

LOGIQ E9

PROPRIETARY SERVICE MANUAL

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Important Precautions

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.

**WARNING
(EN)**

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.

**AVERTISSEMENT
(FR)**

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 GEFÄHREN KOMMEN.

**WARNUNG
(DE)**

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.

**AVISO
(ES)**

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.

**ATENÇÃO
(PT-Br)**

ESTE MANUAL DE ASSISTÊNCIA ESTÁ DISPONÍVEL APENAS 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 EFECTUAR REPARAÇÕES NO EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO PREVIAMENTE ESTE MANUAL.
- A INOBSERVÂNCIA DESTE AVISO PODE RESULTAR EM FERIMENTOS NO TÉCNICO DE ASSISTÊNCIA, OPERADOR OU PACIENTE EM CONSEQUÊNCIA DE CHOQUE ELÉCTRICO, PERIGOS DE ORIGEM MECÂNICA, BEM COMO DE OUTROS TIPOS.

**AVISO
(PT-pt)**

IL PRESENTE MANUALE DI MANUTENZIONE È DISPONIBILE SOLTANTO IN INGLESE.

- SE UN ADDETTO ALLA MANUTENZIONE ESTERNO ALLA GEHC RICHIENDE 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.

**AVVERTENZA
(IT)**

KÄESOLEV TEENINDUSJUHEND ON SAADAVAL AINULT INGLISE KEELES.

- KUI KLIENDITEENINDUSE OSUTAJA NÕUAB JUHENDIT INGLISE KEELEST ERINEVAS KEELES, VASTUTAB KLIENT TÖLKTEENUSE 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.

**HOIATUS
(ET)****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.

**VAROITUS
(FI)****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 ΗΛΕΚΤΡΟΠΛΗΣΙΑ, ΜΗΧΑΝΙΚΟΥΣ ή ΆΛΛΟΥΣ ΚΙΝΔΥΝΟΥΣ.

**ΠΡΟΕΙΔΟΠΟΙΗΣΗ
(EL)****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.

**FIGYELMEZTETÉS
(HU)**

ÞESSI ÞJÓNUSTUHANDBÓK ER EINGÖNGU FÁANLEG Á ENSKU.

- EF ÞJÓNUSTUAÐILI VIÐSKIPTAMANNS ÞARFNAST ANNARS TUNGUMÁLS EN ENSKU, ER ÞAÐ Á ÁBYRGÐ VIÐSKIPTAMANNS AÐ ÚTVEGA PÝÐINGU.
- REYNID EKKI AÐ ÞJÓNUSTA TÆKID NEMA EFTIR AD HAFA SKODAD 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.

VIDVÖRUN
(IS)

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.

VÝSTRAHA
(CS)

DENNE SERVICEMANUAL FINDES KUN PÅ ENGELSK.

- HVIS EN KUNDENS 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.

ADVARSEL
(DA)

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.

WAARSCHUWING
(NL)

ŠI APKALPES ROKASGRĀMATA IR PIEEJAMA TIKAI ANGLU VALODĀ.

- JA KLIENTA APKALPES SNIEDZĒJAM NEPIECIEŠAMA INFORMĀCIJA CITĀ VALODĀ, NEVIS ANGLU, KLIENTA PIENĀKUMS IR NODROŠINĀT TULKOŠANU.
- NEVEICET APRĪKOJUMA APKALPI BEZ APKALPES ROKASGRĀMATAS IZLASIŠANAS UN SAPRAŠANAS.
- ŠI BRĪDINĀJUMA NEIEVĒROŠANA VAR RADĪT ELEKTRISKĀS STRĀVAS TRIECIENA, MEHĀNISNU VAI CITU RISKU IZRAISĪTU TRAUMU APKALPES SNIEDZĒJAM, OPERATORAM VAI PACIENTAM.

**BRĪDINĀJUMS
(LV)****ŠIS EKSPLOATAVIMO VADOVAS YRA IŠLEISTAS TIK ANGLU KALBA.**

- JEI KLIENTO PASLAUGU TEIKĒJUI REIKIA VADVO KITA KALBA – NE ANGLU, VERTIMU PASIRŪPINTI TURI KLIENTAS.
- NEMĒGINKITE ATLIKTI ĪRANGOS TECHNINĒS PRIEŽIŪROS DARBU, NEBENT VADOVAUTUMĒTÈS ŠIUO EKSPLOATAVIMO VADOVU IR JI SUPRASTUMĒTE
- NEPAISANT ŠIO PERSPĒJIMO, PASLAUGU TEIKĒJAS, OPERATORIUS AR PACIENTAS GALIBŪTI SUŽEISTAS DĒL ELEKTROS SMŪGIO, MECHANINIŲ AR KITŲ PAVOJŲ.

**ISPĒJIMAS
(LT)****DENNE SERVICEHÅNDBOKEN FINNES BARE PÅ ENGELSK.**

- HVIS KUNDENS SERVICELEVERANDØR TRENGER ET ANNEN 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.

**ADVARSEL
(NO)****NINIEJSZY PODRĘCZNIK SERWISOWY DOSTĘPNY JEST JEDYNIE W JĘZYKU ANGIELSKIM.**

- JEŚLI FIRMA ŚWIADCZĄCA KLIENTOWI USŁUGI SERWISOWE WYMAGA UDOSTĘPNIENIA PODRĘCZNIKA W JĘZYKU INNYM NIŻ ANGIELSKI, OBOWIĄZEK ZAPEWNENIA STOSOWNEGO TŁUMACZENIA SPOCYWA 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.

**OSTRZEŻENIE
(PL)**

ACEST MANUAL DE SERVICE ESTE DISPONIBIL NUMAI ÎN LIMBA ENGLEZĂ.

- DACĂ UN FURNIZOR DE SERVICII PENTRU CLIENTI NECESITĂ O ALTĂ LIMBĂ DECÂT CEA ENGLEZĂ, ESTE DE DATORIA CLIENTULUI SĂ FURNIZEZE O TRADUCERE.
- NU ÎNCERCAȚI SĂ REPARAȚI ECHIPAMENTUL DECÂT ULTERIOR CONSULTĂRII ȘI ÎNTELEGERII 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.

**ATENȚIE
(RO)**

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 ТЕХОСЛУЖИВАНИЮ, ОПЕРАТОР ИЛИ ПАЦИЕНТ ПОЛУЧАТ УДАР ЗЛЕКТРИЧЕСКИМ ТОКОМ, МЕХАНИЧЕСКУЮ ТРАВМУ ИЛИ ДРУГОЕ ПОВРЕЖДЕНИЕ.

**ОСТОРОЖНО!
(RU)**

ТОВА СЕРВИЗНО РЪКОВОДСТВО Е НАЛИЧНО САМО НА АНГЛИЙСКИ ЕЗИК.

- АКО ДОСТАВЧИКЪТ НА СЕРВИЗНИ УСЛУГИ НА КЛИЕНТ СЕ НУЖДАЕ ОТ ЕЗИК, РАЗЛИЧЕН ОТ АНГЛИЙСКИ, ЗАДЪЛЖЕНИЕ НА КЛИЕНТА Е ДА ПРЕДОСТАВИ ПРЕВОДАЧЕСКА УСЛУГА.
- НЕ СЕ ОПИТВАЙТЕ ДА ИЗВЪРШВАТЕ СЕРВИЗНО ОБСЛУЖВАНЕ НА ТОВА ОБОРУДВАНЕ, ОСВЕН ВСЛУЧАЙ, ЧЕ СЕРВИЗНОТО РЪКОВОДСТВО Е ПРОЧЕТЕНО И СЕ РАЗБИРА.
- НЕСПАЗВАНЕТО НА ТОВА ПРЕДУПРЕЖДЕНИЕ МОЖЕ ДА ДОВЕДЕ ДО НАРАНЯВАНЕ НА ДОСТАВЧИКА НА СЕРВИЗНИ УСЛУГИ, НА ОПЕРАТОРА ИЛИ ПАЦИЕНТА ВСЛЕДСТВИЕНА ТОКОВ УДАР, МЕХАНИЧНИ ИЛИ ДРУГИ РИСКОВЕ.

**ПРЕДУПРЕЖДЕНИЕ
(BG)**

OVAJ PRIRUČNIK ZA SERVISIRANJE DOSTUPAN JE SAMO NA ENGLESKOM JEZIKU.

- AKO KLIJENTOV SERVISER ZAHTEVA JEZIK KOJI NIJE ENGLIESKI, ODGOVORNOST JE NA KLIJENTU DA PRUŽI USLUGE PREVOĐENJA.
- NEMOJTE POKUŠAVATI DA SERVISIRATE OPREMU AKO NISTE PROČITALI I RAZUMELI PRIRUČNIK ZA SERVISIRANJE.
- AKO NE POŠTUJETE OVO UPOZORENJE, MOŽE DOĆI DO POVREĐIVANJA SERVISERA, OPERATERA ILI PACIJENTA UZROKOVANOG ELEKTRIČNIM UDAROM, MEHANIČKIM I DRUGIM OPASNOSTIMA.

**UPOZORENJE
(SR)**

TA SERVISNI PRIROČNIK JE NA VOLJO SAMO V ANGLEŠČINI.

- ČE PONUDNIK SERVISNIH STORITEV ZA STRANKO POTREBUJE NAVODILA V DRUGEM JEZIKU, JE ZA PREVOD ODGOVORNA STRANKA SAMA.
- NE POSKUŠAJTE SERVISIRATI OPREME, NE DA BI PREJ PREBRALI IN RAZUMELI SERVISNI PRIROČNIK.
- ČE TEGA OPORIZILA NE UPOŠTEVATE, OBSTAJA NEVARNOST ELEKTRIČNEGA UDARA, MEHANSKIH ALI DRUGIH NEVARNOSTI IN POSLEDIČNIH POŠKODB PONUDNIKA SERVISNIH STORITEV, UPORABNIKA OPREME ALI PACIENTA.

OPOZORILO
(SL)

OVAJ SERVISNI PRIRUČNIK DOSTUPAN JE SAMO NA ENGLESKOM JEZIKU.

- AKO KLIJENTOV SERVISER ZAHTJEVA JEZIK KOJI NIJE ENGLESKI, ODGOVORNOST KLIJENTA JE PRUŽITI USLUGE PREVOĐENJA.
- NEMOJTE POKUŠAVATI SERVISIRATI OPREMU AKO NISTE PROČITALI I RAZUMJELI SERVISNI PRIRUČNIK.
- AKO NE POŠTUJETE OVO UPOZORENJE, MOŽE DOĆI DO OZLJEDJE SERVISERA, OPERATERA ILI PACIJENTA PROUZROČENE STRUJNIM UDAROM, MEHANIČKIM I DRUGIM OPASNOSTIMA.

UPOZORENJE
(HR)

TÁTO SERVISNÁ PRÍRUČKA JE K DISPOZÍCII LEN V ANGLIČTINE.

- AK ZÁKAZNÍKOV POSKYTOVATEĽ SLUŽIEB VYŽADUJE INÝ JAZYK AKO ANGLIČTINU, POSKYTNUTIE PREKLADATEĽSKÝCH SLUŽIEB JE ZODPOVEDNOSŤOU ZÁKAZNÍKA.
- NEPOKUŠAJTE 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.

UPOZORNENIE
(SK)

DEN HÄR SERVICEHANDBOKEN FINNS BARA TILLGÄNLIG PÅ ENGELSKA.

- OM EN KUNDS SERVICETEKNIKER HAR BEHOV AV ETT ANNAT SPRÅK ÄN ENGELSKA ANSVARAR KUNDEN FÖR ATT TILLHANDAHÄLLA 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.

VARNING
(SV)

BU SERVİS KİLAVUZU YALNIZCA İNGİLİZCE OLARAK SAĞLANMIŞTIR.

- EĞER MÜŞTERİ TEKNİSYENİ KİLAVUZUN İNGİLİZCE DİŞINDAKİ BİR DİLDE OLMASINI İSTERSE, KİLAVUZU TERCÜME ETTİRMEK MÜŞTERİNİN SORUMLULUĞUNDADIR.
- SERVİS KİLAVUZUNU 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.

DİKKAT
(TR)

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For a complete review of all safety requirements, see: [Section 1-4 "Safety considerations" on page 1-18.](#) of the latest version of LOGIQ E9 Service Manual.

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Chapter 1

Introduction

Section 1-1

Overview

1-1-1 Purpose of this chapter

This chapter describes important issues related to safely servicing LOGIQ E9. The service provider must read and understand all the information presented here before installing or servicing a unit.

1-1-2 Contents in this chapter

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Section 1-2

Service manual overview

Attention

This manual contains necessary and sufficient information for the Field Service Engineer or Biotech Engineer to maintain and service the system safely. Advanced equipment training may be provided by factory trained Field Service trainers for the agreed-upon time period.

This service manual provides installation and service information for the LOGIQ E9 ultrasound scanning unit. It is divided in 10 chapters as shown below, in *Table 1-1 "Contents in this service manual" on page 1-3.*

Indications for Use

The LOGIQ E9 is intended for use by a qualified physician for ultrasound evaluation. Specific clinical applications and exam types include:

- Fetal/Obstetrics
- Abdominal (includes renal, GYN/Pelvic)
- Pediatric
- Small Organ (breast, testes, thyroid)
- Neonatal Cephalic
- Adult Cephalic
- Cardiac (adult and pediatric)
- Peripheral Vascular
- Musculo-skeletal Conventional and Superficial
- Urology (including prostate)
- Transrectal
- Transvaginal
- Transesophageal

Contraindication

The LOGIQ E9 ultrasound system is not intended for ophthalmic use or any use causing the acoustic beam to pass through the eye.

1-2-1 Contents in this section

1-2-1	Contents in this section	1-2
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1-2-2 Contents in this service manual

The service manual is divided into ten chapters.

In the beginning of the manual, before chapter 1, you will find the language policy for GE's service documentation, legal information, a revision overview, and the Table of Contents (TOC).

An Index has been included after chapter 10.

Table 1-1 Contents in this service manual

CHAPTER NUMBER	CHAPTER TITLE	DESCRIPTION
1	Introduction	Contains a content summary and warnings.
2	Site preparations	Contains pre-setup requirements for the LOGIQ E9.
3	LOGIQ E9 Setup	Contains setup procedure with procedure checklist.
4	Functional Checks	Contains functional checks that must be performed as part of the installation, or as required during servicing and periodic maintenance.
5	Components and Functions (Theory)	Contains block diagrams and functional explanations of the electronics.
6	Service Adjustments	Contains instructions on how to make any available adjustments to the LOGIQ E9.
7	Diagnostics/Troubleshooting	Provides procedures for running diagnostic or related routines for the LOGIQ E9.
8	Replacement procedures	Provides disassembly procedures and reassembly procedures for all changeable FRUs, available option installation instructions, and upgrade installation instructions.
9	Renewal Parts	Contains a complete list of replacement parts for the LOGIQ E9.
10	Care & Maintenance	Provides periodic maintenance procedures for LOGIQ E9.
N/A	Index	A quick way to the topic you're looking for.

1-2-3 Typical users of the “Basic” Service Manual

- Service Personnel (setup, maintenance, etc.)
- Hospital’s Service Personnel
- Architectural Planners/Installation Planners (some parts of [Chapter 2 - Site preparations](#))

1-2-4 LOGIQ E9 models covered by this manual

Table 1-2 LOGIQ E9 Software Configurations and Hardware/Software Compatibility - Upgrade Options

CONSOLE MODEL NUMBER	DESCRIPTION	SOFTWARE VERSION					
		Phase 1	BT2010	BT2011	R4	R5	R6
		R1.x.x	R2.x.x	R3.x.x	4 Rev. x.x	5 Rev. x.x	6 Rev. x.x
5205000	LOGIQ E9, 100-240 VAC	Y	U	U	U	U	N
5205000-2	LOGIQ E9, 220-240 VAC	Y	U	U	U	U	N
5205000-3	LOGIQ E9, 100-240 VAC	N	Y	U	U	U	N
5205000-4	LOGIQ E9, 220-240 VAC	N	Y	U	U	U	N
5205000-5	LOGIQ E9, 100-240 VAC	N	N	Y	U	U	U
5205000-6	LOGIQ E9, 220-240 VAC	N	N	Y	U	U	U
5205000-7	LOGIQ E9, 100-240 VAC	N	N	N	Y	U	U
5205000-8	LOGIQ E9, 100-240 VAC	N	N	N	N	Y	U
5205000-9	LOGIQ E9, 100-240 VAC	N	N	N	N	N	Y

LOGIQ E9 Software Configurations and Hardware/Software Compatibility - Upgrade Options

LOGIQ E9 Software Configurations and Hardware/Software Compatibility - Upgrade Options	
Y	Original
U	Upgrade available
N	Not supported

Front End Processor - see: [9-12-2 "Front End Boards Compatible Configurations" on page 9-67.](#)

Back End Processor - see: [9-13-1 "Back End Boards Compatible Configurations" on page 9-79.](#)

NOTE: When not otherwise specified, the contents of this manual applies to all LOGIQ E9 models.

1-2-5 Product description**1-2-5-1 Contents in this sub-section**

1-2-5-1	Contents in this sub-section	1-5
1-2-5-2	Overview of the LOGIQ E9 ultrasound scanner	1-6
1-2-5-3	History - hardware/software versions	1-6
1-2-5-4	History - peripherals/software versions.....	1-6
1-2-5-5	FRUs for Back End Processor	1-6
1-2-5-6	History - supported probes	1-6
1-2-5-7	How to turn the scanner ON and OFF	1-6
1-2-5-8	How to check for hardware/software version and installed options	1-6
1-2-5-9	Purpose of the operator manual(s).....	1-6

1-2-5-2 Overview of the LOGIQ E9 ultrasound scanner

The LOGIQ E9 ultrasound unit is a high performance digital ultrasound imaging system with total data management.

The system provides image generation in B-Mode, Color Doppler, Power Doppler, M-Mode, Color M-Mode, PW and 4D, Tissue Velocity imaging, Volume-Guided Ultrasound and Contrast applications. The fully digital architecture of the LOGIQ E9 unit allows optimal usage of all scanning modes and probe types throughout the full spectrum of operating frequencies.

Signal flows from the Probe Connector Panel to the Front End, and then over to the Back End Processor and finally to the monitor and peripherals.

System configuration is stored on the hard drive in the Back End Processor.

All necessary software is loaded from the hard drive on power up.

1-2-5-3 History - hardware/software versions

Refer to [Section 9-6 "Software" on page 9-6](#).

1-2-5-4 History - peripherals/software versions

Refer to [Section 9-15 "Peripherals" on page 9-83](#).

1-2-5-5 FRUs for Back End Processor

Refer to [Section 9-13 "Back End Processor \(BEP\) parts" on page 9-72](#).

1-2-5-6 History - supported probes

Refer to [Section 9-18 "Probes" on page 9-112](#).

1-2-5-7 How to turn the scanner ON and OFF

- To turn the scanner ON see: [4-2-4 "Power shut down" on page 4-7](#).
- To turn the scanner OFF see: [4-2-5 "Top Console position adjustment" on page 4-10](#).

1-2-5-8 How to check for hardware/software version and installed options

- To verify the hardware versions on the boards, refer to [Section 9-5 "LOGIQ E9 Models and hardware/software compatibility" on page 9-5](#).
- Refer to [4-4-1 "Software Configuration Checks" on page 4-53](#) to check the software versions on local software on the boards.
- Refer to [Section 4-3 "Functional checks" on page 4-34](#) to check for installed options.

1-2-5-9 Purpose of the operator manual(s)

The operator manuals should be fully read and understood before operating the LOGIQ E9.

The online versions of the operator manuals are available via the Help function on LOGIQ E9's operator panel.

Section 1-3

Important conventions

1-3-1 Contents in this section

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1-3-2 Conventions used in book

1-3-2-1 Model designations

This manual covers the LOGIQ E9 scanners listed in [1-2-4 "LOGIQ E9 models covered by this manual" on page 1-4](#).

1-3-2-2 Icons

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

1-3-2-3 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 to personnel are labeled in one of three ways:

- DANGER
- WARNING
- CAUTION

When a hazard is present that can cause property damage, but has absolutely no personal injury risk, a NOTICE is used.

 **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. EQUIPMENT DAMAGE POSSIBLE.**

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

Notice Example: Disk drive may crash.

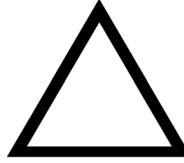
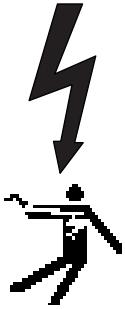
NOTE: Notes are used to provide important information about an item or a procedure.

NOTE: Be sure to read the notes; the information contained in a note can often save you time or effort.

1-3-3 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 possibly cause harm. Even if a symbol isn't used in this manual, it may be included for your reference.

Table 1-3 Standard hazard icons

DANGER	WARNING	CAUTION
		
BIOLOGICAL	ELECTRICAL	MOVING
		
ACOUSTIC OUTPUT	EXPLOSION	SMOKE / FIRE
		
LASER	HEAT	PINCH
 LASER LIGHT		  

1-3-3 Standard hazard icons (cont'd)

Table 1-4 Standard hazard icons (cont'd)

RADIATION	"	"
	"	"

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

Table 1-5 Standard Icons that indicate that a special procedure is to be used

AVOID STATIC ELECTRICITY	TAG AND LOCK OUT	WEAR EYE PROTECTION
		 EYE PROTECTION OR 
HAND PROTECTION	FOOT PROTECTION	"
		"

1-3-4 Product icons

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

Table 1-6 Product icons 1 of 8

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
Identification and Rating Plate 	Manufacturer's name and address	Rear panel
Identification and Rating Plate 	Date of manufacture	Rating Plate
SN	Serial Number	Rating Plate
REF	Catalog Number	Rating Plate
Type/Class Label	Used to indicate the degree of safety or protection.	
R ONLY Rx U.S.	United States only Prescription Requirement label	Rear panel
EC REP	Authorized European Representative address	Rear panel
	Equipment Type BF (man in the box symbol) IEC 878-02-03 indicates B Type equipment having a floating applied part.	Probe connectors including Doppler probe connector
	Equipment Type BF Applied Part (man in the box with paddle) symbol is in accordance with IEC 60417-5334.	Probe
	Equipment Type CF (heart in the box symbol) IEC 878-02-05 indicates equipment having a floating applied part having a degree of protection suitable for direct cardiac contact.	Probe connectors and ECG connector. On newer systems also on the rear of the system.

Table 1-6 Product icons (Continued) 2 of 8

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	DEFIBRILLATOR-PROOF TYPE CF EQUIPMENT.	At the ECG connector on front of system.
Device Listing/Certification Labels	Laboratory logo or labels denoting conformance with industry safety standards such as UL or IEC.	Rear of console
	This precaution is intended to prevent injury that may result if one person attempt to move the unit considerable distances or on an incline due to the weight of the unit.	Rear cover label
	DO NOT push the system at this point or from this area. Use the handle to push/pull the system, e.g., DO NOT use the LCD. Failure to do so may cause serious injury or system damage.	Rear of LCD Monitor Front of On-Board V Nav Stand
	Follow Instructions for Use. "ATTENTION" - Consult accompanying documents is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.	Rear Cover, Rear of LCD Monitor, Miscellaneous Probe Labels
	Symbol indicating that the Instructions for Use are supplied in electronic form.	Rear Panel
	Follow Instructions for Use. "ATTENTION" - Consult accompanying documents is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.	Rear of particular Main Power Supply
"DANGER - Risk of explosion used in..."	The system is not designed for use with flammable anesthetic gases.	Rear cover console
	The system is not designed for use with flammable anesthetic gases.	Rear of console
	C-UL Mark Parts Indicates that the product has been tested and approved in UL Laboratories, based on UL and CSA standards, through mutual approval activities.	Rear of LCD Monitor (inside) Footswitch

Table 1-6 Product icons (Continued) 3 of 8

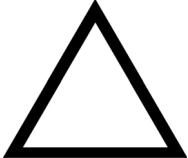
LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	This unit carries the CE mark. The LOGIQ E9 unit complies with regulatory requirements of the European Directive 93/ 42/EEC concerning medical devices. It also complies with emission limits for a Group 1, Class B Medical Device as stated in EN 60601-1-2 (IEC 60601-1-2).	Rear of console
	“CAUTION” The equilateral triangle is usually used in combination with other symbols to advise or warn the user.	Various
		Shear Wave Option Capacitor Pack Monitor Rear Cover
	“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. General Warning	Various, Rear Cover, Probe Label
	“Warning - 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 1-6 Product icons (Continued) 4 of 8

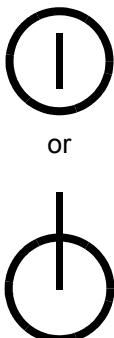
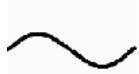
LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	"PINCH POINT" Indicates moving parts that may cause injury (such as the top, rear of the LCD Arm or XYZ Mech).	Various
	"Mains ON" Indicates the Power ON position of the mains power switch. "ON" Indicates the power on position of the power switch. CAUTION THE ON/OFF BUTTON ON THE OPERATOR PANEL DOES NOT ISOLATE MAINS SUPPLY	Rear of console
	ON/OFF button CAUTION SYSTEM SHUTDOWN USING THE ON/OFF BUTTON DOES NOT DISCONNECT LOGIQ E9 FROM MAINS VOLTAGE. For disconnecting LOGIQ E9 from mains voltage after system shutdown, please set the circuit breaker close to the mains inlet to OFF as described in 4-2-4 "Power shut down" on page 4-7 .	Operating Panel
	"Protective Earth" Indicates the protective earth (grounding) terminal.	Used several places inside the system.
	"Equipotential" Indicates the terminal to be used for connecting equipotential conductors when interconnecting (grounding) with other equipment as described in IEC60601-1.	Rear of console
	Alternating Current symbol is in accordance with IEC 60878-01-14.	Rear Panel, Rating Plate, Circuit breaker label of console and Front Panel (if applicable).

