheral devices (ex. B/W printer, Digital Video Recorder etc.) are divided high grade for LOGIQ™ P5 and low grade for LOGIQ™ A5 by it's CPU performance.

5-4-3-3 **PERIPHERAL BLOCK**

• IDE Interface :

SYSCONPM(SYSCONCM) Assy has SATA bus for HDD and PATA bus for DVD-R drive interface.

- Primary Master SATA: HDD
- Secondary Master PATA: DVD-R Drive

• DISPLAY (VGA, DVI, TV input) BLOCK

Basically SOM support 2 kinds of display output. One is LVDS level for Plat panel display, and other is analog RGB for CRT monitor.

To obtain advanced and stable quality image, SYSCONPM(SYSCONCM) Assy convert LVDS signal to Digital Video Interface (DVI) and transport TMDS signal to main display of system.

• ETHERNET BLOCK

SOM on the SYSCONPM(SYSCONCM) has one integrated Ethernet port : Intel 82562 10/100 Mbps Fast Ethernet controller

• SOM supply four USB 1.1/2.0 port. Each USB ports are used for the keyboard, BW digital printer, USB port for usb memory stick, etc.

• VCR INPUT

For Video play back, SYSCONPM(SYSCONCM) has Video Decoder device. It support NTSC/ PAL mode both. It transfers encoded data to SOM through PCI bus.

- Supports capture resolutions up to 768x576(Full PAL mode)
- CCIR 656 Interface
- S-Video & composite input interface

5-4-3-4 **FPGA BLOCK**

• FEBC FPGA(FEBUS Control):

A major function of FEBC is that generate FEBUS to control scan sequence, access register on the each other front end assy, and interface to DSP through EMIFB bus. Other roles are below

- Generates a stable PGC curve for getting better image quality.
- Gathers the diagnostic information: LV, HV, Probe temperature, Nest temperature.
- Supervises the system safety
- Manages the each ASSY information with IIC Bus: SYSCONPM(SYSCONCM), CL1TRX, P3RLY(P2RL), ACWD (option) and Probes
- Controls HV Voltage output level: Transfer the voltage reference data from DSP to APS/APS Pro via IIC interface.

• CPDI FPGA(CHACOM Processing Data Interface):

The major function of CPDI is that transfer mid processed data from CHACOM to DSP local process. CPDI has 2EA 8x1024 Dual port as one scan line image data buffer. Address sequencer indicates to DSP that buffered data is full one scan line. then DSP can transfer a scan line data to one's SDRAM. For debugging, CPDI generate test pattern image data. It will be able to check CHACOM run normally.

5-4-3-5 **CLOCK DISTRIBUTION BLOCK**

Each operation clock is divided from 160MHz. Also ECL logic is used to remove clock skew for all clock distribution.

Required clocks is following:

• 40MHz In-phase and 40MHz Quad-phase for ACWD, CL1TRX assy
• 40MHz In-phase for P3RLY assy

5-4-3-6   POWER CONTROL BLOCK

ON/OFF power sequence control is needed to prevent system to boot up abnormally, and protect to loose important diagnostic information of patient from unexpected power failure.

- Live power

: Whenever main AC power is supplied, Microprocessor on the SYSCONPM(SYSCONCM) must live always by live power supplied by APS/APS Pro Assy.

- System boot-up sequence

Peripheral power -> LV power -> SOM (Main PC) on the SYSCONPM(SYSCONCM).

- Software shut down sequence

Because not ATX power, Main Operation System (Windows XP) have to inform about time to shutdown to DSP by interrupt. So DSP can allow FPGA to assert shutdown signal to MICOM.

- Abnormal shut down sequence

SYSCONPM(SYSCONCM) can force to shutdown system abnormally by pressing power button during 15 second. But live power for MICOM has to alive.

5-4-3-7   CHACOM BLOCK

This ASIC have two main function. One is the CHAF, which have functions of coded excitation decorder and 2nd harmonic filter. The other is COMSO, which has functions of detector, B/M mode edge enhance, Log compression, and dynamic range control.

5-4-3-8   PGC and TEST SIGNAL GENERATION BLOCK

SYSCONPM(SYSCONCM) generate Power Gain Control signal in order to get better quality scan image from CL1TRX. This signal goes into a preamp on the CL1TRX(BL1TRX) Assy. Additionally, SYSCONPM(SYSCONCM) generate test signal used to test analog path of CL1TRX(BL1TRX) Assy. These signals are converted to analog from 8bit digital data from FEBC FPGA, and DSP could update digital PGC and Test data table whenever needed.

5-4-4   SOM Module

The SOM means System On Module which integrates the PC motherboard and CPU and memory and peripheral device for BEP (Back End Process) functionality into a small size PWA. There are 2 kinds of SOM module for LOGIQ™ P5 and LOGIQ™ A5. One is PM SOM Assy with high performance Pentium M CPU and the other is CM SOM Assy with lower performance Celeron M CPU.

PM SOM PWA include moble Pentium M CPU and 915GM chipset and 1G DDR2 memory on small size form factor PCB(3.75 inch x 4.5 inch). CM SOM PWA include mobile Celeron M CPU 915GM chipset and 512MB DDR2 memory.

This SOM module is attached on the SYSCON PWA. So SYSCONPM Assy include PM SOM module and SYSCONCM Assy include CM SOM module.
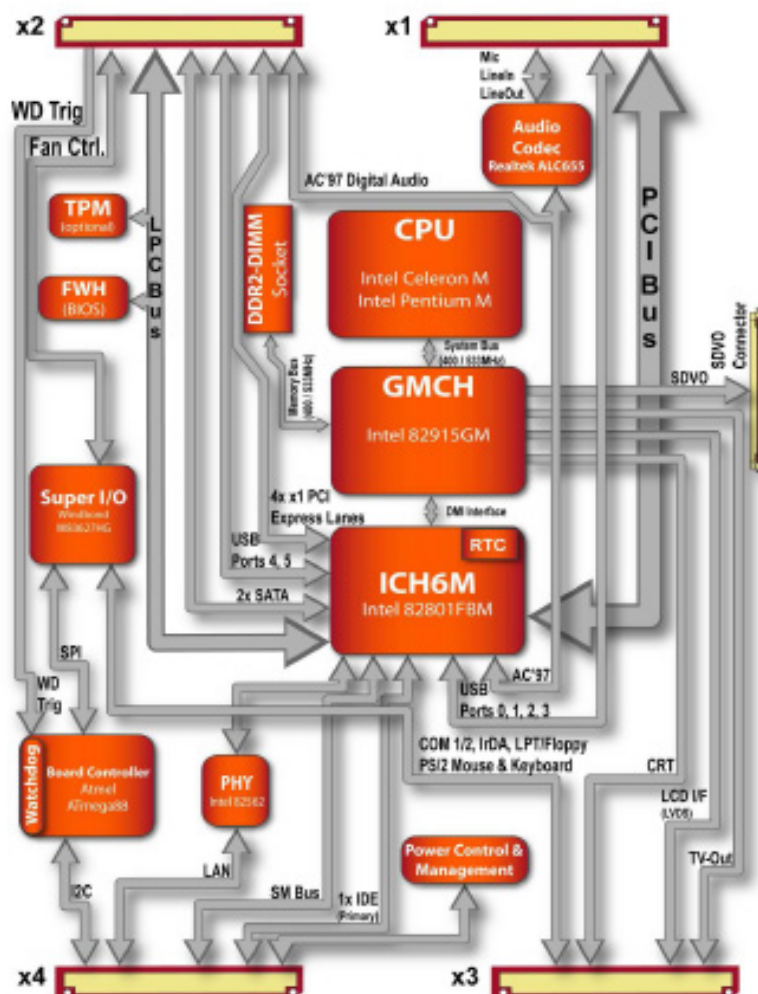
Figure 5-16   PM SOM and CM SOM Block Diagram

5-4-4-1   PM SOM and CM SOM

The difference on both module is BIOS boot screen and label on the module. The label include FRU number.

- •   PM SOM FRU number is 5178410 and CM SOM FRU number is 5178834
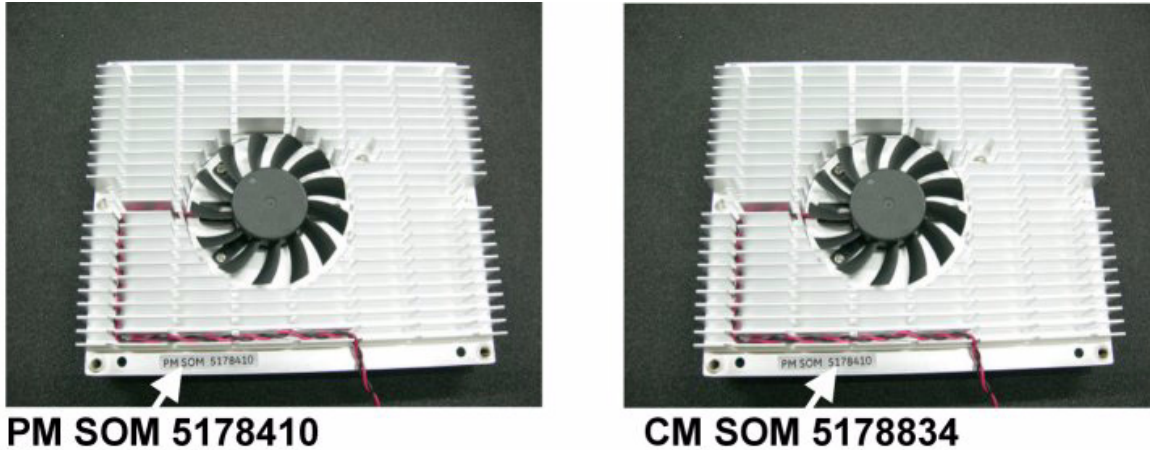
Figure 5-17   Different Label on PM SOM and CM SOM

- •   BIOS display screen are different. The BIOS boot screen come up when power on the system. The number on the screen is FRU number of each SOM assy. The system with PM SOM assy show 5178410 and the system with CM SOM assy shows 5178834.
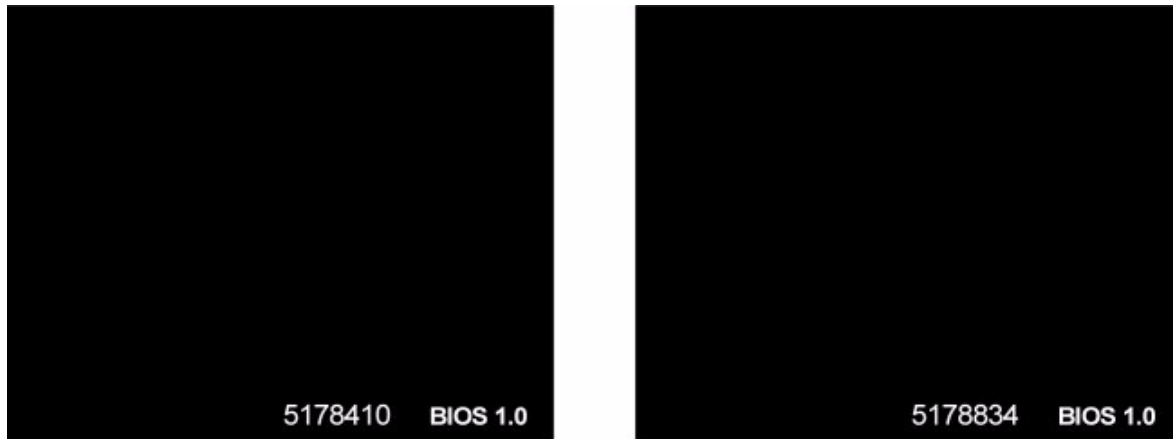
Figure 5-18   BIOS Boot Screen of PM SOM and CM SOM

5-4-4-2   BIOS Content

- To login to Bios mode, press "Del" key in AN keyboard when bios boot screen comes up after system power on.
- The password for bios login is "arirang"
- PM SOM and CM SOM both has same BIOS contents. Only difference is CPU description in main bios screen and CPU configuration menu in advanced menu.
- PM SOM BIOS screen shows the Pentium M CPU configuration. But the CM SOM BIOS screen shows the Celeron M CPU configuration.

```
                  BIOS SET UP UTILITY
  Main    Advanced   Boot    Security    Power   Exit

  System Time              [HH:MM:SS]
  System Date              [xxx  MM:DD:YYYY]
  BIOS ID            : P915RXXX
  OEM Version        : GEUKXXXX
  Processor          : Intel® Pentium®  M Processor 1.8
  CPU Frequency      : 1800MHz
  System Memory      : 1016MB
  Board Information
  Product Revision   : x.x
  Serical Number     : xxxxx
  BC Firmware Rev    : xxx
  Boot Counter       : xxx
  Running Time       : xxxh
```

```
                  BIOS SET UP UTILITY
  Main    Advanced   Boot    Security    Power   Exit

  System Time              [HH:MM:SS]
  System Date              [xxx  MM:DD:YYYY]
  BIOS ID            : P915RXXX
  OEM Version        : GEUKXXXX
  Processor          : Intel® Celeron®  M Processor 1.5
  CPU Frequency      : 150MHz
  System Memory      : 508MB
  Board Information
  Product Revision   : x.x
  Serical Number     : xxxxx
  BC Firmware Rev    : xxx
  Boot Counter       : xxx
  Running Time       : xxxh
```

Figure 5-19   Main BIOS Screen of PM SOM and CM SOM

5-4-4-2 **BIOS Content** (cont'd)

```
            BIOS SET UP UTILITY
    Advanced
ACPI Settings

ACPI Aware O/S                  [Yes]
ACPI 2.0 Feature               [No]
ACPI APIC Support              [Enabled]
Suspend Mode                   [S1 (POS)]
USB Device Wakeup from S3/S4   [Disabled]
Active Cooling Trip Point      [Disabled]
Passive Cooling Trip Point     [90℃]
Critical Trip Point            [110]
Watchdog ACPI Event            [Shutdown]
GPE1 Function                  [No Function]
GPE2 Function                  [No Function]
```

```
            BIOS SET UP UTILITY
    Advanced
Advanced PCI/PnP Settings

Plug & Play OS                 [No]
PCI Latency Timer              [64]
Allocate IRQ to PCI VGA        [Yes]
Allocate IRQ to SMBUS HC       [Yes]

PCI IRQ Resource Exclusion

PCI Interrupt Routing
```

```
            BIOS SET UP UTILITY
    Advanced
Graphics Configuration

Primary Video Device           [Internal VGA]
Internal VGA Mode Select       [Enabled, 8MB]
  Aperture Size Select         [256MB]
DVMT Mode Select               [DVMT Mode]
  DVMT/FIXED Memory            [128MB]
Boot Display Device            [CRT + LFP]
Boot Display Preference        [LEP SDVO-B SDVO-C]
Local Flat Type                [Customized EDID]
Local Flat Type Scaling        [Expand Text & Grap]
SDVO Port B Device             [None]
SDVO Port C Device             [None]
Backlight Control              [100%]
TV Standard                    [VBIOS-Default]
```

```
            BIOS SET UP UTILITY
    Advanced
Configure advanced CPU settings
Module Version : xxx

Manufacturer  : Intel
Brand String  : Intel® Pentium® M Processor 1.8
Frequency     : 1.80GHz
FSB Speed     : 400MHz

Cache L1      : 32KB
Cache L2      : 2048KB

Intel® Speedstep™ tech    [Automatic]
Max. CPU Frequency         [1800Mhz]
```

```
            BIOS SET UP UTILITY
    Advanced
Advanced Chipset Settings
Memory Hole                    [Disabled]

IOAPC                          [Enabled]
APIC ACPI SCI IRQ              [Disabled]
C4 on C3                       [Disabled]
DMI Power Management           [Disabled]

PCI Express Configuration
PCI Express Port 1             [Disabled]
PCI Express Port 2             [Disabled]
PCI Express Port 3             [Disabled]
PCI Express Port 4             [Disabled]
VC1 for Azlia & Root Ports     [Disabled]
```

```
            BIOS SET UP UTILITY
    Advanced
I/O Interface Configuration

Onboard Audio Controller       [AC97]
Onboard Ethernet Controller    [Enabled]
Onboard Floppy Controller      [Disabled]
Floppy A                       [Disabled]
Serial Port 1 Configuration    [Disabled]
Serial Port 2 Configuration    [Disabled]
Parallel Port Address          [Disabled]
```

Figure 5-20 Advanced menu in BIOS

5-4-4-2 **BIOS Content** (cont'd)

```
                BIOS SET UP UTILITY
                     Advanced

IDE Configuration
  ATA/IDE Configuration          [Compatible]
    Legacy IDE Channels          [SATA Pri, PATA Sec]
    Primary IDE Master           [Hard Disk]
    Primary IDE Slave            [Not Detected]
    Secondary IDE Master         [ATAPI CDROM]
    Secondary IDE Slave          [Not Detected]
    Third IDE Master             [Not Detected]
    Third IDE Slave              [Not Detected]
    Fourth IDE Master            [Not Detected]
    Fourth IDE Slave             [Not Detected]
  Hard Disk Write Protect        [Disabled]
  IDE Defect Time Out (Sec)      [35]
  ATA(PI) 80Pin Cable Detection  [Host & Device]
```

```
                BIOS SET UP UTILITY
                     Advanced

USB Configuration
  USB Devices Enabled :
    1 Keyboard
  USB Functions                  [6 USB ports]
  USB 2.0 Controller             [Enabled]
  Legacy USB Support             [Enabled]
  USB Keyboard Legacy Support    [Enabled]
  USB Mouse Legacy Support       [Enabled]
  USB Storage Device Support     [Enabled]
  Port 64/60 Emulation           [Disabled]
  USB 2.0 Controller Mode        [FullSpeed]
  BIOS EHCI Hand-off             [Enabled]
  USB Beep Message               [Enabled]
  USB Stick Default Emulation    [Hard Disk]
  USB Mass Storage Reset Delay   [20 sec]
```

```
                BIOS SET UP UTILITY
                     Advanced

Keyboard/Mouse Configuration
  Boot up Num-Lock               [On]
  Typematic Rate                 [Fast]
  PS/2 Mouse Support             [Auto]
```

```
                BIOS SET UP UTILITY
                     Advanced

Configure Remote Access type and parameters
  Remote Access                  [Disabled]
  Serial Port BIOS Update        [Disabled]
```

```
                BIOS SET UP UTILITY
                     Advanced

Hardware Health Configuration
  H/W Health Function            [Enabled]
  Hardware Health Event Monitoring
  Board Temperature    : xx/xxx
  CPU Temperature      : xx/xxx

  VcoreA               : 1.3xxV
  VcoreB               : 1.0xxV
  +3.3 In              : 3.3xxV
  +5 VIn               : 4.8 ~ 5V
  Vbat                 : 3.3xxV
```

```
                BIOS SET UP UTILITY
                     Advanced

Configure Watchdog Parameters
  POST Watchdog                  [Disabled]

  Runtime Watchdog               [Disabled]
```

Figure 5-21   Advanced Menu in BIOS(cont'd)

5-4-4-2 **BIOS Content** (cont'd)

```
                    BIOS SET UP UTILITY
   Main     Advanced    Boot     Security    Power    Exit

   Boot Device Priority
   Boot Priority Selection        [Type Based]

   1ST Boot Device                [USB CDROM]
   2nd Boot Device                [Primary Master]
   3rd Boot Device                [Disabled]
   4th Boot Device                [Disabled]
   5th Boot Device                [Disabled]
   6th Boot Device                [Disabled]
   7th Boot Device                [Disabled]
   8th Boot Device                [Disabled]


   Boot Settings Configuration
   Quick Boot                     [Enabled]
   Quiet Boot                     [Enabled]
   Boot Display                   [Clear]
   Automatic Boot List Retry      [Disabled]
   AddOn ROM Display Mode         [Keep Current]
   Halt On Error                  [Disabled]
   Ht "Del" Message Display       [Disabled]
   Interrupt 19 Capture           [Disabled]
   PXE Boot to LAN                [Disabled]
   Power Loss Control             [Remain off]
```

Figure 5-22   Boot menu in BIOS

```
                    BIOS SET UP UTILITY
   Main     Advanced    Boot     Security    Power    Exit

   Security Seetings
   Supervisor Password                     : Installed
   User Password                           : not Installed
   Change Supervisor Password
   User Access Level                       [No Access]
   Change User Password
   Password Check                          [Setup]
   Boot Sector Virus Protection            [Disabled]
   Hard Disk Security
   Hard Disk Security User Passwords
   Hard Disk Security Master Passwords
   BIOS Update & Write Protection          [Disabled]
   END-KEY Loads CMOS Default              [Yes]
```

Figure 5-23   Security Menu in BIOS

5-4-4-2   **BIOS Content** (cont'd)

```
                        BIOS SET UP UTILITY
    Main      Advanced    Boot     Security    Power    Exit

    Configure power management and control
    Power management/APM              [Enabled]
    Suspend Time Out                 [Disabled]
    Video power Down Mode            [Disabled]
    Hard Disk Power Down Mode        [Disabled]
    Keyboard & PS/2 Mouse            [Monitor]
    FDC/LPT/COM Ports                [Monitor]
    Primary Master IDE               [Monitor]
    Primary Slave IDE                [Monitor]
    Secondary Master IDE             [Monitor]
    Secondary Slave IDE              [Monitor]
    Resume On Ring                   [Disabled]
    Resume On PME#                   [Disabled]
    Resume On RTC Alarm              [Disabled]
    Power Button Mode                [On/Off]
```

Figure 5-24   Power Menu in BIOS

Section 5-5
Top Console

5-5-1   Keyboard
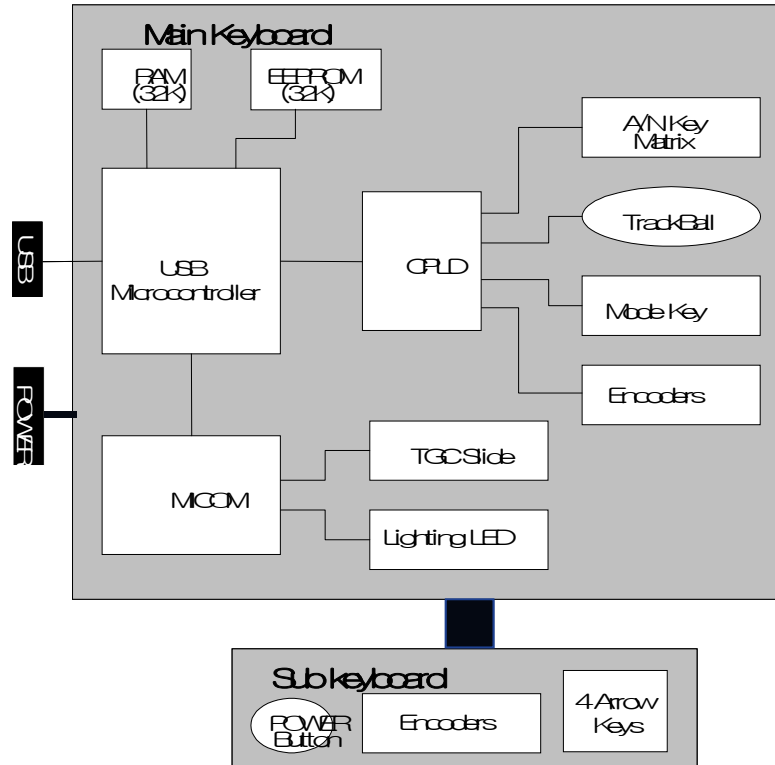
Figure 5-25   Keyboard Block Diagram

LOGIQ™ P5 and LOGIQ™ A5 Keyboard assy consist of 2 assy, one is main keyboard assy and the other is sub keyboard assy.

*   Main keyboard : Has alpha numeric key, Trackball, Encoders, Mode key, TGC controller and lighting components.
*   Sub keyboard: Have five encoder with push function and 4 arrow keys. These keys are used for operation menu selection normally.
*   Difference between LOGIQ™ P5 keyboard and LOGIQ™ A5 keyboard is that the LOGIQ™ A5 keyboard doesn't have the CFM key, CWD key, PDI key since the LOGIQ™ A5 doesn't support CFM,CWD,PDI mode. But if the LOGIQ™ A5 has been upgrade with Color Upgrade kit, LOGIQ™ A5 should have same keyboard as LOGIQ™ P5.

5-5-1-1 KEYBOARD Signal I/O

Main keyboard assy have two main external I/O connectors. One is for USB connection to scan system for main control signal interface, the other is for 5V power supply and momentary switch of scan system with hard drive operation indicator.

(a)Sub keyboard
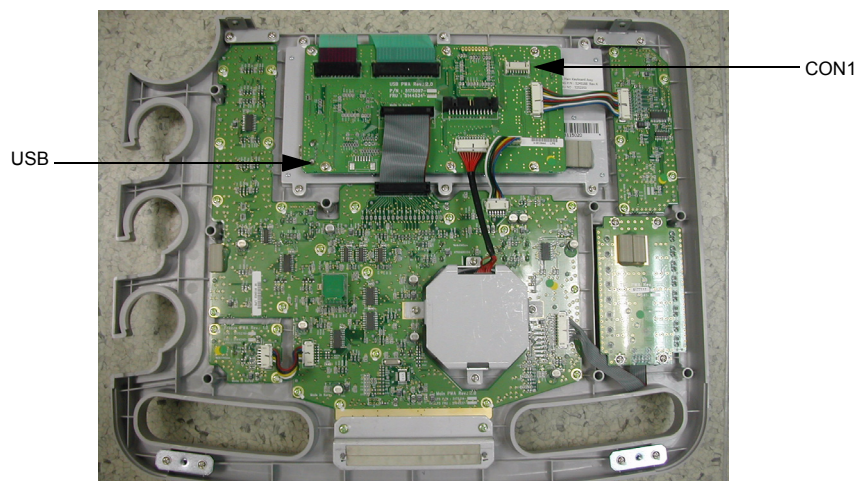
(b)Main Keyboard

Figure 5-26 Main Keyboard and Sub Keyboard connection to system

Table 5-1 CON1 Connector Signal I/O

Pin Number	Pin Name	Signal Path
1	HDD-	L1SYSCON > Backplane > Main Keyboard> Sub Keyboard
2	HDD+	L1SYSCON > Backplane > Main Keyboard> Sub Keyboard
3	Momentary S/W	L1SYSCON > Backplane > Main Keyboard> Sub Keyboard
4	GND	
10	GND	
11	GND	
12	GND	
13	KBD PWR	APS/APS Pro > Backplane > Main Keyboard > Sub Keyboard
14	KBD PWR	APS/APS Pro > Backplane > Main Keyboard> Sub Keyboard

5-5-2   LOGIQ™ P5 Monitor II and LOGIQ™ A5 Monitor II

LOGIQ™ P5 and LOGIQ™ A5 system has 15 inch LCD monitor with DVI-I interface. Monitor have also task lamp to light up the A/N key on keyboard assy.

Both monitor of LOGIQ™ P5 and LOGIQ™ A5 have completely same function and same hardware assembly. Difference is front bezel color. LOGIQ™ P5 bezel color is dar steel blue, and LOGIQ™ A5 bezel color is white gray color.

Figure 5-27   LOGIQ™ P5 Monitor and LOGIQ™ A5 Monitor

5-5-2-1   MONITOR Signal I/O

Monitor assy has two main I/O connectors, One is for DVI-I connection to scan system to display the scan image, the other is for 110V/220V power supply.

Figure 5-28   LCDMON connection in system

5-5-2-2   LCDMON control button function

LCDMON assy has four control buttons; Lamp Power button, Left button, Menu button, Right button.

Figure 5-29   LCDMON control buttons

Table 5-2   main functions of control key buttons

No	Name	Main Functions
1	LAMP POWER	Turns ON/OFF the Task Lamp in located bottom of LCDMON
2	LEFT	- Moves the highlight icon UP to the function that wants - Increases the adjustment of the selected function
3	MENU	- When the OSD menu is off, press once : Performs "Contrast-adjustment" function - When the OSD menu is off, press twice : Performs "Brightness-adjustment" function - When the OSD menu is off, press thee times : Performs "Dim-Brightness-adjustment" function - When the OSD menu is off, press more than 5 seconds : Performs "OSD-adjustment" function - When the OSD menu is on : Selects the function that user wants
4	RIGHT	- Moves the highlight icon Down to the function that wants - Decreases the adjustment of the selected function

Push "Menu" button to select the mode between Contrast, Brightness, and Dim Brightness mode. Then hold down "Left" and "Right" button until the value you want is set. The default values are 80% for the contrast, 80% for the Brightness, and 50% for the Dim-Brightness.
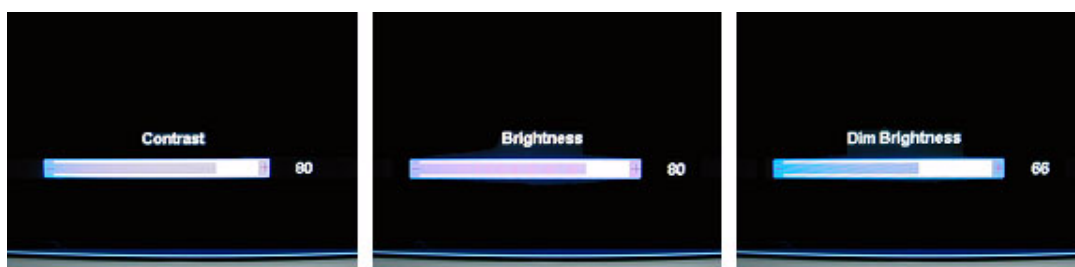
Figure 5-30   Contrast, Brightness and Dim-Brightness adjustment

Section 5-5 - Top Console

Section 5-6
ARP (Rear Panel)

The LOGIQ™ P5 and LOGIQ™ A5 system has the I/O interfaces for peripherals in rear panel. ARP (Arirang Rear Panel) assy has connectors for peripheral. Composite in/out and S-VHS in/out is for the analog video interface for recording and playback of the VCR or DVD recorder. Audio in/out is for audio interface for audio recording and audio playback of the VCR or DVD recorder. The ARP assy also has a USB hub device for expending the USB ports which provide additional USB ports. The analog VGA signal also provide display interface for external VGA monitor.
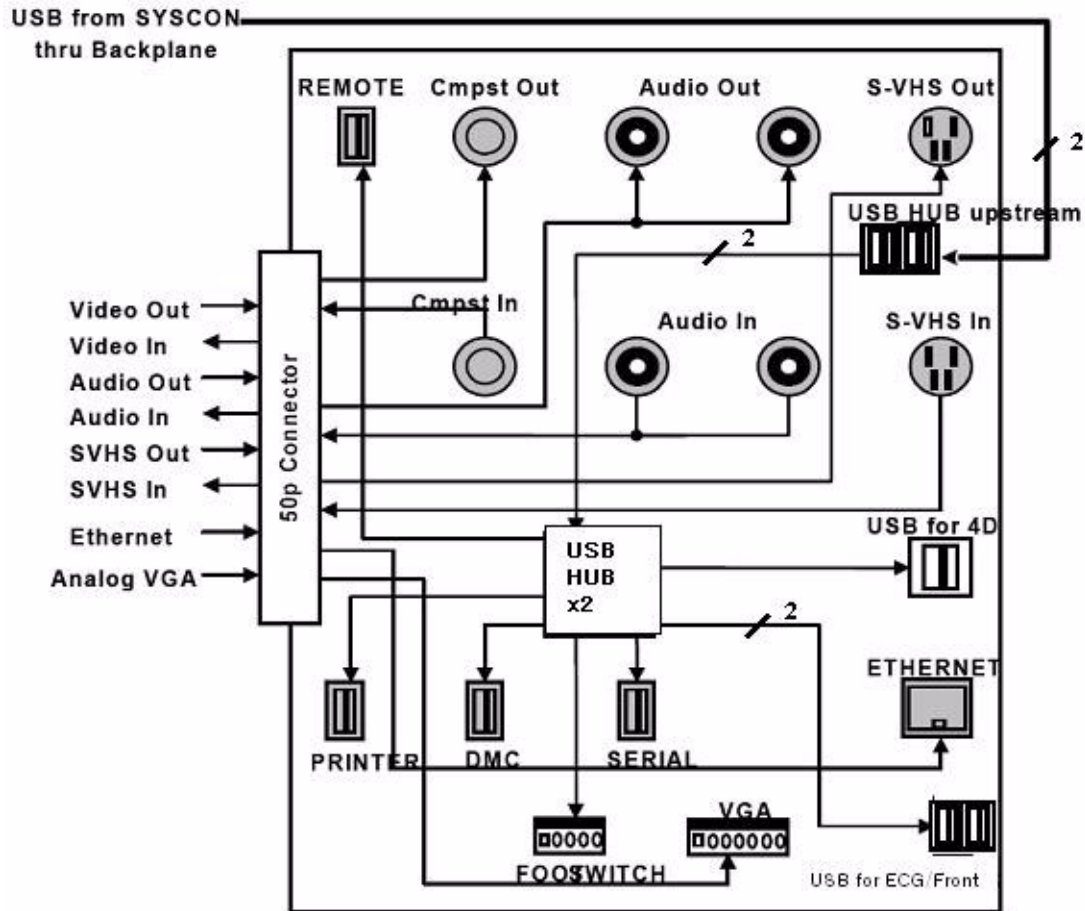
Figure 5-31   AEXP Block Diagram

5-6-1 Input/Output Signals for peripheral

Table 5-3 Input and Output signals for peripherals

Signal Name	Description	Connection from/via/to
Ethernet	Standard TCP/IP Ethernet	Syscon -> ARP -> 7P LAN Connector
External VGA	VGA signal output for external VGA monitor	Syscon -> ARP -> LG Connector -> 15P DSUB Connector
Foot Switch	Foot Switch is mechanical switch that connect a signal to ground	Foot Switch connector -> ARP(USB HUB)
Composite out for DVD Recorder	Compositor video signal output for DVDR	Syscon -> ARP -> BNC Connector
Composite in for DVD Recorder	Compositor input from DVDR	BNC Connector -> ARP -> Syscon
S-VHS out for DVD Recorder	S-VHS output signal for DVDR Recording	Syscon -> ARP -> S-VHS Connector
S-VHS in for DVD Recorder	S-VHS input signal for DVDR playback	S-VHS Connector -> ARP -> Syscon
Audio out L/R for DVD Recorder	Stereo audio output for DVDR Recording	Syscon -> ARP -> RCA Jack
Audio In L/R for DVD Recorder	Stereo audio input from DVDR for DVDR playback	RCA Jack -> ARP -> Syscon
USB Port for BW Printer	USB Port for BW Printer	Syscon -> Backplane -> USB Connector(dual R_A type) -> Front/BW Printer
USB Port for ECG	USB Port for ECG	ARP(USB HUB) -> USB Connector(R_A type) -> ECG
USB Port for 4D	USB Port for 4D	ARP(USB HUB) -> USB Connector(R_B type) -> 4D
USB Port for Digital Color Printer	USB Port for Color Printer	ARP(USB HUB) -> USB Connector(S_A type) -> Color Printer
USB Port for DMC	USB Port for DMC	ARP(USB HUB) -> USB Connector(S_A type) -> DMC
USB Port for USB Device	USB Port for USB Device	ARP(USB HUB) -> USB Connector(S_A type) -> USB Device
USB Port for Remote	USB Port for remote control of VCR/DVD Recorder	ARP(USB HUB) -> USB Connector(S_A type) -> VCR

Section 5-7
Power Diagrams

5-7-1   Overview

The AC Power assy's main tasks are to supply powers the various internal subsystems and to isolate electrically the scanner from the on site Mains Power System. The voltage to peripherals can be confederated to either 110 VAC or 220 VAC. Internal circuit for AC power have the free voltage capability basically but, we should separate the group using of low voltage (100V~127V), high voltage (200V~240V), and mixed voltage (100V~120V for peripheral and 200V ~ 240V for system).

5-7-2   TRANSBOX(AC Power)
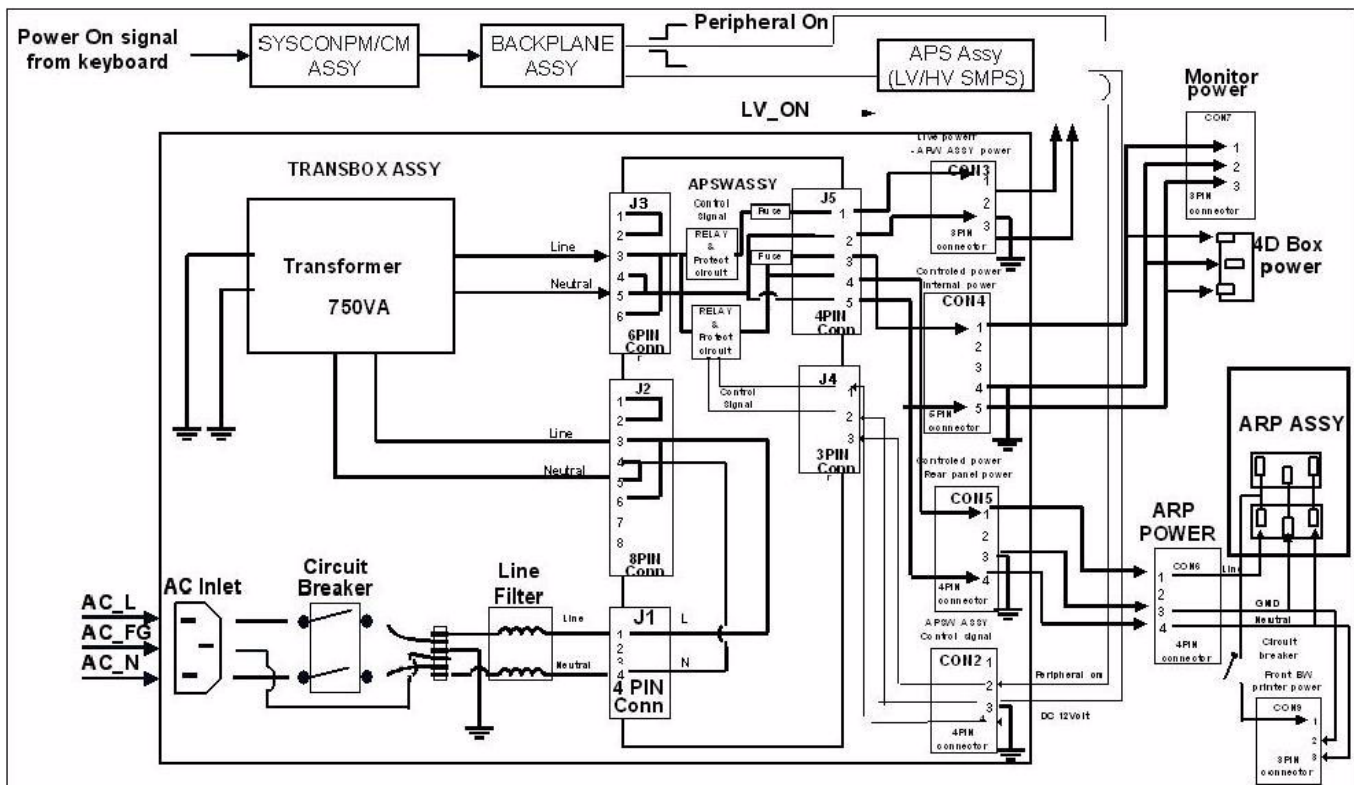
Figure 5-32   AC Power Assy Block Diagram

The mains cord has plugs in one side end. A male plug connects to the mains outlet on site. The mains voltage is routed to the Main Circuit Breaker, located on the rear side of the system. The Main Circuit Breaker is of the auto fuse type, if for some reason the current grows to high, the switch will automatically break the power. From the Main Circuit Breaker, the AC power is routed via the Mains Transformer and the Inrush Current Limiter to internal outlet connector for AC distribution.

The Transformer is the galvanic barrier between the rest of the scanner and the on site AC Mains. Input voltage to the transformer can be either 220 VAC or 110 VAC. AC output of transformer is supplied to the APS/APS Pro through Inrush Current Limiter without additional control. AC output of transformer for LCDMON, 4D BOX(option), and peripheral controlled by the L1SYSCON according to the On/Off status of the system.

5-7-3 APS/APS Pro (LV Power & HV Power)

NOTE: *HVL+ and HVL- are not available for APS PRO.*

DC Powers are supplied by APS and source of all assys in nest and nest fan, etc. To turn on the APS, the live power is needed as a standby power. This live power is generated from APS when the APS receive the AC input from the TRANSBOX. When the LP(live power) is supplied to the L1SYSCON and system momentary switch is pushed on, L1SYSCON make the LV_ON signal level into low to turn on the APS. After turning on the APS, the ACPC in TRANSBOX assy change the relay path on itself to supply stable AC power by using of D12V from APS.

DC Output Capacity:

- +D5VLP, 0.42A rms
- +D5V, 6.5A rms
- +D3.3V, 6.48A rms
- +D12V, 3.36A rms
- +D12VFAN, 0.94A rms
- +A6V, 7.92A rms
- -A6V, 1.52A rms
- +A12V, 1.26A rms
- -A12V, 0.6A rms

APS supplies High Voltage power to activate high voltage transmit pulse and static supply bias voltage on high voltage mux and probe. When L1SYSCON makes the HV_STOP signal to low, the APS generates the HV module in APS. The SHV supplies +/-80V to the system constantly and the THVH and THVL supplies 0~+/- 60V individually.

SYSCONPM(SYSCONCM) control the level of THVH and THVL through the IIC interface.

HV Output Capacity:

- +SHV, +80V, 0.05A rms
- - SHV, -80V, 0.05A rms
- +THVH, 0V~+60V, 0.5A rms
- - THVH, -60V~0V, 0.5A rms
- +THVL, 0V~+60V, 0.5A rms
- - THVL, -60V~0V, 0.5A rms

5-7-4   AC Power Outlet for Peripheral

The ARP CONN ASSY and ARP CONN 220V ASSY are the ARP assemblies which interconnect external signal and power with the LOGIQ™ P5 system. Both of the assemblies are the same except the circuit breaker's current ratings depending on voltage of the system power source (See 'Safety' described below).

5-7-4-1   Safety

• Circuit Breaker

Table 5-4   Circuit Breaker Specification

Assembly	Power Voltage Rating (V)	Peripheral Current Rating (A)	Trip Time	Reset Time
ARP CONN	**110**	**4.0**	1 hour max. @ 5.4A, 25 degreeC	110 second
ARP CONN 220V	**220**	**2.0**	1hour max. @ 3.5A, 25 degreeC	180 second

• Electrical Isolation

The ARP's Insite interface is electrically isolated from the system's internal circuit. The isolator's dielectric strength should be 500VAC RMS or higher within 1 minute (in compliance with IEC60601-1-1).

Section 5-8
Cable Connection

5-8-1 Overview

The cable connection can be separated to two group, internal harness and external cable connection for peripheral equipment.

5-8-2 Internal Cable
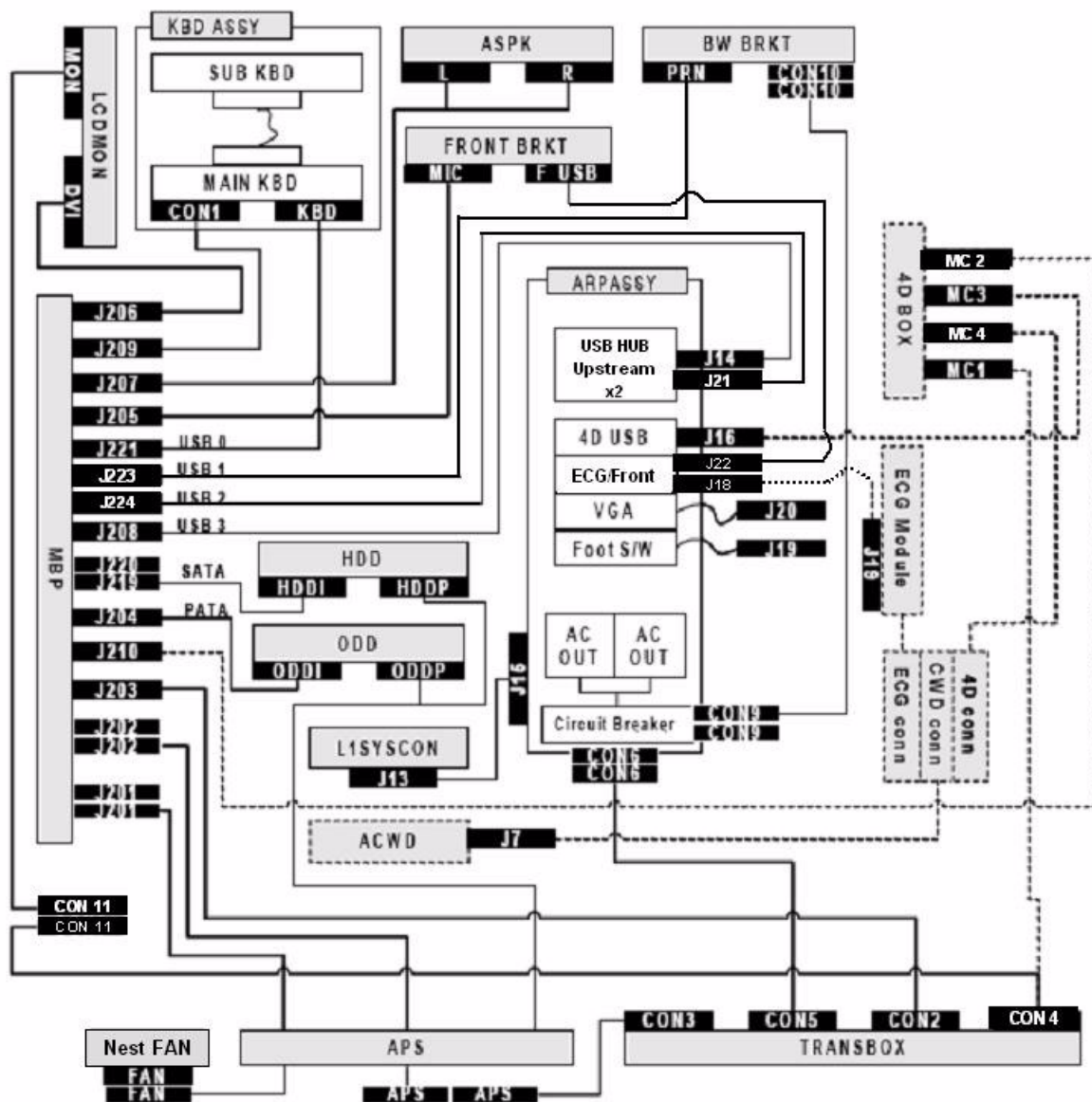
Figure 5-33   Cable Connection - Internal

The black box with white character is the label of the connector and the adjacent same label connector means that the two connectors should be connected each other. The dotted line means optional connection when the customer uses that option.

5-8-3   Peripherals and Cable connection

A DVD recorder, a Black & White Video Printer and a Color Printer may be installed onboard the scanner. These devices are connected to the External I/O (Rear Panel) or Front Panel in the case of B/W Printer. LOGIQ™ P5 do not support analog printer but digital printer.

5-8-3-1   Cable Connection - BW printer

Connect the Power cable and USB cable as shown in Figure 5-34.
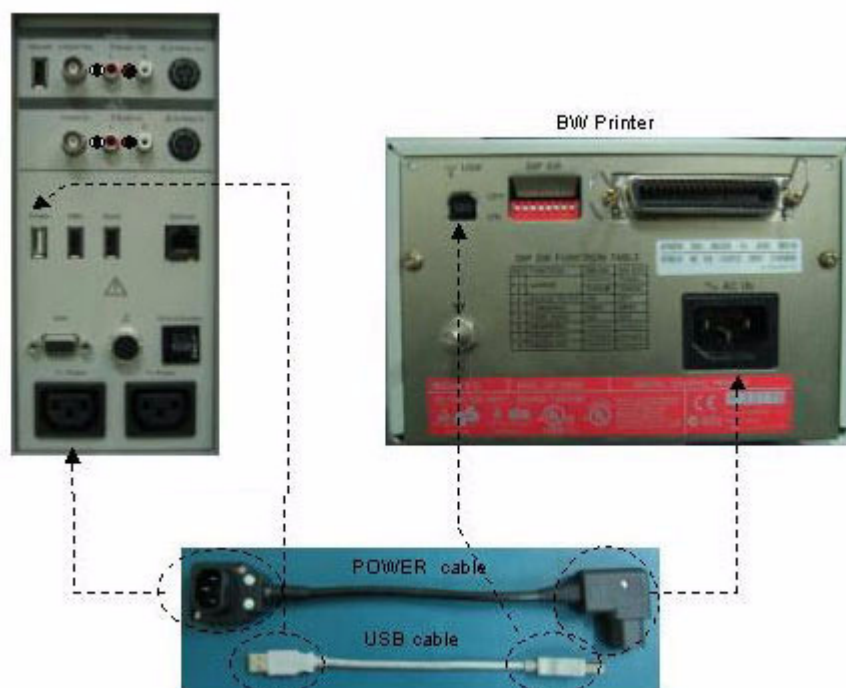
Figure 5-34   Cable Connection - Digital BW Printer

5-8-3-2   Cable Connection - Color Printer

Connect USB cable listed below between the compatible Color Printer like SONY UP-D21MD and the console.
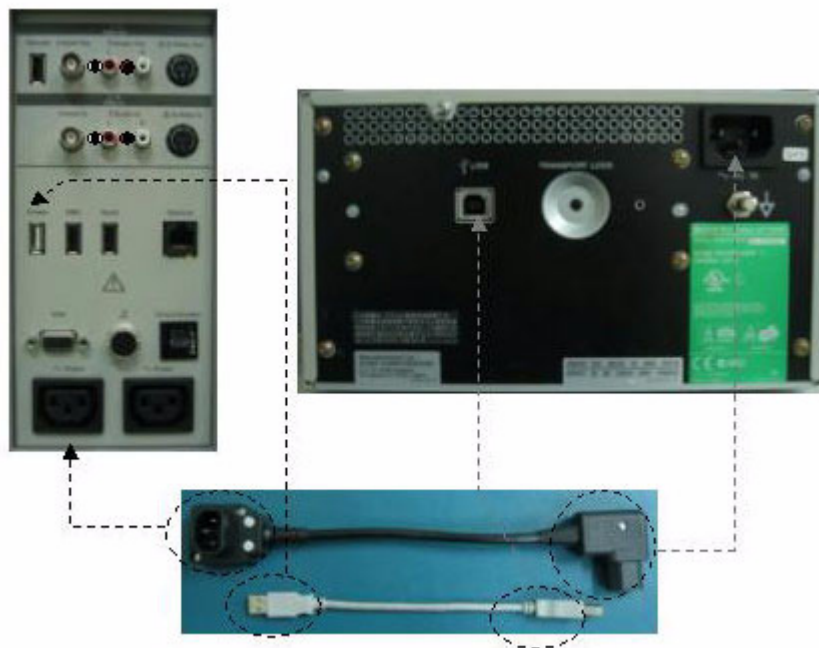
Figure 5-35   Cable Connection - Digital Color Printer

5-8-3-3   Cable Connection - DVD Recorder

Connect the cable listed below between the SONY DVDR and the console.
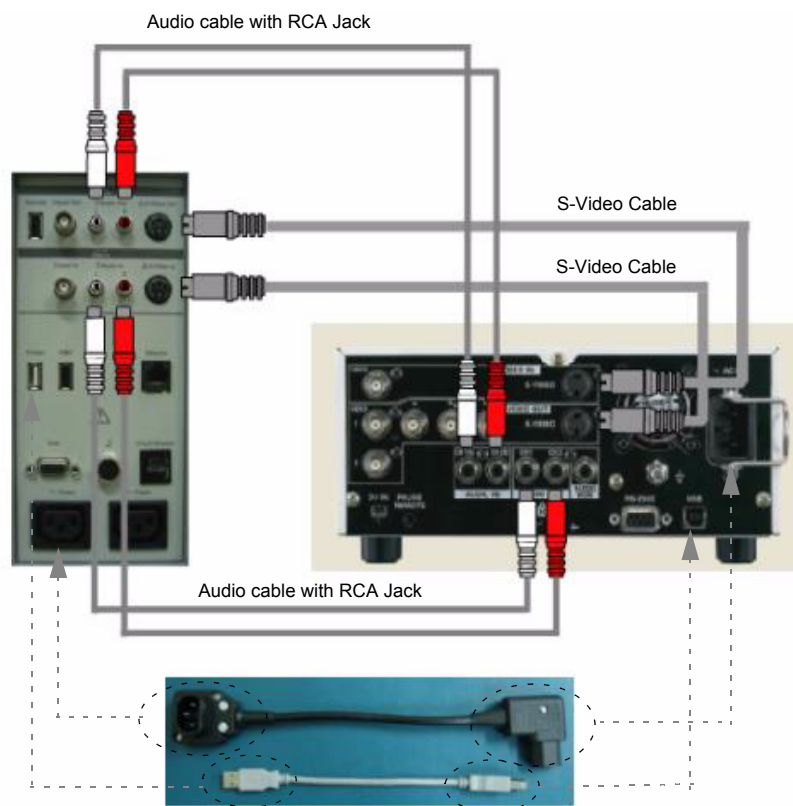
Figure 5-36   Cable Connection - DVD Recorder

Section 5-9 Filters

5-9-1 Filters

The scanner contains the two filters located at

a.) Right side of TRANSBOX to protect TRANSBOX and NEST from dust.

b.) Left side of TRANSBOX to protect TRANSBOX and NEST from dust.

(a)   (b)
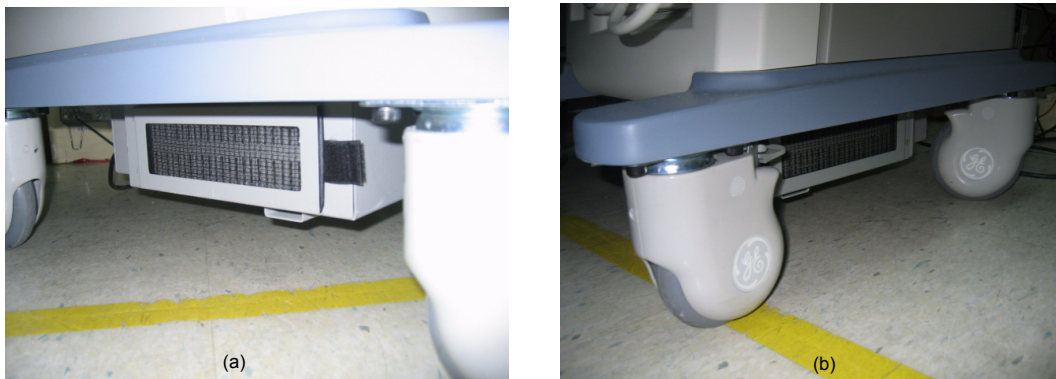
Figure 5-37   Location of Air Filter

5-9-2 Fans

The scanner contains the 5 fans at the following positions for producing an air flow.

a.) One fan : On the surface of heat sink for SOM heat.

b.) Two fans : At the top of the APS/APS Pro for APS/APS Pro heat.

c.) Two fans : At the top of the NEST for NEST Assy and AC Power assy.

(a) Cooling Fan on SYSCOMPM(SYSCONCM)
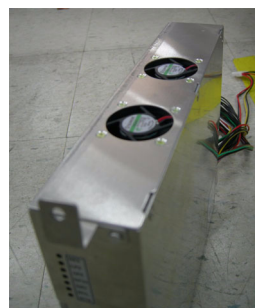
(b) Cooling Fans on APS

(c) Cooling FAN Assy for NEST Cooling

Figure 5-38   Location of Fans

Section 5-10
Service Platform

5-10-1   Introduction

The Service Platform contains a set of software modules that are common to all ultrasound and cardiology systems containing a PC backend. This web-enabled technology provides linkage to e-Services, e-Commerce, and the iCenter, making GE's scanners more *e-enabled* than ever. The Service Platform will increase service productivity and reduce training and service costs.

5-10-2 Global Service User Interface (GSUI)

5-10-2-1 Internationalization

The user interface provided by the service platform is designed for GE personnel and as such is in English only. There is no multi-lingual capability built into the Service Interface.

5-10-2-2 Service Login

1.) Touch **Utility > Service**. It will take about 1p seconds for activations.

2.) Make sure that **CAPS** is <u>OFF</u> for password entry performed later.

3.) The Service Login window for Service Platform will be shown on the monitor display.
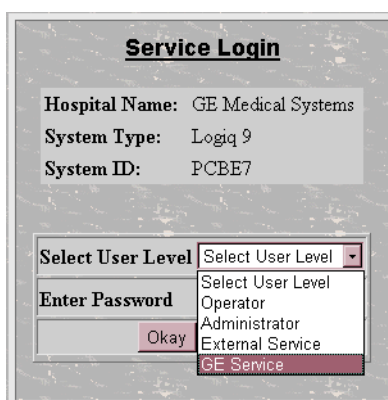
Figure 5-39   Login Screen for Global Service User Interface

5-10-2-3 Access / Security

The service interface has different access and security user levels. Each user is only granted access to the tools that are authorized for their use.

*NOTE: A Service Dongle is necessary for use by GE Service when performing proprietary level diagnostics. OnLine Center access to the scanner requires the password and they must have '**Disruptive**' permission and customer input to run diagnostics.*

Table 5-5   Service Login User Levels

User Level	Access Authorization	Password
Operator	Authorized access to specified diagnostics, error logs and utilities. Same acquisition diagnostic tests as GE Service.	uls
Administrator		uls
External Service		gogems
GE Service	Knowledge of a service level password. A physical Service Key (Dongle) required	rotating security password

NOTE: For a GE Field Engineer, the password changes at specific intervals. Access with the password is tied to the service key.

Every access request, whether successful or not, will be logged into a service access log that is viewable to authorized users.

5-10-3   Service Home Page

When the Service Interface is started, the Service Home Page appears. The Home Page contains the software revision along with the hardware inventory and the results of the latest System Health Information. The navigation bar at the top of the screen allows the user to select from several tools and utilities.
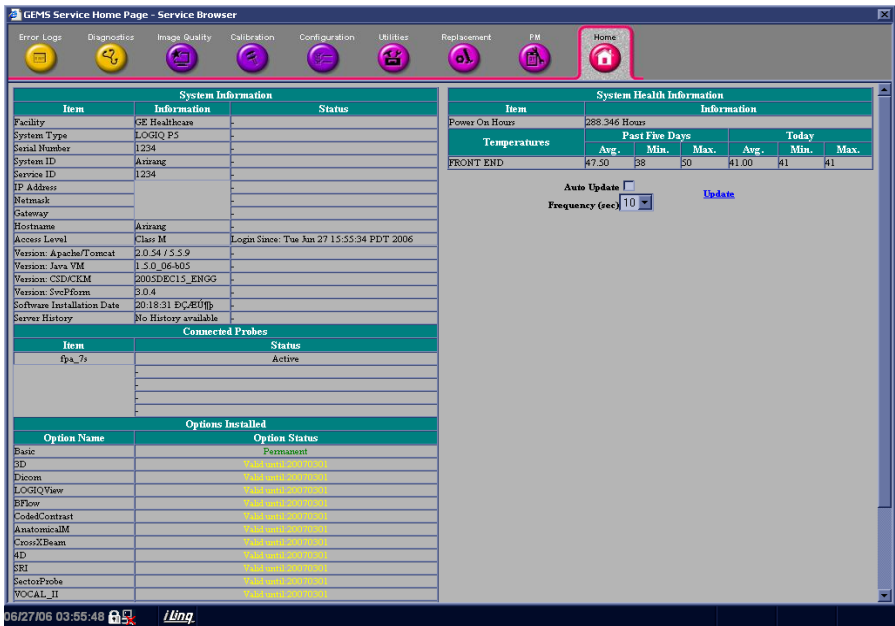
Figure 5-40   GE Service Home Page

5-10-4   Error Logs Tab

From the Error Logs Tab the Log Viewer displays four categories with pull-down sub-menus and an Exit selection. The Service Interface allows scanner logs to be viewed by all service users.

The **Filter** Error log is keyed to GE Service login access permissions and is not available to customer level analysis.

The log entries are color-coded to identify the error level severity at a glance.

Table 5-6   Log Entry Key

Severity	Error Level	Color Code
1	Information	Green
2	Warning	Blue
3	Error	Red

The Service Interface supports the transfer of these logs to local destinations such as the MOD, and CD-ROM drive.
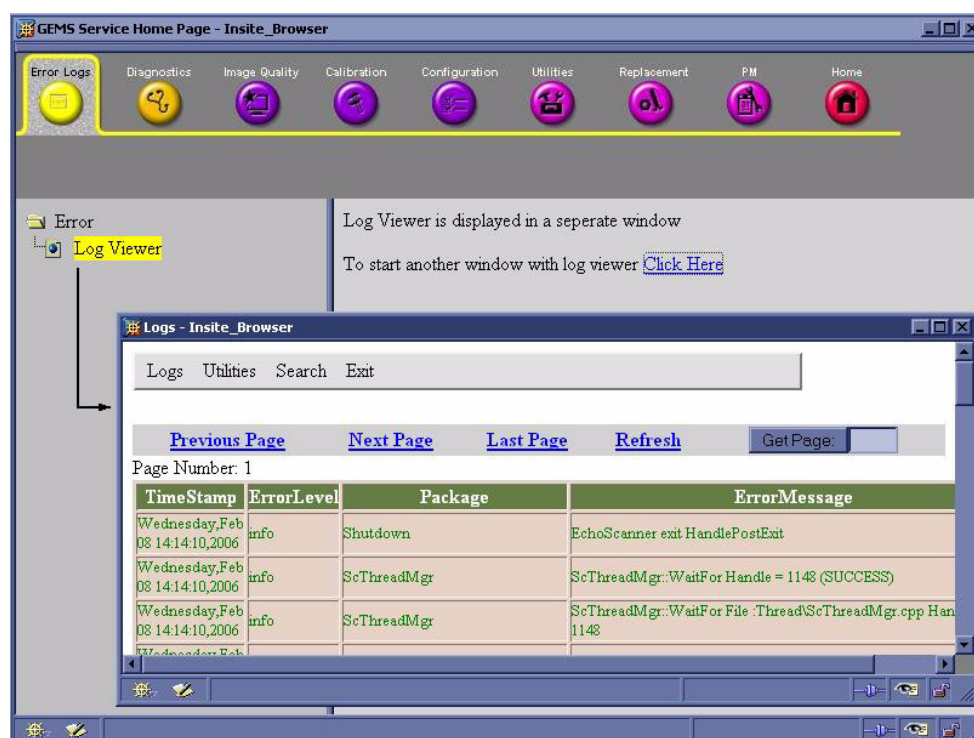
Figure 5-41   Log Viewer / Logs / Log Entries

5-10-4-1   Logs

The seven sub-menus of the Logs category are System, Infomatics, Temperature, Probe, Board, and DICOM.

*NOTE: Figure 5-41 provides a graphical example of the log entries for the **System Logs**.*

Log table headings for the different logs are as follows:

*   **System**

    Log entry headings include Time Stamp; Error Level; Package; and Error Message.

*   **Infomatics**

    Log entry headings include TimeStamp, Revision, PtID, PtDOB, PtSex, PtWeight, PtHeight, ExamID, Exam Category, ExamCurDate, and ExamStartTime.

*   **Temperature**

    Log entry headings include Time Stamp; Error Level; Package; L1SYSCON temperature sensor.

*   **Probe**

    Log entry headings include Time Stamp; Error Level; Package; Error Message; Severity; Revision; and three (3) new labels that have not yet been named.

*   **DICOM**

    Log entry headings include Time Stamp; Error Level; Package; and Error Message.

5-10-4-2   Exit

The sub-menu, **Exit Log Viewer**, returns the user to the Service Desktop home page.

Figure 5-42   Exit Log Sub-Menu

5-10-5 Diagnostics

NOTE: *When Service Login for FRU Diagnostic, scan mode must be B-mode.*

⚠ **WARNING** *Diagnostics should be performed with probes which have 128 or more elements.*

Detailed **Diagnostic** information is found in Diagnostics/Troubleshooting.
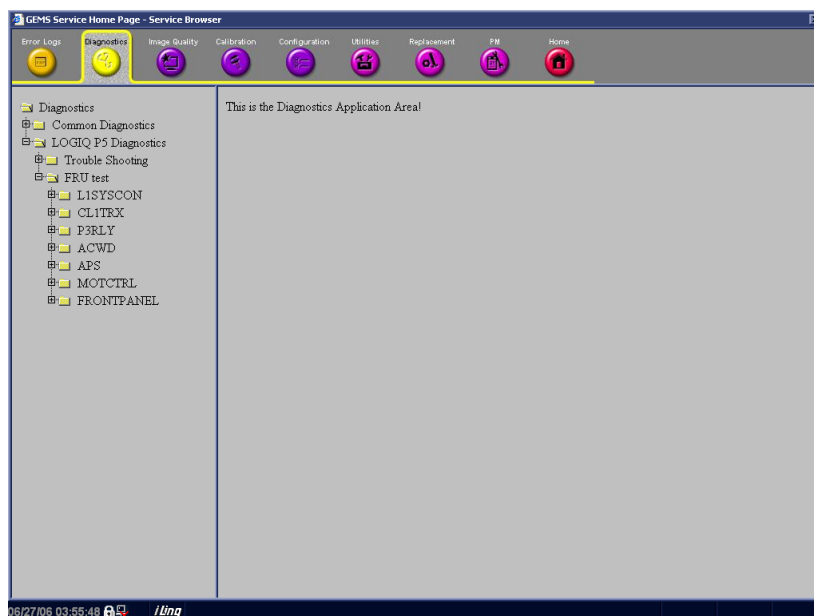
Figure 5-43   GE Service Diagnostic Page

NOTE: *After finishing Diagnostic test, the system should be rebooted.*

5-10-5-1 Diagnostics Execution

Diagnostic tests are executable by both local and remote users. The Service Platform provides top-level diagnostic selection based on the user's level and login access permissions. Remote access will require disruptive diagnostic permissions to run Acquisition diagnostics.

5-10-5-2 Diagnostic Reports

Diagnostic tests return a report to the Service Platform. The platform retains the report and allows for future viewing of the diagnostic logs.

5-10-5-3 Proactive Diagnostics

A system of self-monitoring is largely supported with the integration of *iLinq*. The scheduler, executive, user interfaces, and some of the proactive diagnostic functions are provided by *iLinq*. Other tasks should be provided by the product team.

5-10-6 Image Quality

The **Image Quality** page is intended to contain tools for troubleshooting image quality issues.
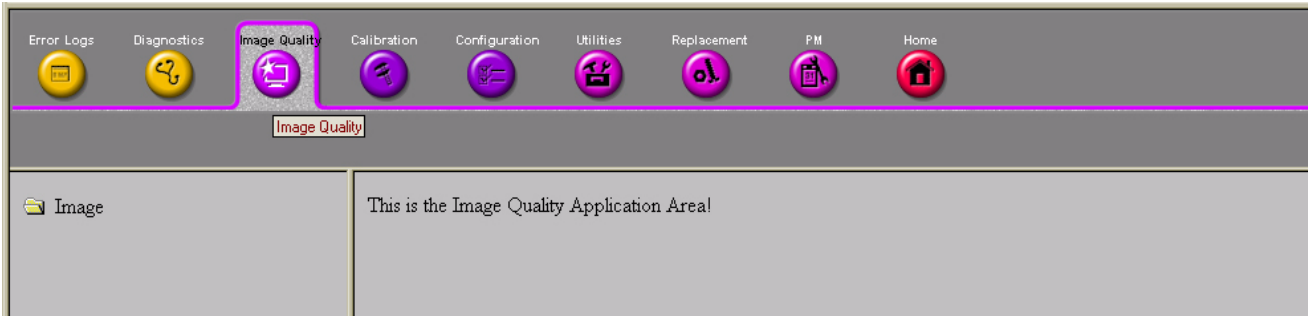
Figure 5-44 Image Quality Page

5-10-7 Calibration

The **Calibration** page is intended to contain the tools used to calibrate the system.
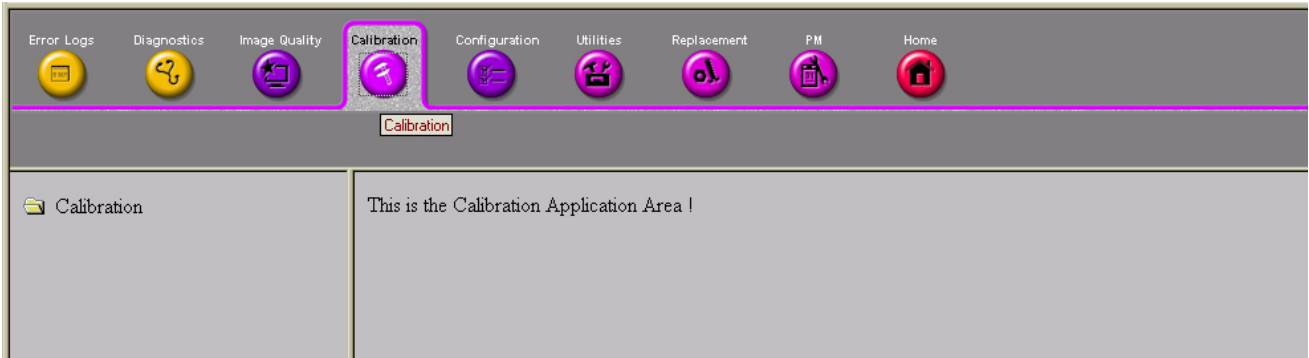
Figure 5-45 Calibration Page

5-10-8 Configuration

The **Configuration** page is intended to be used to setup various configuration files on the system.

The Service Platform is the access and authorization control for remote access to the configuration subsystem.

The enable/disable of software options can be done from this Configuration page.

Figure 5-46   Configuration Page

5-10-8-1   Questra Agent Configuration

These feature that allow the customer to register the system to the GE OnLine Center are available for Warranty and Contract customers only.

5-10-8-1-1   Device Information

Device name and CRM No. are displayed by default.

5-10-8-1-2   Advanced Configuration

Select Enterprise Server to check out to

5-10-8-1-3   Proxy Configuration.

If Proxy is used in the site, it should be filled proper Proxy Server Address and Proxy Server Port. And Press "Submit Changes" button to finish check out process

Figure 5-47   Proxy Configuration

NOTE: The system is needed to reboot to apply settings.

5-10-9 Utilities

The **Utilities** page contains several miscellaneous tools.

Figure 5-48   GE Service Utilities Page

Figure 5-49   Customer Utilities Page

5-10-10   Replacement

The **Replacement** page is intended to contain the tools used to track replacement parts used in the system.
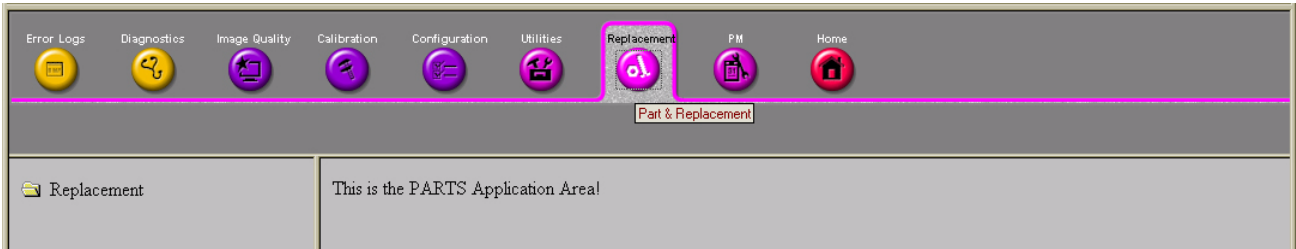
Figure 5-50   Part Replacement Page

5-10-11   PM

The **PM** page is intended to contain the tools used in periodic maintenance of the system.
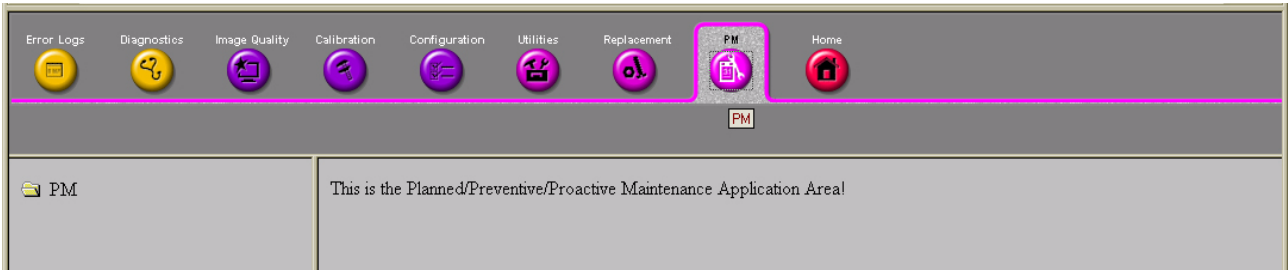
Figure 5-51   Planned Maintenance Page

5-10-12 Remote Software/Option Installation and Updates

The Service Platform provides for remote software downloads. Any file transferred to the scanner will be in the form of an installation package. The actual content of the installation package is dependent on each product.

Software installation is simple and automated with a Graphic User Interface (GUI), where applicable.

Supports software upload via remote transmission

Supports software upload via Service Platform

Options can be activated permanently

Options can be activated for a timed period

Options can be limited to a number of uses

Options that expire must give notice to the user that the option has expired

5-10-12-1 Remote System Shutdown and Restart

The Service Platform provides the ability to restart the system as per standard shutdown/startup procedures. Remote shutdown will only be provided if a software-controlled shutdown exists on the scanner. Scanner system restart is always accessible from the OLC.

5-10-12-2 File and/or Image Transfer

The Service Platform supports file transfers and archived image transfers to the OnLine Center. The Service Platform provides interfaces of the displayed images for transfer to the OLC.

Section 5-11RFS (Service For Request)

5-11-1 General

This describes general RFS functionality.

1.) RFS function is a call for service to be used by customer or FE directly from the system instead of calling GE Cares.

5-11-2 System Checkout Procedure

*If the system is checked out already, skip **5-8-2) System Checkout Procedure** and proceed from **5-8-3) Sending RFS Procedure**.*

1.) Check if the system is connected to the network.
2.) Go to "Utility"
3.) Press "Service"
4.) Log on to the Service Platform with a password.
5.) Press "Configuration"
6.) Press "InSite ExC Agent Configuration"

Figure 5-52   Agent Configuration

5-11-2 **System Checkout Procedure** (cont'd)

All bold fields should be filled

7.) Device Name and CRM No are pre-populated and can not be changed.

8.) Verify that "Send" button is enabled.

9.) Select Continent and Country

10.)Put City, State, and Institution

11.)Select "Product" for the Enterprise.

12.)If Proxy needs to be configured, select "Enable" for the Proxy filed and input IP address and Port number.

13.)Press "Submit Changes". "Please Wait" message is displayed while the system is checking out. Figure 5-53

Figure 5-53   Please Wait

14.)Wait until following screen displays. (Figure 5-54)

Figure 5-54   Configuration done

15.)Configuration is complete.

16.)Close the Service Platform.

5-11-3   Sending RFS Procedure

Service Platform should be turned off in order to open RFS window.

System must be connected to network, configured and checked out to be able to send the RFS

1.) Right Click on "Connect to GE" icon.
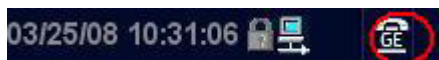
Figure 5-55   Contact GE Icon

All the fields that are marked with asterisk * are mandatory and should be filled in order to send the RFS request to On Line Center.

2.) Fill out the Last name, First name, and Phone number. (Figure 5-56)
3.) Extension, E-mail, and Other system ID fields are optional.
4.) Select Problem Type.

If Problem is about "No Boot", "No Image", "Error message", "Lock up", "Probe", "Peripherals", select "Service" for the Problem Type.

If Problem is about "Presets", "Reports", "Measurements", or "Probe not recognized", select "Applications" for the Problem Type.

5.) Select the Problem Area.
6.) Write the detailed problem description in the Problem Description field.

Figure 5-56   RFS window

5-11-3   Sending RFS Procedure (cont'd)

7.) Then the "Send" button is enabled.

Figure 5-57   RFS send enabled

8.) Click "Send" button and wait for confirmation window with reference number on the screen.

9.) Verify that "confirmation message" pops up in the screen.

10.) RFS request is completed.

11.) On Line Center will contact the customer shortly by phone.

Section 5-12 Machine RFS

5-12-1   General

This describes general MRFS (Machine RFS) functionality.

1.) MRFS function is an automatic call for service from the system to the OLC when system detects high temperature or high or low voltage.

5-12-2   Enabling MRFS

NOTE: *In order to enable MRFS, System must be connected to network and should be checked out to a product server. Default MRFS user should also be set.*

1.) If a system is not already checked out, the system should be checked out to a product server. Refer to *5-11-2 - System Checkout Procedure.*

2.) MRFS function is an automatic call for service from the system to the OLC when system detects high temperature or high or low voltage.

3.) Right Click on "Connect to GE" icon.

Figure 5-58   Contact GE Icon

4.) When RFS window pops up, click on "Users" tab.

Figure 5-59   User tab

5-12-2   Enabling MRFS (cont'd)

    5.) Press "Add User".

Figure 5-60   Add User

All the fields that are marked with asterisk * are mandatory and should be filled

    6.) When fields with asterisk are filled, "Add User" button is enabled.

Figure 5-61   Add User

    7.) Press "Add User" button.

5-12-2   Enabling MRFS (cont'd)

8.) check the checkbox next to the name to set to the default contact. Then Press "Set Default Machine Contact" button,
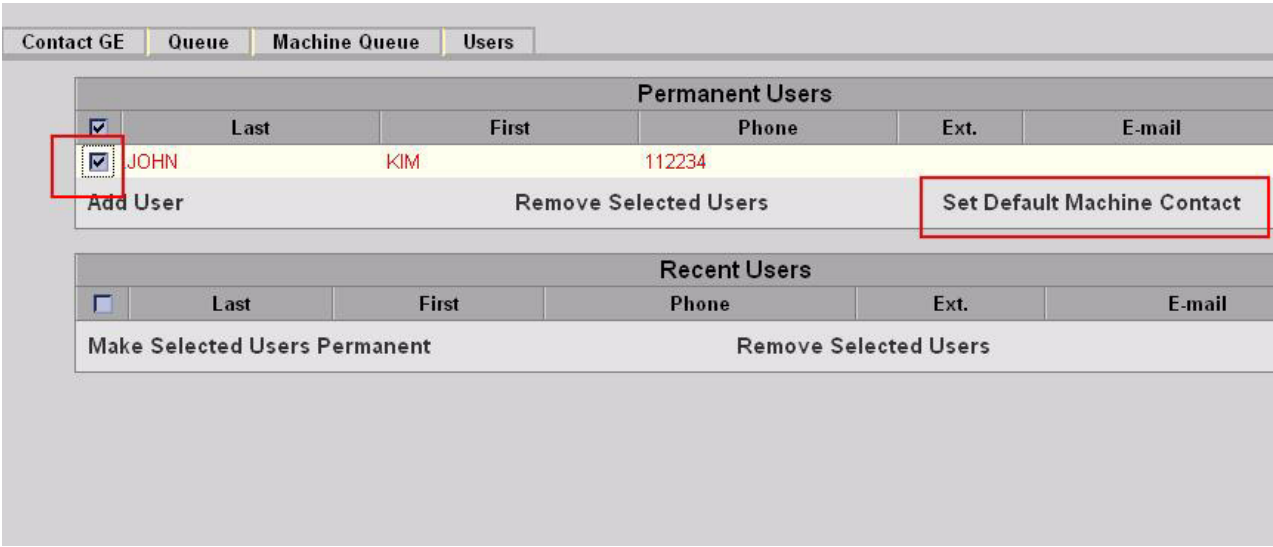
Figure 5-62   Set Default Machine Contact

9.) Now the MRFS is enabled.