Table 1-6 Product icons (Continued) 5 of 8

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION	
	This symbol indicates that waste electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.	Rear of console Rear of LCD Monitor (inside)	
 LAMP CONTAINS MERCURY, DISPOSE ACCORDING TO STATE/LOCAL LAW. or LAMP CONTAINS MERCURY, DISPOSE ACCORDING TO STATE/LOCAL LAW. 灯泡含 水银, 请按当地法律处理。	This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. (Within this system, the backlight lamps in the monitor display, contain mercury.)	Rear Panel Rear of LCD Monitor (inside)	
	ETL Classified MEDICAL EQUIPMENT	ETL Listing Mark Monogram	Rear Panel
	GOST Symbol. Russia Regulatory Country Clearance.	Rear Panel	
	EAC Symbol. TP TC 020/2011	Rear Panel Rating Plate	
	ISO 7010 - P007 Volume Navigation Pacemaker Warning	V Nav Transmitter	

Table 1-6 Product icons (Continued) 6 of 8

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	Indicates the presence of hazardous substance(s) above the maximum concentration value. Maximum concentration values for electronic information products, as set by the People's Republic of China Electronic Industry Standard SJ/T11364-2006, include the hazardous substances of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE). "10" indicates the number of years during which the hazardous substance(s) will not leak or mutate so that the use of this product will not result in any severe environmental pollution, bodily injury, or damage to any assets.	Probe
	Indicates the presence of hazardous substance(s) above the maximum concentration value. Maximum concentration values for electronic information products, as set by the People's Republic of China Electronic Industry Standard SJ/T11364-2006, include the hazardous substances of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE). "20" indicates the number of years during which the hazardous substance(s) will not leak or mutate so that the use of this product will not result in any severe environmental pollution, bodily injury, or damage to any assets.	China Rating Plate

Table 1-6 Product icons (Continued) 7 of 8

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
		
	LCD and Operator Panel information and warnings.	
		Rear of the LCD monitor.
	How to lower LCD prior to transport	
	How to lock Operator Panel prior to transport	
	DO NOT place a finger, hand or any object on the joint of the monitor or monitor arm to avoid injury when moving the monitor and monitor arm.	

Table 1-6 Product icons (Continued) 8 of 8

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	Non-ionizing Electromagnetic Radiation Label	Rear Panel

1-3-5**Product Labels on LOGIQ E9 consoles used in a veterinary environment**

There are different handling instructions when servicing consoles that are used in a veterinary environment.

Table 1-7 Product Labels on LOGIQ E9 consoles used in a veterinary environment

LABEL	LOCATION
	Side Covers
	Back Cover
	Probe(s)

Section 1-4

Safety considerations

1-4-1 Contents in this section

1-4-1	Contents in this section.....	1-18
1-4-2	Introduction	1-18
1-4-3	Human safety	1-18
1-4-4	Mechanical safety	1-20
1-4-5	Electrical safety.....	1-22

1-4-2 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.

1-4-3 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 E9 Training Seminar are authorized to service the equipment.

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

 **WARNING IF THE COVERS ARE REMOVED FROM AN OPERATING LOGIQ E9, SOME METAL SURFACES MAY BE WARM ENOUGH TO POSE A POTENTIAL HEAT HAZARD IF TOUCHED, EVEN WHILE IN SHUTDOWN MODE.**

 **WARNING BECAUSE OF THE LIMITED ACCESS TO CABINETS AND EQUIPMENT IN THE FIELD, PLACING PEOPLE IN AWKWARD POSITIONS, GE HAS LIMITED THE LIFTING WEIGHT FOR ONE PERSON IN THE FIELD TO 16 KG (35 LBS). ANYTHING OVER 16 KG (35 LBS) REQUIRES 2 PEOPLE.**

 **WARNING USE ALL PERSONAL PROTECTION EQUIPMENT (PPE) SUCH AS GLOVES, SAFETY SHOES, SAFETY GLASSES, AND KNEELING PAD, TO REDUCE THE RISK OF INJURY.**

 **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.

1-4-3 Human safety (cont'd)

-  **WARNING** *When the top console is in its locked position, the gas shock is compressed and stores mechanical energy. During normal operation the top console, the weight of the monitor and the mechanical force of the gas shock are in balance. Take care if/when you activate this gas shock. Personal injury can occur after the panel is removed and the shock pressure is released. Take care when you repair the elevation assembly.*
-  **WARNING** *Ensure that the system is turned off and unplugged.*
Wait for at least 20 seconds for capacitors to discharge as there are no test points to verify isolation. The Amber light on the Op Panel On/Off button will turn off.
Beware that the Main Power Supply, Extended Power Shutdown and Back End Processor may be energized even if the power is turned off when the cord is still plugged into the AC Outlet
-  **WARNING** *Risk of electrical shock, system must be turned off and disconnected from power source. Cord must be controlled at all times.* Wait for at least 20 seconds for capacitors to discharge as there are no test points to verify isolation. The Amber light on the Op Panel On/Off button will turn off.
Beware that the Main Power Supply, Extended Power Shutdown and Back End Processor may be energized even if the power is turned off when the cord is still plugged into the AC Outlet
-  **WARNING** *Use extreme caution as long as THE LOGIQ E9 is un-stable, not resting on all four Casters.*
-  **WARNING** *Tilting the console requires two people in order to avoid injury to service personnel and damage to the equipment.*
-  **WARNING** *Beware of possible sharp edges on all mechanical parts. If sharp edges are encountered, the appropriate PPE should be used to reduce the risk of injury. The appropriate PPE is required per EHS Policies and SRA's.*
-  **WARNING** *Wear all PPE including gloves as indicated in the chemical MSDS.*

1-4-4 Mechanical safety

-  **WARNING** While the software installprocedure is designed to preserve data, you should save any patient data, images, system setups to a DVD or hardcopy before doing a software upgrade.
-  **WARNING** PRIOR TO ELEVATING THE SCANNER, VERIFY THAT THE KEYBOARD IS LOCKED IN ITS LOWEST POSITION. VERIFY THAT THE FRONT BRAKE IS LOCKED AND THE SCANNER IS UNABLE TO SWIVEL. VERIFY THAT THE REAR BRAKES ARE IN THE LOCKED POSITION.
-  **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.
-  **WARNING** REMEMBER: If the front caster swivel lock is engaged for transportation, pressing the release pedal once disengages the swivel lock. You must depress the release pedal a second time to engage the brake.
-  **WARNING** The system should NOT be moved with the Operator I/O Panel extended. Move the Operator I/O Panel to its centered and locked position. Lower the Operator I/O Panel as much as possible before moving the system.
-  **CAUTION** BEFORE YOU MOVE OR TRANSPORT THE SYSTEM, MAKE SURE TO LOCK THE LCD MONITOR ARM FIRMLY AND FLIP DOWN THE MONITOR TO PREVENT DAMAGE TO THE SYSTEM.
-  **CAUTION** Always lock the Top/Upper Console in its parking (locked) position before moving the scanner around.
-  **CAUTION** TO AVOID INJURY WHEN YOU MOVE THE LCD MONITOR AND THE MONITOR ARM, DO NOT PUT YOUR FINGER, HAND, OR OBJECT ON THE JOINT OF THE MONITOR OR THE MONITOR ARM.

1-4-4 Mechanical safety (cont'd)

**CAUTION**

LOGIQ E9 WEIGHS 135 KG (298 LB), R3.X AND EARLIER, 140 KG (309 LB), R4.X AND LATER, OR MORE, DEPENDING ON INSTALLED PERIPHERALS, WHEN READY FOR USE. CARE MUST BE USED WHEN MOVING IT OR REPLACING ITS PARTS. FAILURE TO FOLLOW THE PRECAUTIONS LISTED BELOW COULD RESULT IN INJURY, UNCONTROLLED MOTION AND COSTLY DAMAGE. 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 TO AVOID INJURY OR DAMAGE TO THE MONITOR, MAKE SURE THERE IS NOTHING WITHIN RANGE OF THE LCD BEFORE MOVING THE MONITOR AND MONITOR ARM. THIS INCLUDES PEOPLE AS WELL AS THINGS.



CAUTION Ensure that nobody touches the console arm/frogleg when moving the Operator Panel.



CAUTION Use Protective Glasses during drilling, filing and during all other work where eyes need protection.



CAUTION Use Safety Shoes when doing work where there is any chance of foot damage.



CAUTION Use Protective Gloves when drilling and cutting.



NOTICE Be careful not to pinch any of the cables.

NOTE: Special care should be taken when transporting the unit in a vehicle, see [4-2-14-4 "Transporting the LOGIQ E9 by vehicle" on page 4-19](#).

1-4-5 Electrical safety

1-4-5-1 Safe practices

Follow these guidelines to minimize shock hazards whenever you are using the scanner:

- The equipment chassis must be connected to an electrical ground.
- The unit is equipped with a three-conductor AC power cable. This must be plugged into an approved electrical outlet with safety ground. A separate power outlet with a 20 amp circuit breaker for 120 VAC for 120V area, 7.5 amp circuit breaker for 220-240 VAC for 220/240V area or 15 amp circuit breaker for 100 VAC for Japan.
- 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 must meet international electrical standards.

 **WARNING** *Connecting a LOGIQ E9 scanner to the wrong voltage level will most likely destroy it.*

1-4-5-2 Probes

Follow these guidelines before connecting a probe to the scanner:

- Inspect the probe prior to each use for damage or degradation to the:
 - housing
 - cable strain relief
 - lens
 - seal
 - connector pins
 - locking mechanism
- Do not use a damaged or defective probe.
- Never immerse the probe connector or adapter into any liquid.
- The system has more than one type of probe port. Use the appropriate probe port designed for the probe you are connecting.

Section 1-5 Label locations

Refer to the appropriate version of the LOGIQ E9 Basic User Manual, Chapter 2, or the latest version of the LOGIQ E9 Release Notes.

Table 1-8 Basic User Manual and Release Notes per LOGIQ E9 console

CONSOLE MODEL NUMBER	ENGLISH BASIC USER MANUAL DIRECTION NUMBER	ENGLISH RELEASE NOTES DIRECTION NUMBER
5205000	5180374-100	5180358-100
5205000-2, -3	5335626-100	5335634-100
5205000-4, -5	5389558-100	5389562-100
5205000-6, -7	5450756-100	5449984-100
5205000-8	5496408-100	5476411-100
5205000-9	5573149-100	5573151-100

Section 1-6

Dangerous procedure warnings

Warnings, such as the example 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 IF THE COVERS ARE REMOVED FROM AN OPERATING LOGIQ E9, SOME METAL SURFACES MAY BE WARM ENOUGH TO POSE A POTENTIAL HEAT HAZARD IF TOUCHED, EVEN WHILE IN SHUT DOWN MODE.**

 **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.

Section 1-7 Lockout/Tagout (LOTO) requirements

Follow OSHA Lockout/Tagout requirements (USA) or local Lockout/Tagout requirements by ensuring you are in total control of the AC power plug at all times during the service process.

To apply Lockout/Tagout:

- 1.) Plan and prepare for shutdown.
- 2.) Shutdown the equipment.
- 3.) Isolate the equipment.
- 4.) Apply Lockout/Tagout Devices.
- 5.) Disconnect the Extended Power Shutdown battery at J3 when working in the BEP.
- 6.) Control all stored and residual energy.
- 7.) Verify isolation.

All potentially hazardous stored or residual energy is relieved.



NOTICE Energy Control and Power Lockout for LOGIQ E9

When servicing parts of the system where there is exposure to voltage greater than 30 Volts:



1. Turn off the scanner.
2. Unplug the system.
3. Maintain control of the system power plug.
4. Wait for at least 20 seconds for capacitors to discharge as there are no test points to verify isolation. The Amber light on the Op Panel On/Off button will turn off.
5. DISCONNECT THE EPS (EXTENDED POWER SHUTDOWN) BATTERY AT J3, OR THE BATTERY FROM THE CHARGEBOARD AT PCN1 WHEN WORKING IN THE BEP. THIS SHOULD BE DONE WHENEVER THE BEP IS OPEN AND THE EPS OR CHARGEBOARD IS EXPOSED AND CHANGING PARTS.

Beware that the Main Power Supply, Extended Power Shutdown or ChargeBoard and BEP may be energized even if the power is turned OFF if the cord is still plugged into the AC Outlet.

If the Shear Wave Option is present, MAKE SURE the LEDs on the Capacitor Pack are OFF before disconnecting the Capacitor Pack Cables.

Section 1-8

Returning/Shipping Probes and Repair Parts

Equipment being returned must be clean and free of blood and other infectious substances.

GE policy states that body fluids must be properly removed from any part or equipment prior to shipment. GE employees, as well as customers, are responsible for ensuring that parts/equipment have been properly decontaminated prior to shipment. Under no circumstance should a part or equipment with visible body fluids be taken or shipped from a clinic or site (for example, body coils or an ultrasound probe).

The purpose of the regulation is to protect employees in the transportation industry, as well as the people who will receive or open this package.

NOTE: *The US Department of Transportation (DOT) has ruled that "items that were saturated and/or dripping with human blood that are now caked with dried blood; or which were used or intended for use in patient care" are "regulated medical waste" for transportation purposes and must be transported as a hazardous material.*

For LOGIQ E9 Vet system

NOTE: *Return used/unused spare parts from a veterinary environment with the purple recycling label (regardless of its actual condition) and add a description on the label stating that the items were removed from a LOGIQ E9 Vet in a veterinary environment.*

This applies for Probes and covers labeled as Vet used.

If purple recycling label is not used in your region, use local recycling label.

Section 1-9

Electromagnetic compatibility (EMC)

1-9-1 What is EMC?

Electromagnetic compatibility describes a level of performance of a device within its electromagnetic environment. This environment consists of the device itself and its surroundings including other equipment, power sources and persons with which the device must interface. Inadequate compatibility results when a susceptible device fails to perform as intended due to interference from its environment or when the device produces unacceptable levels of emission to its environment. This interference is often referred to as radio-frequency or electromagnetic interference (RFI/EMI) and can be radiated through space or conducted over interconnecting power or 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.

1-9-2 Compliance

LOGIQ E9 conforms to all applicable conducted and radiated emission limits and to immunity from electrostatic discharge, radiated and conducted RF fields, magnetic fields and power line transient requirements.

Applicable standards are: 47CFR Part 18, IEC60601-1-2:2001.

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.*

1-9-3 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.**



WARNING *Risk of electrical shock, system must be turned off. Avoid all contact with electrical contacts, conductors and components. Always use non-conductive handles designed for the removal and replacement of ESD sensitive parts. All parts that have the potential for storing energy must be discharged or isolated before making contact.*

If the Shear Wave Option is present, MAKE SURE the LEDs on the Capacitor Pack are OFF before disconnecting the Capacitor Pack Cables.

Section 1-10 Customer assistance

1-10-1 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.

Before you call, identify the following information, and acquire image (Alt+D) to send to the Customer Care team:

- 1.) System ID serial number.
- 2.) Software version.
- 3.) Date and time of occurrence.
- 4.) Sequence of events leading to issue.
- 5.) Is the issue repeatable?
- 6.) Imaging mode, probe, preset/application.
- 7.) Media brand, speed, capacity, type.
- 8.) Save secondary image capture, cine loop, 4D multi-volume loop.

NOTE: Restart the application before resuming clinical scanning.

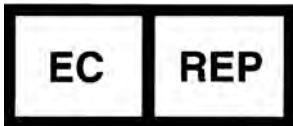
Section 1-10**Customer assistance** (cont'd)**Table 1-9 Phone numbers for Customer Assistance**

LOCATION	PHONE NUMBER	
USA GE Healthcare Ultrasound Service Engineering 9900 Innovation Drive (RP-2156) Wauwatosa, WI 53226	Service: On-site	1-800-437-1171
	Service Parts	1-800-558-2040
	Application Support	1-800-682-5327 or 1-262-524-5698
Canada		1-800-668-0732
Latin America	Service Application Support	1-262-524-5300 1-262-524-5698
Europe GE Ultraschall Deutschland GmbH Beethovenstrasse 239 Postfach 11 05 60, D-42655 Solingen Germany	Support Phone: +49 (0) 212-2802-652 Support Fax: +49 (0) 2122-8024-31	
EAGM	Egypt Service Center UAE Service Center	0020 2322 1252 00971 8003646
Asia (Singapore) GE Ultrasound Asia Service Department - Ultrasound 298 Tiong Bahru Road #15-01/06 Central Placa Singapore 168730	Tel: +65 6291-8528 Fax: +65 6291-7006	
Japan Support Center	Phone: 81-426-48-2940 Fax: 81-426-48-2905	
China	86-800-810 8188 86-400-812 8188 86-10-6788 2652	
India	1-800-425-8025 1-800-425-7255 1-800-102-7750	

1-10-2 System manufacturer**Table 1-10 System manufacturer**

MANUFACTURER	FAX NUMBER
GE Healthcare - GE Medical Systems Ultrasound and Primary Care Diagnostics, LLC 9900 Innovation Drive Wauwatosa, WI 53226 USA	414-721-3865

Table 1-11 Authorized Representative

AUTHORIZED REPRESENTATIVE	TELEPHONE / FAX NUMBER
The location of the CE marking is shown in the Safety chapter of this manual.  Authorized EU Representative European registered place of business: GE Medical Systems Information Technologies GmbH (GEMS IT GmbH) Munzinger Strasse 3, D-79111 Freiburg, GERMANY	+49 761 45 43 -0 / +49 761 45 43 -233

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Chapter 2

Site preparations

Section 2-1

Overview

2-1-1 Purpose of this chapter

This chapter provides the information required to plan and prepare for the setup of a LOGIQ E9. Included are descriptions of the facility and electrical needs to be met by the purchaser of the LOGIQ E9.

2-1-2 Contents in this chapter

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2-2	General console requirements	2-2
2-3	Facility needs	2-7

Section 2-2

General console requirements

2-2-1 Contents in this section

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2-2-3	Electrical requirements	2-3
2-2-4	EMI limitations	2-5
2-2-5	Probes environmental requirements	2-6
2-2-6	Time and manpower requirements	2-6

2-2-2 Console environmental requirements

2-2-2-1 If the LOGIQ E9 is very cold or hot

When unpacking the device, allow the temperature of the device to stabilize before powering up. The following table describes guidelines for reaching operational temperatures from storage or transport temperatures. See: [Table 2-1](#)

Table 2-1 LOGIQ E9 Acclimate 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	95	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

2-2-2-2 Environmental specifications

Table 2-2 Environmental Specifications for LOGIQ E9 Scanners

		Operational	Storage	Transport (< 16 hrs.)
Temperature		10° - 35° C (50° - 96° F)	-10° - 50° C (-14° - 122° F)	-10° - 50° C (-14° - 122° F)
Humidity		30% - 80% non-condensing	30% - 80% non-condensing	30% - 80% non-condensing
Pressure		70 - 106 kPa	70 - 106 kPa	70 - 106 kPa
Heat Dissipation		4712 Btu/hour	"	"

2-2-2-3 Cooling

The cooling requirement for the LOGIQ E9 scanner with LCD and onboard peripherals, is up to 4712 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.

2-2-2-4 Lighting

Bright light is needed for LOGIQ E9 installation, updates and repairs. However, operator and patient comfort may be optimized if the room light is subdued and indirect. Therefore a combination lighting system (dim/bright) is recommended. Keep in mind that lighting controls and dimmers can be a source of EMI which could degrade image quality. These controls should be selected to minimize possible interference.

2-2-3 Electrical requirements

2-2-3-1 General requirements

NOTE: *GE 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 LOGIQ E9.*

The LOGIQ E9 will function on Voltages from 100-240 Volts and 50 or 60 Hz. However, if using 220 volt power, then a center tapped power source is required.

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 LOGIQ E9 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 LOGIQ E9 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.*

2-2-3-2 Electrical requirements for LOGIQ E9

In the table below, the electrical specifications for LOGIQ E9 include LCD and on board peripherals.

Table 2-3 Electrical specifications for the LOGIQ E9

PART NUMBER	DESCRIPTION	VOLTAGE	TOLERANCES	POWER CONSUMPTION	FREQUENCY
5205000-x	LOGIQ E9, 100-240 VAC	100-240 VAC	+/-10%	1100 W	50/60 Hz

The current drain varies, depending on the mains voltage.

- At 230 VAC, the current may be up to 8 A.
- At 100 VAC, the current may be up to 10 A.

2-2-3-3 Inrush current

During power on, an inrush circuit prevents the current from increasing above the stated values.

Table 2-4 Inrush current at different mains voltages

VOLTAGE	50 Hz	60 Hz
90 VAC	13 A	12 A
110 VAC	9 A	11 A
220 VAC	5.5 A	6 A
264 VAC	6 A	5 A

2-2-3-4 Site circuit breaker**CAUTION POWER OUTAGE MAY OCCUR.**

THE LOGIQ E9 SCANNER 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.

It is recommended that the branch circuit breaker for the LOGIQ E9 be readily accessible.

2-2-3-5 Site power outlets

A dedicated AC power outlet must be within reach of the LOGIQ E9 without extension cords. Other outlets adequate for the external peripherals, medical and test equipment needed to support this LOGIQ E9 must also be present within 1 m (3.2 ft.) of the LOGIQ E9. Electrical installation must meet all current local, state, and national electrical codes.

2-2-3-6 LOGIQ E9 power plug

If the LOGIQ E9 arrives without a power plug, or with the wrong plug, you must contact your GE dealer or the installation engineer must supply what is locally required.

2-2-3-7 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.

2-2-4 EMI limitations

Ultrasound machines are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the air or wiring. Ultrasound machines also generate EMI. The LOGIQ E9 complies with limits as stated on the EMC label. However there is no guarantee that interference will not occur in a particular installation.

Possible EMI sources should be identified before the LOGIQ E9 is installed.

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

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

The presence of a broadcast station or broadcast van may also cause interference.

See: [Table 2-5](#) for EMI Prevention tips.

Table 2-5 EMI prevention/abatement

EMI RULE	DETAILS
Be aware of RF sources	Keep the LOGIQ E9 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 LOGIQ E9	Poor grounding is the most likely reason a LOGIQ E9 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 LOGIQ E9, replace all covers and tighten all screws. Any cable with an external connection requires a magnet wrap at each end. Install the Card Rack cover over the Card Rack. Loose or missing covers or RF gaskets allow radio frequencies to interfere with the ultrasound signals.
Replace broken RF gaskets	If more than 20% or a pair of the fingers on an RF gasket are broken, replace the gasket. Do not turn on the LOGIQ E9 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 LOGIQ E9. 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 Rack or hang out of the peripheral bays. Loop the excess length for peripheral cables inside the peripheral bays. Attach the LCD cables to the frame.

2-2-5 Probes environmental requirements

Table 2-6 Environmental Requirements - Probes

	Standard Probes	4D Probes
Operation:	10° to 40° C (50 to 104 °F)	18° to 40° C (64.4 to 104 °F)
Storage:	-10° to 60° C (14 to 140 °F) -10° to 60° C (14 to 140 °F)	-10° to 50° C (14 to 122 °F)
Temperatures in degrees Celsius (°C) conversion to degrees F: (°F) = (°C * 9/5) + 32		

⚠ NOTICE SYSTEMS AND ELECTRONIC PROBES ARE DESIGNED FOR STORAGE TEMPERATURES OF -10 TO +50 degrees C. or +60 degrees C, DEPENDING ON THE TYPE OF PROBE. WHEN EXPOSED TO LARGE TEMPERATURE VARIATIONS, THE PRODUCT SHOULD BE KEPT IN ROOM TEMPERATURE FOR 10 HOURS BEFORE USE.

Refer to the Table in [section 2-2-2-1 on page 2-2](#) to determine the needed settlement time.

2-2-6 Time and manpower requirements

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

⚠ CAUTION

HAVE TWO PEOPLE AVAILABLE TO DELIVER AND UNPACK THE LOGIQ E9. ATTEMPTS TO MOVE THE LOGIQ E9 CONSIDERABLE DISTANCES OR ON AN INCLINE BY ONE PERSON COULD RESULT IN INJURY OR DAMAGE OR BOTH.



Section 2-3 Facility needs

2-3-1 Contents in this section

2-3-1	Contents in this section.	2-7
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2-3-3	Required facility needs.	2-8
2-3-4	Desirable features.	29
2-3-5	Minimal floor plan suggestions.	2-9
2-3-6	Networking setup requirements.	2-11

2-3-2 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. Purchaser responsibility includes:

- Procuring the materials required.
- Completing the preparations before delivery of the LOGIQ E9.
- Paying the costs for any alterations and modifications not specifically provided in the sales contract

NOTE:

All electrical installations 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, calibrations, and testing must also be performed by qualified personnel. The products involved (and the accompanying electrical installations) are highly sophisticated and special engineering competence is required. All electrical work on these products 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 LOGIQ E9 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 (preferably prior to the purchase).

The ultrasound suite must be clean prior 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 LOGIQ E9 reliability.

2-3-3 Required facility needs

NOTE: *GE Healthcare 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.*

The LOGIQ E9 will function on Voltages from 100-240 Volts and 50 or 60 Hz. However, if using 220 volt power, then a center tapped power source is required.

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.

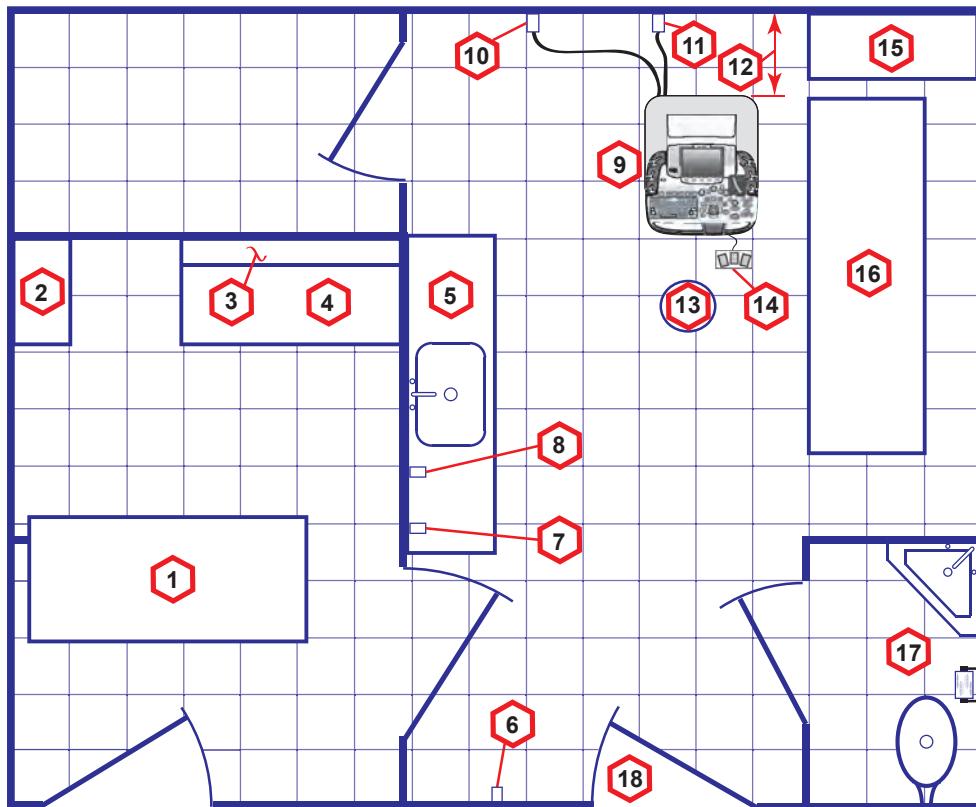
- Dedicated single branch power outlet of adequate amperage (see: *Table 2-3 "Electrical specifications for the LOGIQ E9" on page 2-3*) meeting all local and national codes which is located less than 2.5 m (8 ft.) from the LOGIQ E9's proposed location
- Door opening is at least 76 cm (30 in) wide.
- Proposed location for LOGIQ E9 is at least 0.46 m (18 inches) from the wall or objects 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 (3.2 ft.) of the LOGIQ E9 to connect cables.
- Power outlets for other medical equipment and gel warmer.
- Power outlets for test equipment within 1 m (3.2 ft.) of LOGIQ E9.
- 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).

2-3-4 Desirable features

In addition to the Floor Plan Suggestions shown in Figure 2-1 and Figure 2-2, a nearby waiting room and a Receptacle for Bio-hazardous Waste, like used probe sheaths is suggested. Grid represents 305 x 305 mm (1 x 1 foot).

2-3-5 Minimal floor plan suggestions

Figure 2-1 Floor Plan Suggestion 4.27 x 5.18 m (14 x 17 foot)

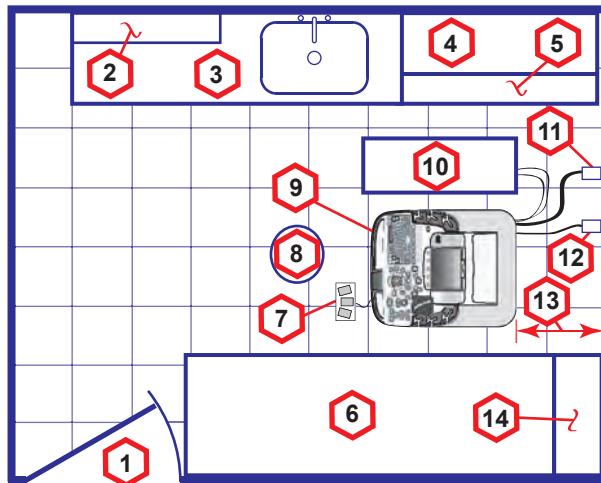


Floor Plan Suggestion 4.27 x 5.18 m (14 x 17 foot) Key

Item	Description	Item	Description
1.	Secretaries or Doctors Desk	2.	File Cabinet
3.	Film Viewer	4.	Counter Top
5.	Counter Top and Sink with hot and cold water	6.	Overhead Lights Dimmer - Dual Level Lighting (bright and dim)
7.	Emergency Oxygen	8.	Suction Line
9.	LOGIQ E9	10.	Dedicated Power Outlet - Circuit Breaker protected and easily accessible
11.	Network Interface	12.	457 mm (18 inches) distance of LOGIQ E9 from wall or objects
13.	Stool	14.	Footswitch
15.	Storage for Linens and Equipment	16.	Examination Table – 1930 x 610 mm (76 x 24 inches)
17.	Lavatory and Dressing Room	18.	Door – at least 762 mm (30 inches)

2-3-5 Minimal floor plan suggestions (cont'd)

Figure 2-2 Floor Plan Suggestion 2.44 x 3.05 m (8 x 10 foot)



Floor Plan Suggestion 2.44 x 3.05 m (8 x 10 foot) Key

Item	Description	Item	Description
1.	Door – at least 762 mm (30 inches)	2.	Film Viewer
3.	Counter Top, Sink with hot and cold water and Supplies Storage	4.	Linen Supply
5.	Probes/Supplies	6.	Examination Table – 1930 x 610 mm (76 x 24 inches)
7.	Footswitch	8.	Stool
9.	LOGIQ E9	10.	External Peripherals
11.	Dedicated Power Outlet - Circuit Breaker protected and easily accessible	12.	Network Interface
13.	457 mm (18 inches) distance of LOGIQ E9 from wall or objects	14.	GE Cabinet for Software and Manuals

2-3-6 Networking setup requirements**2-3-6-1 Stand alone scanner (without network connection)**

None.

2-3-6-2 Scanner connected to hospital's network**Supported networks:**

- 10/100/1000 Mbps Ethernet network connection
- Up to 300 Mbps WLAN (option)

2-3-6-3 InSite Requirements

Need internet access available to be able to connect to Insite ExC.

2-3-6-4 Purpose of the 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 LCD 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.

2-3-6-5 DICOM option setup requirements

To configure the LOGIQ E9 to work with other network connections, the site's network administrator must provide information to complete the form in *Figure 2-3 "Worksheet for DICOM Network Information" on page 2-12*. Ensure that there are no spaces in any field of the form.

Entries must include:

- A host name, local port number, AE Title, IP address and Net Mask for the LOGIQ E9.
- 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 E9 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 troubleshooting.

For connectivity setup information, refer to the current revision of the LOGIQ E9 Basic User Manual. See: *Table 1-8 "Basic User Manual and Release Notes per LOGIQ E9 console" on page 1-22*.

2-3-6-5 DICOM option setup requirements (cont'd)

Figure 2-3 Worksheet for DICOM Network Information

LOGIQ E9					
Host Name	<input type="text"/>				IP Address <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> Local Port <input type="text"/>
AE Title	<input type="text"/>				Net Mask <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
Network Speed	<input type="text"/>				Default Gateway <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
DHCP	<input type="checkbox"/>				
DICOM APPLICATION					
	NAME	MAKE/	AE TITLE	IP PORT	OTHER CONFIGURATION
Store 1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> <input type="checkbox"/>	Raw Data Allow Multiframe Structured Reporting Compression _____
Store 2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> <input type="checkbox"/>	Raw Data Allow Multiframe Structured Reporting Compression _____
Store 3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> <input type="checkbox"/>	Raw Data Allow Multiframe Structured Reporting Compression _____
DICOM Print	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> <input type="checkbox"/>	Vendor: _____ Print Size: _____ Medium: _____ Copies: _____ Orientation: _____ Color _____
Worklist	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> <input type="checkbox"/>	
Storage Commit	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> <input type="checkbox"/>	Associated Storage AE _____
DICOM MPPS	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> <input type="checkbox"/>	

Chapter 3

LOGIQ E9 Setup

Section 3-1

Overview

3-1-1 Purpose of this chapter

This chapter contains information needed to set up the LOGIQ E9. Included is 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 setup, and how to check and test the unit, probes, and external peripherals for electrical safety are included in this procedure.

3-1-2 Contents in this chapter

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3-2	Setup reminders	3-2
3-3	Receiving and unpacking the equipment	3-4
3-4	Packing materials - recycling information.....	3-12
3-5	Preparing for setup.....	3-12
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3-9	Connectivity Setup and Tips	3-40
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3-11	Configuring Insite ExC	3-86

Section 3-2

Setup reminders

3-2-1 Average setup time

Table 3-1 Average setup time

DESCRIPTION	AVERAGE SETUP TIME	COMMENTS
UNPACKING THE LOGIQ E9	0.5 HOUR	
SET UP LOGIQ E9 WO/OPTIONS	4 HOURS	DEPENDENT ON THE CONFIGURATION
DICOM NETWORK CONFIGURATION	2 HOURS OR MORE	DEPENDENT ON THE CONFIGURATION
INSTALL INSITE / ILINK	0.5 HOUR	

3-2-2 Setup warnings

 **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** 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 OPERATE THIS UNIT UNLESS ALL BOARD COVERS AND FRAME PANELS ARE SECURELY IN PLACE. LOGIQ E9 PERFORMANCE AND COOLING REQUIRE THIS.
-  **NOTICE** NEVER REVERSE POLARITY ON ANY METER THAT INTERCEPTS THE POWER CORD WITH POWER CONNECTED TO THE SYSTEM.
EVEN IN THE OFF STATE, REVERSING POLARITY ON THE POWER CAN SERIOUSLY DAMAGE THE POWER SUPPLY.

If the unit is very cold or hot, allow the temperature of the device to stabilize before powering up. The following table describes guidelines for reaching operational temperatures from storage or transport temperatures. See: [2-2-2 "Console environmental requirements" on page 2-2](#).

3-2-2 Setup warnings (cont'd)



CAUTION OPERATOR MANUAL(S)

THE USER MANUAL(S) SHOULD BE FULLY READ AND UNDERSTOOD BEFORE OPERATING THE LOGIQ E9 AND KEPT NEAR THE UNIT FOR QUICK REFERENCE.



CAUTION ACOUSTIC OUTPUT HAZARD

ALTHOUGH THE ULTRASOUND ENERGY TRANSMITTED FROM THE LOGIQ E9 PROBE IS WITHIN AIUM/NEMA STANDARDS, AVOID UNNECESSARY EXPOSURE. ULTRASOUND ENERGY CAN PRODUCE HEAT AND MECHANICAL DAMAGE.



Section 3-3

Receiving and unpacking the equipment

3-3-1 Purpose of this section

This section describes how to receive and unpack LOGIQ E9.

3-3-2 Contents in this section

3-3-1	Purpose of this section	3-4
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3-3-5	The Tilt and Shock indicators	3-6
3-3-6	Unpacking the LOGIQ E9	3-8

3-3-3 Receiving and unpacking warnings



CAUTION

TWO PEOPLE ARE NEEDED TO UNPACK THE UNIT BECAUSE OF ITS WEIGHT. ATTEMPTS TO MOVE THE UNIT CONSIDERABLE DISTANCES OR ON AN INCLINE BY ONE PERSON COULD RESULT IN INJURY OR DAMAGE OR BOTH.



TWO PEOPLE ARE REQUIRED WHENEVER A PART WEIGHING 16 KG (35 LBS) OR MORE MUST BE LIFTED.



CAUTION

REMEMBER TO USE RELEVANT PERSONAL PROTECTING EQUIPMENT (PPE) DURING PACKING/UNPACKING. CHECK WITH YOUR LOCAL EHS REPRESENTATIVE.

3-3-4 Receiving the LOGIQ E9

3-3-4-1 Overview

Improper handling during transportation may harm the equipment inside the package even if the package itself is undamaged.

3-3-4-2 Examine package

Examine package closely at time of delivery.

3-3-4-3 Damage in transportation

Follow this procedure if damage is apparent:

Table 3-2 Damage in transportation

STEP	TASK
1.	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.
2.	Report the damage to the carrier. <ul style="list-style-type: none">• 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.

3-3-5 The Tilt and Shock indicators

3-3-5-1 Overview

Improper handling during transportation may harm the equipment inside the package even if the package itself is undamaged.

To make it easier to detect if the handling during transportation has been improper, a Tilt or TIPNTELL indicator and a Shock indicator have been attached to the transportation box.

3-3-5-2 Position of the Tilt or TipNTELL and Shock indicators

The Tilt and Shock indicators have been attached to the side of the transportation box.

Figure 3-1 Tilt and Shock indicators



Figure 3-2 TIPNTELL indicator and Label

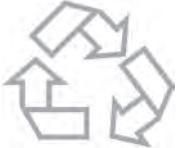


NOTE: Before cutting the straps, check the Tilt or TIPNTELL and Shock indicators to make sure they have not been triggered. If triggered, report it to the carrier. If not, then cut the straps around the crate.

3-3-5-3 LOGIQ E9 Transportation Box Label

The LOGIQ E9 Transportation Box Label is located on the transportation box.

Figure 3-3 LOGIQ E9 Transportation Box Labeling

SYMBOL	DEFINITION/COMMENTS	SYMBOL	DEFINITION/COMMENTS
	RECYCLING Recyclable Wood or		KEEP DRY (protect from moisture)
	RECYCLING China Specific		FRAGILE, Handle with Care
	TOP, UPRIGHT - Transportation and Storage		DO NOT STACK

3-3-6 Unpacking the LOGIQ E9

The instruction manual describes the best method for unpacking the LOGIQ E9 ultrasound scanning unit. Images are ONLY for reference; wear proper PPE when handling packaging (gloves, safety shoes, etc...).

Table 3-3 Uncrating Instructions

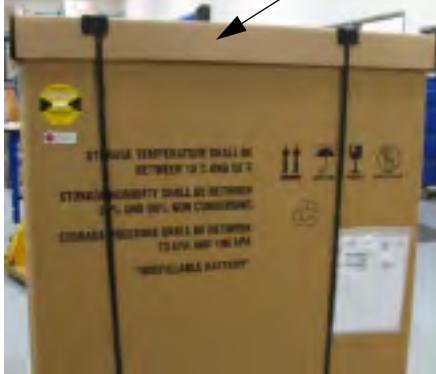
Steps	Corresponding Graphic
1. Before cutting the straps, check Shock and Tilt Tags to make sure they have not been triggered. If damaged, report it to the carrier. If not, then cut the straps around the crate.	
2. Remove the top cover.	

Table 3-3 Uncrating Instructions (Continued)

Steps	Corresponding Graphic
<p>3. Remove the outside shipping box.</p> <p><i>Note: Two people are recommended for performing this step.</i></p>	 
<p>4. Remove the LCD foam.</p>	

Table 3-3 Uncrating Instructions (Continued)

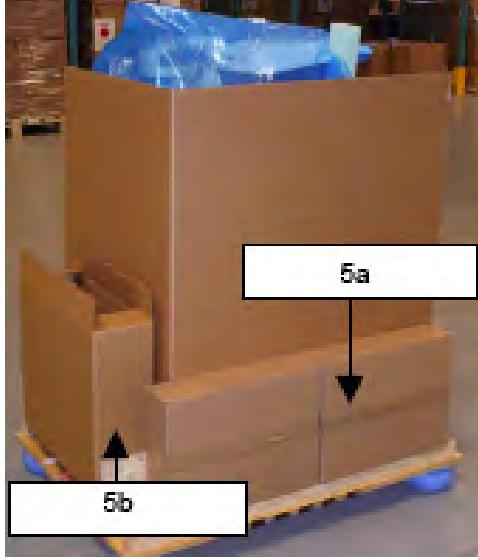
Steps	Corresponding Graphic
5. Remove the a) Probes and b) accessory boxes.	
6. Remove the L-shaped Cardboard divider. <i>Note: Use special care when removing the divider.</i>	
7. Remove the OP panel foam placed between the monitor and probe holders.	

Table 3-3 Uncrating Instructions (Continued)

Steps	Corresponding Graphic
8. Remove the lower OP panel brace placed between the lower OP panel and the wooden ramp, by moving upward and back. Remove the wooden ramp.	
9. Attach the wooden ramp to the Pallet Base with Velcro on the rear side of the LOGIQ E9.	
10. Loosen the tie-down strap at the front of the LOGIQ E9. Push the brass piece to pull back handle, then push brass piece to loosen strap.	
11. Disconnect the tie-down strap at the rear of the LOGIQ E9.	

Table 3-3 Uncrating Instructions (Continued)

Steps	Corresponding Graphic
<p>12. Pull the LOGIQ E9 down the Pallet Base ramp.</p> <p><i>Note: Remember to pull in the LOGIQ E9 from the back for safer transportation.</i></p>	
<p>13. Remove the clear plastic (wrapped around the LOGIQ E9) from the unit.</p>	
<p>14. Place all of the filling inside the Transportation Box. Close the box, and store the filling for possible future use.</p>	

Section 3-4

Packing materials - recycling information

The packing materials for LOGIQ E9 are recyclable:

- The Transportation Box is made of cardboard.
- Lever lockings (hinges) are made of zinc plated steel.
- The inner reinforcements are made of Ethafoam (Polyethylene foam).
- The plastic foil is made of LDPE (Low Density Polyethylene).

Section 3-5

Preparing for setup

3-5-1 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.

3-5-2 Physical inspection

Verify that the LOGIQ E9 arrived intact (visual inspection).

If the LOGIQ E9 has been damaged, please refer to "Damage in Transportation" on page 3-3-4-3 "*Damage in transportation*" on page 3-5 in the beginning of this manual.

3-5-2-1 LOGIQ E9 voltage settings

See: [3-6-4-1 "Verification of the LOGIQ E9's voltage setting" on page 3-19](#).

3-5-3 Volume Navigation Stand

To assemble the Volume Navigation Stand, See: [8-15-2 "Assembling or replacing the Roll Stand" on page 8-635](#) or [8-15-4 "On-Board V Nav Stand Option Contents, location and placement of parts" on page 8-643](#).

- 3-5-3-1 Back Cover Label and ETL testing laboratories safety rating label (ETL may not be present)**
 For location of Rating Plate Label, see: *Figure 3-12 "Rating Plate(s) Location - How to Identify Console Model Number" on page 3-16.*

Figure 3-4 Back Cover Label with ETL Label

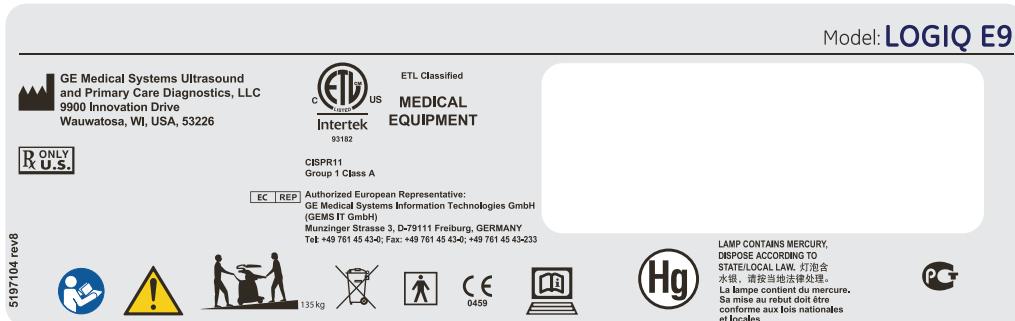
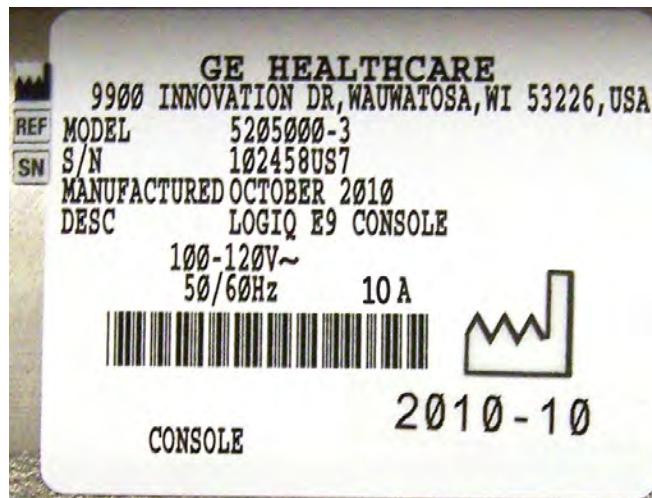


Figure 3-5 Rating Plate Label - R3.x and earlier 100-120V shown



**3-5-3-1 Back Cover Label and ETL testing laboratories safety rating label (ETL may not be present)
(cont'd)**

Figure 3-6 Rating Plate Label - R4.x.x

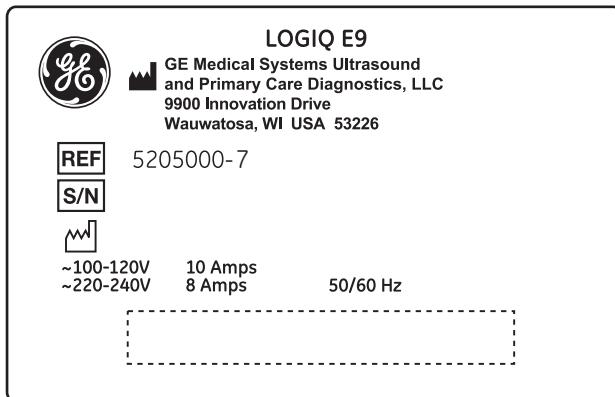


Figure 3-7 Rating Plate Label - R5.x.x

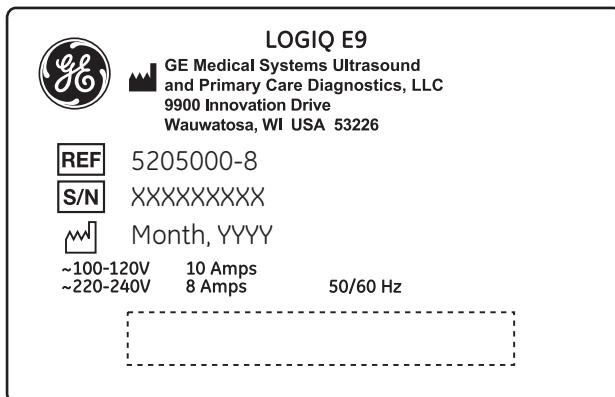
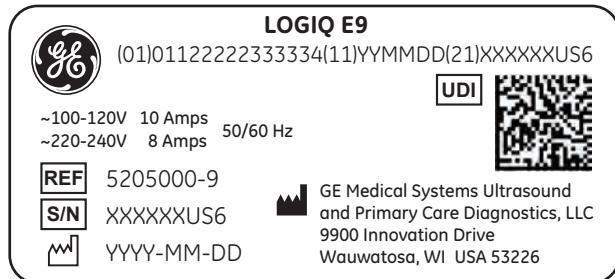
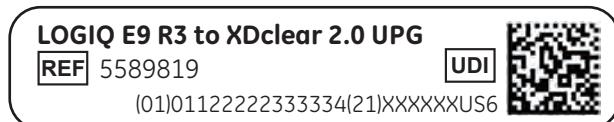
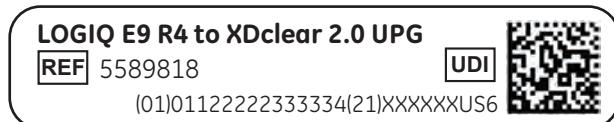
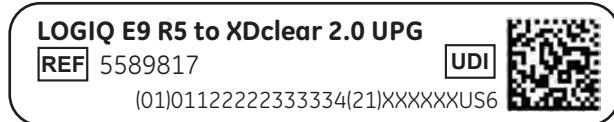


Figure 3-8 Rating Plate Label - R6.x.x



**3-5-3-1 Back Cover Label and ETL testing laboratories safety rating label (ETL may not be present)
(cont'd)****Figure 3-9 Rating Plate Label - R3 upgraded to XDclear 2.0****Figure 3-10 Rating Plate Label - R4 upgraded to XDclear 2.0****Figure 3-11 Rating Plate Label - R5 upgraded to XDclear 2.0****Figure 3-12 Rating Plate(s) Location - How to Identify Console Model Number**

3-5-4 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 LOGIQ E9 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.

See: [2-2-4 "EMI limitations" on page 2-5](#) for more information about EMI protection.

Section 3-6

Completing the setup

3-6-1 Purpose of this section

This section describes how to complete the set up of LOGIQ E9.

3-6-2 Contents in this section

3-6-1	Purpose of this section	3-18
3-6-2	Contents in this section.....	3-18
3-6-3	LOGIQ E9 specifications.....	3-18
3-6-4	Electrical specifications.....	3-19
3-6-5	Connections on the I/O Rear Panel	3-20
3-6-6	Connections on the Patient I/O panel	3-22
3-6-7	Connecting Probes	3-22
3-6-8	Power On/Boot Up	3-24
3-6-9	Power shut down.....	3-28
3-6-10	Complete power down	3-30

3-6-3 LOGIQ E9 specifications

3-6-3-1 LOGIQ E9 requirements verification

- Verify that the site meets the requirements listed in (see: [Section 2-3 "Facility needs" on page 2-7](#)).
- Verify that the specifications below don't conflict with any on-site conditions.

3-6-3-2 Physical dimensions

The physical dimensions of the LOGIQ E9 unit are summarized in [Table 3-4](#).

Table 3-4 Physical dimensions of LOGIQ E9 with monitor and peripherals

PART NUMBER	HEIGHT*	WIDTH	DEPTH	UNIT
5205000, -2, -3, -4, -5, -6	1130	585	830	mm
	44.5	23.03	32.67	Inches
5205000-7, -8, -9	1300	585	830	mm
	51.2	21.9	32.7	Inches

* Dimensions given with floating keyboard stowed for transport and the LCD Monitor down.

3-6-3-3 Weight with monitor and peripherals

Table 3-5 Weight of LOGIQ E9 with monitor and peripherals

PART NUMBER	WEIGHT [KG]	WEIGHT [LBS]
5205000-x	135	298

3-6-3-4 Acoustic noise output

Less than 48 dB(A) at 20 degrees Celsius, measured in the operators head position, 20 cm in front of the keyboard's right corner, at 1.30 m above the floor, and in a distance of 1 meter at all four sides, 1 meter above the floor.

3-6-4 Electrical specifications

 **WARNING CONNECTING A LOGIQ E9 UNIT TO THE WRONG VOLTAGE LEVEL WILL MOST LIKELY DESTROY THE UNIT.**

3-6-4-1 Verification of the LOGIQ E9's voltage setting

Verify that the mains voltage specified for the unit is available on-site.

The voltage setting for the unit is found on a label on the back of the LOGIQ E9 on lower rear frame of the LOGIQ E9.

3-6-4-2 Electrical specifications for LOGIQ E9

See: [Table 2-3 "Electrical specifications for the LOGIQ E9" on page 2-3](#) for the electrical specifications for LOGIQ E9 include LCD and on board peripherals.