10.) When system detects high temperature or abnormal voltage, the system will send the RFS to the OLC automatically.

Section 5-13Fast Polling

5-13-1   General

This describes Fast Polling feature that will change the polling rate to 15 seconds for 10 minutes.

5-13-2   Enabling Fast Polling

1.) Right Click on "Connect to GE" icon.
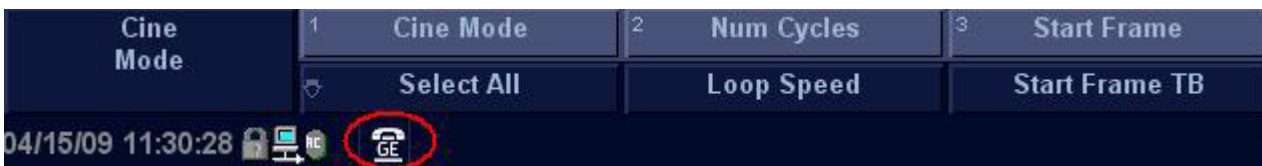
Figure 5-63

2.) Pressing "OK" will change the polling rate to 15 seconds for 10 minutes.
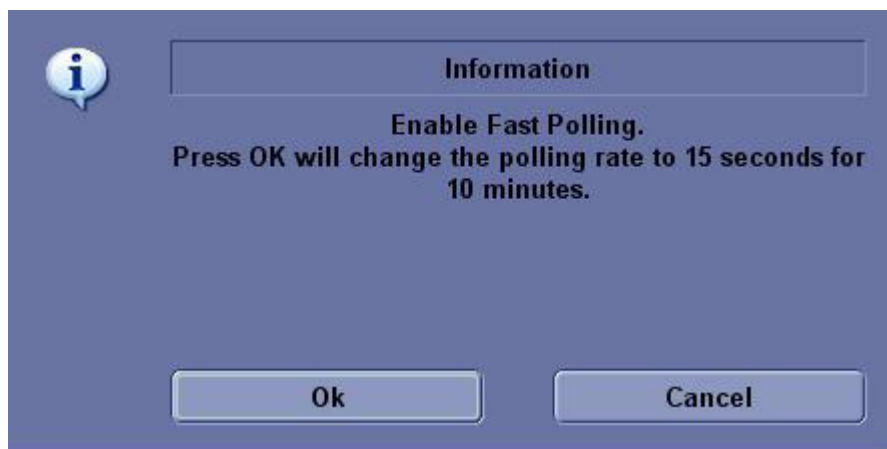
Figure 5-64   Agent Configuration

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Section 5-13 - Fast Polling

Chapter 6
Service Adjustments

Section 6-1
Overview

6-1-1   Purpose of this chapter 6

This section describes how to test and adjust the scanner. These tests are optional. You may use them to check the system for errors.

Table 6-1   Contents in chapter

Section	Description	Page Number
6-1	Overview	6-1
6-2	Regulatory	6-1
6-3	Monitor Adjustments	6-2

Section 6-2
Regulatory

Verify, where applicable, that any regulatory information or tests required by national law are present and accounted for, and any regulatory tests required by national law are performed *and* documented.

Section 6-3
Monitor Adjustments

6-3-1   Rotate and tilt the monitor

The monitor position can be adjusted for easy viewing.

- The monitor can be rotated around its central pivot point.
- The monitor can be tilted for the optimum viewing angle.
- the monitor can be flipped up and down.

NOTE: *When moving the system, flip down the monitor to its lowest possible position to improve stability.*
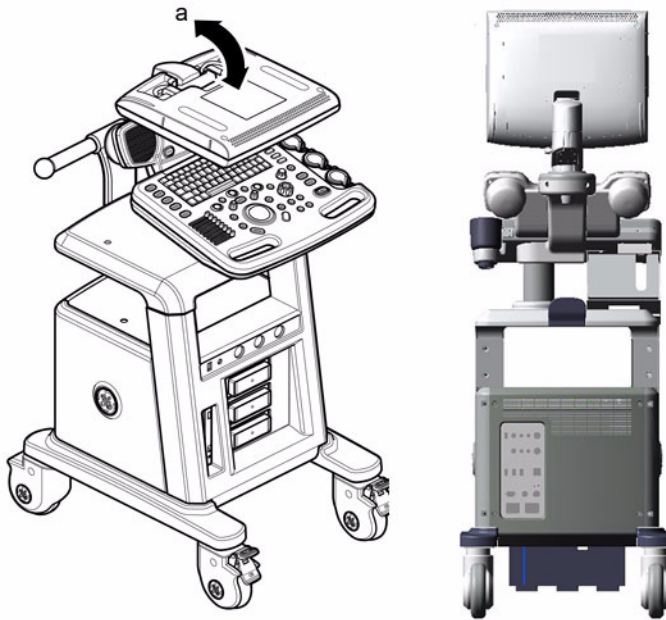
Figure 6-1 LCD monitor Flip up and down

6-3-2   Brightness and Contrast

Adjusting the monitor's contrast and brightness is one of the most important factors for proper image quality. If these controls are set incorrectly, the Gain, TGC, Dynamic Range and even Power Output may have to be changed more often than necessary to compensate.

The proper setup displays a complete gray scale. The lowest level of black should just disappear into the background and the highest white should be bright, but not saturated.

To adjust the contrast:

1.) Press the Toggle button on the display monitor once.

2.) Press the Adjustment (+) button to increase contrast. Press the Adjustment (-) button to decrease contrast.

3.) The amount of contrast is shown on a slide bar on the screen.

To adjust the brightness:

4.) Press the Toggle button on the display monitor twice.

5.) Press the Adjustment (+) button to increase brightness. Press the Adjustment (-) button to decrease brightness.

6.) The amount of brightness is shown on a slide bar on the screen.

Figure 6-2   Brightness and Contrast

1. Contrast Indicator
2. Brightness Indicator
3. Dim Brightness Indicator
4. Light Button
5. Adjustment (-) Button
6. Toggle Button
7. Adjustment (+) Button

Record any changes to the final brightness and contrast settings and leave this information with the system. Generally speaking, do not change the controls once they have been set. Once set, the display then becomes the reference for the hard copy device(s).

NOTE: After readjusting the monitor's Contrast and Brightness, readjust all preset and peripheral settings.

6-3-3   LCD Plastic filter

6-3-3-1   Tools

- •   Common Phillips screwdrivers
- •   Allen/Unbraco wrench
- •   Stubby screwdriver (Flat tip and Cross tip)

6-3-3-2   Removal procedure

1.) Remove the Monitor cover set. Refer to the 8-2-2 "Monitor cover set" on page 8-5 and the figure below.

2.) Remove the LCD Plastic filter.
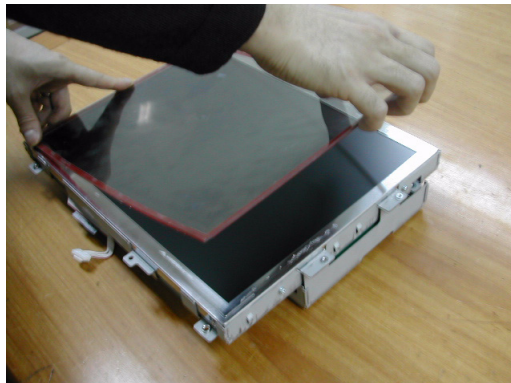
Figure 6-3   Removing the LCD plastic filter

3.) Put the LCD plastic filter on the LCD monitor after detaching the tape of the LCD plastic filter.
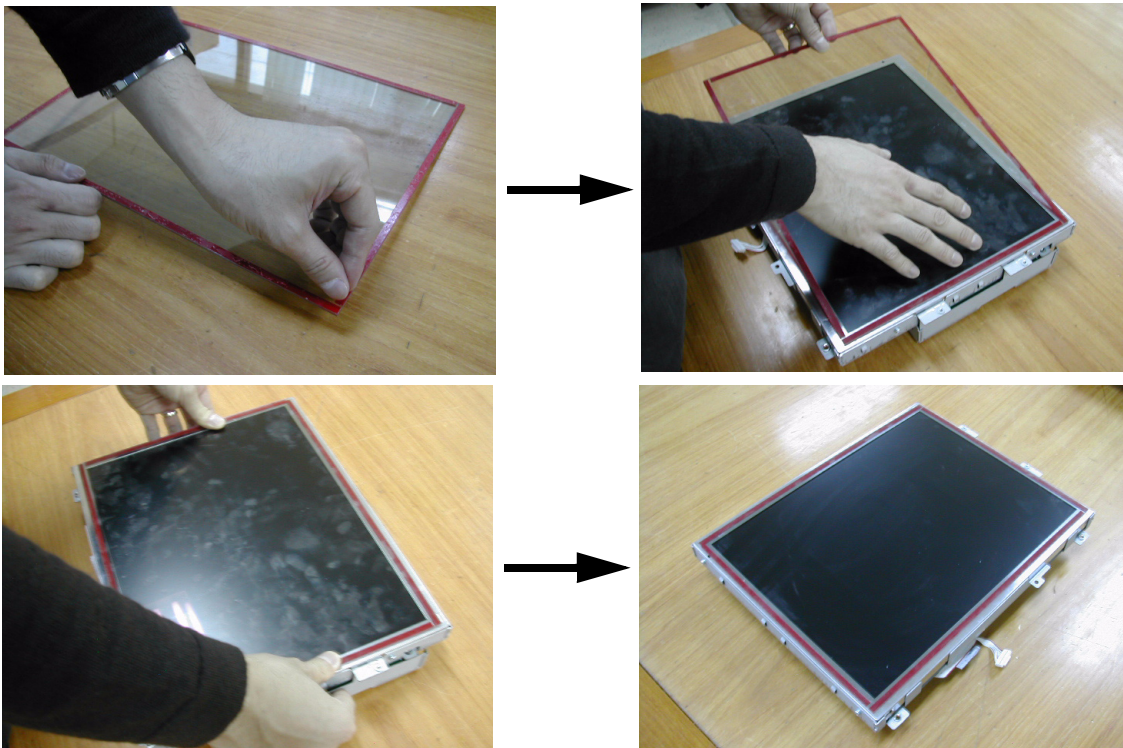
Figure 6-4   Putting the LCD plastic filter on the LCD monitor

6-3-3-2 **Removal procedure** (cont'd)

4.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 6-2   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 2+, 6-3-3. Equipment passed all required tests and is ready for use. "
4-3-2	Power Off / Shutdown	
4-8-2	LCD plastic filter Function Validation Procedure	
10-5-5	Physical Inspection	

6-3-3-3 **Mounting Procedure**

1.) Install the LCD monitor cover parts in the reverse order of removal procedure. Refer to the 8-2-2 "Monitor cover set" on page 8-5.

2.) Put the label on the rear of the LCD monitor.

Figure 6-5   Putting the label on the rear of the LCD monitor

6-3-4   Flexible LCD arm - locking mechanism

Flexible LCD arm's rotation movement can be adjusted by using the LCD arm's locking mechanism.

To unlock the LCD arm:

1.) Pull the LCD arm toggle knob and turn clockwise to unlock the LCD arm.

Figure 6-6   Unlocking the Flexible LCD arm

To lock the LCD arm :

1.) Turn counter clockwise and push the LCD arm toggle knob and to lock the LCD arm.
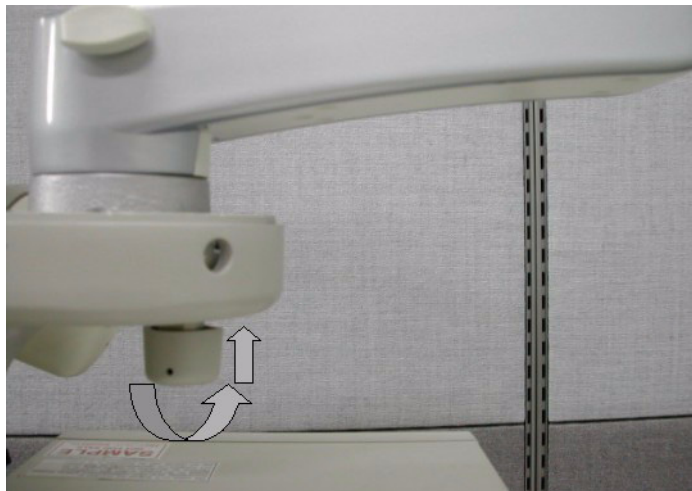
Figure 6-7   Locking the Flexible LCD arm

Section 6-4
Trackball Cleaning

The trackball on the keyboard need to be cleaning periodically.

1.) Open the trackball

Figure 6-8   Open Trackball

Remove dust inside of bucket

Figure 6-9   Trackball Hole

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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. Basic host, system, and board level diagnostics are run whenever power is applied. Some Service Tools may be run at the application level.

NOTE: Be sure to disable ECG function before performing Diagnostic function.

NOTE: Make sure that convex or linear probe is connected before the system starts. (sector probe is not applicable for the service diagnostics)

Table 7-1   Contents in Chapter 7

Section 7-2
Gathering Trouble Data

7-2-1　Overview

There may be a time when it would be advantageous to capture trouble images and system data (logs) for acquisition through remote diagnostics (InSite) or to be sent back to the manufacturer for analysis. There are different options to acquire this data that would give different results.

7-2-2　Collect Vital System Information

The following information is necessary in order to properly analyze data or images being reported as a malfunction or being returned to the manufacturer:

-　　Product Name = LOGIQ™ P5

From the *Utility>System>About* screen:

Applications Software

-　　Software Version
-　　Software Part Number

System Image Software

-　　Image Part Number
-　　Image Date

7-2-3   Collect a Trouble Image with Logs

If the system should malfunction, press the Alt-D keys simultaneously. This will collect a screen capture of the image monitor, system presets and the following logs:

- Keyboard Shadow Log
- Error Logs
- Crash Log
- Power Supply
- Temperature

NOTE: *Power Supply and Temperature logs are not currently being updated by the LOGIQ™ P5.*

This Alt-D function is available at all times.
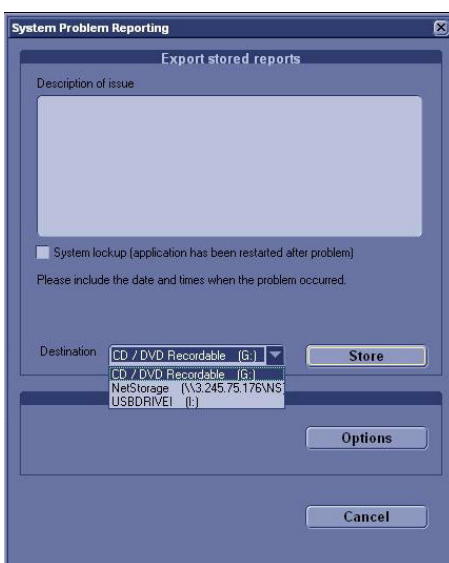
Figure 7-1   ALT-D Dialog Box

When Alt-D is pressed, a menu box appears that allows for:

- A place to enter a description of the problem
- A choice to store to a pre-formatted CD-R/DVD, USB or Network storage.

The subsequent file is compressed and time stamped. The screen capture is a bitmap which eliminates the possibility of artifacts from compression.

Section 7-3
Screen Captures

There may be times when the customer or field engineer will want to capture a presentation on the screen so it may be recovered by the OnLine Center through InSite. This is accomplished by first saving the image(s) to the clipboard using a Print Key.

The P2 key is the factory default print key to accomplish a secondary screen capture. However, the default is for the video area only or the customer may have customized the P2 Key function. Therefore, screen capture should involve the following steps:

1.) Check and record any custom settings for the Print2 button.
2.) Set the Print2 button to Whole Screen, Secondary Capture.
3.) Capture the required screens to the Hard Drive or CD-R / DVD-R.
4.) Restore the Print2 button to it's original settings.

7-3-1 Check and Record the P2 Key Function

Check the function of the Print2 Key in the event that the customer may have made some custom settings.

1.) Select *Utility* from the FrontPanel.
2.) Select *Connectivity* from the Menu.
3.) Select the *Buttons* tab on the Connectivity screen.
4.) In the *Button* field, select Print2.

The Connectivity/Buttons Screen will be displayed like the one shown in Figure 7-2.
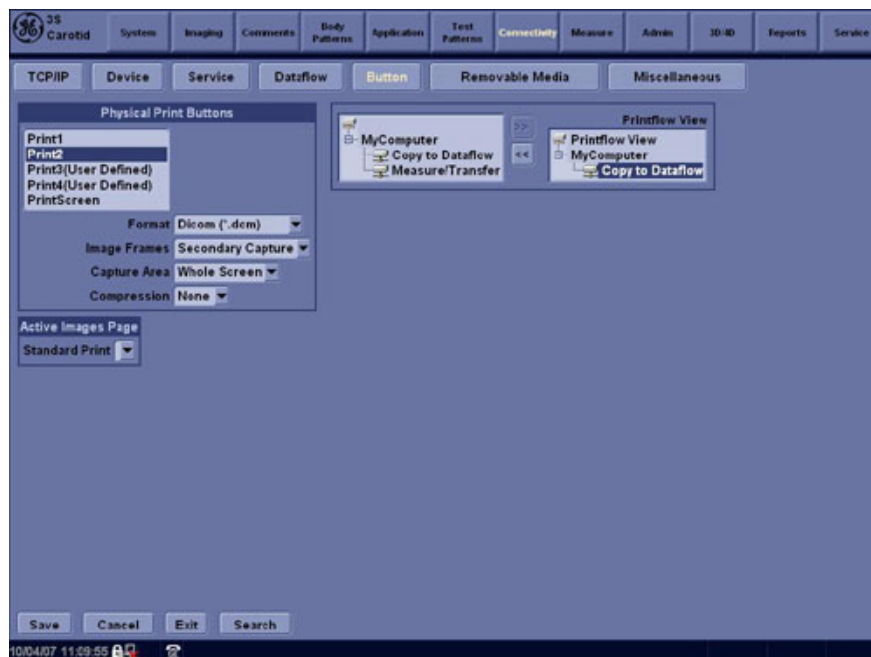
Figure 7-2   Buttons Set Up Screen

P2 is the factory default Screen Capture Key. If it is not set to Whole Screen or Screen Capture, as shown in Figure 7-2, proceed to step 5 to record the customer's custom settings.

7-3-1   **Check and Record the P2 Key Function** (cont'd)

    5.) In the "Physical Print Buttons"box, record the followings.

       *   Format

       *   Image Frames

       *   Capture Area

       *   Compression

    6.) In the "Printflow View", record the print flow associated with the Print2 Button.

7-3-2   **Setting the P2 Key to Screen Capture**

If the P2 Key is not set to screen capture:

    1.) While on the Connectivity screen, with the Buttons tab displayed, go to the drop down selection menu in the *Destinations* section.

    2.) Ensure that Capture Area is set to Whole Screen, secondary Capture and None Image Compression.

    3.) The P2 Key should now be set up for whole screen capture, sending the screens to the image buffer (clipboard).

7-3-3 Capturing a Screen

The following is a generic process to capture any screen from the scanner:

1.) Navigate to and display the image/screen to be captured.
2.) Press P2. This will place a snapshot of the screen on the "clipboard" displayed at the bottom of the scan image display.

Clipboard Thumbnails
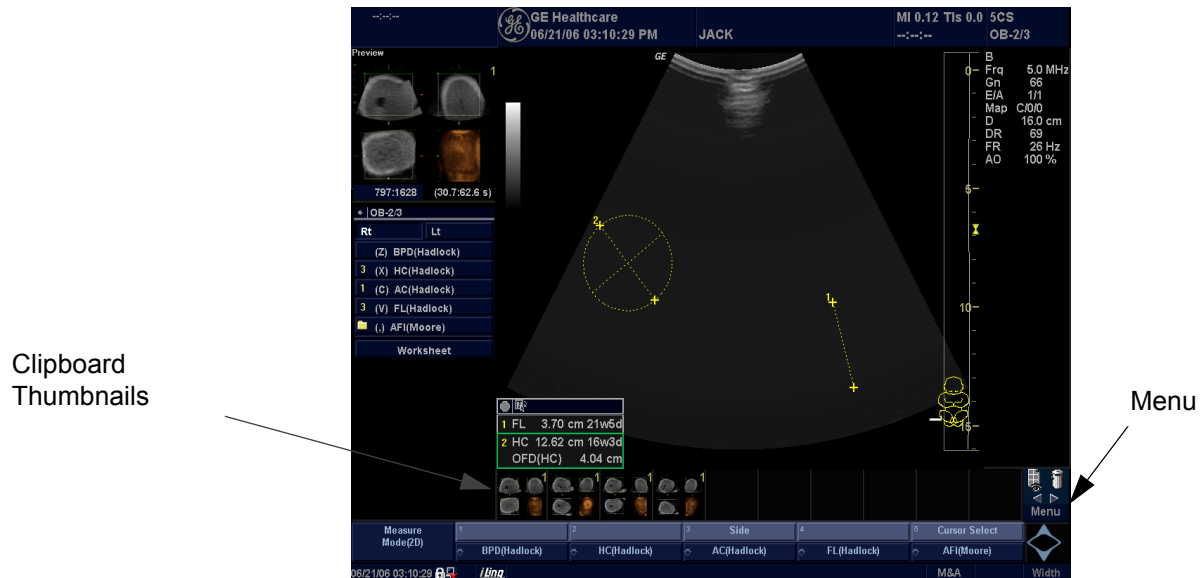
Menu

Figure 7-3   Select Image to Capture

3.) Highlight the snapshot to be stored to the system hard drive or CD-R / DVD-R.
4.) Select Menu on the right side of the image screen, then highlight and select SAVE AS.
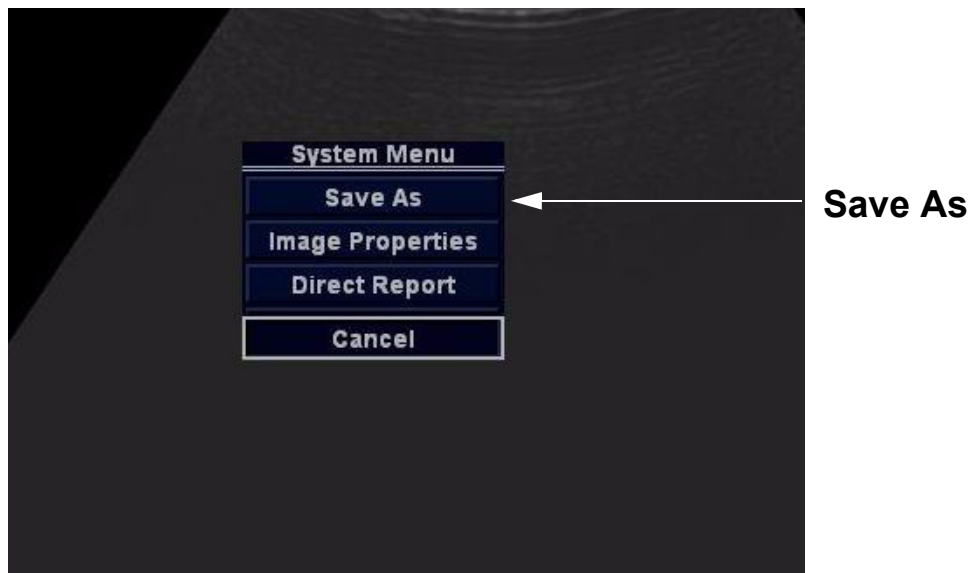
Save As

Figure 7-4   Menu > Save As

7-3-3 Capturing a Screen (cont'd)

Figure 7-5 Save Dialog Box

> 5.) A Save dialog box will be opened. Choose the destination as the archive location to save the image on the CD-R/DVD-R, USB or network storage.

7-3-4 Reset the P2 Key to Customer's Functionality

If the customer had programmed the P2 Key to a function other than screen capture, restore that functionality recorded in section 7-3-1 on page 4. refer to Figure 7-2.

> 1.) Select *Utilit*y from the Keyboard.
>
> 2.) Select *Connectivity* from the Menu.
>
> 3.) Select the *Buttons* tab on the Connectivity screen.
>
> 4.) In the *Button* field, select Print2.
>
> 5.) In the "Physical Print Buttons"box, select the options recorded in step 5, Section 7-3-1. :
>
>   *   Format
>   *   Image Frames
>   *   Capture Area
>   *   Compression

Section 7-4
Diagnostics

As described in - Components and Functions (Theory), the service platform uses a web-based user interface (UI) to provide access to common service components.

The Diagnostic home page displays a listing of test categories consisting of Common Diagnostics, and LOGIQ™ P5 Diagnostics. Expand the desired main category to select groups or individual tests.
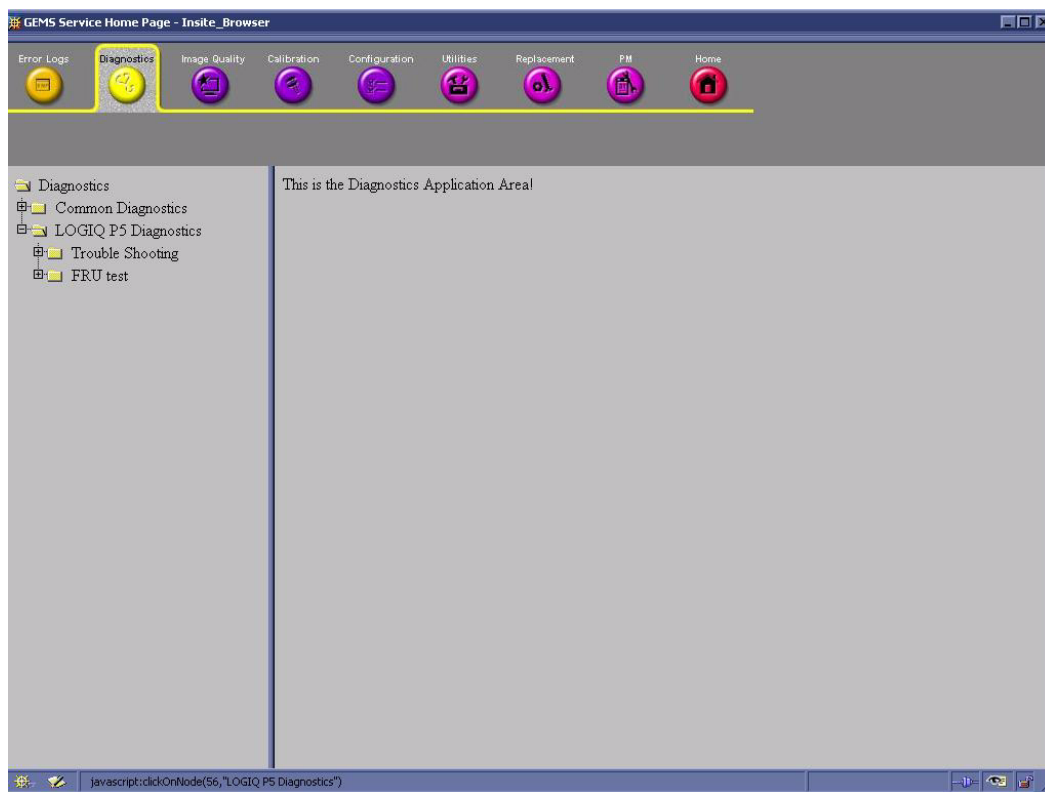
Figure 7-6   Global Service User Interface Diagnostic Screen

Section 7-5
Common Diagnostics

Common Diagnostics is the first main heading under the GSUI heading of Diagnostics.

Figure 7-7 shows the top level menu choices under Common Diagnostics. The subheadings and their respective diagnostic/troubleshooting menu choices are called out and described in the sections below.
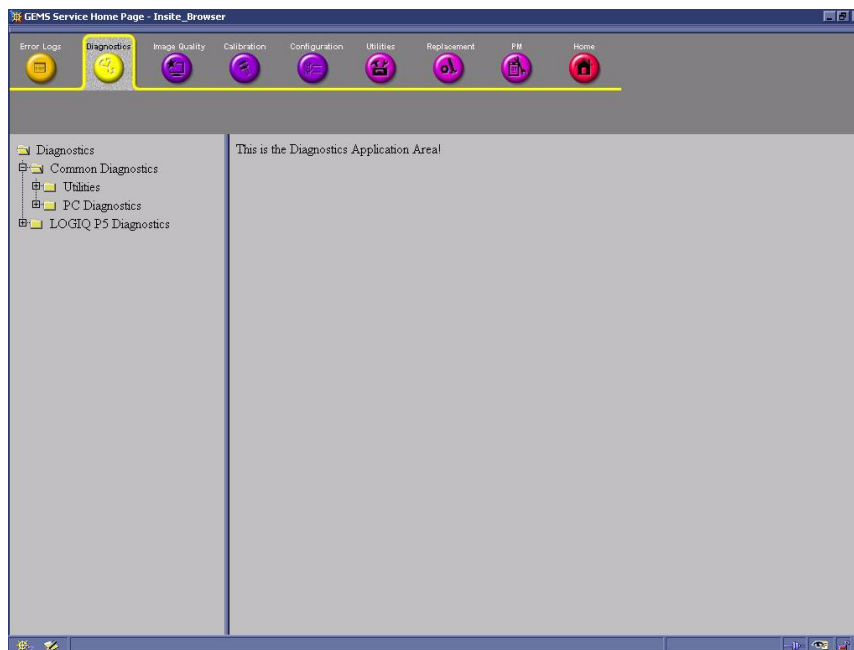
Figure 7-7   Common Diagnostics

7-5-1   Utilities

Provides two selections:

7-5-1-1   Disruptive Mode

Allows you to enable or disable disruptive mode troubleshooting. If you are accessing through InSite, this can only be enabled with the customer/operator confirmation.

7-5-1-2   System Shutdown

Allows for system shutdown from the diagnostic menu. Select to retain Disruptive Mode or Not.

After submitting to or shutdown a confirmation screen gives one last chance to confirm or cancel the request.

7-5-2 PC Diagnostics (Non-Interactive Tests)

7-5-2-1 CPU Tests

- **CPU Test (All)** - This diagnostic performs a battery of tests on your CPU to ensure it is working properly. The following tests are a complete list of the tests performed on the PC's CPU.
- **CPU: Registers** - The CPU registers are tested using the default test patterns defined above. On 32 bit CPUs, the extended registers are also checked. If errors are detected, the failed registers are listed.
- **CPU: Arithimetics** - Tests the proper function of arithmetic commands ADC, ADD, DEC, DIV, IDIV, IMUL, INC, MUL, SBB and SUB with 16 and 32-bit operands. If errors are detected, the failed commands and operands are listed.
- **CPU: String Operations** - Tests the proper operation of string commands LODS, MOVS, SCAS and STOS with 8, 16 and 32-bit operands. If errors are detected, the failed commands and operands are listed.
- **CPU: Logical Operations** - Tests the proper operation of logical operations AND, NOT, OR and XOR with 16 and 32-bit operands. If errors are detected, the failed operands are listed.
- **CPU: Math Registers** - Tests coprocessor register stack, pointers and commands FLDLZ, FLDPI, FLDLN2, FLDLG2, FLDL2T, FLDL2E and FLD1. If errors are detected, the failed steps and commands are listed.
- **CPU: Math Commands** - Tests coprocessor commands FBLD/FBSTP, FLD/FST, FXCH, FCOM, FICOM, FTST, FXAM and FUCOM. If errors are detected, the failed instructions are listed.
- **CPU: Math Arithimetics** -
- **CPU: Transcendental** - Tests coprocessor transcendental commands F2XM1, FPATAN, FPTAN, FYL2X, FYL2XP1, FCOS, FSIN and FSINCOS. If errors are detected, the failed commands are listed.
- **CPU: MMX Arithmetic** - Tests MMX commands PADD, PSUB, PMUL and PMADD. If errors are detected, the failed commands are listed.
- **CPU: MMX Logical** - Tests MMX commands PAND, PANDN, POR and PXOR. If errors are detected, the failed commands are listed.
- **CPU: MMX Shift** - Tests MMX commands PSLL and PSRL. If errors are detected, the failed commands are listed.
- **CPU: MMX Data Transfer** - Tests MMX commands MOVD and MOVQ. If errors are detected, the failed commands are listed.
- **CPU: MMX Misc.** - Tests MMX commands PCMPEQ, PCMPGT, PACKSS, PACKUS, PUNPCK and PUNPCK. If errors are detected, the failed commands are listed.

7-5-2-2   Hard Drive Tests

- **Hard Drive Test (All)** - The Hard Drive test examines your hard disk drive using a series of tests to ensure that your drive can perform its functions.

    The following tests are performed on your hard drive to ensure the hard disk controller and the drive mechanism are working correctly. The disk surface itself is also checked.

NOTE: The hard drive test can take over ten minutes.

- **Hard Drive: Linear Seek** - Hard disk drive heads are moved from track 0 to the maximum track one track at a time.
- **Hard Drive: Random Seek** - Hard disk drive heads are moved randomly several hundred times.
- **Hard Drive: Funnel Seek** - Hard disk drive heads are moved in a funnel fashion, i.e., from the first track on the drive to the last, then to the second track, then to the second to last track, then to the third track, and so on.
- **Hard Drive: Surface Scan** - This test scans for surface defects on the hard disk drive.

7-5-2-3   Memory Tests

- **Memory Test (All)** - Eighteen test patterns are used to test memory locations. If errors are detected, the address of the block the error was detected in is shown. During testing, these diagnostics will also look out for parity errors and other exceptions. These will be added to the Test Log as errors if encountered.
- **Memory: Pattern Test** - PC-Doctor uses several test patterns to test as much memory as possible.
- **Memory: Parity Test** - This test checks for parity errors on the memory bus during intensive string transfer operations. If an error is detected, the address of the failed block is displayed.

7-5-2-4   CD/DVD Drive Test

NOTE: Although the global aspect of the diagnostics allow for DVD testing, the LOGIQ™ P5 does not have a DVD drive.(Option)

- **DVD/CD-ROM Test (All)** - The CD-ROM/DVD test examines the CD-ROM/DVD drive to make sure it is working properly. You may use either a data CD-ROM disk or a DVD disk for these tests. You cannot use an audio CD, such as a regular commercial music CD, with this test.

NOTE: The PC is sometimes slow in recognizing a newly inserted CD-ROM/DVD disk. It is best to wait a few seconds after inserting a disk into the drive before you run any tests.

There are two types of CD-ROM/DVD tests:

1.) *Seek Tests:* Ensures the drive can access all locations on a disk, and
2.) *Read Tests:* Ensures the drive can read all the data.

- **DVD/CD-ROM: Linear Seek** - Tests that all locations can be accessed on a CD-ROM or DVD disk in a linear fashion, starting from the first to the last.
- **DVD/CD-ROM: Random Seek** - Tests that all locations can be accessed on a CD-ROM or DVD disk randomly.
- **DVD/CD-ROM: Funnel Seek** - Tests that all locations can be accessed on a CD-ROM or DVD disk in a funnel fashion, starting from the first then moving to the last, then, at the next pass starting from the second location then moving to the next to the last, and so on
- **DVD/CD-ROM: Linear Read** - Reads the data on the CD-ROM or DVD in a linear fashion, starting from the start to the end.
- **DVD/CD-ROM: Random Read** - Reads the data on the CD-ROM or DVD randomly.

7-5-2-5   Video Test

- **Video Test (All)** - This diagnostic tests your system's video capabilities. This involves testing the video memory with 18 patterns, testing your graphics acceleration, and text output. You will see these tests being performed on your monitor.

   You can cancel this test at any time by hitting the Escape (Esc) key.

The following tests are performed on your monitor:

- **Video: Memory** - Video memory is tested by filling the video buffer with 18 test patterns, one pattern at a time. The tests will fill the entire screen with a single color.
- **Video: Data Transfer** - This tests the graphics acceleration part of your video controller. These tests will appear on your screen as black and white concentric squares and rectangles of various sizes and colors. If errors are detected, the locations of the problems are displayed.
- **Video: Text Output** - This test prints a text string in random sizes and colors to tests your video device driver and video controller.

7-5-2-6 **USB Test (Not yet supported)**
- **USB Test (All)**
- **USB Configuration Test**
- **USB Devices Test**

7-5-2-7 **PCI Board Configuration Test**

A bus is a set of circuits, wires or connectors which connect the various components of your system. A PCI (Peripheral Component Interconnect) bus is a fast standard bus which is common in Pentium systems. Various tests are run on the PCI bus in order to ensure it is working up to speed.

The motherboard is scanned to verify the configuration space and to make sure the diagnostics can communicate with the board.

7-5-2-8 **Network Test**

7-5-3   PC Diagnostics (Interactive Tests)

7-5-3-1   Keyboard Test

1.) Click **Keyboard Test** from the PC Diagnostics interactive tests menu.

2.) Click the Test button. A keyboard layout is displayed on which you can see the keys of your keyboard.

3.) Press each key on your keyboard once and make sure that the corresponding keys on-screen are removed from view. If a key on-screen is not removed, that key may be damaged and you may have to have your keyboard repaired or replaced.

4.) To reset the keyboard, click the Reset Keys button.

5.) To exit the test, click Close.

7-5-3-2   Audio Test

1.) Click **Audio Test** from the PC Diagnostic interactive tests menu.

2.) To test the WAV sound reproduction click Left Channel, Right Channel, or Both Channels to test your speakers. You should hear a guitar chord.

3.) To test MIDI sound reproduction click the button under MIDI. You should hear a few seconds of recorded music.

4.) Click on the Beep button. You should hear a low "beep" from your PC.

If no sound is produced in these tests, choose the More Info button in the Audio Test dialog box for information about possible causes and solutions.

7-5-3-3 **Mouse Test**

1.) Click **Mouse Test** from the PC Diagnostic interactive tests menu.

The Mouse test dialog box presents you like Figure 7-8.
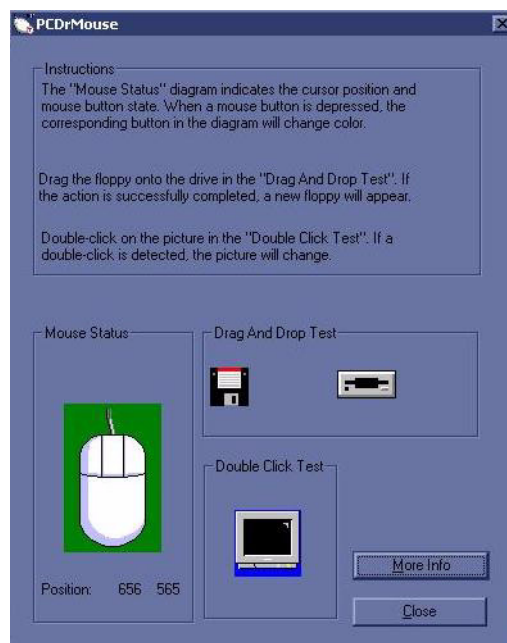
Figure 7-8   Mouse Test

2.) The Mouse coordinates are displayed when the trackball is moved.

3.) Press the right Button (Set B/Pause Button) on the front panel, the Mouse which is turned to Yellow on the right side is shown on the monitor.
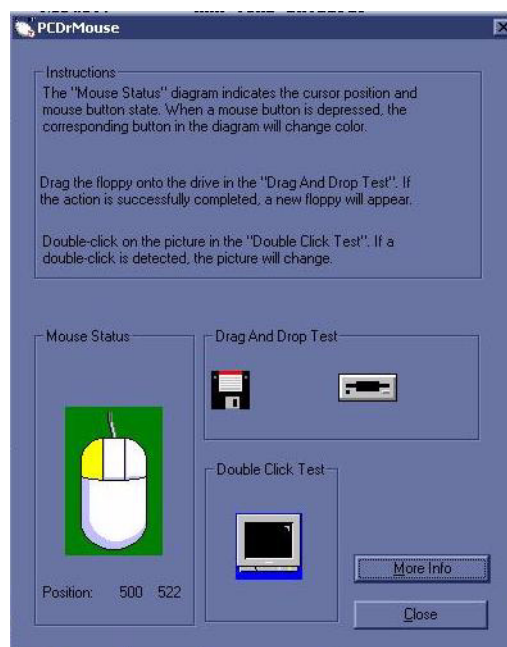
Figure 7-9

4.) Left Button is the same as above.

7-5-4 FRU Test

7-5-4-1 SYSCONPM/SYSCONCM

These programs are provided for testing the SYSCONPM/SYSCONCM board.

Table 7-2   FRU Test, SYSCONPM/SYSCONCM Diagnostics Menu

Menu	Descriptions	User Level	Tools
Full Test	Performs all of the L1 SYSCON board tests listed below	All	None
Assy Revision Test	Test EEPROM. Send test pattern to write to EEPROM and read Displays the board revision of the SYSCONPM/SYSCONCM board	All	None
USC I/F Test	The CL1TRX, P3RLY, optional ACWD boards are connected to the SYSCONPM/SYSCONCM via the USC bus. The DSP in SYSCONPM/SYSCONCM accesses the boards above to check if the USC bus is connected properly to each board.	All	None
FEBUS Test	Checks if The DSP in SYSCONPM/SYSCONCM accessed the boards, CL1TRX/BL1TRX and ACWD, via the FEBUS.	All	None
TRIG Test	Check the trigger max, min and ever interval	All	None
PCI I/F Test	Sends the command to the DSP to check the SDRAM in SYSCONPM/SYSCONCM	All	None
DSP Memory Test	Sends the command to the DSP to check the internal DSP memory	All	None
Board Temperature	Read SYSCON Board Temperature.	All	None
CHACOM I/F Test	Sends the command to read / write data from DSP to CHACOM	GE FE Only	None

7-5-4-2 CL1TRX/BL1TRX

These programs are provided for testing the CL1TRX /BL1TRZboard.

Table 7-3   FRU Test, CL1TRX/BL1TRX Diagnostics Menu

Menu	Descriptions	User Level	Tools
Full Test	Performs all of the CL1TRX/BL1TRX board tests listed below	All	None
Assy Revision Test	Test EEPROM. Send test pattern to write to EEPROM and read Displays the board revision of the CL1TRX/BL1TRX board	All	None
USC I/F Test	Checks if the DSP in SYSCONPM/SYSCONCM can access the CL1TRX/BL1TRX boards via USB bus.	All	None
FEBUS Test	Checks if the DSP in SYSCONPM/SYSCONCM can access the CL1TRX/BL1TRX board via FE bus.	All	None
HV Test	Read HV Power	All	None
PGC Test	Sends the test data High, Mid, Low level to PGC Register, then CL1TRX/BL1TRX read result data and verify it.	All	None
TEST Wave Test	Sends the test data High, Mid, Low level to Test wave Register, then CL1TRX/BL1TRX read result data and verify it.	All	None
TRX Data Memory Test	Send the command to read / write to TRX data memory.	All	None
OQX2 Test	The DSP in L1SYSCON reads and writes the OQCARD registers in CL1TRX/BL1TRX via FE bus.	All	None
TPG2 Test	The DSP in L1SYSCON reads and writes the TPG2 registers in CL1TRX/BL1TRX via FE bus.		
RX Channel Test	Send test wave pattern to the input stage of preamp on CL1TRX/BL1TRX, perform 64 channel scanning, Read raw data, and analyze it.		
TX Channel Test	Send test wave pattern to the CL1TRX/BL1TRX, read returned small signal, Read the data and analyze it. Note: APS/APS Pro HV test is required prior to the TRX TX channel test.		

7-5-4-3 P3RLY/P2RLY

These programs are provided for testing the P3RLY/P2RLY board.

NOTE: *A Convex Probe is needed for RLY Channel Test.*

Table 7-4   FRU Test, P3RLY Diagnostics Menu

Menu	Descriptions	User Level	Tools
Full Test	Performs all of the P3RLY/P2RLY board tests listed below	GE FE Only	None
Assy Revision Test	Test EEPROM. Send test pattern to write to EEPROM and readDisplays the board revision of the P3RLY/P2RLY board	All	None
FEBUS Test	Checks if the DSP in SYSCONPM/SYSCONCM can access the P3RLY/P2RLY board via FE bus.	GE FE Only	None
SHV Test	Send the command to SHV resister in P3RLY/P2RLY board to read SHV status.	GE FE Only	None
OPEN Test	Checks whether probe connected or not on P3RLY/P2RLY.	GE FE Only	Probe
PROBE CODE	Checks if the 8 bits of the Probe Code in the probe connector is properly connected. If connected probe is available, display code and Probe name.		

7-5-4-4 ACWD

These programs are provided for testing the ACWD board.

Table 7-5   FRU Test, ACWD Diagnostics Menu

Menu	Descriptions	User Level	Tools
Full Test	Performs all of the ACWD board test listed below	All	None
Assy Revision TEst	Test EEPROM.Send test pattern to write to EEPROM and readDisplays the board revision of the ACWD board	All	None
USC Interface Test	Checks if the DSP in SYSCONPM/SYSCNCM can access the ACWD boards via USB bus.	All	None
FEBUS Test	Allows SYSCONPM/SYSCNCM to access FE bus interface in the ACWD in order to check if FE bus line is normal.		
IQ Data Read	Send the command to perform CW scanning, read IQ data from assigned memory, analyze the data with FFT algorithm.		
Probe Connection	Checks whether ACWD probe connected or not.		
Channel Test	Generate test pattern, perform 32 channel scanning in ACWD, read the data and analyze it.		

7-5-4-5   APS/APS Pro

These programs are provided for testing the APS board.

Table 7-6   FRU Test, APS Diagnostics Menu

Menu	Descriptions	User Level	Tools
Full Test	Performs all of the APS test listed below	All	None
HV voltage stability	Read HV voltage and display HV values.	All	None
LV voltage stability	Read HV voltage and display LV values.	All	None

7-5-4-6   FRONT PANEL

These programs are provided for testing the Front panel.

Table 7-7   FRU Test, ACWD Diagnostics Menu

Menu	Descriptions	User Level	Tools
FRONT PANEL Overall	Performs all of the Front Panel tests listed below	All	None
FRONT PANEL Revision	Test EEPROM.Send test pattern to write to EEPROM and read.Displays the board revision of the Front Panel.	All	None
ROM	Makes a check of internal ROM check sum.	All	None
RAM	Writes / reads data over all address of RAM and also makes a check of control program.	All	None
EEPROM	Writes / reads data over all address of EEPROM	All	None
SWITCH	Test switch in Front Panel.	All	None
Echoback	Rotate or depress any key, Verify that it is displayed on the CRT monitor. To finish the test, press "Abort" key and wait until complete message appears.	All	None

NOTE: For the EchoBack test, it is highly recommended to press a button less than two times per a second.

NOTE: When Abort button is pressed to finish EchoBack test, you have to wait until "Completed." message is displayed to proceed other tests.

Section 7-6
LED Descriptions

7-6-1   CL1TRX/BL1TRX Assy

The CL1TRX/BL1TRX Assy is located at the No.1 slot in the NEST Assy.

Table 7-8   LEDs on CL1TRX/BL1TRX Assy

LED	Descriptions	Normal State
DS1	FPGA configuration OK status Indicator	Normally Blinking

7-6-2   P3RLY/P2RLY Assy

The P3RLY Assy is located at the front of the NEST Assy.

Table 7-9   LEDs on P3RLY/P2RLY Assy

LED	Descriptions	Normal State
D1	MUX embedded Probe Recognition Indicator	Normally On
D2	Selected probe connector position number bit 0	Depend on live probe position
D3	Selected probe connector position number bit 1	Depend on live probe position
D4	FPGA Configuration OK status indicator	Normally On

7-6-3   SYSCONPM/SYSCONCM Assy

The SYSCONPM/SYSCONCM Assy is located at the No.3 slot of the NEST Assy.

Table 7-10   LEDs on L1SYSCON Assy

LED	Descriptions	Normal State
DS1	CPDI FPGA configuration OK indicator	Normally On
DS2	Frame Start signal. Scan running status indicator	Normally blinking on scanning
DS3	FEBC FPGA configuration OK indicator	Normally On
DS4	DSP operation OK indicator	Normally blinking

7-6-4   APS/APS Pro Assy

NOTE: *HVL+ and HVL- are not available for APS PRO.*

The APS/APS Pro Assy is located at the No. 4 slot of the NEST Assy.

Table 7-11   LEDs on APS/APS Pro Assy

LED	Descriptions	Normal State
DP5 (Top)	Digital 5V output indicator	Normally On
LP5	Live Power 5V output indicator	Normally On
AP6	Analog 6V output indicator	Normally On
DP33	Digital 3.3V output indicator	Normally On
SHV+	SHV+ output indicator status indicator	Normally On
HVL+	HVL+ level indicator	Normally On in CFM mode or PW mode
HVH+ (Bottom)	HVH+ level indicator	Normally On in B mode

Section 7-7Trouble Shooting Tree

7-7-1   System Does Not Power On / Boot Up
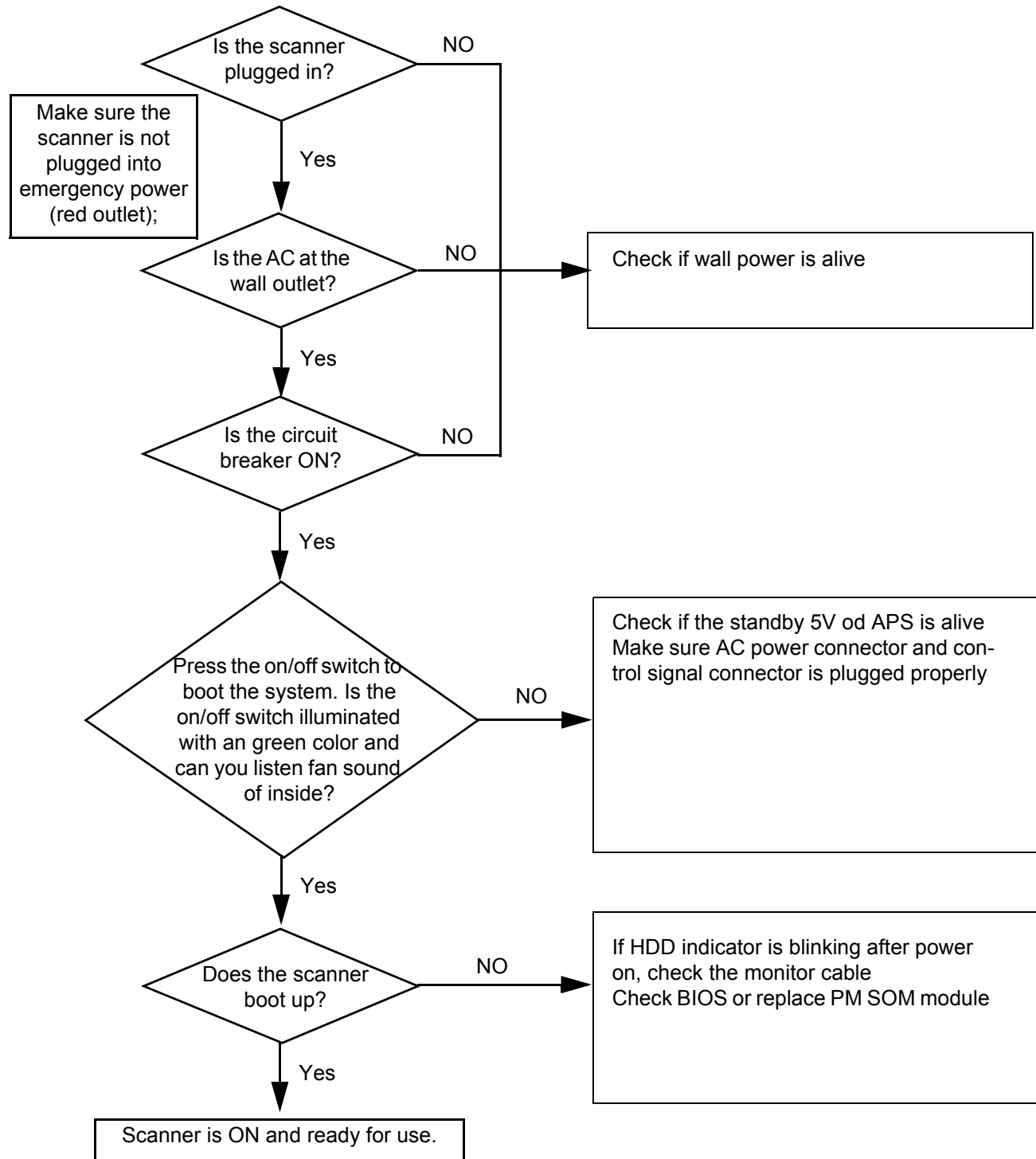
Figure 7-10   Power On / Boot Up Flowchart

7-7-2   System Does Not Boot

```
                    ╭─────────────────────────╮
                    │   System doesn't boot!   │
                    ╰─────────────────────────╯
                              │
                              ▼
                         ◇ Is the AC power cable
                           seated to the Scanner and        NO
                           to the wall power outlet? ─────────────────┐
                                                                      │
                              │                                       ▼
                             YES                          ┌──────────────────────────┐
                              │                           │  Connect the AC power cable │
                              ▼                           │ between the Scanner and the wall │
                                                          │   power outlet in right way. │
                                                          └──────────────────────────┘
                         ◇ Is the main breaker turned      NO
                              ON?                 ─────────────────┐
                                                                   │
                              │                                    ▼
                             YES                       ┌──────────────────────────┐
                              │                        │   Turn ON the main breaker of │
                              ▼                        │        the Scanner.       │
                                                       └──────────────────────────┘
                         ◇ Has the ON/OFF
                           key on the Control Panel     NO
                           been pressed once? ─────────────────┐
                                                               │
                              │                                ▼
                             YES                    ┌──────────────────────────┐
                              │                     │  Press the ON/OFF button on the │
                              ▼                     │       Control Panel.      │
                       Go on to the next page.      └──────────────────────────┘
```

Figure 7-11   System does not Boot

7-7-2   System Does Not Boot (cont'd)

System doesn't boot! (cont'd)

Do the fans start to run? — **NO** →

Check;
1.) AC Power
2.) AC Transformer

YES

Is the SOM module starting to display start-up screens on the monitor? — **NO** →

Check/replace the PM SOM/CM SOM module.

YES

Is the LOGIQ starting display shown on the monitor? — **NO** →

Turn off the power, wait a few seconds, and try to turn on the power again.

Go on to the next page.
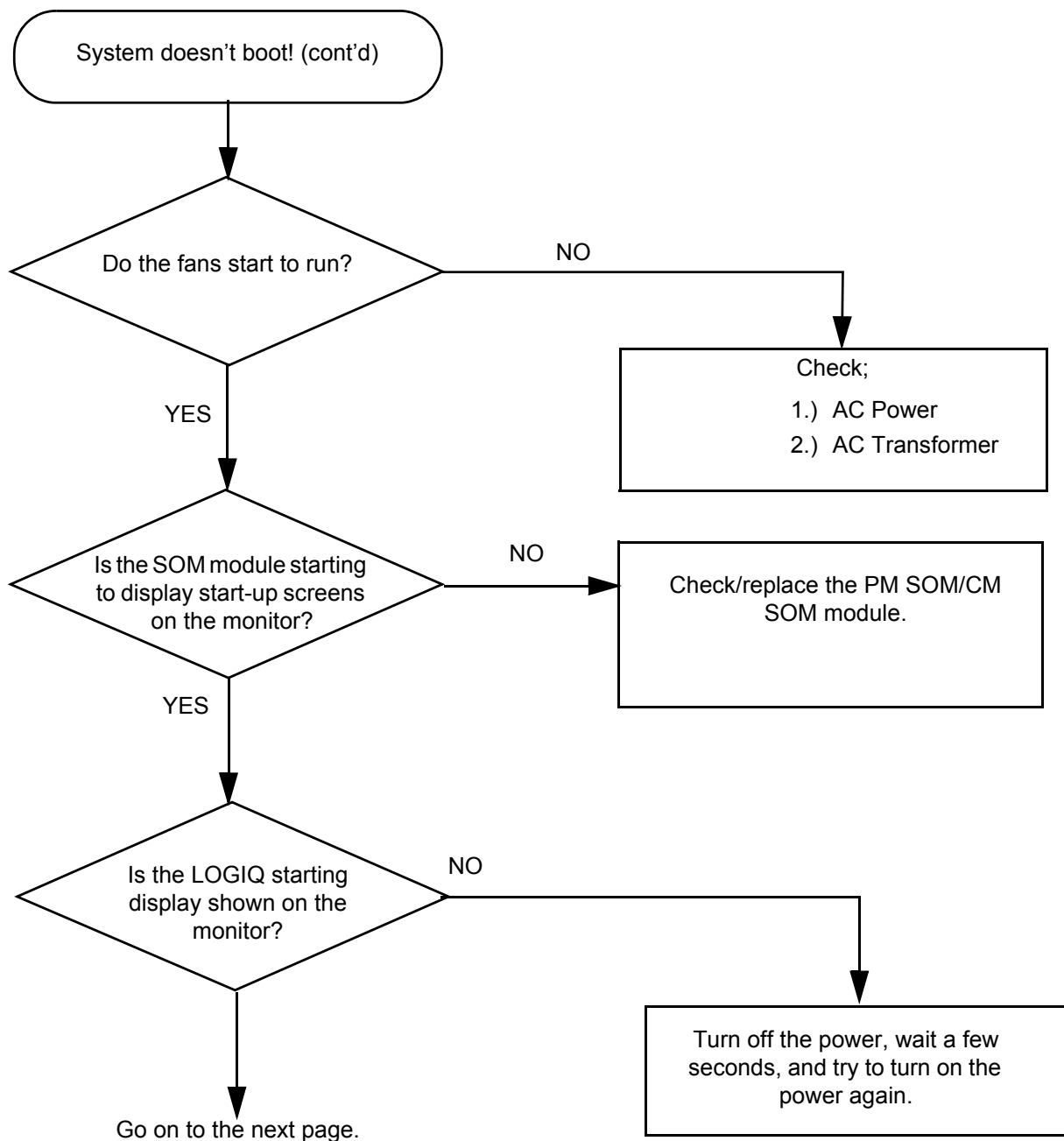
Figure 7-12   System does not Boot (contd.)

7-7-2   System Does Not Boot (cont'd)

System doesn't boot! (cont'd)

Are the Control Panel keys lit?

NO

1.) Check the Control Panel cable connection.

2.) Check/replace Control Panel.

END

YES

Is regular scan display shown on the monitor?

NO

YES

Press and hold the main switch for five (5) seconds to reboot the system.

Go to Scan Procedure section.
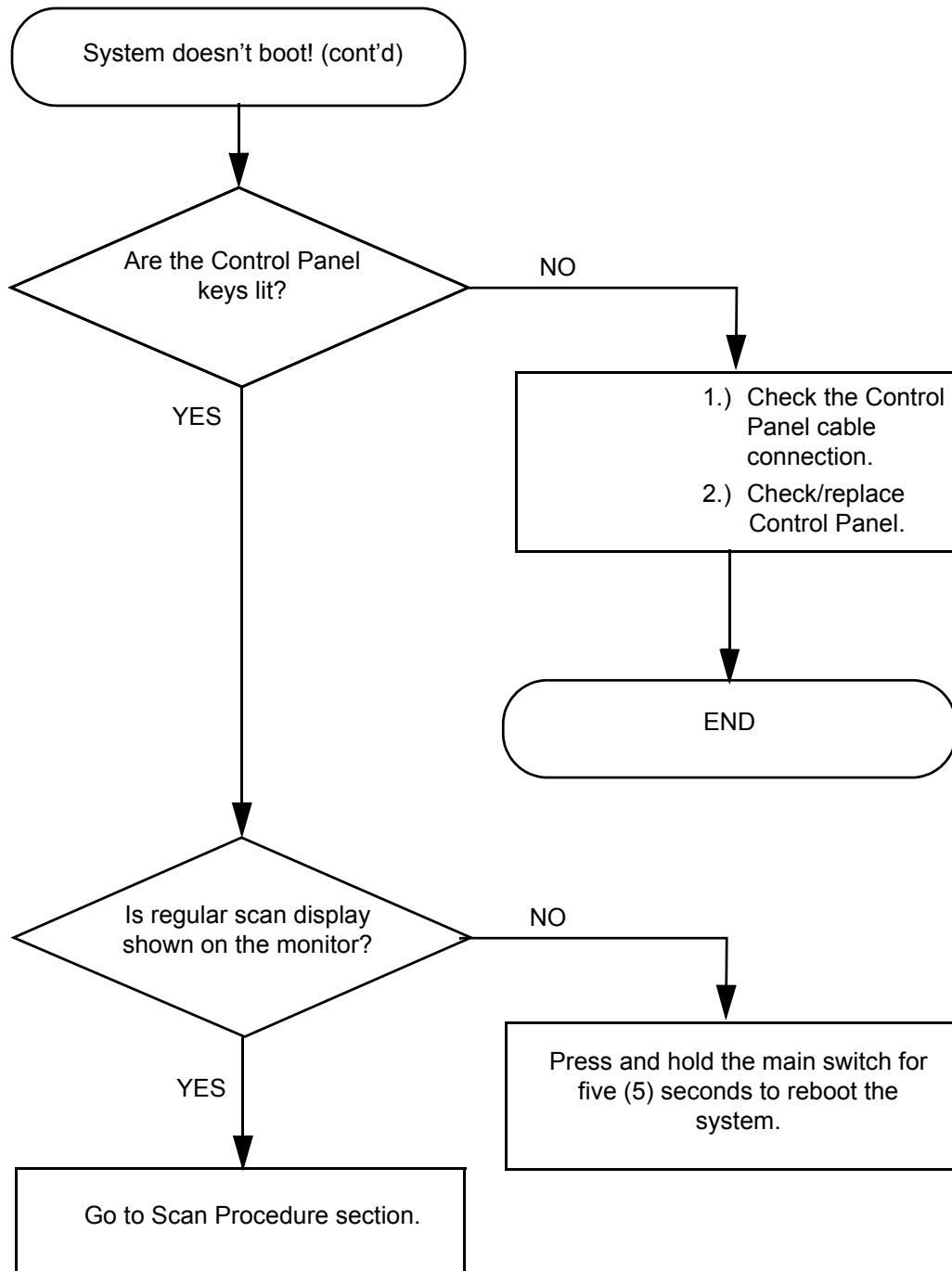
Figure 7-13   System does not Boot (contd.)

7-7-3   Noise in Image
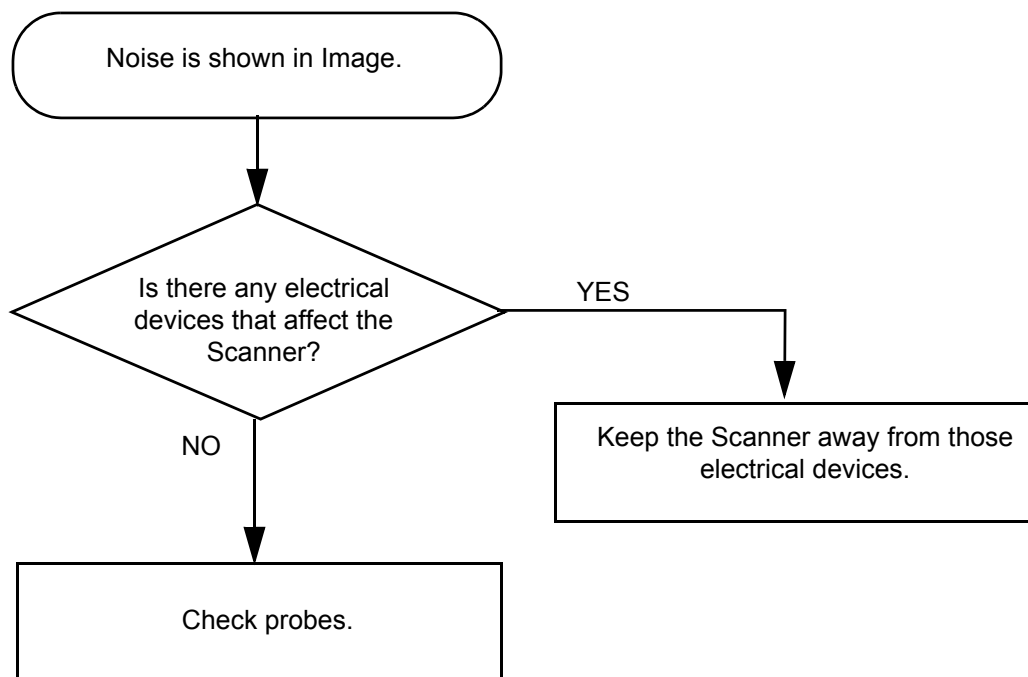
Figure 7-14   Noise in Image

7-7-4 **Unable to Scan**
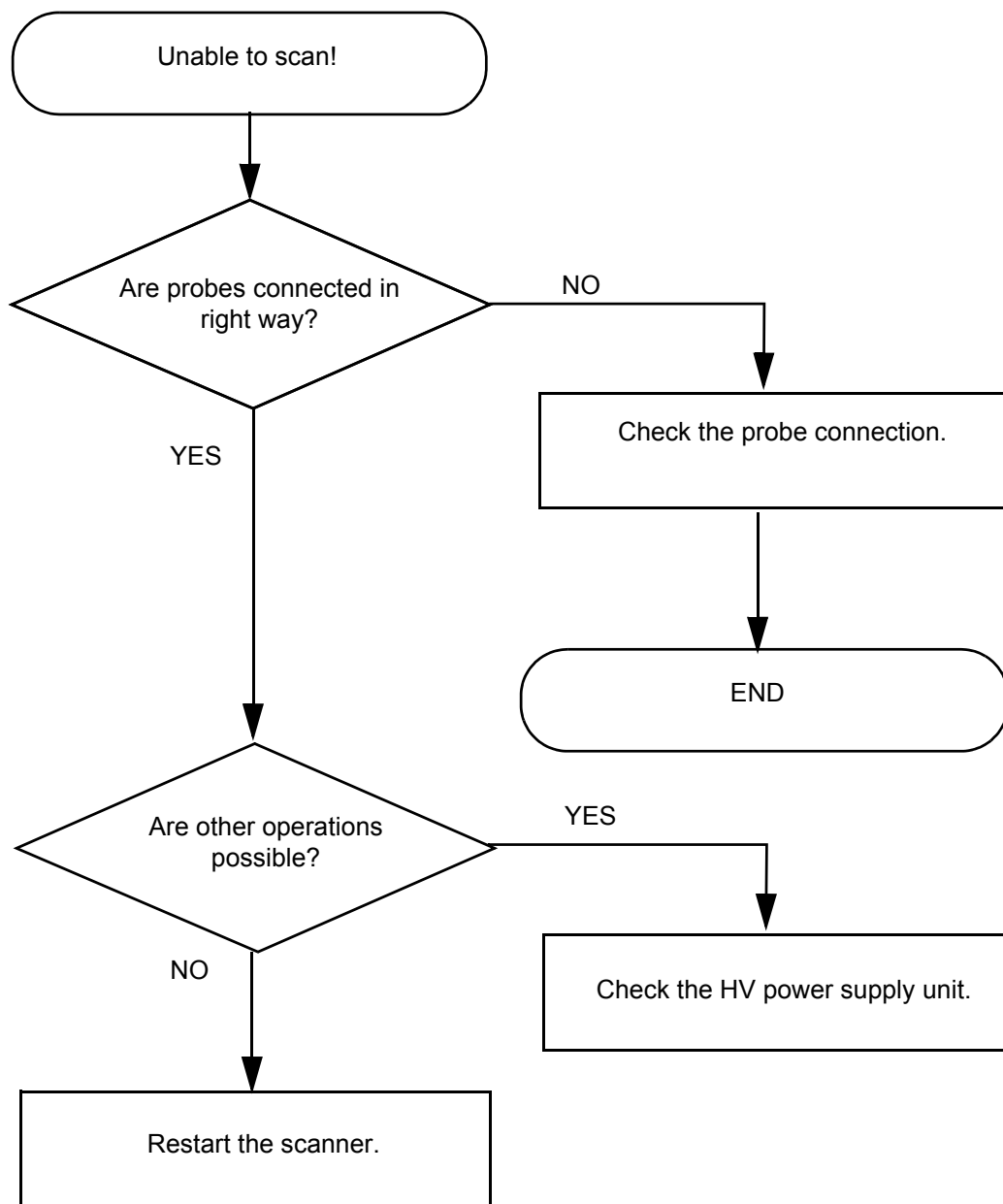
Figure 7-15   Unable to Scan

7-7-5 **Trackball**
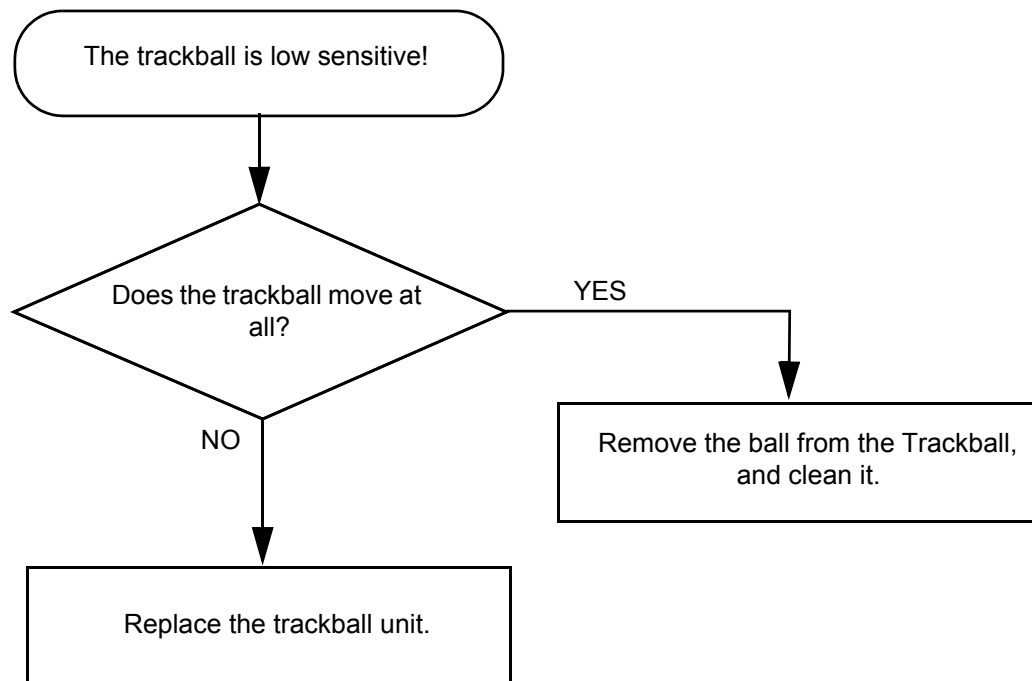
Figure 7-16 Trackball Troubleshooting

7-7-6   Monitor Troubleshooting

NOTE: *Reset the monitor settings to the factory defaults prior to troubleshooting the monitor.*

⚠ **NOTICE** Comments to remember about the 15" monitor.

The monitor is the diagnostic monitor and is connected to AC 110/220 VAC.

The monitor powers down with the console.

Power output from AC Power assy via AC distributor in AC Transbox assy:

When the monitor is not connected to the AC power there is a leakage current which when measured with a DVM can indicate high voltage.

When a load is applied, the voltage collapses to low voltage if the monitor is not switched on.

7-7-6 **Monitor Troubleshooting** (cont'd)
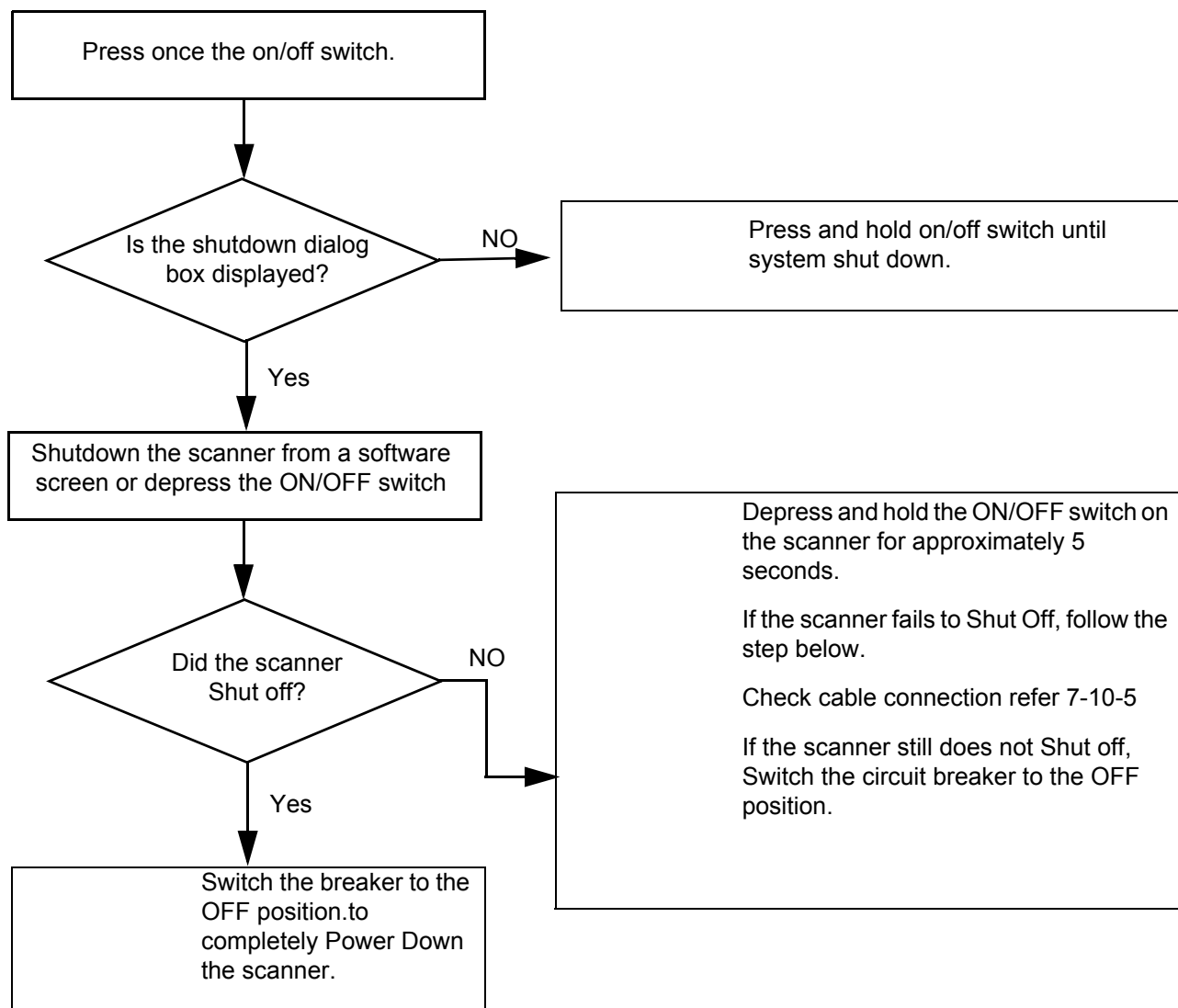
Figure 7-17   Monitor Troubleshooting

- Monitor does not work
    - Check AC circuit breaker
    - Verify power is present at monitor outlet
    - Check if video is present at backplane
- Prints do not match monitor
    - Verify factory default settings. Chapter 18 in the User Manual calls out suggested settings for various exam and lighting conditions.
- Video test patterns are not clear, bright, parallel or square
    - Replace the monitor

7-7-7   Unable to Record to VCR

Unable to record to VCR!

Is the VCR properly connected?

NO → Check that all signal, and power supply cable connections to the VCR unit are OK.

YES

Is the VCR tape put into the device?

NO → Put the tape into the device and rewind it.

YES

Is recording unable even by manual operation?

NO → - Check the signal cable connections between VCR and Internal I/O.
- Check the cables between BEP and Internal I/O

YES

Replace VCR.