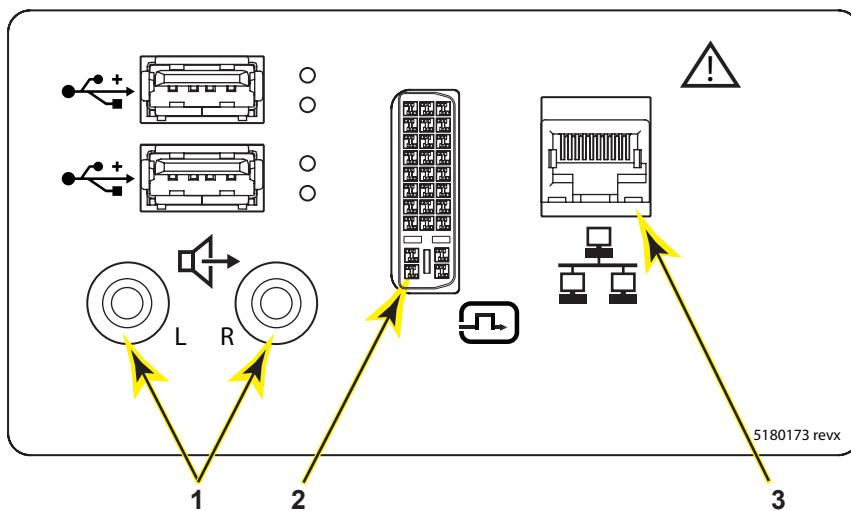
3-6-5 Connections on the I/O Rear Panel

NOTE: Accessory equipment connected to the analog and digital interfaces must be certified according to the respective IEC standards (e.g. IEC60950 for data processing equipment and IEC60601-1 for medical equipment). Furthermore, all complete configurations shall comply with the valid version of the system standard IEC60601-1-1. Everybody who connects additional equipment to the signal input part or signal output part of LOGIQ E9, configures a medical system, and is therefore responsible that the system complies with the requirements of the valid version of IEC60601-1-1. If in doubt, consult the technical service department or your local representative for GE.

3-6-5-1 Connect Ethernet

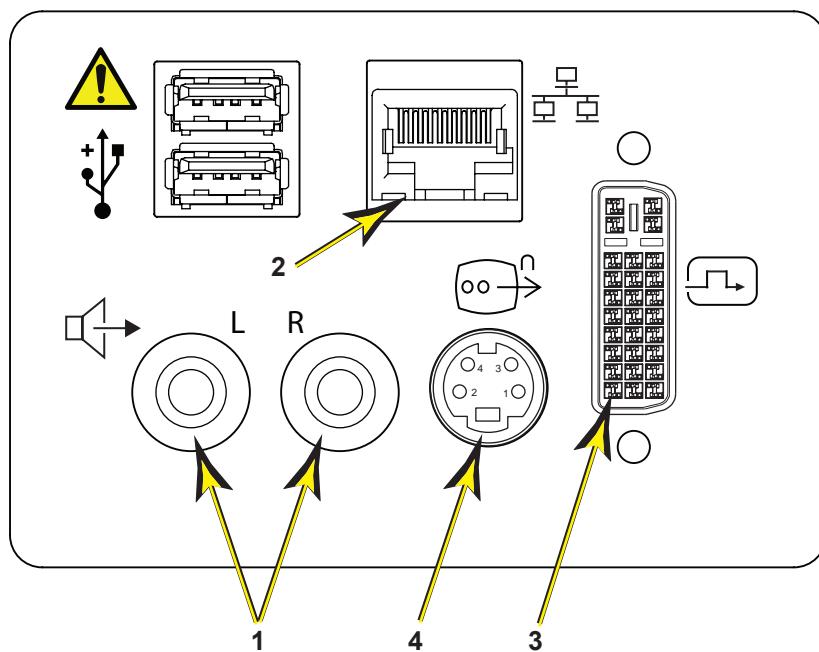
Connect the Ethernet cable to the Ethernet connector (3) on the External I/O (rear side of LOGIQ E9).

Figure 3-13 Ethernet, Audio (1) and DVI-I (2) connection for External Monitor on rear side of LOGIQ E9 - R3.x and earlier



3-6-5-1 Connect Ethernet (cont'd)

Figure 3-14 Audio (1), Ethernet (2), DVI-I (3) and SVHS (4) connection for External Monitor on rear side of LOGIQ E9 - R4.x and Later



CAUTION To avoid breaking the back cover while opening it in order to connect up the network cable, use a flat blade screw driver or plastic card and pull hard to open up the back cover door.

SVHS Specifications for BEP6

- DVI-I delivering both analog RGB and digital DVI out the rear customer accessible DVI-I port.
- The DVI-I output support a fixed 1280x1024 resolution @60Hz 24 bit color depth.
 - *NOTE: Any display connected to the DVI-I output is intended to serve as a clone of the image on the main display. In the event that a display connected to DVI-I video output is not capable of displaying the resolution being used by the main display, then the auxiliary display will be blank or show a "no-signal" message.*
- The DVI-D Video output deliver a minimum of 1280x1024 @60Hz 24-bit color depth.

3-6-5-2 Connect USB Flash Drive

Refer to the current revision of the LOGIQ E9 Basic User Manual, Chapter 3, Section 7.

3-6-6 Connections on the Patient I/O panel

3-6-6-1 Connect ECG

Refer to Chapter 10 in the Basic User Manual for more information.

3-6-7 Connecting Probes

3-6-7-1 Introduction to Connecting Probes

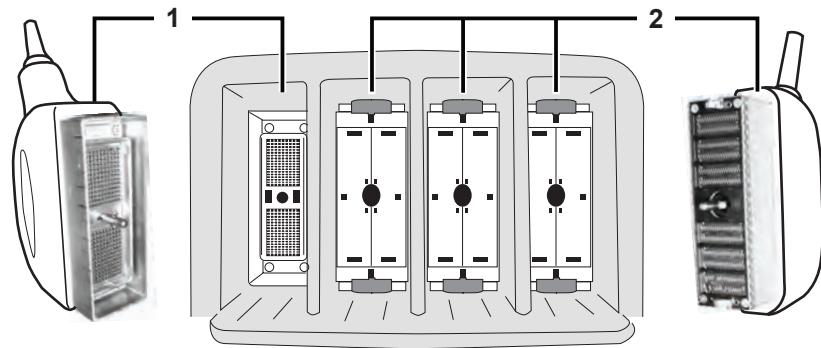
Probes can be connected at any time, whether the unit is on or off.

R3.x and earlier LOGIQ E9s have two types of probe ports: one non-DLP probe port and three DLP probe ports (Figure 3-16). R4.x and later LOGIQ E9s have one type of probe ports: four DLP probe ports (Figure 3-15).

The non-DLP probe port is compatible with the S1-5, S4-10, 6Tc (TEE probe), and 3CRF probe connectors.

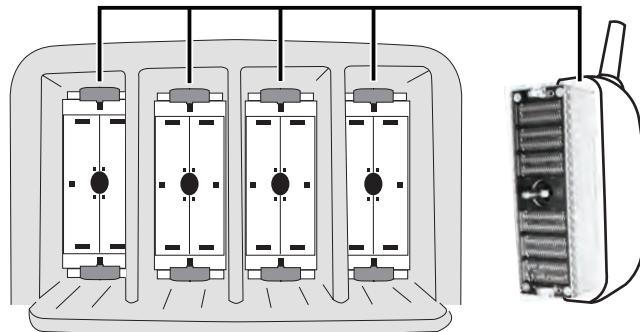
The three DLP probe ports are specific to the LOGIQ E9 probe connectors.

Figure 3-15 Probe connectors - (1) Non-DLP and (2) DLP Probe Port - R3.x and earlier



R4.x and later LOGIQ E9s have one type of probe ports: four DLP probe ports (Figure 3-16).

Figure 3-16 Probe connectors, four DLP Probe Ports - R4.x and Later



3-6-7-2 Connect a probe

NOTE: *It is not necessary to turn OFF power to connect or disconnect a probe. However, it is a good idea select a different probe or to freeze the image when removing a probe to avoid disconnecting a live probe.*

 **CAUTION DO NOT ALLOW THE PROBE HEAD TO HANG FREELY. EXCESSIVE IMPACT TO THE PROBE WILL RESULT IN IRREPARABLE DAMAGE.**

 **CAUTION TO PREVENT PROBE CONNECTOR PINS DAMAGE, OR PCB BOARD DAMAGE, DO NOT USE EXCESSIVE FORCE WHEN CONNECTING THE PROBES.**

1.) Before connecting the probe:

- a.) Perform a visual check of the probe pins and LOGIQ E9 sockets.
 - b.) Remove any dust or foam rests from the probe pins.
 - c.) Verify the probe and the probe cable for any visual damage.
- 2.) Hold the probe connector vertically with the cable pointing upward.
- 3.) Turn the connector locking handle counter-clockwise to the horizontal position.
- 4.) Align the connector with the probe port and carefully push into place.
- 5.) Turn the locking handle clockwise to the full vertical position to lock in place.
- 6.) Position the probe cable so that it is not resting on the floor.

 **CAUTION KEEP THE PROBE CABLES AWAY FROM THE WHEELS.
DO NOT BEND THE PROBE CABLES.
DO NOT CROSS CABLES BETWEEN PROBES.**

3-6-7-3 Disconnect a probe

- 1.) Select a different probe or Freeze the image before removing a probe in order to avoid disconnecting a live probe.
- 2.) Rotate the lock handle counter-clockwise to the horizontal position to unlock the connector.
- 3.) Remove the connector from the port.
- 4.) Ensure that the probe head is clean before placing the probe in its storage case, see: [10-5-9 "Cleaning" on page 10-12](#) for cleaning instructions.

 **CAUTION REFER TO THE TEE PROBE MANUAL FOR FURTHER INSTRUCTIONS (DIRECTION KZ192871).**

3-6-8 Power On/Boot Up**3-6-8-1 Warnings**

-  **DANGER** **ALWAYS CONNECT THE UNIT TO A FIXED POWER SOCKET WHICH HAS THE PROTECTIVE GROUNDING CONNECTOR.**
-  **DANGER** **NEVER USE A THREE-TO-TWO PRONG ADAPTER; THIS DEFEATS THE SAFETY GROUND.**
-  **DANGER** **ENSURE THAT THE POWER CORD AND PLUG ARE INTACT AND THAT THE POWER PLUG IS THE PROPER HOSPITAL-GRADE TYPE (WHERE REQUIRED).**
-  **CAUTION** **LOGIQ E9 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 LOGIQ E9 PERFORMANCE AND COOLING PURPOSES.
-  **NOTICE** **Use only power supply cords, cables and plugs provided by or designated by GE.**

NOTE: *Do not cycle the Circuit Breaker ON-OFF-ON in less than five seconds. When turning OFF the Circuit Breaker, WAIT until the ON/OFF button is no longer lit. The LOGIQ E9 should de-energize completely before turning the circuit breaker ON.*

3-6-8-2 Detailed Procedure

For a detailed procedure, see: [4-2-3 "Power ON/Boot Up" on page 4-3.](#)

3-6-8-3 Connect AC (mains) Power to the LOGIQ E9

Connecting AC Power to the LOGIQ E9 ultrasound unit involves preliminary checks of the power cord, voltage level and compliance with electrical safety requirements.

NOTE: *The LOGIQ E9 will function on Voltages from 100-240 Volts and 50 or 60 Hz. However, if using 220 volt power, then a center tapped power source is required (North America Only).*

- 1.) Ensure that the wall outlet is of appropriate type, and that the Circuit Breaker is turned off.
- 2.) Uncoil the power cable, allowing sufficient slack so that the unit can be moved slightly.
- 3.) Verify that the power cable is without any visible scratches or any sign of damage.
- 4.) Verify that the on-site mains voltage is within the limits indicated on the rating label near the Circuit Breaker on the rear of the unit.
- 5.) Connect the Power Cable's female plug to the Power Inlet at the rear of the unit.
- 6.) Lock the plug in position with the Retaining Clamp (ACC Clamp).
- 7.) Verify that the Mains Power Circuit Breaker is in OFF position, if not, switch it OFF.

Figure 3-17 The Circuit Breaker and ON/OFF button



- 8.) Connect the Power Cable's other end (male plug) to a hospital grade mains power outlet with the proper rated voltage, and the unit is ready for Power ON/Boot Up.

3-6-8-4 Switch ON the AC Power to LOGIQ E9

- 1.) Switch ON the Mains Power Circuit Breaker at the rear of the unit. The **ON/OFF** button will become amber.

Figure 3-18 The Circuit breaker and ON/OFF button



You should hear a “click” from the relays in the AC Power and the unit is ready to boot. The **ON/OFF** button will turn amber. This indicates that there is power to the PS, but the system is OFF.

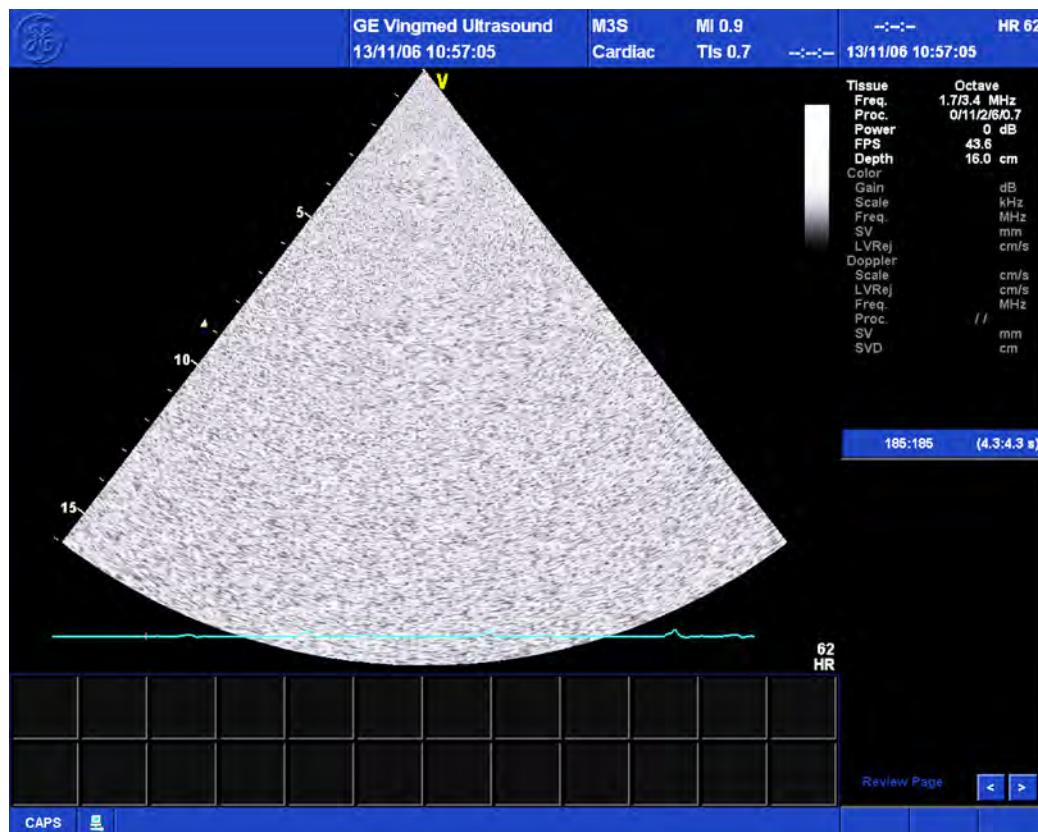
- 2.) Press once on the **ON/OFF** button on the Operator Panel to boot the unit. The **ON/OFF** button will turn green when it is pressed.

During a normal boot, you may observe that:

- a.) The unit's ventilation fan starts on full speed, but slows down after a few seconds (listen to the fan sound).
- b.) Power is distributed to the peripherals, Operator Panel (Console), Monitor, Front End Processor and Back End Processor.
- c.) Back End Processor and rest of the LOGIQ E9 starts with the sequence listed in the next steps:
- d.) Back End Processor is turned ON and starts to load the software.
- e.) The Start Screen is displayed on the monitor.
- f.) A start-up bar indicating the time used for software loading, is displayed on the monitor.
- g.) The software initiates and sets up the Front End electronics and the rest of the instrument.
- h.) The backlight in the keyboard is lit.
- i.) As soon as the software has been loaded, either a 2D screen is displayed on the screen, indicating that a probe has been connected, or a No Mode screen is displayed, indicating that no probe has been connected.

3-6-8-4 Switch ON the AC Power to LOGIQ E9 (cont'd)

Figure 3-19 2D Screen on the display



NOTE: Total time used for start-up is typically less than 170 seconds. When using the sleep mode (R2.x.x or R3.x.x), start-up time is less than 120 seconds. If starting after a power loss or a lock-up, the start-up time may be up to four minutes.

3-6-9 Power shut down

When you switch off the unit, the system performs an automatic shutdown sequence.

Figure 3-20 System - Exit menu - R1.x.x



The SYSTEM - EXIT menu, used when switching off the unit, gives you these choices:

- **Logoff**
Use this button to log off the current user.
The system remains ON and ready for a new user to log on.
If the Logoff button is dimmed, it indicates that no user is logged on to the unit at the moment.
- **Shutdown**
Use this button to shut down the system. The entire system will shut down. It is recommended to perform a full shutdown at least once a week.
If the Shutdown button is dimmed, press the ON/OFF button or Alt F10 to shut down the unit.
- **Cancel**
Use this button to exit from the System-Exit menu and return to the previous operation.
- **Exit** (Only available when logged in as GE Service with Service Dongle)
Select this button when you want to exit to the Windows Desktop.

3-6-9 Power shut down (cont'd)

Sleep mode (only available in LOGIQ E9 running R2.x.x and R3.x.x software).

Figure 3-21 System - Exit menu



The SYSTEM - EXIT menu, used when switching off the unit, gives you these choices:

- **Logoff**

Use this button to log off the current user.

The system remains ON and ready for a new user to log on.

If the Logoff button is dimmed, it indicates that no user is logged on to the unit at the moment.

- **Shutdown**

Use this button to shut down the system. The entire system will shut down. It is recommended to perform a full shutdown at least once a week.

If the Shutdown button is dimmed, press the ON/OFF button or Alt F10 to shut down the unit.

- **Cancel**

Use this button to exit from the System-Exit menu and return to the previous operation.

- **Exit** (Only available when logged in as GE Service with Service Dongle)

Select this button when you want to exit to the Windows Desktop.

3-6-10 Complete power down

- 1.) Press once on the **ON/OFF** button on the Operator Panel to display the **System - Exit** menu.

Figure 3-22 Press once on the ON/OFF button



3-6-10 Complete power down (cont'd)

Figure 3-23 System - Exit menu (R1.x.x)



Figure 3-24 System - Exit menu (R2.x.x and R3.x.x)



3-6-10 Complete power down (cont'd)

Figure 3-25 System - Exit / Download menu (R5 and later)



- 2.) Select **Shutdown** to do a complete power down of the unit.

The Back End Processor will first turnoff the LOGIQ E9 activity and print the message "Please wait - Shutdown in progress in the LCD display on the Operator Panel.

Next, it starts to shut down itself. The time to turn down the unit, including the Back End Processor, may vary from 10 seconds up to approximately 1 minute.

The last thing that shuts down, is the light on the Operator Panel, indicating that you can continue with the next step.



NOTICE Be sure to wait with the next step until the system has finished its shut-down. Failing to do so, may destroy data on the Hard Disk Drive, making the system fail later.

- 3.) Switch off the Mains Power Circuit Breaker, located on the rear of the unit. This will cut power distribution within the unit.

3-6-10 Complete power down (cont'd)

3-6-10-1 Sleep Mode

Only available in LOGIQ E9 running R2.x.x and R3.x.x software.

Use Sleep Mode when you do a portable exam in order to reduce the time to start up the system. When you use Sleep Mode, it only takes 90 seconds to start up the system versus 2-3 minutes. To activate Sleep Mode, press the **ON/OFF** button and select **Sleep**.



NOTICE For optimum system operation, it is recommended that a full shutdown of the system is performed at least once every 24-hour period. If you shut down the system at the end of the day, no other action is needed.

Before returning a system to the customer, perform the functional checks. See: *Section 4-3 "Functional checks" on page 4-34*.

Section 3-7 Configuration

3-7-1 Purpose of this section

This section describes how to configure the LOGIQ E9.

3-7-2 Contents in this section

3-7-1	Purpose of this section	3-34
3-7-2	Contents in this section.....	3-34
3-7-3	LOGIQ E9 configuration	3-34
3-7-4	Optional Peripherals/Peripheral Connection.....	3-35
3-7-5	Available Probes	3-36
3-7-6	Software Options Configuration	3-36

After completing configuration, as described in this section, next step is to control/adjust connectivity settings, starting with *Section 3-8 "Connectivity overview" on page 3-39*.

3-7-3 LOGIQ E9 configuration

For complete instructions, refer to the appropriate version of the LOGIQ E9 Basic User Manual, Chapter 16, or the appropriate LOGIQ E9 Release Notes. See: *Table 1-8 "Basic User Manual and Release Notes per LOGIQ E9 console" on page 1-22*.

Information includes Entering Location, Adjusting Date and Time, Selecting User Interface Language, Selecting Online Manual Language, Selecting Units of Measure

3-7-3-1 System Configuration

- Set Device Destinations (see: *4-2-15-8 "Connectivity — Recording Miscellaneous settings" on page 4-27*).
- Set Dataflow (see: *4-2-15-6 "Connectivity — Recording Dataflow settings" on page 4-25*).
- Set Buttons (see: *4-2-15-7 "Connectivity — Recording the Print Key Assignments" on page 4-26*).
- Set up System Admin (see: *4-2-15-9 "Admin — Recording the Software Option Keys" on page 4-29*).
- Set up Users (see: *4-2-15-10 "Admin — Users" on page 4-30*).
- Set up Backup management (see: *4-2-15-11 "System — Data Store Management" on page 4-31*).
- Set up Peripherals (see: *4-2-15-12 "System — Recording Peripheral settings" on page 4-32*).
- Set up Keyboard: language and regional settings. (For complete instructions, refer to the appropriate version of the LOGIQ E9 Basic User Manual, Chapter 16, or the appropriate LOGIQ E9 Release Notes. See: *Table 1-8 "Basic User Manual and Release Notes per LOGIQ E9 console" on page 1-22*).

3-7-4 Optional Peripherals/Peripheral Connection

3-7-4-1 Contents in this sub-section

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3-7-4-3	Approved External Peripherals (Optional)	3-35
3-7-4-4	Additional Information.....	3-35
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3-7-4-6	Test the DVR Microphone.	3-36
3-7-4-7	Turn OFF Power to LOGIQ E9.....	3-36

3-7-4-2 Approved Internal Peripherals (Optional)

This list covers the internal peripherals available for LOGIQ E9:

- Printer, Monochrome (Black and White), Digital, SONY.
- Digital Video Recorder (DVR). Refer to the current revision of the LOGIQ E9 DVR Option Manual, Direction 5180205-100.
- USB Flash Drive. Refer to the current revision of the LOGIQ E9 User Manual.
- 4D Motor Controller. Refer to the current revision of the LOGIQ E9 Options Manual, Direction 5180288-100.
- Volume Navigation. Refer to the current revision of the LOGIQ E9 Options Manual, Direction 5180409-100.
- WLAN (Wireless LAN R2.x.x and R3). Refer to the current revision of the LOGIQ E9 Options Manual, Direction 5335640-100.
- WLAN (Wireless LAN R4.x.x and later). Refer to the current revision of the LOGIQ E9 Options Manual, Direction 5335640-100.
- WLAN V3 (Wireless LAN R6.x.x and later). Refer to the current revision of the LOGIQ E9 Options Manual, Direction 5694231-100.
- Patient I/O (ECG Option R2.x.x or later). Refer to the current revision of the LOGIQ E9 Options Manual, Direction 5335639-100

3-7-4-3 Approved External Peripherals (Optional)

The external printers are connected via Ethernet (TCP/IP Network) as DICOM devices.

- DICOM Printers. Connected via Ethernet (TCP/IP Network or WLAN) as DICOM devices.
- USB Printers, see: [9-15-1 "Printers" on page 9-84](#).
- USB Footswitch

3-7-4-4 Additional Information

See: [Section 9-15 "Peripherals" on page 9-83](#) for replacement units.

3-7-4-5 Printer/DVR Checks

Check that Printer/DVR work as described below:

Table 3-6 Peripheral Checks

Step	Task to do	Notes
1.	Press Freeze.	Stops image acquisition.
2.	Press (Print 1), (Print 2), (Print 3) or (Print 4) on the Control Panel	Prints image displayed on the screen on Black and White or Color printer, depending on the key assignment configuration.
3.	Press [VIDEO] icon on the Control Panel.	Brings up the DVR Touch Panel (if the customer has the DVR option).
4.	Press [VIDEO] icon on the Control Panel	Returns to the scanning mode
5.	Press [RECORD] icon on the Control panel.	Starts Recording.
6.	Press [PLAY] icon on the Control panel.	Plays back an examination.
7.	Press [STOP] icon on the Control panel.	Stops recording.

3-7-4-6 Test the DVR Microphone

If a DVR is installed, record and/or play back a recording to test the microphone.

- a.) In scanning mode, press the record button on the console.
- b.) Press the microphone icon button on the touch panel.
- c.) Note the counter number setting, speak a few words, rewind to original counter number, and play back.

3-7-4-7 Turn OFF Power to LOGIQ E9

See: [3-6-9 "Power shut down" on page 3-28.](#)

3-7-5 Available Probes

See: [Section 9-18 "Probes" on page 9-112.](#)

3-7-6 Software Options Configuration**3-7-6-1 Software Option Installation**

A password (Software Option String) enables a software option or a combination of software options. This password is specific for each LOGIQ E9.

3-7-6-2 Installing a Software Option

- 1.) From the Touch Panel, select **Utility -> Admin -> System Admin**.
- 2.) Enter the new option key code in the SW Option Key section.