Figure 7-18   VCR Troubleshooting

7-7-8 Printer Troubleshooting
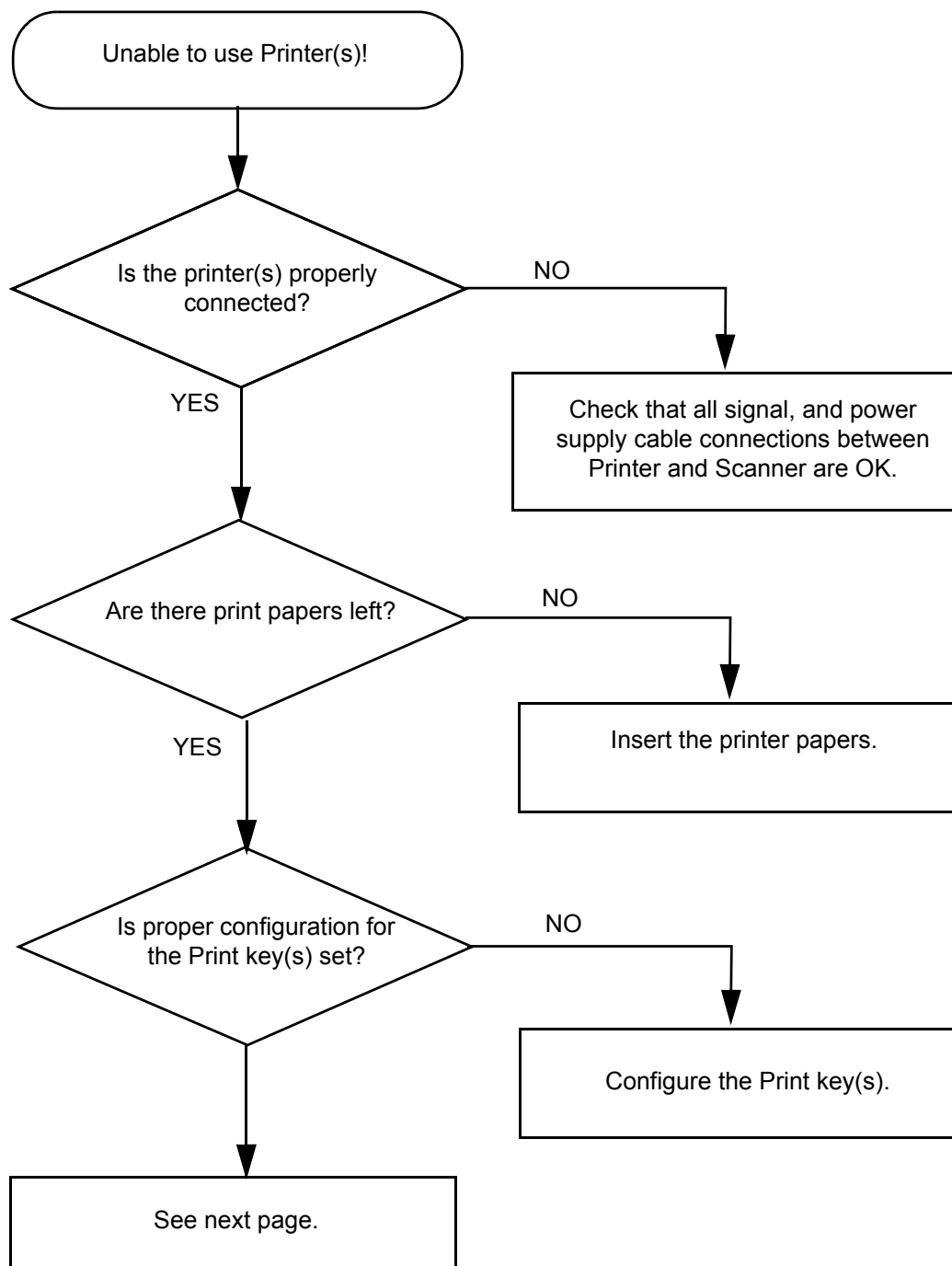
Figure 7-19 Printer Troubleshooting

7-7-8   **Printer Troubleshooting** (cont'd)
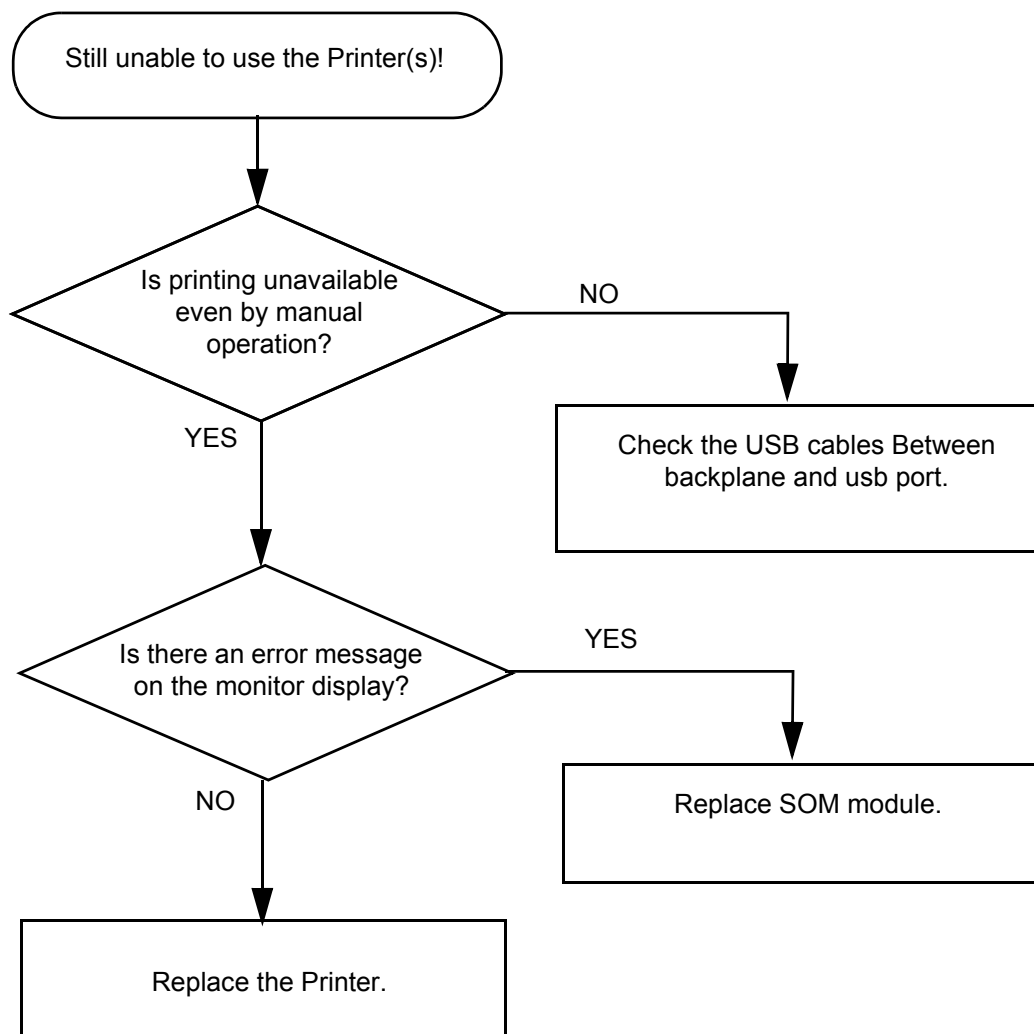
Figure 7-20   Printer Troubleshooting (contd.)

7-7-9   DVD-RW Troubleshooting
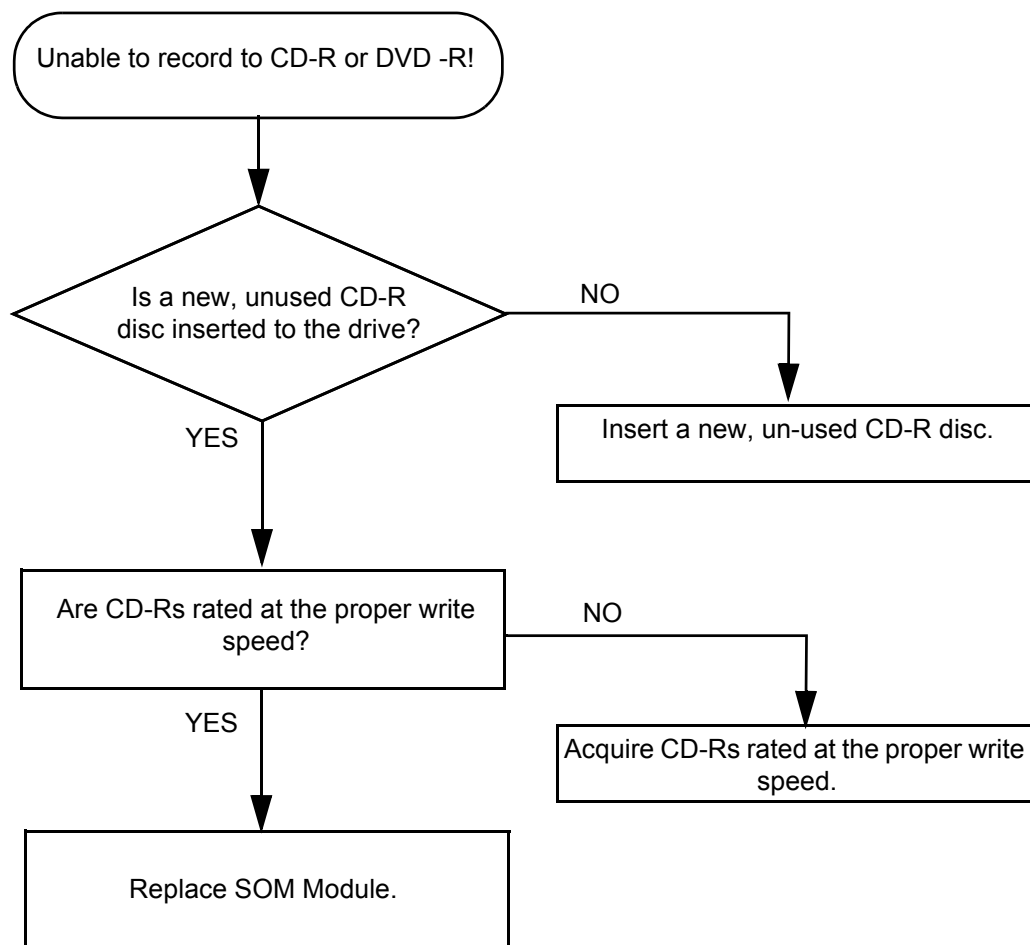
Figure 7-21   CD-RW Troubleshooting

7-7-10 Network Troubleshooting

7-7-10-1 No Connection to the Network at All

1.) Check that the network cable between the scanner and the wall network is connected and well seated in both ends.

2.) Try a network cable that is known to be OK.

3.) Check the cable between the SYSCONPM(SYSCOMCM) and Rear Panel.

4.) Connect a Crossed network cable between the Scanner and your PC. Try to ping from the scanner to the IP address on the PC. If OK, the hardware connection inside the scanner is OK.

7-7-10-2 No Contact With Server, But Connection to Network is OK

Check Network setup on the scanner.

7-7-10   Network Troubleshooting (cont'd)

```
        ╭────────────────────────────╮
        │  No Connection to the Network │
        ╰────────────────────────────╯
                     │
                     ▼
              ╱────────────╲
            ╱  Is the        ╲
          ╱  TCP/IP Cable between ╲        NO
         ⟨  LOGIQ™ P5 and network  ⟩──────────────┐
          ╲  outlet connected and well ╱           │
            ╲    seated?   ╱                        ▼
              ╲──────────╱              ┌───────────────────────────┐
                 │ YES                  │ Connect the cable and     │
                 ▼                      │ verify that it is well    │
      ┌──────────────────────────┐     │ seated in both ends.      │
      │ Try a network cable that  │     └───────────────────────────┘
      │ is known to be OK         │
      └──────────────────────────┘
                 │
                 ▼
           ╱────────────╲
         ╱                ╲       YES
        ⟨ Is the connection ⟩──────────────┐
         ╲    OK now?      ╱                │
           ╲────────────╱                  ▼
              │ NO                ┌──────────────────────────┐
              ▼                   │ Replace the AEXP cable    │
         ╱────────────╲          │ between SYSCON and        │
       ╱  Is the        ╲        │ Rear panel.               │
      ⟨ cable between SYSCON ⟩ NO └──────────────────────────┘
       ╲ and Rear Panel OK? ╱──────────────┐
         ╲────────────╱                     │
            │ YES                           ▼
            ▼                    ┌──────────────────────────┐
  ┌──────────────────────────┐  │ Replace the Rear Panel.   │
  │ Connect a Crossed Network │  └──────────────────────────┘
  │ Cable between the Scanner │
  │ and your PC/Laptop.       │
  │ Try to ping from the      │
  │ PC/Laptop to LOGIQ™ P5.   │
  │ If OK, the hardware        │
  │ connection inside          │
  │ LOGIQ™ P5 is OK.          │
  └──────────────────────────┘
```

Figure 7-22   Network Troubleshooting

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Section 7-7 - Trouble Shooting Tree

Chapter 8
Replacement Procedures

Section 8-1
Overview

8-1-1 Purpose of Chapter 8

This chapter describes replacement procedures for the following modules and subsystems.

Section	Description	Page Number
8-1	Overview	8-1
8-2	DISASSEMBLY/RE-ASSEMBLY	8-2
8-3	Software Loading Procedure	8-117
8-4	Software Installation	8-129
8-5	Full Backup/Restore Procedure	8-160
8-6	Software Reloading	8-164
8-7	Mechanical Option Installation instruction	8-174

Table 8-1 Contents in Chapter 8

Section 8-2 DISASSEMBLY/RE-ASSEMBLY

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

⚠ **CAUTION** Do not wear the ESD wrist strap when you remove a part of power supply unit. Turn OFF power and unplug the power cord before removing a part of power supply unit. However be sure to turn off power and wear the strap before you remove a circuit boards.

⚠ **WARNING** *DO NOT SERVICE OR DISASSEMBLE PARTS UNDER FRU UNIT LEVEL AT ANY CIRCUMSTANCES.*

NOTE: *If the LOGIQ P5/A5/A5pro needs to be sent for repair, ensure that any patient information is erased from the storage device, or that the storage device is removed from the LOGIQ P5/A5/ A5pro before shipping. In case that any patient information is still residing on the LOGIQ P5/ A5/A5pro, GE will contact the customer and request for urgent collection of that patient information. GE will keep this patient information in a secure environment for a maximum period of 1 month. All patient information will be permanently deleted at that point.*

If PHI (Patient Healthcare Information) data needs to be sent to GE employees for service purposes,

GE will ascertain agreement from the customer. The patient information shall only be transferred by approved service processes, tools and devices restricting access, protecting or encrypting data where required, and providing traceability in the form of paper or electronic documents at each stage of the procedure while maintaining compliance with cross-border restrictions of patient information

8-2-1 LCD Plastic filter

8-2-1-1 Tools

- Common Phillips screwdrivers
- Allen/Unbraco wrench
- Stubby screwdriver (Flat tip and Cross tip)

8-2-1-2 Removal procedure

1.) Remove the LP5 Monitor cover set. Refer to the 8-2-2 "Monitor cover set" on page 8-5.
2.) Remove the LCD Plastic filter.
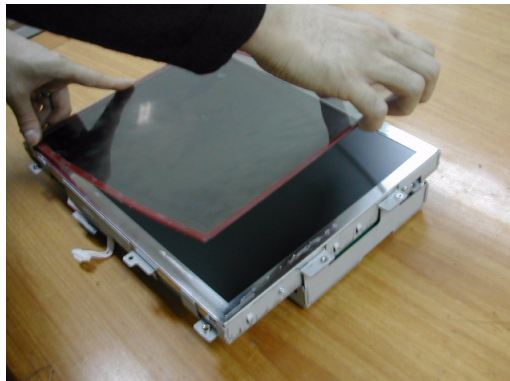
Figure 8-1   Removing the LCD plastic filter

3.) Put the LCD plastic filter on the LCD monitor after detaching the tape of the LCD plastic filter.
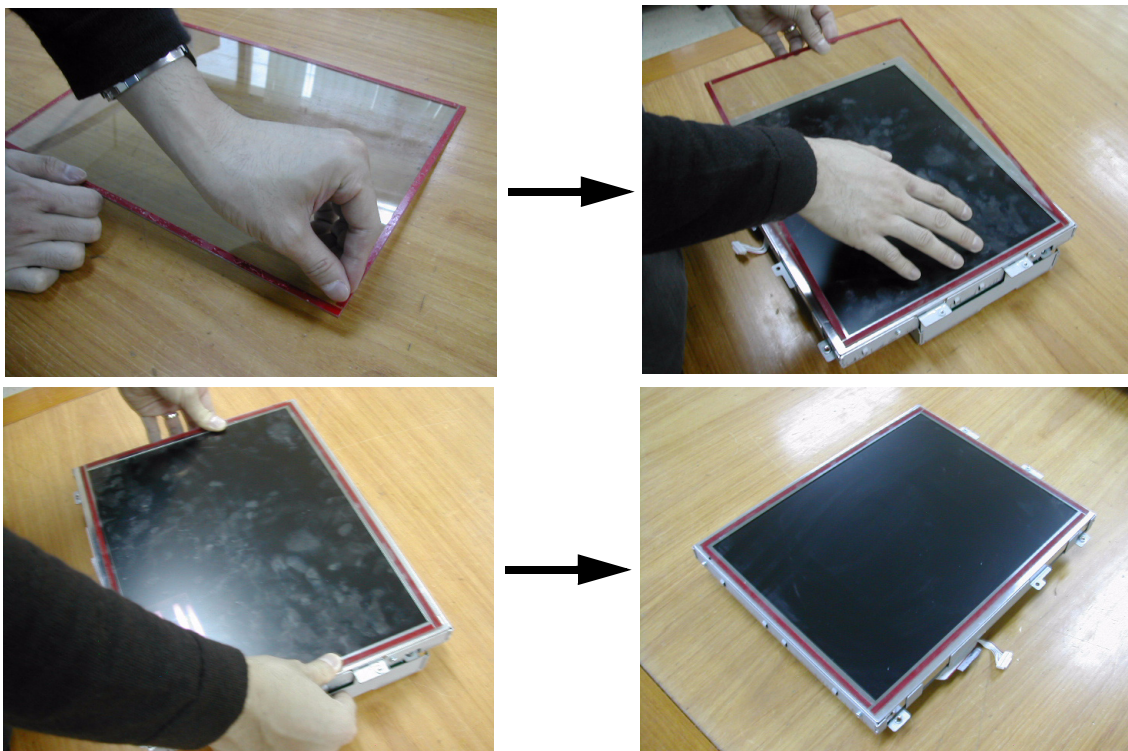
Figure 8-2   Putting the LCD plastic filter on the LCD monitor

8-2-1-2 **Removal procedure** (cont'd)

4.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-2 Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-1. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-2	LCD plastic filter Function Validation Procedure	
Section 10-5-5	Physical Inspection	

8-2-1-3 **Mounting Procedure**

1.) Install the LCD monitor cover parts in the reverse order of removal procedure. Refer to the 8-2-2 "Monitor cover set" on page 8-5.

2.) Put the label on the rear of the LCD monitor.

Figure 8-3 Putting the label on the rear of the LCD monitor

8-2-2   Monitor cover set

8-2-2-1   Tools
- Common pillips screwdrivers
- Allen/Unbraco wrench
- Stubby screwdriver (Flat tip and Cross tip)

8-2-2-2   Removal procedure

1.) Remove the LCD cable cover.
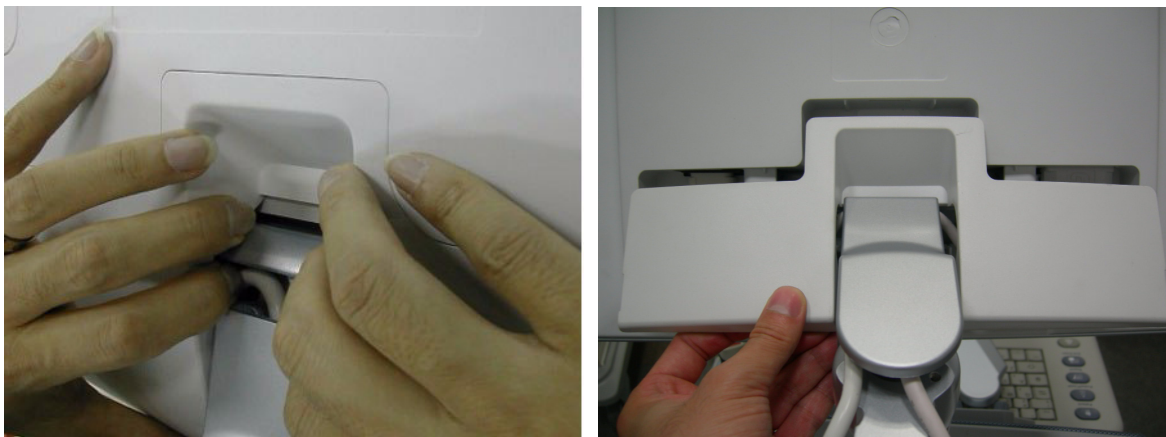
Figure 8-4   Removing the LCD cable cover

2.) Unscrew 1 screw (2306565, BH M4x16 WHT) to remove the power cord bracket assembled under the LCD cable cover.
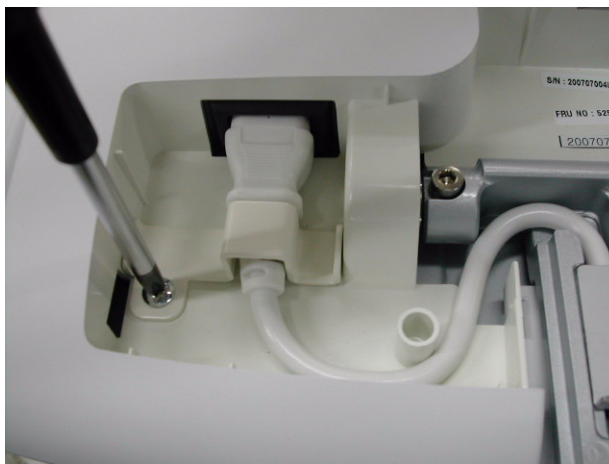
Figure 8-5   Removing the power cord bracket

8-2-2-2   Removal procedure (cont'd)

3.) Disconnect power cable and DVI cable.

Figure 8-6   Disconnecting power cable and DVI cable

4.) Unscrew 2 screws(5177684, HSH M5x20 WHT) to separate LCD monitor.

Figure 8-7   Separating the LCD monitor

5.) Unscrew 4 screws to remove the LCD rear cover.

Figure 8-8   Removing the LCD rear cover

8-2-2-2 **Removal procedure** (cont'd)

6.) Unscrew 4 screws to remove the OSD key assy and disconnect the connect.
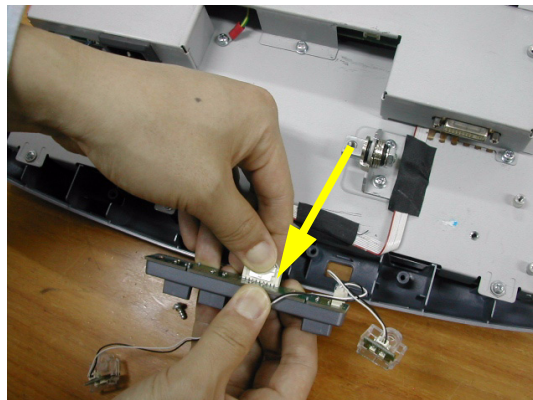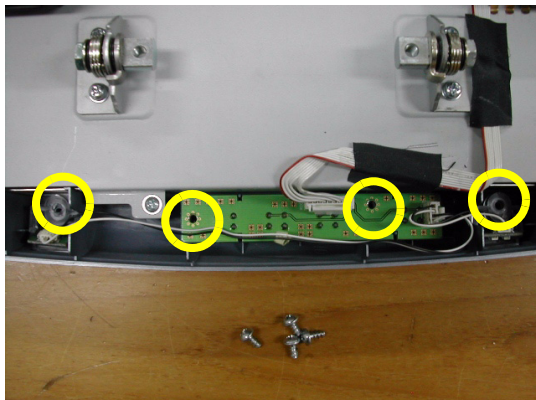
Figure 8-9   Separating the OSD key assy

7.) Separate the LCD tact knob and LCD lamp window from the OSD key assy.
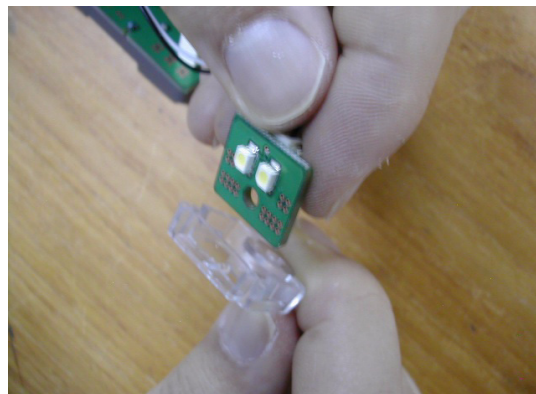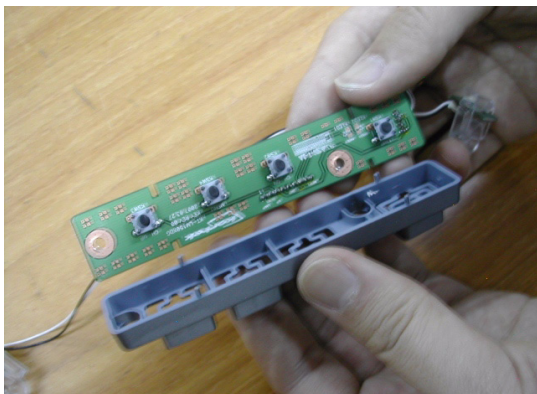
Figure 8-10   Separating the LCD tact knob and LCD lamp window

8.) Unscrew 5 screws to remove LCD front cover.

Figure 8-11   Removing the LCD front cover

8-2-2-2 **Removal procedure** (cont'd)

9.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-3 Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-2. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-2	LCD plastic filter Function Validation Procedure	
Section 10-5-5	Physical Inspection	

8-2-2-3 **Mounting Procedure**

Install the each of the new part in the reverse order of removal procedure.

8-2-3 OSD button and lamp set, LCD Plastic Filter

8-2-3-1 Tools

• Common pillips screwdrivers

8-2-3-2 Preparations

• Shut down the system and switch off the main breaker.
• Maneuver control console to a suitable position for removing the monitor.

8-2-3-3 Removal procedure

1.) Unscrew 4 screws (1-4) from the LCD front cover.

Figure 8-12   Unscrews 4 screws

2.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-4   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-3. Equipment passed all required tests and is ready for use. "
Section 4-6-2	15" OSD Key Assy Function Validation Procedure	
Section 10-5-5	Physical Inspection	

8-2-3-4 Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-4   LCD Std Arm with Cover

8-2-4-1   Tools
- Common pillips screwdrivers
- Allen/Unbraco wrench

8-2-4-2   Preparations
- Shut down the system and switch off the main breaker.
- Maneuver control console to a suitable position for removing the monitor.

8-2-4-3   Removal procedure

1.) Remove the Power Cable, DVI Cable.

POWER CABLE ← → DVI CABLE

Figure 8-13   Removing the Cable

2.) Unscrew 1 screw to remove the LCD arm cover.

Figure 8-14   Unscrews 1 screw

8-2-4-3 **Removal procedure** (cont'd)

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-5 **Functional Tests**

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-4. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-8	Flexible LCD Arm Function Validation Procedure	
Section 10-5-5	Physical Inspection	

8-2-4-4 **Mounting Procedure**

Install the new parts in the reverse order of removal.

8-2-5 Monitor Assy

8-2-5-1 Tools
- Common pillips screwdrivers
- Allen/Unbraco wrench

8-2-5-2 Preparations
- Shut down the system and switch off the main breaker.
- Maneuver control console to a suitable position for removing the monitor.

8-2-5-3 Removal procedure

1.) Detach the monitor assy from arm.
   - Open monitor cable cover
   - Unscrew a screw of the power connector fixture bracket
   - Unplug the power plug and DVI connector
   - Flip down the monitor
   - Unscrew the 2 hexa screw of the monitor hinge

Figure 8-15 Disassemble Monitor from STD arm

While unscrew the hinge hexa screw from the arm, keep hold the monitor to prevent drop down.

2.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-6 Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-5. Equipment passed all required tests and is ready for use. "
Section 4-6-1	15" LCDMON II Assy & LCD Panel with filter Function Validation Procedure	
Section 10-5-2	Functional Checks (See Also Chapter 4)	

8-2-5-4 Mounting Procedure
Install the new parts in the reverse order of removal

8-2-6   Flexible LCD Arm Removal Procedure

8-2-6-1   Tools
- Common pillips screwdrivers
- Allen/Unbraco wrench
- Stubby screwdriver (Flat tip and Cross tip)

8-2-6-2   Preparations
- Shut down the system and switch off the main breaker.
- Maneuver control console to a suitable position for removing the monitor.

8-2-6-3   Removal procedure

1.) Remove the LCD cable cover.

Figure 8-16   Removing the LCD cable cover

2.) Unscrew 1 screw (2306565, BH M4x16 WHT) to remove the power cord bracket assembled under the LCD cable cover.

Figure 8-17   Removing the power cord bracket

8-2-6-3   **Removal procedure** (cont'd)

3.) Disconnect power cable and DVI cable.

Figure 8-18   Disconnecting power cable and DVI cable

4.) Unscrew 1 screw (2329677, TAP M4X16) to remove the Fold cover.

Figure 8-19   Removing the Fold cover

5.) Unscrew 2 screws (2159634, BH M4x10 WHT) to remove the Cable clamp.

Figure 8-20   Removing the Cable clamp

8-2-6-3   **Removal procedure** (cont'd)

6.) Unscrew 2 screws (5177684, HSH M5x20 WHT) to separate the LCD MONITOR and 1 screw (2159625, PH M4x8 W/SP) to remove the Cable bracket.

NOTE: *While unscrewing the hinge hexa screw from the arm, keep hold of the monitor to prevent dropping down.*
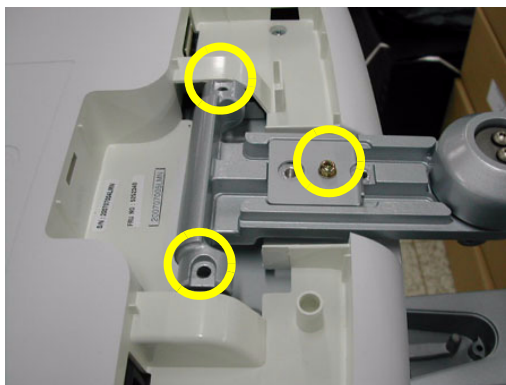
Figure 8-21   Separating the LCD monitor & Removing the Cable bracket.

7.) Unscrew 2 screws (2337572, FH M3x6 WHT) to remove the Arm cover L & R.

Figure 8-22   Removing the Arm cover L & Arm cover R

8.) Unscrew 2 screws (2159632, BH M4x6 WHT) to remove the Cam cover L & R.
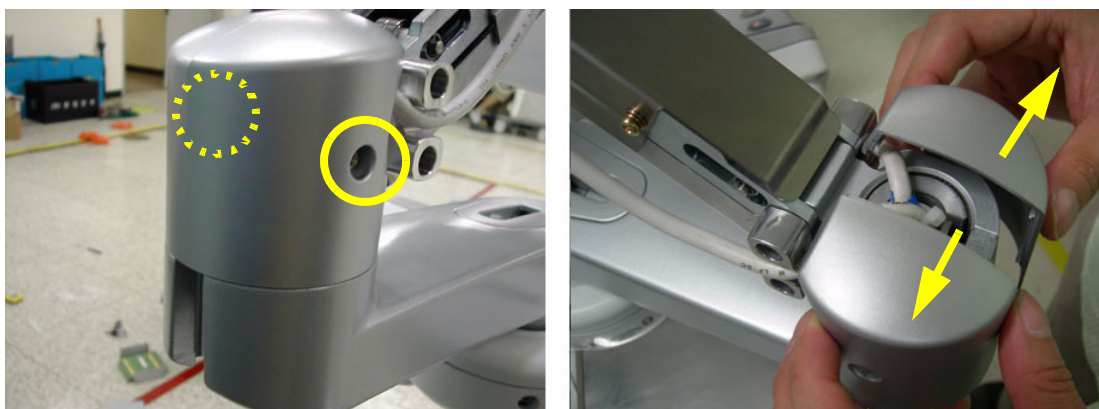
Figure 8-23   Removing the Cam cover L & Cam cover R

8-2-6-3 **Removal procedure** (cont'd)

9.) Unscrew 4 screws (2159634, BH M4x10 WHT) to remove the Arm bottom cover.

Figure 8-24   Removing the Arm bottom cover

10.) Unscrew 1 screw (2329677, TAP M4X16) to remove the Lock cover.
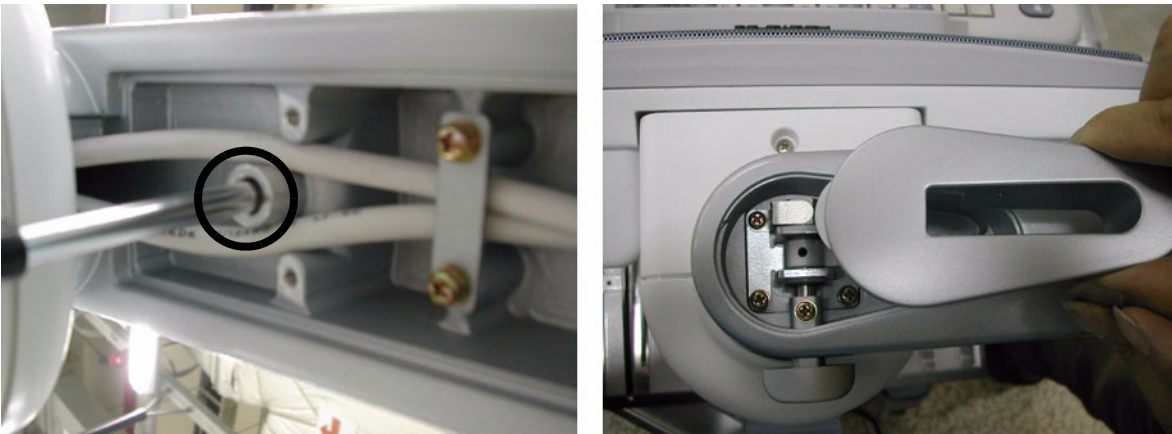
Figure 8-25   Removing the Lock cover

11.) Unscrew 2 screws (2159625, PH M4x8 W/SP) to remove the Lower arm guide bracket.
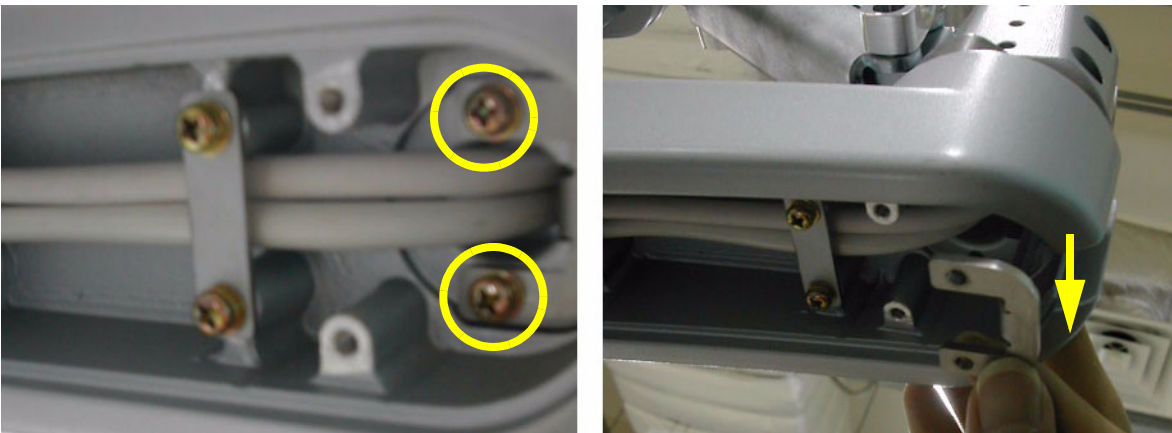
Figure 8-26   Removing the Lower arm guide bracket

8-2-6-3   Removal procedure (cont'd)

12.)Unscrew 2 screws (2159626, PH M4X20) to remove the Arm stopper.
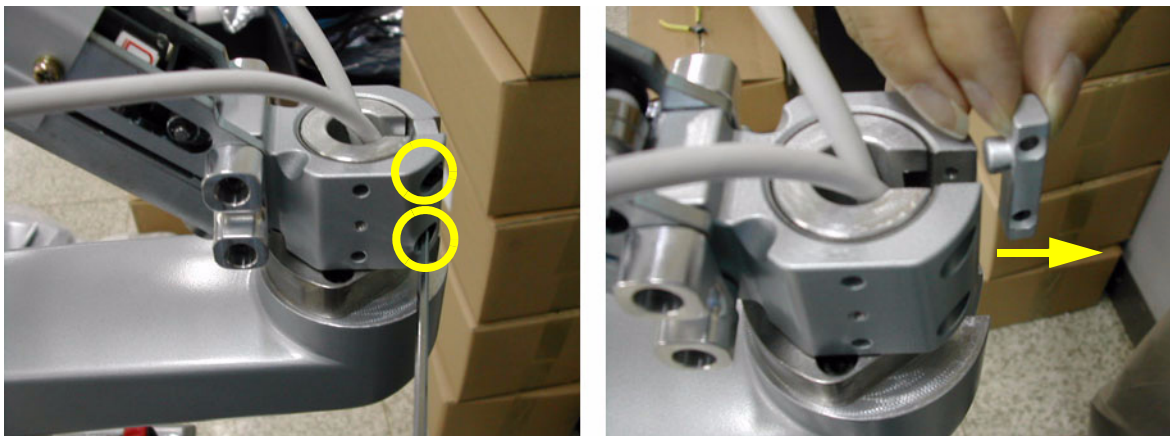
Figure 8-27   Removing the Arm stopper

13.) Pull out power cable & DVI cable. Make sure flexible arm not to rotate.

Figure 8-28   Pulling out power cable & DVI cable

14.) Unscrew 4 screws (2159625, PH M4x8 W/SP) to remove the Lower arm cable bracket and pull out power cable & DVI cable.

Figure 8-29   Unscrewing 4 screws

8-2-6-3   **Removal procedure** (cont'd)

15.)Unscrew 3 screws (2159634, BH M4x10 WHT) after removing the rubber caps to remove neck front cover, neck rear cover.
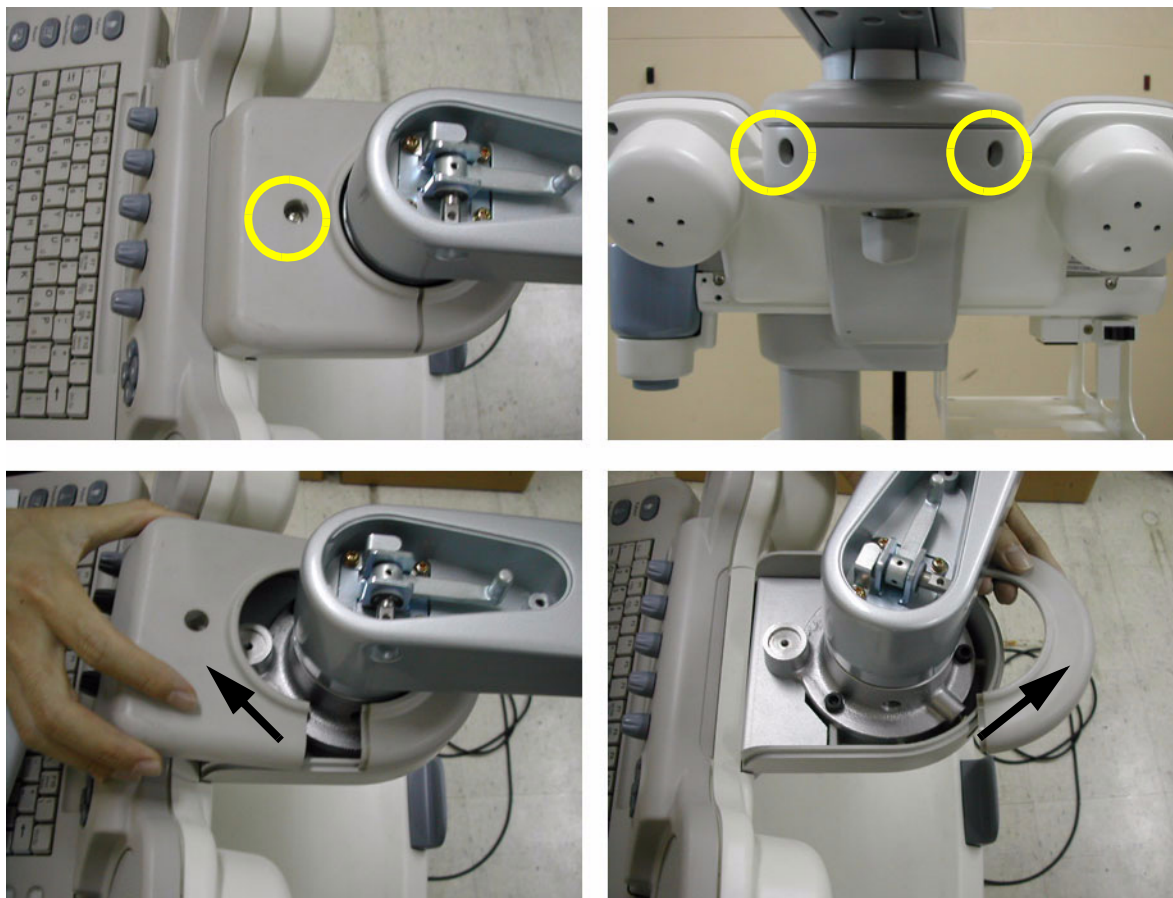
Figure 8-30   Unscrewing 3 screws and removing the neck front cover & neck rear cover

16.)Unscrew 3 screws(5327646, HSH M6X16 WHT) to separate the flexible arm neck pipe.

Figure 8-31   Separating the neck pipe

8-2-6-3 **Removal procedure** (cont'd)

17.)Unscrew 1 screw (2159625, PH M4x8 W/SP) to remove the OP bracket.
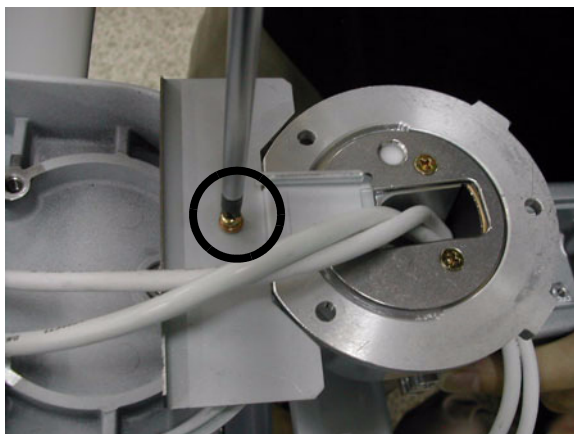
Figure 8-32   Removing OP bracket

18.) Unscrew 3 screws (2373562, FH M4x10 YEL) to separate the Flexible arm stopper (A+B).
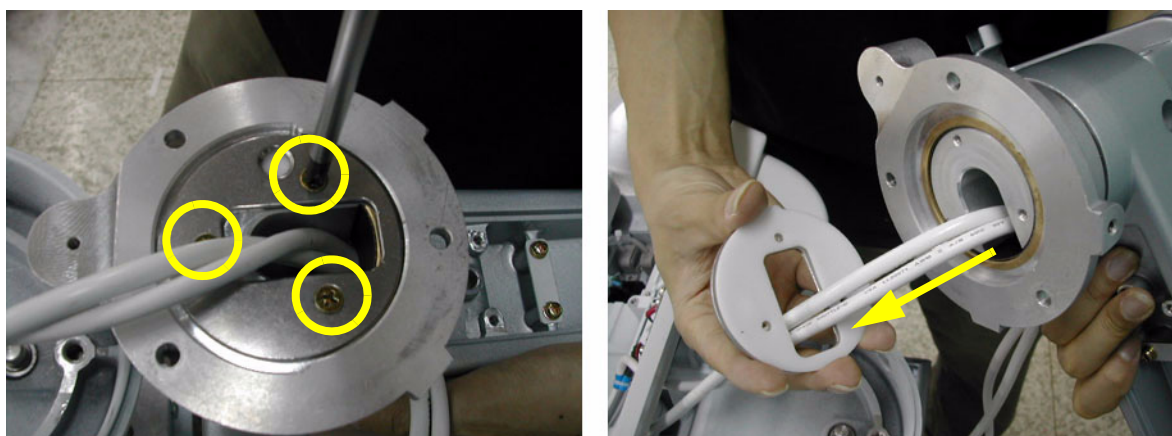
Figure 8-33   Separating the flexible arm stopper

8-2-6-3 **Removal procedure** (cont'd)

19.)Pull out power cable & DVI cable and remove the oilless bush after separating the neck pipe.
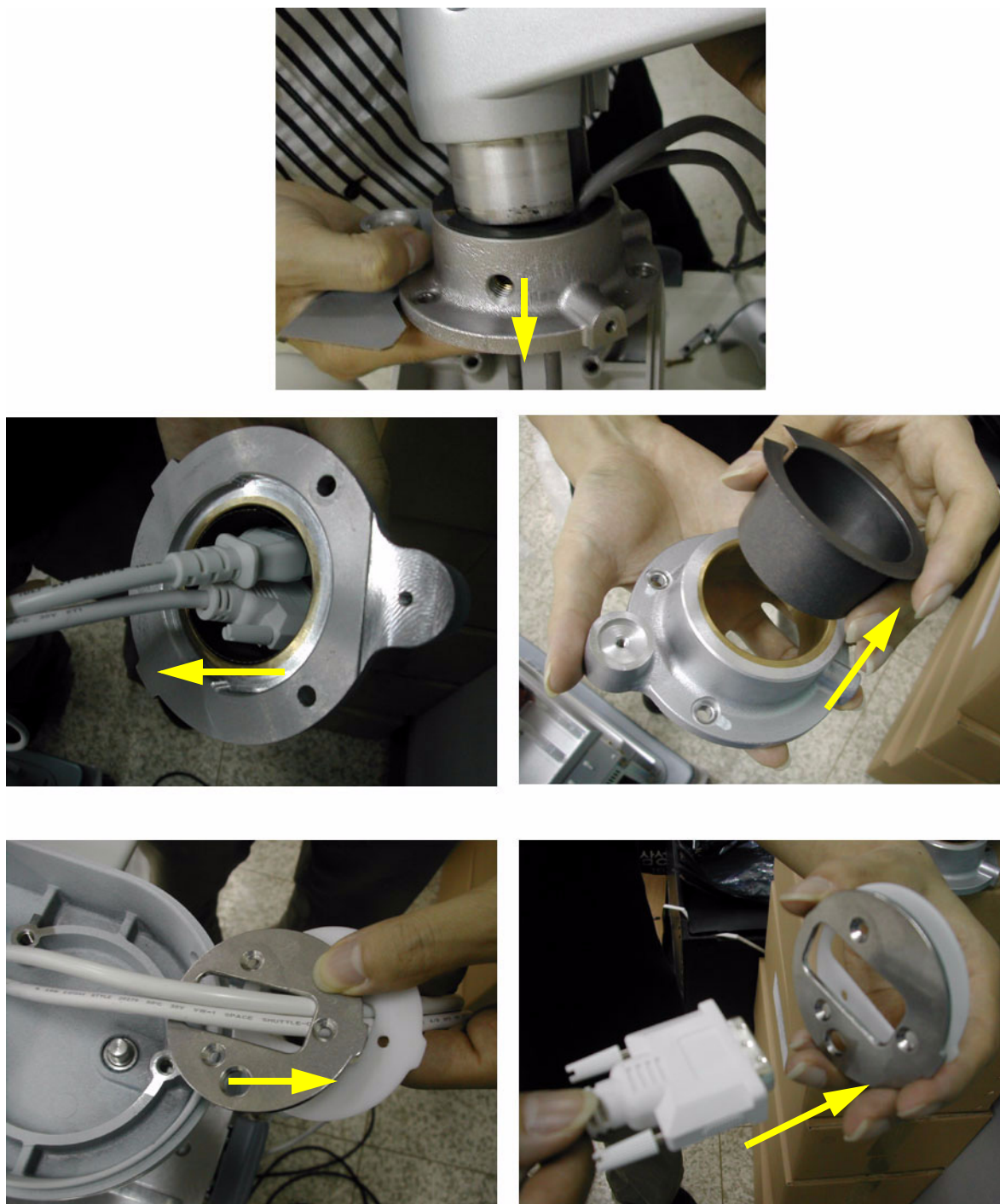
Figure 8-34   Pulling out power cable & DVI cable and removing the stopper

8-2-6-3   **Removal procedure** (cont'd)
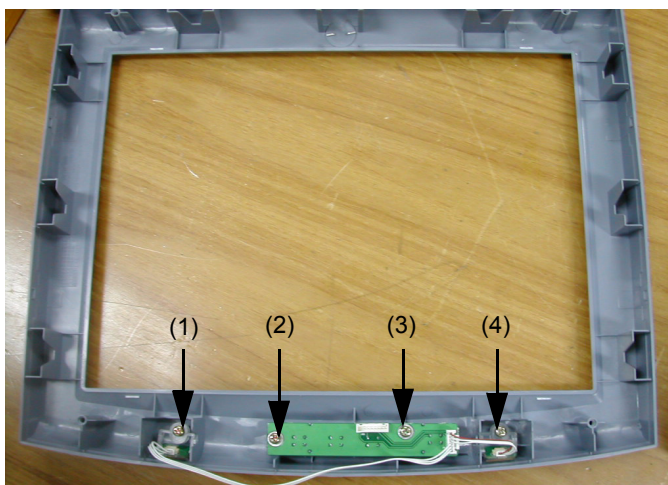
20.)Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-7   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-6. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-8	Flexible LCD Arm Function Validation Procedure	
Section 10-5-5	Physical Inspection	

8-2-6-4   Assembly procedure

First, remove LP5/LA5 Main K/B Assy and LP5/LA5 Sub K/B Assy

1.) Change the MON PWR CONN LONG cable and remove the cable tie of the DVI cable for flexible arm.

MON PWR CONN LONG cable
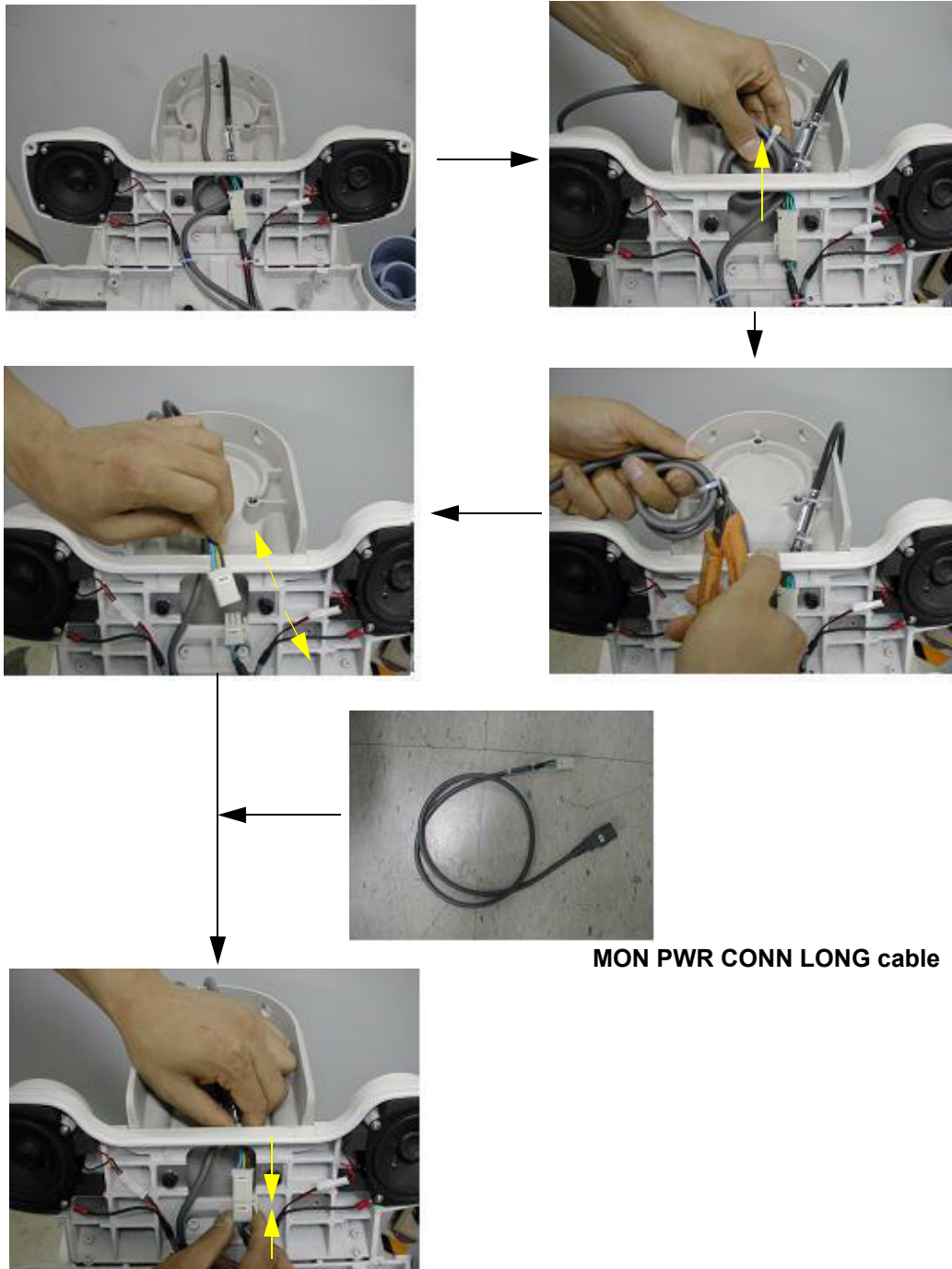
Figure 8-35   Changing the MON PWR CONN LONG cable

8-2-6-4 **Assembly procedure** (cont'd)

2.) Assemble the LCD locking mechanism.

a.) Put the stopper pin inside the spring and then put them inside the spring holder. Fix it with spring pin.
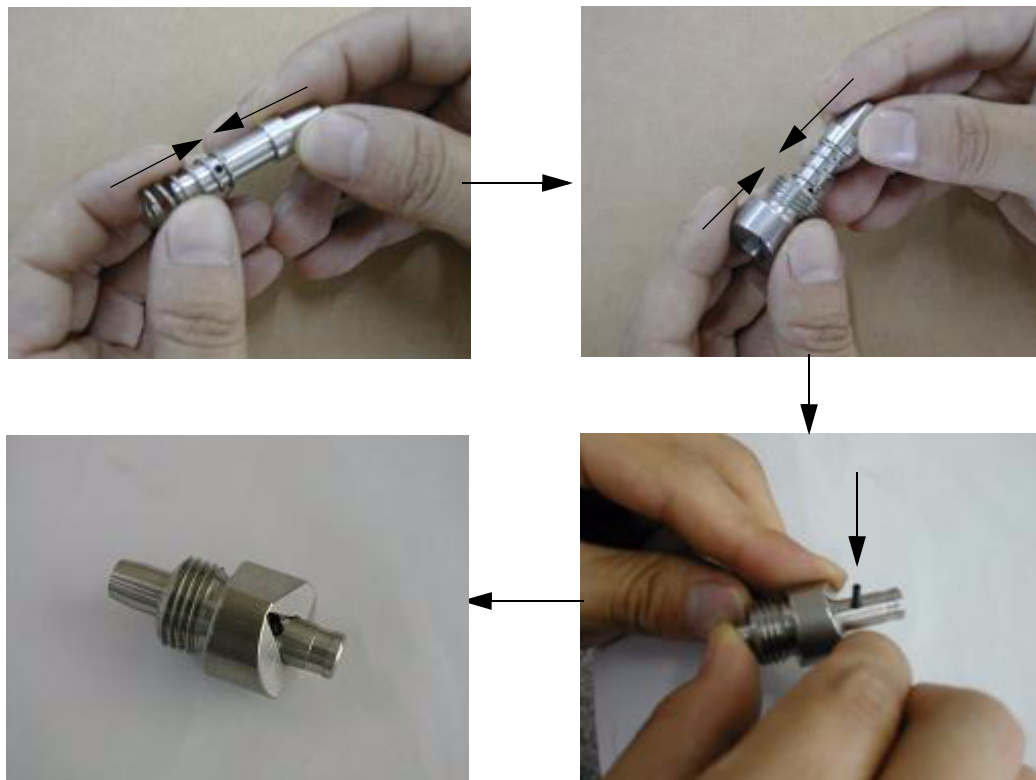
Figure 8-36   Assembling the spring holder Assy

b.) Put lock tite 290 on the M16 tap of the spring holder Assy and screw it.

Figure 8-37   Screwing the spring holder Assy

8-2-6-4   Assembly procedure (cont'd)

b-1) Mold die of AL neck frame modified as seen in the figure below does not need a nut.

Figure 8-38   Screwing the spring holder Assy

c.) Insert holder grip as seen the picture below and fix it with 2set screws(2327580, M2.6X4).
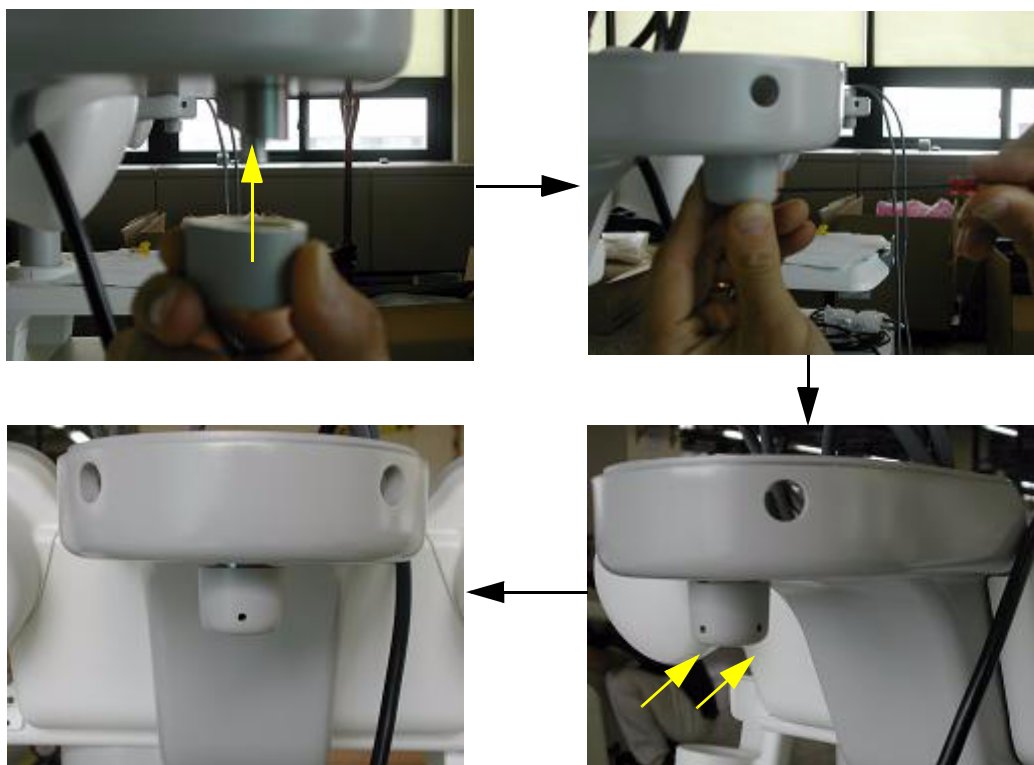
Figure 8-39   Assembling the holder grip

8-2-6-4 **Assembly procedure** (cont'd)

3.) Insert two of the flexible arm stoppers (A+B) to the Power Cable and DVI cable in the Order illustrated on the figure below. Make sure that chamfered shape of the flexible Arm stopper should face inside.

Flexible Arm Stopper
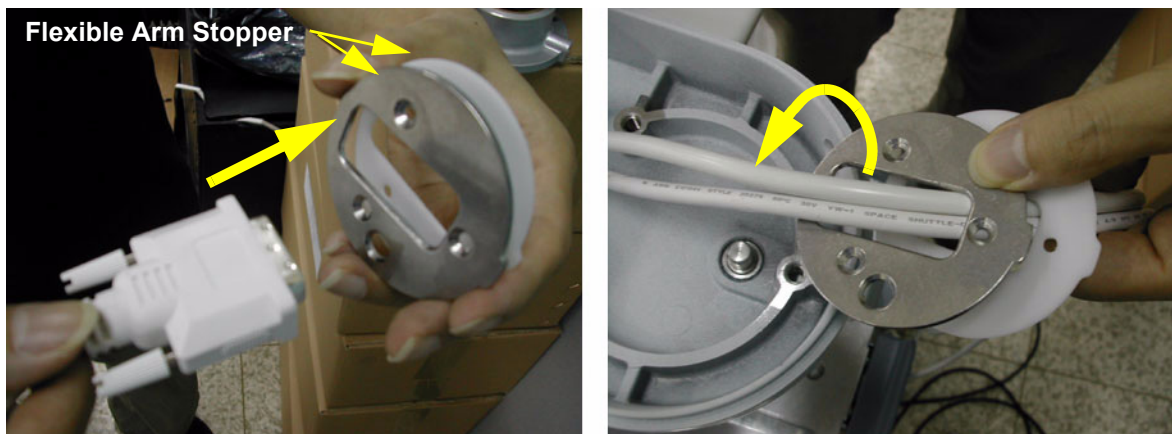
Figure 8-40   Inserting cables to the flexible arm stopper

4.) Insert oilless bush into the flexible arm neck pipe and insert two cables into the flexible arm neck pipe.

Figure 8-41   Inserting the oilless bush

5.) Insert the flexible arm into the flexible arm neck pipe.

Figure 8-42   Inserting the flexible arm

8-2-6-4   Assembly procedure (cont'd)

6.) Screw 3 screws (2373562, FH M4X10 YEL) to fix the flexible arm stopper after adjusting the holes.
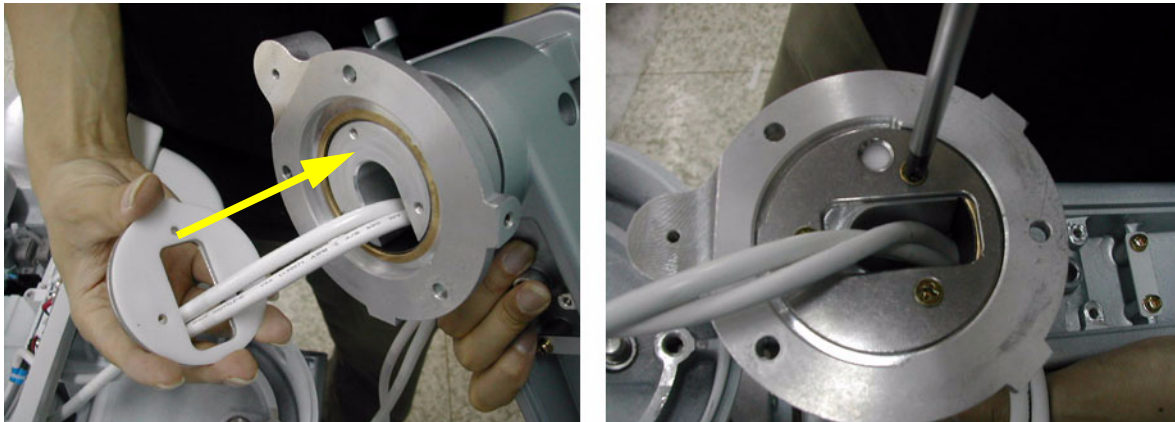
Figure 8-43   Fixing the flexible arm stopper

7.) Screw 1 screw (2159625, PH M4X8 W/SP) to install OP bracket.
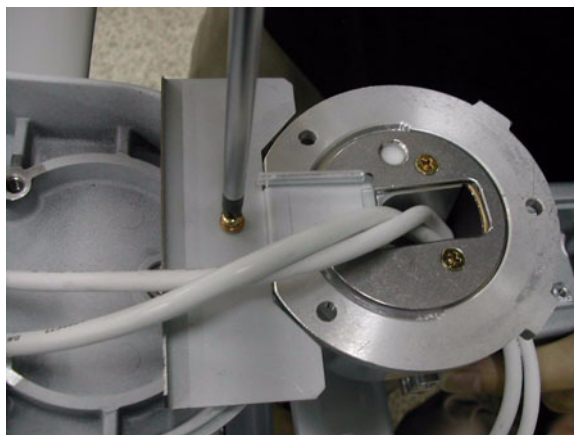
Figure 8-44   Installing OP Bracket

8.) Screw 3 screws (5327646, HSH M6X16 WHT) to install the arm neck pipe. Make sure place DVI cable be on the right side, power cable on the left side.

Figure 8-45   Assembling the arm neck pipe

8-2-6-4   **Assembly procedure** (cont'd)

9.) Screw 2 screws (5177684, HSH M5X20 WHT) to assemble the LCD monitor with flexible arm Top part.

Figure 8-46   Screwing 2 screws

10.) Insert the two cables inside the Flexible arm and Screw 4 screws (2159625, PH M4X8 W/SP) to assemble the Lower arm cable bracket.

Figure 8-47   Screwing 4 screws

11.) Put in the two cables. Make sure place DVI cable be on the right side, power cable on the left side.

Figure 8-48   Putting in the cables

8-2-6-4   **Assembly procedure** (cont'd)

12.)Screw 2 screws (2159626, PH M4X20) to assemble the Arm stopper.
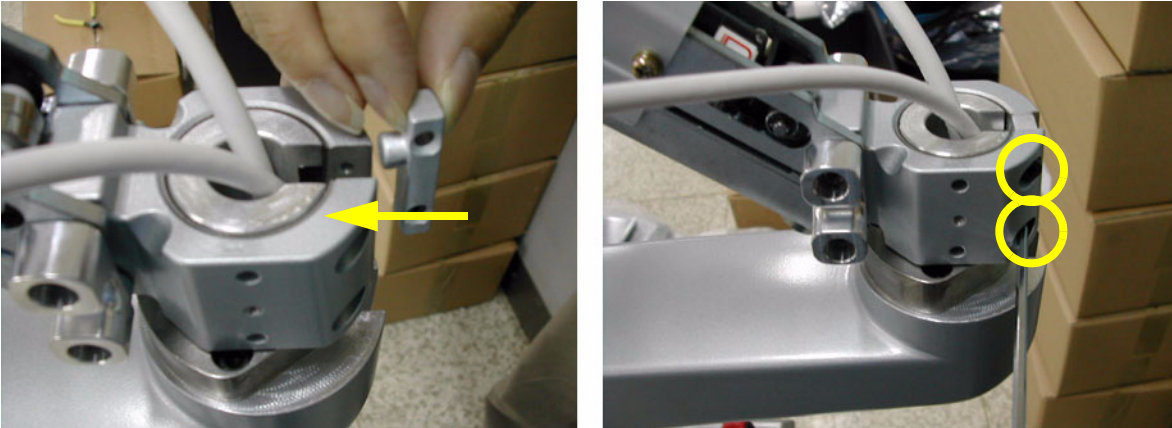
Figure 8-49   Installing the Arm stopper

13.)Screw 2 screws (2159625, PH M4X8 W/SP) to assemble the Lower arm guide bracket.

Figure 8-50   Assembling the Lower arm guide bracket

14.)Tie the Cables with Cable tie.

Figure 8-51   Tying the cables

8-2-6-4   Assembly procedure (cont'd)

15.) Place the cables inside the slot and connect power cable and DVI cable.

Figure 8-52   Placing the Cables

16.) Assemble the Cable bracket with 1 Screw (2159625, PH M4X8 W/SP)

Figure 8-53   Assembling the Cable bracket

17.) Screw 2 screws (2159634, BH M4X10 WHT) to assemble the Cable clamp.

Figure 8-54   Assembling the Cable clamp

8-2-6-4   **Assembly procedure** (cont'd)

18.) Place the cables like the figure below.

Figure 8-55   Placing the cables

19.) Screw 1 screw (2306565, BH M4X16 WHT) to fix the Power cable.

Figure 8-56   Assembling the power cord bracket

8-2-6-4 **Assembly procedure** (cont'd)

20.)Assemble the LCD cable cover.

Figure 8-57   Assembling the LCD cable cover

8-2-6-4   Assembly procedure (cont'd)

21.) Screw 3 screws (2159634, BH M4x10 WHT) after placing the neck front cover and neck Rear cover.
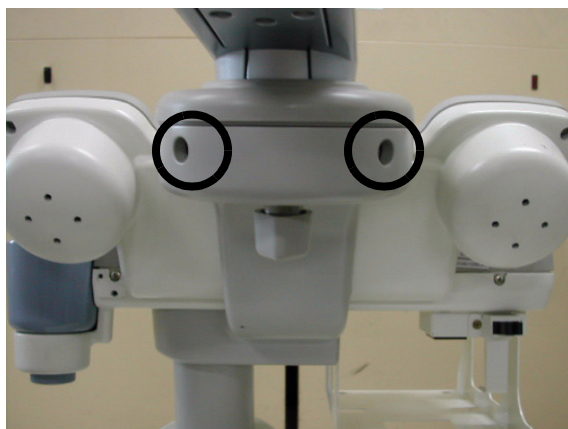
Figure 8-58   Assembling the neck front cover and the neck rear cover

22.) Screw 1 screw (2159625, PH M4X8 W/SP) to assemble the Lock Knob.

Figure 8-59   Assembling the Lock Knob

8-2-6-4   Assembly procedure (cont'd)

23.)Screw 1 screw (2329677, TAP M4X16) to assemble the Lock Cover.

Figure 8-60   Assembling the Lock Cover

8-2-6-4   Assembly procedure (cont'd)

24.)Screw 2 screws (2159632, BH M4X6 WHT) to assemble the Cam Cover L & R.
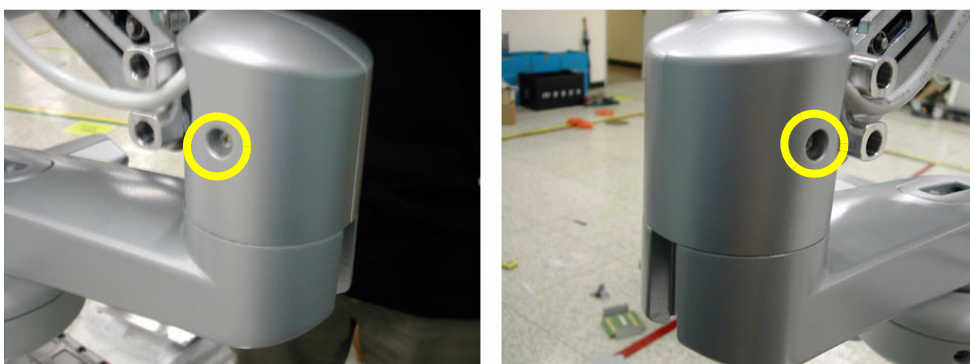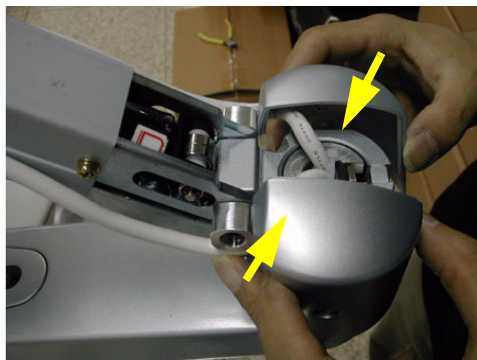
Figure 8-61   Assembling the Cam Cover L & R

25.)Screw 1 screw (2329677, TAP M4X16) to assemble the Fold Cover.

Figure 8-62   Assembling the Fold Cover

8-2-6-4   **Assembly procedure** (cont'd)

26.)Screw 2 screws (2337572, FH M3X6 WHT) to assemble the Arm cover L & R.

Figure 8-63   Assembling the Arm Cover L & R

27.)Screw 4 screws (2159634, BH M4X10 WHT) to assemble the Arm bottom Cover.
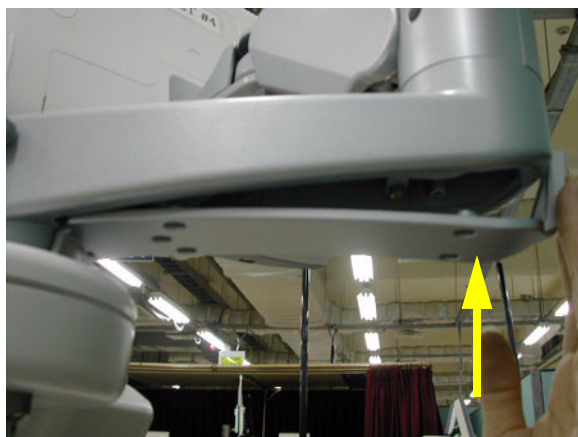
Figure 8-64   Assembling the Arm bottom cover

8-2-6-4   **Assembly procedure** (cont'd)

28.)Attach LCD Arm Caution Label, LCD Arm Rotation Label, LCD Lock Caution Label.

LCD Arm Caution Label

LCD Arm Rotation Label

LCD Lock Caution Label

Figure 8-65   Flexible Arm

8-2-7 Main Keyboard Assy

8-2-7-1 Tools

• Common pillips screwdrivers

8-2-7-2 Preparations

• Shut down the system and switch off the main breaker.

8-2-7-3 Removal procedure

1.) Remove the 3 Probe holders & Cup holder from the keyboard.

Figure 8-66   Removing holders

2.) Unscrew 4 screws from the bottom front of the keyboard.
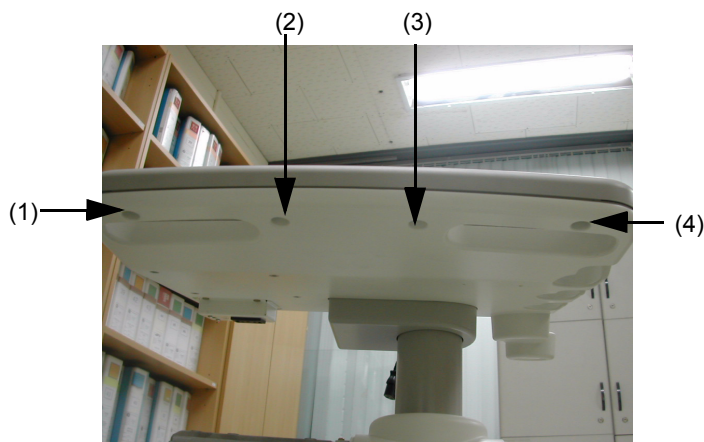
Figure 8-67   Unscrews 4 screws

8-2-7-3 **Removal procedure** (cont'd)

3.) Unscrew 2 screws from the rear side of the keyboard.

Figure 8-68   Unscrews 2 screws

4.) Lift the top cover of the keyboard and disconnect 4 cables from the keyboard.
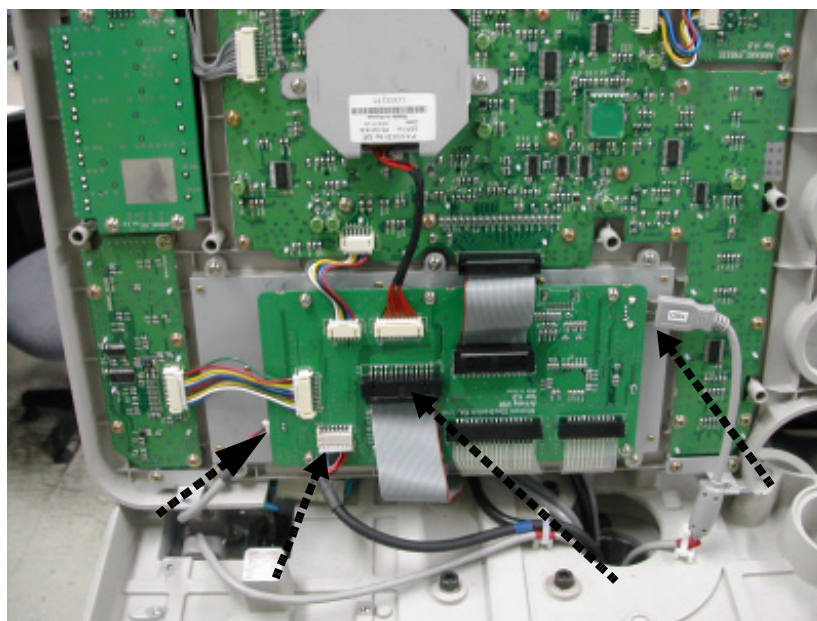
Figure 8-69   Lifting the top cover & Disconnecting 5 Cables

8-2-7-3   **Removal procedure** (cont'd)

5.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-8   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-7. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-7-1	Main Keyboard Assy Function Validation Procedure	
Section 4-3-4	System B/M-Mode Checks	
Section 4-3-5	System CFM and PWD Checks	
Section 10-5-2	Functional Checks (See Also Chapter 4)	

8-2-7-4   **Mounting Procedure**

Install the new parts in the reverse order of removal.

8-2-8 Sub Keyboard Assy

8-2-8-1 Tools

• Common pillips screwdrivers

8-2-8-2 Preparations

• Shut down the system and switch off the main breaker.

8-2-8-3 Removal procedure

1.) Remove the Main Keyboard Assy. Refer to the 8-2-7 "Main Keyboard Assy" on page 8-37.

2.) Unscrew 4 screws (1-4). 2 screws(1-2) are back side or the speaker and 2 screws(3-4) are bottom of sub keyboard.

Figure 8-70   4 Screw Sub Keyboard Assy

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-9   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-8. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-7-2	Sub Keyboard Assy Function Validation Procedure	

8-2-8-4   Mounting Procedure

1.) The product emblem is attached on the sub keyboard, so proper elblem should be attached on the sub keyboard when replace the sub keyboard.

The sub keyboard FRU include 4 kinds of emblem which are LOGIQ P5, LOGIQ P5 Ob, LOGIQ A5, LOGIQ A5 pro.

Figure 8-71   Emblems

2.) Attache proper product emblem as same as install base system before assemble the sub keyboard assy.

Figure 8-72   Emblem on Sub Keyboard

3.) Refer Install the new parts in the reverse order of removal.

8-2-9 Trackball Assy

8-2-9-1 Tools

• Common pillips screwdrivers

8-2-9-2 Preparations

• Shut down the system and switch off the main breaker.

8-2-9-3 Removal procedure

1.) Remove the Main Keyboard Assy. Refer to the 8-2-7 "Main Keyboard Assy" on page 8-37.

2.) Unscrew 4 screws (1-4) and disconnect the cable.
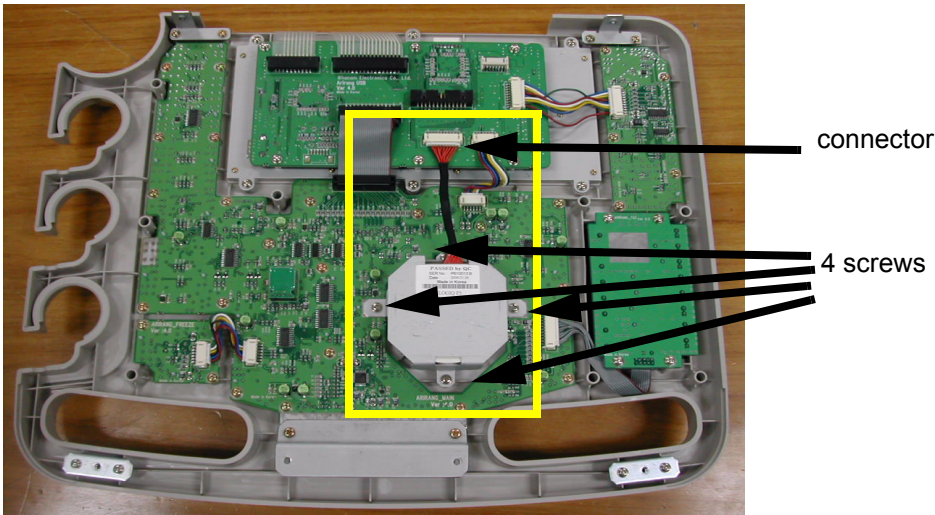
connector

4 screws

Figure 8-73 Screws and connector for Trackball

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-10   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-9. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-7-3	Trackball Assy validation	

8-2-9-4 Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-10 English, Greek, Russian, Swedish, Norwegian A/N Key assy

8-2-10-1 Tools

• Common pillips screwdrivers

8-2-10-2 Preparations

• Shut down the system and switch off the main breaker.