Figure 3-26 System Admin screen, R1.x.x - Add button

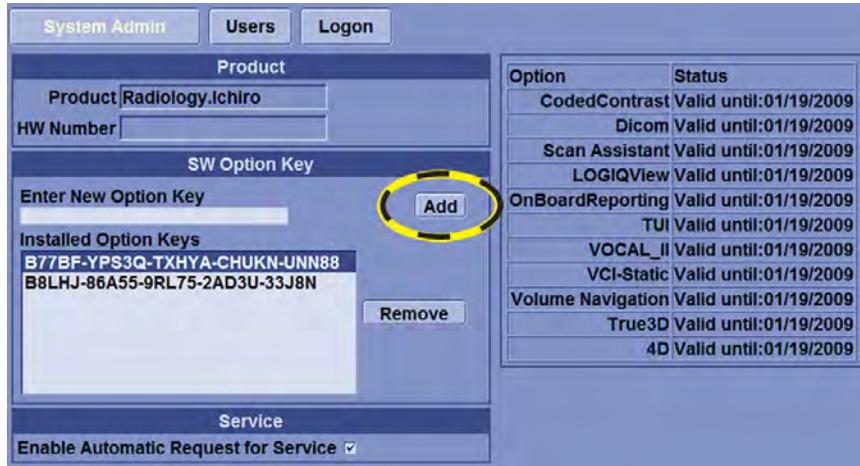
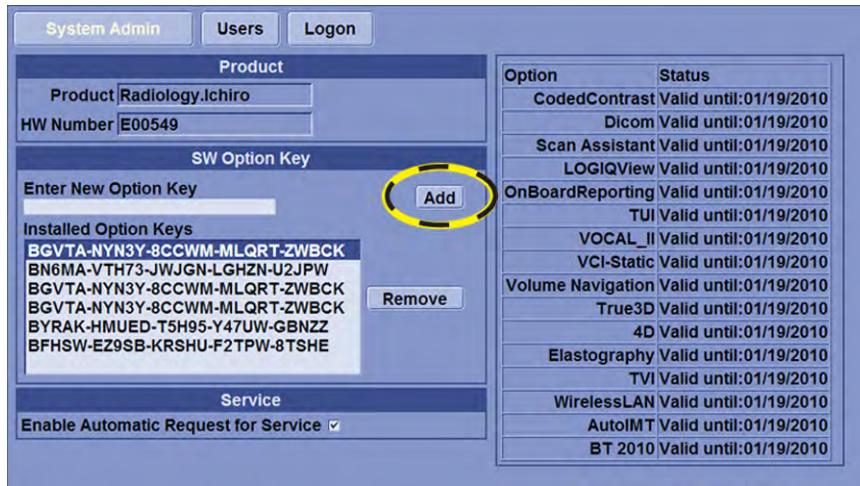


Figure 3-27 System Admin screen, R2.x.x or later - Add button



- 3.) Select the **Add** button.

CAUTION **INCORRECT PASSWORD ENTRY WILL RESULT IN LOSS OF SYSTEM OPTIONS.**
IF PASSWORD IS INCORRECT, PLEASE CONTACT YOUR LOCAL GE SERVICE
REPRESENTATIVE OR THE ONLINE CENTER.

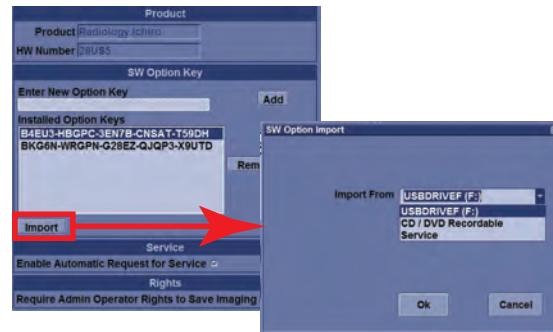
3-7-6-2 Installing a Software Option (cont'd)

- 4.) In R5 and later the Option String can be imported from the media.

Figure 3-28 Option Keys File in R5 and later - Import

Media (CD/DVD, USB)
Option keys file can be imported from
Service Folder

There is an import button on the Utilities/
System Admin Preset Menu.



- 5.) Press Save to save the new setting.
- 6.) Restart to save and activate the settings and adjustments you have done so far.

Section 3-8

Connectivity overview

NOTE: If you are new or unfamiliar to connectivity on the LOGIQ E9, read Chapter 16, Customizing Your System, of the Basic User Manual before you continue with the next descriptions and procedures.

3-8-1 Physical connection

3-8-1-1 Stand-alone LOGIQ E9

No network connection needed.

3-8-1-2 Sneaker Net environment

No network connection needed.

3-8-1-3 Wired Ethernet from LOGIQ E9 to a Workstation

3-8-1-3-1 Direct Cable Connection from the LOGIQ E9 to a Workstation via a Crossover Cable.

You will only need a Crossover Cable for network use to connect the two units this way.

- 1.) Connect one end of the crossed network cable to the network connector on the LOGIQ E9.
- 2.) Connect the other end to the network connector to the Workstation, see the Workstation Service Manual.

3-8-1-3-2 Connection via a Peer-to-Peer Network

You will need a network switch and one network cable for each unit connected to the switch.

3-8-1-3-3 Connection via Hospital Network

You will need one network cable to connect the LOGIQ E9 to a wall outlet on the hospital's network.

3-8-1-4 Connection using Wireless Option (R2.x.x or later)

Refer to:

- R2.x.x and R3.x.x, see: [8-6-8-3 "WLAN - Set up and Check" on page 8-178](#).
- R4.x and later, see: [8-11-23-3 "WLAN Set-up" on page 8-548](#).
- Chapter 5 for theory.
- Chapter 16, Configuring Connectivity of the LOGIQ E9 Basic User Manual.

Section 3-9 Connectivity Setup and Tips

Refer to the LOGIQ E9 Basic User Manual and see: Section "3-9-1 *Setup the LOGIQ E9 for DICOM Communications (cont'd)*" on page 3-41 for more information.

TOPICS covered in this Section:

- Section 3-9-1 "*Setup the LOGIQ E9 for DICOM Communications*" on page 3-40
- Section 3-9-2 "*Devices, Services, Dataflows and Print Buttons*" on page 3-42
- Section 3-9-3 "*How to Get the LOGIQ E9 to Recognize another Device on the Network*" on page 3-43
- Section 3-9-4 "*DICOM Image Storage Service*" on page 3-43

3-9-1 Setup the LOGIQ E9 for DICOM Communications

Table 3-7 Utility -> Connectivity -> TCP/IP screen

<p>1. Enter the LOGIQ E9 computer name. This may be the same as the station name.</p> <p>2. Enter the LOGIQ E9 IP address, subnet mask, default gateway and network speed. For automatic assignment of IP address, subnet mask and default gateway, select DHCP.</p> <p><i>NOTE: If possible, set the LOGIQ E9 Network Speed to match that of the Network switch. If in doubt, set it to AutoDetect. Otherwise, transfer times can be two to five times longer, during which the LOGIQ E9 will appear to be locked up. (If the Hard Drive activity light on the front of the console is lit steady or blinks quickly, the LOGIQ E9 is most likely not hung.)</i></p>

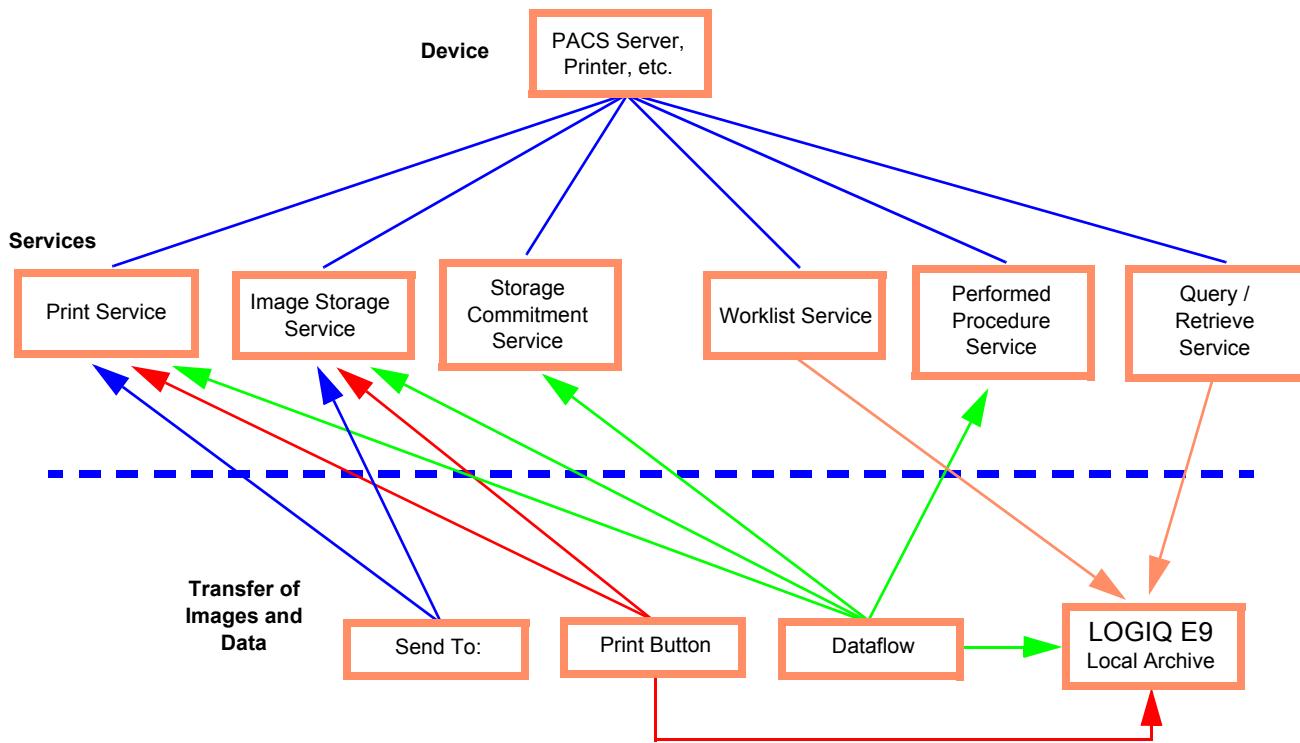
3-9-1 Setup the LOGIQ E9 for DICOM Communications (cont'd)

Table 3-8 Utility -> Connectivity -> Device screen

1.	Select MyComputer .
2.	<p>Assign an AE Title to the LOGIQ E9. (AE stands for Application Entity. DICOM services use this to identify the LOGIQ E9.) AE Title is case-sensitive. This title may contain the Computer Name from the TCP/IP page, if desired. Maximum number of characters in AE Title is 16 characters.</p> <p><i>NOTE: It is NOT recommended to use the factory default. This is not prohibited, but more than one system with the same AE Title can cause confusion.</i></p>
3.	Edit the Port Number if needed. "104" is typical. Save your changes and reboot the system.

3-9-2 Devices, Services, Dataflows and Print Buttons

Figure 3-29 Dataflows



A device is a physical unit, separate from the LOGIQ E9, where images and data can be stored and shared. A device provides various services to the LOGIQ E9.

To represent the device on the LOGIQ E9, add it in **Utility -> Connectivity -> Device**.

To represent the services of the device(s) on the LOGIQ E9, add them in **Utility -> Connectivity -> Service**.

Set up Dataflows and Print Buttons to direct images and data to the services.

Use **Utility -> Connectivity -> Dataflow** and **Utility -> Connectivity -> Button**.

A dataflow stores images in the clipboard to the local Hard Disk Drive. When the exam ends, the dataflow sends the images to the services assigned to it. (A Direct Store setting on the dataflow changes this behavior.)

See: 1.) ["Dataflow" on page 3-50](#).)

A print button sends an image to the services assigned to it whenever pressed. A print button also stores the image locally (to the “clipboard”) if “Copy to Dataflow” is assigned to it.

Send To (in the Exam View tab) sends an existing exam’s images and other data to one service at a time.
See: 3.) ["Send To" on page 3-50](#).)

Worklist and Query/Retrieve services transfer data to the LOGIQ E9. See: [3-9-7 "DICOM Worklist Service" on page 3-63](#) and [3-9-11 "DICOM Query/Retrieve \(Q/R\) Service" on page 3-75](#).

Keep in mind that the settings of a print button that stores an image on the LOGIQ E9 determine the format of the image file stored locally. A service’s settings dictate the format of the file that is sent to the service.

3-9-3 How to Get the LOGIQ E9 to Recognize another Device on the Network

Table 3-9 Utility -> Connectivity -> Device screen

<p>1. Press Add. The system creates a device called “NewDevice.”</p>	
<p>2. Change the name to one of your choosing.</p>	<p>3. Enter the IP address of the device.</p>
<p style="text-align: center;">Ping / Smiley</p> <div style="text-align: center;"> </div>	
<p>4.</p> <p>Save your changes and then press Ping. A “Smiley Face” indicates successful communication between yourLOGIQ E9 and the device. A ‘Frown’ indicates failed communication. Check the following:</p> <ul style="list-style-type: none"> • Is the device running? • Is it connected to the network? • Did you enter the right IP address? 	

3-9-4 DICOM Image Storage Service

An Image Storage Service provides a place to store patient and exam data from the LOGIQ E9 and corresponding images. The Image Storage Service, or the device that hosts it, is often called a Patient Archiving and Communication System (PACS).

3-9-4-1 Initial Steps

To setup an Image Storage Service on the LOGIQ E9, follow these steps:

Table 3-10 Initial Steps - Setup an Image Storage Service

R3.x and earlier	R4.x and later
(continued on next page)	

Table 3-10 Initial Steps - Setup an Image Storage Service

1.	In Utility -> Connectivity -> Service , from the Destination Device drop-down menu, select the device on which the service resides. (This assumes you have already setup the device in the Device tab in 3-9-1 "Setup the LOGIQ E9 for DICOM Communications" on page 3-40).
2.	From the Select Service Type to Add drop-down menu, select DICOM Image Storage and press Add .
3.	Change the name of the service to one of your choosing.
4.	Enter the AE Title and Port Number of the service. AE Title is case-sensitive.
5.	Save your changes and press Verify . A Smiley Face indicates successful communication with the service. <i>NOTE: If you get a successful Ping (Smiley Face) at the device level but not at the service level, it is possible that the AE Title or Port Number of the service settings are incorrect. Ensure that these are correct then re-verify. Be sure that the service type (Store, Print, etc) is correct and supported by the device.</i>

3-9-4-2 Properties

Maximum Retries, Retry Interval, and Timeout are used by the Retry protocol when the LOGIQ E9 encounters communication problems with a service:

Table 3-11 Properties

Maximum Retries, Retry Interval, Timeout	
Timeout	How many seconds the LOGIQ E9 should attempt to establish communications with the service
Maximum Retries	How many times to attempt to establish communication again in the event of failure
Retry Interval	How many seconds to wait between each retry attempt
Using the values in Table 3-10 "Initial Steps - Setup an Image Storage Service" on page 3-44 (which are the default and recommended settings), the LOGIQ E9 will attempt to establish communications for 30 seconds, up to three times (the original attempt and two retries), with a gap between each attempt of 10 seconds.	
R3.x and earlier Allow Multiframe	<p>When a print button is set to RawDicom Single (see: 2.) "Print Button" on page 3-62), and the user presses it while scanning live, it stores a single DICOM frame (bitmap of the image), along with the raw-data of the image. The raw data allows the system to treat this as a multi-frame image (cine clip) because it can regenerate the multiple frames from the raw data when the situation calls for it.</p> <p>One such situation is “Allow Multiframe.” It instructs the LOGIQ E9 to generate a multi-frame image to send to the service in the event that the clip was stored via a print button set to RawDicom Single. When the time comes to send the clip to the service, the LOGIQ E9 will generate a multi-frame from the raw data before putting it on the spooler. Such multi-frames are not permanently stored on the LOGIQ E9 local hard drive.</p> <p><i>NOTE: “Allow Multiframe” is relevant only for clips stored via a print button set to RawDicom Single. Images stored with either “Dicom & Multiple” or “RawDicom & Multiple” print button settings are always transferred as multi-frame images, regardless of the setting for “Allow Multiframe.”</i></p>
R4.x and later Allow Clips	Loops shall be transferred only if this option is checked. Default state should be checked.
(continued on next page)	

Table 3-11 Properties

Allow Raw Data	This will transfer the raw data of an image, if the image was stored as RawDICOM. Checkmark this when transferring to a service that can interpret GE-proprietary raw image data, such as Centricity. If it is checked when sending to a service that does not support GE raw data, the service may accept the image but ignore the raw data, or may not accept the image. <i>NOTE: The LOGIQ E9 stores raw data in a DICOM private tag in an image file. A PACS may delete all private tags, or it may leave them intact, or it may allow configuration in this regard. Keep this in mind if you later want to retrieve raw data images from the service.</i>
Compression - Compression takes time, but saves time when the image is transferred.	
R3.x and earlier Compression	This compresses image files prior to sending them to the service. Also, storage space on the service is reduced with compression. Set the compression type to one the service accepts.
R4.x and later Allow Enhanced DICOM Objects	Enhanced DICOM objects shall only be transferred if this option is checked. Default state should be unchecked. This allows a capable PACS to display 3D/4D images.
R4.x and later Still Image Compression	This compresses still image files prior to sending them to the service.
R4.x and later Clip/Volume Compression	This compresses loops /enhanced DICOM files prior to sending them to the service.
Compression Formats	
<i>NOTE: Determine which compression formats the service accepts. Using an incorrect format will cause problems that can be hard to troubleshoot.</i>	
None	No compression occurs.
RLE	Run-length Encoding – compression that does not lose any data that will degrade image quality (so-called “lossless” compression).
JPG	Joint Photographic Experts Group – compression that provides both lossless and lossy (image quality degradation) settings. Select this and a “Quality %” field appears, in which you can select “lossless” or various numeric settings; the higher the setting, the less image data is compressed (bigger image file) and the less image quality is degraded.
JPEG2000	Improved version of JPEG that, compared to JPEG, maintains the same image quality in a smaller image file, or provides better image quality in a file of the same size.
(continued on next page)	

Table 3-11 Properties

Max Framerate	This controls the maximum number of frames per second that are transferred: <ul style="list-style-type: none"> • 25, 30 (R3.x and earlier) 60, 80 (R4.x and later) – Certain high-frame-rate applications like cardiology can generate very large datasets. Use 25 or 30 to decimate image frames as desired to send no more than 25 or 30 frames per second. This can affect image quality. • Full - no frame rate decimation occurs (frames are not dropped). In radiology, frame rates are typically under 25-30 so Full should be an acceptable setting.
Color Support	This controls when color appears in images sent to the service: <ul style="list-style-type: none"> • Gray – Regardless of color in the image area, or in annotation (comments, measurements, arrows, body patterns, depth scale, title bar), images sent to the service will be in shades of gray. (In DICOM terms, the Gray setting forces images to be sent in MONOCHROME2 format.) • Color – Even if there is no color in the image area itself, an image sent to the service will still have color, even if only the title bar and depth scale have color. (The Color setting forces images to be sent in RGB format.) • Mixed – If the image area itself has color, an image sent to the service will have color; otherwise, the image will be in shades of gray. (The Mixed setting sends images as is, without conversion.) <p><i>NOTE: Color is recommended unless the user wants to reduce image storage size. Then, Mixed is suggested.</i></p>
Reopen Per Image	The LOGIQ E9 creates an “association” with the service prior to sending images to it. Think of it as a handshake. When check-marked, “Reopen Per Image” causes the LOGIQ E9 to create an association with the service for each image in a group of images and to release that association after each image is transmitted. When it is unchecked, the LOGIQ E9 creates only one association prior to sending any images, and doesn’t release it until all images have been sent. Reopen Per Image is common for CT or MR, where associations are used to distinguish views (one association for each view). This is not a typical use for Ultrasound. Unless you have a specific reason to create an association for each image, leave this option unchecked.
Enable Structured Reporting	A Structured Report is a non-image DICOM data file that contains measurements and calculations of an exam. If you want to transmit a Structured Report, check Enable Structured Reporting .

(continued on next page)

Table 3-11 Properties

Key Image Notes	<p>Key Image Notes (KIN) provides a way in DICOM to convey certain information and requests about images in an exam between the LOGIQ E9 and the service. The LOGIQ E9 supports one KIN mode: Image Rejection. Image Rejection indicates which images in a currently-open exam should be deleted.</p> <p>To use Image Rejection, assign the service to a dataflow, and check the Direct Store dataflow setting. When the user scans with this dataflow in an exam, deletes one or more images in the clipboard and ends the exam, the LOGIQ E9 sends a KIN DICOM object to the service. This object lists the images to be rejected. The service either deletes the images or tags them with a label such as "Rejected for Quality Reasons."</p>
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3-9-4-3 Sending Images and Data to a DICOM Image Storage Service

The LOGIQ E9 provides three ways to send images and data:

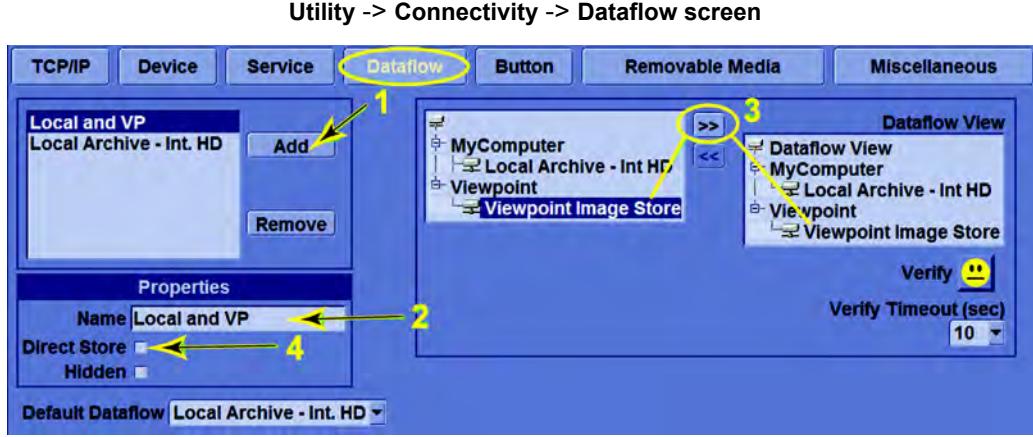
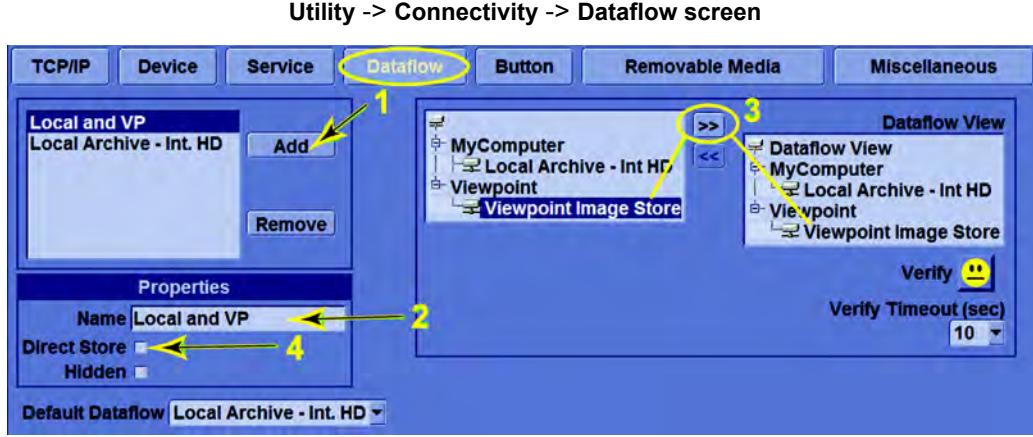
- 1.) Dataflow
- 2.) Print Button
- 3.) Send To

1.) Dataflow

The LOGIQ E9 default setup stores images in its local Hard Disk Drive. A dataflow allows the LOGIQ E9 to send images to other locations as well.

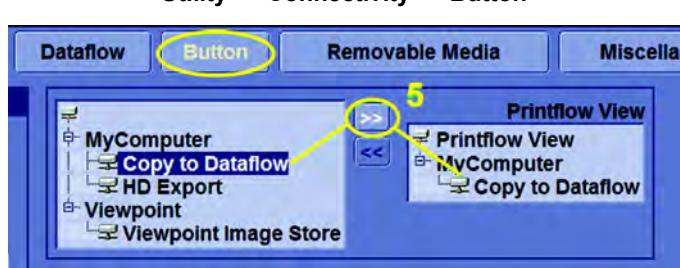
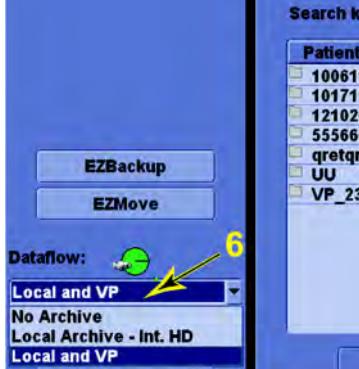
To setup a dataflow, follow these steps:

Table 3-12 Dataflow

 Utility -> Connectivity -> Dataflow screen	
<p>1. Navigate to Utility -> Connectivity -> Dataflow; press Add. The system creates a dataflow called “NewDataflow.”</p> <p>2. Change the name to one of your choosing.</p> <p>3. Notice the list of available services to the left of the << and >> buttons. Select each DICOM service you want to attach to your dataflow and press >>. This makes it appear in the list on the right, indicating that the service is now assigned to the dataflow.</p> <p><i>NOTE: You cannot remove “Local Archive – Int HD” from the dataflow. This guarantees that images will be saved on the local Hard Disk Drive of the LOGIQ E9 and not just transmitted to the service.</i></p> <p>4. Check Direct Store if you want an image generated by a print button to immediately be sent to the dataflow’s attached services rather than waiting until the exam is ended for all images.</p> <p><i>NOTE: If you plan to generate long cine loops, “Direct Store” is NOT recommended (either on the dataflow or via a Print button directly), because system response may be slow.</i></p>	

(continued on next page)

Table 3-12 Dataflow

 Utility -> Connectivity -> Button	
5.	<p>Navigate to Utility -> Connectivity -> Button, select a print button and add “Copy to Dataflow” to its Printflow View. DO NOT add the DICOM Image Storage Service to the Printflow as you would run the risk of sending each image to the service twice. Set the other parameters of the print button as you choose, using “Print Button Settings” in section Table 3-14 “Print Button Settings” on page 3-53 as a guide; but keepin mind that the settings ofthe service will override the settings of the button for the images sent to the service.</p>
 Patient Page - Dataflow Drop-down Menu	
6.	<p>Back on the Patient page, select your dataflow from the drop-down menu. From that point on, pressing your configured print button sends your images to the service(s) added to your dataflow.</p> <p><i>NOTE: Whenever you change the settings of a dataflow, before you use it, select a different dataflow or “No Archive” on the Patient screen, and then reselect the changed dataflow. This forces the LOGIQ E9 to read the modified resource file and implement your changes. If you change the settings of any service to which the dataflow directs traffic, you do not need to reselect it.</i></p>

3-9-4-3 Sending Images and Data to a DICOM Image Storage Service (cont'd)

For R4 and later, proceed to: "[2.\) Print Button - R4.x and later](#)" on page 3-55.

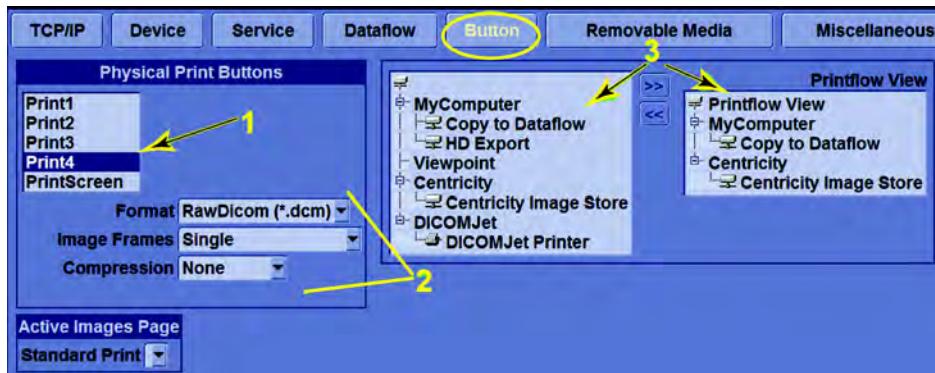
2.) Print Button - R3.x and earlier

The typical use for a print button is to copy to dataflow. However, the print button can be set up for image transfer to a DICOM Image Storage service as a quick way to accomplish "direct store" to that service without having to setup a dataflow. Each image is immediately sent to the service rather than waiting until the exam is ended for all images to be transferred. Another use of this technique is to send existing images directly to a PACS.

NOTE: If you plan to generate long cine loops, it is NOT recommended to use "Direct Store" (either on the dataflow or via a print button directly) as the system response may be slow.

To setup a Print Button for this purpose, follow these steps:

Table 3-13 Print Button Setup - R3.x and earlier

	
1.	In Utility -> Connectivity -> Button, select one of the "Physical Print Buttons."
2.	Set Format, Image Frames, and Compression as desired. See: Table 3-14 "Print Button Settings" on page 3-53 .
3.	<p>Notice the list of available services to the left of the << and >> buttons. Select each DICOM service you want to assign to your print button and press >>.</p> <p>(If you don't add "Copy to Dataflow" to the print button's Printflow, you will send images directly to the DICOM service(s) without having them stored permanently on the LOGIQ E9. With a dataflow, the images are always stored permanently in the database of the LOGIQ E9.)</p> <p>From this point on, pressing your configured print button immediately places the image on the spooler to be sent to the service(s) assigned to the button.</p> <p><i>NOTE: If you are using a dataflow to which one of your DICOM services is assigned, DO NOT add that same service to a print button. If you do, two copies of each image may be sent to the service with each press of the print button.</i></p>

3-9-4-3 Sending Images and Data to a DICOM Image Storage Service (cont'd)

Table 3-14 Print Button Settings

Format	
DICOM	The resulting file contains DICOM data and a bitmap of the image. Use DICOM format to store to DICOM Print devices or to Image Storage services that do not support raw data. Raw DICOM can still be used in these cases, but it is best to uncheck the Allow Raw Data box on the service. This flexibility is why the system defaults to RawDicom (Single) for P1.
RawDicom	The resulting file includes the Raw Data, the DICOM data and a bitmap of the image. Use RawDicom format to store locally to the LOGIQ E9. This allows for numerous post-processing, non-acquisition actions and for the replay of cine loops without the overhead of storing multiple DICOM frames. (Loops are included in the rawdata.) RawDicom can also be used to send to a PACS, such as Centricity and ViewPoint, which supports various degrees of raw data functionality.
M&A	Use this to generate a Structured Report for the measurements and calculations of the exam currently open. See: 3-9-10 "Structured Reporting" on page 3-73 for additional information.
Image Frames	
Single	Stores a single DICOM frame (bitmap of the image). Note that a raw-data loop is still available if used with RawDicom. This format captures the video area. It allows measurements without calibration.
Multiple	Stores multiple DICOM frames (one bitmap for each frame). Select this to either store multiple DICOM frames locally on the LOGIQ E9 or to export cine loops to import elsewhere. This option requires more disk space and takes longer to store images after the print button is pressed. This format captures the image area only. It allows measurements without calibration.
Secondary Capture	Stores a screen capture of a selected area. Select this and another drop-down menu lets you select Image Area, Video Area, or Whole Screen for the capture area. A Secondary Capture contains no calibration data, just pixel data. Thus it requires manual calibration for measurements, if you recall the image on the LOGIQ E9 or review it on the PACS. Measurements without calibration use pixels as the unit.
Independent of the Single, Multiple and Secondary Capture, dual and quad screen images are sent as secondary captures to a PACS. Measurements on these types of images are in pixels.	
Note about "bitmap": Bitmap does not refer to a file in ".bmp" format. The terms "image", "frame", and "bitmap" are interchangeable in a way. For multi-frame images it makes sense to say frame. On the other hand, DICOM is all about images; the image portion of the file (as opposed to the header) is really nothing more than a bitmap or screen capture.	
(continued on next page)	

Table 3-14 Print Button Settings

Compression	<p>Print buttons use the same formats as Compression on the Image Storage Service.</p> <p><i>NOTE: Suppose compression is specified on both a print button and on an image storage service, either assigned to the button or assigned to the dataflow in use. Also, suppose the compression settings are different. At the point the LOGIQ E9 is to send an image generated by the print button to the service, the LOGIQ E9 will first un-compress the compressed version of the print button, and then recompress it using the settings of the service. If the compression of the print button is lossy, the un-compression will not completely restore the original image. Then applying the compression of the service still generates a lossy image. The process of un-compressing and recompressing only has a negative impact on system performance.</i></p> <p><i>In general then, DO NOT use compression on a print key if images it generates end up getting sent to a service; or, IF YOU DO, use the exact same compression on the service.</i></p>
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NOTE: Print button actions can also be modified per model (abdomen, etc.) by settings in **Utility -> Application -> Print Controls**. Inspect them when print button behavior differs from expected.

3-9-4-3 Sending Images and Data to a DICOM Image Storage Service (cont'd)

2.) Print Button - R4.x and later

The typical use for a print button is to copy to dataflow. However, the print button can be set up for image transfer to a DICOM Image Storage service as a quick way to accomplish "direct store" to that service without having to setup a dataflow. Each image is immediately sent to the service rather than waiting until the exam is ended for all images to be transferred. Another use of this technique is to send existing images directly to a PACS.

NOTE: If you plan to generate long cine loops, it is NOT recommended to use "Direct Store" (either on the dataflow or via a print button directly) as the system response may be slow.

To setup a Print Button for this purpose, follow these steps:

Table 3-15 Print Button Setup - R4.x and later

1.	In Utility -> Connectivity -> Button , select one of the "Physical Print Buttons."
2.	<p>Notice the list of available services to the left of the << and >> buttons. Select each DICOM service you want to assign to your print button and press >>.</p> <p>(If you don't add "Copy toDataflow" to the print button's Printflow, you will send images directly to the DICOM service(s) without having them stored permanently on the LOGIQ E9. With a dataflow, the images are always stored permanently in the database of the LOGIQ E9.)</p> <p>From this point on, pressing your configured print button immediately places the image on the spooler to be sent to the service(s) assigned to the button.</p> <p><i>NOTE: If you are using a dataflow to which one of your DICOM services is assigned, DO NOT add that same service to a print button. If you do, two copies of each image may be sent to the service with each press of the print button.</i></p>
Continued on next page.	

Table 3-15 Print Button Setup - R4.x and later

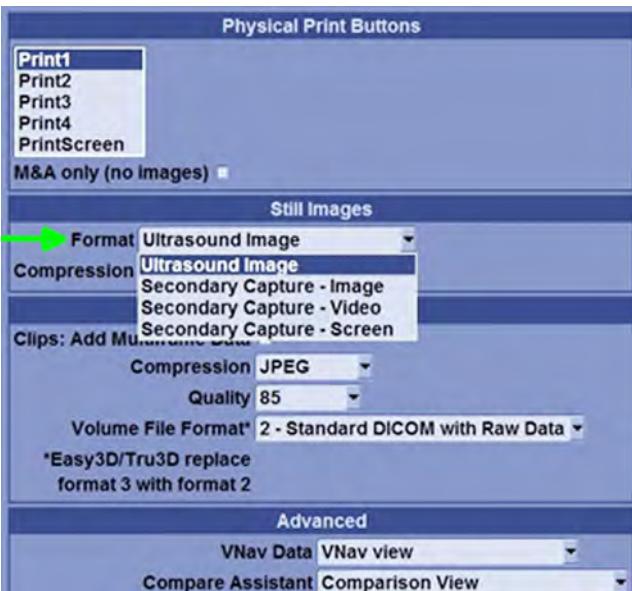
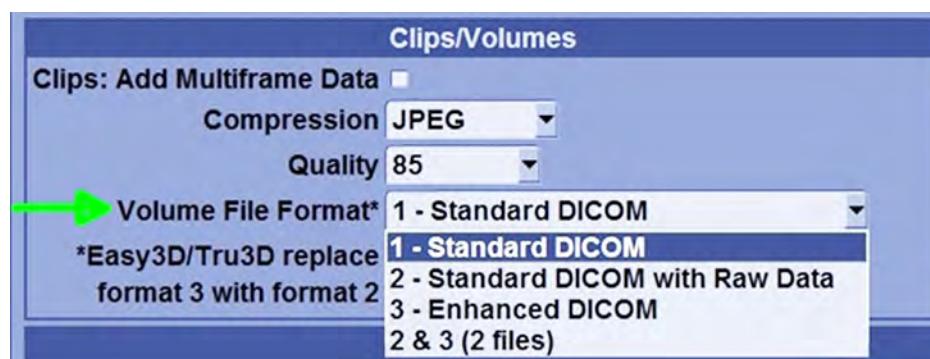
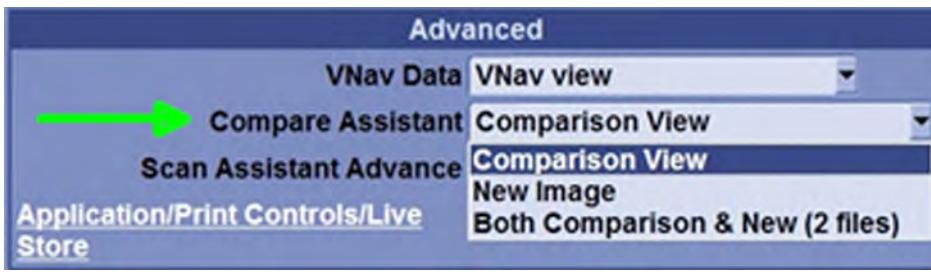
Attributes	
3.	<i>NOTE: Print button actions can also be modified per model (abdomen, etc.) by settings in Utility -> Application -> Print Controls. Inspect them when print button behavior differs from expected.</i>
4.	M&A only (no images): Use this to generate a Structured Report for the measurements and calculations of the exam currently open. See: 3-9-10 "Structured Reporting" on page 3-73 for additional information.
Continued on next page.	
5.	<p>Still Images:</p>  <p>Format:</p> <p>Ultrasound Image: Stores a single DICOM frame (bitmap of the image), along with the raw data. This format captures the video area. It allows measurements without calibration. (Print buttons always store an image's raw data to the clipboard, for both clips and single-frames – with one exception for Volume File Format (see below). Whether raw data gets sent to an Image Storage Service depends on the service's settings.)</p> <p>Secondary Capture – Image, Video, or Screen: Stores a screen capture of a selected area: Image Area, Video Area, or Whole Screen. A Secondary Capture contains no calibration data, just pixel data. Thus it requires manual calibration for measurements, if you recall the image on the LOGIQ E9 or review it on the PACS. Measurements without calibration use pixels as the unit.</p> <p>Whether the image is a Single-frame, Clip, or Secondary Capture: dual and quad screen images are sent as secondary captures to a PACS. Measurements on these types of images are in pixels.</p> <p>Note about “bitmap”: Bitmap does not refer to a file in “.bmp” format. The terms “image”, “frame”, and “bitmap” are interchangeable in a way. For multi-frame images it makes sense to say frame. On the other hand, DICOM is all about images; the image portion of the file (as opposed to the header) is really nothing more than a bitmap or screen capture.</p>
6.	Continued on next page.

Table 3-15 Print Button Setup - R4.x and later

7.	<p>Compression: Print buttons use the same formats as Compression on the Image Storage Service.</p> <p>NOTE: Suppose compression is specified on a print button, and also on an image storage service that is either assigned to the button or assigned to the dataflow in use. Also, suppose the compression settings are different. At the point the LOGIQ E9 is to send an image generated by the print button to the service, the LOGIQ E9 will first un-compress the compressed version of the print button, and then recompress it using the settings of the service. If the compression of the print button is lossy, the un-compression will not completely restore the original image. Then applying the compression of the service still generates a lossy image. The process of un-compressing and recompressing only has a negative impact on system performance.</p> <p>In general then, DO NOT use compression on a print key if images it generates end up getting sent to a service; or, IF YOU DO, use the exact same compression on the service.</p>
8.	<p>Clips / Volumes: This section covers those settings for clips and volumes that can affect the number, contents and properties of images sent to an Image Storage Service.</p> <p>Clips: Add Multiframe Data: Stores multiple DICOM frames (one bitmap for each frame). Select this to either store multiple DICOM frames locally on the LOGIQ E9 or to export cine loops to import elsewhere. This option requires more disk space and takes longer to store images after the print button is pressed. This format captures the image area only. It allows measurements without calibration.</p> <p>Compression: See Compression for Still Images above.</p> <p>Volume File Format:</p>  <p>This only applies to volume images (3D, 4D).</p> <ol style="list-style-type: none"> 1. Standard DICOM: Allows the user to not store raw data, for space considerations. 2. Standard DICOM with Raw Data: Stores the raw data. 3. Enhanced DICOM: DICOM provides separate tags and objects for 3D images. Many PACS do not support them. If a customer's PACS does provide support, this setting will use the 3D-specific tags instead of standard tags. It also includes raw data. 2 & 3: Include both 3D-specific tags and standard tags.

Continued on next page.

Table 3-15 Print Button Setup - R4.x and later

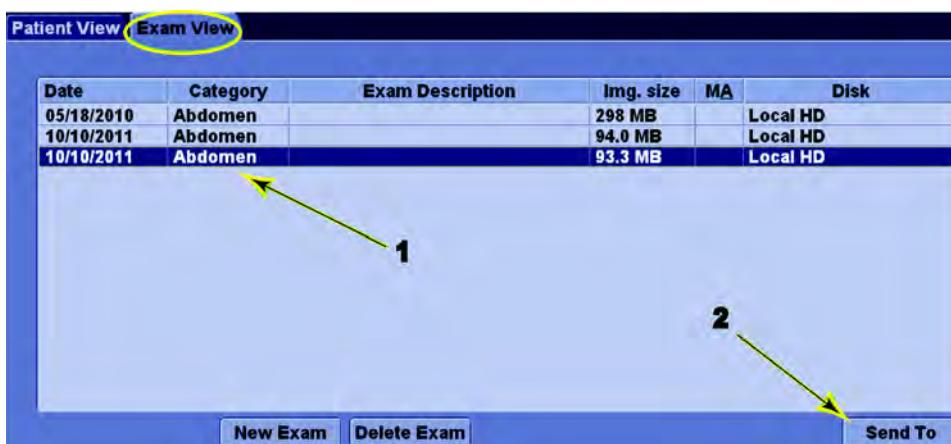
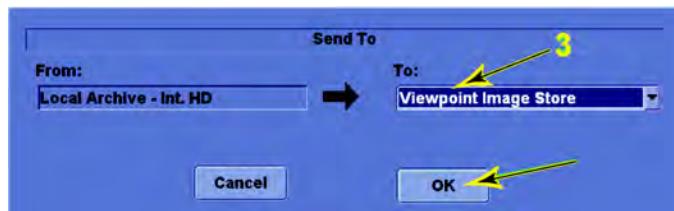
<p>9. Advanced: VNav Data: VNav displays a non-Ultrasound series (such as CT or MR slices) next to the live scan. VNav view: Print the dual-screen image – the non-Ultrasound series on one side and the live Ultrasound scan on the other. Ultrasound Only: Print only the Ultrasound image. V Nav & Ultrasound (2 files): Print one each of V Nav view and Ultrasound Only.</p>	 <pre> Advanced VNav Data VNav view VNav view Ultrasound only VNav & Ultrasound (2 files) </pre>
<p>Compare Assistant: Compare Assistant displays an image from a previous exam next to the live scan. Comparison View: Print the dual-screen image – the previous image on one side and the live scan on the other. New Image: Print only the live scan. Both Comparison & New (2 files): Print one each of Comparison View and New Image.</p>	 <pre> Advanced VNav Data VNav view Compare Assistant Comparison View Comparison View New Image Both Comparison & New (2 files) </pre>

3-9-4-3 Sending Images and Data to a DICOM Image Storage Service (cont'd)

3.) Send To

Use **Send To** to send existing exams to a DICOM service. Follow these steps:

Table 3-16 Send To

	
1.	On the Patient screen, select the desired patient. In the Exam View tab, select the exam to transfer.
2.	Press Send To .
	
3.	A pop-up appears with a drop-down menu. Select any existing service to which images can be sent (typically, DICOM Image Storage and Print services). Select the desired service and press OK .
4.	Press F4 to access the DICOM Job Spooler to confirm successful transmission of the exam.

3-9-5 DICOM Print Service

A DICOM printer is different from a typical network printer. It understands and accepts image files in DICOM format, and extracts and prints the images within.

Print Service Setup

To setup a Print Service on your LOGIQ E9, follow these steps:

Table 3-17 Print Service Setup

<ol style="list-style-type: none"> In Utility -> Connectivity -> Service, from the Destination Device drop-down menu, select the device on which the service resides. (This assumes you have already setup the device in the Device tab.) From the Select Service drop-down menu, select DICOM Print and press Add. Change the name of the service to one of your choosing. Enter the AE Title and Port Number of the service. AE Title is case-sensitive. From the Vendor drop-down menu, select the vendor of the service printer. The system adjusts some of the Properties of the printer accordingly. Maximum Retries, Retry Interval and Timeout have the same use as with DICOM Image Storage Services. See: 3-9-4-2 "Properties" on page 3-46. Set the Properties of the printer as desired. Refer to the operator manual of the printer for preferred or expected settings. The graphic in this Table shows typical settings. 	
(continued on next page)	

Table 3-17 Print Service Setup

8.	<p>The LOGIQ E9 allows you to annotate each image: check Enable. The Annotation section of the screen expands to let you set parameters for this feature:</p> <ul style="list-style-type: none">a.) Field: Combination of patient id, last name, and first name to appear in the annotationb.) Location: one or more of these, depending on the Vendor selected:<ul style="list-style-type: none">• Top: Annotation appears once, at the top of each sheet, whether one or more images are on the sheet• Bottom: Annotation appears once, at the bottom of each sheet, whether one or more images are on the sheet• Per Image: Annotation appears on each imagec.) Format ID and Starting Position: These are available only if the Vendor is “Other.” “Other” settings and uses are beyond the scope of this document. Refer to the operator manual of the printer for guidance.
9.	Save your changes and press Verify . A Smiley Face indicates successful communication with the service.

3-9-6 Print Service Use**Print Service Use**

As with a DICOM Image Storage Service, the LOGIQ E9 provides three ways to send images to a Print Service:

- 1.) Dataflow
- 2.) Print Button
- 3.) Send To

The setups and uses are basically the same, except when the Format of the Print Service is set to something other than 1x1. Then, if the Print Service is tied either to a dataflow with Direct Store set, or to a print button, the LOGIQ E9 will hold each image in its spooler until the number of images specified by Format is reached. For example, a Format of 3x4 specifies 12 images per sheet. Until you press the print button 12 times, the LOGIQ E9 sends nothing to the Print Service. If you press the print button 24 times, the LOGIQ E9 sends the images in two batches of 12 each. Any images left on the spooler when you start a new exam or end the patient are sent at that point.

3-9-7 DICOM Worklist Service

A Worklist provides a repository of data for patients scheduled for an exam. The LOGIQ E9 can query and filter the entries of the Worklist and retrieve one or more of them to create a patient for each with an initial exam.

Worklist Setup

For R6, there is a new field in Worklist Setup, see: [Table 3-19 "New Field in Worklist Setup" on page 3-64](#).

To setup a Worklist Service on the LOGIQ E9, follow these steps:

Table 3-18 Worklist Setup

1.	In Utility -> Connectivity -> Service, from the Destination Device drop-down menu, select the device on which the service resides. (This assumes you have already setup the device in the Device tab.)
2.	From the Select Service drop-down menu, select DICOM Worklist and press Add .
3.	Change the name of the service to one of your choosing.
4.	Enter the AE Title and Port Number of the service. AE Title is case-sensitive.
5.	Maximum Retries, Retry Interval and Timeout have the same use as with DICOM Image Storage Services. See: 3-9-4-2 "Properties" on page 3-46 .
6.	Set Maximum Results to the maximum number of results returned. The default and recommended setting is 100.
7.	Search Criteria are filters that restrict the entries returned by a query to those that match all criteria. The LOGIQ E9 provides two defaults: Modality (set to "US" for Ultrasound), and Scheduled Procedure Step Start Date (commonly known as Exam date, and set to today). Modify these or add other criteria as you wish. These define "remote" filtering. See: "Remote" versus "Local" Filtering" on page 3-65 .
8.	Save your changes and press Verify . A Smiley Face indicates successful communication with the service.
9.	Select the Don't Use checkbox when you DO NOT want to remotely filter on that search criterion. The tag will not be part of the Query. This is useful when a Worklist service does not correctly handle the tag.

3-9-7 DICOM Worklist Service (cont'd)

Table 3-19 New Field in Worklist Setup

R5.1.1 and earlier

R5.1.2 and later
 <p>Verify Before Query: If the LOGIQ E9 attempts a Query to a service that does not respond, the scanner will wait for a period determined by the Timeout and Maximum Retries settings. During this period user input is disabled. To avoid this, checkmark Verify Before Query. Then the scanner will first verify that the service will respond, and wait no longer than "Verify Timeout" seconds. If the service fails to respond in that time, the LOGIQ E9 will not attempt the Query.</p>

3-9-7 DICOM Worklist Service (cont'd)

"Remote" versus "Local" Filtering

The search criteria you set up in the **Utility -> Connectivity -> Service** page are used in "remote" filtering. When you press the **Query** button on the Worklist screen, the criteria becomes part of the DICOM message exchange between the LOGIQ E9 and the Worklist service. The service returns only those entries that match all of the search criteria.

In contrast, "local" filtering occurs "on the fly" on the patient data already queried, listed and stored on the LOGIQ E9. Local filtering occurs every time you enter a value in one of the fields above the list on the Worklist screen, such as Patient ID. The displayed list gets filtered progressively for each selection you make or character you enter. *Table 3-20 "'Remote' versus 'Local' Filtering"* illustrates this example: For a Worklist with dozens of entries, select Accession Number as the Search Key and enter "1." The list is filtered to display only those entries whose Accession Number starts with "1." Now enter "2" after the "1." The list is filtered again to display only those entries whose Accession Number starts with "12."

Table 3-20 "Remote" versus "Local" Filtering

Local Filtering - Query Button NOT pressed						
Patient ID:	Last Name:	First Name:	Exam Date:	Exam Description:	Accessi...	Listing 4
Search key: Accession Number	string: 12*					
VP_13	Friend of	Davis	09/15/2009	OB	12	
VP_226	RAND	DEE	08/30/2011	Midsection	120	
VP_239	Overridden	Bee	09/28/2011	nose job	121	
VP_2	Test	Patient	09/11/2009	vascular	124361	

Local filtering DOES NOT generate any DICOM traffic between the LOGIQ E9 and the service. It acts only upon the list already on the LOGIQ E9. This local list does not constitute actual patients and exams on the LOGIQ E9. Creation of patients and exams does not occur until you select one or more entries on the list and press Transfer . But, there is a twist; if you enter a value in one of the fields above the list on the Worklist screen, and then press Query , you are doing "remote" filtering again. The filter comprises the search criteria you set up in the Utility -> Connectivity -> Service page, plus whatever you entered in the field(s) above the list on the Worklist screen.

Remote Filtering - Query Button PRESSED (exact match ONLY)						
Patient ID:	Last Name:	First Name:	Exam Date:	Exam Description:	Accessi...	Listing 1
Search key: Accession Number	string: 12					
VP_13	Friend of	Davis	09/15/2009	OB	12	

Continuing the Accession Number example: Enter "12" and press Query . The query returns only exact matches.
--

3-9-7 DICOM Worklist Service (cont'd)

"Remote" versus "Local" Filtering (con't.)

To get partial matching, similar to what local filtering provides, add an asterisk at the end of the string:

Table 3-21 "Remote" versus "Local" Filtering (con't.)