8-2-10-3 Removal procedure

1.) Remove the Main Keyboard Assy. Refer to the 8-2-7 "Main Keyboard Assy" on page 8-37.
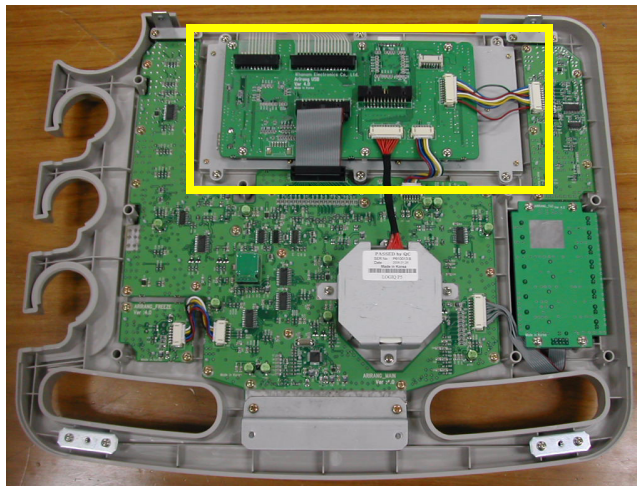
Figure 8-74   A/N Key in keyboard

2.) Remove USB PCB by unscrewing 6 screws (1-6) and disconnecting the 6 cables.
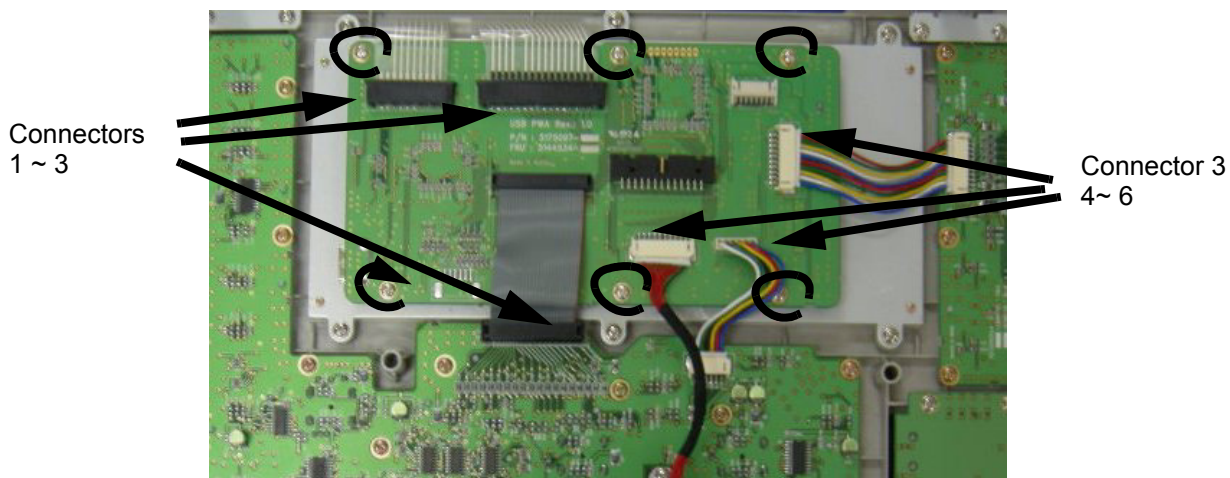
Figure 8-75   USB PCB

8-2-10-3 **Removal procedure** (cont'd)

3.) Unscrew 6 screws from the back side of the A/N key assy.

Figure 8-76   Screws on the A/N Key

4.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-11   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-10. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-7-4	A/N Key assy validation	

8-2-10-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-11   Freeze key assy

8-2-11-1   Tools

• Common pillips screwdrivers

8-2-11-2   Preparations

• Shut down the system and switch off the main breaker.

8-2-11-3   Removal procedure

1.) Remove the Main Keyboard Assy. Refer to the .
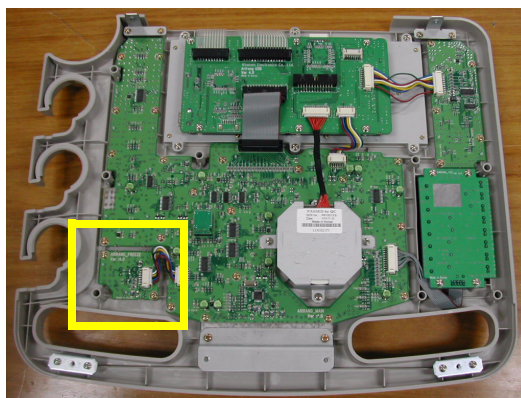
Figure 8-77   Freeze Key in the main keyboard

2.) Remove the 3 screws (1-3) and disconnect 1 cable.

Figure 8-78   Freeze Key connector

8-2-11-3   **Removal procedure** (cont'd)

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-12   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-11. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-7-5	Freeze key validation	

8-2-11-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-12 TGC key assy / TGC Knob Set

8-2-12-1 Tools

- Common pillips screwdrivers

8-2-12-2 Preparations

- Shut down the system and switch off the main breaker.

8-2-12-3 Removal procedure

1.) Remove the CFUNCKEY Assy. Refer to the 8-2-7 "Main Keyboard Assy" on page 8-37.
2.) Remove the TGC Knobs.

Figure 8-79   8 TGC Knobs

3.) Unscrew 4 screws (1-4).
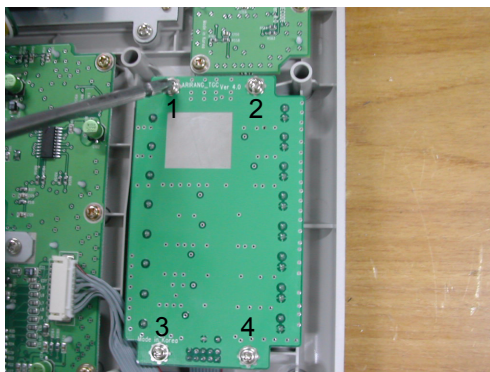
Figure 8-80   TGC PCB Assy in Keyboard

8-2-12-3   **Removal procedure** (cont'd)

4.) Disconnect 1 connector from the PCB.

Figure 8-81   TGC Key Connector

5.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-13   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-12. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-7-6	TGC key assay / TGC Knob Set validation	

8-2-12-4   **Mounting Procedure**

Install the new parts in the reverse order of removal.

8-2-13 Sub Keyboard Encoder Knob Set

8-2-13-1 Tools

- Common pillips screwdrivers

8-2-13-2 Preparations

- Shut down the system and switch off the main breaker.

8-2-13-3 Removal procedure

1.) Remove all the Encoder Knobs from the keyboard.

Figure 8-82   Knob in Sub Keyboard

2.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-14   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-13. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-7-7	Sub Keyboard Encoder Knob Set validation	

8-2-13-4 Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-14 Keycap set, Main Keyboard Encoder Knob set

8-2-14-1 Tools
• Common pillips screwdrivers

8-2-14-2 Preparations
• Shut down the system and switch off the main breaker.

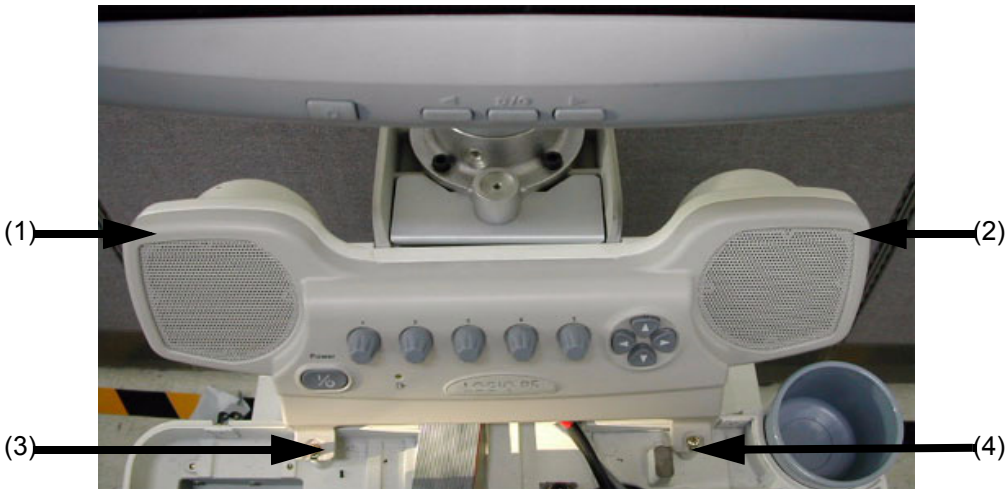#### 8-2-14-3 Removal procedure

1.) Remove key caps from the keyboard.

Figure 8-83   Key Caps

2.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-15   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-14. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-4	TGC key assy/TGC Knob Set, Sub keyboard encoder Knob Set, Keycap set, Main Keyboard Encoder Knob set Function Validation Procedure	
Section 10-5-5	Physical Inspection	

8-2-14-4 Mounting Procedure
Install the new parts in the reverse order of removal.

8-2-15   Side Left Cover

8-2-15-1   Tools

- Common pillips screwdrivers

8-2-15-2   Preparations

- Shut down the system and switch off the main breaker.

8-2-15-3   Removal procedure

1.) Unscrew 2 screws (1-2).

Figure 8-84   2 screw on Side left cover

2.) Remove the left cover.

Figure 8-85   Open Side left cover

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-16   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-15. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-15-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-16 Side Right Cover

8-2-16-1 Tools

• Common pillips screwdrivers

8-2-16-2 Preparations

• Shut down the system and switch off the main breaker.

8-2-16-3 Removal procedure

1.) Unscrew 2 screws (1-2).

Figure 8-86   2 screw on side right cover

2.) Remove the Right cover.

Figure 8-87   Open side right cover

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-17   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-16. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-16-4 Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-17   Front Cover

8-2-17-1   Tools

• Common pillips screwdrivers

8-2-17-2   Preparations

• Shut down the system and switch off the main breaker.

8-2-17-3   Removal procedure

1.) Remove the Left, and Right side covers. Refer to the and .

2.) Remove the dummy left and right covers. Refer to the Figure 8-88.

3.) Unscrew 2 screws (1-2) from the left side of the front cover.

Figure 8-88   Screws of Dummy Cover

4.) Unscrew 2 screws (1-2) from the right side of the Front cover.
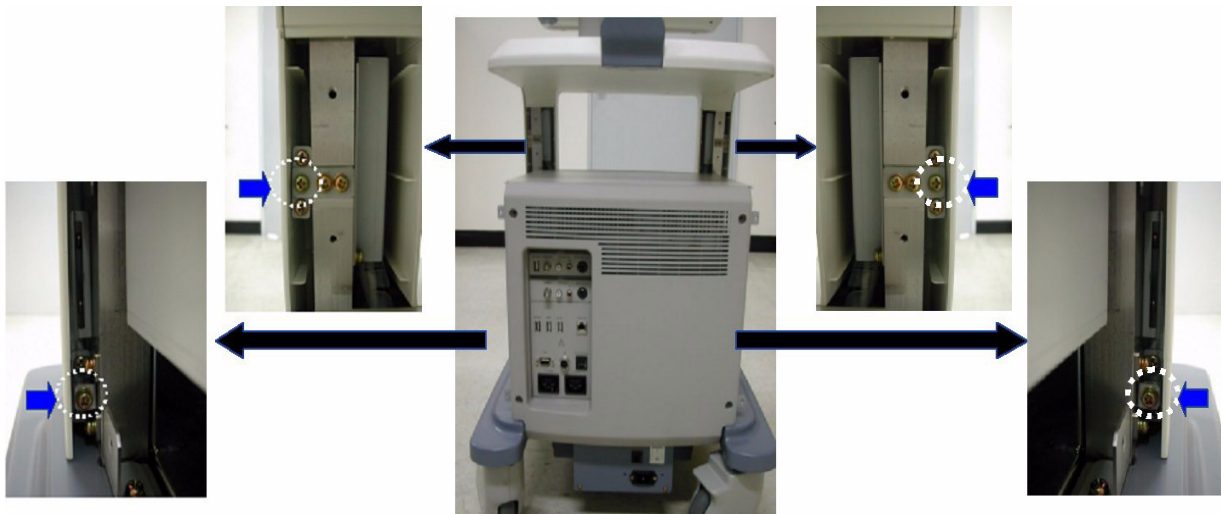
Figure 8-89   Screws of the front cover

8-2-17-3 **Removal procedure** (cont'd)
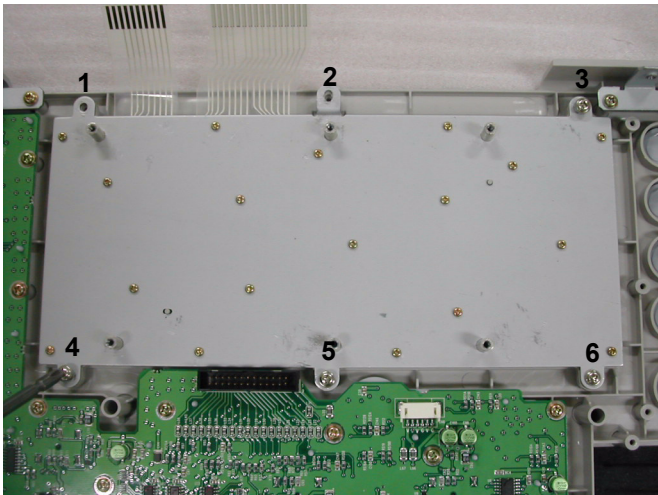
5.) Remove the front cover.

Figure 8-90   Removal of front cover

6.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-18   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-17. Equipment passed all required tests and is ready for use. "
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-17-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-18 Rear Cover

8-2-18-1 Tools

• Common pillips screwdrivers

8-2-18-2 Preparations

• Shut down the system and switch off the main breaker.

8-2-18-3 Removal procedure

1.) Remove the Left, and Right side covers. Refer to the and .

2.) Remove 4 rubber caps from the rear cover of the system.
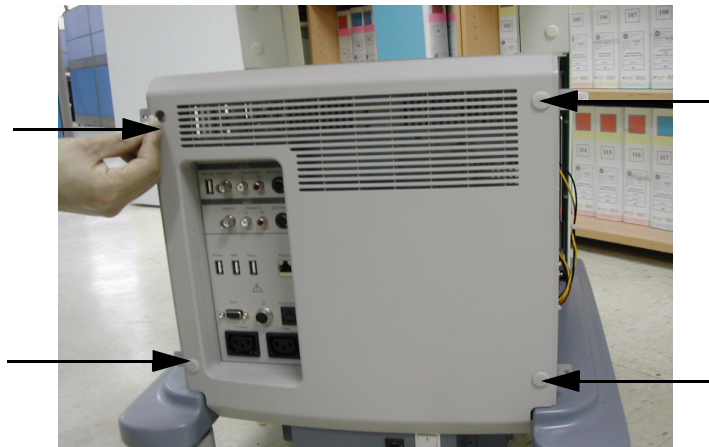
Figure 8-91   4 rubber caps on Rear Cover

3.) Unscrew 4 screws (1-4) from the rear cover.
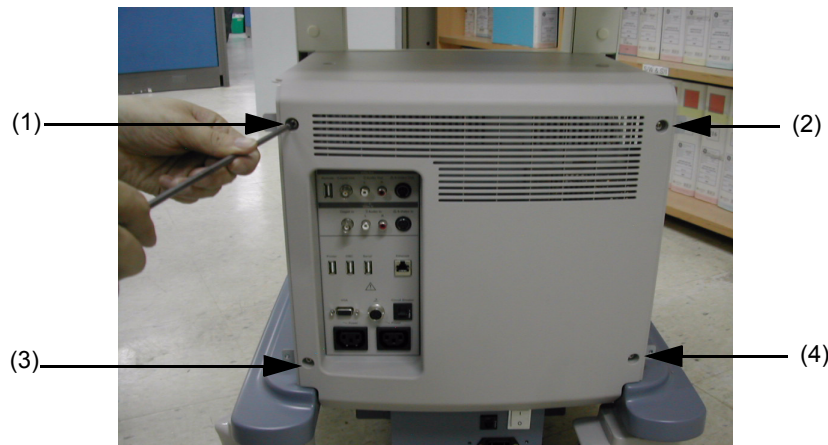
Figure 8-92   4 screws on rear cover

4.) Remove the Rear Cover.
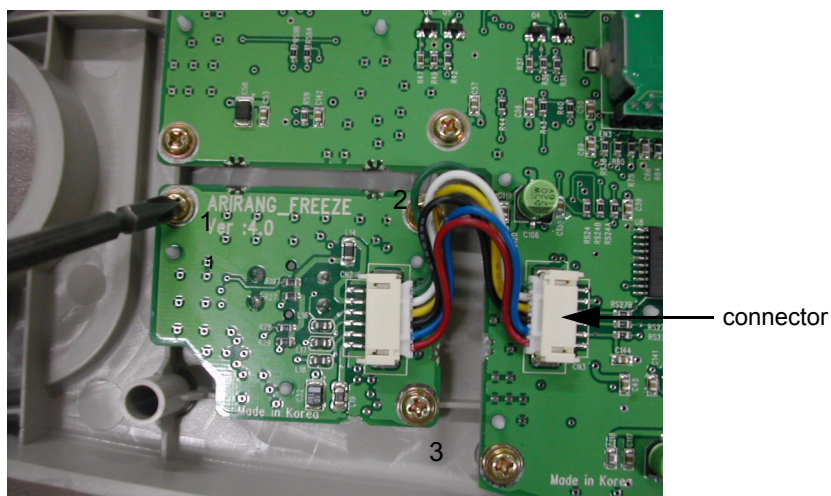
8-2-18-3 **Removal procedure** (cont'd)

5.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-19   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-18. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-18-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-19   Middle Cover

8-2-19-1   Tools
- Common pillips screwdrivers
- Stubby screwdriver (Flat tip and Cross tip)

8-2-19-2   Preparations
- Shut down the system and switch off the main breaker.

8-2-19-3   Removal procedure

1.) Remove the Left, and Right side covers. Refer to the 8-2-15 "Side Left Cover" on page 8-51 and 8-2-16 "Side Right Cover" on page 8-52. And Remove the Rear Cover. Refer to the 8-2-18 "Rear Cover" on page 8-55.

2.) Remove 2 rubber caps (1-2) from the middle cover of the system.
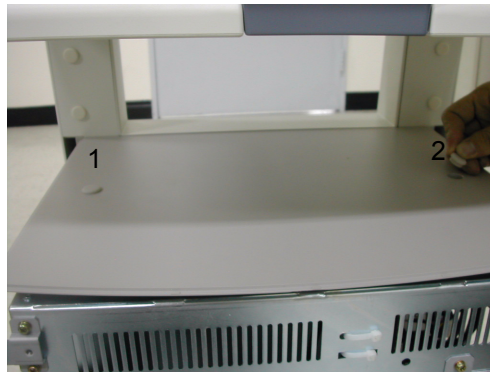
Figure 8-93   2 rubber cap of middle cover

3.) Unscrew 2 screws (1-2) from the middle cover.

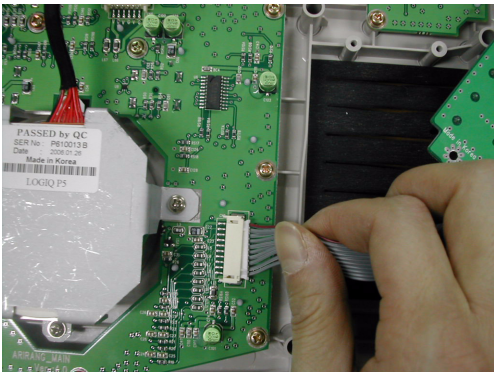**Figure 8-94   2 screws of middle cover**

8-2-19-3   Removal procedure (cont'd)

4.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-20   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-19. Equipment passed all required tests and is ready for use. "
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-19-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-20 Top Cover

8-2-20-1 Tools

• Common pillips screwdrivers

8-2-20-2 Preparations

• Shut down the system and switch off the main breaker.

8-2-20-3 Removal procedure

1.) Remove the Dummy Cover L/R. Refer to the 8-2-25 "Dummy Cover L / R" on page 8-66.

2.) Remove the Top Bottom Cover. Refer to the 8-2-21 "Top Bottom Cover" on page 8-60.

3.) Remove 2 rubber caps (1-2) from the top cover of the system and unscrew 2 screws (1-2).

Figure 8-95   2 rubber caps of top cover

4.) Unscrew 5 screws (1-5) from the bottom of the top cover.

5.) Remove the Top Cover.

6.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-21   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-20. Equipment passed all required tests and is ready for use. "
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-20-4 Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-21 Top Bottom Cover

8-2-21-1 Tools
• Common pillips screwdrivers
• Stubby screwdriver (Flat tip and Cross tip)

8-2-21-2 Preparations
• Shut down the system and switch off the main breaker.

8-2-21-3 Removal procedure
1.) Remove the Dummy Cover L/R. Refer to the 8-2-25 "Dummy Cover L / R" on page 8-66.
2.) Unscrew 7 screws (1-7) from the bottom of the top cover.

Figure 8-96 Top bottom cover

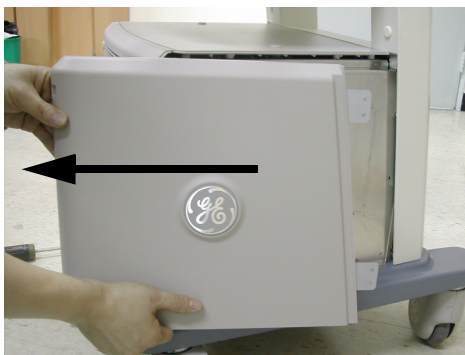3.) Remove the Top Bottom Cover.
4.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-22   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-21. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-21-4 Mounting Procedure
Install the new parts in the reverse order of removal.

8-2-22   Pole Cover

8-2-22-1   Tools

- Common pillips screwdrivers

8-2-22-2   Preparations

- Shut down the system and switch off the main breaker.

8-2-22-3   Removal procedure

1.) Remove the Dummy Cover L/R. Refer to the 8-2-25 "Dummy Cover L / R" on page 8-66.
2.) Remove the Top Bottom Cover. Refer to the 8-2-21 "Top Bottom Cover" on page 8-60.
3.) Remove the Top Cover. Refer to the 8-2-20 "Top Cover" on page 8-59.
4.) Unscrew 2 screws (1-2).

Figure 8-97   Pole Cover

5.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-23   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-22. Equipment passed all required tests and is ready for use. "
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-22-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-23   Neck Front

8-2-23-1   Tools
• Common pillips screwdrivers

8-2-23-2   Preparations
• Shut down the system and switch off the main breaker.

8-2-23-3   Removal procedure

1.) Remove 1 rubber cap.

Figure 8-98   rubber cap of neck front cover

2.) Unscrew 1 screw and remove the Neck Front.

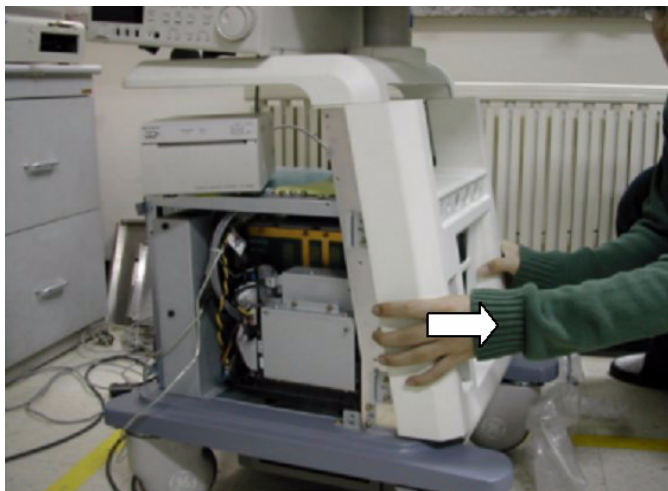**Figure 8-99   Open neck front cover**

8-2-23-3   **Removal procedure** (cont'd)

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-24   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-23. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-23-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-24   Neck Rear

8-2-24-1   Tools
• Common pillips screwdrivers

8-2-24-2   Preparations
• Shut down the system and switch off the main breaker.

8-2-24-3   Removal procedure
1.) Remove 2 rubber caps (1-2).

Figure 8-100   rubber cap of neck rear cover

2.) Unscrew 2 screws and remove the Neck Rear.

Figure 8-101   Open neck rear cover

8-2-24-3   **Removal procedure** (cont'd)

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-25   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-24. Equipment passed all required tests and is ready for use. "
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-24-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-25 Dummy Cover L / R

8-2-25-1 Tools
• Common pillips screwdrivers

8-2-25-2 Preparations
• Shut down the system and switch off the main breaker.

8-2-25-3 Removal procedure

1.) Remove 2 rubber caps (1-2).

Figure 8-102   rubber cap of dummy cover

2.) Unscrew 2 screws and remove the dummy cover L.

Figure 8-103   screws of dummy cover

3.) Same process is applied for dummy cover R.

8-2-25-3 **Removal procedure** (cont'd)

4.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-26   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-25. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-25-4 **Mounting Procedure**

Install the new parts in the reverse order of removal.

8-2-26   EMI Cover L

8-2-26-1   Tools

- Common pillips screwdrivers

8-2-26-2   Preparations

- Shut down the system and switch off the main breaker.

8-2-26-3   Removal procedure

1.) Remove the Side Left Cover. Refer to the 8-2-15 "Side Left Cover" on page 8-51.
2.) Unscrew 6 screws (1-6).

Figure 8-104   EMI Cover L

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-27   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-26. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-26-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-27   EMI Cover R

8-2-27-1   Tools

• Common pillips screwdrivers

8-2-27-2   Preparations

• Shut down the system and switch off the main breaker.

8-2-27-3   Removal procedure

1.) Remove the Side Right Cover. Refer to the 8-2-16 "Side Right Cover" on page 8-52.
2.) Unscrew 9 screws (1-9).

Figure 8-105   EMI Cover R

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-28   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-27. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-27-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-28   APS/APS Pro Assy

NOTE: *APS Power Supply can not be adjusted.*

8-2-28-1   Tools
- Common pillips screwdrivers
- Nipper

8-2-28-2   Preparations
- Shut down the system and switch off the main breaker.

8-2-28-3   Removal procedure

1.) Remove the Side Left Cover. Refer to the 8-2-15 "Side Left Cover" on page 8-51.

2.) Remove the EMI Cover L. Refer to the 8-2-26 "EMI Cover L" on page 8-68.

3.) Remove Hard Disk assy to unplug the APS/APS Pro connectors on backplane easily.

- Unplug the HDD power connector on the HDD and the SATA connector from the bottom side of the backplane. Pull out the connector.

4.) Unscrew 4 screws of the HDD bracket.
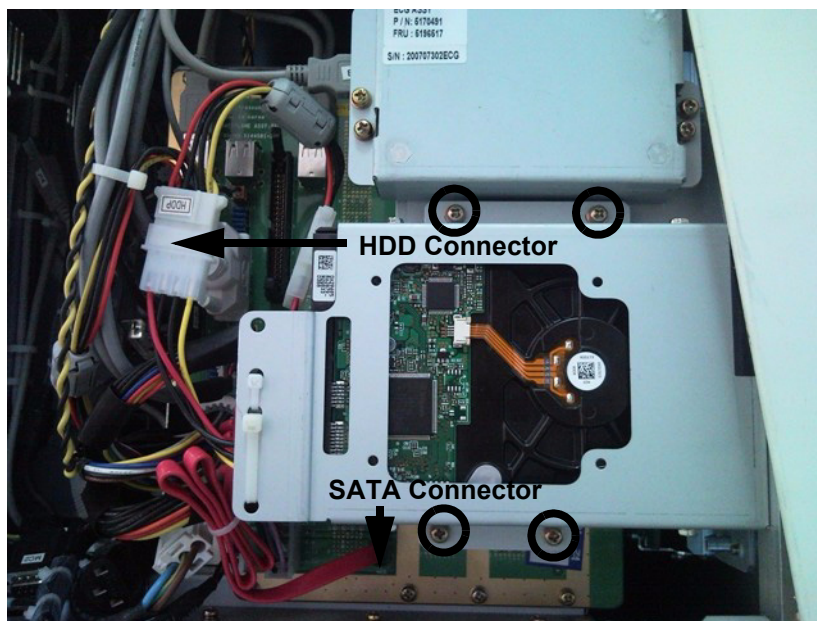
Figure 8-106   Remove HDD

5.) Unplug the DC power connector from DVD RW drive.

6.) The APS/APS Pro assy have 5 connectors, 3 connectors are pluged on backplane and 1 connector is connected to nest cooling fan power and 1 connector is AC power connector.

8-2-28-3   **Removal procedure** (cont'd)

7.) Unplug 3 connectors from the backplane and disconnect the 3P AC connector near bottom of the backplane and disconnect the 2P connector near the nest cooling fan.
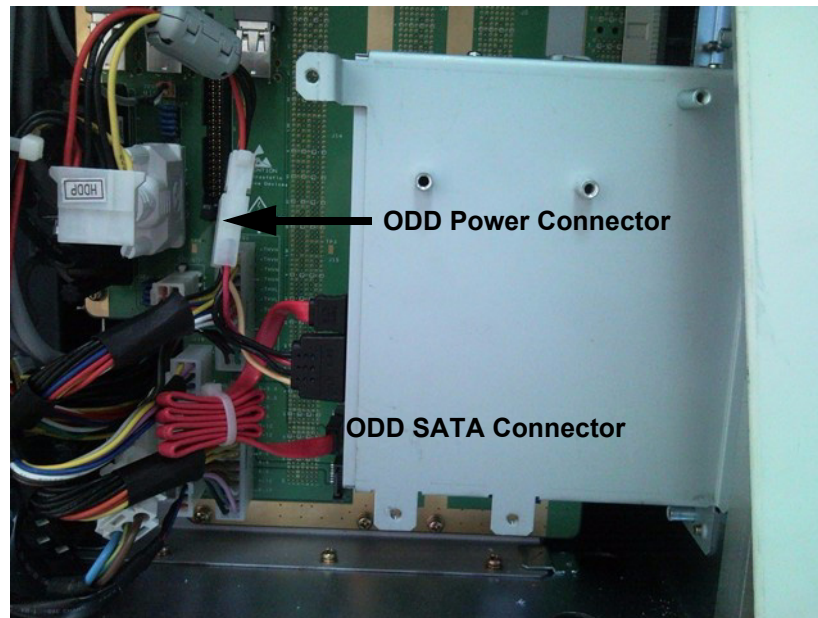
Figure 8-107   **APS/APS Pro Connectors of backplane**

8.) Remove the Side Right Cover. Refer to the 8-2-16 "Side Right Cover" on page 8-52.

9.) Remove the EMI Cover R. Refer to the 8-2-27 "EMI Cover R" on page 8-69.

10.)Unplug the J14 connector and unscrew 2 screws (1-2). Pull out the APS/APS Pro assy carefully. During take out the APS/APS Pro assy, the power connector on the backplane side should be passed through the square hole on the backplane.
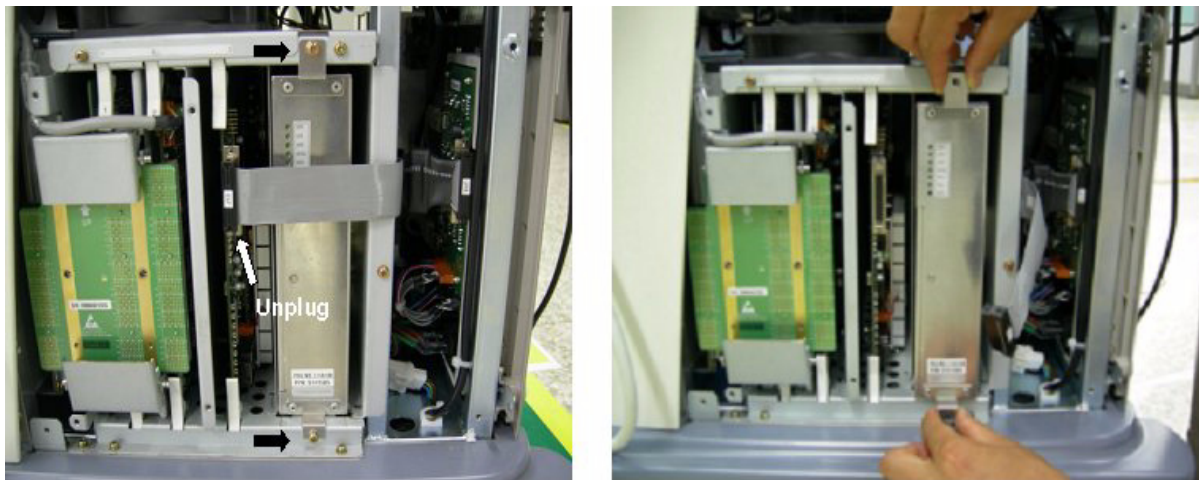
Figure 8-108   **Pull out the APS/APS Pro Assy**

8-2-28-3 **Removal procedure** (cont'd)

11.)Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-29   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-28. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-9-5	APS/APS Pro Assy PCB Function Validation Procedure	
Section 10-5-2	Functional Checks (See Also Chapter 4)	
Section 10-5-5	Physical Inspection	

8-2-28-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-29   CL1TRX Assy / BL1TRX Assy

8-2-29-1   Tools

• Common pillips screwdrivers

8-2-29-2   Preparations

• Shut down the system and switch off the main breaker.
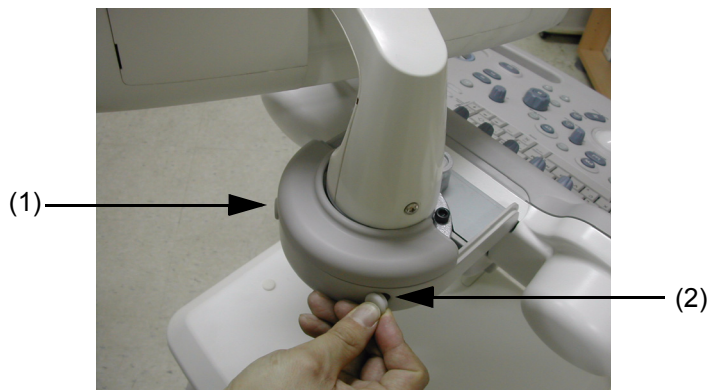
8-2-29-3   Removal procedure

1.) Remove the Side Right Cover. Refer to the .

2.) Remove the EMI Cover R. Refer to the .

3.) Unscrew 2 screws (1-2) and eject the PCB.
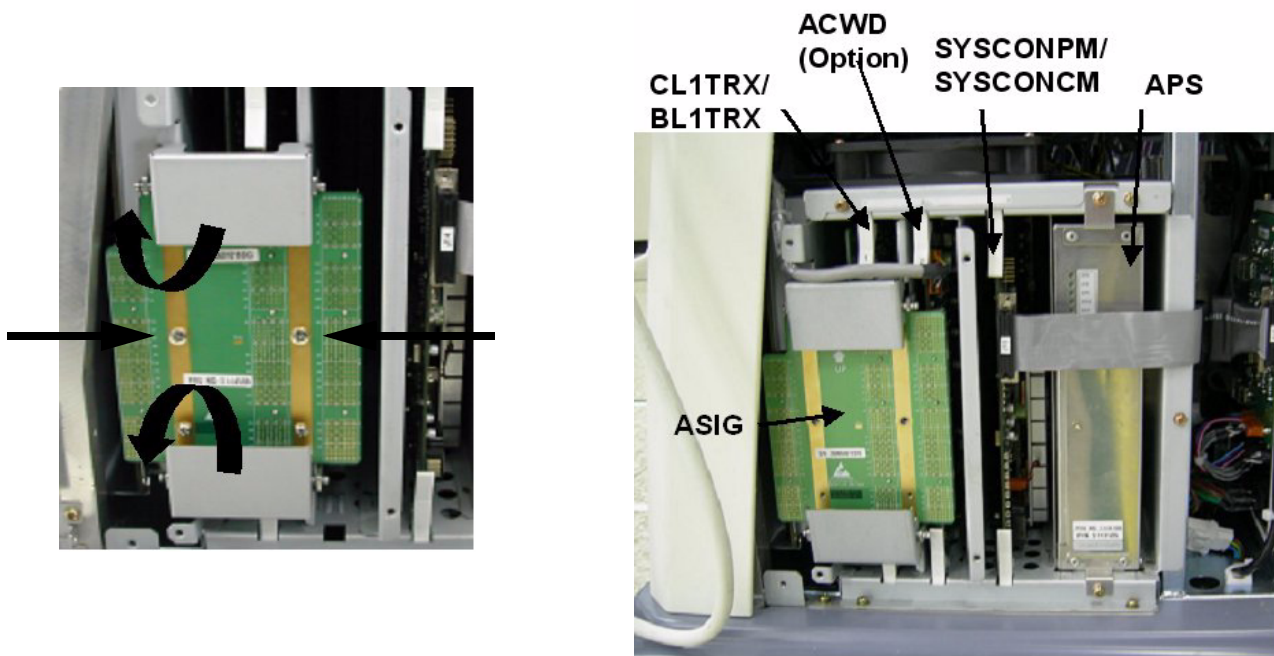
Figure 8-109   Eject ASIG Assy

4.) The CL1TRX(BL1TRX) board is located on the most left slot in the nest box.

8-2-29-3 **Removal procedure** (cont'd)

5.) Pull the CL1TRX Assy out.

Figure 8-110 Eject the CL1TRX(BL1TRX) Board

6.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-30 Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	
Section 4-9-1	CL1TRX Assy / BL1TRX Assy Function Validation Procedure	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-29. Equipment passed all required tests and is ready for use. "
Section 4-3-4	System B/M-Mode Checks	
Section 4-3-5	System CFM and PWD Checks	
Section 10-5-2	Functional Checks (See Also Chapter 4)	

8-2-29-4 **Mounting Procedure**

Install the new parts in the reverse order of removal.

8-2-30 P3RLY / P2RLY Assy & P2RLY with Dummy

8-2-30-1 Tools

• Common pillips screwdrivers

8-2-30-2 Preparations

• Shut down the system and switch off the main breaker.

8-2-30-3 Removal procedure

1.) Remove the side right cover. Refer to the 8-2-16 "Side Right Cover" on page 8-52.

2.) Remove the side left cover. Refer to the 8-2-15 "Side Left Cover" on page 8-51.

3.) Remove the Front Cover. Refer to the 8-2-17 "Front Cover" on page 8-53.

4.) Remove the ASIG Board. Refer to the 8-2-35 "ASIG Assy" on page 8-86.

5.) Unscrew 8 screws (1-8) and remove the metal cover.
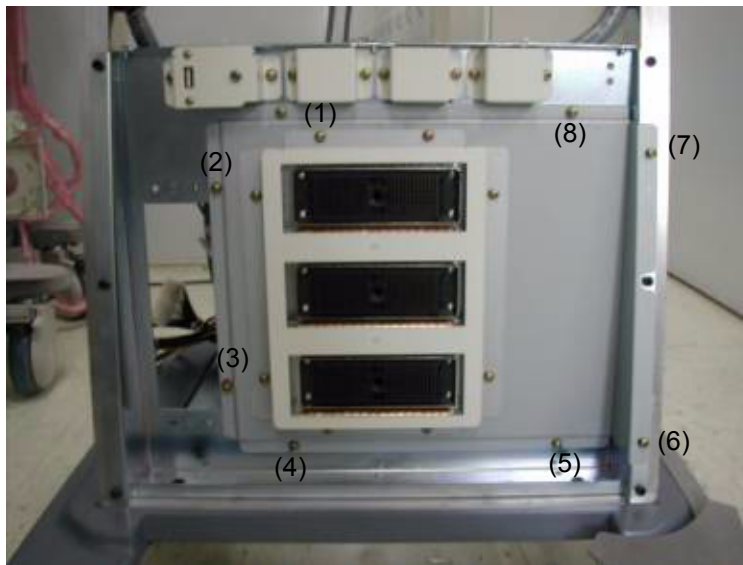
Figure 8-111   RLY Cover

6.) Unscrew 6 screws (1-6) and remove the PCB.
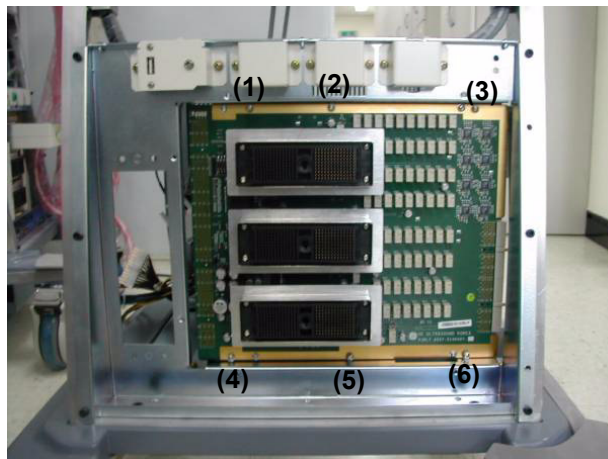
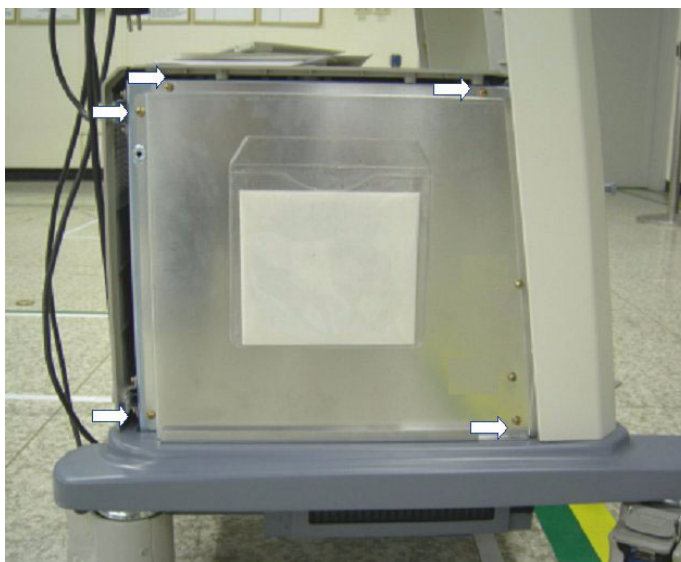**Figure 8-112   Screws of the RLY board**

8-2-30-3 **Removal procedure** (cont'd)

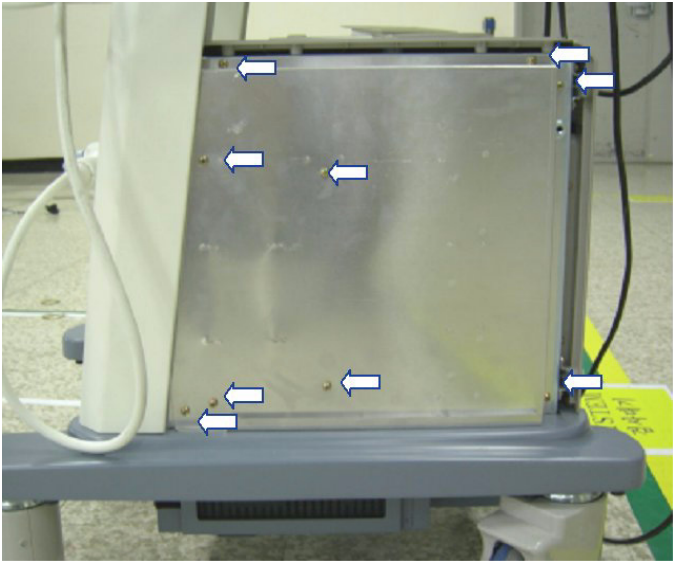7.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-31   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-30. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-9-6	P3RLY,P2RLY and P2RLY with Dummy Assy function check procedure	
Section 4-3-4	System B/M-Mode Checks	
Section 4-3-5	System CFM and PWD Checks	
Section 10-5-2	Functional Checks (See Also Chapter 4)	
Section 10-5-7	Probe Maintenance	

8-2-30-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-31   Backplane Assy

8-2-31-1   Tools

- Common pillips screwdrivers

8-2-31-2   Preparations

- Shut down the system and switch off the main breaker.

8-2-31-3   Removal procedure

1.) To detached the backplane, all pwas in the cardcage should be removed from cardcage.
2.) Open the Side Left Cover and Side Right Cover. Refer to the 8-2-15 "Side Left Cover" on page 8-51 and 8-2-16 "Side Right Cover" on page 8-52.
3.) Open the EMI Cover L and EMI Cover R. Refer to the 8-2-26 "EMI Cover L" on page 8-68 and 8-2-27 "EMI Cover R" on page 8-69.
4.) Remove all pwas from the nest box.
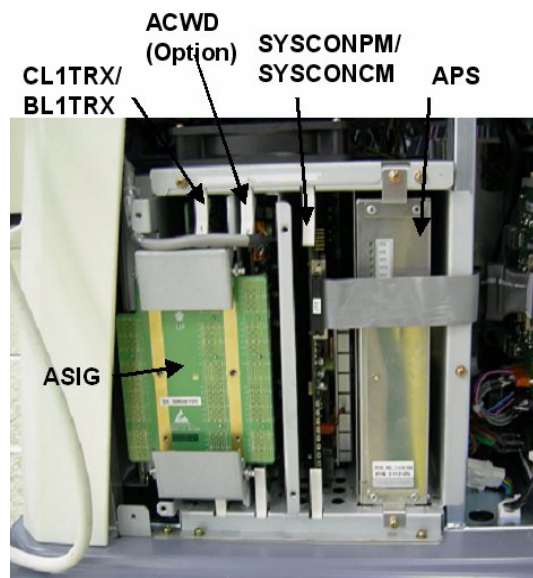
Figure 8-113   PWAs in the nest box

5.) Open the front cover. Refer to the 8-2-17 "Front Cover" on page 8-53.
6.) Remove the P3RLY / P2RLY Board. Refer to the 8-2-30 "P3RLY / P2RLY Assy & P2RLY with Dummy" on page 8-75.
7.) Remove the DVD, HDD. Refer to the 8-2-44 "DVD R/W Drive" on page 8-98 and 8-2-47 "SATA HDD Assy" on page 8-104.
8.) Unplug all the cable connectors all in Backplane Assy.

8-2-31-3 **Removal procedure** (cont'd)

9.) Unscrew 16 screws from the Backplane Assy.

Figure 8-114   Backplane

10.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-32   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	
Section 4-9-9	BackPlane Assy Function Validation Procedure	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-31. Equipment passed all required tests and is ready for use. "
Section 4-3-4	System B/M-Mode Checks	
Section 4-3-5	System CFM and PWD Checks	
Section 10-5-2	Functional Checks (See Also Chapter 4)	

8-2-31-4 **Mounting Procedure**

Install the new parts in the reverse order of removal.

8-2-32   ACWD Assy

8-2-32-1   Tools

• Common pillips screwdrivers

8-2-32-2   Preparations

• Shut down the system and switch off the main breaker.

8-2-32-3   Removal procedure

1.) Remove the Side Right Cover. Refer to the 8-2-16 "Side Right Cover" on page 8-52.

2.) Remove the EMI Cover R. Refer to the 8-2-27 "EMI Cover R" on page 8-69.

3.) Remove the ASIG Board. Refer to the 8-2-35 "ASIG Assy" on page 8-86.

4.) Pull the ACWD assy out from Nest box. The ACWD assy is located in slot #2.
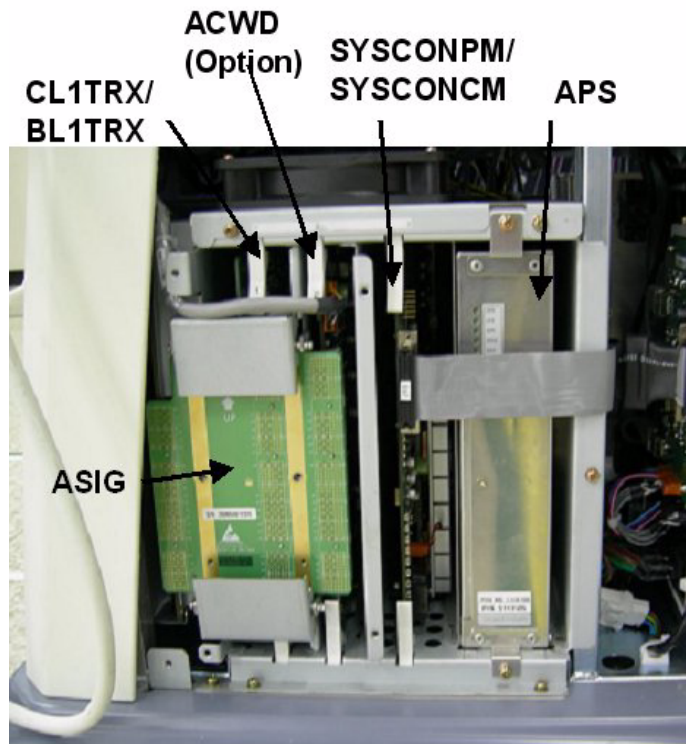
Figure 8-115   PWAs in Nest Box

8-2-32-3 **Removal procedure** (cont'd)

5.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-33   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-32. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-9-9	ACWD Assy Function Validation Procedure	
Section 4-3-5	System CFM and PWD Checks	
Section 10-5-2	Functional Checks (See Also Chapter 4)	
Section 10-5-5	Physical Inspection	

8-2-32-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-33   SYSCON PM Assy/SYSCON CM Assy

8-2-33-1   Tools

•   Common pillips screwdrivers

8-2-33-2   Preparations

•   Shut down the system and switch off the main breaker.

8-2-33-3   Removal procedure

1.) Remove the Side Right Cover. Refer to the 8-2-16 "Side Right Cover" on page 8-52.

2.) Remove the EMI Cover R. Refer to the 8-2-27 "EMI Cover R" on page 8-69.

3.) Remove the SYSCONPM(SYSCONCM) assy in slot #3 in the nest box.
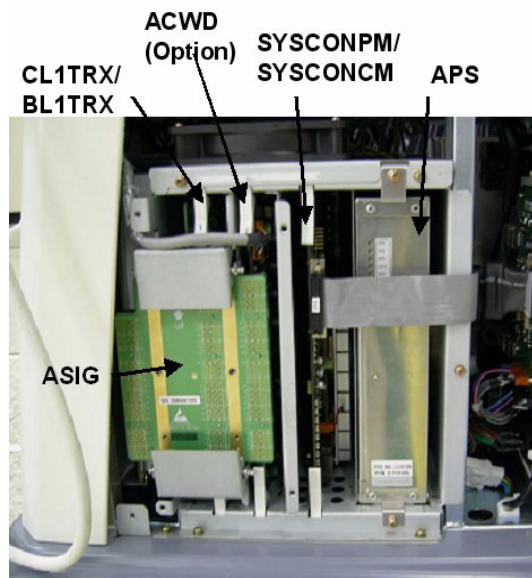
Figure 8-116   PWAs in Nest Box

4.) Eject one ASIR ROM from old SYSCONML with regular screw driver.

Separate ASIR ROM form new SYSCONML as same procedure.
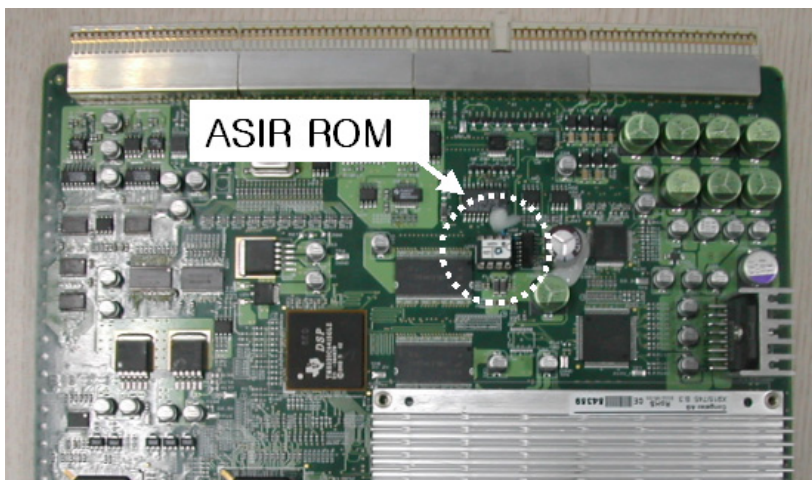
Figure 8-117   ASIR location

8-2-33-3   **Removal procedure** (cont'd)
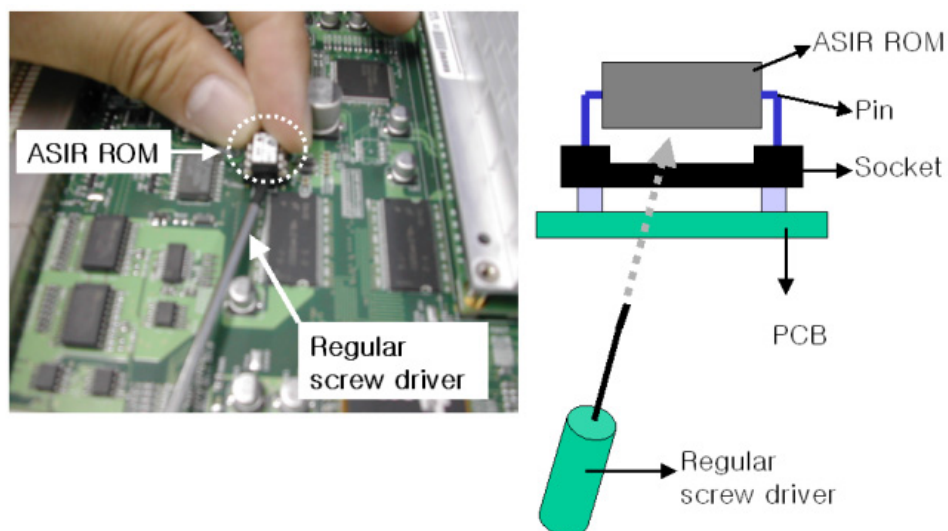
Figure 8-118   Separation of ASIR ROM

5.) Mount ASIR ROM to new SYSCONML Assy. Refer to the Figure 8-119.

6.) Confirm mounting direction and pin number.
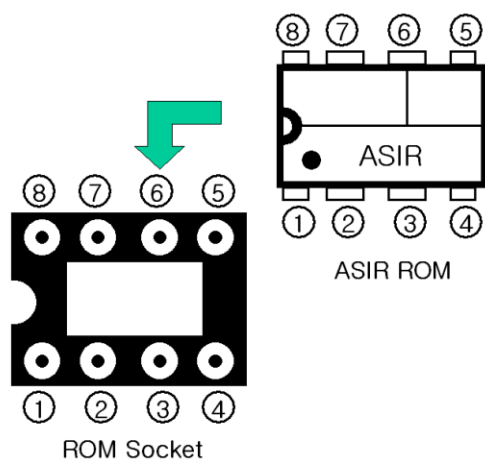
Figure 8-119   ASIR ROM mounting direction

NOTE: *It is important to swap ASIR ROM(U23). Because it contains the serial Number and option the system.*

8-2-33-3 **Removal procedure** (cont'd)

7.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-34   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	
Section 4-9-4	SYSCONML Assy Function Validation Procedure	
Section 4-3-4	System B/M-Mode Checks	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-33. Equipment passed all required tests and is ready for use. "
Section 4-3-5	System CFM and PWD Checks	
Section 4-5	Peripheral Checks	
Section 10-5-2	Functional Checks (See Also Chapter 4)	
Section 10-5-2-2	Peripheral/Option Checks	
Section 10-5-5	Physical Inspection	

8-2-33-4   **Mounting Procedure**

Install the new parts in the reverse order of removal.

8-2-34 PM SOM Assy with 1G/ CM SOM Assy with 512M

8-2-34-1 Tools

• Common pillips screwdrivers

8-2-34-2 Preparations

• Shut down the system and switch off the main breaker.

8-2-34-3 Removal procedure

1.) Remove the Side Right Cover. Refer to the 8-2-16 "Side Right Cover" on page 8-52.

2.) Remove the EMI Cover R. Refer to the 8-2-27 "EMI Cover R" on page 8-69.

3.) Remove the SYSCOM PM / CM Assy. Refer to the 8-2-33 "SYSCON PM Assy/SYSCON CM Assy" on page 8-81.

4.) Unscrews 4 screws.
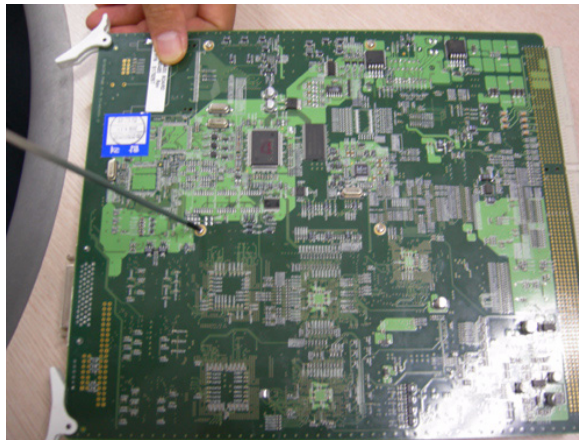
Figure 8-120   4 screws for SOM on SYSCON

5.) Remove the SOM Assy.
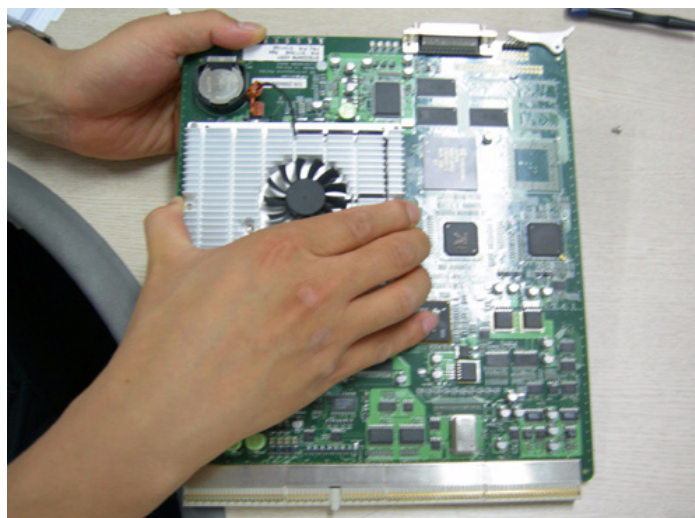
Figure 8-121   Detached the SOM from SYSCON PWA

8-2-34-3   Removal procedure (cont'd)

6.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-35   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	
Section 4-9-7	SOM Function Validation Procedure	
Section 4-3-4	System B/M-Mode Checks	
Section 4-3-5	System CFM and PWD Checks	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-34. Equipment passed all required tests and is ready for use. "
Section 4-5	Peripheral Checks	
Section 10-5-2	Functional Checks (See Also Chapter 4)	
Section 10-5-2-2	Peripheral/Option Checks	
Section 10-5-5	Physical Inspection	

8-2-34-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-35   ASIG Assy

8-2-35-1   Tools

• Common pillips screwdrivers

8-2-35-2   Preparations

• Shut down the system and switch off the main breaker.

8-2-35-3   Removal procedure

1.) Remove the Side Right Cover. Refer to the 8-2-16 "Side Right Cover" on page 8-52.

2.) Remove the EMI Cover R. Refer to the 8-2-27 "EMI Cover R" on page 8-69.

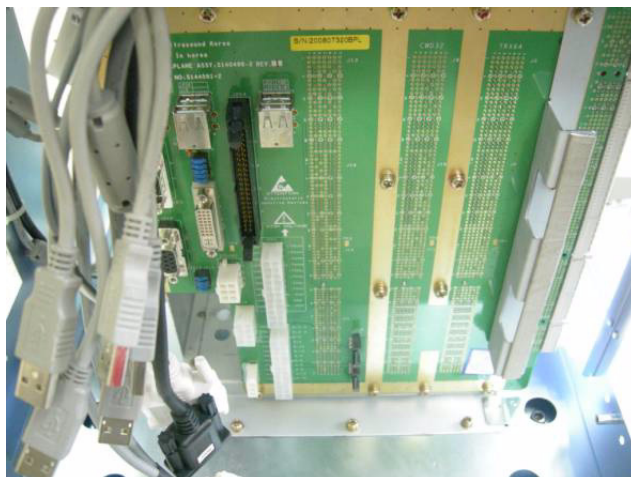3.) Unscrew 2 screws (1-2) and eject the PCB.

Figure 8-122   Eject the ASIG

4.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-36   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	
Section 4-9-16	ASIG ASSY Function Validation Procedure	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-35. Equipment passed all required tests and is ready for use. "
Section 4-3-4	System B/M-Mode Checks	
Section 4-3-5	System CFM and PWD Checks	
Section 10-5-2	Functional Checks (See Also Chapter 4)	

8-2-35-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-36   Battery on SYSCONPM/CM Assy

NOTE: *If the battery on SYSCONPM/CM Assy runs out, the system date will be reset. Then can not exit to maintenance mode.*

NOTE: *The Battery is UL critical component. So must use the battery approved. The recommended one is CR2450 manufactured by TOSHIBA.*

8-2-36-1   Tools

- Common pillips screwdrivers
- Option strings

8-2-36-2   Preparations

- Shut down the system and switch off the main breaker.

8-2-36-3   Removal procedure

1.) Remove the Side Right Cover. Refer to the 8-2-16 "Side Right Cover" on page 8-52.
2.) Remove the EMI Cover R. Refer to the 8-2-27 "EMI Cover R" on page 8-69.
3.) Unplug the J13 connector. Refer to the Figure 8-123.
4.) Remove the SYSCONPM(SYSCONCM) assy in slot #3 in the nest box.
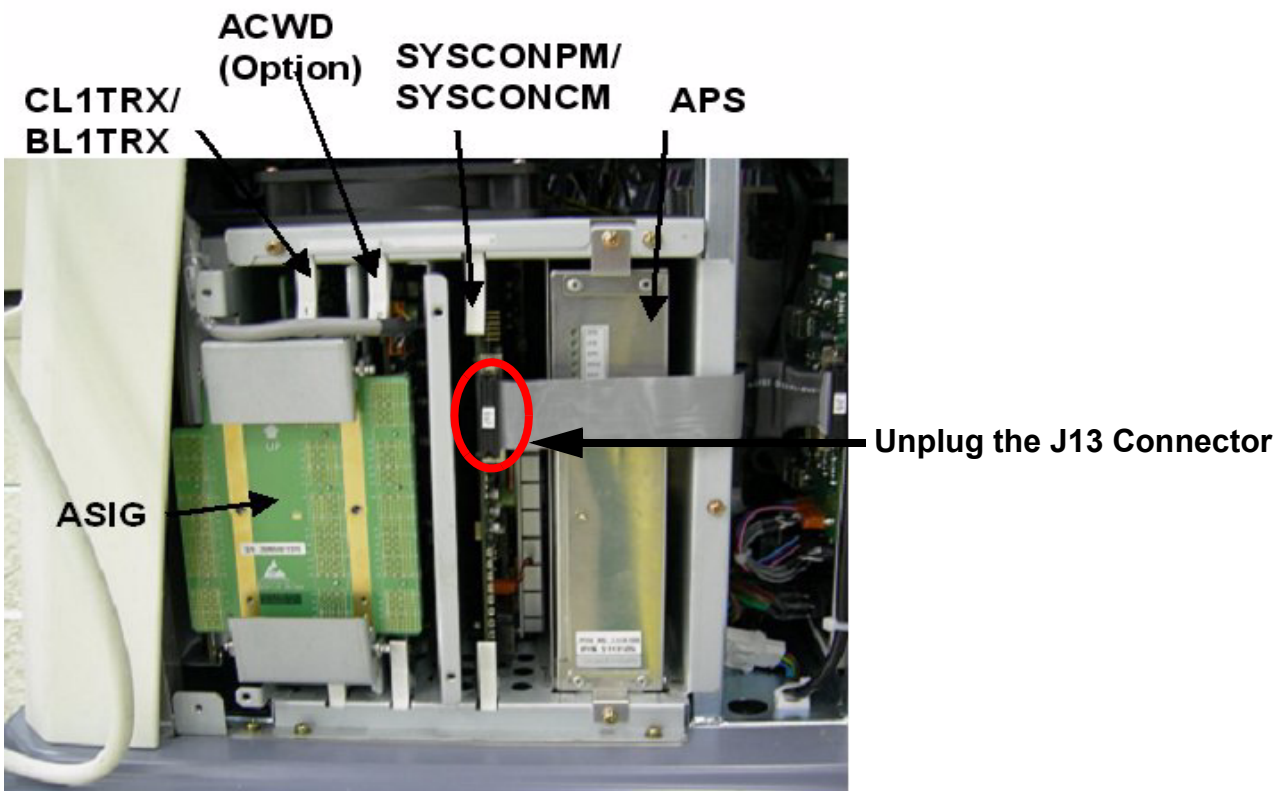
Figure 8-123   Pull out the SYSCONPM(SYSCONCM) Assy

8-2-36-3 **Removal procedure** (cont'd)

5.) Remove the battery.
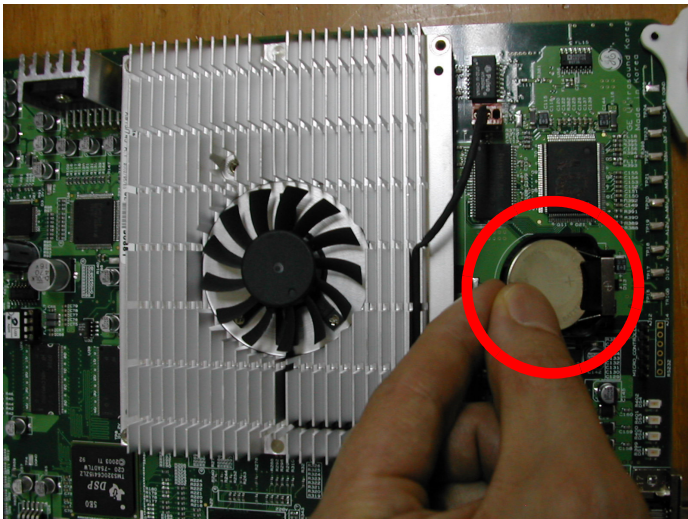
Figure 8-124 Pull out the battery from SYSCON PWA

6.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-37   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	
Section 4-9-4	SYSCONML Assy Function Validation Procedure	
Section 4-3-4	System B/M-Mode Checks	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-36. Equipment passed all required tests and is ready for use. "
Section 4-3-5	System CFM and PWD Checks	
Section 4-5	Peripheral Checks	
Section 10-5-2	Functional Checks (See Also Chapter 4)	
Section 10-5-2-2	Peripheral/Option Checks	
Section 10-5-5	Physical Inspection	

8-2-36-4   **Mounting Procedure**

Install the new parts in the reverse order of removal.

8-2-37 Front Caster / Rear Caster

NOTE: *Both Front Casters and Rear Casters are swivel type in LOGIQ™ A5 but in LOGIQ™ A5, only Front Casters are swivel type (Rear Casters are "Fixed" type).*

8-2-37-1 Tools
- Common pillips screwdrivers
- Allen/Unbraco wrench

8-2-37-2 Preparations
- Shut down the system and switch off the main breaker.

8-2-37-3 Removal procedure

1.) Unscrew 8 screws (1A-8A) to remove the front caster.
2.) Unscrew 8 screws (1-8) to remove the rear caster.

Figure 8-125   Casters

8-2-37-3   **Removal procedure** (cont'd)

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-38   **Functional Tests**

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-37. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-6	Front caster/Rear caster Function Validation Procedure	
Section 10-5-5	Physical Inspection	

8-2-37-4   **Mounting Procedure**

Install the new parts in the reverse order of removal.

8-2-38   Rear Handle

8-2-38-1   Tools

- Common pillips screwdrivers
- Allen/Unbraco wrench

8-2-38-2   Preparations

- Shut down the system and switch off the main breaker.

8-2-38-3   Removal procedure

1.) Unscrew 1 screw. Remove the Handle Dummy brkt.

Figure 8-126   Handle Dummy Bracket

2.) Unscrew 2 screws (1-2) from the back of the rear handle.

(1)   (2)

Figure 8-127   Rear Handle

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-39   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-38. Equipment passed all required tests and is ready for use. "
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-38-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-39   Rear Hook

8-2-39-1   Tools
• Common pillips screwdrivers

8-2-39-2   Preparations
• Shut down the system and switch off the main breaker.

8-2-39-3   Removal procedure

1.) Unscrew 2 screws (1-2) and remove Rear hook.
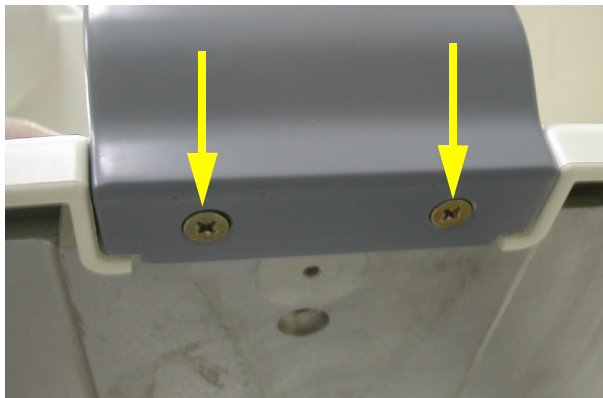
Figure 8-128   Screws on rear hook

2.) Unscrew 2 screws (1-2) and remove.
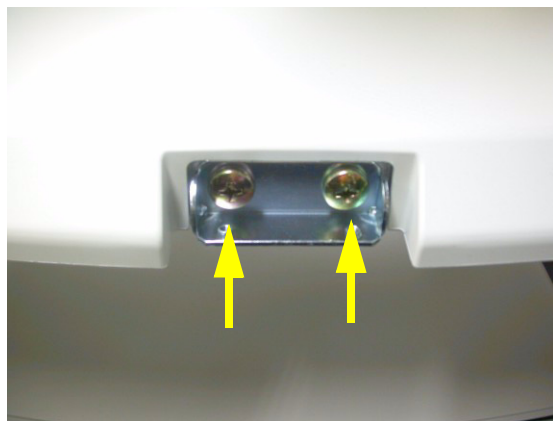
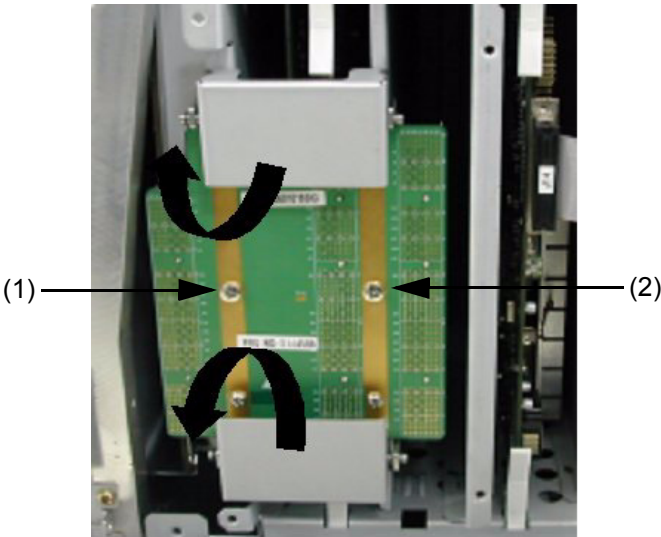**Figure 8-129   Screws on the rear hook fix brkt**

8-2-39-3 **Removal procedure** (cont'd)

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-40   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-39. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-39-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-40   Probe Holder

8-2-40-1   Tools

• No need tool

8-2-40-2   Removal procedure

1.) Remove the probe holders from the Keyboard.

Figure 8-130   Probe Holders

2.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-41   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-40. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-7	Probe holder Function Validation Procedure	
Section 10-5-5	Physical Inspection	

8-2-40-3   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-41   Cup Holder

8-2-41-1   Tools
• No need tool

8-2-41-2   Removal procedure

1.) Remove the cup holder.

Figure 8-131   Cup holder

2.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-42   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-41. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-41-3   Mounting Procedure
Install the new parts in the reverse order of removal.

8-2-42 ECG Cable Hook

8-2-42-1 Tools

- Common pillips screwdrivers

8-2-42-2 Removal procedure

1.) Unscrew 2 screws (1-2) to remove the ECG Cable Hook.

Figure 8-132   Screws of cable hook

2.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-43   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-42. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-1	Cover Parts Function Validation	
Section 10-5-5	Physical Inspection	

8-2-42-3 Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-43   Air Filter Set

8-2-43-1   Tools

- No need tool

8-2-43-2   Preparations

- Shut down the system and switch off the main breaker.

8-2-43-3   Removal procedure

1.) Pull out the 2 Air filters from the bottom left and right side of the system (1-2).

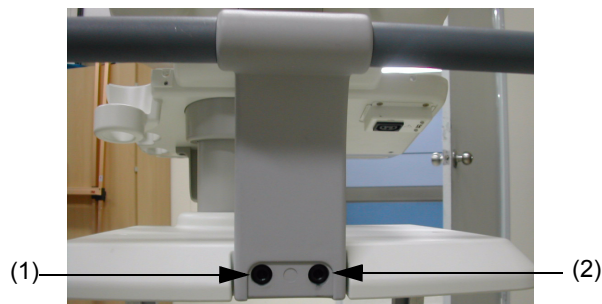**Figure 8-133   Air filters**

2.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-44   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-43. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-8-3	Air filter set Function Validation Procedure	
Section 10-5-5	Physical Inspection	

8-2-43-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-44 DVD R/W Drive

8-2-44-1 Tools

- Common pillips screwdrivers

8-2-44-2 Preparations

- Shut down the system and switch off the main breaker.

8-2-44-3 Removal procedure

1.) Remove the side left cover. Refer to the 8-2-15 "Side Left Cover" on page 8-51.

2.) Remove EMI L Cover. Refer to the 8-2-26 "EMI Cover L" on page 8-68.

3.) .) Remove the HDD assy. Refer to the 8-2-47 "SATA HDD Assy" on page 8-104.

4.) Disconnect the HDD power cable and unscrew 4 screws of the HDD fixture bracket.
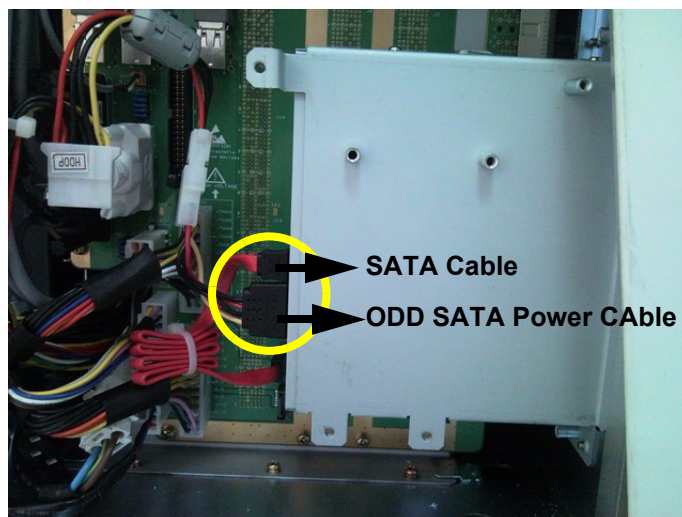
Figure 8-134   ODD SATA Power Cable and SATA cable of DVD Drive

5.) Remove the Front Cover. Refer to the 8-2-17 "Front Cover" on page 8-53.

8-2-44-3 **Removal procedure** (cont'd)

6.) Unscrew the 4 screws on the front of the DVD drive and remove the DVD Assy.
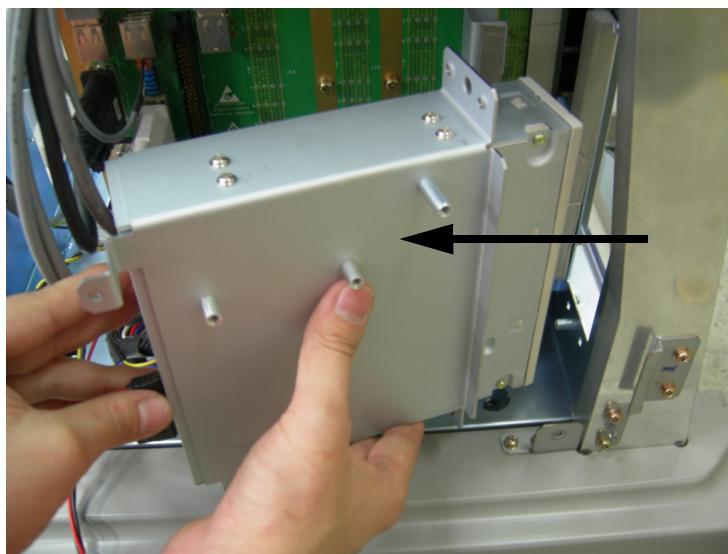
Figure 8-135 Unscrew 4screws and remove the DVD Assy

7.) Unscrew 8 screws to remove the bracket from the DVD Assy.
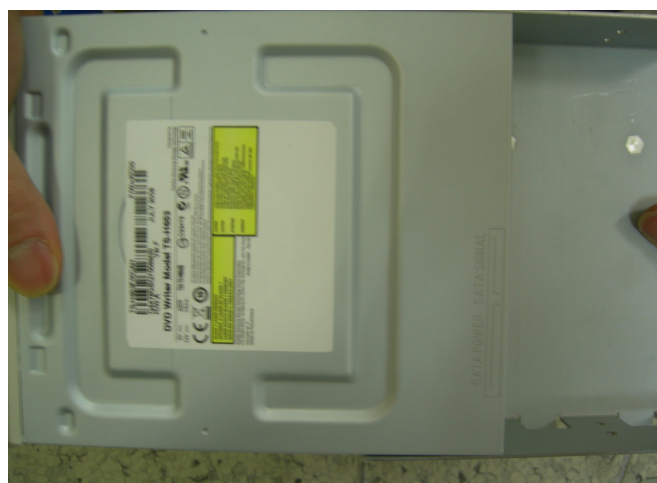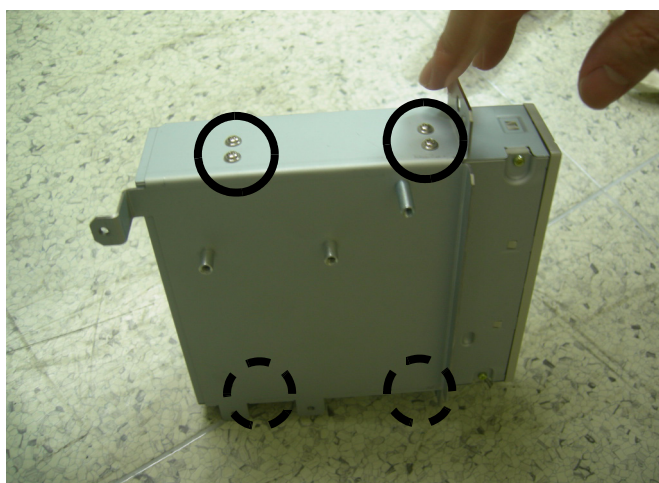
Figure 8-136 Unscrew 8screws and remove the DVD Drive from the bracket

8.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-45 Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-44. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	

8-2-44-4 **Mounting Procedure**

Install the new parts in the reverse order of removal.

8-2-45   Nest Fan Assy

8-2-45-1   Tools
- Common pillips screwdrivers

8-2-45-2   Preparations
- Shut down the system and switch off the main breaker.

8-2-45-3   Removal procedure

1.) Remove the Left Cover. Refer to the 8-2-15 "Side Left Cover" on page 8-51.

2.) Remove the EMI Cover Left. Refer to the 8-2-26 "EMI Cover L" on page 8-68.

3.) Unplug the Connection.

Figure 8-137   Power connector of Nest fan

4.) Remove the Right Cover. Refer to the 8-2-16 "Side Right Cover" on page 8-52.

5.) Remove the EMI Cover Right. Refer to the 8-2-27 "EMI Cover R" on page 8-69.

6.) Unscrews 2 screws.
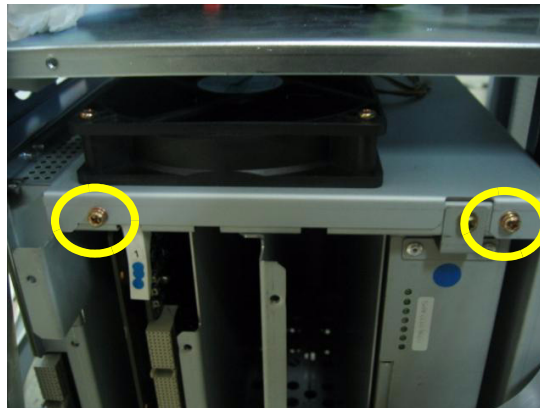
Figure 8-138   2 screws on the Nest Fan

8-2-45-3 **Removal procedure** (cont'd)

7.) Remove the Nest fan assy.

Figure 8-139   Pull out the nest fan

8.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-46   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-45. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-9-10	Nest fan Function Validation Procedure	
Section 10-5-5	Physical Inspection	

8-2-45-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-46   ARP Assy 110V/220V

8-2-46-1   Tools

• Common pillips screwdrivers

8-2-46-2   Preparations

• Shut down the system and switch off the main breaker.

8-2-46-3   Removal procedure

1.) Remove side right cover and EMI cover. Refer to the 8-2-16 "Side Right Cover" on page 8-52 and 8-2-27 "EMI Cover R" on page 8-69.

2.) Remove the Rear Cover. Refer to the 8-2-18 "Rear Cover" on page 8-55.

3.) Unscrew 4 screws (1-4).

Figure 8-140   Screws of the rear panel

4.) Disconnect J15 connector.

Figure 8-141   AEXP Cable of rear panel

8-2-46-3 **Removal procedure** (cont'd)

5.) Disconnect three (3) USB connectors or 5 USB connectors from the rear panel and 2 AC power connector. The 4D controller USB and ECG USB connector also connect to this rear panel PWA.
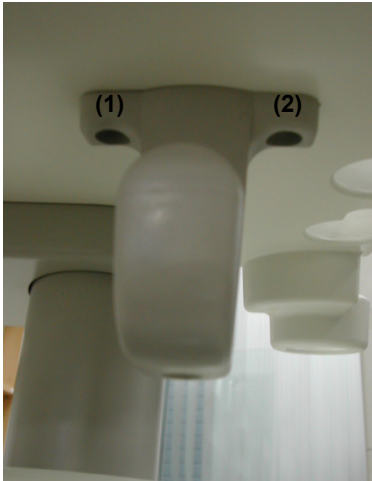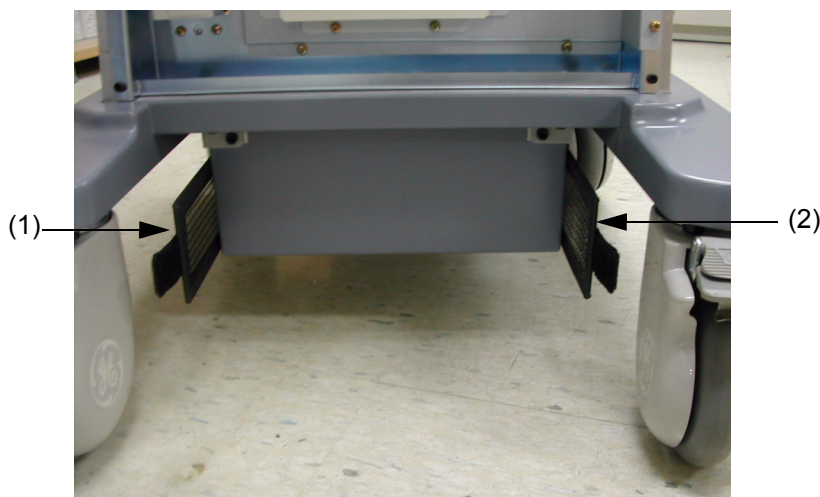

Figure 8-142 Open Rear Panel

6.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-47 Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	
Section 4-9-15	ARP Assy Function Validation Procedure	
Section 4-5	Peripheral Checks	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-46. Equipment passed all required tests and is ready for use. "
Section 10-5-2-2	Peripheral/Option Checks	
Section 10-5-5	Physical Inspection	
Section 10-6-3	Outlet Test - Wiring Arrangement - USA & Canada	

8-2-46-4 **Mounting Procedure**

Install the new parts in the reverse order of removal.

8-2-47 SATA HDD Assy

8-2-47-1 Tools

- Common pillips screwdrivers

8-2-47-2 Preparations

- Shut down the system and switch off the main breaker.

8-2-47-3 Removal procedure

1.) Remove the side left cover. Refer to the 8-2-15 "Side Left Cover" on page 8-51.

2.) Remove EMI L Cover. Refer to the 8-2-26 "EMI Cover L" on page 8-68.

3.) Disconnect the HDD power cable and unscrew 4 screws of the HDD fixture bracket.
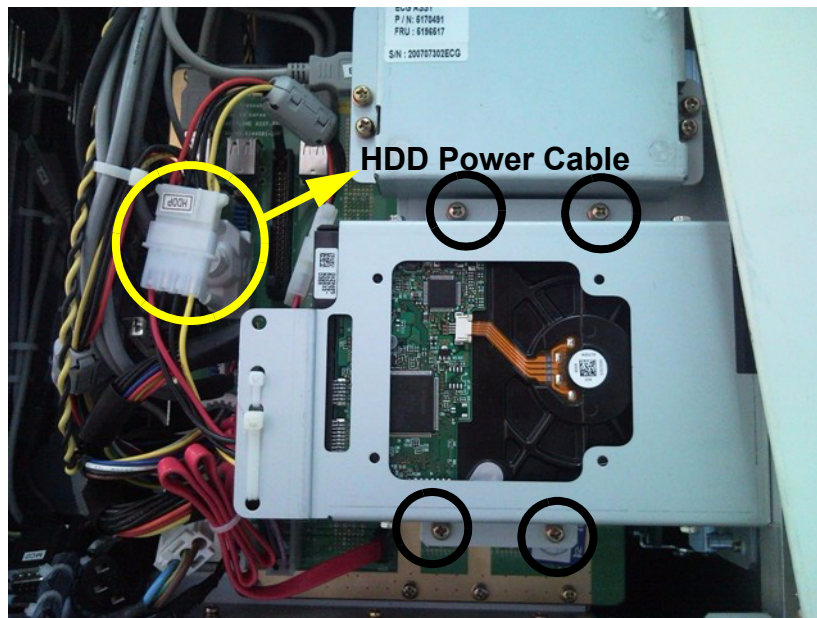
Figure 8-143   HDD in System

8-2-47-3   **Removal procedure** (cont'd)

4.) Unplug the SATA cable from the backplane on the bottom of backplane.
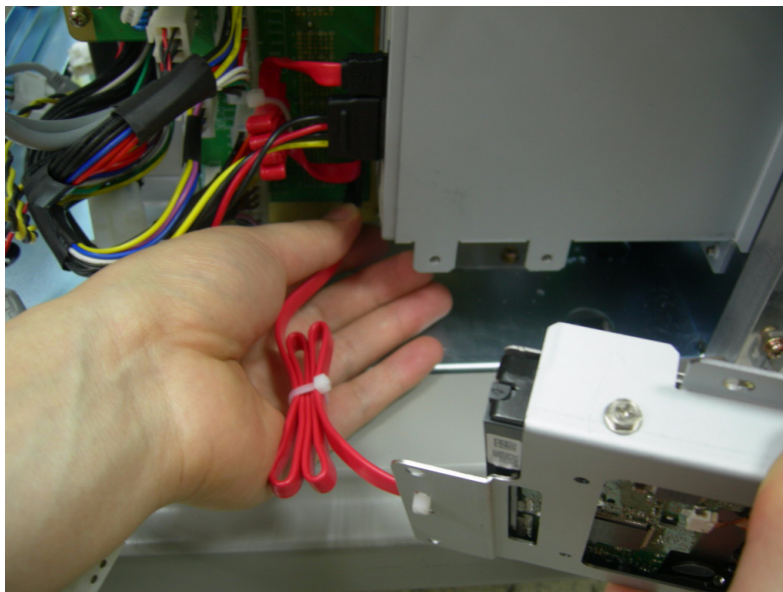
Figure 8-144   Unplug the SATA Cable

5.) Disconnect the SATA Power Cable and SATA Cable from HDD Assy after removing 2ea cable ties. And unscrew 4screws to remove the HDD Fixture bracket.
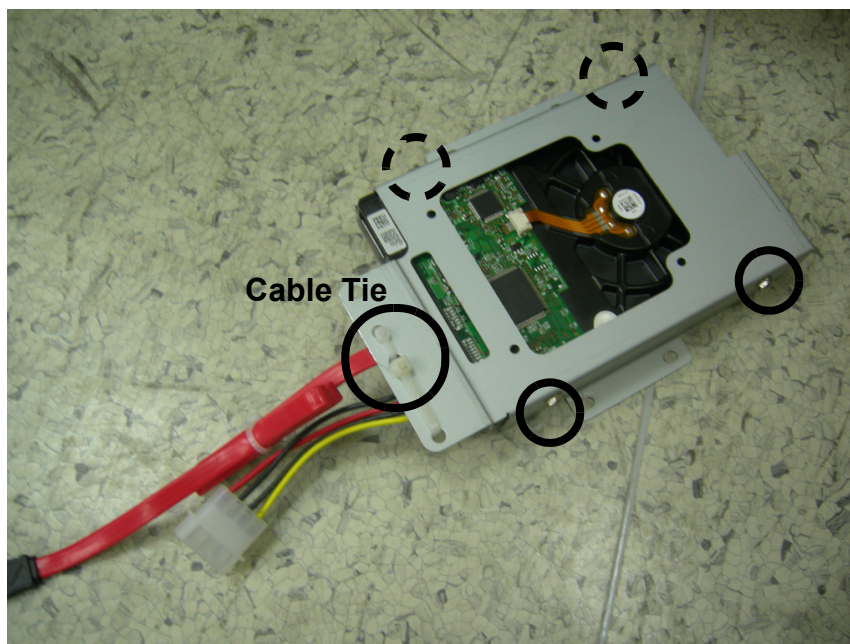
Figure 8-145   Separate HDD and HDD Fixture Bracket

8-2-47-3 **Removal procedure** (cont'd)

6.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-48   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-47. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	

8-2-47-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-48 ACPC Assy

8-2-48-1 Tools
- Common pillips screwdrivers
- Allen/Unbraco wrench
- Stubby screwdriver (Flat tip and Cross tip)

8-2-48-2 Preparations
- Shut down the system and switch off the main breaker.

8-2-48-3 Removal procedure

1.) Remove the AC Input Box Assy. Refer to the .

2.) Disconnect 5 connectors.
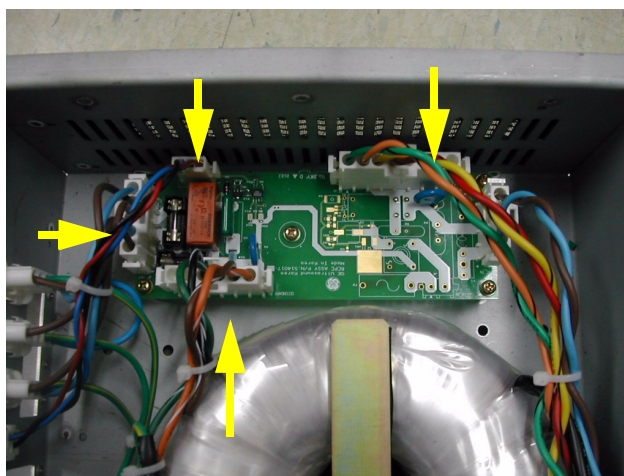
Figure 8-146   ACPC in Transbox

3.) Unscrew 5 screws to remove the ACPC Assy.
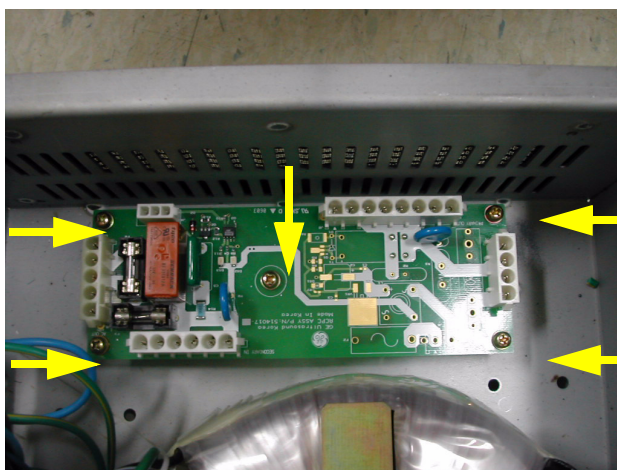
Figure 8-147   Screws of ACPC assy

8-2-48-3 **Removal procedure** (cont'd)

4.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-49   Functional Tests

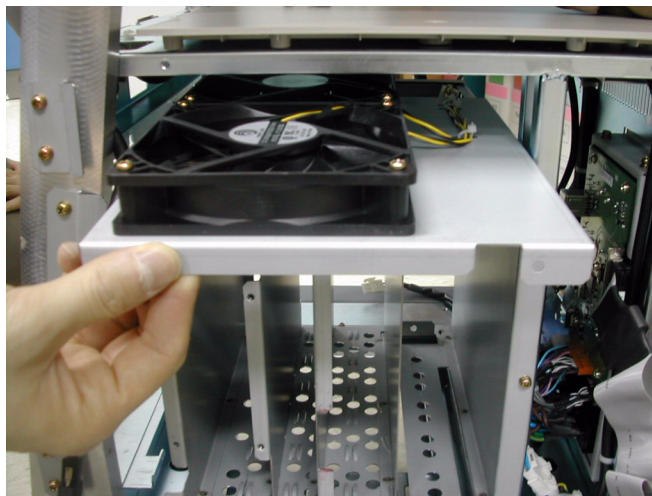| Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	
Section 4-9-12	ACPC Assy set Function Validation Procedure	
Section 10-5-2-2	Peripheral/Option Checks	
Section 10-5-5	Physical Inspection	
Section 10-6-2	GEMS Leakage Current Limits	
Section 10-6-3	Outlet Test - Wiring Arrangement - USA & Canada	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-48. Equipment passed all required tests and is ready for use. "
Section 10-6-4	Grounding Continuity	
Section 10-6-5	Chassis Leakage Current Test	
Section 10-6-6	Isolated Patient Lead (Source) Leakage–Lead to Ground	
Section 10-6-7	Isolated Patient Lead (Source) Leakage–Lead to Lead	
Section 10-6-9	Probe Leakage Current Test	

8-2-48-4   Mounting Procedure

Install the new parts in the reverse order of removal.

8-2-49 Transbox Assy 110V/220V

8-2-49-1 Tools

- Common pillips screwdrivers
- Allen/Unbraco wrench

8-2-49-2 Preparations

- Shut down the system and switch off the main breaker.

8-2-49-3 Removal procedure

- To detached the AC Power assy, All open 4 pcs console cover that are left, right, front, rear cover

1.) Remove side left cover and right side cover. Refer to the 8-2-15 "Side Left Cover" on page 8-51 and 8-2-16 "Side Right Cover" on page 8-52.

2.) Remove rear side cover and front cover. Refer to the 8-2-17 "Front Cover" on page 8-53 and 8-2-18 "Rear Cover" on page 8-55.

3.) Unscrew 2 pcs M4 screw and 2 pcs hexa screw on the front of AC trans box. And unscrew 4 pcs screw and 2pcs hexa screw on the rear side of Transbox assy and open inlet panel.
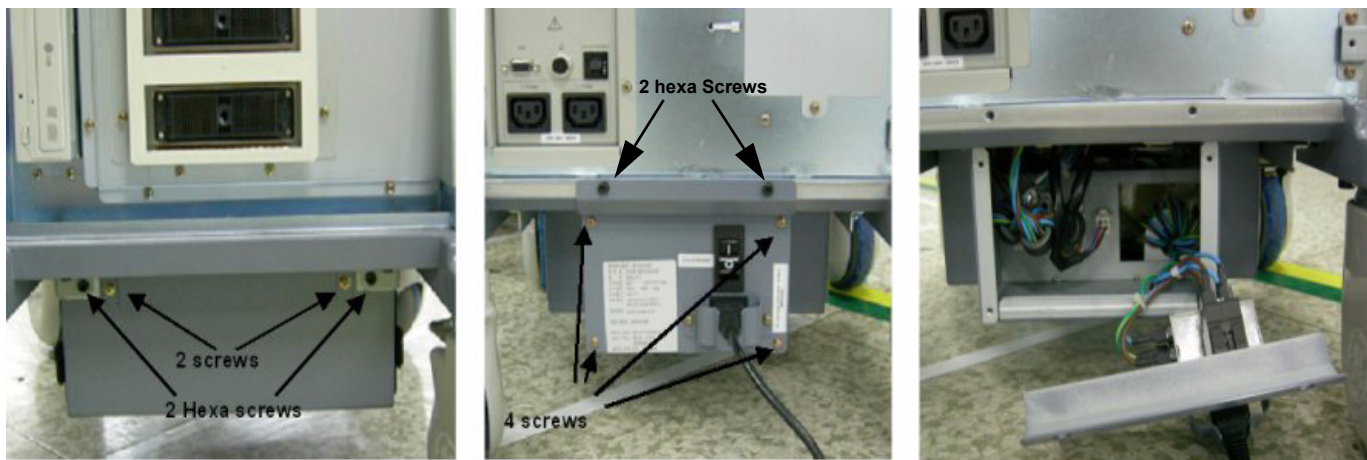
Figure 8-148   4 screw on the front of the AC transbox assy

4.) Unplug 4 connectors inside of AC transbox and pull out the transbox assy.

5.) Pull out the transbox assy.

8-2-49-3 **Removal procedure** (cont'd)

6.) Unplug 4 connectors inside of AC transbox and pull out the transbox assy.
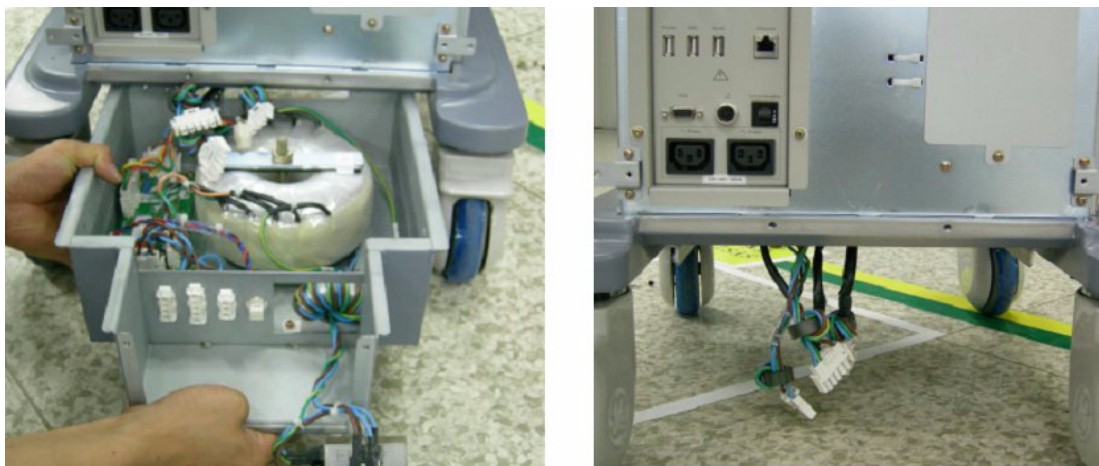
Figure 8-149   Pull out the Transbox assy

7.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-50   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	
Section 4-3-2	Power Off / Shutdown	
Section 4-9-11	Transbox Function Validation Procedure	
Section 10-5-2-2	Peripheral/Option Checks	
Section 10-5-3	Input Power	
Section 10-5-5	Physical Inspection	
Section 10-6-2	GEMS Leakage Current Limits	"Service Manual, Direction 5394141, Rev 1+, Section 8-2-49. Equipment passed all required tests and is ready for use. "
Section 10-6-3	Outlet Test - Wiring Arrangement - USA & Canada	
Section 10-6-4	Grounding Continuity	
Section 10-6-5	Chassis Leakage Current Test	
Section 10-6-6	Isolated Patient Lead (Source) Leakage–Lead to Ground	
Section 10-6-7	Isolated Patient Lead (Source) Leakage–Lead to Lead	
Section 10-6-9	Probe Leakage Current Test	

8-2-49-4   Mounting Procedure

Install the new parts in the reverse order of removal.

When installing the Transbox assy, the transbox chassis should be inserted into the guide rail which is under the frame chassis.

Figure 8-150   Insert the Transbox assy

8-2-50   Fuse Set

8-2-50-1   Tools
- Common pillips screwdrivers
- Allen/Unbraco wrench
- Stubby screwdriver (Flat tip and Cross tip)

8-2-50-2   Preparations
- Shut down the system and switch off the main breaker.

8-2-50-3   Removal procedure
1.) Remove the AC Transbox assy. Refer to the .
2.) Replace the 2 fuses located on the ACPC assy in the transbox assy.
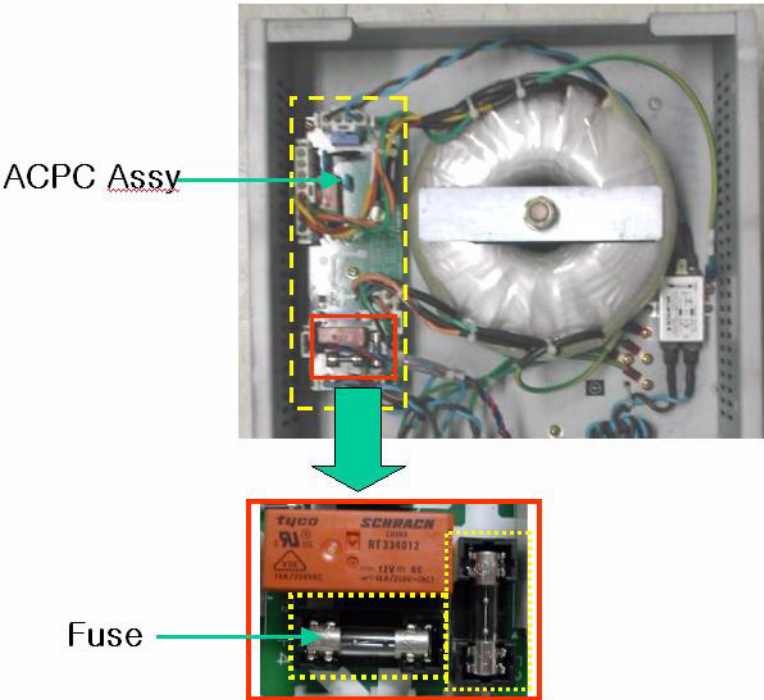
Figure 8-151   FUSE in Transbox assy

3.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-51   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 2+, Section 8-2-50. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-9-14	Fuse set Function Validation Procedure	
Section 10-5-2-2	Peripheral/Option Checks	

8-2-50-4   Mounting Procedure
Install the new parts in the reverse order of removal.

8-2-51 Read and Write Serial Info

8-2-51-1 How to start serial no read/write program

1.) Plug the service dongle on the usb port on rear panel.

2.) Turn on the system.

3.) When the Start Application dialog box appears, press [F2] before it automatically starts Echoloader.)

Figure 8-152   Start Application Dialog Box

4.) When the Maintenance Access dialog box pops up, type in the service password.
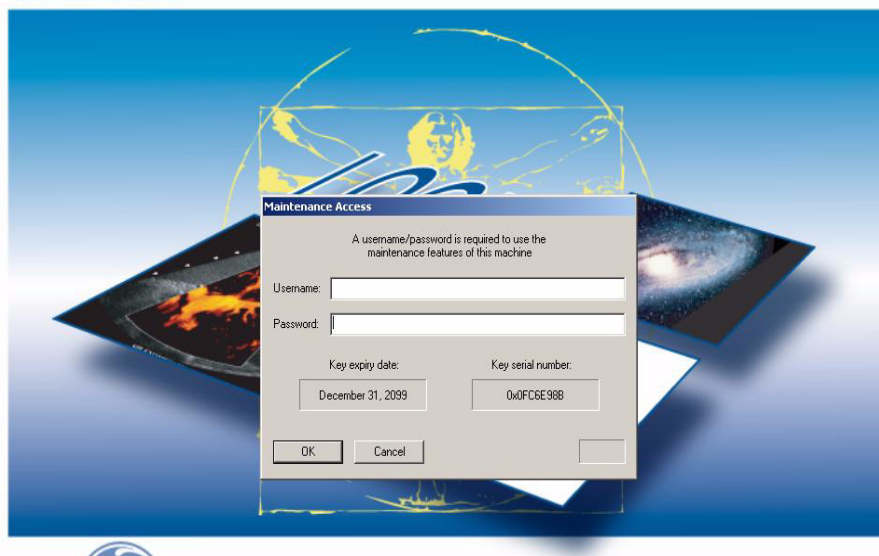
Figure 8-153   Maintenance Access Dialog Box

8-2-51-1 **How to start serial no read/write program** (cont'd)

5.) If the win XP screen appears, run the window explorer. Move the cursor to bottom of the screen. If the task bas appear, click the explorer icon.

Figure 8-154   Windows Explorer

6.) Run the "asn.exe" by double click. This execution file is in "C:\Arirang\target\bin" directory
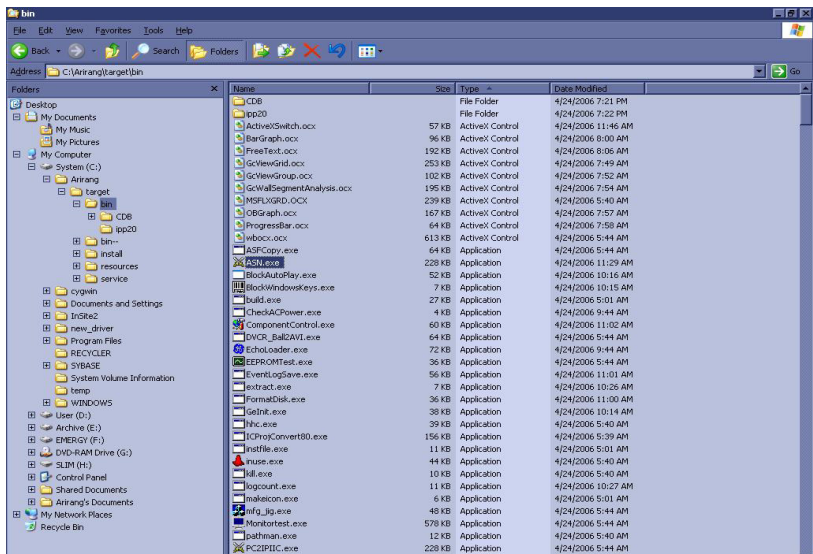
Figure 8-155   "asn.exe"

8-2-51-1 **How to start serial no read/write program** (cont'd)

7.) When asn.exe starts running, Logon windows pops up. Type in maintenance password to start asn.exe.
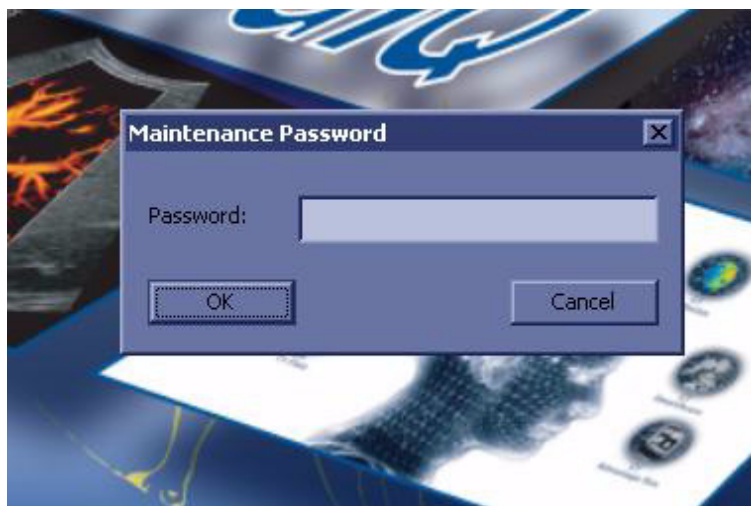
Figure 8-156 Execute the "ASN.EXE"

8-2-51-2   How to read Serial No

1.) Check checkboxes of system boards you want to read or System Serial No checkbox.

NOTE: You can read System Serial No, L1SYSCON board, CL1TRX board, P3RLY board, and ACWD board information.

Figure 8-157   Reading System Info

8-2-51-3   How to write info on the system

1.) Check checkboxes of system boards you want to write or System Serial No checkbox.
2.) Put the Serial No, Part No, or Rev on the blank box.
3.) Press "Write" Button.

Section 8-3
Software Loading Procedure

8-3-1   General

This describes a full system software loading (Base Software Load Image + Arirang Application Load Image) procedure.

Use this instruction when:

- Performing the HDD with new one (Base Software Load Image + Arirang Application Load Image)

- Performing the system revision-up (Application)

8-3-2   Parts Required

LOGIQ™ P5 Base Software DVD

LOGIQ™ P5 Application Software CD

Blank CD-Rs (for patient image backup) or DVDs

Service Dongle

NOTE: *Patient Image Data will be deleted when all the drives are ghosted. Back up them on the CD-R or DVD before starting software loading*

NOTE: *Insert the service dongle into this service port located at the rear panel before installing the Base System Software Load image*

8-3-3   TimeRequired

Approximately 2hours

8-3-4 Software Loading Steering Guide
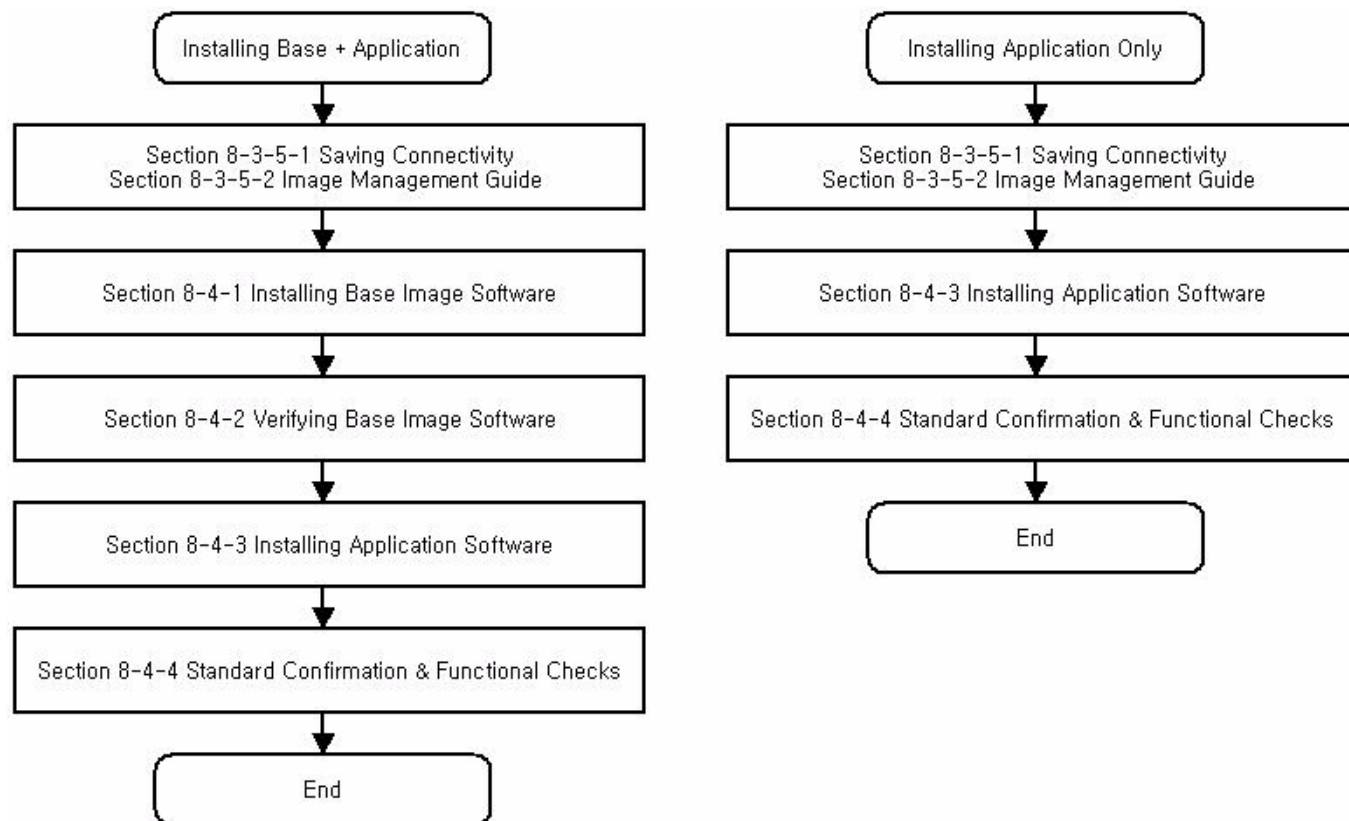
Figure 8-158   Flow Chart - Installation of Base and Application CD

8-3-5 Before Starting Software Loading

8-3-5-1 Saving Connectivity

Before starting upgrade, <u>write down</u> the **Connectivity Setting** for back-up.

1.) Go to **Utility > Connectivity** and click the **Tcpip** tab.

2.) Write down the following parameters:.

Parameters	Descriptions (Entry for Stand-Alone System)
Computer Name	
Enable DHCP	
IP-Address	
Subnet Mask	
Default Gateway	
Note : For a stand-alone system, preset values of IP address, subnet mask, and default gateway, shown above, must entered.	

Figure 8-159   Connectivity

8-3-5-2   **Image Management Guide**

NOTE: *Before upgrade to R4.X.X software, perform recommended image backup procedure.*

Export/Import Data/Images Between Systems - Use this to copy both patient data and images for specified patient(s) from one system to another.

To move exams from one Ultrasound system to another, you need to export/import exam information.

NOTE: *Both database information and images are exported. No data is deleted from the local archive when exporting data.*

Exporting Data

To export an exam(s) to a compatible Ultrasound system:

1.)   Format the removable media (DVD or CD-ROM). Label the removable media. Answer Yes/OK to the messages.Press Patient. Deselect any selected patient(s) in the search portion of the Patient screen. Press Data Transfer (located at the upper, right-hand corner of the Patient menu).

Figure 8-160   Exam Data Transfer

2.)   Select Export task Button.
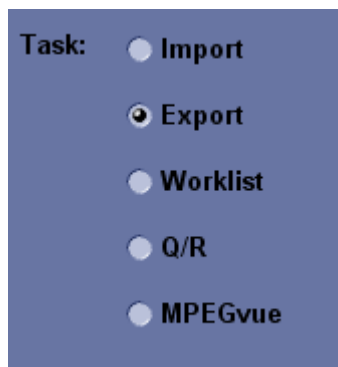
Figure 8-161   Task button

3.)   The [From] combo box is not active. It displays Local Archive. The [To] combo box is active. Select the type of removable media CD/DVD. Then please wait until the patient list is visible.

Figure 8-162   To Combo Box

8-3-5-2 **Image Management Guide** (cont'd)

4.) In the patient list at the top of the Patient menu, select the patient(s) you want to export. You can use Windows commands to select more than one patient. To select a consecutive list of patients, click the cursor on the first name, move the cursor to the last name, then press and hold down the Shift+right Set key to select all the names.To select a non-consecutive list of patients, click the cursor at the first name, move the cursor to the next name, then press and hold down the Ctrl+right Set key, move the cursor to the next name, then press and hold down the Ctrl+right Set key again, etc.You can also search for patients via the Search key and string. Or, Select All Button from the Patient Menu:

Figure 8-163   Source Section

NOTE: *You need to use your best judgment when moving patients' images. If there are lots of images or loops, then only move a few patients at a time.*

5.) Once you have selected all of the patients to export, press Transfer Button as shown in Figure 8-163 on page 8-121 from the Patient Menu.

6.) The progress bar appears as the copy is taking place. Once transfer completed, the exported patient list will be shown as Figure 8-164.

Figure 8-164   Destination Section of Patient Screen

7.) Press F3 to eject the media. Specify that you want to finalize the CD-ROM or DVD.

8-3-5-2   **Image Management Guide** (cont'd)

Importing Data

To import an exam(s) to another Ultrasound system:

1.) At the other Ultrasound system, insert the CD-ROM/DVD.

2.) Press Patient. Press Exam Data Transfer (located at the upper, left-hand corner of the Patient menu).

Figure 8-165   Exam Data Transfer

3.) Select Import task Button.

Figure 8-166   Task button

4.) The [TO] combo box is not active. It displays Local Archive. The [FROM] combo box is active. Select the type of removable media CD/DVD Rom. Then please wait until the patient list is visible.

Figure 8-167   From

5.) The Patient menu just shows the patients available for import from the removable media you just loaded onto the system.

6.) Select the patients to be imported.

7.) Once you have selected all of the patients to import, press Transfer Button.

8.) Please wait for the patient information to be copied to this Ultrasound system. Progress bar appears while the import is taking place.

8-3-5-3   **Printer setting Back-up**

Before starting upgrade, write down, print out or save the printer setting for back-up.

NOTE: *All the customized image setting of digital printer will be lost after software loading. Take the back up and restore all the digital printers setting at software loading.*

NOTE: *This printer setting is for only digital printers, not analog printers.*

1.) Insert the CD or removable media and Format.
2.) Go to Utility -> System -> Peripherals and click the Printers.

Figure 8-168   Printer set backup

3.) Press the left button of the trackball on the printer which need to be backup -> Click "properties".
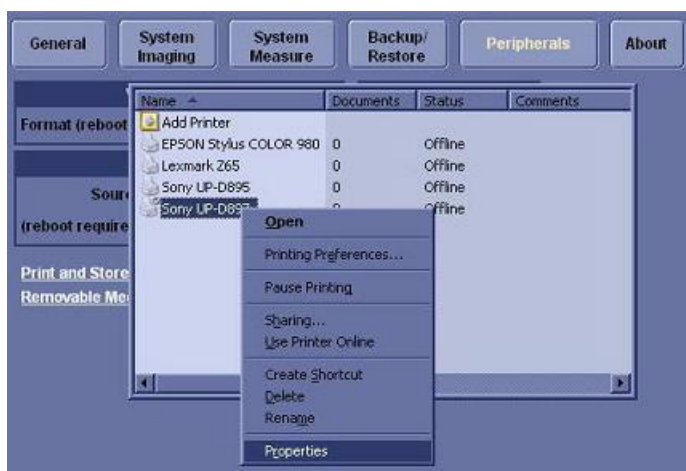
Figure 8-169   Printer set backup

8-3-5-3   **Printer setting Back-up** (cont'd)

4.) Select "Printing Preferences".
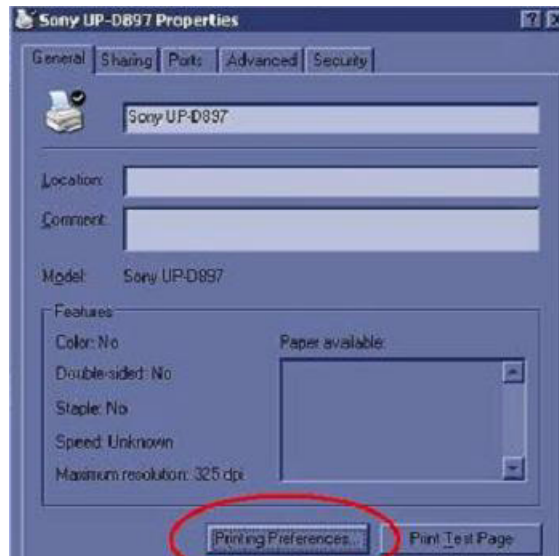
Figure 8-170   Printer set backup

5.) If Sony D897 is used, Click "Write".
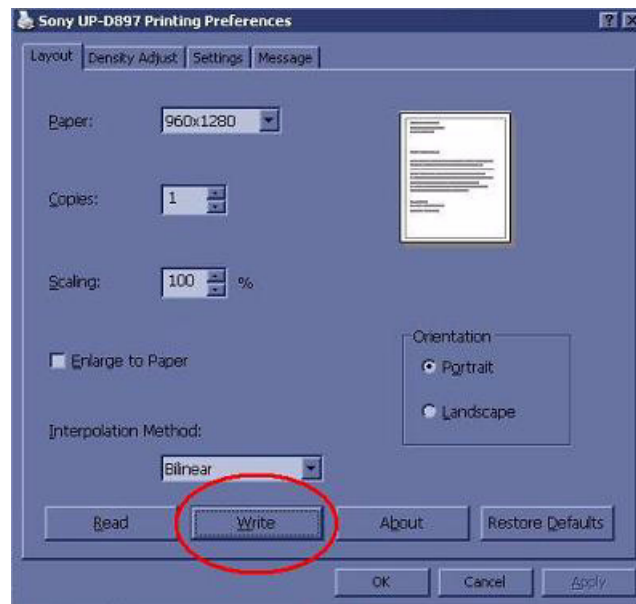
Figure 8-171   Printer set backup

8-3-5-3   **Printer setting Back-up** (cont'd)

      6.)   Select removable disk or other media.
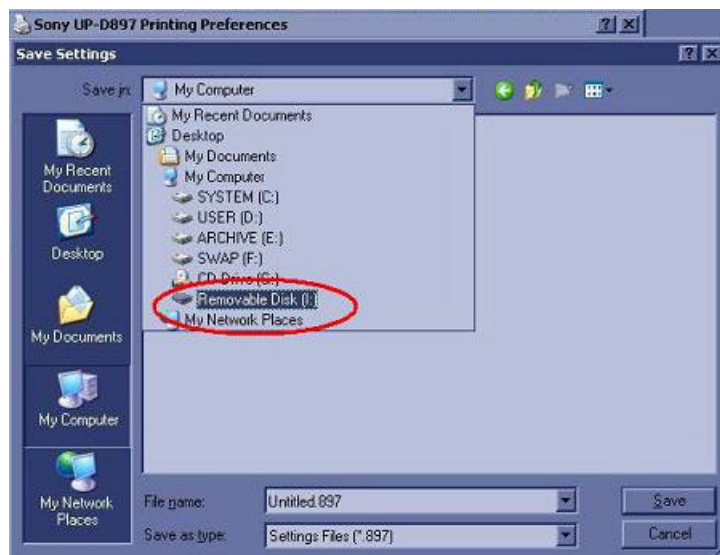
Figure 8-172   Printer set backup

      7.)   Click the "Save" to write the printer configuration.
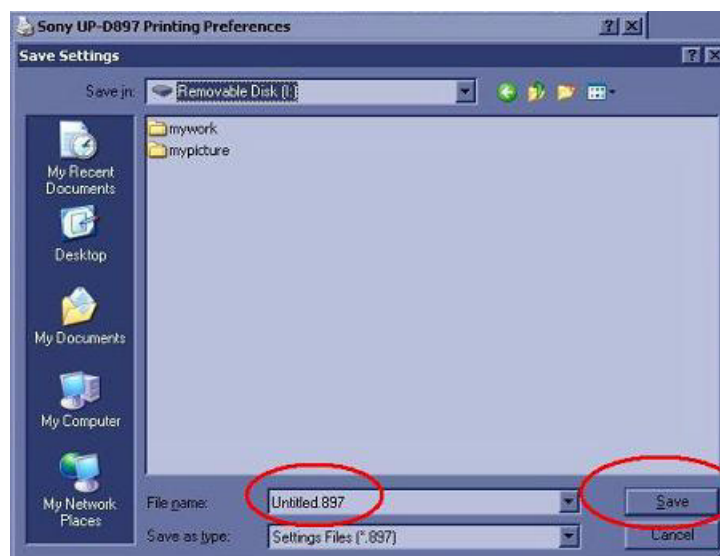
Figure 8-173   Printer set backup

8-3-5-3 **Printer setting Back-up** (cont'd)

8.) Click the "OK" until all printer windows are closed.
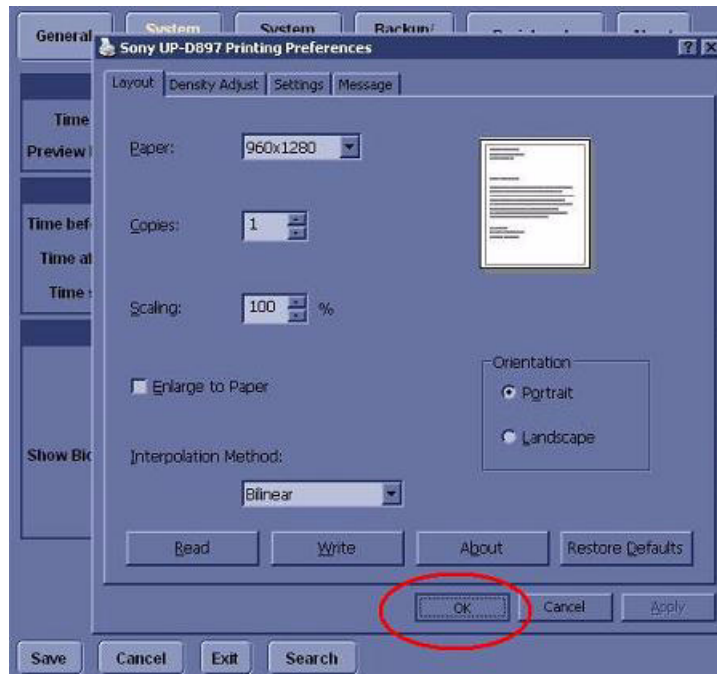
Figure 8-174 Printer set backup

9.) If Sony D895 is used, repeat the step1 to setp4 and write down the Orientation set.
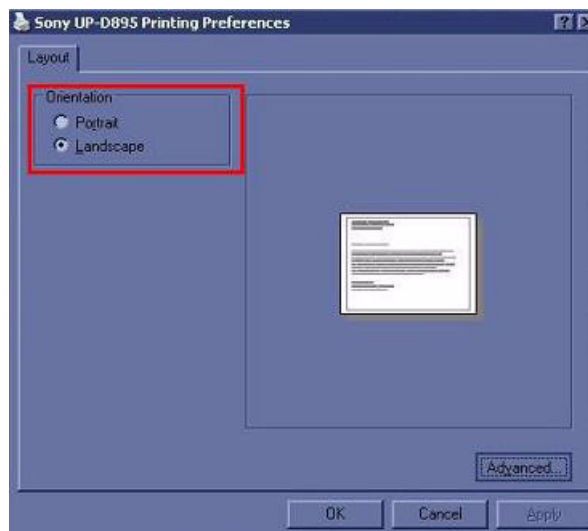
Figure 8-175 Printer set backup

8-3-5-3   Printer setting Back-up (cont'd)

10.) Click the "Advanced", then writhe down the Paper size and scaling parameters.
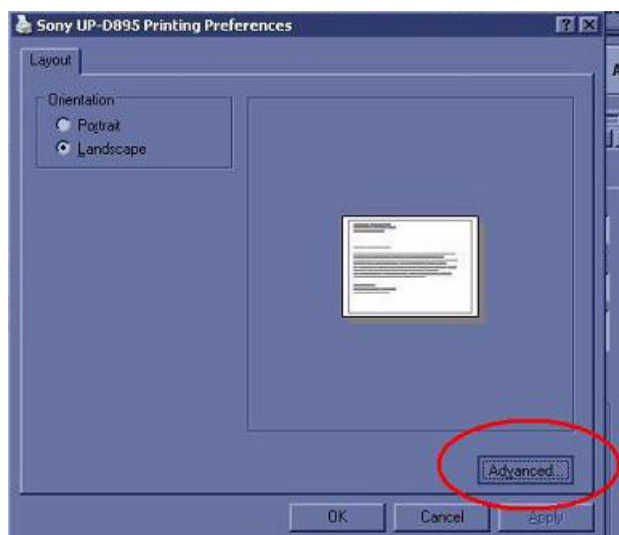
Figure 8-176   Printer set backup

Parameters	Descriptions
Orientation	Portrait or Landscape
Paper size	Paper size
Scaling	Rate of length and width

Table 8-52 Parameters

11.)Click "Properties" of the "Density Adjust".

Figure 8-177   Printer set backup

8-3-5-3 **Printer setting Back-up** (cont'd)

12.) Click "Save" -> select a removable disk or other media -> save the printer configuration.
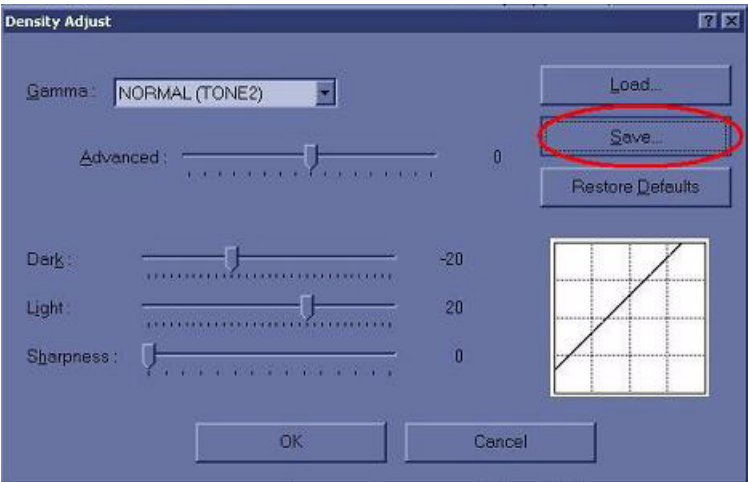
Figure 8-178   Printer set backup

13.) Click the "OK" until all printer windows are closed.

14.) If the printer does not support the configuration save or write option, write down or print out the following parameters.

Parameters	Descriptions
Orientation	Portrait or Landscape
Paper size	Paper size
Scaling	Rate of length and width
Density	AdjustGamma curve

Table 8-53 Parameters

NOTE: *The parameters depend on printers, so the above parameters are shown to another names and more parameters setting could be needed.*

Section 8-4 Software Installation

8-4-1 Installing Base Image Software

NOTE: *While we do not believe it is necessary, It would not hurt to disconnect the system from the network and remove all transducers.*

NOTE: *All digital peripherals, reporting systems connected via the USB ports should be either power off or disconnected prior to the software installation*

1.) Power ON the scanner.

2.) Tap gently the **DEL** key until the following screen appears.Enter "**arirang**" as a password if the system request a password, then press the **Enter** key.

Figure 8-179   Enter Current Password

3.) Move to **Advanced** and select **IDE Configuration**.
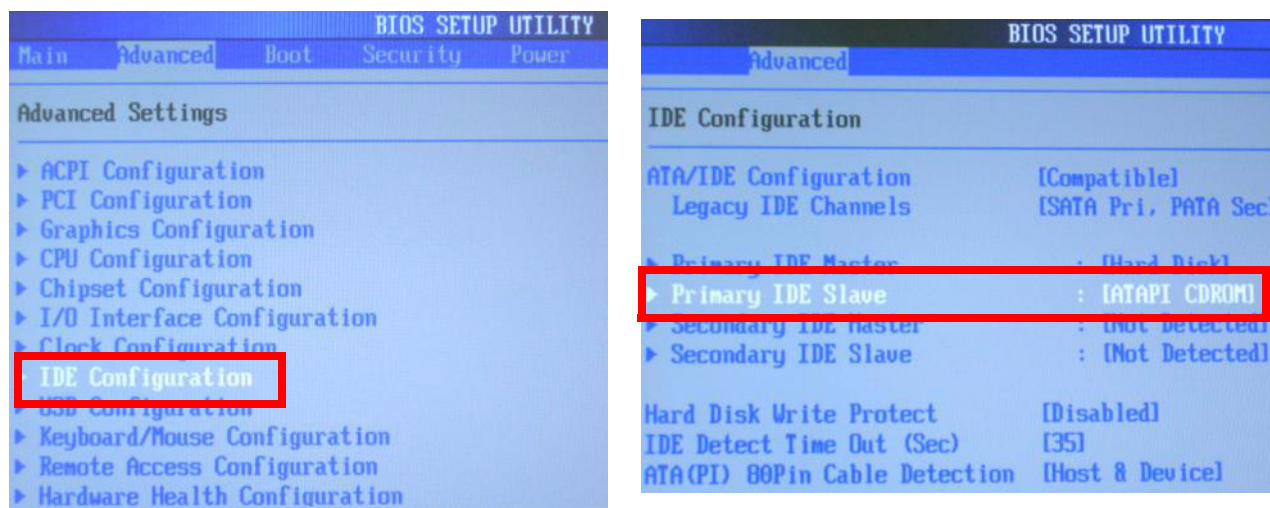
Figure 8-180   IDE Configuration

8-4-1   Installing Base Image Software (cont'd)

4.) If the BIOS setting value in **Primary IDE Slave** is **ATAPI CDROM**, the **1st Boot Device** in Boot menu should be **Primary Slave**. If the 1st Boot Device is not Primary Slave, please change the setting value using **Enter** key and **Arrow** key.
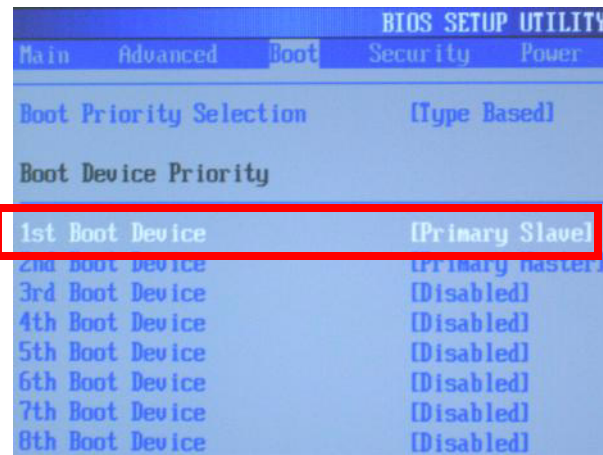
Figure 8-181   Boot Device Priority

5.) If the BIOS setting value in **Secondary IDE Master** is **ATAPI CDROM**, the **1st Boot Device** in Boot menu should be **Secondary Master**. If the 1st Boot Device is not Secondary Master, please change the setting value using **Enter** key and **Arrow** key.
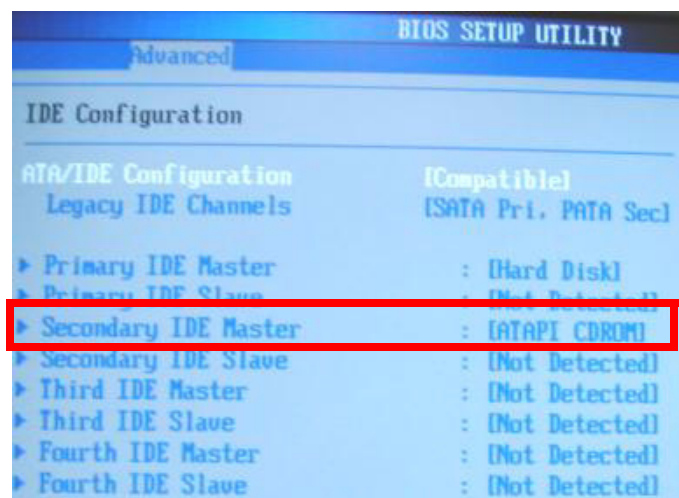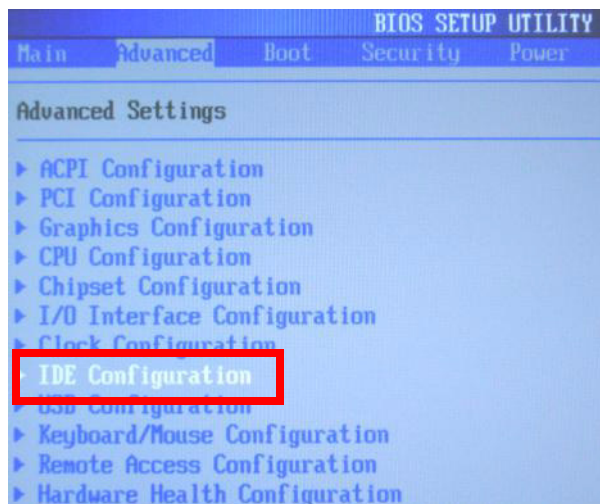
Figure 8-182   IDE Configuration

8-4-1   Installing Base Image Software (cont'd)
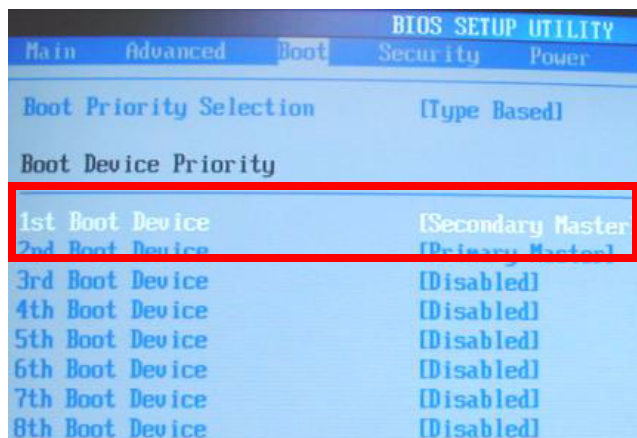
Figure 8-183   Boot Device Priority

6.) Insert the BT11 Base Image Software Disk into the CD/DVD ROM drive.

7.) After restarting the system, the following screen will be displayed.
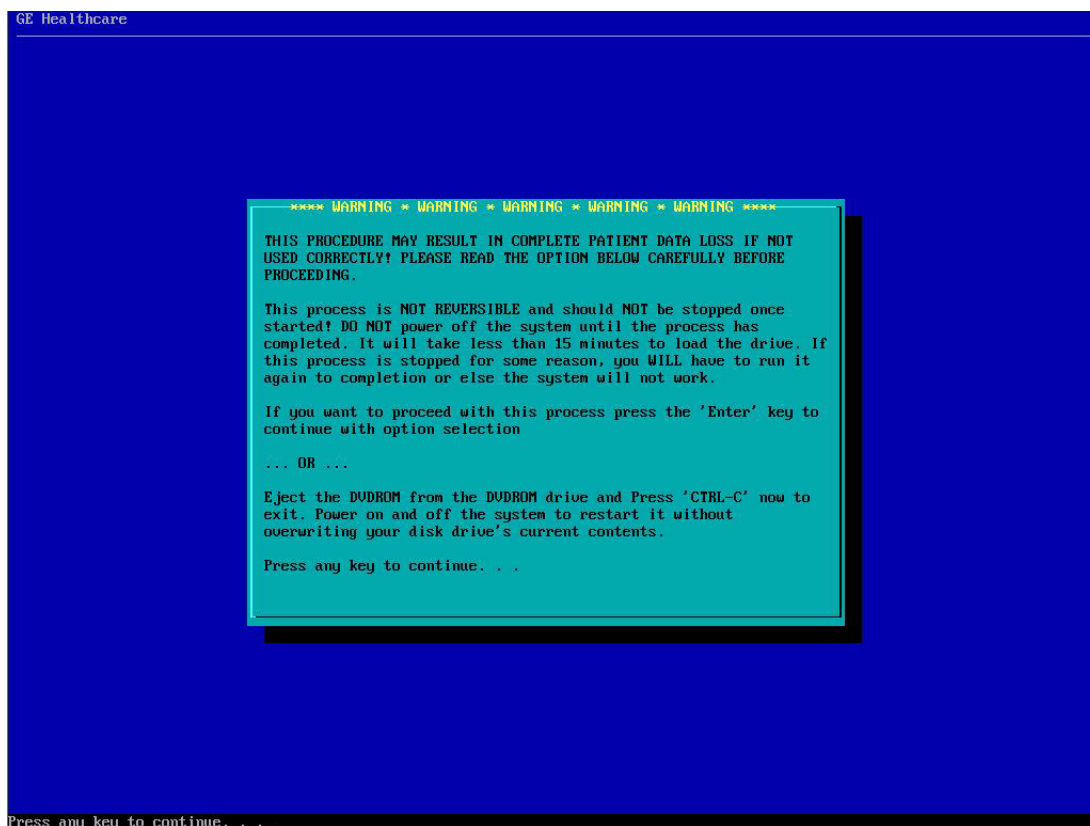
Figure 8-184   Installation Warning

8-4-1 **Installing Base Image Software** (cont'd)

8.) Press Enter key and then the following screen will be shown. (If you want to abort installation procedures, press CTRL+C.)
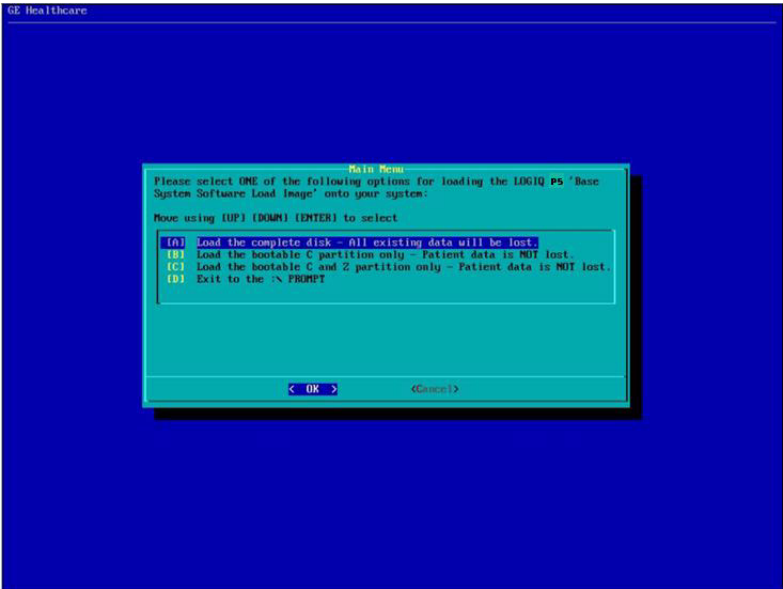
Figure 8-185 Base Image Software Installation Menu

9.) Press **A** key to install the complete disk.

⚠ **NOTICE** Select **A** when installing the new HDD or upgrading from BT09. (HDD capacity should be minimum 120GB)

Select **B** when replacing C:\ partition only. It means all customer data are NOT deleted. The Ghost procedure is performed with data of the drivers D, E, F and Z left.

Select **C** when replacing C:\ partition and Z:\ partition. It means all customer data are NOT deleted. The Ghost procedure is performed with data of the drivers D, E and F left. Z:\ partition used for reloading C:\ partition and Application software will be replaced.

Drive Partition	Usage
(GRUB)	grub data
C	System Files and Application
D	User Defined and Preset
E	Patient Archive data
F	Swap
Z	C:\partition Repository for Reloading Function

Table 8-54 Drive Partition

8-4-1   Installing Base Image Software (cont'd)

10.) Approx. twenty(20) minutes later, the following screen appears. Eject the Base Image Software Disk from the CD/DVD ROM drive.

```
The "Base System Software Load Image" process has successfully completed.
You will now need to load the "Application Software" onto your system.

1. Please eject the DVDROM from the drive.
2. Press "ALT + CTRL + DEL" key to restart the system.
3. Continue with the "Application Software" load procedure.

Thank you!

J:\>_
```
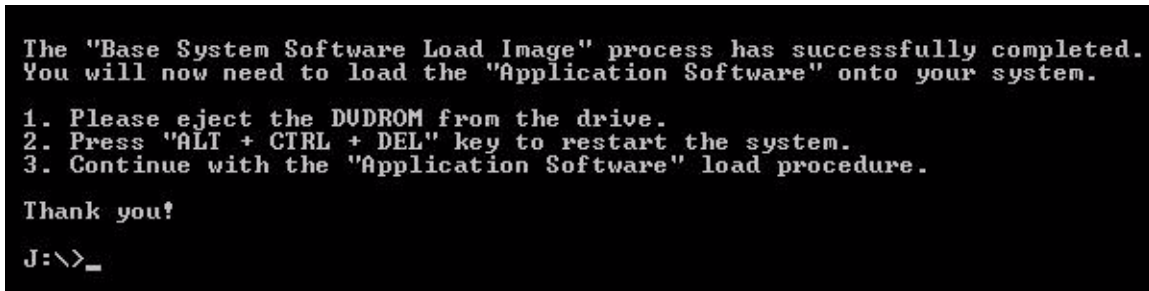
Figure 8-186   Installation Completion

11.) After removing the disk from the drive, Press ALT + CTRL + DEL key.

*NOTE: After Installing Base Image Software, the "General failure reading drive A. Abort, Retry, Fail?"
             message can be appeared, but Ignore it! All procedure would be successfully done.*

⚠ **WARNING** ***Remove the disk from the drive. Otherwise you will be encountered the Base Image
                 Software installation screen iteratively.***

12.) The following message box can be displayed after the SYSTEM boot up. Press Yes.

System Settings Change

Windows has finished installing new devices. The software that supports your device requires that you restart your computer. You must restart your computer before the new settings will take effect.

Do you want to restart your computer now?

[Yes]   [No]
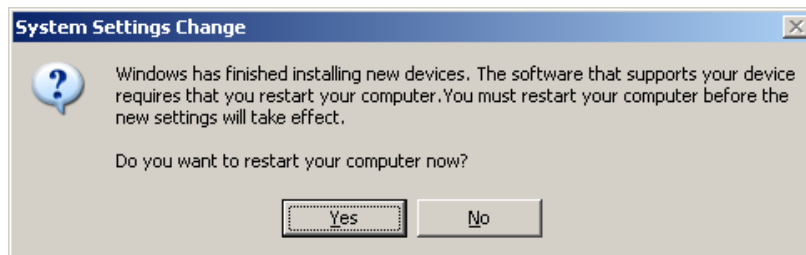
Figure 8-187   System Setting Change

8-4-2   Verifying Base Image Software

8-4-2-1   Partition Checks

1.) Reboot the SYSTEM and the Desktop screen will be shown as blow.
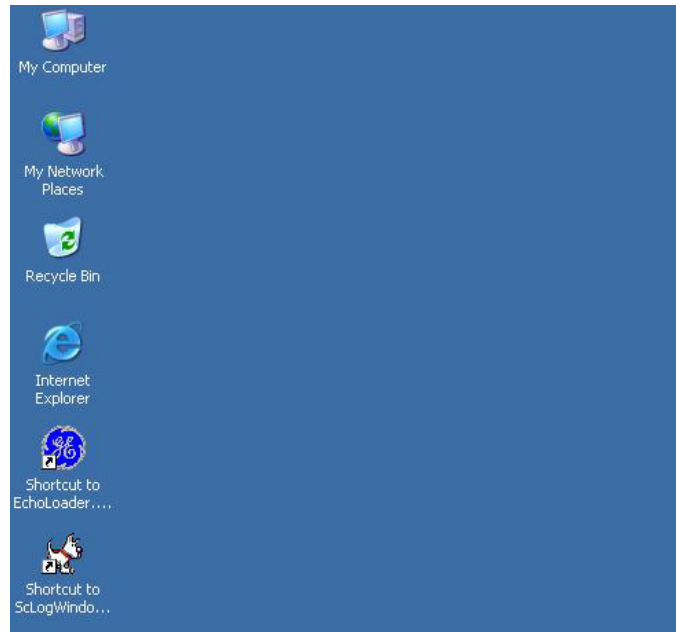
Figure 8-188   Desktop Screen

2.) Click **Start** button and **Run** menu, then type *explorer* and click **OK**
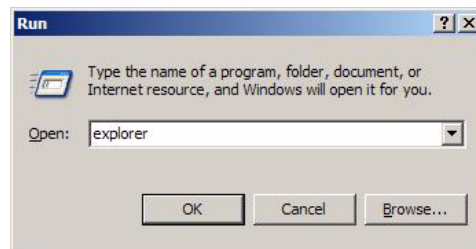
Figure 8-189   Executing Windows Explorer

3.) Right-click **My Computer** icon on the Desktop and click **Manage.**
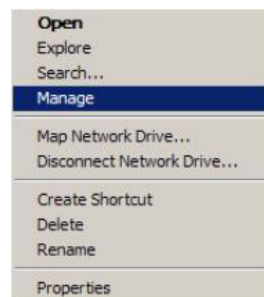
Figure 8-190   Opening the Manage Window

8-4-2-1 **Partition Checks** (cont'd)

4.) Select **Storage -> Disk Management** and check that only **File System, Status, Capacity** and **Drive Letter** of each partition are same as follows

NOTE: *If 160GB HDD is used, refer to the Figure 8-191.*
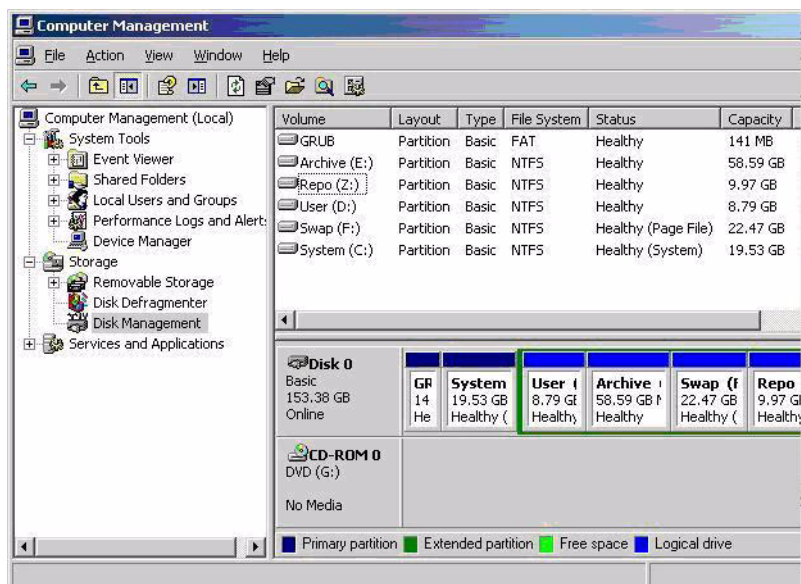
Figure 8-191   Disk Management 160G HDD

NOTE: ***Repo*** *partition and* ***CD/DVD-ROM Drive's*** *Drive Letter should be assigned as Z:, G: respectively.*

8-4-2-2 **Driver Checks**

1.) On the window XP desktop, left click on My Computer then right click on Properties.

2.) The System Properties window appears. Select **Hardware > Device Manager.**

3.) Verify that ?, X, or ! is not displayed
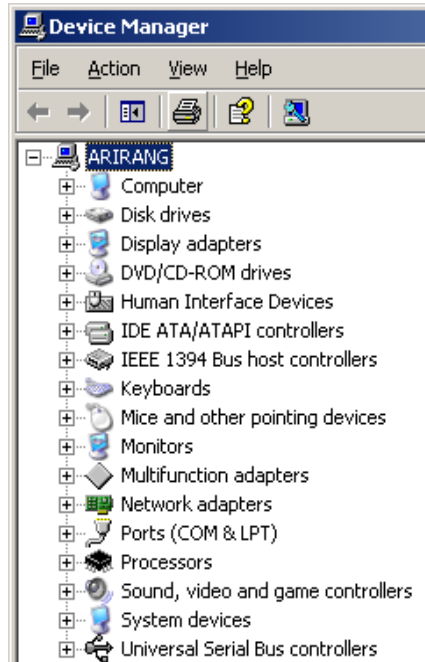
Figure 8-192   Device Manager

• If X or ! is displayed:

- Left-click on the device with X mark, then right -click on **Enable**

- Left-click on the device with ! mark, then right click on **Properties** to perform the device driver recognition. When some files are required, designate the file in the directories of **C:\WINNT\SYSTEM32 or C:\WINNT\SYSTEM32\DRIVERS**. If they are not found, search them using a window search function.

8-4-2-3   USB Printer Checks (USB Printer User Only)

Without any newly additional user invention, LOGIQ™ P5 will recognize the below 19 kinds of USB printer

Printer Name	Comment
Sony UP-D895/D895MD	Digital BW Printer
Sony UP-D897	
Mitsubishi P93D	
Mitsubishi P95DW/P95D/P95DE/ P95DW-N/P95DW-B	
Sony UP-D23MD	Digital Color Printer
Sony UP-D25MD	
Mitsubishi CP30DW/CP30DW-Z	
HP 990cxi	Standard Printer
LexMark Z65	
HP 5550	
HP 6122	
HP 6540	
HP 5650	
HP 1000	
HP 1200	
Xerox Phaser 8400	
HP Office jet Pro K550	
HP Office jet Pro K5400	
HP Deskjet D4360	
HP Deskjet 6940	
HP Officejet 6000 Special Edition	

This procedure assumes that the P5 software is installed and is functioning properly.

1.) Attach the USB cable from the printer to the USB port on assigned position

Table 8-55   USB Port Position

USB Port Position	Peripheral
Right USB Port on Rear Connector Panel	Standard Printer
Left USB Port on Rear Connector Panel:	Digital Color Printer
USB Port on OP Printer Bracket Back Panel	Digital BW Printer

⚠ **NOTICE** *If you plug in USB printer for the first time to the system, restart the system.*

8-4-2-3   USB Printer Checks (USB Printer User Only) (cont'd)

⚠️   **NOTICE**   *Once a USB printer is connected to one of the USB ports, don't take out the USB printer and plug it in another USB port.*
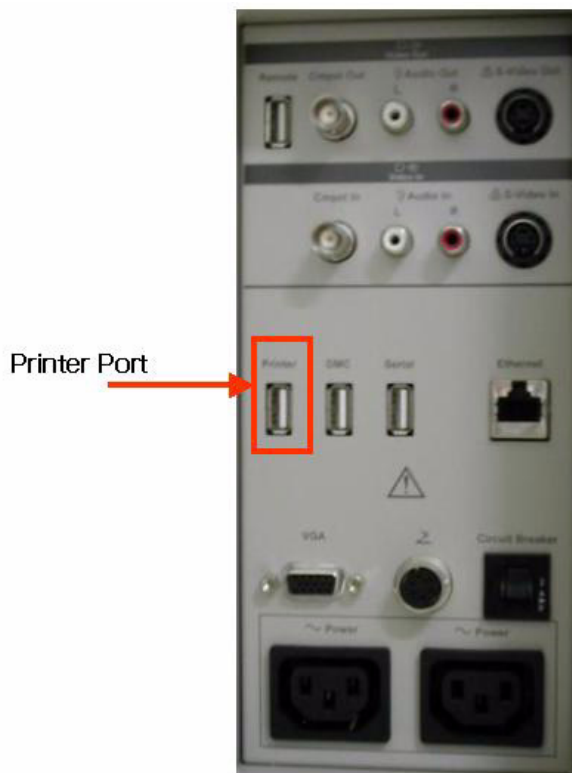
Figure 8-193   USB Port - Rear Panel Connector
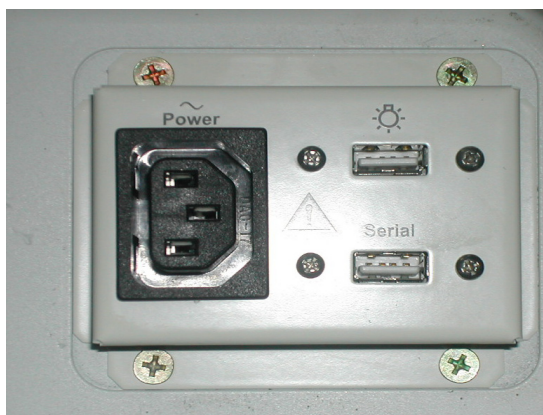
Figure 8-194   USB Port - OP Printer Bracket Back Panel

2.) Make sure that printer properties are proper. (Image orientation and size). Refer to the latest Release Notes.

8-4-2-4   DMC Checks (DMC User Only)

NOTE: DMC Cable is supplied only as an option.

1.) Check DMC Cable (USB to Serial Bridge).

2.) Plug in the Cable as shown on the right side of the USB port.

DMC Cable

Plug on the right

Figure 8-195   DMC Cable

3.) Ensure **USB to Serial Bridge port** is recognized by the system.

4.) Trackball to My computer icon and left click

5.) Right click on **Properties**.

6.) Right click on the **Hardware** tab.

7.) Right click on the device manager in the middle right of the hardware tab window.