Remote Filtering - Query Button PRESSED (partial matching)																																			
<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> Patient ID: <input type="text"/> Last Name: <input type="text"/> First Name: <input type="text"/> Search key: <input type="button" value="Accession Number"/> string: <input type="text" value="12*"/> <input type="button" value="Clear"/> <input type="button" value="Dicom properties"/> </div> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9; margin-top: 5px;"> Listing 4 <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Patient ID</th> <th>Last Name</th> <th>First Name</th> <th>Exam Date</th> <th>Exam Description</th> <th>Accessi...</th> </tr> </thead> <tbody> <tr> <td>VP_13</td> <td>Friend of</td> <td>Davis</td> <td>09/15/2009</td> <td>OB</td> <td>12</td> </tr> <tr> <td>VP_226</td> <td>RAND</td> <td>DEE</td> <td>08/30/2011</td> <td>Midsection</td> <td>120</td> </tr> <tr> <td>VP_239</td> <td>Overridden</td> <td>Bee</td> <td>09/28/2011</td> <td>nose job</td> <td>121</td> </tr> <tr> <td>VP_2</td> <td>Test</td> <td>Patient</td> <td>09/11/2009</td> <td>vascular</td> <td>124361</td> </tr> </tbody> </table> </div>						Patient ID	Last Name	First Name	Exam Date	Exam Description	Accessi...	VP_13	Friend of	Davis	09/15/2009	OB	12	VP_226	RAND	DEE	08/30/2011	Midsection	120	VP_239	Overridden	Bee	09/28/2011	nose job	121	VP_2	Test	Patient	09/11/2009	vascular	124361
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VP_239	Overridden	Bee	09/28/2011	nose job	121																														
VP_2	Test	Patient	09/11/2009	vascular	124361																														
<p>Some of the remote search keys use special formats:</p> <ul style="list-style-type: none"> - A tag that represents a date (example: 00400002 Scheduled Procedure Step Start Date, which is generally called "Exam Date") – three formats: <ul style="list-style-type: none"> * A valid single date in format YYYYMMDD (example: 20141112 for November 12, 2014) * A range of dates separated by a dash (example: 20140902-20141002 for the range September 2, 2014 through October 2, 2014) * TODAY[x,y], a range around today's date where x represents the number of days before today, and y represents the number of days after today (examples: TODAY[0,0] means today only; TODAY[1,3] means yesterday, today, and the three days after today) - A tag that represents a person's name, such as 00100010 Patient's Name. A complete name entry has five components separated by carets (^): <ul style="list-style-type: none"> * LastName^FirstName^MiddleName^Prefix^Suffix (Example: Public^John^Q.^Mr.^Jr. for "Mr. John Q. Public Jr.") - Many non-date tags formed by letters, numbers or both can use the asterisk as a wildcard. <ul style="list-style-type: none"> * For example, "M*" for Patient's Name will return all patients whose last name starts with M. "M" by itself though returns only those patients whose name is exactly "M". * Exceptions: Patient ID and Modality require an exact match. 																																			

3-9-7 DICOM Worklist Service (cont'd)

"Remote" versus "Local" Filtering (con't.)

The format of the values used for Search Criteria for both Worklist and Query/Retrieve services are defined in the DICOM standard: <http://medical.nema.org/dicom>. Select the latest year available in this folder. Open Part 5: "Data Structures and Encoding", and examine *Table 3-22 "Dicom Value Representations"*. For example, here are the rules for a valid AE Title:

Table 3-22 Dicom Value Representations

VR Name	Definition	Character Repertoire	Length of Value
AE (Application Entity)	A string of characters that identifies an Application Entity with leading and trailing spaces (20H) being non-significant. A value consisting solely of spaces shall not be used.	Default Character Repertoire excluding character code 5CH (the BACKSLASH "\\" in ISO-IR 6) and control characters LF, FF, CR and ESC.	16 bytes maximum

Basically, an AE Title can be up to 16 characters. Leading and trailing spaces are ignored. A title of all spaces is not valid. **These characters are not allowed:** "\", line feed, form feed, carriage return, and escape.

3-9-7 DICOM Worklist Service (cont'd)

Worklist Use

Follow these steps for Worklist Use:

Table 3-23 Worklist Use

<table border="1"> <tr> <td>1.</td><td>From the Patient screen, press Worklist. The Data Transfer screen appears with Worklist selected as the Task.</td></tr> <tr> <td>2.</td><td>In the From: drop-down menu, select the Worklist to query.</td></tr> <tr> <td>3.</td><td>Press Query. The LOGIQ E9 displays a list of all entries in the Worklist that meet the criteria set in both the Utility -> Connectivity -> Service page and on this Worklist screen.</td></tr> <tr> <td>4.</td><td>To filter this list further, enter (more) values in Patient ID, Last Name, etc. This provides local filtering. It DOES NOT generate more query requests to the Worklist service.</td></tr> <tr> <td>5.</td><td>Select one or more entries from the list and press Transfer. The LOGIQ E9 creates initial patient and exam data for each entry. If you transferred a single entry, the LOGIQ E9 returns to the Patient screen with the patient and new exam selected.</td></tr> <tr> <td colspan="2">The Worklist screen provides a couple of other controls:</td></tr> <tr> <td>6.</td><td>Clear: This clears all local filters and restores the list to the last actual Query.</td></tr> <tr> <td>7.</td><td>Dicom properties: This button displays some DICOM tags for the currently selected entry.</td></tr> </table>		1.	From the Patient screen, press Worklist . The Data Transfer screen appears with Worklist selected as the Task.	2.	In the From: drop-down menu, select the Worklist to query.	3.	Press Query . The LOGIQ E9 displays a list of all entries in the Worklist that meet the criteria set in both the Utility -> Connectivity -> Service page and on this Worklist screen.	4.	To filter this list further, enter (more) values in Patient ID, Last Name, etc. This provides local filtering. It DOES NOT generate more query requests to the Worklist service.	5.	Select one or more entries from the list and press Transfer . The LOGIQ E9 creates initial patient and exam data for each entry. If you transferred a single entry, the LOGIQ E9 returns to the Patient screen with the patient and new exam selected.	The Worklist screen provides a couple of other controls:		6.	Clear : This clears all local filters and restores the list to the last actual Query.	7.	Dicom properties : This button displays some DICOM tags for the currently selected entry.
1.	From the Patient screen, press Worklist . The Data Transfer screen appears with Worklist selected as the Task.																
2.	In the From: drop-down menu, select the Worklist to query.																
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4.	To filter this list further, enter (more) values in Patient ID, Last Name, etc. This provides local filtering. It DOES NOT generate more query requests to the Worklist service.																
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The Worklist screen provides a couple of other controls:																	
6.	Clear : This clears all local filters and restores the list to the last actual Query.																
7.	Dicom properties : This button displays some DICOM tags for the currently selected entry.																

3-9-8 DICOM MPPS (Modality Performed Procedure Step) Service

A DICOM Performed Procedure, also known as Modality Performed Procedure Step (MPPS), is a way to inform your billing system that an ultrasound procedure has been completed and can be billed.

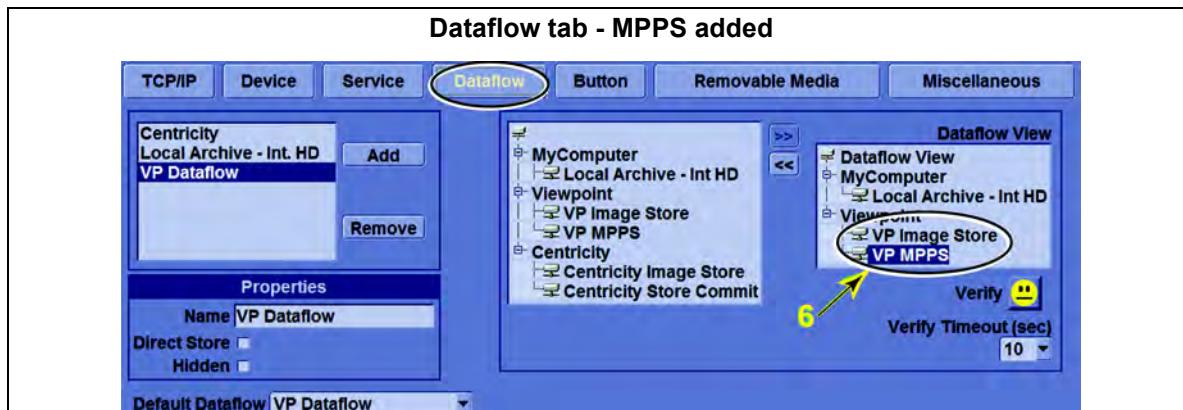
A typical setup has your Worklist Service handle MPPS communications. For example, you can retrieve today's scheduled exams and report completed exams to the same system.

To set up MPPS on the LOGIQ E9, follow these steps:

Table 3-24 Setup and Use a DICOM MPPS

1.	In Utility -> Connectivity -> Service , from the Destination Device drop-down menu, select your Worklist device.
2.	From the drop-down menu of services, select Dicom Performed Procedure and press Add .
3.	Provide a name, set the AE Title and Port Number for your Worklist service. AE Title is case-sensitive.
4.	Maximum Retries, Retry Interval and Timeout have the same use as with DICOM Image Storage Services. See: 3-9-4-2 "Properties" on page 3-46 .
5.	Save your changes and press Verify . A Smiley Face indicates successful communication with the service.
(continued on next page)	

Table 3-24 Setup and Use a DICOM MPPS

 <p>Dataflow tab - MPPS added</p> <p>The screenshot shows the 'Dataflow' tab of a software interface. On the left, there's a list of dataflows: 'Centricity Local Archive - Int. HD' and 'VP Dataflow'. Below this is a 'Properties' section with 'Name' set to 'VP Dataflow', 'Direct Store' checked, and 'Hidden' unchecked. A dropdown menu 'Default Dataflow' is set to 'VP Dataflow'. On the right, a 'Dataflow View' window is open, showing a tree structure: 'MyComputer' > 'Local Archive - Int HD' > 'Viewpoint' > 'VP Image Store' > 'VP MPPS'. Another tree on the right shows 'Dataflow View' > 'MyComputer' > 'Local Archive - Int HD' > 'Viewpoint' > 'VP Image Store' > 'VP MPPS'. A yellow circle highlights the 'Dataflow' tab tab, and another yellow circle highlights the 'VP MPPS' node in the 'Dataflow View' tree. A yellow arrow points from the number '6' to the 'VP MPPS' node.</p>	
6.	<p>In the Dataflow tab, add your MPPS service to the same dataflow that handles your DICOM Image Storage service.</p> <p>To set up MPPS on the server end, refer to the documentation of the Worklist service.</p> <p>From this point on, from the perspective of the user, MPPS works quietly in the background. It handles completed exams, abandoned exams, and empty exams with no input or monitoring required from the user.</p>

3-9-9 DICOM Storage Commitment Service

DICOM Storage Commitment enables the LOGIQ E9 to obtain a commitment from the image storage service that images have been stored. With this commitment, you may choose to delete the images from the LOGIQ E9.

To set up Storage Commitment on the LOGIQ E9, follow these steps:

Table 3-25 DICOM Storage Commitment Service Setup and Use

<p>1. In Utility -> Connectivity -> Service, from the Destination Device drop-down menu, select your Image Storage server.</p> <p>2. From the drop-down menu of services, select Dicom Storage Commitment and press Add.</p> <p>3. Provide a name, set the AE Title and Port Number for your Image Storage service.</p> <p>4. Maximum Retries, Retry Interval and Timeout have the same use as with DICOM Image Storage Services. See: 3-9-4-2 "Properties" on page 3-46.</p> <p>5. For Associated Storage, select the name of your Image Storage service.</p> <p>6. Save your changes and press Verify. A Smiley Face indicates successful communication with the service.</p>	
(continued on next page)	

Table 3-25 DICOM Storage Commitment Service Setup and Use

<p>7. In the Dataflow tab, add your Storage Commitment service to the same dataflow that handles your Image Storage service.</p> <p>Storage Commitment includes “reverse negotiation” with the receiving end – the Image Storage service. Basically, the receiver needs to know the AE Title, IP address and Port Number of the LOGIQ E9. Refer to the documentation of the Image Storage service for setting up Storage Commitment.</p>	<p><i>NOTE: The Store Commit and its Associated Storage (A) MUST BE in the same Dataflow!</i></p>
---	---

DICOM Job Spooler - STC identified

DICOM JOB SPOOLER								
#	Last Name	Patient ID	Destination	Type	Contents	Status	Error	
3	Test	TestStoreCommit	Centricity Store Commit	STC	1	Done		
2	Test	TestStoreCommit	Centricity Image Store	Storage	1	Done		

To confirm a successful Storage Commitment, press **F4** to inspect the spooler after you send images to the Image Storage service. An entry of:

- Type: STC
- Contents: Value equals the number of images stored, plus one if a Structured Report was sent.
- Status: “Done” or “Success”
- Error: no indication confirms a successful storage commitment.

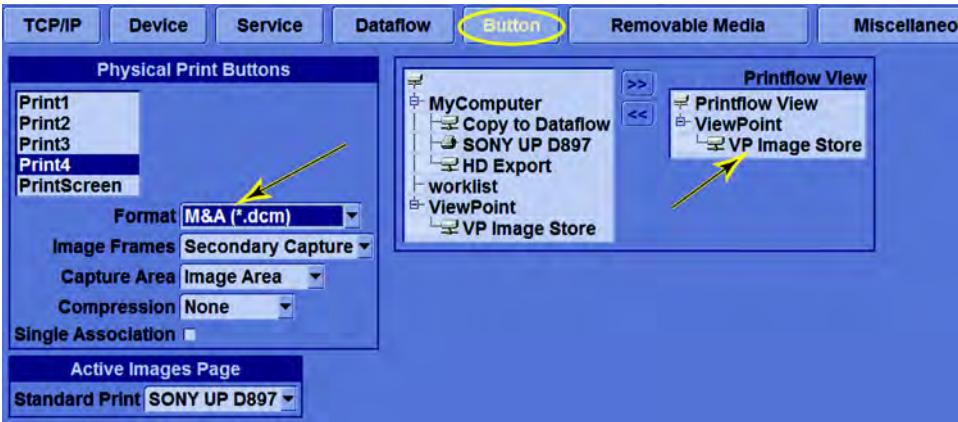
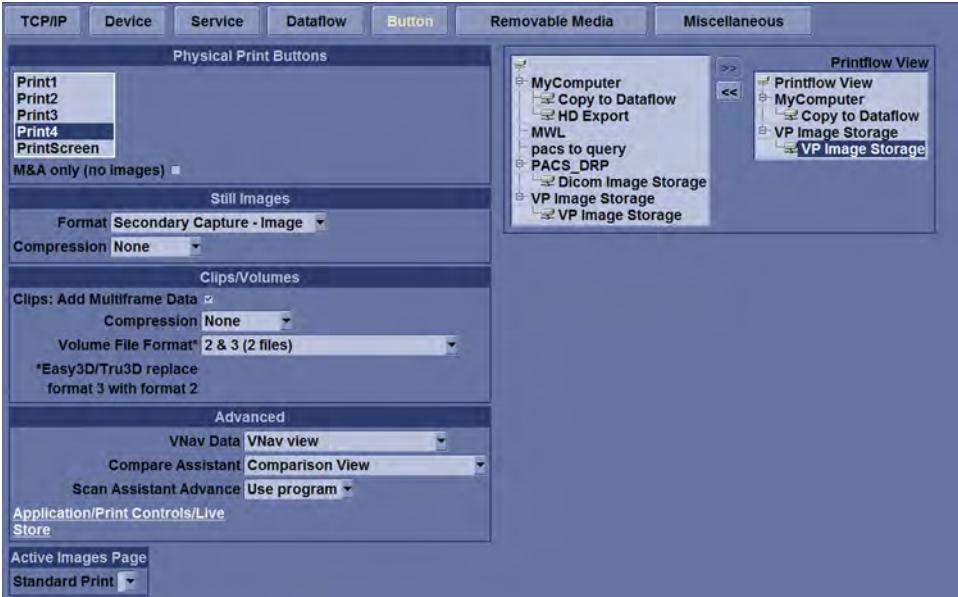
3-9-10 Structured Reporting

Structured Reporting provides for transmission of exam measurements and calculations in a separate non-image file. It is not a service in itself, but is a feature of some DICOM Image Storage services, and is always associated with one. The service must be able to interpret and display the data in the Structured Report. Refer to the documentation of the Image Storage service documentation for Structured Reporting.

Table 3-26 Structured Reporting

Utility -> Connectivity -> Service - Enable Structured Reporting checked	
	<p>To enable Structured Reporting for an Image Storage service, go to the set-up screen for that service in Utility -> Connectivity -> Service, check the Enable Structured Reporting box and press Save.</p> <p>From that point on, the LOGIQ E9 sends a Structured Report at the end of an exam with measurements.</p>
(continued on next page)	

Table 3-26 Structured Reporting

Sending Structure Report - R3.x and earlier	
	
Sending Structure Report - R4.x and later	
	
<p>A Structured Report can be sent for the measurements and calculations of the currently-open exam via a Print button. Add the Image Storage service to the Printflow setting of that button and set the Format for that button to "M&A." Take measurements in an exam and press the Print button. The LOGIQ E9 generates a Structured Report and sends it to the Image Storage service.</p> <p>The LOGIQ E9 does not store Structured Report files. Instead, when called upon, it conveys the measurements and calculations to the service via the DICOM message exchange between them.</p>	

3-9-11 DICOM Query/Retrieve (Q/R) Service

A Q/R service retrieves patients' data and corresponding exams from a PACS. The LOGIQ E9 can query the service for exams belonging to patients that match search attributes. The LOGIQ E9 can then retrieve the exams from the service and store them in the local archive.

3-9-11-1 Q/R Service Setup

Follow these steps for Q/R Service Setup:

Table 3-27 Q/R Service Setup

1.	In Utility -> Connectivity -> Service, from the Destination Device drop-down menu, select the device on which the service resides. (This assumes you have already setup the device in the Device tab.)
2.	Verify Before Query: If the LOGIQ E9 attempts a Query to a service that does not respond, the LOGIQ E9 will wait for a period determined by the Timeout and Maximum Retries settings. During this period, user input is disabled. To avoid this, checkmark Verify Before Query. Then the LOGIQ E9 will first verify that the service will respond, and wait no longer than "Verify Timeout" seconds. If the service fails to respond in that time, the LOGIQ E9 will not attempt the Query. From the Select Service drop-down menu, select Dicom Query/Retrieve and press Add .
3.	Change the name of the service to one of your choosing.
4.	Enter the AE Title and Port Number of the service. AE Title is case-sensitive.
5.	Maximum Retries, Retry Interval and Timeout have the same use as with DICOM Image Storage Services. See: 3-9-4-2 "Properties" on page 3-46 .
6.	Set Maximum Results to the maximum number of results returned.
7.	Search Criteria are essentially the same as with Worklists. The concepts of "Remote" and "Local" queries are also the same. See: "Remote" versus "Local" Filtering" on page 3-65 .
8.	Save your changes and press Verify . A Smiley Face indicates successful communication with the service. <i>NOTE: In many cases, the Q/R service allows a LOGIQ E9 to query its patient data, but will not allow actual transfer of exams/images without some level of authorization. Typically, the service needs to know the AE Title, IP address, and Port Number of the LOGIQ E9. Refer to the documentation of the Q/R service.</i>

3-9-11-2 DICOM Query/Retrieve (Q/R) Service

Q/R Service Use

Follow these steps for Q/R Service Use:

Table 3-28 Q/R Service Use

<p>1. From the Patient screen, press Data Transfer. The Data Transfer screen appears. Select Q/R as the Task.</p> <p>2. In the From: drop-down menu, select the Q/R service to query.</p> <p>3. Press Query. The LOGIQ E9 displays a list of all patients in the Q/R service that meet the criteria set in both the Utility -> Connectivity -> Service page and on this Q/R screen.</p> <p>4. To filter this list further, enter (more) values in Patient ID, Last Name, etc.</p> <p><i>NOTE: This provides local filtering; it DOES NOT generate more query requests to the Q/R service, unless you press the Query button again.</i></p> <p>5. Select one or more entries (patients or individual exams) from the list and press Transfer. The LOGIQ E9 retrieves the patients and their exams and stores them on its local hard drive. These patients are available on the patient screen. You can view their exams and images, and create new exams for them.</p> <p>Each patient entry in the list indicates the number of series (exams) available for retrieval (5a). To retrieve all of them, double-click anywhere in the row, or single-click the row and press the Transfer button. To retrieve individual exams, single-click on the entry's folder icon (5b). This displays a list of the exams. Double-click the exam you want to retrieve, or Ctrl-click and Shift-click to select more than one and then press Transfer.</p> <p>6. During the transfer, the Transfer button changes to "Cancel". Press it to return control to the LOGIQ E9 before all selected patients download. Example: If you selected 5 patients to transfer, but pressed Cancel while the third one was transferring, Patients 1 and 2 have been retrieved and will remain on the LOGIQ E9. Patients 4 and 5 will not be retrieved. As for Patient 3, cancellation depends on when you pressed Cancel during its transfer; a partial cancellation may occur: the patient's data transfers, but not its images.</p>	

3-9-11-3 Q/R Support for Volume Navigation

V Nav (Volume Navigation) combines 3D images from other modalities (CT, MR, etc.) with Ultrasound scanning. Use Q/R to load non-Ultrasound images into the LOGIQ E9.

The LOGIQ E9 supports retrieval of these non-US image types:

- MR (Magnetic Resonance)
- CT (Computed Tomography)
- PT (Positron Emission Tomography)
- XA (X-Ray Angio)
- MG (Digital Mammography)

Use filter “00080061 Modalities in Study” to retrieve non-US images. To filter on more than one modality, separate each by a “\” (backslash). For example, “US\MR\CT\PT\XA\MG” returns entries for all modalities supported by the LOGIQ E9.

Basic Use with V Nav

This guide is not intended to cover V Nav extensively. However, here are the initial steps:

Table 3-29 Q/R Support for Volume Navigation

 Image History Display	
Disk: Local HD	10/25/11 05:18:27PM SHR
MR Series # 4 [82 Images]	01 20 2006 Local HD
Turbo 3D T1 COR	10 25 2011 ACTIVE EXAM
1. Query and retrieve the non-US study from PACS.	
2. Create a new exam for this patient.	
3. Press the V Nav key located above the keyboard on the operator panel.	
4. On the Touch Panel, press Load ; select From Database from the pop-up menu.	
5. An Image History page displays on the screen. Select any desired image in the non-US series and press Review .	
(continued on next page)	

Table 3-29 Q/R Support for Volume Navigation

<p style="text-align: center;">LOGIQ E9 Scan Screen</p>	
<p>6. The LOGIQ E9 displays the scan screen, prompts you to confirm the patient data set selected, and displays the non-US volume on the right side of the screen.</p> <p>7. To scroll through the dataset, press the Scroll Z Trackball button. Use the Trackball to scroll through the dataset to find the area of interest.</p> <p>8. When done, press Scroll Z again. You are now scanning live on the left side of the screen with your reference view on the right screen.</p>	

3-9-12 Spooler

The DICOM Job Spooler shows all current and recent outgoing jobs performed by the LOGIQ E9. Outgoing jobs involve objects sent to a remote service: images, Structured Reports, and Key Image Notes sent to a PACS; print jobs to a DICOM printer; Storage Commitment to a PACS; and Modality Performed Procedure Step to a Worklist service. They do not include incoming objects – namely, Worklist and Q/R queries and transfers.

Table 3-30 Spooler

Dicom Job Spooler Display								
DICOM JOB SPOOLER								
#	Last Name	Patient ID	Destination	Type	Contents	Status	Error	In
1	de test	083111-1	SECUREVIEW	Storage	1	Done		
<input type="button" value="Refresh"/> <input type="button" value="Delete..."/> <input type="button" value="Resend"/> <input type="button" value="Send To..."/> <input type="button" value="Hide"/> <input type="button" value="Select All"/>								

Toggle **F4** on the keyboard to alternately display and hide the Spooler.

The columns in the DICOM JOB SPOOLER display:

- # – job number
- **Last Name and Patient ID** – patient data
- **Destination** – name of service receiving the objects
- **Type** – object type: “Storage” for images, Structured Reports, and Key Image Notes; “STC” for Storage Commitment; “MPPS” for Modality Performed Procedure Step
- **Contents** – number of objects being sent
- **Status** – Pending, Active, Hold, Done or Success, Failed
- **Error** – populated if the transfer fails
- **Information** – may contain general information

The buttons in the DICOM JOB SPOOLER display:

- **Refresh** – Refresh the status of jobs on the spooler
- **Delete...** – Select one or more jobs on the spooler and press **Delete...** to delete them. A pop-up asks you to confirm your choice. (Successful jobs get deleted automatically after several minutes.)
- **Resend** – Select a single job and press **Resend** to send it to its original destination. If you select more than one job, the Resend button is disabled.
- **Send To...** – Select a single job and press **Send To...** to send the job to any image storage or print service set up on the LOGIQ E9. A pop-up presents a list of these services. If more than one job is selected, the Send To... button is disabled.
- **Hide** – Same as **F4**: return to scan screen
- **Select All** – Selects all jobs in the list

*NOTE: Data for a service, such as IP address, AE Title and Port #, become part of the job. If any are incorrect, the job fails. If you correct the error, do not use **Resend** to try to send the job again. The job file is not updated with the correct data and it will fail to transfer. Instead, return to the Exam View tab, press **Send To...** and select the service or press "Send To" on the Spooler Display. This replaces the old job file with one that has the correct data.*

(continued on next page)

3-9-12 Spooler (cont'd)

Common Error Messages

No connection established – check network and log file: This usually indicates a bad or missing network connection OR incorrect IP Address, AE Title, or Port # between the LOGIQ E9 and service.

The remote system was not able to interpret the image information – check log file: This indicates an issue with the image or patient data, such as a missing Patient ID.

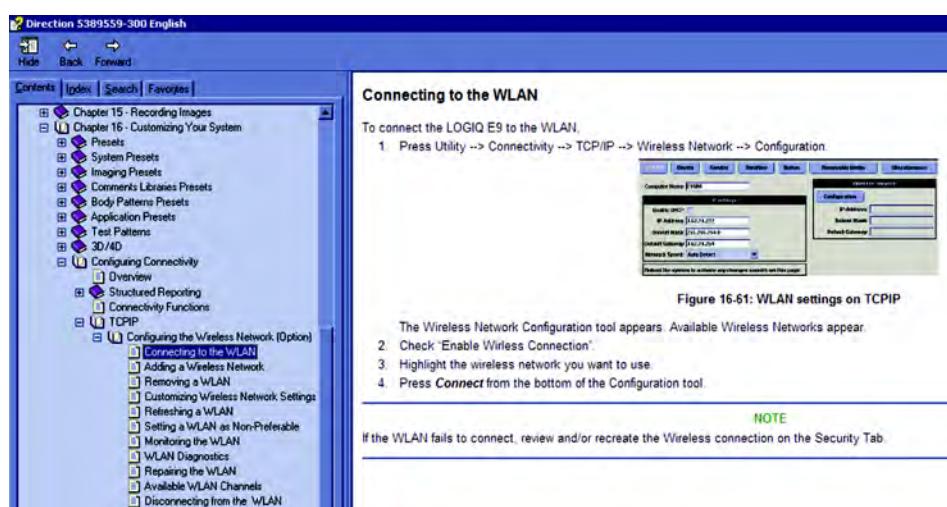
The remote service is out of resources: For example, the PACS has no more storage space.