8-4-2-4   DMC Checks (DMC User Only) (cont'd)

8.) Make sure"USB to Serial Bridge" is displayed as shown the Figure 8-196
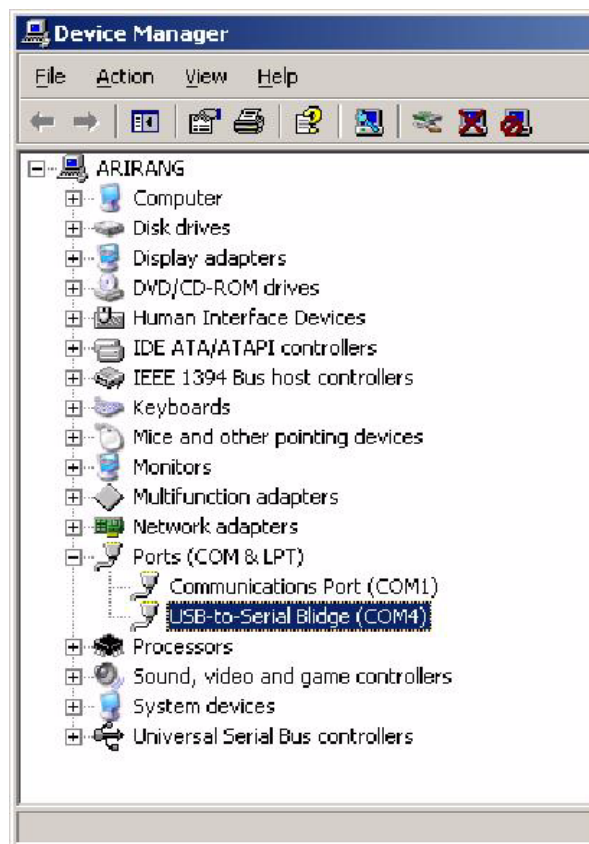
Figure 8-196   Device Manager Windows

8-4-3 Installing Application Software

NOTE: *First time SW installation with peripherals on can cause the BlueScreen.*

NOTE: *When connecting peripherals to the system, make sure to turn off the system first in order to avoid the BlueScreen.*

⚠ **WARNING** *Base Image software should also be installed prior to the application.*

1.) Place the "Application Software" CD into the DVD drive.
2.) Press the Start button on the tool bar at the bottom of the LCD screen and select "**Run**".
Enter "**G:\LoadSoftware**" into the dialog box as shown below.
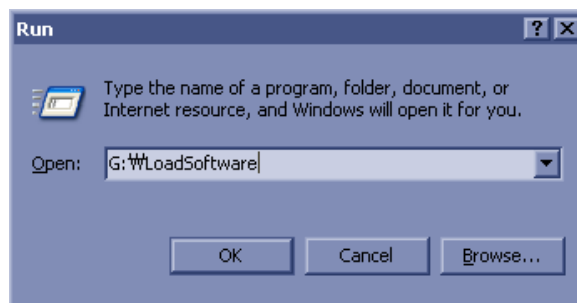
Figure 8-197   Run Load Software

3.) You will see a Command (CMD) window open as shown in the Figure 8-198.
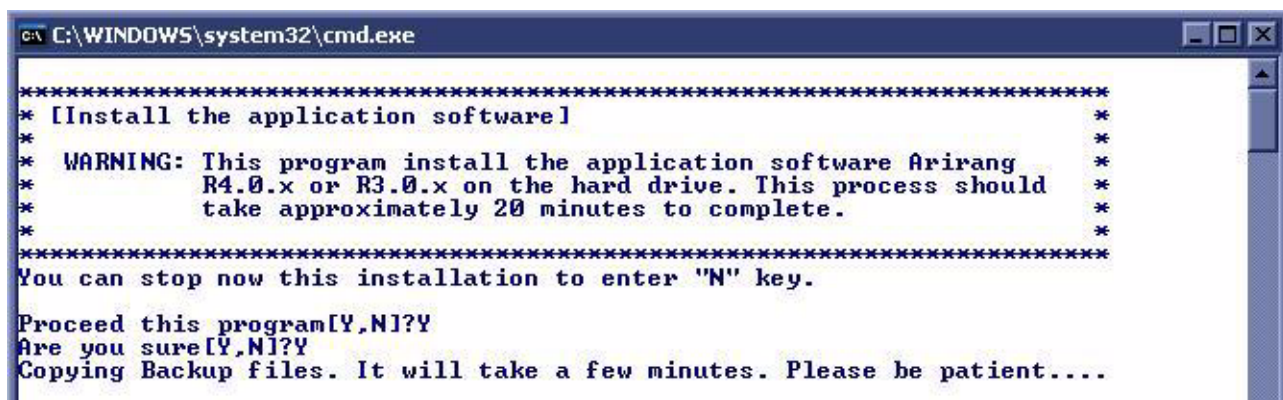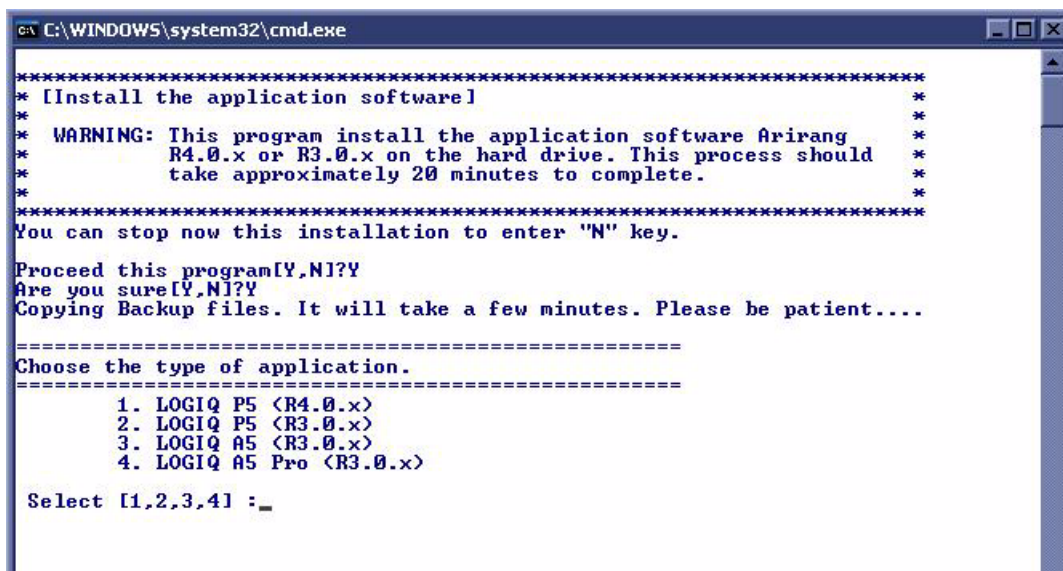
Figure 8-198   Command Window

4.) Press the "Y" key twice and copying backup files starts. This takes a few minutes.

8-4-3 **Installing Application Software** (cont'd)

5.) After copying backup files, the following options appear. (Software version can be changed.)

Figure 8-199   Select system

6.) Select a product to be installed.

7.) Then, press the "Y" key to continue. Then the program requests confirmation - "Are you sure?" then Press the "Y" key again.

8.) The installation process will be started. it will take about 20 minutes.

9.) To apply the preset by region, select one of the below options.

Figure 8-200   Region selection

8-4-3   Installing Application Software (cont'd)

10.)After the installation is completed the system will power off automatically.

Figure 8-201   Installation Complete Message

NOTE: Some of systems doesn't power off automatically. In this case, press and hold power button more than 5 sec. to power off.

*NOTE: **Do not operate with using mouse or keyboard during installation procedures.***
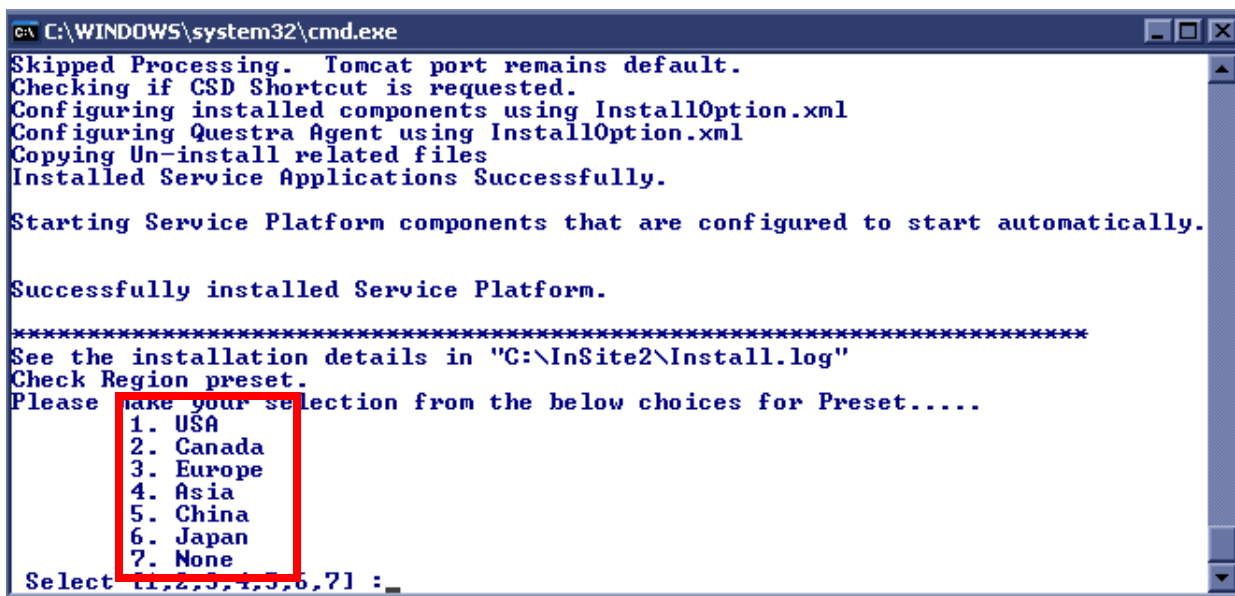
11.)Turn on the system and immediately eject the button on the DVD drive to eject the DVDROM Verify that the system boots up no error.(It will take a few minutes)

NOTE: The application installation is completed, reboot is required.

12.)Shut down the system.
13.)Start the system

8-4-4 Standard Confirmation & Functional Checks

Configure the system settings and perform functional checks after installation of software.

Items for configuration and functional checks include:

- Confirmation of the software version
- Preset Data (if necessary)
- Patient Image Data (if necessary)
- Functional Checks for Service Platform (Diagnostic Program)

8-4-4-1 Confirming software version

1.) Touch the Utility button on the Touch Panel

2.) Click on About tab. The software version will be shown on the monitor as shown. Confirm the following: Refer to the Figure 8-202.

Figure 8-202 Confirmation of software version

3.) Make sure that Application Software Version (R4.x.x or R3.0.x)), Software Part Number (described on the Application Software CD-ROM) and Image Part Number (described on the Base Image Software CD-ROM).

8-4-4-2   **Setting Computer Name**

1.) Click on Utility, then select Connectivity.

2.) Click on TCP/IP tab.

Figure 8-203   TCPIP tab

3.) Type **Computer Name**

⚠ **NOTICE**   The Computer name is unique. Check the scanner serial number printed on the label located at the rear lower side of the scanner. For example, when 12345SU1 is printed, P5-12345SU1 must be entered as a computer name.

⚠ **NOTICE**   If **Enable DHCP** checkbox is checked and LAN cable is disconnected from the system, the system bootup time might slow down.

4.) Verify that **Enable DHCP** has no check mark. If checked, remove the mark.

NOTE: *If Enable DHCP mark is checked, the system cannot checkout by VOLC.*

5.) Check if **Computer Name, IP Address, Subnet Mask, and Default Gateway** are proper ones which you wrote down in section 8-3-5-1Saving Connectivity.

NOTE: ***If the "Save" is NOT performed, you can NOT enter Patient screen and NOT perform Export/Import***

6.) Click on Save button

7.) Click OK for confirmation dialog box

8.) The system will power OFF automatically.

9.) Turn on the system for functional checks

8-4-4-3   **Setting Printer Preferences**

NOTE: *If the 1-3-5 printer setting back-up is NOT performed, ignore this section.*

1.) Insert removable disk or media that the printer setting was saved.

2.) Go to Utility -> System -> Peripherals click the Printers.

Figure 8-204   Printer set restore

3.) Press the left button of the trackball on the printer which need to be restore from the saved printer setting -> Click "properties" -> Click "Printing Preferences".

4.) If Sony D897 is used, click "Read".
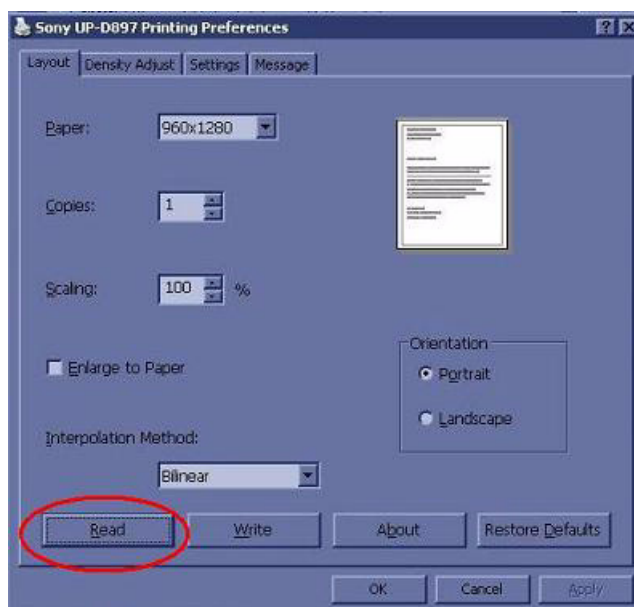
Figure 8-205   Printer set restore

8-4-4-3   **Setting Printer Preferences** (cont'd)

> 5.) Select removable disk or media that the printer setting was saved -> Click "Open".

Figure 8-206   Printer set restore

> 6.) Click the "OK" until all printer windows are closed.
>
> 7.) If Sony D895 is used, repeat the above step 1 and 3, then set the parameters below in the layout tab and advanced tab.

Parameters	Descriptions
Orientation	Portrait or Landscape
Paper size	Paper size
Scaling	Rate of length and width

Table 8-56 Parameters

8-4-4-3 **Setting Printer Preferences** (cont'd)

8.) Click the properties of the Density Adjust".
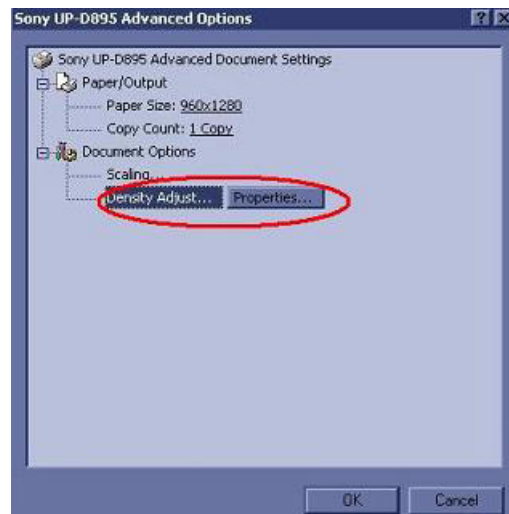
Figure 8-207   Printer set restore

9.) Click "Load".
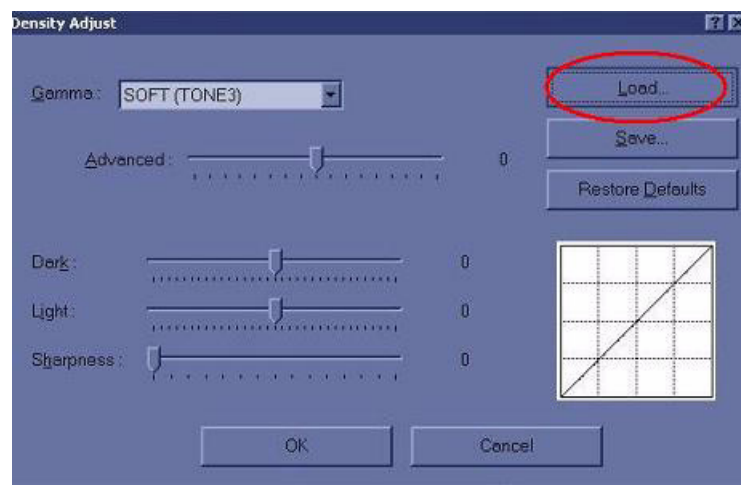
Figure 8-208   Printer set restore

10.)Select removable disk or media which the printer setting was saved -> click "Open".

11.)Click the "OK" until all printer windows are closed.

8-4-4-3   Setting Printer Preferences (cont'd)

12.)If the printer is not support restore option, restore the printer set from the recorded parameters.

Parameters	Descriptions
Orientation	Portrait or Landscape
Paper size	Paper size
Scaling	Rate of length and width
Density	AdjustGamma curve

Table 8-57 Parameters

NOTE: *The parameters depend on printers, so the above parameters are shown to another names and more parameters setting could be needed.*

8-4-4-4 **Functional Checks for Service Platform (Diagnostic Program)**

The Service platform uses a web-based user interface (UI) to provide access to common service components.

NOTE: *After perform diagnostics, shut down and restart to make the system working properly.*

1.) Go to Utility and press Service to launch Service Platform. It will take some seconds for activating.

2.) Make sure that **CAPS** is not selected (should be dimmed) for password entry performed later.
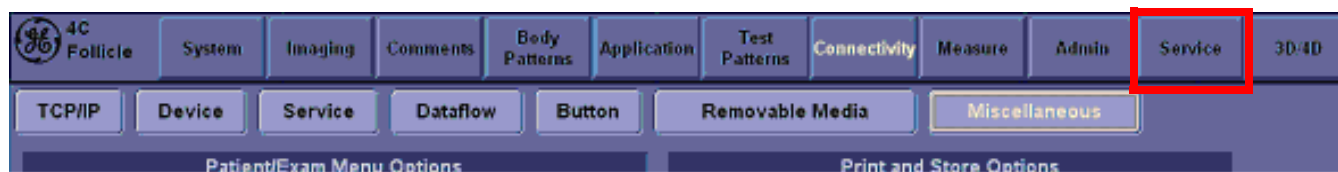
Figure 8-209   Utility -> Service

3.) The Service Login window for Service Platform will be shown on the monitor display.

Figure 8-210   Log in screen

⚠ **CAUTION** **If the Login window for Service Platform is not displayed on the monitor, the installation of the Service Platform has failed. Reload the application software or Base System Software (OS) + application software. Contact a Technical Support for details.**

8-4-4-4   Functional Checks for Service Platform (Diagnostic Program) (cont'd)

4.) Select **GE Service** at the "Select User Level" field.

5.) Enter the password for the Service Platform.

6.) Click on **Okay**.
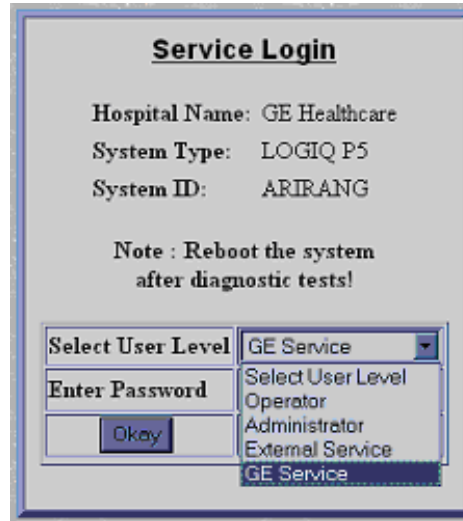
Figure 8-211   Select User Level

7.) Verify that the following screen (Service Platform) is displayed on the monitor.

⚠ **NOTICE** When the service platform is NOT displayed, check if **CAPS** lock is selected. The **CAPS** should not be selected.

8.) Click on **x** located at the upper right corner of the service platform screen to close the Service

Platform and return to the scan panel.
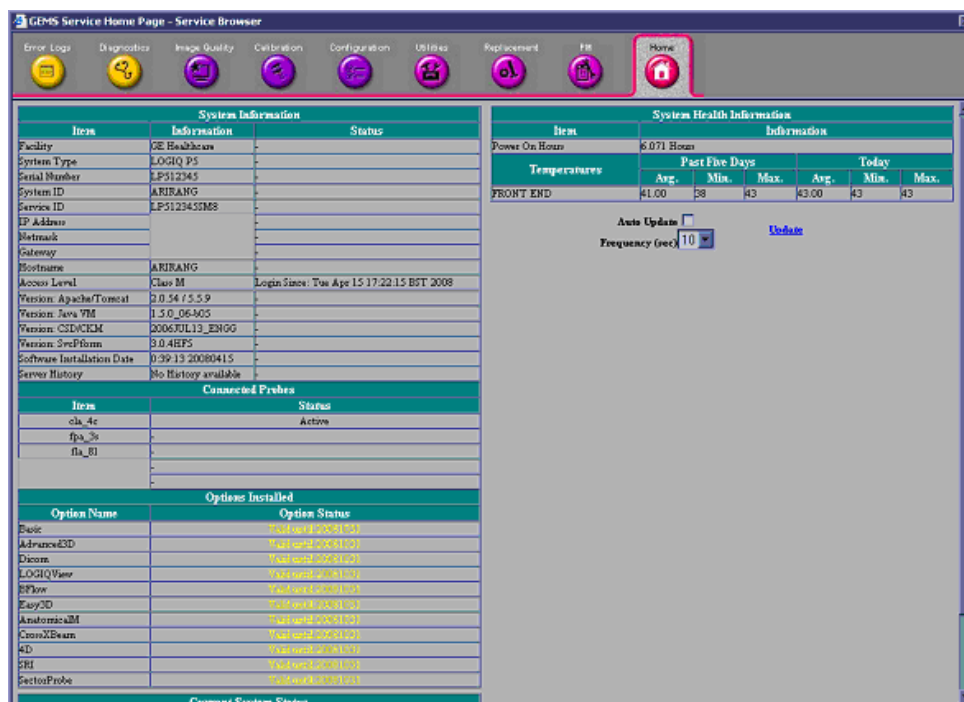
Figure 8-212   Service Platform screen

8-4-4-5   Setting the VCR (if necessary)

1.) Select **Utility > System > Peripheral tab.**

2.) Under Video Settings, PAL or NTSC.

3.) Under VCR, select Composite or S-Video.

4.) Under VCR, select Panasonic LQ-MD800 or Mitsubishi MD3000, as appropriate.

Figure 8-213   Utility > System>Peripherals

5.) Click on Save.

6.) Shut down the scanner, then restart the scanner.

7.) Verify that the VCR can be properly operated.

⚠ **NOTICE** Be sure to connect the converter and cable before booting up the system. Otherwise the LOGIQ™ P5 system does not recognize the peripheral devices

8.) Perform the following functional tests. If all are successful, include the debrief script provided below.

Table 8-58   Functional Tests

Service Manual Section	Functional Test / Diagnostic Test	Debrief Script
Section 4-3-1	Power On/Boot Up	"Service Manual, Direction 5394141, Rev 1+, Section 8-4-4. Equipment passed all required tests and is ready for use. "
Section 4-3-2	Power Off / Shutdown	
Section 4-5	Peripheral Checks	

8-4-4-6   Verifying the VCR (if necessary)

1.) Press Record button, VCR menu shows up at the bottom of the screen.

Figure 8-214   VCR Menu

2.) Click Counter Reset, then Press Record menu to start recording.

Figure 8-215   Record Menu

Displays a red dot in the VCR status area on the Title bar to indicate that recording has begun.
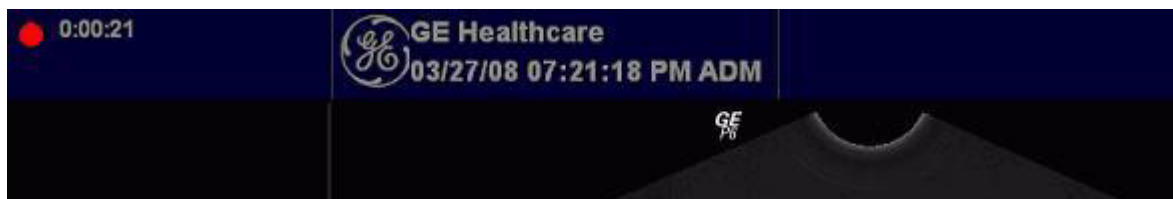
Figure 8-216   VCR Status

3.) Press Stop to stop recording the tape at the desired moment.
4.) Press Search to adjust the starting time for video playback.
5.) Press Play to start VCR playback.

8-4-4-7 Setting Printer Properties in Application Software (if necessary)

1.) Select Utility -> Connectivity -> Service tab

2.) Select *Standard Printer, and Add*
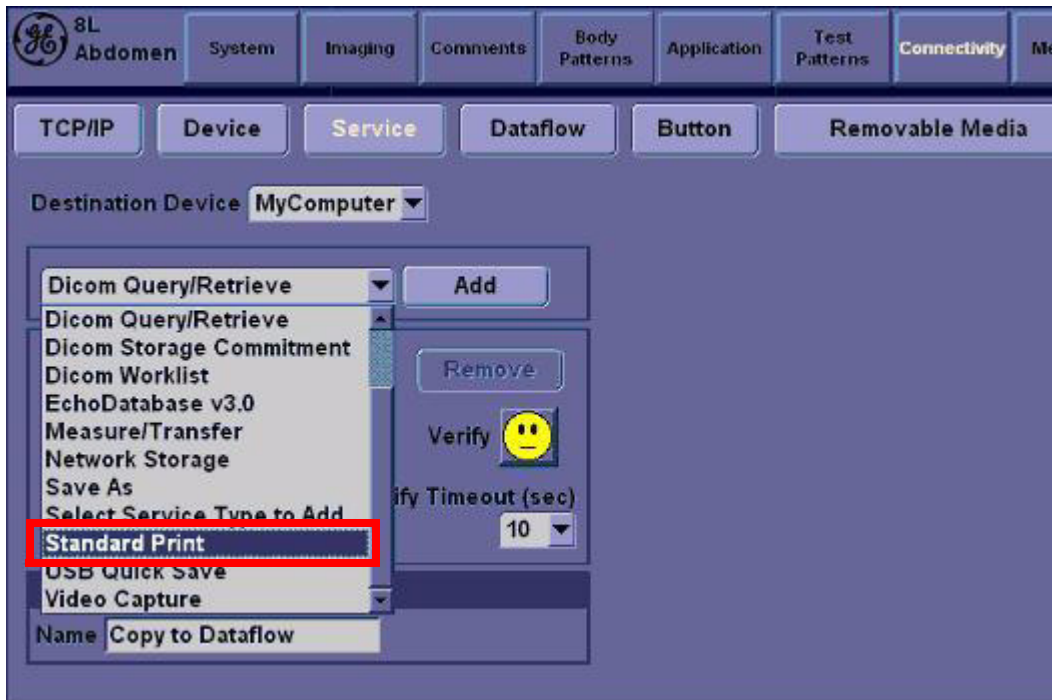
Figure 8-217 Utility > Connectivity > Service

3.) Under Properties, select desired Printer, and Save.
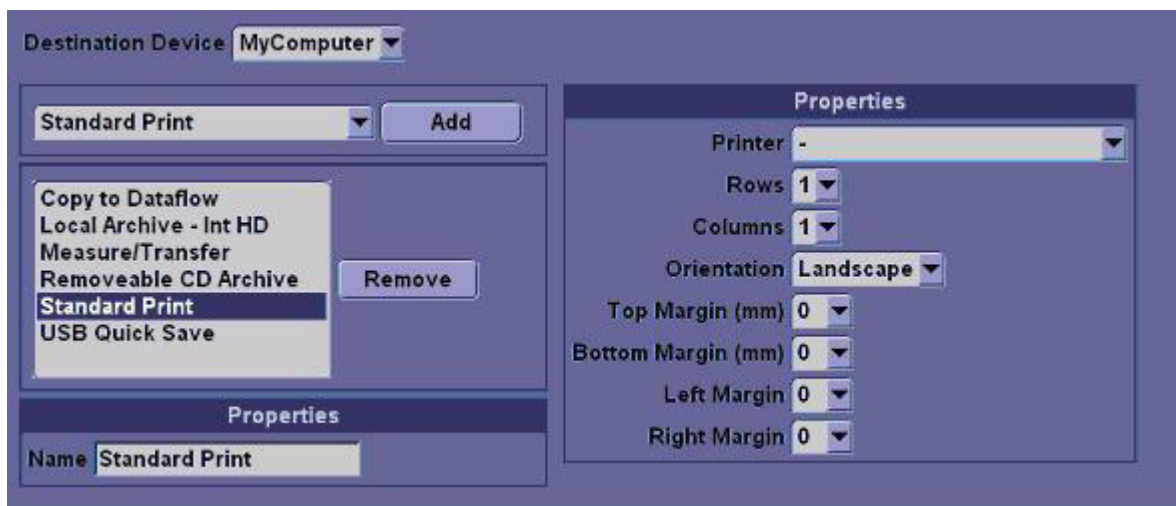
Figure 8-218 Select the Printer

8-4-4-8   Print Key Assignment and Checkout (if necessary)

1.) Select Utility-> Connectivity-> Button tap.

2.) Choose the desired print button (for example, Print1) under Physical Print Button.
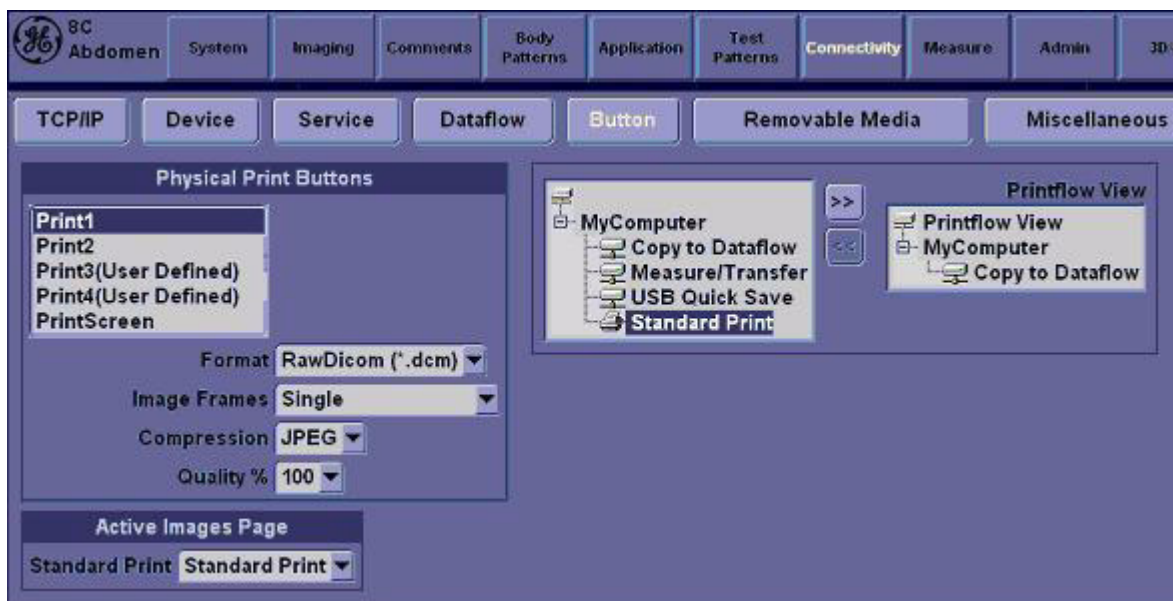
Figure 8-219   Physical Print Button

3.) Select Standard Print, and press > >Standard Print is added under printflow View.

⚠ **NOTICE** Press << to delete a existing Standard Print.
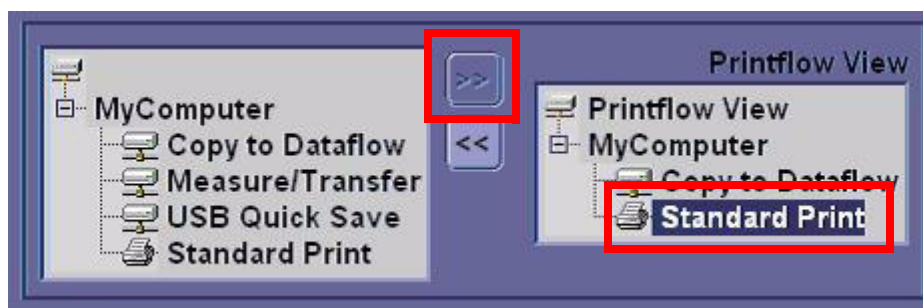
Figure 8-220   Standard Print

4.) Press the print key just configured.

The screenshot prints to the destination printer.

8-4-4-9   Regional Setup Procedure for Japanese

You can set up the keyboard for Japanese. If you select Japanese, the following items display or may be entered in Japanese.

- Patient Name
- Exam Comment (on Patient screen and Worksheet)
- Annotation (Comments)
- Error/Warning Messages
- DICOM/Worklist

1.) In Utility--> System--> General, set the Language as JPN. Save this setting, but do not reboot the system yet.
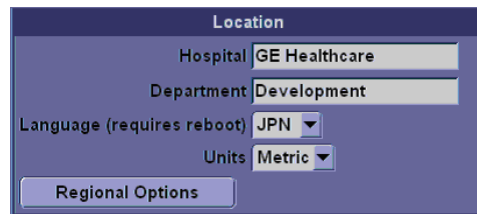
Figure 8-221   Changing the System Language to JPN

2.) Press Regional Options, under Standards and Formats select Japanese, under Location select Japan. Press Apply.
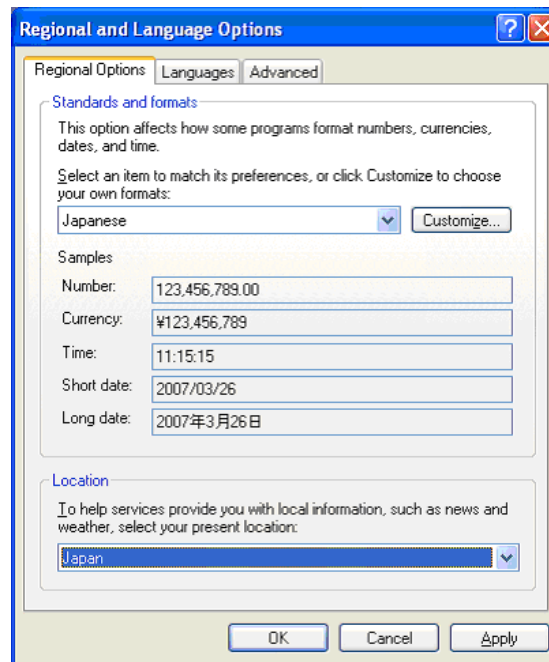
Figure 8-222   Regional Options

8-4-4-9 **Regional Setup Procedure for Japanese** (cont'd)

3.) Select the Language tab, press Details, under Installed Services add the **Japanese-Microsoft IME Standard 2002 ver. 8.1** keyboard, under Default input language select Japanese, press Apply, Press OK.
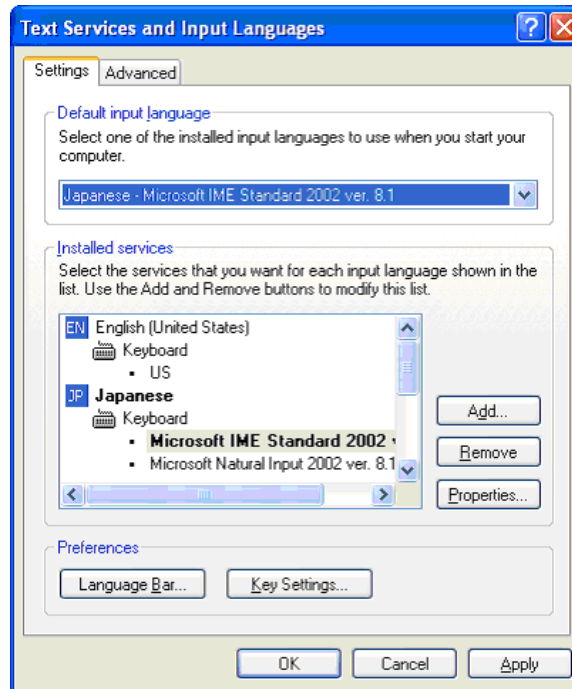
Figure 8-223   Regional and Language Options—Language Tab

4.) Select the Advanced tab, then select Japanese in the Language for non-Unicode programs pull-down menu. Press Apply. Answer Yes to use files already loaded on the hard disk, then answer No to not reboot the system yet, press OK. Press Save and Exit the Utility screen.

5.) Reboot the system. When your system restarts, the system appears in the selected language.

NOTE: *To have the settings take effect, you **MUST** turn off the system and turn it back on.*

6.) In Utility --> System --> General, press Regional Options. Select Language Tab and press Details. Remove English under Installed Services. Press Apply and OK.

7.) To type in Japanese, press Alt + tilde/accent key (located between the Esc and F1 keys) in order to start the Input Method Editor (IME).

8-4-4-10 **Product Type Check of the System**

To verify that the correct version of Application software was installed, check the **Product Type** of the Application software. Verification steps are listed below.

1.) Turn on the system. Wait until the screen comes up.

2.) Press the **Utility** key and click **Admin** tab.

3.) Check the value of **Product** item.
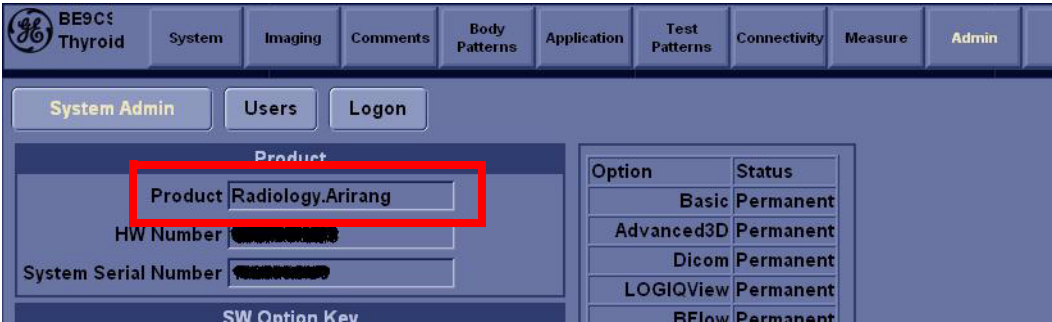
Figure 8-224   Checking Product Type

4.) The following table is the matching table.

Installed Application	Value of Product item
P5	Radiology.Arirang
A5	Radiology.Arirang.BW
A5Pro (A5 w/o PW)	Radiology.Arirang.BW2

Table 8-59   Product Type Matching Table

Section 8-5 Full Backup/Restore Procedure

8-5-1 General

This describes a Full Backup (Database, Image, User preset, Service Data) procedure.

Use this instruction when you need to save the data :

- before changing a HDD with a new one
- before reinstalling Base Application
- when you just want to save all of the current data.

8-5-2 Parts Required

- USB HDD

8-5-3 Full Backup Procedure

1.) While the Echoloader is running, press 'Utility' button and click on the 'Admin'.
2.) When Title Login window pops up, select an operator with admin authorization.
3.) Type in the password.
4.) press "OK".
5.) Select "System Admin" page.
6.) press "Execute" button under Full Backup box and the window below pops up.
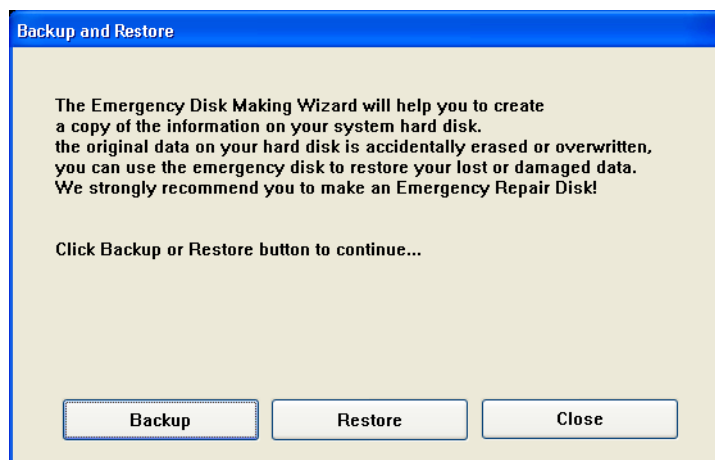
Figure 8-225   Backup and Restore Window

8-5-3   Full Backup Procedure (cont'd)

7.) Press "Backup". Then the below window pops up.
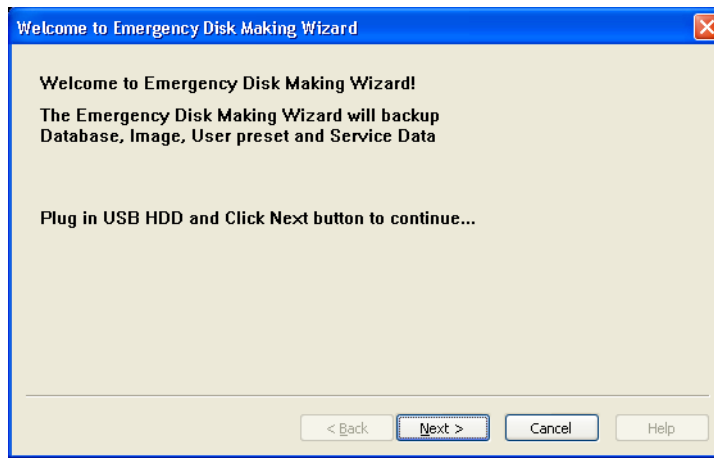
Figure 8-226   Emergency Disk Making Wizard

8.) Insert a USB HDD.

NOTE: It might take about 30 seconds for the system to recognize the USB HDD.

9.) Press "Next".

10.)Select USB HDD for backup when Select Drive window is displayed.
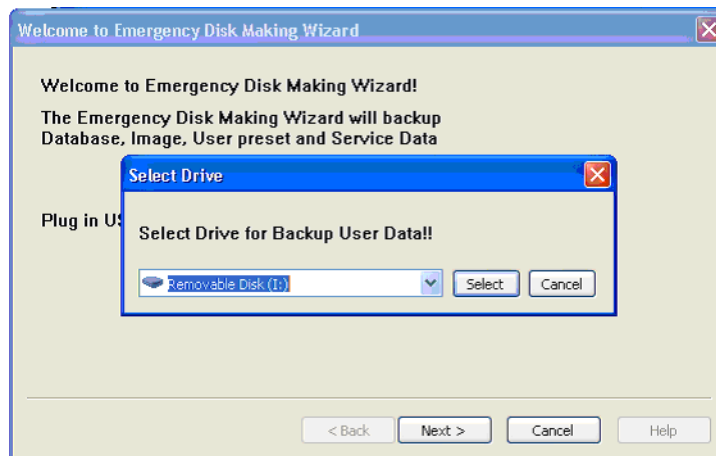
Figure 8-227   Drive select

11.)Verify that USB HDD is in the list.

8-5-3   Full Backup Procedure (cont'd)

12.)If USB HDD with enough space is not already plugged in, plug in one.Then press Next
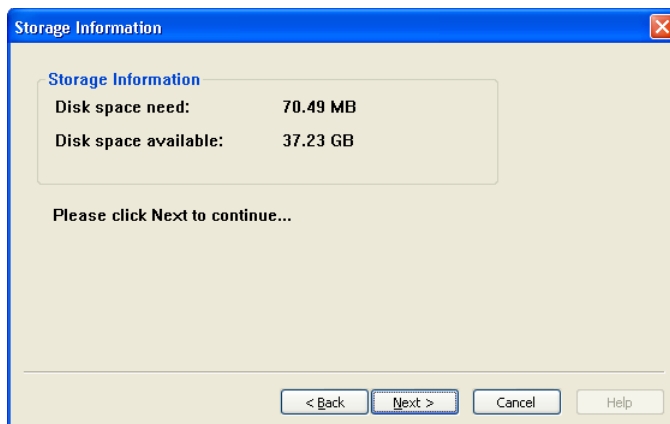
Figure 8-228   Storage Information

13.)Press next to continue. Then the below windows appear.
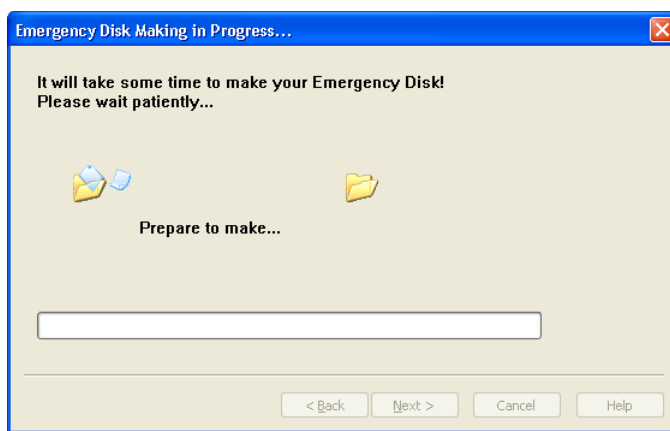
Figure 8-229   Emergency Disk Making Preparation
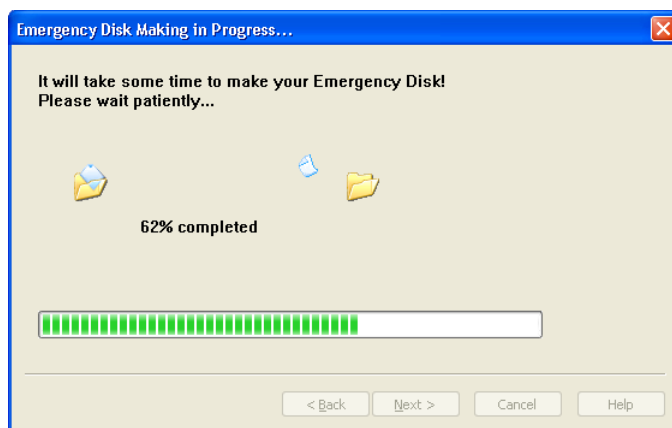
Figure 8-230   Emergency Disk Making in Progress

14.)Verify that "Backup was completed!" message is displayed.

15.)Press Finish to complete.

8-5-4   Restore procedure

1.) From Figure 8-225, press "Restore" button.

2.) Rest of the procedure is the same with "Backup" procedure.

⚠ **NOTICE** **The system should be rebooted after finishing of Restore procedures.**

3.) After reboot,

Press "Patient". Verify that Patient data are restored

Press "Utility". Verify that Userdefined data are restored.

Section 8-6Software Reloading

8-6-1 General

This describes general Software Reloading of C:\ partition functionality.

8-6-2 Software Reloading Procedure

8-6-2-1 Perform Software Reloading in the Service Platform

No media (CD/DVD) is needed to perform this function. This can be done in two ways.

A) By logging on to the Service Platform

B) To access the system remotely.

In case of performing Software Reloading remotely, you will need the assistance of the customer to switch the system back on and put it in disruptive mode.

The following procedure applies to both Locally and Remotely.

1.) Go to Utility->System->General
2.) Press "Date/Time"

Figure 8-231   Date/Time

8-6-2-1   **Perform Software Reloading in the Service Platform** (cont'd)

3.) Press "Time Zone"

Figure 8-232   Time Zone

4.) Register the current Time Zone

Current Time Zone	

Table 8-1 Current Time Zone

5.) Press "Cancel".

6.) Log onto the Service Platform.

7.) Go to "Utilities"->"Common Utilities".

8.) Go to "Utility"->"System"->"About"

Verify that Software version and software build version are same with the ones before the Software Reloading.

8-6-2-1   **Perform Software Reloading in the Service Platform** (cont'd)

9.) Select "Reload System Software"
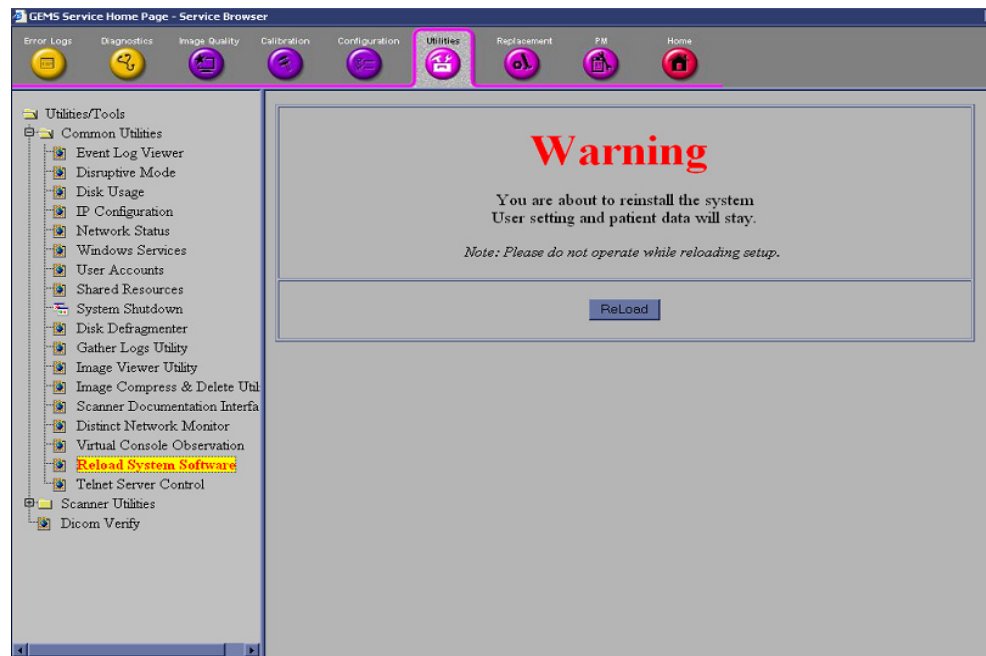
Figure 8-233   Reload system Software

10.)Verify that "Local Archive" is available under Dataflow.

11.)Press "ReLoad".

12.)Confirmation message pops up.

13.)Press "Yes" to proceed.

14.) Progress bar is displayed
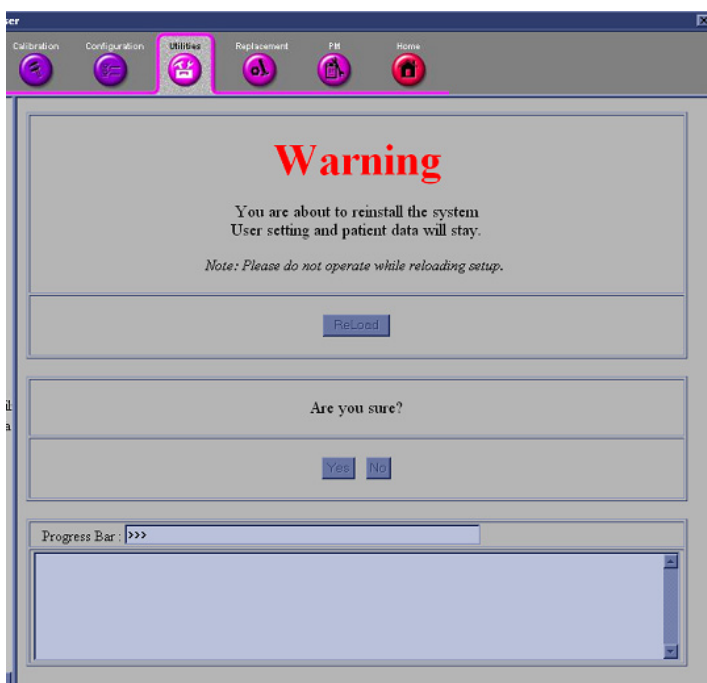
Figure 8-234   Reloading setup in progress

8-6-2-1　　　　**Perform Software Reloading in the Service Platform** (cont'd)

　　15.)Setup is completed successfully

　　　　a.) If you do s/w reloading from the system directly, please shut down the system now.

　　　　b.) For remote s/w reloading, please enable Disruptive mode.
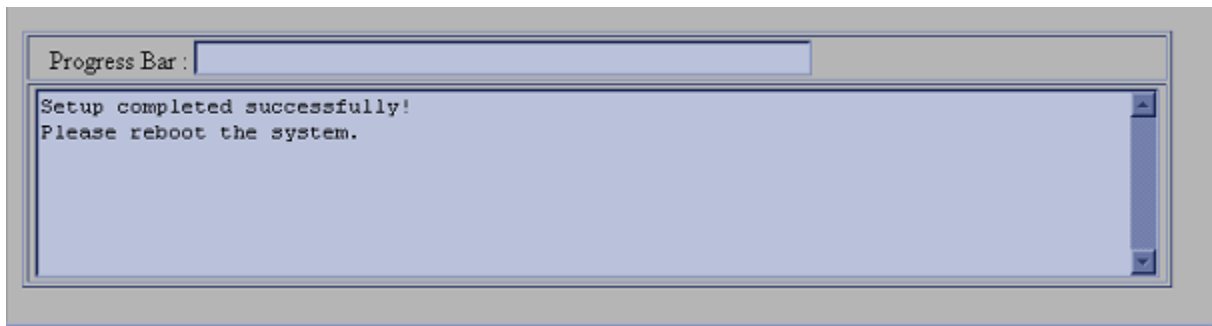
Figure 8-235　setup completed message

　　16.)Press "Disruptive mode"
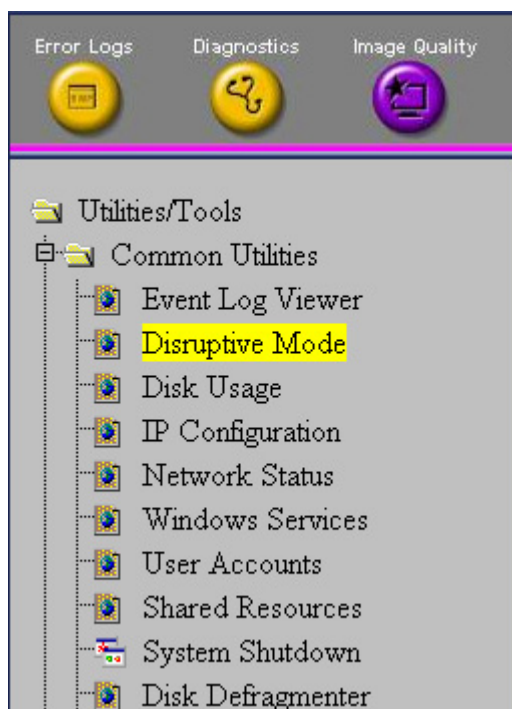
Figure 8-236　Disruptive mode

8-6-2-1 **Perform Software Reloading in the Service Platform** (cont'd)

17.)If "Disruptive Mode Status" is disabled, Press "Yes" to enable disruptive mode.

For the remote reloading, customer has to agree to the diruptive mode. The following window (Figure 8-237) pops up in the system screen and customer has to press "Yes" to enable Disruptive mode.
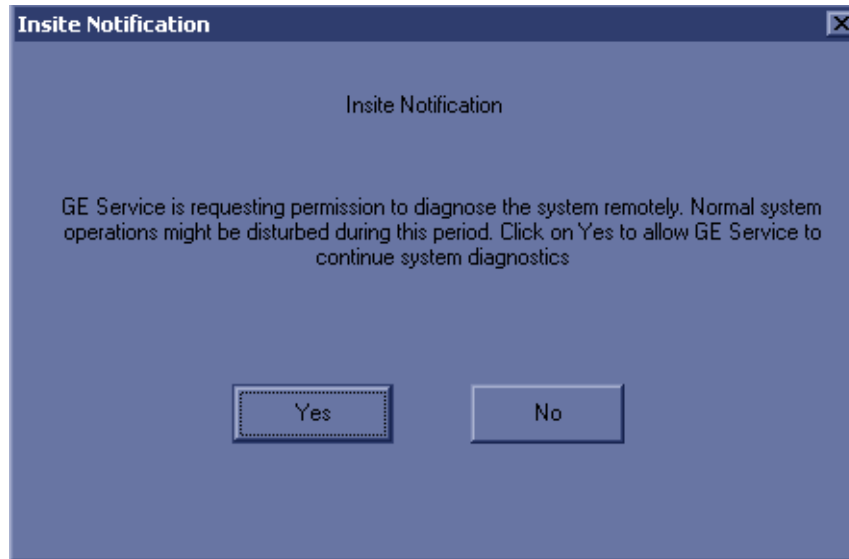
Figure 8-237   Insite Notification

18.)Press "System Shutdown"
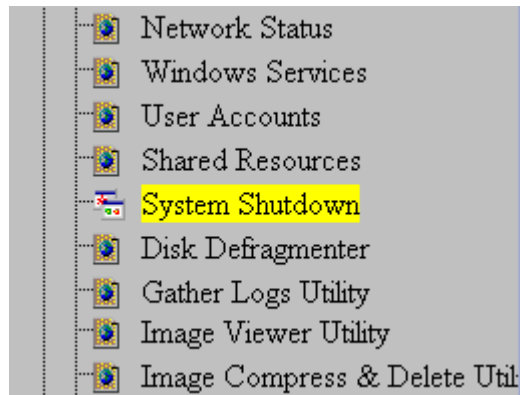
Figure 8-238   System Shutdown

NOTE: *If the service dongle is inserted or the system is logged on to the maintenance mode, "System shutdown" will not work. Please close programs and reboot the system manually.*

8-6-2-1   Perform Software Reloading in the Service Platform (cont'd)

19.)Select "Restart System"
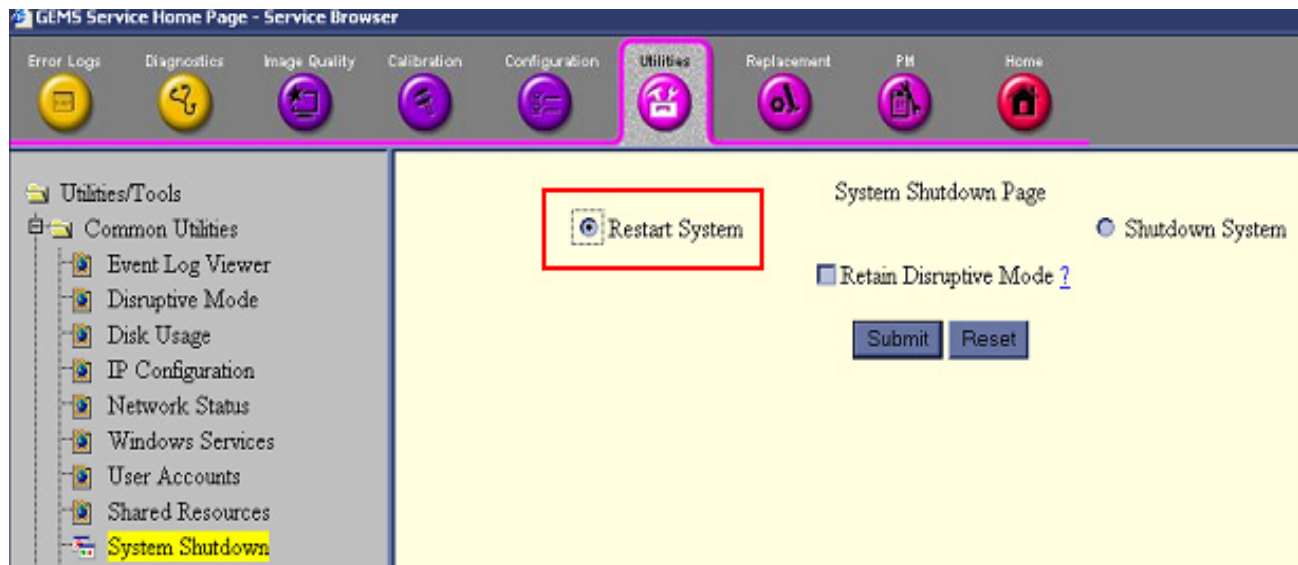
Figure 8-239   Restart System

20.)Press "Submit"

21.)Press "Confirm" when confirmation message is displayed.

22.)After a while, the system restarts automatically.

23.)Verify that correct date and time are displayed correctly.

8-6-2-2 **Software Reloading**

1.) The Base S/W load starts automatically immediately after boot up
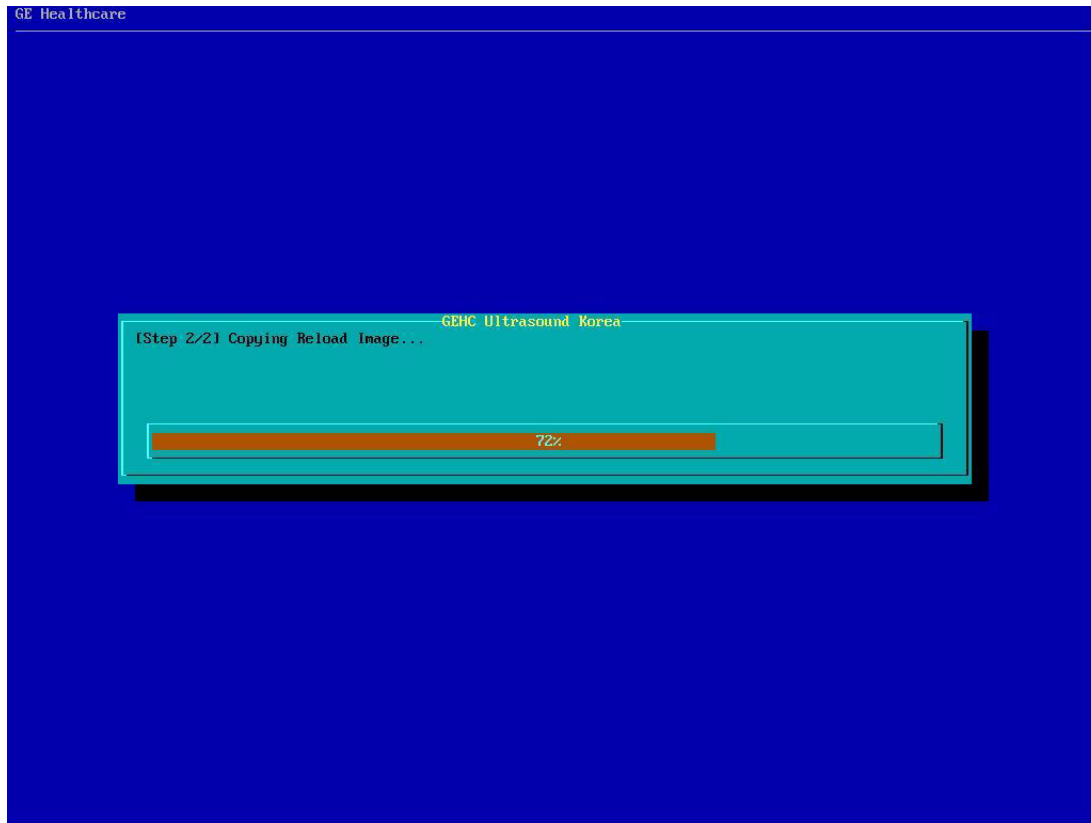
Figure 8-240   Reloading C:\ partition from Reloading Ghost Image

2.) After finishing C: partition reloading, the system restarts automatically.

3.) When the system restarts, an application installation starts automatically.
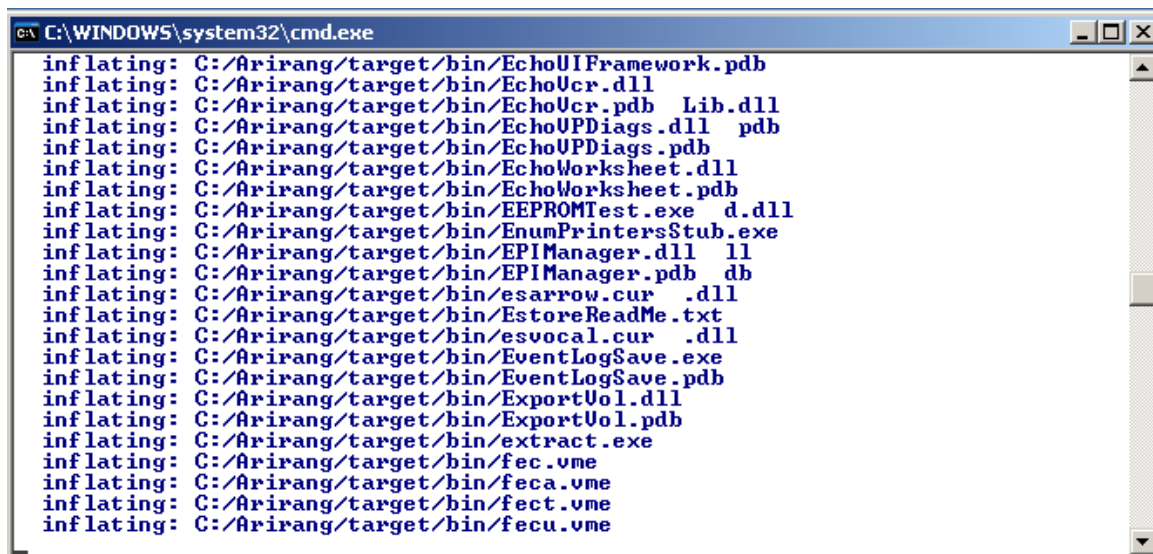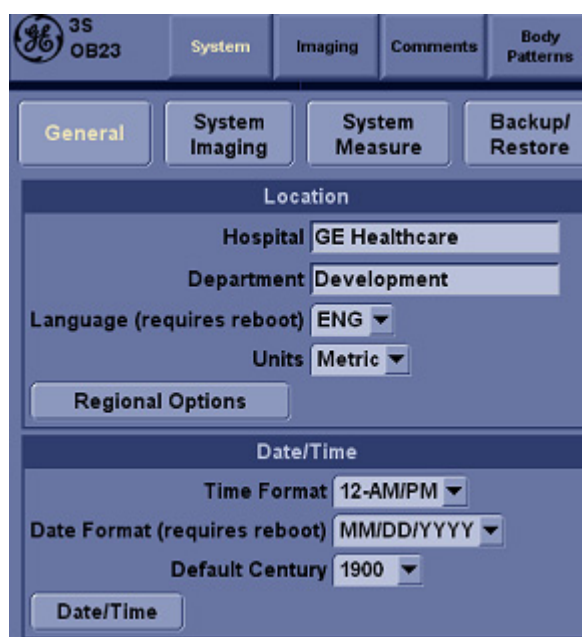
Figure 8-241   Application installation

8-6-2-2 **Software Reloading** (cont'd)

4.) When installation is finished, the system shuts down automatically.

5.) Press Power Button to start the system.

6.) When system fully boots up after the software reloading, please shutdown system again.

NOTE: *For the following procedure, disruptive mode should be approved in order to be in done remotely.*

7.) Start the system.

8.) Press "Patient" button, and verify under Dataflow that "Local Archive" is available. If it's not available, shut down the unit one more time.

9.) To put the Local Time Zone back, Go to Utility->System->General

10.)Click "Date/Time"

Figure 8-242 Date/Time

8-6-2-2   **Software Reloading** (cont'd)
11.)Press Time Zone

Figure 8-243   Time Zone

12.)Change the time zone to the local time zone from Table 1.
13.)Press "Apply"
14.)Press "Date & Time" tab.
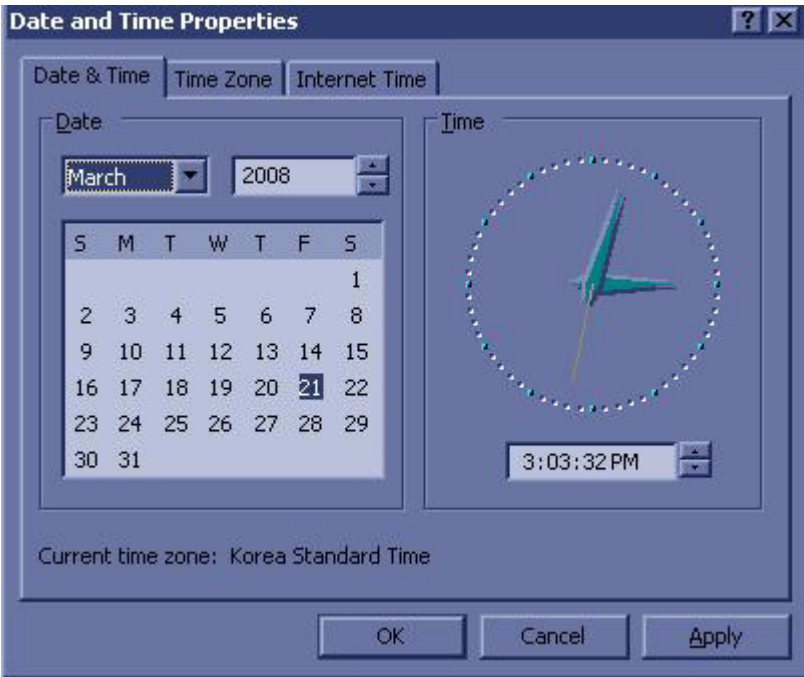
Figure 8-244   Date & Time

8-6-2-2   **Software Reloading** (cont'd)

15.)Change the Date and Time correctly if needed.

16.)Press "Apply"

17.)Press "OK"

18.)Turn off the system.

19.)Start the system.

20.)Check if the correct date and time are displayed.

Figure 8-245   Date and Time check

21.)The software reloading is completed.

Section 8-7
Mechanical Option Installation instruction

These service in subtractions describe the installation procedures of following mechanical options to LOGIQ™ P5.

8-7-1   Endo Probe Holder Installation

1.) Check out the 2 screw holes to be used to install Endo Probe Holder.

Figure 8-246   Endo Probe Holder Installation

2.) Install Endo Probe holder on the bottom side of the Cable Arm Hook by screwing 2 screws(2159634, BH M4x10 WHT).

Figure 8-247   Endo Probe Holder

8-7-2   Microphone Option fixture Installation

1.) Use 2 holes at the bottom of the keyboard.

Figure 8-248   Microphone option holes

2.) Screw 2 screws (5178673, FH M4x6 WHT) to fix the Microphone fixture.
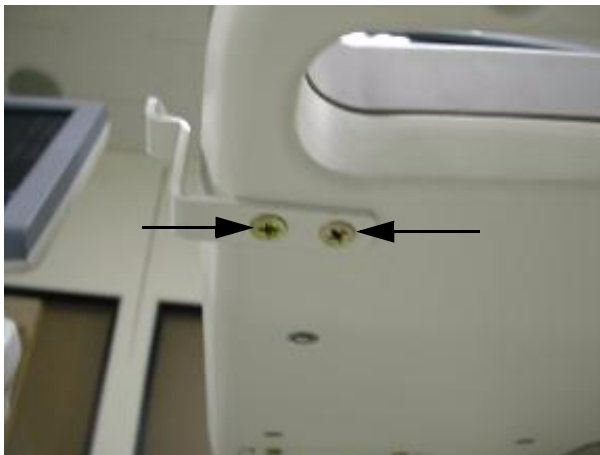
Figure 8-249   installation of Microphone

8-7-3   BT11 BW Printer Option Installation

1.) This section describes the installation procedure of the BW Printer option.

2.) Assemble the BW PRINTER to BW PRINTER FIX BRKT with screwing 4 screws (2306562, FH M3X6).
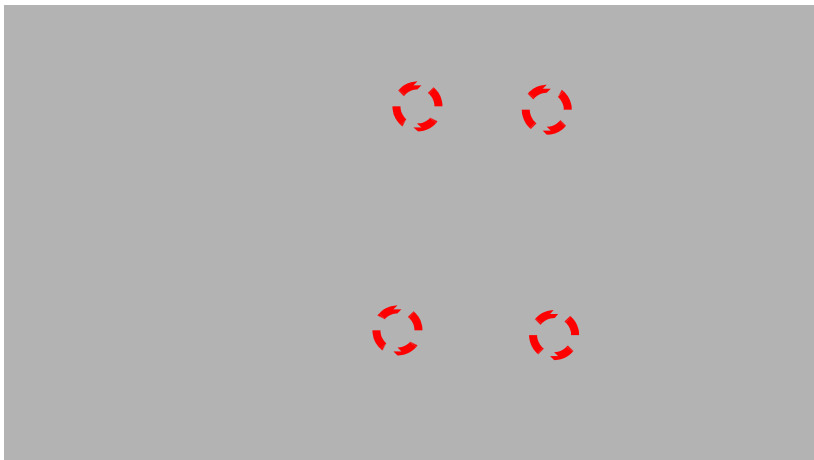
Figure 8-250   BT11 BW PRINTER Option Installation

3.) Assemble the BT11 BW PRINTER ASSY to SYSTEM using 2 SCREWS (5176744, BH M4X20).

Figure 8-251   BT11 BW PRINTER Option Installation

8-7-3   BT11 BW Printer Option Installation (cont'd)

4.) Connect the PRT CABLE ASSY 3 (5168835-2) between BW PRINTER and SYSTEM REAR PANEL.

Attach the CABLE MOUNT (5399222) on the REAR COVER and fix the cable as the picture below.
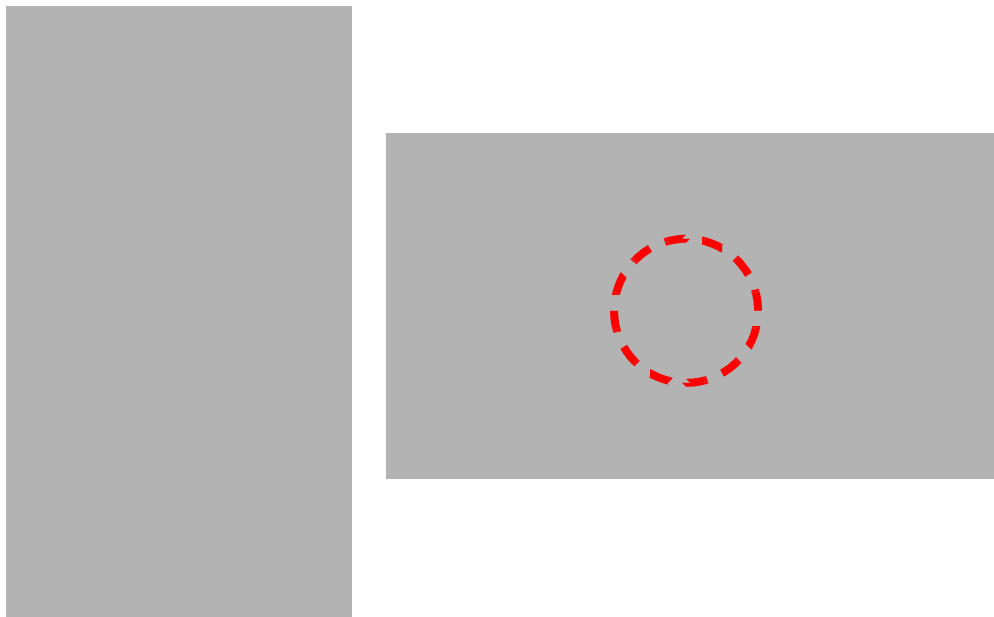
Figure 8-252   BT11 BW PRINTER Option Installation

5) Finished feature of BW PRINTER option.

Figure 8-253   BT11 BW PRINTER Option Installation

8-7-4   Drawer Option installation

1.) Push the drawer from the front to the rear direction.

Figure 8-254   Drawer Option Installation

2.) Unscrew 2 existing screws from the middle cover.

3.) Using the bracket, fix the drawer by screwing 3 screws each of left and right side of the drawer.

2337572
(Screw, FH M3x6 WHT)
5176744
(Screw, BH M4x20 WHT)

Middle Cover

Figure 8-255   Installation of Drawer Option

8-7-5   Cable Arm Hook installation

1.) Cable Arm Hook should be installed in prior to installing Probe Cable Hanger, or Endo Probe Holder.

2.) Unscrew 1 existing screw(2159634, BH M4x10 WHT) from the rear side of the keyboard.

Figure 8-256   Cable Arm Hook installation

3.) Screw 2 screws(2306565 BH M4x16 WHT, 2159634 BH M4x10 WHT) to fix the Cable Arm hook. User longer screw provide on the upper hole, and use existing screw removed in the step 2 on the figure below.
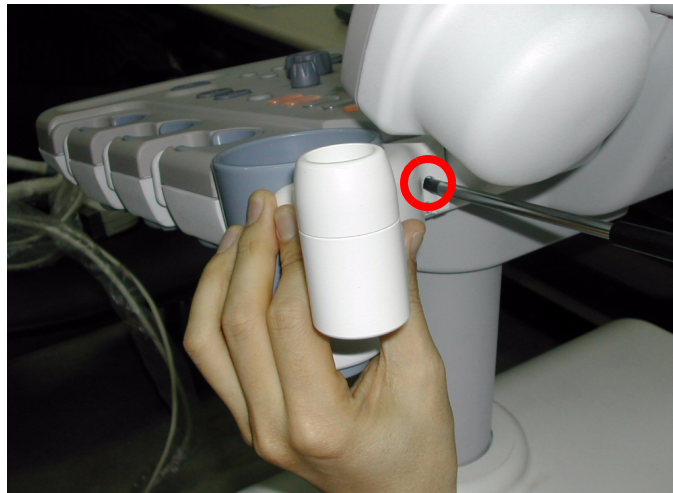
Figure 8-257   Cable Arm Hook installation

8-7-6   BW Printer Fixture Keyboard installation

1.) Put loctite 290 on the screw(2159634, BH M4X10 WHT) edge.

Figure 8-258   BW Printer Fixture Keyboard installation

2.) Fix the BW printer cover beneath the keyboard by the screw(2159634, BH M4X10 WHT).
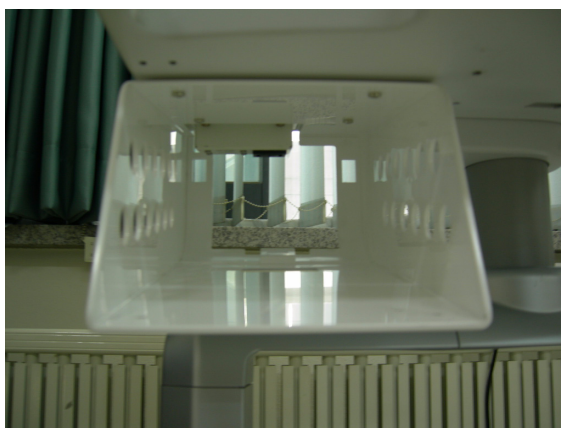
Figure 8-259   BW Printer Cover Keyboard installation

3.) Fix the BW printer base bracket to the BW Printer by screwing 4 screws(2306562, FH M3x6 YEL)
(1-4).
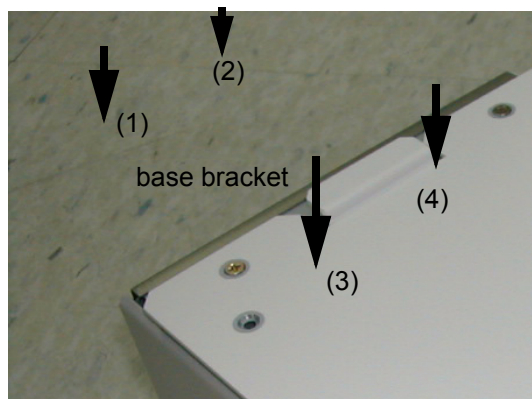
Figure 8-260   BW Printer Fixture Keyboard installation

8-7-6   BW Printer Fixture Keyboard installation (cont'd)

4.) Slide and place the BW printer with printer plate to the BW printer cover and screw 2 screws (5178673, FH M4x6 WHT) (1-2) to fix it.

Figure 8-261   BW Printer Fixture Keyboard installation

5.) Connect the Power Cable and USB Cable from the printer to the system and tie the cable properly.
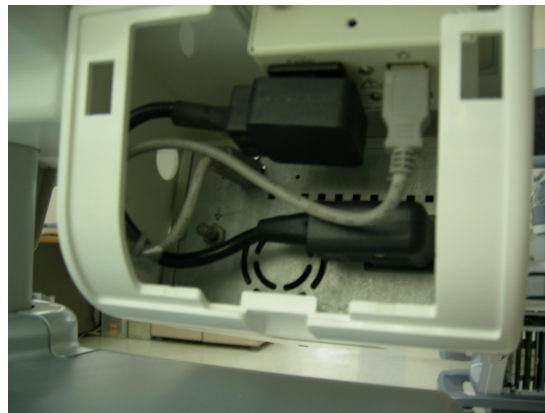
Figure 8-262   BW Printer Fixture Keyboard installation

8-7-6   BW Printer Fixture Keyboard installation (cont'd)

6.) Install the BW Printer rear cover.

a.) Push the BW Printer rear cover to the rear of BW printer cover.

b.) Fix the hook of BW Printer rear cover on the BW Printer cover.

c.) Push the bottom of BW printer rear cover and install the rear cover.
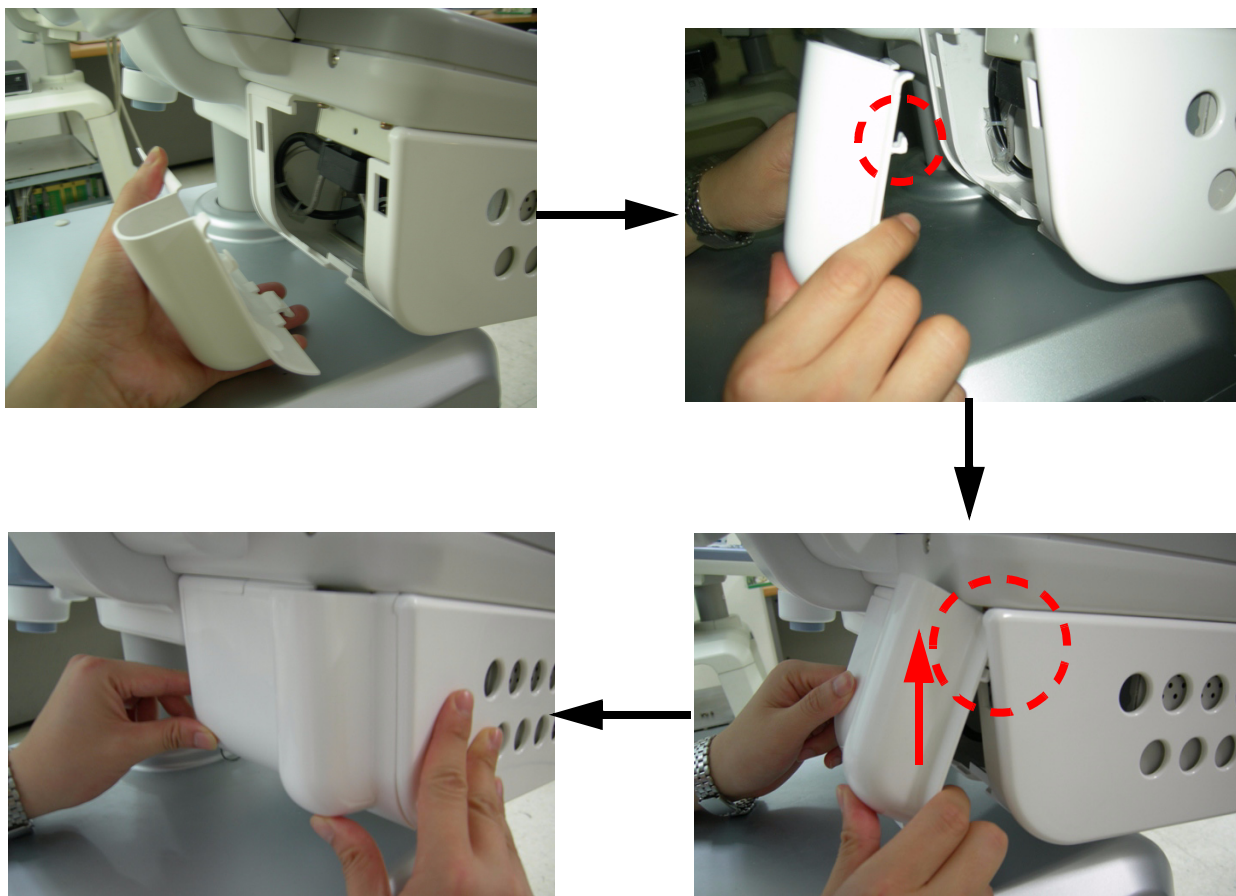
Figure 8-263   BW Printer Fixture Keyboard installation

8-7-7   BW printer Fixture Middle installation

1.) Install BW Printer on the top of the base bracket by screwing 4 screws(2306562, FH M3x6 YEL).
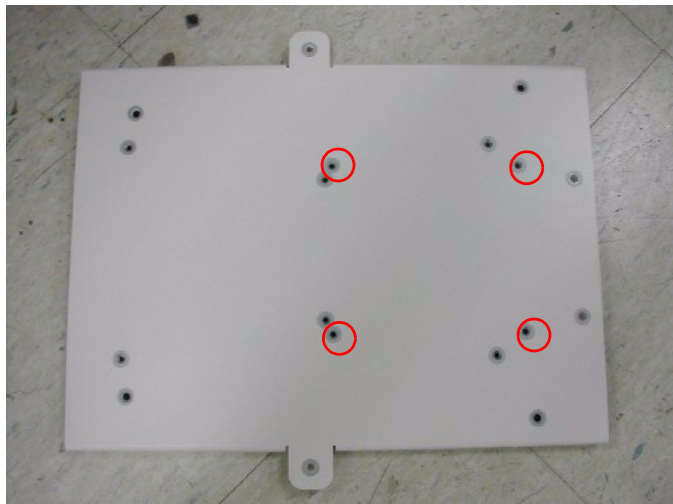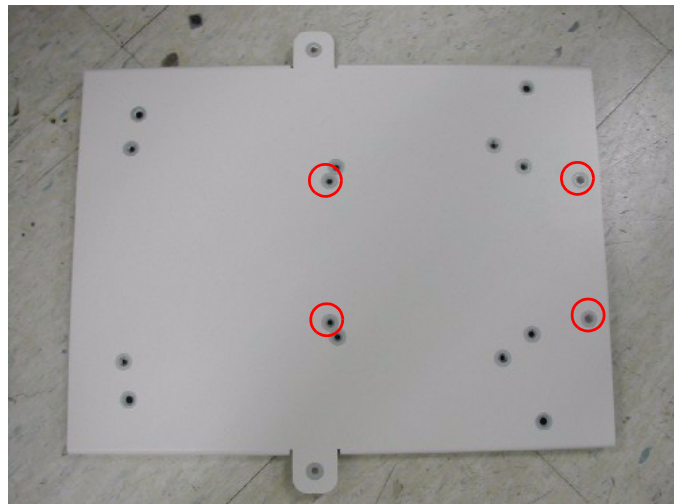
Mitsubishi P93DW   **SONY UP-D897**

Figure 8-264   BW Printer Fixture Middle installation

2.) Unscrew 2 existing screw from the middle cover.

3.) Place the BW printer with base bracket on the middle cover and screw 2 screws(5176744, BH M4x20 WHT) to fix it.

Figure 8-265   BW Printer Fixture Middle installation

8-7-7 **BW printer Fixture Middle installation** (cont'd)

4.) Connect the USB cable and power cable from the printer to the system.

Figure 8-266   BW Printer Fixture Middle installation

5.) Install BW hide bracket to the rear side of the BW printer and screw 2 screws(2159633, BH M4x8 WHT) to fix it.
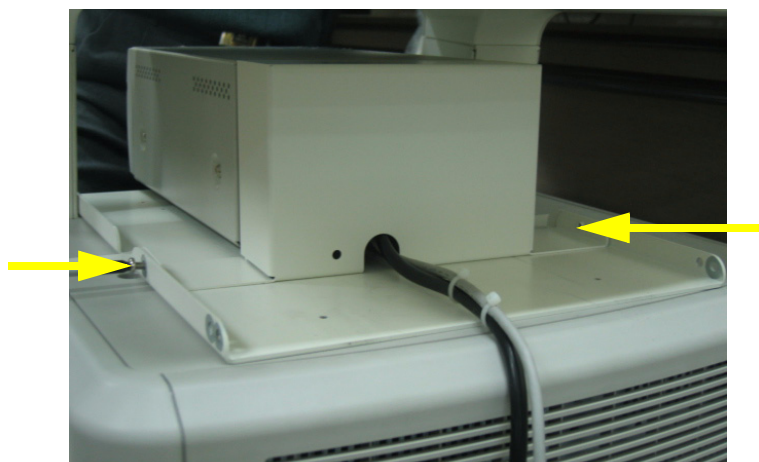
Figure 8-267   BW Printer Fixture Middle installation

6.) Tie the cables using the tie wrap as illustrated in the figure below.

Figure 8-268   BW Printer Fixture Middle installation

8-7-8   Color Printer Fixture Middle installation - UP23MD Printer

1.) Install color printer on the top of the base bracket by screw 4 screws(2306562, FH M3x6 YEL).
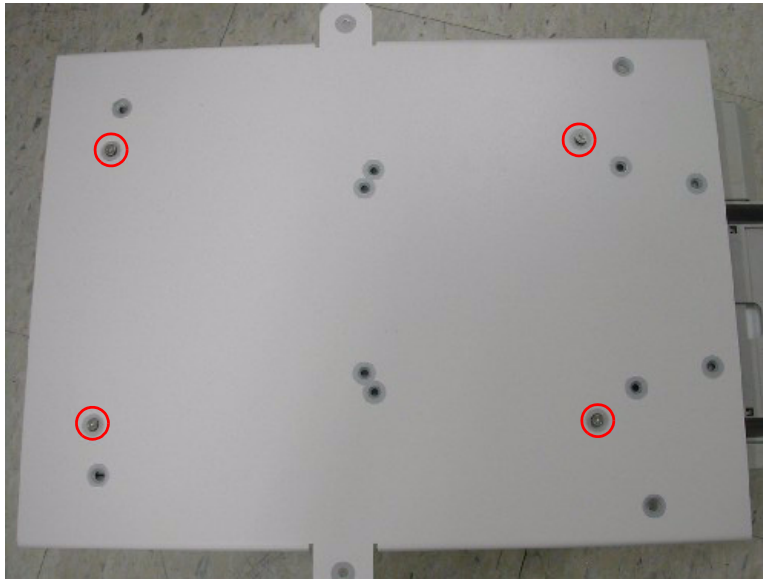
Figure 8-269   Color Printer Fixture Middle installation

2.) Unscrew 2 existing screws from the middle cover.

3.) Screw 1 screw (5176744, BH M4x20 WHT) on each side of the system to fix the Color printer with base bracket to the system.
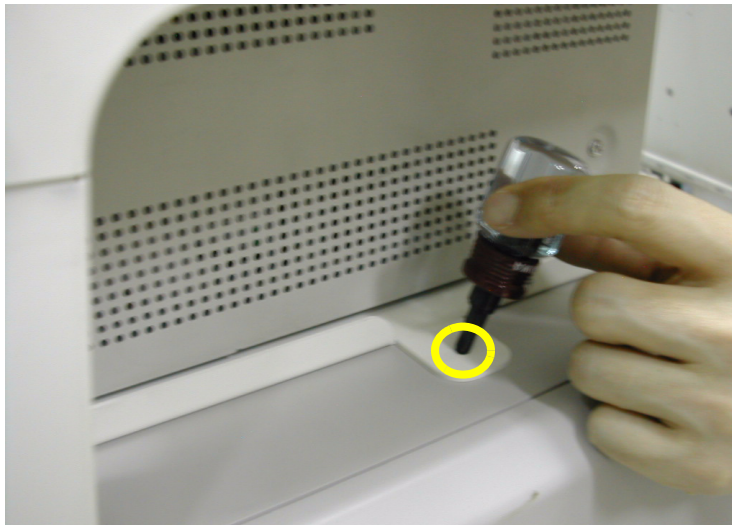
Figure 8-270   Color Printer Fixture Middle installation

8-7-8   Color Printer Fixture Middle installation - UP23MD Printer (cont'd)

4.) Connect the USB cable and Power cable from the color printer to the system as shown in the figure below.

Figure 8-271   Color Printer Fixture Middle installation

5.) Install Color printer hide bracket and screw 4 screws(2159633, BH M4x8 WHT) to fix it.

Figure 8-272   Color Printer Fixture Middle installation

6.) Tie the cables using the tie wrap as illustrated in the figure below.

Figure 8-273   Color Printer Fixture Middle installation

8-7-9   Color Printer Fixture Middle installation - UP-D25MD Printer

1.) Install color printer on the top of the base bracket by screw 4 screws(2306562, FH M3x6 YEL).
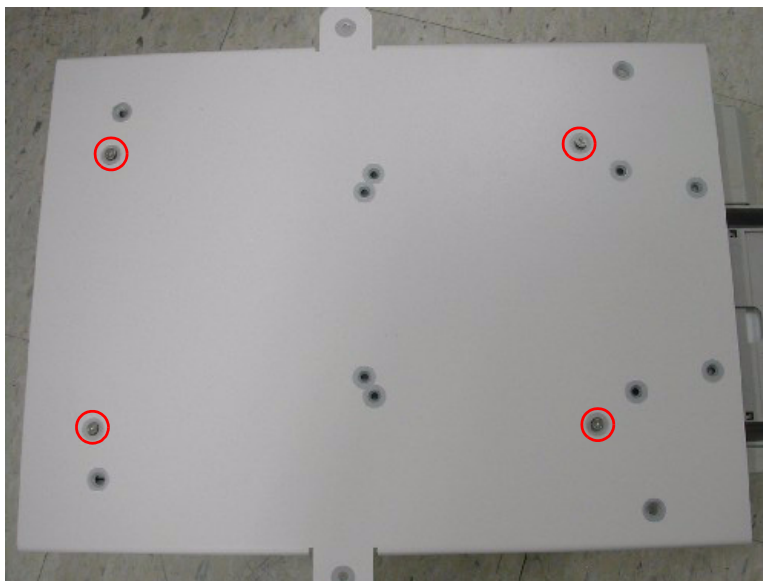
Figure 8-274   Color Printer Fixture Middle installation

2.) Unscrew 2 existing screws from the middle cover.

3.) Screw 2 screws (5176744, BH M4x20 WHT) on each side of the system to fix the Color printer with base bracket to the system.
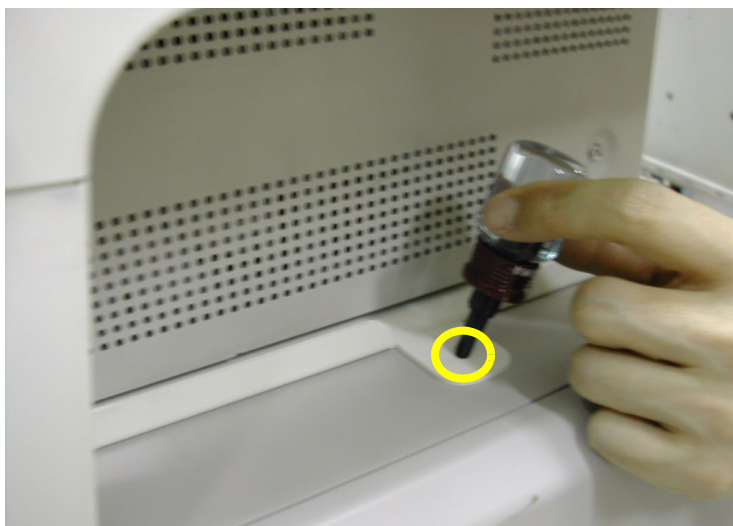
Figure 8-275   Color Printer Fixture Middle installation

8-7-9 **Color Printer Fixture Middle installation - UP-D25MD Printer** (cont'd)

4.) Connect the USB cable and Power cable from the color printer to the system as shown in the figure below.

Figure 8-276   Color Printer Fixture Middle installation

5.) Install Mid Color Cable Bracket and screw 4 screws(2159633, BH M4X8) to fix it.

Figure 8-277   Color Printer Fixture Middle installation

6.) Tie the cables using the tie wrap as illustrated in the figure below.

Figure 8-278   Color Printer Fixture Middle installation

8-7-10 Printer VCR DVD Fixture Top installation - UP23MD Printer

1.) Unscrew 2 existing screws from the top cover.
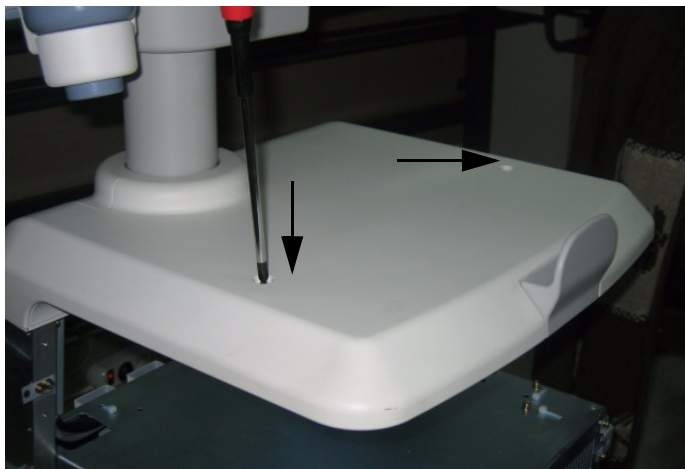
Figure 8-279   Printer VCR DVD Fixture installation top

2.) Install Fixture DVD bot bracket on the top cover by screwing 2 screws(2327592, FH M4x14 YEL).
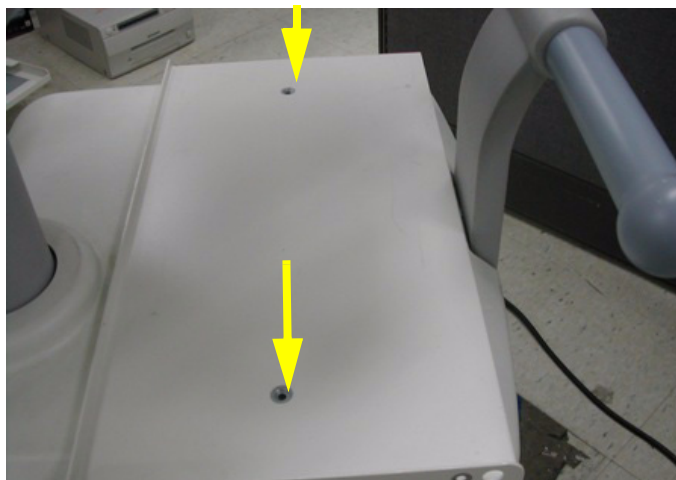
Figure 8-280   Printer VCR DVD Fixture installation top

3.) Install color printer to the DVD top bracket by screwing 4 screws(2306562, FH M3x6 YEL).
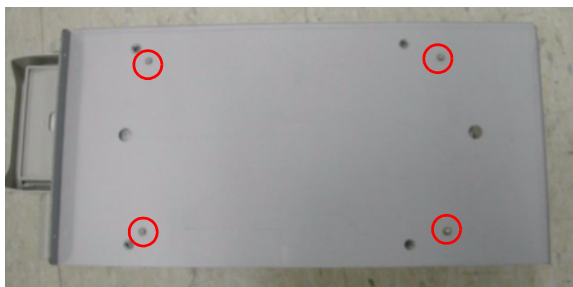
Figure 8-281   Printer VCR DVD Fixture installation top

8-7-10   Printer VCR DVD Fixture Top installation - UP23MD Printer (cont'd)

4.) Screw 4 screws(2159633, BH M4x8 WHT) on both sides to fix the color printer and DVD with top bracket to the color printer top bracket.

Figure 8-282   Printer VCR DVD Fixture installation top

5.) Connect the USB cable and Power cable from the color printer and DVD to the system. For more wiring information, refer to the Basic Service Manual.

6.)   Install hide bracket by screwing 2 screws(2159633, BH M4x8 WHT).

Figure 8-283   Printer VCR DVD Fixture installation top

7.) Tie the cable properly using the tie wrap.

8-7-11   Color Printer Fixture Top Installation - UP-D25MD Printer

1.) Unscrew 2 existing screws from the top cover.
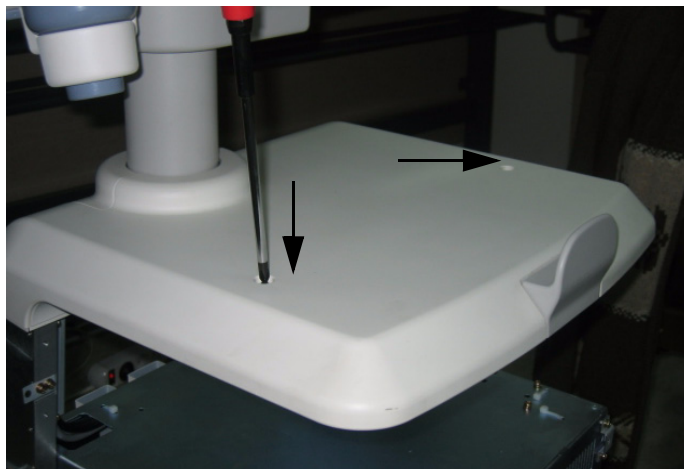
Figure 8-284   Color Printer Fixture Top Installation

2.) Connect the USB cable and Power cable to the Color Printer.

Figure 8-285   Color Printer Fixture Top Installation

3.) Install Fixture DVD bot bracket on the top cover by screwing 2 screws (2327592, FH M4x14).
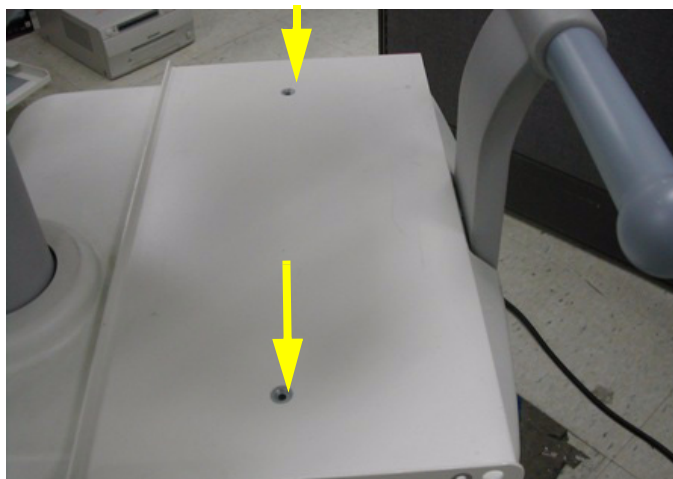
Figure 8-286   Color Printer Fixture Top Installation

Section 8-7 - Mechanical Option Installation instruction

8-7-11   Color Printer Fixture Top Installation - UP-D25MD Printer (cont'd)

4.) Install Top Cable BRKT_UPD25MD by screwing 2 screws(2159633, BH M4X8).
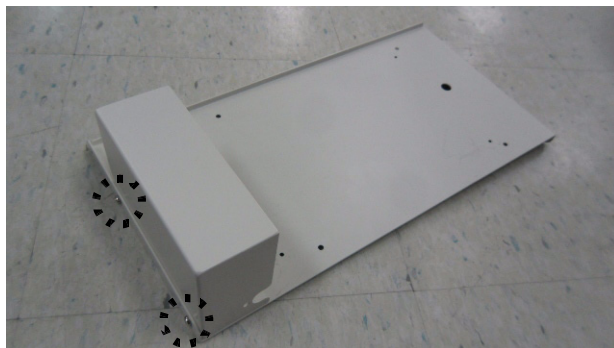
Figure 8-287   Color Printer Fixture Top Installation

5.) Install Color Printer to the DVD top Bracket by screwing 4 screws (2306562, FH M3X6).

Figure 8-288   Color Printer Fixture Top Installation

6.) Screw 4 screws(2159633, BH M4X8) on both sides to fix the color printer with TOP Bracket to the color printer bottom bracket.
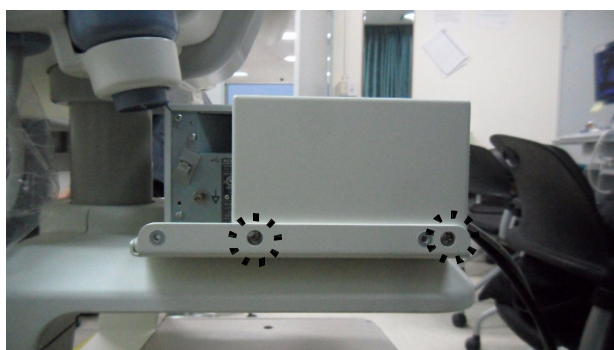
Figure 8-289   Color Printer Fixture Top Installation

8-7-11 Color Printer Fixture Top Installation - UP-D25MD Printer (cont'd)

7.) Connect the USB cable and Power Cable to the system.

8.) Tie the cables using the tie wrap.
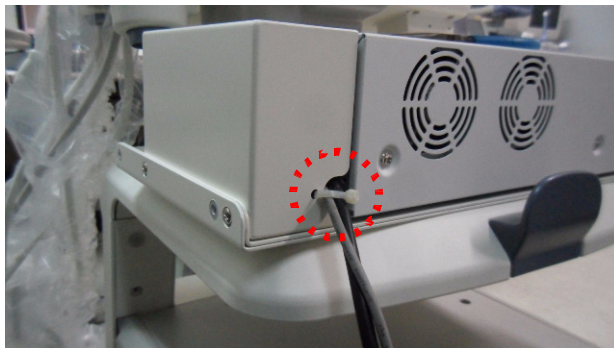
Figure 8-290   Color Printer Fixture Top Installation

8-7-12 Printer VCR DVD fixture Top installation - CP900 Printer

1.) Unscrew 2 existing screws from the top cover.
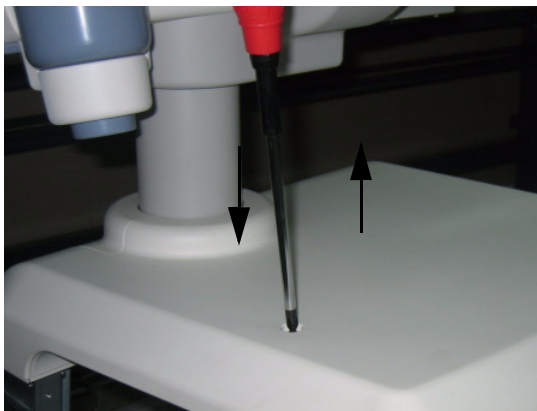
Figure 8-291   Printer VCR DVD Fixture Top installation

2.) Install Fixture VCR bot bracket on the top cover by screwing 2 screws(2306565, BH M4x16 WHT).
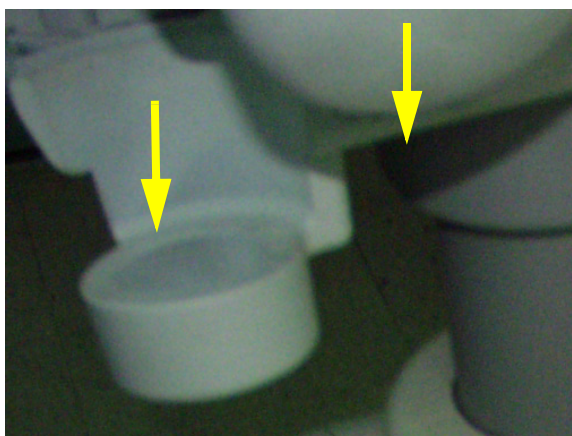
Figure 8-292   Printer VCR DVD Fixture Top installation

3.) Install color printer to the VCR top bracket by screwing 4 screws(5161586, M3x8 WHT).
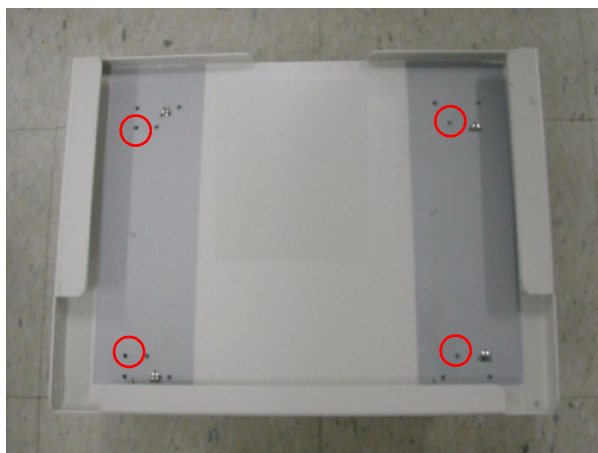
Figure 8-293   Printer VCR DVD Fixture Top installation

8-7-12 **Printer VCR DVD fixture Top installation - CP900 Printer** (cont'd)

4.) Screw 2 screws(2159633, BH M4x8 WHT) on each sides to fix the color printer with base bracket to the color printer top bracket.
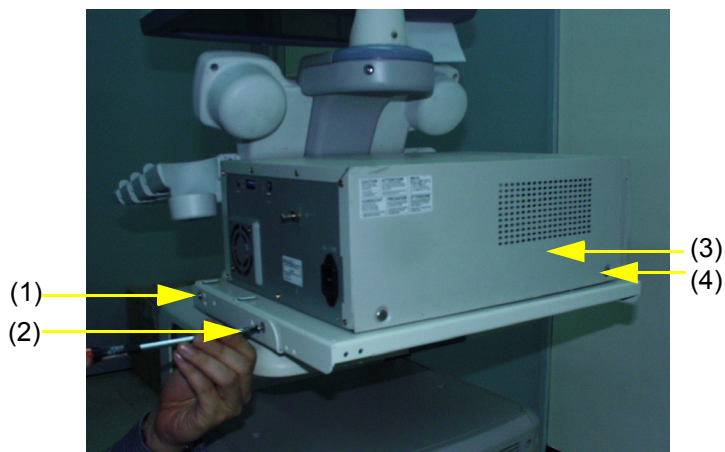
Figure 8-294 Printer VCR DVD Fixture Top installation

5.) Connect the USB from the color printer as shown in the figure below.

Figure 8-295 Printer VCR DVD Fixture Top installation

6.) Connect the cable from the color printer to the system.

Figure 8-296 Printer VCR DVD Fixture Top installation

8-7-12   Printer VCR DVD fixture Top installation - CP900 Printer (cont'd)

7.) Install hide bracket by screwing 3 screws(2159633, BH M4x8 WHT).

Figure 8-297   Printer VCR DVD Fixture Top installation

8.) Tie the cable properly using the tie wrap.

8-7-13   Printer VCR DVD Fixture Top Installation (MD-3000)

8-7-13-1   VCR Remote Port Configuration

1.) LOGIQ™ P5 control the Mitsubishi MD-3000 VCR through USB. Hence the VCR remote control port must be configured as USB

2.) Open the remote control module in the VCR.
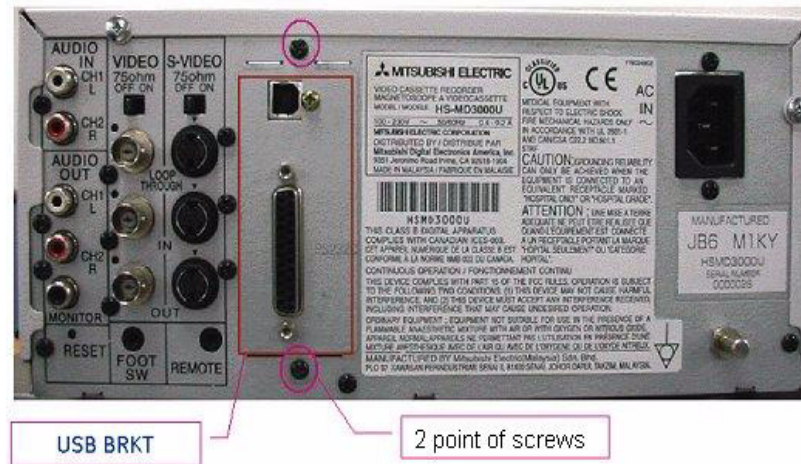
Figure 8-298   VCR Remote Control Panel

3.) Unscrew 2 screws on the VCR remote control port panel and out the remote control module from VCR. Unscrew 1 screw on the module.
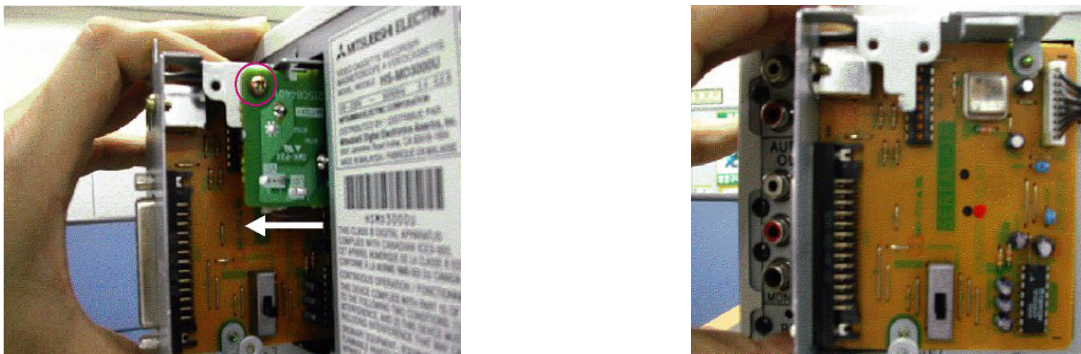
Figure 8-299   VCR Remote Control Panel 2

8-7-13-1   **VCR Remote Port Configuration** (cont'd)

4.) Set the DIP switch on the VCR remote control panel. The SW 7 in DIP switch should be set to "ON" position for the USB remote control.
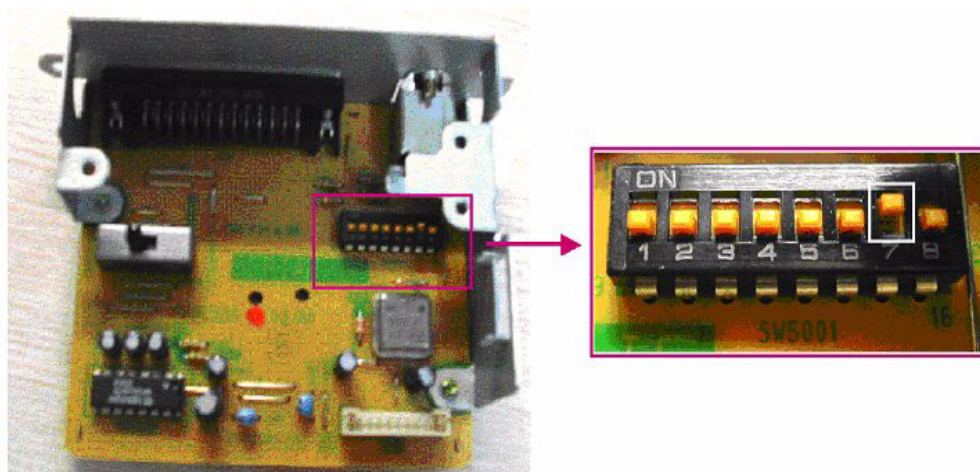
Figure 8-300   DIP Switch on the Panel

5.) Insert the remote control module into the VCR and connect the USB cable between the "Remote" USB on the console rear panel and USB port of VCR.

6.) Plug the service dongle and turn on the VCR and System.

7.) Login to maintenance mode and open the device manager.

8.) Check if the VCR remote device is identified by OS.
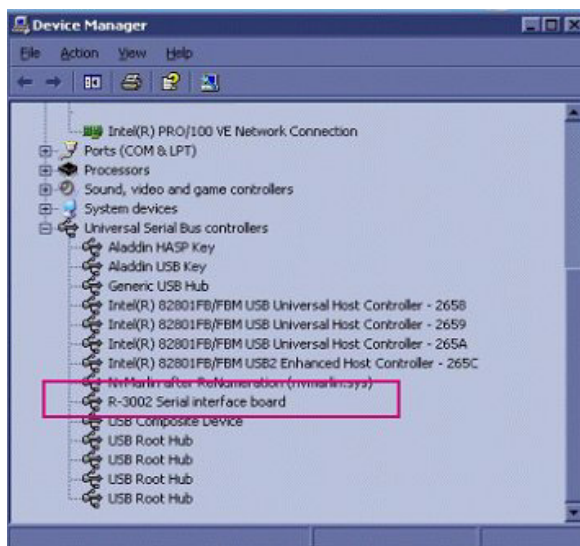
Figure 8-301   Remote device in the device manager

8-7-13-2   Bracket Installation

1.) Unscrew 2 existing screws from the top cover.
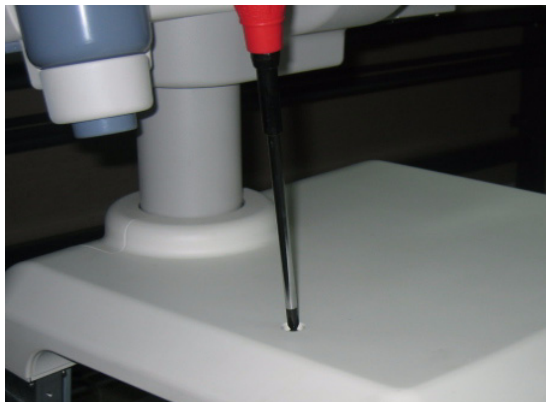
Figure 8-302   Printer VCR DVD Fixture Top installation

2.) Install Fixture Top bracket on the top cover by screwing 2 screws(2306565, BH M4x16 WHT).
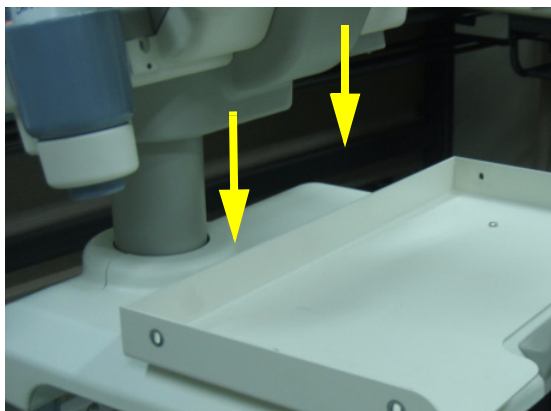
Figure 8-303   Printer VCR DVD Fixture Top installation

3.) Install VCR recorder to the base bracket by screwing 4 screws(2159634, BH M4x10 WHT).
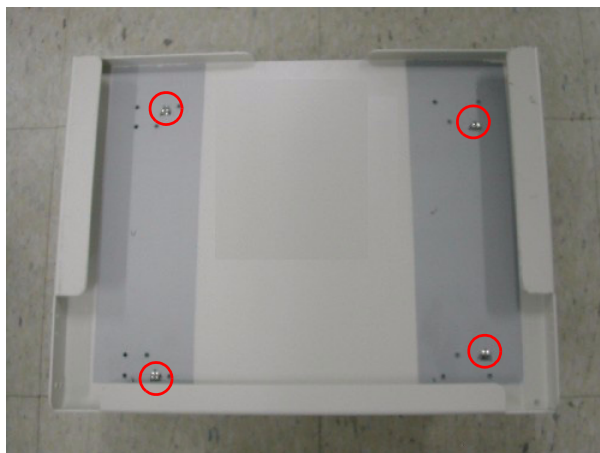
Figure 8-304   Printer VCR DVD Fixture Top installation

8-7-13-2 **Bracket Installation** (cont'd)

4.) Screw 2 screws(2159633, BH M4x8 WHT) on each side of the system to fix the VCR recorder with base bracket to the VCR top bracket.

Figure 8-305 Printer VCR DVD Fixture Top installation

5.) Connect the cables (Power Cable, USB cable, S-VHS Cable, and Sound cables) from the VCR to the system.

Figure 8-306 Printer VCR DVD Fixture Top installation

6.) Connect the cables to the system on the rear panel.

Figure 8-307 Printer VCR DVD Fixture Top installation

8-7-13-2 Bracket Installation (cont'd)

7.) Connect the cables (Power Cable, USB cable, S-VHS Cable, and Sound cables) from the VCR to the system.

Figure 8-308   Printer VCR DVD Fixture Top installation

8.) Connect the cables to the system on the rear panel.

Figure 8-309   Printer VCR DVD Fixture Top installation

9.) Install VCR hide bracket by screwing 3 screws(2159633, BH M4x8 WHT).

Figure 8-310   Printer VCR DVD Fixture Top installation

8-7-14   Printer VCR DVD Fixture Top Installation (MD-800)

1.) Unscrew 2 existing screws from the top cover.
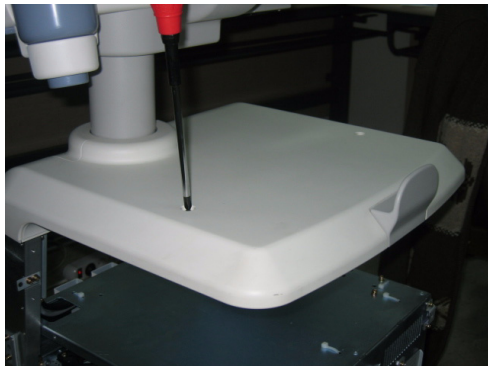
Figure 8-311   Printer VCR DVD Fixture Top installation (LQ MD800)

2.) Install Fixture DVD bot bracket on the top cover by screwing 2 screws(2327592, FH M4x14 YEL).
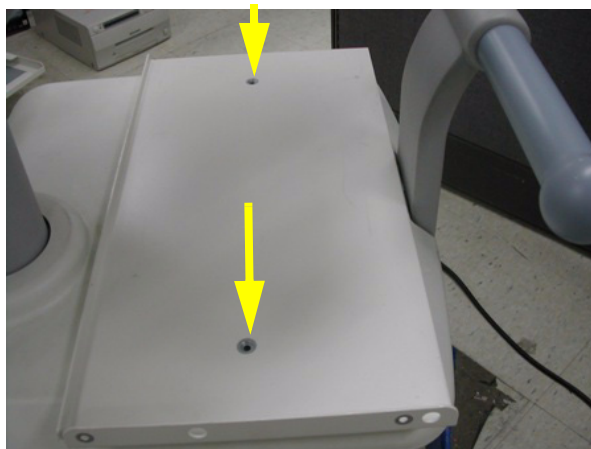
Figure 8-312   Printer VCR DVD Fixture installation top

3.) Install Fixture Top bracket on the top cover by screwing 4 screws(2373565, FH M4x20).
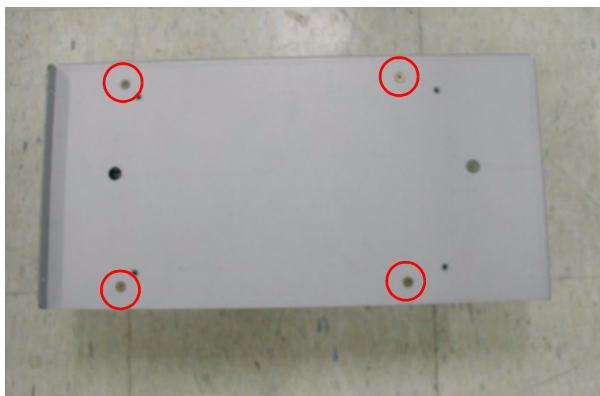
Figure 8-313   Printer VCR DVD Fixture Top installation (LQ MD800)

8-7-14   **Printer VCR DVD Fixture Top Installation (MD-800)** (cont'd)

4.) Install DVD recorder to the base bracket by screwing 2 screws(2159633, BH M4x8 WHT) on each side.

Figure 8-314 Printer VCR DVD Fixture Top installation (LQ MD800)

5.) Connect the USB cable and power cable from the DVD to the system.

Figure 8-315 Printer VCR DVD Fixture Top installation (LQ MD800)

6.) Connect the cables to the system on the rear panel.

Figure 8-316 Printer VCR DVD Fixture Top installation (LQ MD800)

8-7-14   Printer VCR DVD Fixture Top Installation (MD-800) (cont'd)

7.) Install DVD hide bracket by screwing 2 screws(2159633, BH M4x8).

Figure 8-317   Printer VCR DVD Fixture Top installation (LQ MD800)

8-7-15   Rear Handle installation

1.) Unscrew 2 screws (1-2) and remove Rear hook.

Figure 8-318   Rear Handle Installation

2.) Unscrew 2 screws (1-2) and remove the rear handle bracket.

Figure 8-319   Rear Handle Installation

8-7-15   Rear Handle installation (cont'd)

3.) Screw 2 screws(5172296, HSH M8x25) from the back of the rear handle.
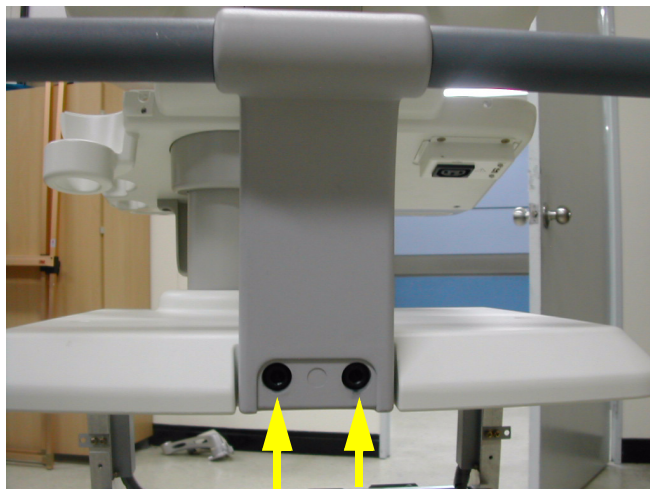
Figure 8-320   Rear Handle Installation

4.) Screw 1 screw(5178673, FH M4x6 WHT) and Install handle dummy bracket.

(1)

Figure 8-321   Rear Handle Installation

8-7-16   Additional Task Lamp installation

1.) This is the installation instruction of additional task lamp.

Figure 8-322   Additional Task Lamp Installation

2.) Connect the USB connector to the location of light bulb mark.

Figure 8-323   Additional Task Lamp Installation

3.) Install plastic holder to the task lamp bracket.
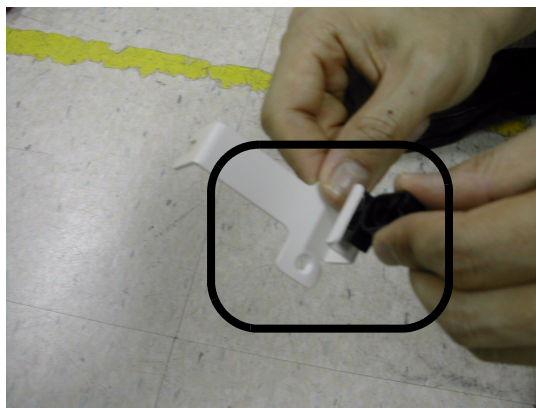
Figure 8-324   Additional Task Lamp Installation

8-7-16   **Additional Task Lamp installation** (cont'd)

    4.) Install task lamp bracket to the rear side of keyboard by screwing 2 screws(5178673, FH M4x6 WHT).
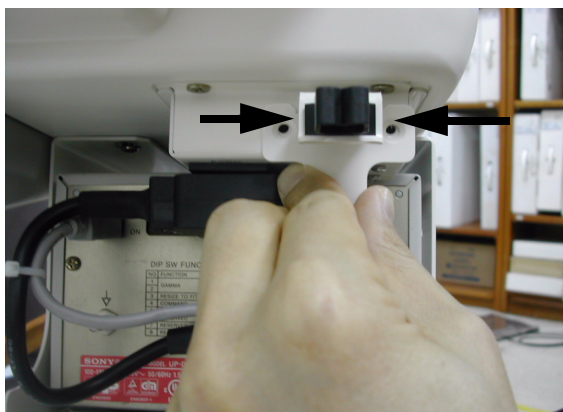
Figure 8-325   Additional Task Lamp Installation

    5.) Fix the task lamp light as shown on the figure below.

Figure 8-326   Additional Task Lamp Installation

    6.) Install BW hide bracket if it is uninstalled during the installation process.

Figure 8-327   Additional Task Lamp Installation

8-7-17 Protect Cover Installation

1.) Refer to the figure below the location of the protect covers to be installed.

Front Protect Cover   Rear Protect Cover
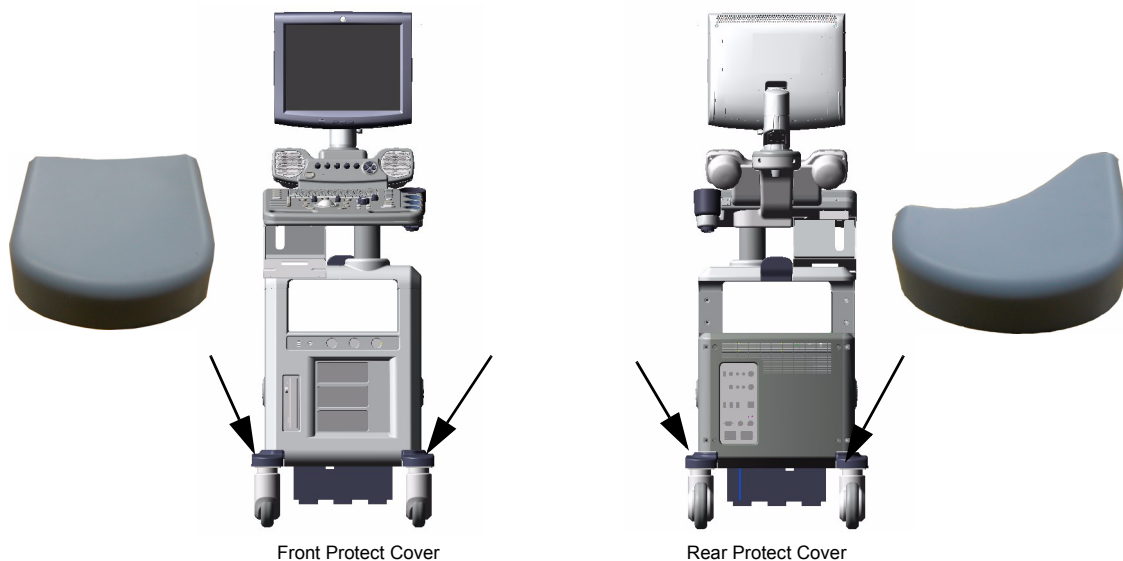
Figure 8-328   Protect Cover Installation

2.) Install the protect cover using the double stick tape.

Figure 8-329   Protect Cover Installation

8-7-18   Swivel Lock Caster Installation

NOTE: *Both Front Casters and Rear Casters are swivel type in LOGIQ™ A5 but in LOGIQ™ A5, only Front Casters are swivel type (Rear Casters are "Fixed" type).*

1.) This is the installation instruction of the Protect Cover. Refer to the figure below for the location of the protect covers to be installed.

2.) Lift the system up front and fix it not to move during installation.

3.) Unscrew 8 screws (1A-8A) to remove the existing front casters. Refer to the figure below. keep the screws for use.

4.) Replace them to Swivel Lock Casters by screwing 8 screws (1A-8A).

Figure 8-330   Swivel Lock Caster

8-7-19   LOGIQ A5 Rear Swivel Caster Installation

1.) Refer to the figure below for the location of the Rear Swivel Caster to be installed.

2.) Lift the system up front and fix it not to move during installation.

3.) Unscrew 8 screws (1-8) to remove the existing front casters. Refer to the figure below. keep the screws for use.

4.) Replace them to Rear Swivel Casters by screwing 8 screws (1-8).

Figure 8-331   Rear Swivel Caster

8-7-20   **BT11 Drawer Option Installation**

1.) This section describes the installation procedure of the drawer option.

2.) Assemble the BW PRINTER to DRAWER FIX BRKT with screwing 4 screws (2306562, FH M3X6).

Figure 8-332   BT11 Drawer Option Installation

3.) Assemble the BT11 DRAWER to DRAWER FIX BRKT using 2 hooks.
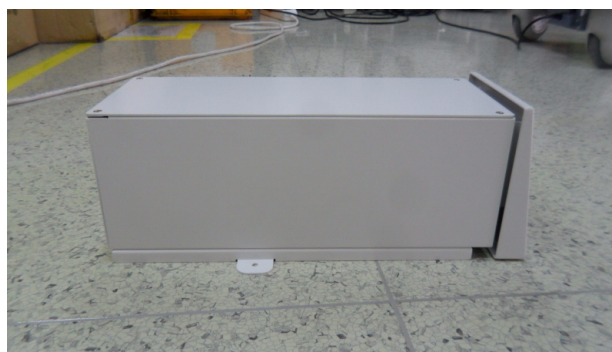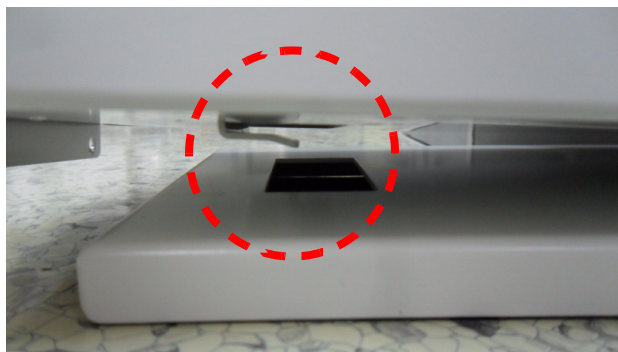
Figure 8-333   BT11 Drawer Option Installation

8-7-20   BT11 Drawer Option Installation (cont'd)

4.) Screw 2 screws (2159634, BH M4X10) behind the Assembly.
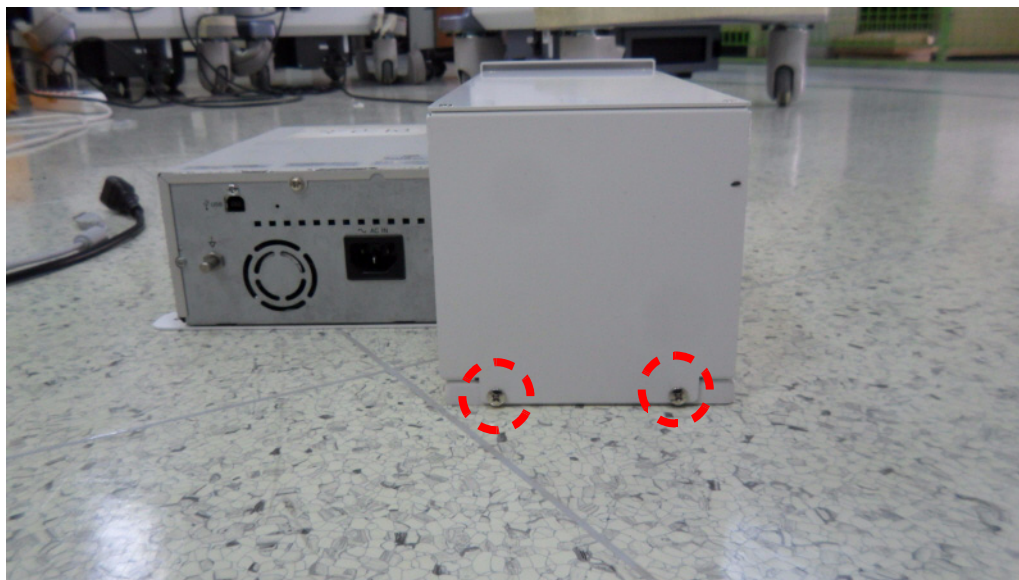
Figure 8-334   BT11 Drawer Option Installation

5.) Screw 2 screws (5176744, BH M4X20) to fix the DRAWER Assy to the system.

Figure 8-335   BT11 Drawer Option Installation

8-7-20   BT11 Drawer Option Installation (cont'd)

6.) Connect the BW Printer cable and fix the cables with CABLE MOUNT. Refer to the pictures below.

Figure 8-336   BT11 Drawer Option Installation

7.) Installation Completion.

Figure 8-337   BT11 Drawer Option Installation

8-7-21   MTZ PROBE HOLDER Installation

1.) This section describes the installation procedure of the MTZ PROBE HOLDER.

2.) Assemble the MTZ PROBE HOLDER FIX BRKT to MTZ HOLDER with 3 screws (2160212, FH M4X8)

Figure 8-338   MTZ PROBE HOLDER Installation

3.) Assemble the Holder to bottom of the Keyboard with 2 screws (2159634, BH M4X10).

Figure 8-339   MTZ PROBE HOLDER Installation

4.) Installation completion.

Figure 8-340   MTZ PROBE HOLDER Installation

8-7-22 DVR Fixture Top Installation - SONY DVO-1000MD DVD Recorder

1.) This section describes the installation procedure of SONY DVO-1000MD DVD recorder.

2.) Unscrew 2 existing screw from the TOP COVER.
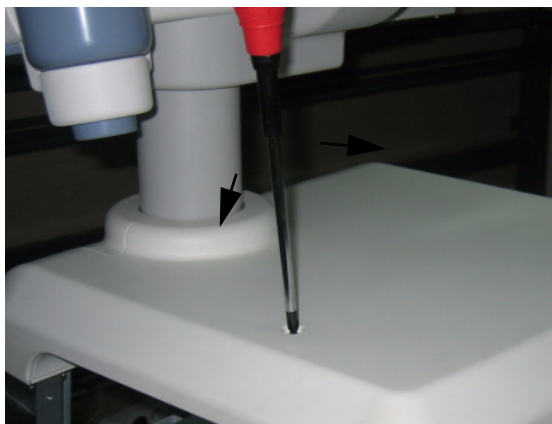
Figure 8-341   SONY DVR Fixture Top Installation

3.) Assemble the FIXTURE DVD BOTTOM BRKT on the TOP COVER by screwing 2 screws (2327592, FH M4X14).
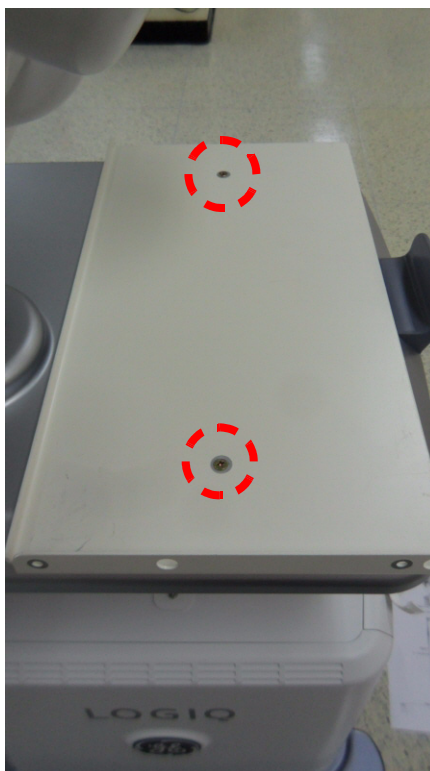
Figure 8-342   SONY DVR Fixture Top Installation

8-7-22   DVR Fixture Top Installation - SONY DVO-1000MD DVD Recorder (cont'd)

4.) Assemble the SONY DVO-1000MD to TOP FIXTURE BRKT by screwing 4 screws (2306562, FH M3X6).
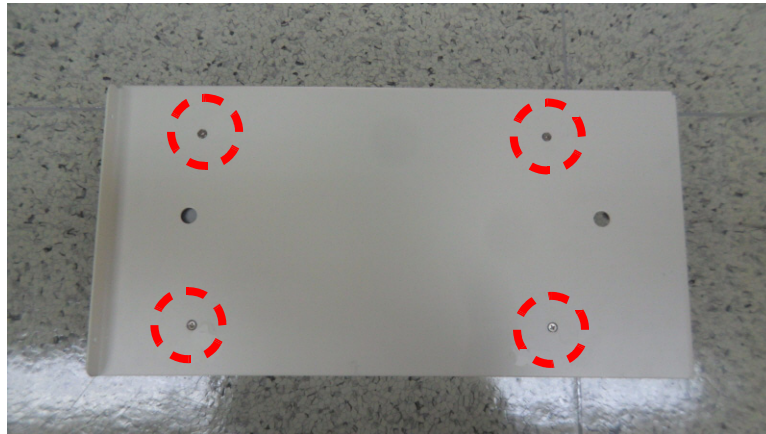
Figure 8-343   SONY DVR Fixture Top Installation

5.) Assemble the DVO-1000MD with TOP FIXTURE BRKT to FIXTURE DVD BOTTOM BRKT by screwing 4 screws (2159333, BH M4X8).
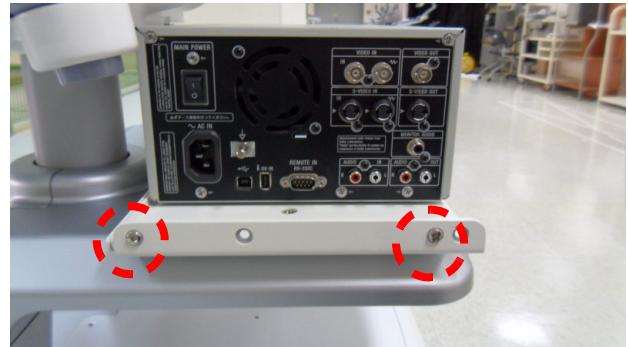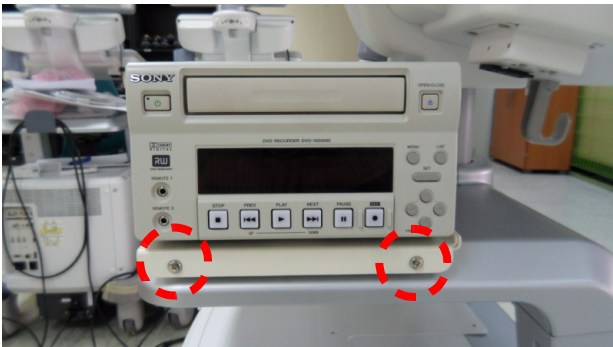
Figure 8-344   SONY DVR Fixture Top Installation

8-7-22   **DVR Fixture Top Installation - SONY DVO-1000MD DVD Recorder** (cont'd)

6.) Connect the cable connector with the reference to the picture below.
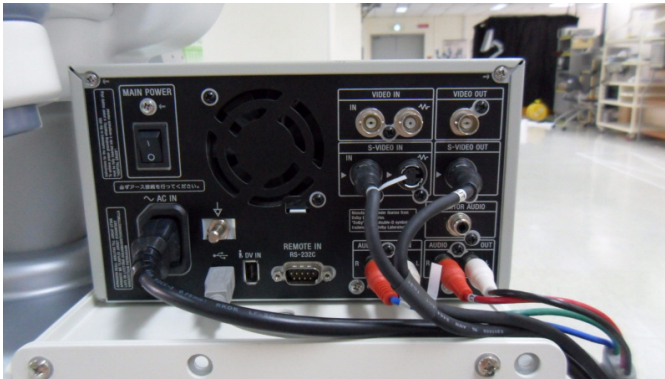
Figure 8-345   SONY DVR Fixture Top Installation

7.) Assemble the TOP CABLE BRKT behind the SONY DVR to cover the Cables by screwing 2 screws (2153633, BH M4X8) and tie the cable using the CABLE TIE with the hole in the red rectangle shown in the right picture of Figure 8-346 below.
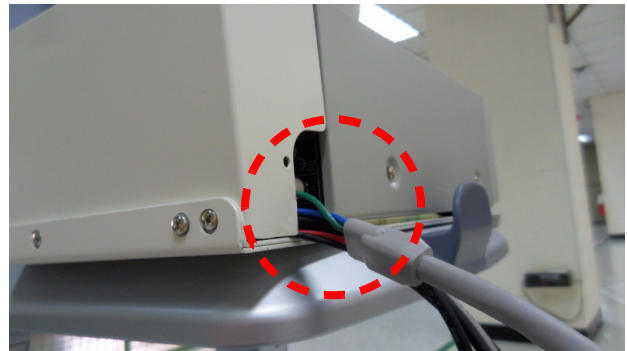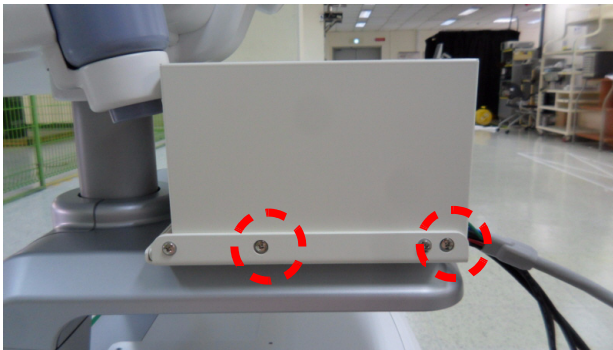
Figure 8-346   SONY DVR Fixture Top Installation

Section 8-8
PHI(Protecting Health Information) DATA COMMUNICATION

It's not allowed to send the PHI data outside of confidential Patient-Doctor environment without encryption of PHI.

If PHI needs to be sent to GE employees for troubleshooting purpose, all PHI should be encrypted or protected from unauthorized access by using PKZIP to compress the files with password. And also it can only be sent via a GE Intranet.

8-8-1   Prevent exporting patient data to removable

To protect health information, prevent exporting patient data to removable media (CD/DVD/USB flash/USB HDD) using Data Transfer (Export/MPEGVue), SaveAs, QuickSave, EzBackup/EzMove, Backup for Patient/Report Archive.

This feature can be set ON/OFF by only Administrator on Utility -> Admin -> System Admin page. (Default is Off)
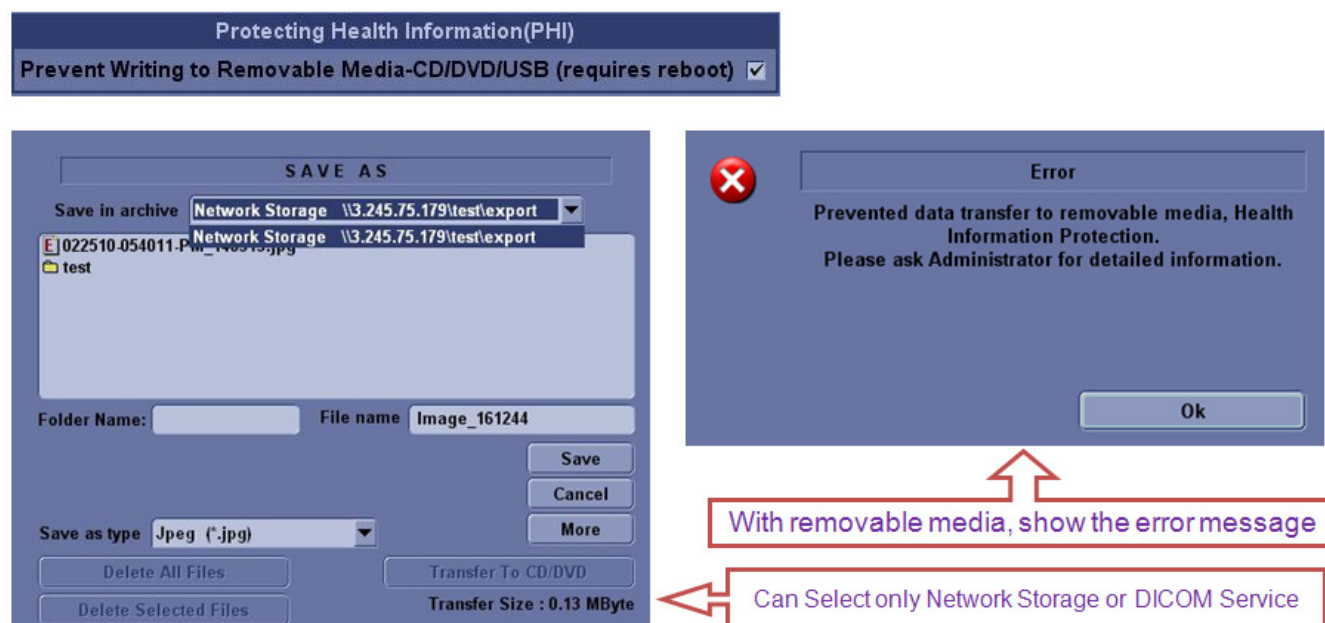
Figure 8-347   Enable/Disable Option for Prevent export data to removable media

8-8-2   ENCRYPTION PROCEDURE

1.) Open PKZip for windows wizard, click on **Use PIZIP options Wizard** and click on options to do some settings.

Figure 8-348   Open PKZip for windows wizard for setting Options

2.) Switch to Security tab, make below settings, and then click "**OK**"
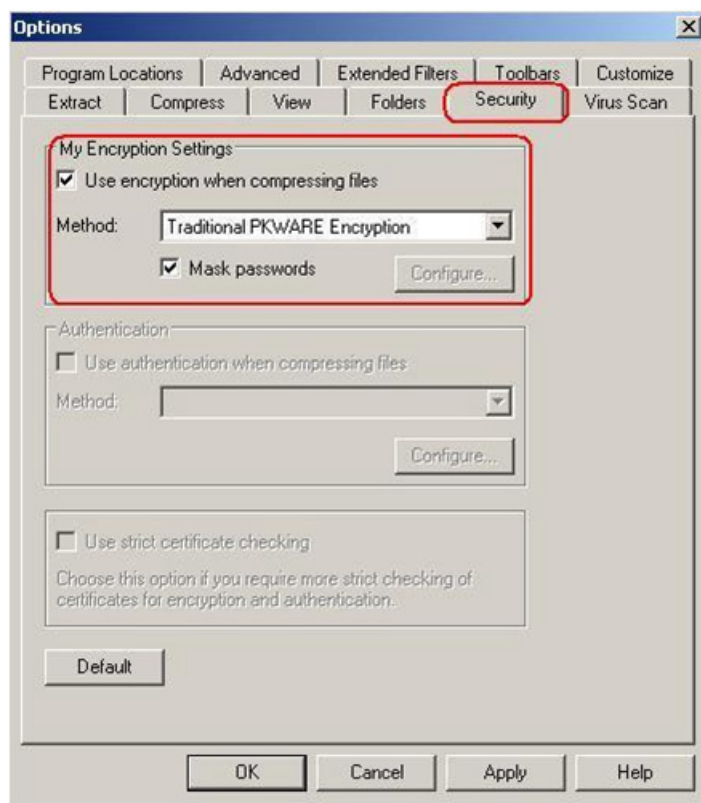
Figure 8-349   Setting Security tab for mask passwords

3.) Choose Compress files into a new ZIP file, and then click "Next"
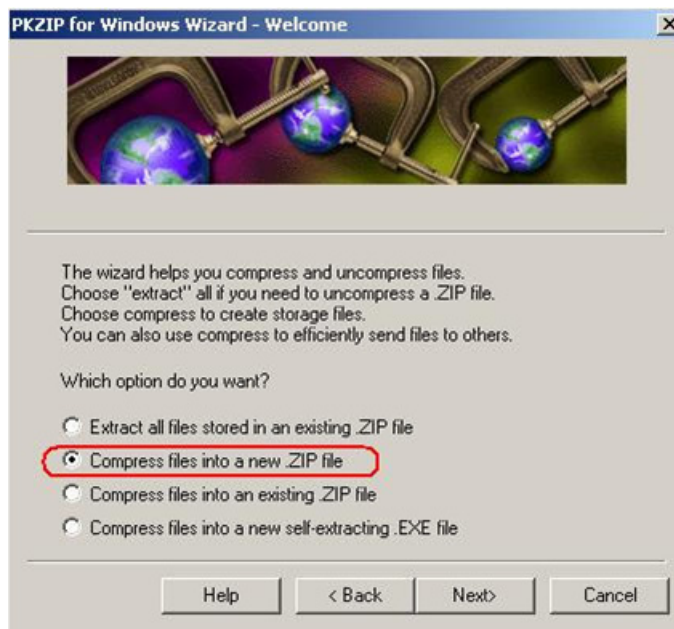
Figure 8-350   Setting Compress files into a new .ZIP file

4.) Set storage location and file name

Figure 8-351   Set storage location and file name

5.) Select the files you want to compress, the **Add to List**, click on **Finish**
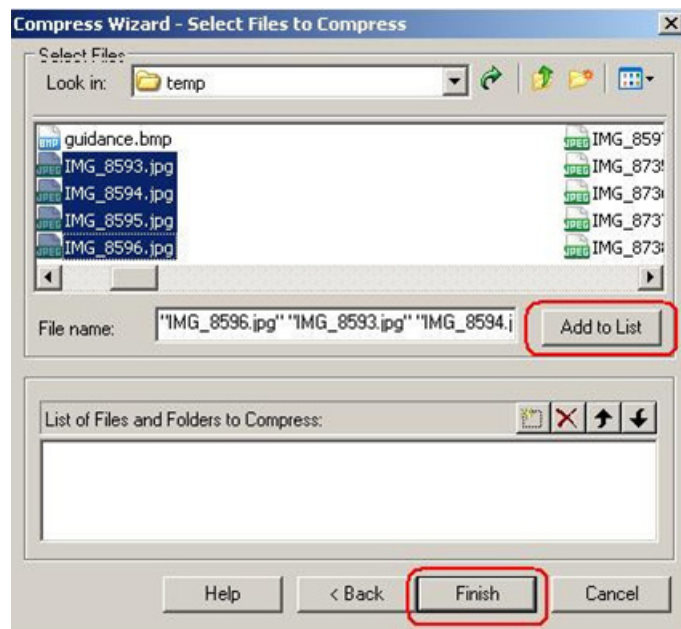
Figure 8-352   Select the file want compress

6.) A dialog box will pop out ask for password entry, enter password, confirm it then click **OK**.

Figure 8-353   Confirm password entry

7.) After finish compress, click **Done.**
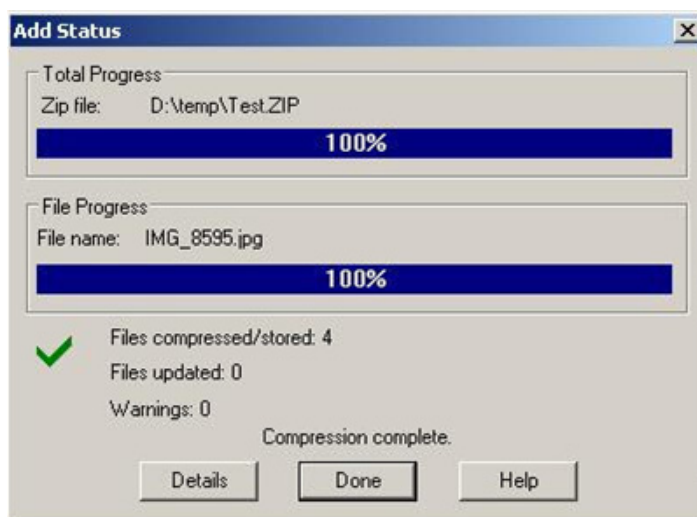
Figure 8-354   Successful extraction

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Chapter 9
Renewal Parts

Section 9-1 Overview

This chapter gives you an overview of Renewal Parts for LOGIQ™ P5 and A5/A5Pro.

Table 9-1   Contents in Chapter 9

Section	Description	Page Number
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Section 9-2 List of Abbreviations

- Assy - Assembly
- Ctrl - Control
- FRU 1 - Replacement part available in part hub
- FRU 2 - Replacement part available from the manufacturer (lead time involved)
- Int - Internal
- I/O - Input/Output
- KB - Keyboard
- LCD - Liquid Crystal Display
- MON - Monitor
- PAT - Patient
- PC - Personal Computer (Back End Processor)
- SYSCONCM - System control cellular SOM
- SYSCONPM - System control Pentium SOM
- APS - Arirang Power supply
- ARP - Arirang RearPanel
- ACWD - Arirang Continuous Wave Doppler
- P3RLY - Port 3 Relay
- P2RLY - Port 2 Relay
- CL1TRX - COLOR MLA1 TX/RX
- BL1TRX - BLACK & WHITE MLA1 Tx/Rx
- ARC - Arirang Remote control
- ACPC - AC Power Control
- AEXP - Arirang External Pheriperal
- ASIG - Analog Signal connection

Section 9-3 MONITOR
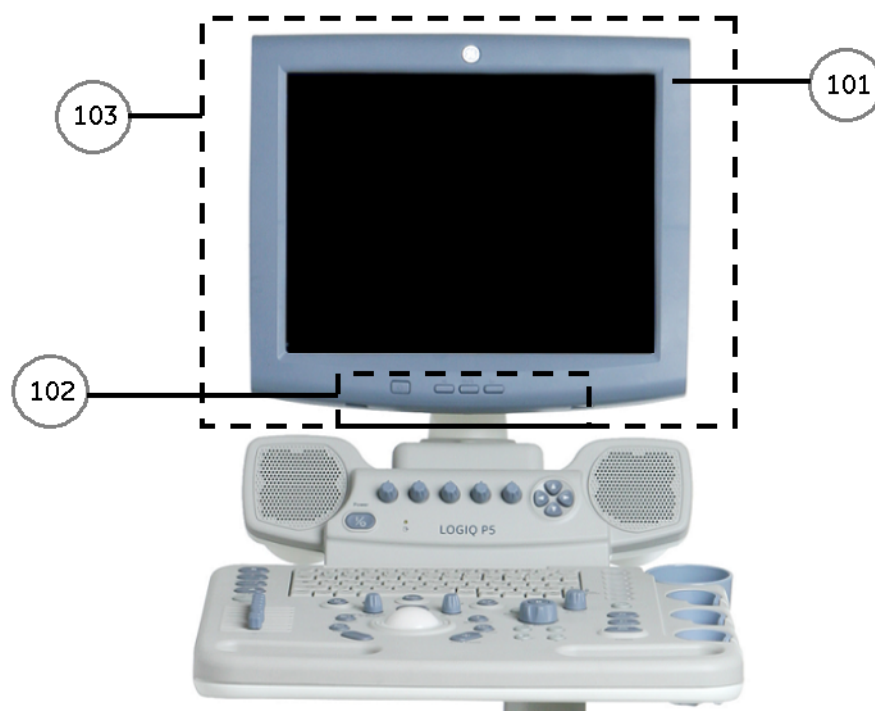
Figure 9-1   Monitor

Section 9-3   MONITOR (cont'd)

Item	Part Name	FRU Number	Description	Qty	FRU	R1.0.X	R2.0.X	R3.0.X~	R4.0.X~
101	LA5 monitor cover set	5144589-3	LOGIQ A5	1	1	Yes	Yes	Yes	
	LP5 Monitor cover set	5144590-3	LOGIQ P5	1	1	Yes	Yes	Yes	
	LP5 Monitor Cover Set	5252337-2		1	1				Yes
102	LCD Arm with cover	5144507	LOGIQ A5	1	1	Yes	Yes	Yes	
	LCD Flexible Arm KIT	5264538	LOGIQ P5	1	1	Yes	Yes	Yes	
	LCD Arm with cover	5399274	LOGIQ P5	1	1				Yes
	LCD Flexible Arm KIT	5257303-3	Common with LP6	1	1				Yes
103	P5 LCDMON II Assy	5328696	LOGIQ P5	1	1	Yes	Yes	Yes	
	A5 LCDMON II Assy	5328697	LOGIQ A5	1	1	Yes	Yes	Yes	
	P5 BT11 LCDMONII Assy	5399193	LOGIQ P5	1	1				Yes

Table 9-2   MONITOR

Section 9-4 KEYBOARD
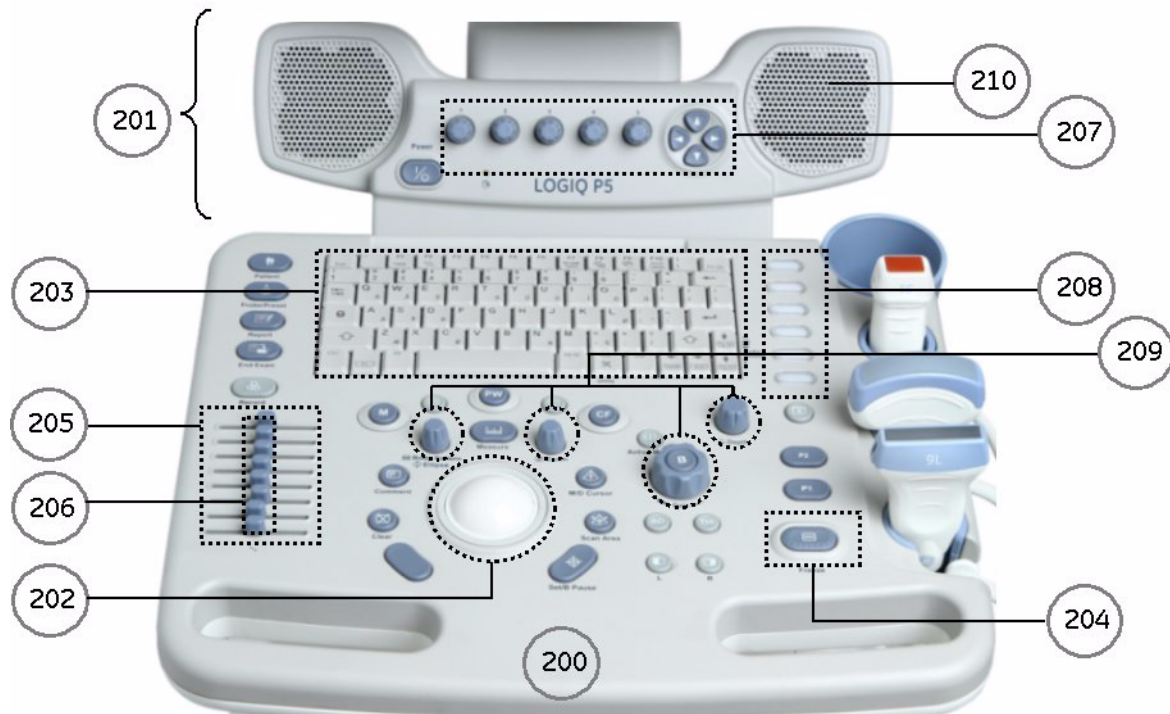
Figure 9-2   KEYBOARD BLOCK

Section 9-4 KEYBOARD (cont'd)

Item	Part Name	FRU Number	Description	Qty	FRU	R1.0.X	R2.0.X	R3.0.X~	R4.0.X~
200	LOGIQ P5 Main Keyboard Assy	5144536	LOGIQ P5 ONLY	1	1	Yes	Yes	Yes	
	LOGIQ A5 Main Keyboard Assy	5171625	LOGIQ A5 ONLY	1	1	Yes	Yes	Yes	
	LOGIQ P5 Main Keyboard Assy for JPN	5334846	LOGIQ P5 Japan Only	1	1			Yes	
	LOGIQ A5 Main Keyboard Assy for JPN	5334848	LOGIQ A5 Japan Only	1	1			Yes	
	Main Keyboard Assy	5252353	Common with LP6	1	1				Yes
	Main Keyboard Assy for JPN	5334850	Common with LP6	1	1				Yes
201	LOGIQ P5 Sub Keyboard Assy	5144538-2	LOGIQ P5 ONLY	1	1	Yes	Yes	Yes	
	LOGIQ A5 Sub Keyboard Assy	5177533-2	LOGIQ A5 ONLY	1	1	Yes	Yes	Yes	
	LOGIQ P5 Sub Keyboard Assy for JPN	5334847	LOGIQ P5 Japan Only	1	1			Yes	
	LOGIQ A5 Sub Keyboard Assy for JPN	5334849	LOGIQ A5 Japan Only	1	1			Yes	
	LP5 Sub Keyboard Assy	5399194	LOGIQ P5	1	1				Yes
	LP5 Sub Keyboard Assy for JPN	5399192	LOGIQ P5	1	1				Yes
202	Trackball Assy	5144543	LOGIQ P5/A5	1	1	Yes	Yes	Yes	Yes
203	English A/N Key Assy	5144533	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	Greek A/N Key Assy	5168937	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	Russian A/N Key Assy	5167845	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	Swedish A/N Key Assy	5177708	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	Norwegian A/N Key Assy	5176980	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	English A/N Key Assy	5252354	Common with LP6	1	1				Yes
	Greek A/N Key Assy	5252355	Common with LP6	1	1				Yes
	Russian A/N Key Assy	5252356	Common with LP6	1	1				Yes
	Swedish A/N Key Assy	5252357	Common with LP6	1	1				Yes
	Norwegian A/N Key Assy	5252358	Common with LP6	1	1				Yes
204	Freeze Key Assy	5144540	LOGIQ P5/A5	1	1	Yes	Yes	Yes	Yes
205	TGC Key Assy	5144541	LOGIQ P5/A5	1	1	Yes	Yes	Yes	Yes
206	TGC Knob Set	5144542	LOGIQ P5/A5	1	1	Yes	Yes	Yes	Yes
207	Sub Keyboard Encoder Knob set	5144539	LOGIQ P5/A5	1	1	Yes	Yes	Yes	Yes
208	LOGIQ P5 Keycap set	5144547	LOGIQ P5 ONLY	1	1	Yes	Yes	Yes	Yes
209	Main Keyboard Encoder Knob set	5177823	LOGIQ P5/A5	1	1	Yes	Yes	Yes	Yes
210	Speaker Pad	5224928	LOGIQ P5/A5	1	1	Yes	Yes	Yes	Yes

Table 9-3   KEYBOARD

Section 9-5 COVERS
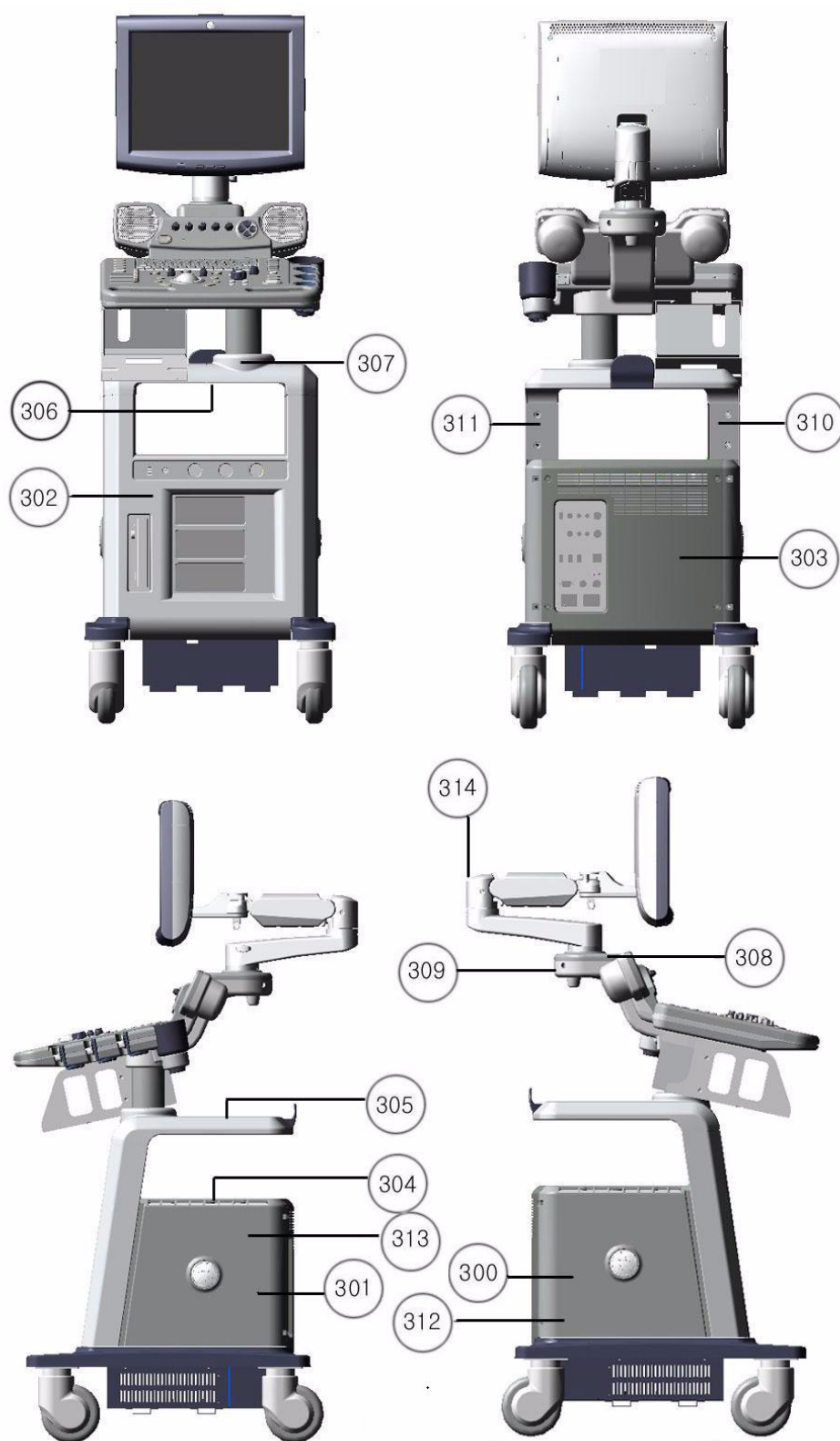
Figure 9-3   COVERS

Section 9-5 COVERS (cont'd)

Item	Part Name	FRU Number	Description	Qty	FRU	R1.0.X	R2.0.X	R3.0.X~	R4.0.X~
300	Side Left Cover	5327119	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	Side Left Cover	5327214	Common with LP6	1	1				Yes
301	Side Right Cover	5327120	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	Side Right Cover	5327215	Common with LP6	1	1				Yes
302	Front Cover	5144511	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	Front Cover	5336567	Common with LP6	1	1				Yes
303	Rear Cover	5144512-2	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	LP6 Rear Cover	5252315	Common with LP6	1	1				Yes
304	Middle Cover	5144513	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	LP6 Middle Cover	5252310	Common with LP6	1	1				Yes
305	Top Cover	5144514	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	LP6 Top Cover	5252319	Common with LP6	1	1				Yes
306	Top Bottom Cover	5144515	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	LP6 Top Bottom Cover	5252318	Common with LP6	1	1				Yes
307	Pole Cover	5144516	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	LP6 Pole Cover	5252314	Common with LP6	1	1				Yes
308	Neck Front	5144517	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	Neck Front	5399195	LOGIQ P5	1	1				Yes
309	Neck Rear	5144519	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	LP6 Neck Rear	5252312	Common with LP6	1	1				Yes
310	Dummy Cover L	5168108	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	Dummy Cover L	5257053	Common with LP6	1	1				Yes
311	Dummy Cover R	5167096	LOGIQ P5/A5	1	1	Yes	Yes	Yes	
	Dummy Cover R	5257042	Common with LP6	1	1				Yes
312	EMI Cover L	5327123	LOGIQ P5/A5	1	1	Yes	Yes	Yes	Yes
313	EMI Cover R	5327124	LOGIQ P5/A5	1	1	Yes	Yes	Yes	Yes
314	Flexible Arm Cover Set	5306791-2	LOGIQ P5	1	1	Yes	Yes	Yes	
	Flexible Arm Cover Set	5257033-2	Common with LP6	1	1				Yes

Table 9-4 COVERS

Section 9-6PCB
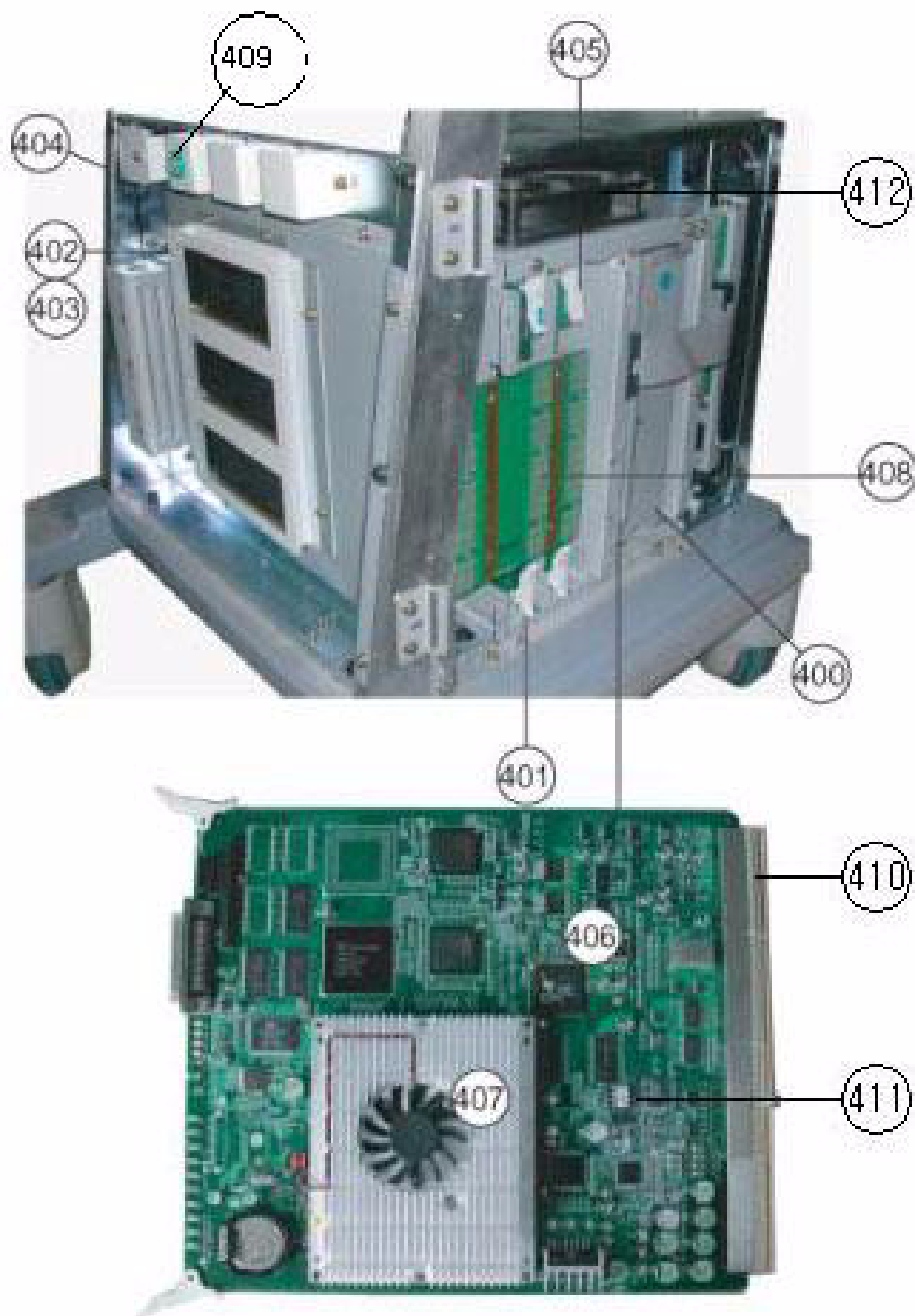
Figure 9-4   PCB BOARDS

Section 9-6   PCB (cont'd)

Item	Part Name	FRU Number	Description	Qty	FRU	R1.0.X	R2.0.X	R3.0.X~	R4.0.X~
400	APS Assy	5166108	LOGIQ P5 / LOGIQ A5	1	1	Yes	Yes	Yes	Yes
401	CL1TRX Assy	5144578	LOGIQ P5 or LOGIQ A5 with Color Option	1	1	Yes	Yes	Yes	Yes
	BL1TRX Assy	5172144	LOGIQ A5 ONLY	1	1	Yes	Yes	Yes	Yes
402	P3RLY assy	5144579-2	LOGIQ P5 or LOGIQ A5 with 3 port option	1	1	Yes	Yes	Yes	Yes
	P2RLY assy	5144580-2	LOGIQ A5 ONLY	1	1	Yes	Yes	Yes	Yes
403	P2RLY with dummy	5177273-2	LOGIQ P5 ONLY	1	1	Yes	Yes	Yes	Yes
404	Backplane assy	5144581-2	Make sure to check the removal procedure and notice of "8-2-31 - Backplane Assy"before removing and installation the Assy.	1	1	Yes	Yes	Yes	Yes
405	ACWD Assy	5144582-2		1	1	Yes	Yes	Yes	Yes
406	SYSCONPM Assy	5144584-4	LOGIQ P5 ONLY Make sure to check the removal procedure and notice of "8-2-33 - SYSCON PM Assy/SYSCON CM Assy"before removing and installation the Assy	1	1	Yes	Yes	Yes	Yes
	SYSCONCM Assy	5177111-4	LOGIQ A5 ONLY Make sure to check the removal procedure and notice of 8-2-33 - SYSCON PM Assy/SYSCON CM Assy"before removing and installation the Assy	1	1	Yes	Yes	Yes	Yes
407	PM SOM Assy with 1G	5178410-2	LOGIQ P5 or LOGIQ A5 with CPU Upgrade or Color Upgrade Option	1	1	Yes	Yes	Yes	Yes
	CM SOM Assy with 512M	5178834-2	LOGIQ A5 ONLY	1	1	Yes	Yes	Yes	Yes
	DualCore SOM	5252327-2	PC module Common with LP6	1	1				Yes
408	ASIG Assy	5144588		1	1	Yes	Yes	Yes	Yes
409	ECG Assy	5196517		1	1	Yes	Yes	Yes	Yes
410	L1SYSCON BASE BOARD	5179267-4	Make sure to check the removal procedure and notice of "8-2-33 - SYSCON PM Assy/SYSCON CM Assy"before removing and installation the Assy	1	1	Yes	Yes	Yes	Yes
411	ASIR Assy	5264181		1	1	Yes	Yes	Yes	Yes
412	Nest Fan Assy	5144556		1	1	Yes	Yes	Yes	Yes

Table 9-5   PCB BOARDS

Section 9-7 BODY
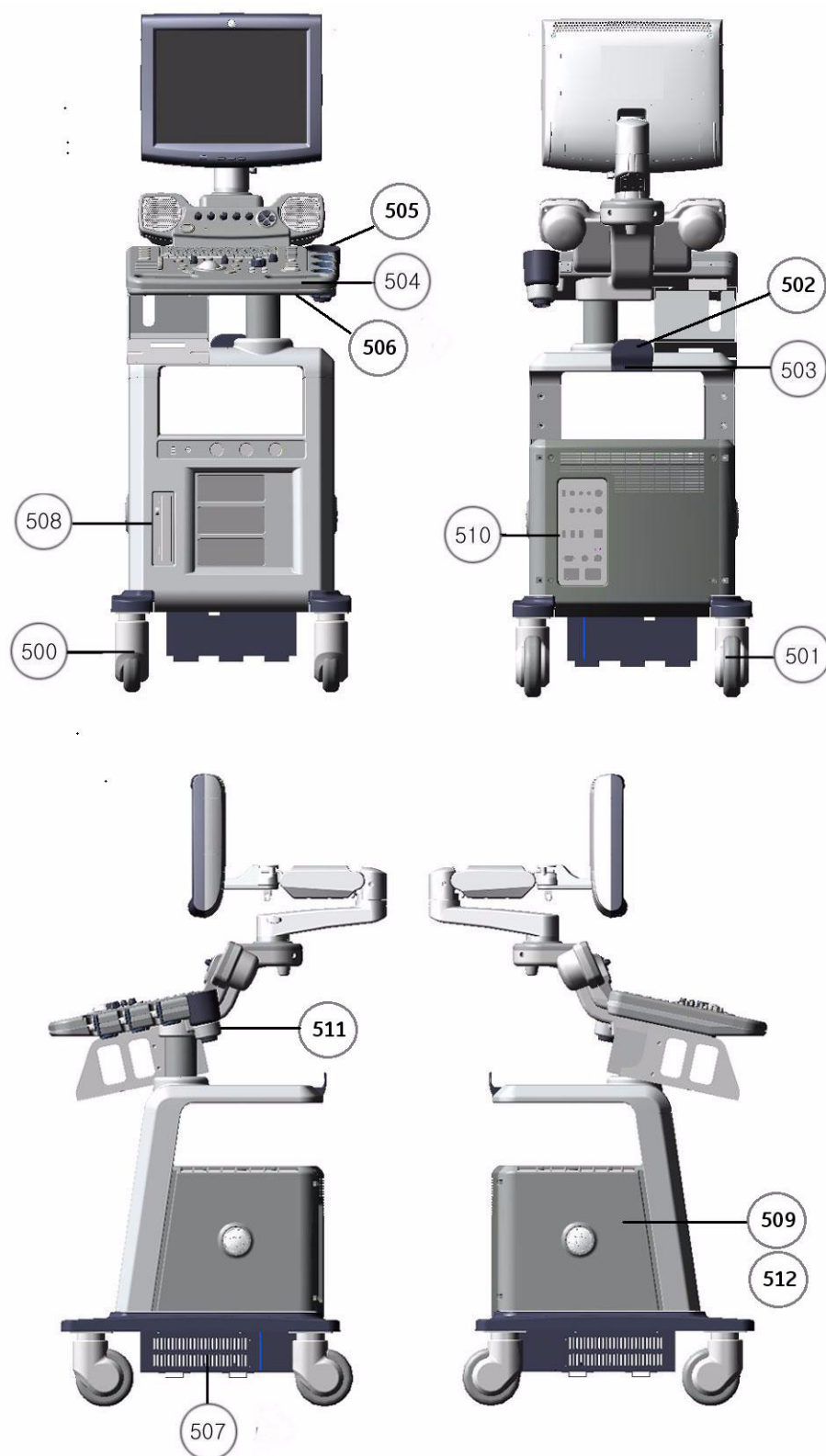
Figure 9-5   BODY BLOCK

Section 9-7   BODY (cont'd)

Item	Part Name	FRU Number	Description	Qty	FRU	R1.0.X	R2.0.X	R3.0.X~	R4.0.X~
500	Front Caster	5144523	LOGIQ P5 ONLY	1	1	Yes	Yes	Yes	Yes
	Front Caster	5178525	LOGIQ A5 ONLY	1	1	Yes	Yes	Yes	Yes
501	Rear Caster	5144524	LOGIQ P5 ONLY	1	1	Yes	Yes	Yes	Yes
	Rear Caster	5177898	LOGIQ A5 ONLY	1	1	Yes	Yes	Yes	Yes
502	Rear Handle	5144525	Option	1	1	Yes	Yes	Yes	Yes
503	Rear Hook	5165418		1	1	Yes	Yes	Yes	Yes
504	Probe Holder	5165304		1	1	Yes	Yes	Yes	Yes
505	Cup Holder	5168950		1	1	Yes	Yes	Yes	Yes
506	ECG Cable Hook	5164599	Option	1	1	Yes	Yes	Yes	Yes
507	Air Filter Set	5144526		1	1	Yes	Yes	Yes	Yes
509	SATA (80G) HDD Assy	5177519		1	1	Yes	Yes		
	P5 BT09 160G SATA HDD Assy	5328125		1	1			Yes	
	SATA HDD 250G Assy	5400701	Common with LP6	1	1	Yes	Yes	Yes	Yes
510	ARP Assy 110V	5144586-2		1	1	Yes	Yes	Yes	Yes
	ARP Assy 220V	5144587-2		1	1	Yes	Yes	Yes	Yes
	LP6 ARP Assy 110V	5252328	Common with LP6	1	1				Yes
	LP6 ARP Assy 220V	5252329	Common with LP6	1	1				Yes
511	Cable Arm Hook	5178888-2	Option	1	1	Yes	Yes	Yes	Yes
512	160G HDD for Consip	5264671	Only Italy Consip System	1	1	Yes	Yes	Yes	Yes
513	Touch UP paint	5176646	Option	1	1	Yes	Yes	Yes	Yes
	Touch UP paint	5257041	Common with LP6	1	1				Yes
514	UPS Fixture brkt Kit	5212390	Option	1	1	Yes	Yes	Yes	Yes
517	Option Dummy Brkt	5363935-2	Option Common with LP6	1	1	Yes	Yes	Yes	Yes

Table 9-6   BODY BLOCK

Item	Part Name	FRU Number	Description	Qty	FRU	R1.0.X	R2.0.X	R3.0.X~	R4.0.X~
508	Samsung Slim DVD Drive	5264920-2	Samsung latptop type Slim DVD drive	1	1		Yes		
	DVD drive	5269594-2	Pioneer DVD Drive	1	1	Yes			
515	DAB Assy	5315404	Samsung Slim DVD driver adapter Assy	1	1		Yes		
516	DVD Assy Set	5327112-2	Samsung SATA DVD + BRKT	1	1			Yes	Yes

Table 9-7   DVD

Section 9-8 POWER
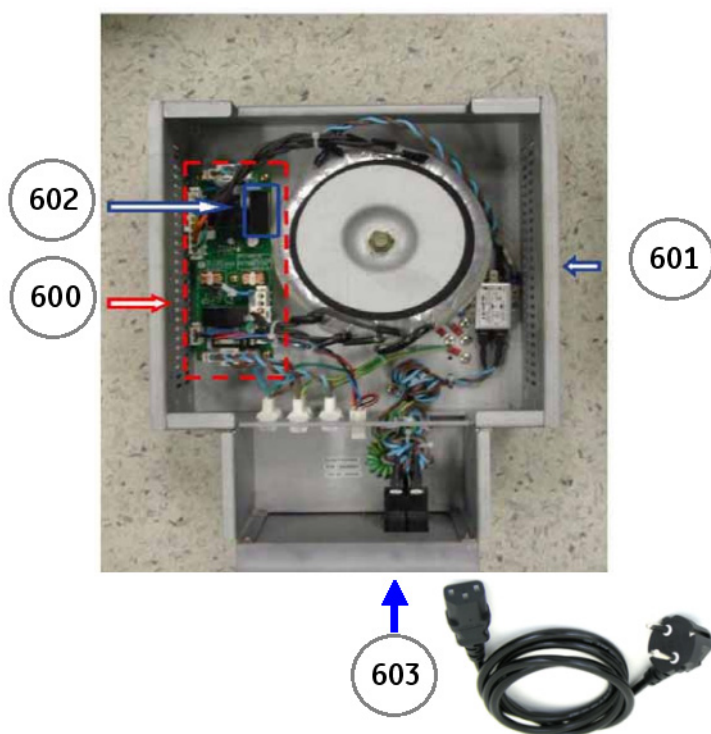
Figure 9-6   POWER BLOCK

Section 9-8   POWER (cont'd)

Item	Part Name	FRU Number	Description	Qty	FRU	R1.0.X	R2.0.X	R3.0.X~	R4.0.X~
600	ACPC Assy	5144559		1	1	Yes	Yes	Yes	Yes
601	LOGIQ P5 Transbox Assy 110V	5144560	LOGIQ P5 ONLY	1	1	Yes	Yes	Yes	Yes
	LOGIQ P5 Transbox Assy 220V	5144562	LOGIQ P5 ONLY	1	1	Yes	Yes	Yes	Yes
	LOGIQ A5 Transbox Assy 110V	5177417	LOGIQ A5 ONLY	1	1	Yes	Yes	Yes	Yes
	LOGIQ A5 Transbox Assy 220V	5177276	LOGIQ A5 ONLY	1	1	Yes	Yes	Yes	Yes
602	Fuse Set 110	5168996		1	1	Yes	Yes	Yes	Yes
	Fuse Set 220	5177924		1	1	Yes	Yes	Yes	Yes
603	Power Cord for 110v	2389073	110v	1	1	Yes	Yes	Yes	Yes
	Power Cord for 220v	5308254	220v	1	1	Yes	Yes	Yes	Yes
	Power Cord for China	2389074	Only China	1	1	Yes	Yes	Yes	Yes
	Power Cord for Israel	5189985		1	1	Yes	Yes	Yes	Yes
	Power Cord for Argentina	5189874		1	1	Yes	Yes	Yes	Yes
	Power Code for Italy	5189619		1	1	Yes	Yes	Yes	Yes
	Power Cord for Denmark	5189461		1	1	Yes	Yes	Yes	Yes
	Power Cord for ANZ	5189439		1	1	Yes	Yes	Yes	Yes
	Power Cord for UK/HK	5189398		1	1	Yes	Yes	Yes	Yes
	Power Cord for Switzerland	5189311		1	1	Yes	Yes	Yes	Yes
	Power Cord for India	5189127		1	1	Yes	Yes	Yes	Yes

Table 9-8   POWER BLOCK

Section 9-9Cables

Multi Cable Assy1
5169853

Multi Cable Assy2
5168859

Multi Cable Assy3
5168797

ACPC Cable
5168846

AEXP Cable
5172066

Printer Cable Assy1
5177395

Printer Cable Assy2
5168842

Peripheral AC PWR
Cable 5165244

APS/APS PRO AC PWR
Cable 5172066

IEC Type ECG Cable

AHA Type ECG Cable

DCWD Cable Assy

Figure 9-7   Cable

Section 9-9   Cables (cont'd)

Item	Part Name	FRU Number	Description	Qty	FRU	R1.0.X	R2.0.X	R3.0.X~	R4.0.X~
700	Multi Cable Assy 1	5169853	DVI Cable + Speaker Cable + KBD Control Cable 1. DVI Cable Connect one side (Label:DVI) to LCDMON II Assy and another side (Label:J206) to PCB Silk J206 of Backplane Assy 2. Speaker Cable Connect one side (Label: L & R) to Label L,R of Speaker Assy and another side (Label:J207) to PCB Silk J207 of Backplane Assy 3. Keyboard Control Cable Connect one side (Label:CON1) to Keyboard Assy and another side (Label:J209) to PCB Silk J209 of Backplane Assy	1	1	Yes	Yes	Yes	Yes
701	Multi Cable Assy 2	5168859	Mon Pwr Cable + BW PWR Cable + BW USB Cable + KB USB Cable 1. Monitor Power Cable - Connect one side (Label:CON7) to Label CON 7 of Monitor power Con cable or Monitor power con long cable and another side (Label: CON 11) to Lable CON 11 of Internal AC Power cable assy 2. BW Printer Power Cable - Connect one side (Label:CON10) to Label CON10 of USB CON Cable and another side (Label: CON9) to Lable CON9 of LP5 ARP Assy 3.Keyboard USB Cable - Connect one side (Label:KBD) to LP5 Keyboard Assy and another side (Label: J221) to PCB Silk J221 of LP5 Backplane Assy" 4. BW Printer USB Cable - Connect one side (Label:PRN) to BW Printer Bracket and another side (Label: J223) to PCB Silk J223 of LP5 Backplane Assy"	1	1	Yes	Yes	Yes	Yes

Table 9-9   Cables

Item	Part Name	FRU Number	Description	Qty	FRU	R1.0.X	R2.0.X	R3.0.X~	R4.0.X~
702	Multi Cable Assy 3	5168797	Front USB Cable + MIC Cable 1. Front USB Cable - Connect one side (Label: F_USB) to Front USB Bracket and another side (Label: J14) to Label J14 of LP5 ARP Assy 2. MIC Cable - Connect one side (Label:MIC) to LP5 Front USB Bracket and another side (Label: J205) to PCB Silk J205 of LP5 Backplane Assy	1	1	Yes	Yes	Yes	Yes
703	Monitor Power Conn Cable	5166286	Connect one side (label:CON7) to Label "CON7" of Monitor power cable and another side (Label:MON) to LCDMON II Assy	1	1	Yes	Yes	Yes	Yes
704	Monitor Power Conn Long Cable	5168941	Connect one side (label:CON7) to Label "CON7" of Monitor power cable and another side (Label:MON) to LCDMON II Assy	1	1	Yes	Yes	Yes	Yes
705	ACPC Cable	5168846	Connect one side (Label: J203) to PCB Silk "J203" of LP5 Backplane and another side (Label:CON2) to Label "CON2" of Internal ACPC ConCable	1	1	Yes	Yes	Yes	Yes
706	Printer Cable Assy 1	5177395	Connect one side to BW Printer Power cable and another side to External Printer (short cable)	1	1	Yes	Yes	Yes	Yes
707	Printer Cable Assy 2	5168842	Connect one side to BW Printer Power cable and another side to External Printer (long cable)	1	1	Yes	Yes	Yes	Yes
708	EIDE Cable	5168955-2	Connect one side (Label:ODD) to LP5 ODD Assy and another side (Label: J204) to PCB Silk J204 of LP5 Backplane Assy	1	1	Yes	Yes		
709	APS AC Power Cable	5168913	Connect one side (Label:APS) to Label APS of LP5 APS Assy and another side (Label: CON3) to Label CON3 of LP5 AC Out Cable	1	1	Yes	Yes	Yes	Yes

Table 9-9   Cables

Item	Part Name	FRU Number	Description	Qty	FRU	R1.0.X	R2.0.X	R3.0.X~	R4.0.X~
710	Peripheral AC Power Cable	5165244	Connect one side (Label CON5) to Label CON5 of LP5 AC Out Cable and another side (Label: CON6) to Label CON6 of LP5 ARP Assy	1	1	Yes	Yes	Yes	Yes
711	AEXP Cable	5172066	Connect one side (Label J13) to Label PCB Silk J13 of LP5 Syscon Assy and another side (Label: J15) to Label J15 of LP5 ARP Assy	1	1	Yes	Yes	Yes	Yes
712	DCWD Cable Assy	5174403	Connect one side to DCWD Bracket and another side(Label: J7) to PCB Silk J7 of ACWD Assy	1	1	Yes	Yes	Yes	Yes
713	IEC Type ECG CABLE	5341188	ECG Patient Cable only for Japan	1	1	Yes	Yes	Yes	Yes
714	AHA Type ECG CABLE	5341189	ECG Patient Cable for Asia, US, and Europe.	1	1	Yes	Yes	Yes	Yes

Table 9-9   Cables

Section 9-10 Options

Table 9-10   OPTIONS

Item	Part Name	FRU Number	Description	Qty	FRU	R1.0.X	R2.0.X	R3.0.X~	R4.0.X~
800	Endo Probe Holder	5171933		1	1	Yes	Yes	Yes	Yes
801	VCR DVD Fixture Top	5171717-2		1	1	Yes	Yes	Yes	Yes
802	BW Printer Fixture Keyboard	5172473-3		1	1	Yes	Yes	Yes	Yes
803	BW Printer Fixture Middle	5172353-2		1	1	Yes	Yes	Yes	Yes
804	VCR Color Printer DVD Fixture Middle	5172238-3		1	1	Yes	Yes	Yes	Yes
805	Paper Holder	5172484-2		1	1	Yes	Yes	Yes	Yes
806	LCD Flexible Arm KIT	5264538-2		1	1	Yes	Yes	Yes	Yes
807	Probe Cable Hanger	5172178		1	1	Yes	Yes	Yes	Yes
808	Drawer	5171620		1	1	Yes	Yes	Yes	Yes
809	ECG Kit with AHA cable	5172098-2		1	1	Yes	Yes	Yes	Yes
810	ECG kit with IEC cable	5341186		1	1	Yes	Yes	Yes	Yes
811	4D KIT	5171709-5		1	1	Yes	Yes	Yes	Yes
812	3 Button Foot Switch	5327110		1	1	Yes	Yes	Yes	Yes
	1 Button Foot Switch	5327111		1	1	Yes	Yes	Yes	Yes
813	Additional Task Lamp KIT	5171582		1	1	Yes	Yes	Yes	Yes
814	Microphone	5171727		1	1	Yes	Yes	Yes	Yes
815	Protective Cover	5176417		1	1	Yes	Yes	Yes	Yes
816	Swivel Lock Caster	5184603		1	1	Yes	Yes	Yes	Yes
817	3rd probe Ports kit	5171892-3		1	1	Yes	Yes	Yes	Yes
818	CW Doppler kit	5171900-2	LOGIQ P5 ONLY	1	1	Yes	Yes	Yes	Yes
819	ARC Switch Set	5327115		1	1			Yes	Yes
820	ARC Receiver Dongle	5336186		1	1			Yes	Yes

Section 9-11Software

Table 9-11   Software

Item	Part Name	FRU Number	Description	Qty	FRU
900	LP5 BT11 CD SET	5395395	R4.0.X	1	1
	LP5 A5 BT09 CD SET	5327125	R3.0.X	1	1
	LP5 A5 BT08 CD SET	5272499-5	R2.0.4	1	1
	LP5 A5 BT06 CD SET	5196353-8	R1.0.8	1	1

Section 9-12Probes

Table 9-12   Probes

Item	Part Name	FRU Number	Qty	FRU	R1.0.X	R2.0.X	R3.0.X~	R4.0.X~
1	3.5C PROBE	2050357	1	1	Yes	Yes	Yes	Yes
2	3.5CS PROBE	2051858	1	1	Yes	Yes	Yes	Yes
3	4C PROBE	5123455	1	1	Yes	Yes	Yes	Yes
4	8C PROBE	2348094	1	1	Yes	Yes	Yes	Yes
5	E8C PROBE	2294641	1	1	Yes	Yes	Yes	Yes
6	E8CS PROBE	47236865	1	1	Yes	Yes	Yes	Yes
7	BE9C PROBE	2389382	1	1	Yes	Yes	Yes	Yes
8	8L PROBE	5140738	1	1	Yes	Yes	Yes	Yes
9	9L PROBE	5149427	1	1	Yes	Yes	Yes	Yes
10	10L PROBE	2294523	1	1	Yes	Yes	Yes	Yes
11	11L PROBE	5171885	1	1		Yes	Yes	Yes
12	12L PROBE	2295377	1	1	Yes	Yes	Yes	Yes
13	i739 PROBE	2259206	1	1	Yes	Yes	Yes	Yes
14	t739 PROBE	2259246	1	1	Yes	Yes	Yes	Yes
15	3S-02 PROBE	2323337	1	1	Yes	Yes	Yes	Yes
16	5S-02 PROBE	2347469	1	1	Yes	Yes	Yes	Yes
17	7S-02 PROBE	2347471	1	1	Yes	Yes	Yes	Yes
18	ERB PROBE	2258309	1	1	Yes	Yes	Yes	Yes
19	4D3C-L PROBE	KTZ195893	1	1	Yes	Yes	Yes	Yes
20	P2D	TE100024	1	1	Yes	Yes	Yes	Yes
21	P6D	TQ100002	1	1	Yes	Yes	Yes	Yes
22	UG7C Probe	5147187	1	1	Yes	Yes	Yes	Yes
23	5CS Probe	5143934	1	1	Yes	Yes	Yes	Yes
24	3CRF Probe	5196216	1	1			Yes	Yes
25	4DE7C Probe	KTZ195859	1	1		Yes	Yes	Yes
26	3Sp Probe	5327196	1	1			Yes	Yes
27	5Sp Probe	5327197	1	1			Yes	Yes
28	4D8C Probe	KTZ156959	1	1			Yes	Yes
29	BE9CS Probe	5266132	1	1			Yes	Yes
30	i12L Probe	2264883	1	1			Yes	Yes

Section 9-13 Peripherals

Table 9-13   Peripherals

Item	Part Name	FRU Number	Description	Qty	FRU
1	LQ-MD800P	5120592	Panasonic LQ-MD800P DVR Video Recorder	1	1
2	LQ-MD800E	5120593	Panasonic LQ-MD800E DVR Video Recorder	1	1
3	VCR Mitsubishi HS-MD3000U	066E9513	VCR	1	1
4	VCR Mitsubishi HS-MD3000E	066E9514	VCR	1	1
5	Sony UP-D895MD	2288502	Digital B/W printer	1	1
6	SONY UP-D897	5171608	Digital B/W printer	1	1
7	Mitsubishi P93D		Digital B/W printer	1	1
8	Mitsubishi P95DW		Digital B/W printer	1	1
9	Mitsubishi P95D		Digital B/W printer	1	1
10	Mitsubishi P95DE		Digital B/W printer	1	1
11	Mitsubishi P95DW-N		Digital B/W printer	1	1
12	Mitsubishi P95DW-B		Digital B/W printer	1	1
13	SONY UP-D23MD	2401985	Digital Color printer	1	1
14	Sony UP-D25MD	5389822	Digital Color printer	1	1
15	Mitsubishi CP30DW	5310492	Digital Color printer	1	1
16	Mitsubishi CP30DW-Z		Digital Color printer	1	1
17	HP 990cxi	066E0407	Standard printer	1	1
18	HP 6122	2378741	Standard printer	1	1
19	HP 6540	5121837	Standard printer	1	1
20	HP 5650	5121839	Standard printer	1	1
21	HP Business Inkjet 1200	066E0424	Standard printer	1	1
22	HP Office jet Pro K550	EP100925	Standard printer	1	1
23	HP Office jet Pro K5400	EQ100158	Standard printer	1	1
24	HP Deskjet D4360	5357534	Standard printer	1	1
25	HP Deskjet 6940	5351754	Standard printer	1	1
26	LexMark Z65		Standard printer	1	1
27	HP 1000		Standard printer	1	1
28	Xerox Phaser 8400		Standard printer	1	1
29	HP Officejet 6000 Special Edition		Standard printer	1	1
30	Sony DVO-1000MD		VCR	1	1

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Chapter 10
Care & Maintenance

Section 10-1
Overview

10-1-1   Periodic Maintenance Inspections

It has been determined by engineering that your LOGIQ™ P5 system does not have any high wear components that fail with use, therefore no Periodic Maintenance Inspections are mandatory. Some Customers Quality Assurance Programs may require additional tasks and or inspections at a different frequency than listed in this manual.

10-1-2   Purpose of Chapter 10

This chapter describes **Care & Maintenance** on the scanner and peripherals. These procedures are intended to **maintain the quality** of the ultrasound **systems performance**. Read this chapter completely and familiarize yourself with the procedures before performing a task.

Table 10-1   Contents in Chapter 10

Section	Description	Page Number
10-1	Overview	10-1
10-2	Why do Maintenance	10-2
10-3	Maintenance Task Schedule	10-2
10-4	Tools Required	10-4
10-5	System Maintenance	10-7
10-6	Electrical Safety Tests	10-12
10-7	When There's Too Much Leakage Current...	10-28

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

⚠ **DANGER**   **THERE ARE SEVERAL PLACES ON THE BACKPLANE, THE AC DISTRIBUTION, AND DC DISTRIBUTION 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.**

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

⚠ **CAUTION**   **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 Maintenance

10-2-1 Keeping Records

It is good business practice that ultrasound facilities maintain records of quality checks and corrective maintenance. The Ultrasound Inspection Certificate (provided on page 10-29) 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 physicists, 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. Please contact us for coverage information and/or price for service.

Section 10-3
Maintenance Task Schedule

10-3-1 How often should care & maintenance tasks be performed?

The Care & Maintenance Task Schedule (provided on page 10-3) specifies how often your LOGIQ™ P5 should be serviced and outlines items requiring special attention.

NOTE: *It is the customer's responsibility to ensure the LOGIQ™ P5 care & maintenance is performed as scheduled in order to retain its high level of safety, dependability and performance.*

Your GE Service Representative has an in-depth knowledge of your LOGIQ™ P5 ultrasound scanning system and can best provide competent, efficient service. Please contact us for coverage information and/or price for service.

The service procedures and recommended intervals shown in the Care & Maintenance Task Schedule assumes that you use your LOGIQ™ P5 for an average patient load (10-12 per day) and not use it as a primary mobile unit which is transported between diagnostic facilities.

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

Table 10-2 Customer Care Schedule

Service at Indicated Time	Daily	Monthly	Quarterly	Per Facilities QA Program	Notes
Clean Probes	●*				* or before each use
Clean Probe Holders	●				
Clean Air Filter			●		more frequently depending on your environment
Inspect AC Mains Cable		●			Mobile Unit Check Weekly
Inspect Cables and Connectors		●			
Clean Console		●			
Clean Monitor and Touch Panel		●			
Inspect Wheels, Casters, brakes and Swivel Locks		●			Mobile Unit Check Daily
Check Control Panel Movement		●			Mobile Unit Check Daily
Console Leakage Current Checks				●	also after corrective maintenance
Peripheral Leakage Current Checks				●	also after corrective maintenance
Surface Probe Leakage Current Checks				●	also after corrective maintenance
Endocavity Probe Leakage Current Checks				●	also after corrective maintenance
Transesphongeal Probe Leakage Current Checks				●	also after corrective maintenance
Surgical Probe Leakage Current Checks				●	also after corrective maintenance
Measurement Accuracy Checks				●	also after corrective maintenance
Probe/Phantom Checks				●	also after corrective maintenance
Functional Checks				●	also after corrective maintenance

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.

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

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
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

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

Tool ID	Description	Tool ID	Description
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 10-4   Overview of GE-2 Tool Kit Contents

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
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		

10-4-2   Special Tools, Supplies and Equipment

10-4-2-1   Specific Requirements for Care & Maintenance

Table 10-5   Overview of Requirements for Care & Maintenance

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
Air Filter	10-5-4-2	air intake
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
3.5" MOD MEDIA	E8381AA E8381AB	blank 128 M disk blank 230 M disk
5.25" MOD Media		
3.5" MOD Media Cleaner	2117811	cleans the diskettes
5.25" MOD Media Cleaner		cleans the diskettes
3.5" MOD Head Cleaner Kit	2148392	cleans the drive heads
5.25" MOD Head Cleaner Kit		cleans the drive heads
QIQ Phantom	E8370RB	RMI Grayscale Target Model 403GS
CD-RW Media		For LOGIQ™ P5
B/W Printer Cleaning Sheet		See printer user manual for requirements
Color Printer Cleaning Sheet		See printer user manual for requirements
Disposable Gloves		

Section 10-5
System Maintenance

10-5-1   Preliminary Checks

The preliminary checks take about 15 minutes to perform. refer to the system user documentation whenever necessary.

Table 10-6   System Checks

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 Ultrasound Inspection Certificate (see page 29). 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 and touch panel.
6	Presets	Backup all customer presets on an CD-RW.

10-5-2 Functional Checks (See Also Chapter 4)

The functional checks take about 60 minutes to perform. refer to the system user documentation whenever necessary.

10-5-2-1 System Checks

Table 10-7   System Functional Checks

Check	Step	Description
	B-Mode	Verify basic B-Mode (2D) operation. Check the basic system controls that affect this mode of operation.
	CF-Mode	Verify basic CF-Mode (Color Flow Mode) operation. Check the basic system controls that affect this mode of operation.
	Doppler Modes	Verify basic Doppler operation (PW and CW if available). 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.
	*Applicable Software Options	Verify the basic operation of all optional modes such as Multi-Image, 3D, Contrast, Harmonics, Cine, Stress Echo,... etc. Check the basic system controls that affect each options operation.
	Xmit/Recv Elements	Use the Visual Channel Utility on the 10L probe to verify that all system xmit/recv channels are functional.
	Keyboard Test	Perform the Keyboard Test Procedure to verify that all keyboard controls are OK.
	Monitor	Verify basic Monitor display functions. refer to Chapter 3 of the User Manual.
	Touch Panel	Verify basic Touch Panel 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.

NOTE: ** Some software may be considered standard depending upon system model configuration.*

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.

Table 10-8   GE Approved Peripheral/Hardware Option Functional Checks

Step	Item	Description
1	VCR	Verify record/playback capabilities of the VCR. Clean heads and covers if necessary.
2	B/W Printer	Verify hardcopy output of the B/W video page printer. Clean heads and covers if necessary.
3	Color Printer	Verify hardcopy output of the Color video page printer. Clean heads and covers if necessary.
4	DICOM	Verify that DICOM is functioning properly. Send an image to a DICOM device.
5	InSite/iLinq	Verify that InSite is functioning properly. Ensure two-way remote communications. (Warranty & Contract Customers only)
6	Camera	Verify hardcopy output of the film camera. Clean as necessary.
7	Footswitch	Verify that the footswitch is functioning as programed. Clean as necessary.
8	ECG	Verify basic operation with customer

10-5-3   Input Power

10-5-3-1   Mains Cable Inspection

Table 10-9   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 kind.
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.

10-5-4   Cleaning

10-5-4-1   General Cleaning

Table 10-10   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).

10-5-4-2   Air Filter Cleaning

Table 10-11   Air Filter Cleaning - frequency varies with your environment

Step	Item	Description
1	Remove Filter Cover	refer to Chapter 8 for air filter location and removal instructions.
2	Clean Filter	The filters can be cleaned in sprinkling water, or they can be dusted with a vacuum cleaner. If the filter is metal wash and/or vacuum. If the filter is fiber or plastic vacuum or replace.
3	Install Filter	Install the clean filter.

NOTE: *For your convenience or of the air filter is too dirty, replacement filters are available. refer to Chapter 9 for the air filter replacement part number.*

10-5-5   Physical Inspection

Table 10-12   Physical Checks

Step	Item	Description
1	Labeling	Verify that all system labeling is present and in readable condition. refer to the LOGIQ™ P5 User Manual for details.
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	Wheels & Brakes	Check all wheels and casters for wear and verify operation of foot brake, to stop the unit from moving, and release mechanism. Check all caster locks and caster swivel locks for proper operation.
6	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.
7	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.
8	External I/O	Check all connectors for damage and verify that the labeling is good.
9	Op Panel Lights	Check for proper operation of all operator panel and TGC lights.
10	Monitor Light	Check for proper operation of any monitor lights if available.
11	External Microphone	Check for proper operation of any external microphones by recording an audio test.

10-5-6 Optional Diagnostic Checks

Optionally you can access the diagnostic software as described in Chapters 5 or 7. View the error logs and run desired diagnostics.

10-5-6-1 View the Logs

1.) Review the system error log for any problems.

2.) Check the temperature log to see if there are any trends that could cause problems in the future.

3.) Check the Configuration Log; update if needed.

10-5-7 Probe Maintenance

10-5-7-1 Probe Related Checks

Table 10-13   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

10-5-7-2 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.

10-5-7-3 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.*

NOTE: *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.*

NOTE: *Disinfect a defective probe before you return it. Be sure to tag the probe as being disinfected.*

Section 10-6
Electrical Safety Tests

10-6-1   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.

⚠ **WARNING** *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.*

⚠ **CAUTION** **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.**

⚠ **CAUTION** **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:
    *   Based on your facilities QA program for surface probes
    *   Based on your facilities QA program for endocavitary probes
    *   whenever probe damage is suspected

10-6-2 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.

Table 10-14 Chassis Leakage Current Limits—Accessible Metal Surfaces

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 10-15 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	0.05 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 10-16 Type CF Applied Part Leakage Current Limits - Surgical Probes and ECG Connections

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

NOTE: **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.

10-6-3   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.
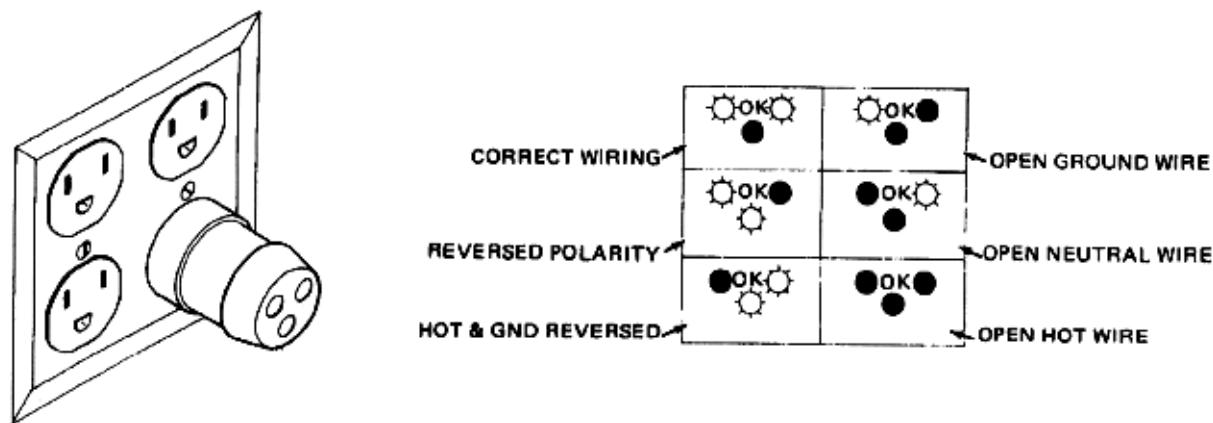
Figure 10-1   Typical Outlet Tester

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.
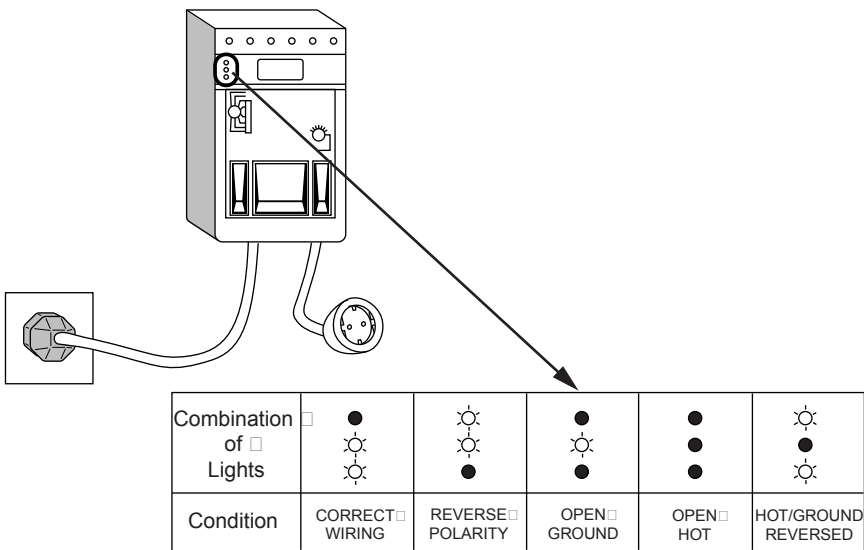
Figure 10-2   Dale 600 Outlet Test

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.

10-6-4 Grounding Continuity

⚠ **CAUTION** **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.
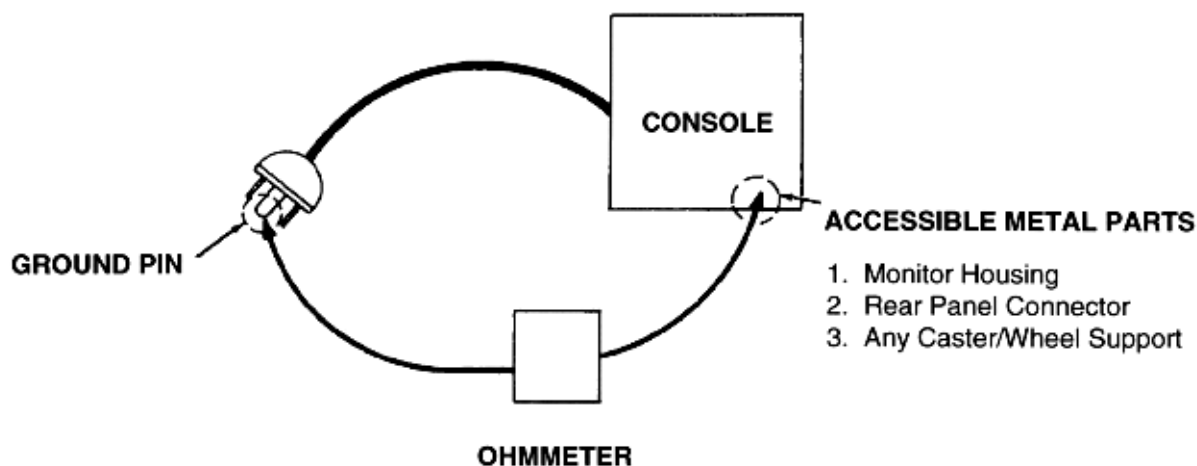
Figure 10-3   Ground Continuity Test

10-6-4-1 Meter Procedure

Follow these steps to test the ground wire resistance.

1.) Turn the LOGIQ™ P5 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™ P5 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.

10-6-4-2   Dale 600 - Ground Continuity

The Dale 600 measures line cord resistance from the third pin of the attachment plug to the meter's Chassis Cable clamp. Test the grounding continuity of the system to all exposed metal parts in accordance with the IEC 601-1.1 procedure as above. refer to the Dale 600 Instruction Manual for meter self tests and operation. Record measured resistance of the grounding continuity. The ground wire resistance should be less than 0.2 (Use any safety analyzer.)
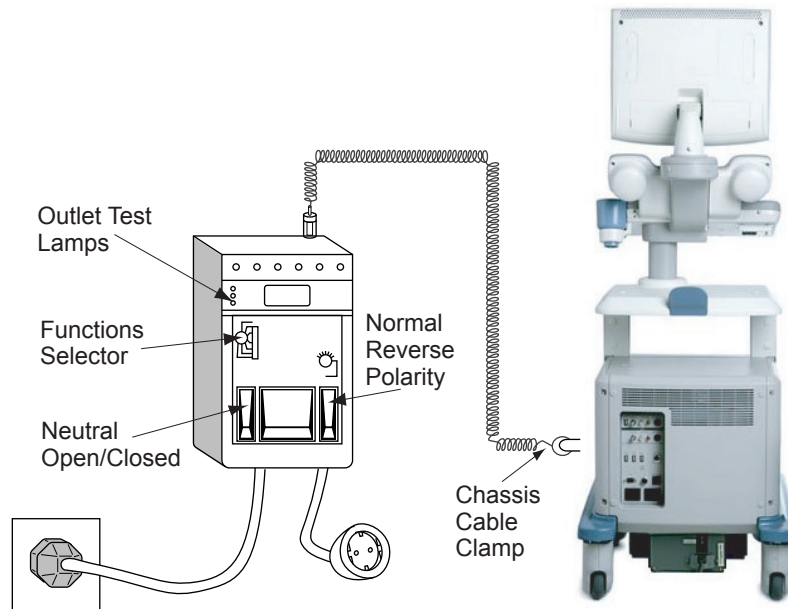
Figure 10-4   Dale 600 Ground Continuity Test

10-6-5 Chassis Leakage Current Test

10-6-5-1 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.

⚠ **CAUTION** **Electric Shock Hazard. When the meter's ground switch is OPEN, don't touch the unit!**

⚠ **CAUTION** **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.**

10-6-5-2 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.
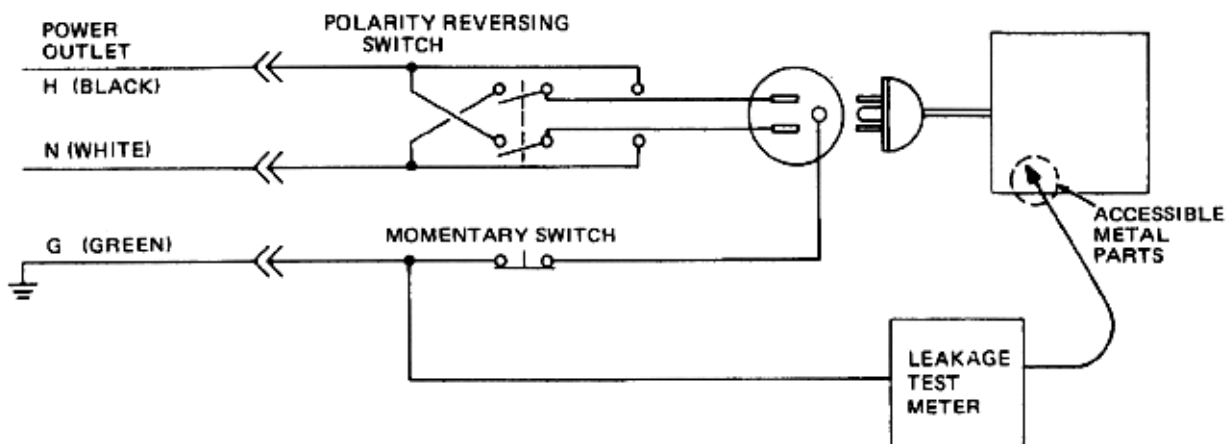
**Figure 10-5 Set Up for Chassis Source Leakage Current,
IEC 601-1 Clause 19 - Continuos Leakage Currents and
Patient, Auxiliary Currents**

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 10-14.

10-6-5-3   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™ P5 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™ P5.

4.) Set the tester's "FUNCTION" switch to CHASSIS position.
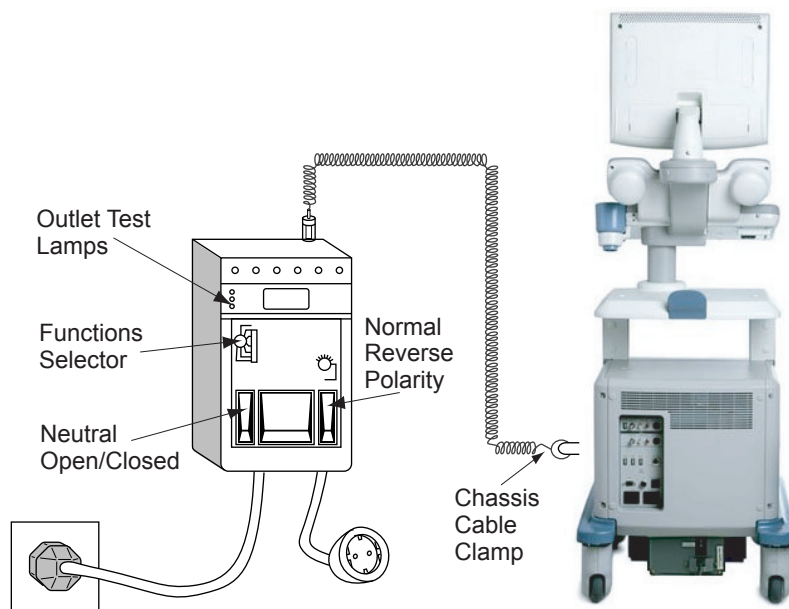
Figure 10-6   Ground and Chassis Leakage Current Test

5.) Follow the test conditions described for respective test points shown in Table 10-17.

Table 10-17 Chassis Leakage Current Test Condition

TEST	CONDITION
1	Mounting screw for probe receptacle
2	caster support
3	Mounting screw for CRT housing
4	Mounting screw for peripheral plugged into unit
5	Mounting screw for other peripheral powered by unit

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

10-6-5-4   Data Sheet for Chassis Source Leakage Current

The test passes when all readings measure less than the value shown in Table 10-14. Record all data on the PM Inspection Certificate.

Table 10-18 Typical Data Sheet for Chassis Source Leakage Current

Unit Power	Tester Polarity Switch	Tester Neutral or Ground Switch	Test 1 Probe Connector	Test 2 caster	Test 3 CRT	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					

10-6-6   Isolated Patient Lead (Source) Leakage–Lead to Ground

10-6-6-1   Definition

This test measures the current which would flow to ground from any of the isolated ECG leads. The meter simulates a patient who is connected to the monitoring equipment and is grounded by touching some other grounded surface. Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the ultrasound console Off and On. For each combination the operating controls, such as the lead switch, should be operated to find the worst case condition.

⚠️ **CAUTION**   **Equipment damage possibility. Never switch the Polarity when the unit is powered ON. Be sure to turn the unit power OFF before switching the polarity using the POLARITY switch. Otherwise, the unit may be damaged.**

10-6-6-2   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 operating controls such as the lead switch should be operated to find the worst case condition.
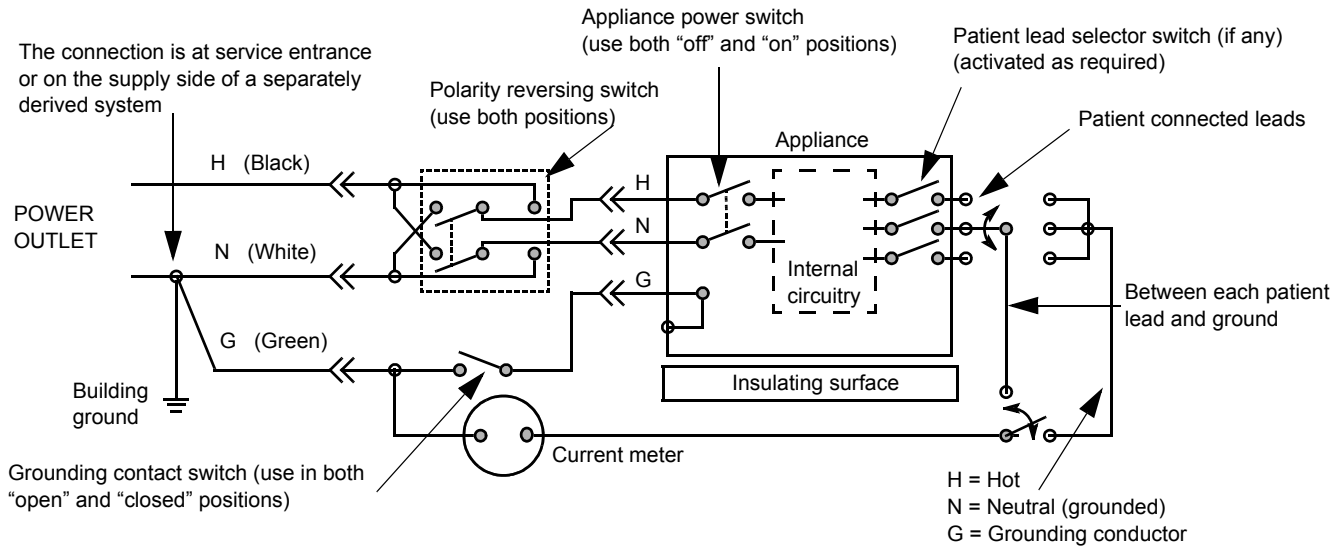
Figure 10-7   Test Circuit for Measuring Non-Isolated Patient Leads

10-6-6-3   Dale 600 Meter Procedure

The Dale 600 provides five snap type ECG buttons for testing patient leads. Snap on all patient leads to the meter and assure that the ground clip is connected to the system's ground terminal. Select the meter's LEAD-GND function. Select and test each ECG lead positions (except "ALL") of the LEAD selector, testing each to the power condition combinations found in "PATIENT LEAD LEAKAGE" table in the "PM CHECKLIST". Record the highest leakage current measured for each Power selection.

⚠ **CAUTION**   **Line voltage is applied to the ECG leads during this test. To avoid possible electric shock hazard, the system being tested must not be touched by patients, users or anyone while the ISO TEST switch is depressed. When the meter's ground switch is OPEN, don't touch the unit!**

Follow these steps to test the ECG module for leakage current.

1.) Turn the LOGIQ™ P5 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™ P5 unit.

4.) Connect the patient leads to the corresponding snaps located at the upper front of the Dale 600/ 600E. Lead nomenclature for this test is not important.

10-6-6-3Dale 600 Meter Procedure (cont'd)
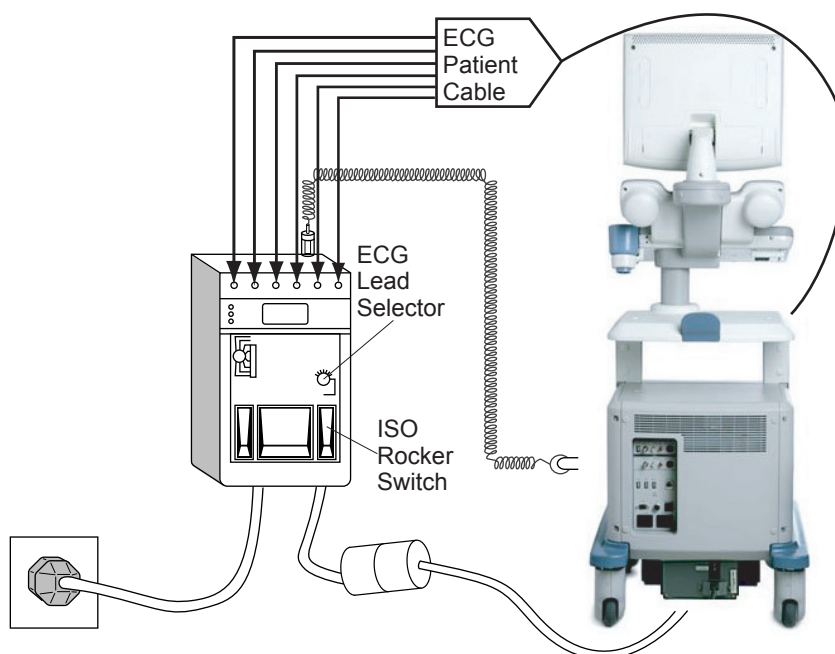
Figure 10-8   ECG Leakage Current Test

5.) Set the meter's "FUNCTION" switch to LEAD TO GROUND position to measure the patient lead to ground leakage current.

6.) Select and test each ECG lead positions (except ALL) of the LEAD selector, testing each to the power condition combinations.

Table 10-19 Testing Power Conditions

ECG Power	Meter's Polarity Switch	Meter's Neutral Switch
ON	NORM	CLOSED
ON	NORM	OPEN
ON	REVERSE	CLOSED
ON	REVERSE	OPEN
OFF	NORM	CLOSED
OFF	NORM	OPEN
OFF	REVERSE	CLOSED
OFF	REVERSE	OPEN

10-6-6-3 Dale 600 Meter Procedure (cont'd)

7.) Record the patient lead to ground leakage current measured on the data sheet.

8.) Set the meter's "FUNCTION" switch to LEAD TO LEAD position to measure the lead to lead leakage current.

9.) Select and test each ECG lead positions (except ALL) of the LEAD selector, testing each to the power condition combinations.

10.) Record the lead to lead leakage current measured on the data sheet.

11.) Set the meter's "FUNCTION" switch to LEAD ISO position to measure the patient lead isolation current.

12.) Select and test each ECG lead positions (except ALL) of the LEAD selector, testing each to the power condition combinations.

13.) Depress the rocker switch to ISO TEST and read the isolation current. To apply the voltage to the lead safely, the voltage is only applied when the rocker switch is depressed to ISO TEST.

14.) Record the patient lead isolation current measured on the data sheet.

10-6-7 Isolated Patient Lead (Source) Leakage–Lead to Lead

reference the procedure in the IEC 60601-1. When using the Dale 600, switch the meter's function selector to the LEAD-LEAD position. Select and test each of the five ECG lead positions (except ALL) on the LEAD selector, testing each to the power condition combinations found in the table. Record the highest leakage current measured.

10-6-7-1 Dale 600 Patient Lead Tests

NEUTRAL POLARITY

1.) Closed Normal
2.) Open Normal
3.) Closed Reversed
4.) Open Reversed

10-6-8 Isolated Patient Lead (Sink) Leakage-Isolation Test

reference the procedure in the IEC 60601-1. When using the Dale 600, switch the meter's function selector to the LEAD-ISO. Select the ALL position on the lead selector. Depress the rocker switch to ISO TEST to test lead isolation.

⚠ **CAUTION** **Line voltage is applied to the ECG leads during this test. To avoid possible electric shock hazard, the system being tested must not be touched by patients, users or anyone while the ISO TEST switch is depressed.**

NOTE: *It is not necessary to test each lead individually or power condition combinations as required in previous tests.*

10-6-8-1   Data Sheet for ECG Leakage Current

The test passes when all readings measure less than the value shown in the table below. Record all data on the PM Inspection Certificate.

Table 10-20 Maximum Allowance Limit for ECG Leakage Current

	AC Power Source	Maximum Allowance Limit	
		GROUND OPEN	GROUND CLOSED
Patient Lead to Ground Leakage Current Test and Patient Lead to Lead Leakage Current Test	115V	10uA	10uA
	220/240V	500uA	10uA

Table 10-21   Maximum Allowance Limit for ECG Leakage Current

	AC Power Source	Maximum Allowance Limit
Patient Lead Isolation Current Test	115V	20uA
	220/240V	5mA

Table 10-22 Typical Data Sheet for ECG Leakage Current

ECG Power	Tester Polarity Switch	Tester Ground Switch	Tester Lead Selector				
			RL	RA	LA	LL	C
ON	NORM	CLOSED					
ON	REVERSE	CLOSED					
ON	NORM	OPEN					
ON	REVERSE	OPEN					
OFF	NORM	CLOSED					
OFF	REVERSE	CLOSED					
OFF	NORM	OPEN					
OFF	REVERSE	OPEN					

10-6-9   Probe Leakage Current Test

10-6-9-1   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.

10-6-9-2   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.
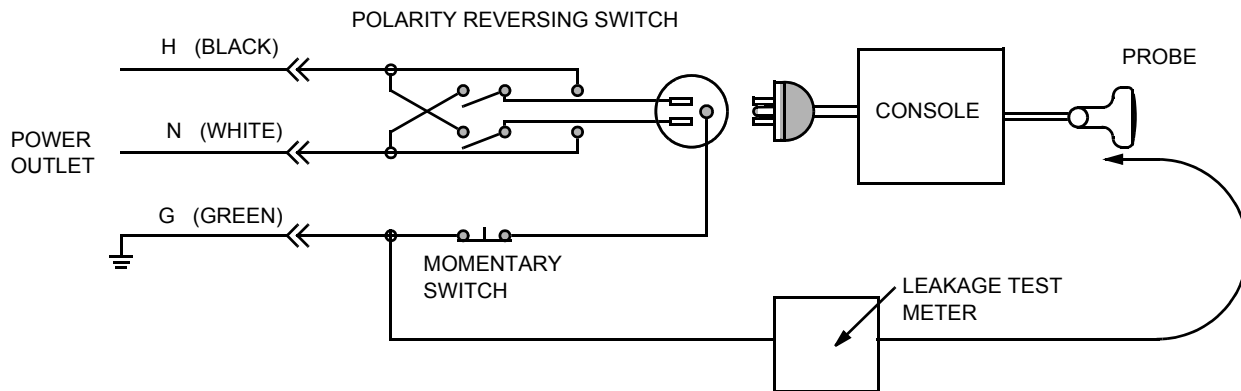

Figure 10-9   Set Up for Probe Leakage Current

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.

10-6-9-3   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.

⚠ **CAUTION**   **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™ P5 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".

10-6-9-3Meter Procedure Using Probe Adapter (cont'd)
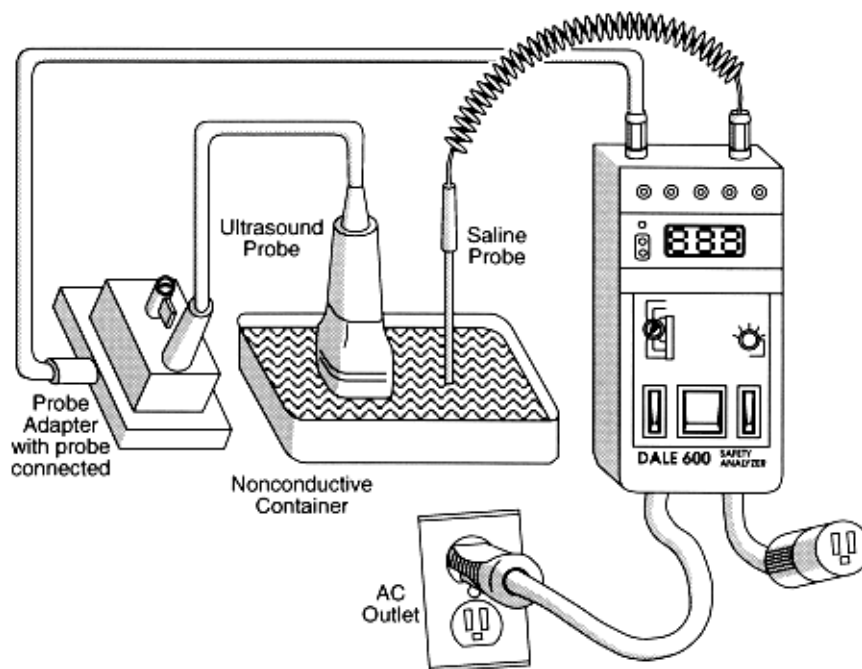
Figure 10-10   Transducer Source Leakage Current Test

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 10-23 for every transducer.

11.)Keep a record of the results with other hand copies of PM data.

10-6-9-4   No Meter Probe Adapter Procedure
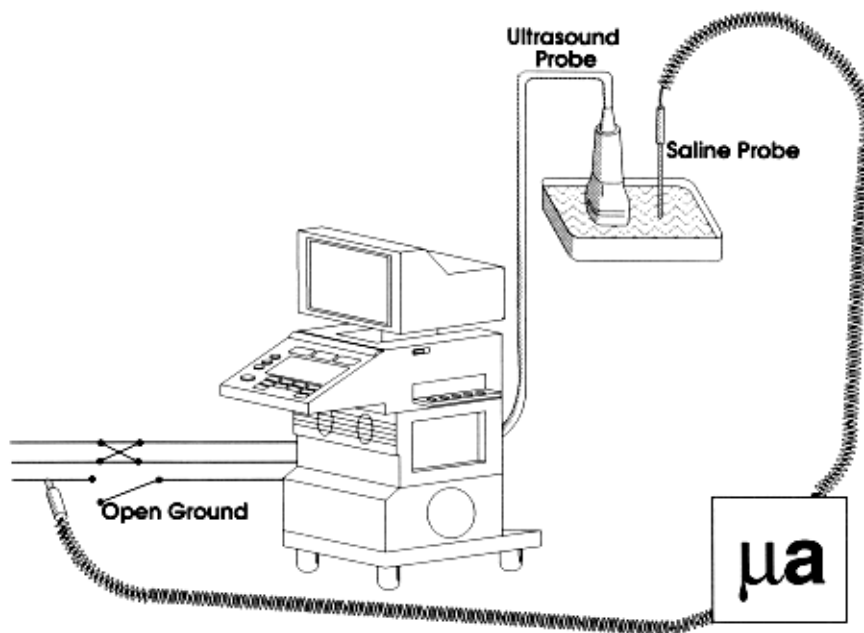
Figure 10-11   Check Without Probe Adapter

Follow these steps to test each transducer for leakage current.

1.) Turn the LOGIQ™ P5 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 10-23 for every transducer.
10.)Keep a record of the results with other hand copies of PM data.

10-6-9-5   Data Sheet for Transducer Source Leakage Current

The test passes when all readings measure less than the values shown in Table 10-15 and Table 10-16. Record all data on the PM Inspection Certificate.

⚠ **CAUTION** **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**

.

Table 10-23 Typical Data Sheet For Transducer Source Leakage Current

Transducer Tested:			
Unit Power	**Tester Power Polarity Switch**	**Tester GROUND or NEUTRAL 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	

Section 10-7
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.

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

PROBE FAILS

Test the probe in another connector to isolate if the fault lies with the probe or the scanner.

NOTE: *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.

ECG FAILS

Inspect cables for damage or poor connections.

ULTRASOUND 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

Functional Check (if applicable)	OK? or N/A
B-Mode Function	
Doppler Modes Function	
CF-Mode Function	
M-Mode Function	
Applicable Software Options	
Applicable Hardware Options	
Control Panel	
Monitor	
Touch Panel	
Measurement Accuracy	
GE Approved Peripherals	

PHYSICAL INSPECTION AND CLEANING

Physical Inspection and Cleaning (if applicable)	Inspect	Clean
Console		
Monitor		
Touch Panel		
Air Filter		
Probe Holders		
External I/O		
Wheels, Brakes & Swivel Locks		
Cables and Connectors		
GE Approved Peripherals (VCR, CD-RW, MOD, Printers)		

COMMENTS:

_____

_____

_____

_____

ELECTRICAL SAFETY

Electrical Test Performed	Max Value Allowed	Value Measured	OK?	Comments
Outlet (correct ground &wiring config.)				
System Ground Continuity				
Chassis Source Leakage Current - Probe				
Chassis Source Leakage Current - Caster				
Chassis Source Leakage Current - CRT				
Patient Lead Source Leakage (Lead to Ground)				
Patient Lead Source Leakage (Lead to Lead)				
Patient Lead Source Leakage (Isolation)				
Peripheral 1 Leakage Current				
Peripheral 1Ground Continuity				
Peripheral 2 Leakage Current				
Peripheral 2Ground Continuity				
Peripheral 3 Leakage Current				
Peripheral 3Ground 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: _____