3-9-13 Wireless

Configuring a Wireless network is beyond the scope of this guide. Both the User and Service manuals cover Wireless setup in detail. In particular, for setting up the WLAN, refer to the appropriate version the LOGIQ E9 Basic User Manual, Chapter 16, or the appropriate LOGIQ E9 Release Notes. See: [Table 1-8 "Basic User Manual and Release Notes per LOGIQ E9 console" on page 1-22](#), Configuring the Wireless Network (Option). (Available via the "Help" F1 key on the LOGIQ E9 keyboard.)

Table 3-31 Wireless

"Help" F1 Key Display



Connecting to the WLAN

To connect the LOGIQ E9 to the WLAN.

1. Press Utility --> Connectivity --> TCP/IP --> Wireless Network --> Configuration.

Figure 16-61: WLAN settings on TCP/IP

The Wireless Network Configuration tool appears. Available Wireless Networks appear.

2. Check "Enable Wireless Connection".
3. Highlight the wireless network you want to use.
4. Press **Connect** from the bottom of the Configuration tool.

NOTE
If the WLAN fails to connect, review and/or recreate the Wireless connection on the Security Tab.

NOTE: When both wired and wireless are enabled, the LOGIQ E9 chooses wired.

3-9-14 Network “Sniffer”

The LOGIQ E9 includes a network sniffer, Wireshark, that displays network traffic between the LOGIQ E9 and other devices. Its output can be saved in files. It is useful for debugging connectivity issues. Usually only DICOM traffic is examined. Follow these steps:

Table 3-32 Network “Sniffer”

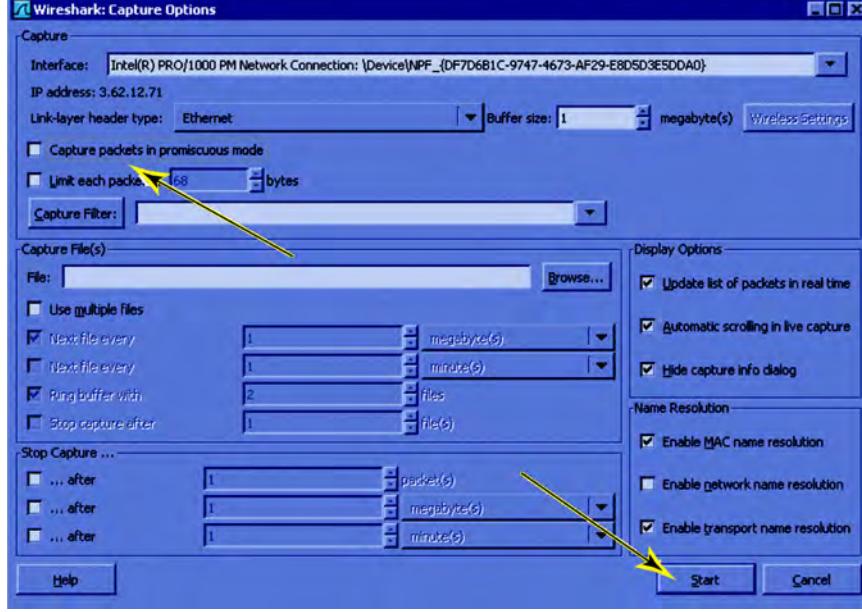
	
1.	Press Alt-N to display Wireshark.
2.	In Capture/Interfaces press Options on the interface that corresponds to the LOGIQ E9 IP address.
	
3.	Make sure "Capture packets in promiscuous mode" is unchecked. Press Start .
(continued on next page)	

Table 3-32 Network "Sniffer"

Network Connection: Capturing Wireshark						
4. In the "Filter" bar, enter "dcm" or "dicom." (Which one Wireshark accepts, depends on its version. Wireshark will indicate whether it accepts one or the other by turning the Filter background green.) Press Apply .						
Once Wireshark displays DICOM traffic, select an individual line and expand the DICOM tree in the lower frame to view DICOM-specific data.						
Wireshark Info column						
Capture Restart clears the current traffic display, in preparation for the next DICOM exchange.						
In the Wireshark Info column, entries with "Reject" or "Abort" definitely indicate issues. For example, the above exchange occurred when the LOGIQ E9 tried to send an exam to Viewpoint, but Viewpoint did not have the correct AE Title for the LOGIQ E9.						
(continued on next page)						

Table 3-32 Network “Sniffer”

Encoded Value in the “Status” tag						
No.	Time	Source	Destination	Protocol	Info	
6675	356.009473	3.62.12.71	3.62.13.65	DCM	DCM Continuation[Unreassembled P	
6676	356.009479	3.62.12.71	3.62.13.65	DCM	DCM Continuation[Unreassembled P	
6677	356.009485	3.62.12.71	3.62.13.65	DCM	DCM Continuation[Unreassembled P	
6689	356.198422	3.62.13.65	3.62.12.71	DCM	DCM Data	
6690	356.229305	3.62.12.71	3.62.13.65	DCM	DCM RELEASE Request	
6691	356.229543	3.62.13.65	3.62.12.71	DCM	DCM RELEASE Response	
<ul style="list-style-type: none"> ⊕ Frame 6689 (210 bytes on wire, 210 bytes captured) ⊕ Ethernet II, Src: Dell_3a:51:7a (00:19:b9:3a:51:7a), Dst: Advantec_ae:5e:66 (00:d0:c9:ae:5e:66) ⊕ Internet Protocol, Src: 3.62.13.65 (3.62.13.65), Dst: 3.62.12.71 (3.62.12.71) ⊕ Transmission Control Protocol, Src Port: acr-nema (104), Dst Port: vchat (1168), Seq: 418, Ack: 534944! ⊕ [Reassembled TCP Segments (156 bytes): #6686(12), #6689(144)] ⊕ DICOM <ul style="list-style-type: none"> PDU 0x4 (Data) PDU LENGTH: 0x00000092 ⊕ PDU Detail: DCM Data <ul style="list-style-type: none"> DATA LENGTH: 0x00000092 Context 0x5 (1.2.840.10008.1.2.1) Flags 0x3 (Command, last Fragment) <ul style="list-style-type: none"> (0000,0000) 4 Group Length 0x84 (132) (0000,0002) 1c Affected Class 1.2.840.10008.5.1.4.1.1.3.1\000 (0000,0100) 2 Command Field 0x8001 'C-STORE-RSP' (0000,0120) 2 Resp Message ID 0x1b (27) (0000,0800) 2 Data Set (0x0101 means no data set present) 0x101 (257) (0000,0900) 2 Status 0x110 '' (0000,1000) 30 Affected Instance UID 1.2.840.113619.2.256.896736845414.1316037586.91\000 						

Other times, however, the actual reason for an issue is often encoded in innocuous-looking entries near the end of the exchange. For example, the above situation involved the LOGIQ E9 attempting to send an image to Viewpoint directly via a print button, without a patient id. Viewpoint's "C-STORE-RSP" message to the LOGIQ E9 indicated, by an encoded value in the "Status" tag, that it did not store the image.

(continued on next page)

Table 3-32 Network "Sniffer"

Wireshark: Save file as

To save the network traffic currently displayed, stop the capture and press **File / Save As**. In the pop-up, select a destination drive or folder, name the file, select both “All packets” and “Displayed” under Packet Range, and press **Save**.

This saves the DICOM traffic in a file with suffix “.pcap”, which can be analyzed by Wireshark or a similar network sniffer.

Section 3-10

Setup paperwork

NOTE: During and after setup, the documentation (i.e. CDs with documentation, User's Manuals, Installation Manuals etc.) 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.

3-10-1 Contents in this Section

- 3-10-1 "Contents in this Section" on page 3-85
 - 3-10-2 "User Manual(s)" on page 3-85
 - 3-10-3 "Product Locator Card / UDI" on page 3-85

3-10-2 User Manual(s)

Check that the correct User Manual(s) or CD with User Manuals, per software (SW) revision and language, for the system is included.

3-10-3 Product Locator Card / UDI

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

The UDI of the medical device must be captured when any work is performed on that device. Refer to your local procedures on the actual capturing of the UDI.

Figure 3-30 Product Locator Card (Example)

	Mailing Address	GEHC - Americas Product Locator - W523 P.O. Box 414 Milwaukee, WI 53201-0414	GIB, European Central Admin Product Locator Cards XEROX Office VÁNUJÍTMÉTCHOLÓGIAI GÉPGYÁR FÓTI ÚT 141 1046 Budapest Hungary	Product Locator Card Asia Service Operation No. 1, Yongchang North Road Beijing Economic and Technologic Development Area Beijing 100176 China
DESCRIPTION	FDA	MODEL	REV	SERIAL
	OCP	BS	ORD	
	DISTRICT	CUSTOMER NO.	DATE (MO - DA - YR)	
DESTINATION NAME AND ADDRESS				
ZIP CODE				
SHIPMENT				
46-303268P1 Rev 14				
	Mailing Address	GEHC - Americas Product Locator - W523 P.O. Box 414 Milwaukee, WI 53201-0414	GIB, European Central Admin Product Locator Cards XEROX Office VÁNUJÍTMÉTCHOLÓGIAI GÉPGYÁR FÓTI ÚT 141 1046 Budapest Hungary	Product Locator Card Asia Service Operation No. 1, Yongchang North Road Beijing Economic and Technologic Development Area Beijing 100176 China
DESCRIPTION	FDA	MODEL	REV	SERIAL
SYSTEM LTD.	OCP	BS	ORD	EMPLOYEE NO.
	DISTRICT	ROOM	DATE (MO - DA - YR)	
CUSTOMER NO.				
DESTINATION NAME AND ADDRESS				
INSTALLATION				
46-303268P1 Rev 14				
ZIP CODE				

Section 3-11

Configuring Insite ExC

3-11-1 Contents in this section

3-11-1	Contents in this section.....	3-86
3-11-2	Prerequisites for InSite ExC Setup	3-86
3-11-3	Configuration Steps.....	3-86
3-11-4	Configuring InSite ExC	3-87

3-11-2 Prerequisites for InSite ExC Setup

- 1.) If not already available, collect the following information from the IT Administrator:

a.) System IP Address

_____ / _____ / _____ / _____

b.) Default Gateway

_____ / _____ / _____ / _____

Proxy Server, if necessary

_____ / _____ / _____ / _____ and Port _____

c.) Proxy Authentication, if necessary

User _____ and Password_____ and Scheme.

d.) System ID (SID) number_____

3-11-3 Configuration Steps

- 1.) Complete 3-11-2 - Prerequisites for InSite ExC Setup.
- 2.) Configure the system on the customer's network using the System IP Address and Gateway Address collected above.

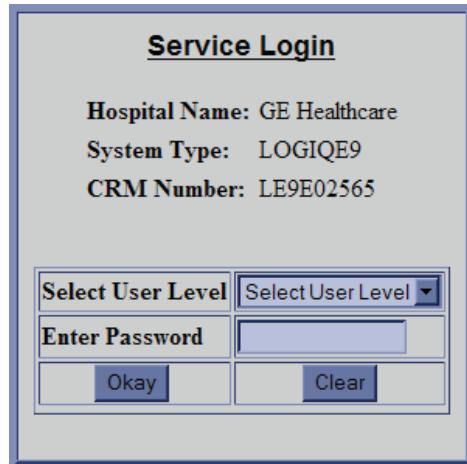
NOTE: See the appropriate system Service Manual to configure the system to access the network.

- 3.) On the LOGIQ E9, access the Service Login screen.

The Service Login screen opens ([Figure 3-31 "Service Login Screen - LOGIQ E9" on page 3-87](#)).

3-11-3 Configuration Steps (cont'd)

Figure 3-31 Service Login Screen - LOGIQ E9



- 4.) Select GE Service and enter the password, then select **OKAY**.
The Service Desktop opens.
- 5.) Select the **CONFIGURATION** tab.
The Configuration Page opens (Figure 3-32 "Configuration Home Page - LOGIQ E9" on page 3-88).

3-11-4 Configuring InSite ExC

Configure the System to connect to InSite ExC. All bold fields are mandatory. Before configuring the agent be sure that you have a network connection and check that it is configured. You will not be able to perform checkout with the default network configuration.

3-11-4-1 Configuring Agent Configuration

- 1.) Select the **CONFIGURATION** tab and choose the **InSite ExC Agent Configuration** link in the frame on the left side.
- 2.) Inspect the Device Name field and the CRM field. The Device Name field auto populates with the prefix LE9_ followed by the Serial number.

NOTE: *The Device Name cannot be edited.*

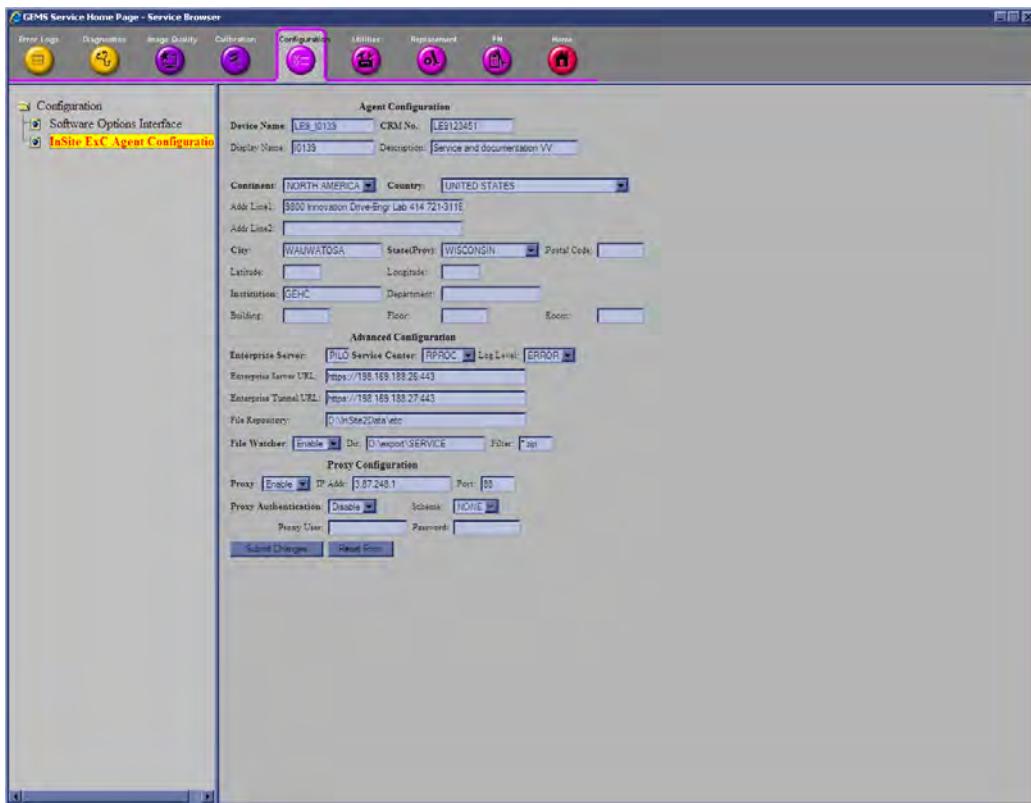
- 3.) In the Serial Number/System ID (CRM) field (for Ultrasound), enter the System ID now.
This is a required field. For consoles located in the U.S.A., the System ID is pre-populated. Outside of the U.S.A., follow the local System ID convention.

The CRM field auto-populates with format of LOGIQ E9 followed with the first five digits of the serial number. The CRM field is editable, and can be edited to reflect the desired System ID.

NOTE: *If CRM says unknown, try rebooting. When you install software the system reboots, but you need a second boot to get the serial number into the service platform.*

3-11-4-1 Configuring Agent Configuration (cont'd)

Figure 3-32 Configuration Home Page - LOGIQ E9



- 4.) In the Display Name field, enter a descriptive name that is easy to identify with this device. For example, "Unit 1".
- 5.) In the Description field, create a unique description of the system. For example, "St. Mary's Hospital".

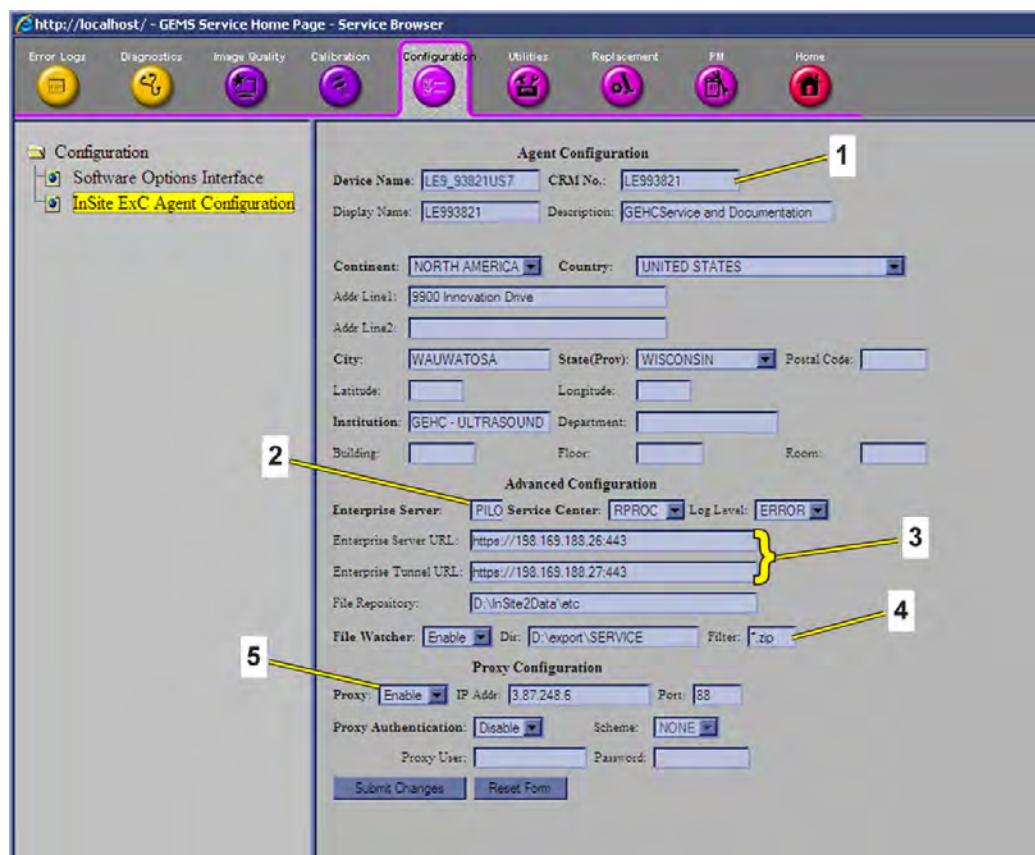
3-11-4-1 Configuring Agent Configuration (cont'd)

- 6.) Configure the following mandatory fields as desired:

- Continent
- Country
- City
- State
- Institution

The Agent Configuration Tool screen opens (Figure 3-33).

Figure 3-33 Completed Agent Configuration Tool screen - LOGIQ E9



1.	Must match System ID	3. Must show IP addresses for the server selected	5. Must be DISABLE, unless a proxy server is provided by the hospital
2.	Must be PILOT or PRODUCTION	4. Recommended to filter *.zip	

3-11-4-2 Configuring Advanced Configuration

- 1.) Select **PILOT2** or **PRODUCTION** from the **Enterprise Server** dropdown list. The Pilot server is used for initial production, please check with the OLC to verify that the current server is used.
 - Enterprise parameters are populated for Pilot as shown below:
 - * Enterprise Server URL = <https://198.169.188.26:443>
 - * Enterprise Tunnel URL = <https://198.169.188.27:443>
 - Or for Production, as shown below:
 - * Enterprise Server URL = <https://198.169.188.10:443>
 - * Enterprise Tunnel URL = <https://198.169.188.11:443>

2.) Configure the **Service Center** settings as RPROC.

3.) Select **Enable** in the File Watcher field.

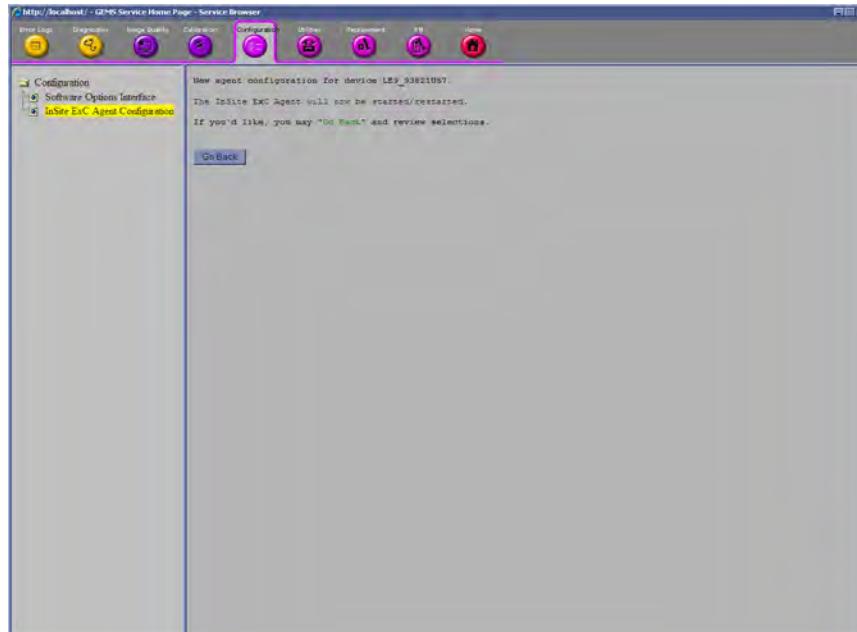
NOTE: *File Watcher will monitor d:\export\service for R2.x.x or earlier, and d:\service for R3.x.x and later.*

NOTE: *Do not change the Directory field.*

- 4.) In the Filter field, it is recommended to set it to *.zip, so that the system will only upload zip files to the back office. Example, Alt D logs.
- 5.) If a proxy is needed, select **Enable** from the Proxy dropdown list and enter a valid proxy server address and port (if needed).
If proxy authentication is needed:
 - a.) Enable it and enter Scheme (if needed).
 - b.) Enter User information and Password.
- 6.) Save the settings from the previous steps by clicking the **Submit Changes** button. A page is displayed on the CSD indicating the “agent will be restarted.”

If a screen requests ok for password, select **Yes**. The Submit Changes screen opens.

Figure 3-34 Submit Changes Response



3-11-4-2 Configuring Advanced Configuration (cont'd)

- 7.) Access and inspect the CSD Home Page. The Home Page appears and indicates Configured and Checked out.

If configured properly, the Service Home Page updates in approximately 10 seconds (although it may take up to 2 minutes). If it does not check out, confirm the Agent Configuration Tool screen has correct URL / IP address information. Make corrections, and repeat 1 Select PILOT2 or PRODUCTION from the Enterprise Server dropdown list. The Pilot server is used for initial production, please check with the OLC to verify that the current server is used. 3-50. If it fails again, contact the OLC or the Hospital IT department to check that your system has access to the Internet.

NOTE: *If this fails wait a minute and refresh the page by clicking on the home page button again. There is often a delay before the checkout is complete.*

Figure 3-35 Configuration Home Page - LOGIQ E9

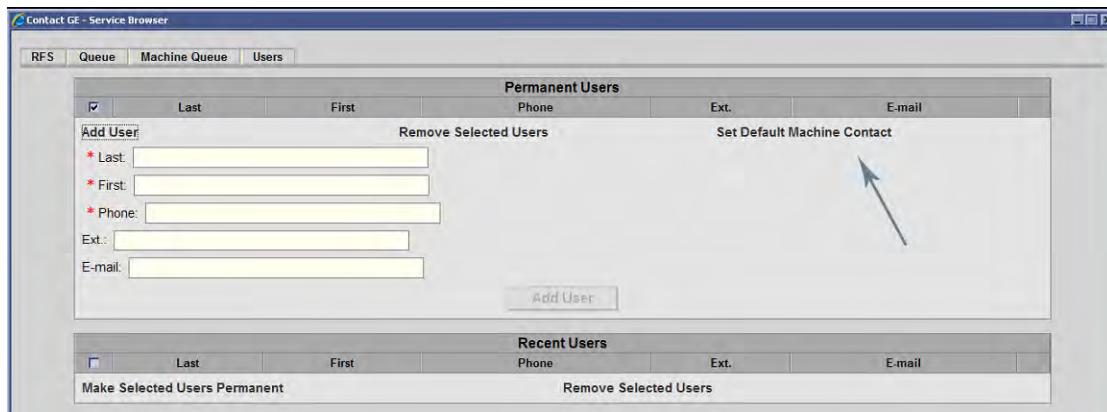


3-11-4-3 Configuring Request for Service (RFS)

To configure the LOGIQ E9 to enable the customer to submit an RFS,

- 1.) Position the Windows pointer on top of the GE InSite ExC icon at the bottom of the display.
- 2.) Press the right Trackball Set key. This opens the RFS screen.
- 3.) Select the Users tab and type the site's Contact Name. Manual and machine-generated RFS requests are directed to this person. Items with red asterisks are required fields and must be filled in.
- 4.) Click on Set Default Machine contact.

Figure 3-36 Select Default Machine Contact



NOTE: Machine-generated RFS is the system default. If you wish to disable RFS, remove the checkmark at Automatic Request for Service via **Utility -> Admin -> System Admin**.

Figure 3-37 Request for Service Setting on System Admin Page



3-11-4-4 Remote Check and Configuration

Contact the OnLine Center for InSite Checkout confirmation.

Section 7-2

Service Safety Considerations

-  **DANGER** DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT. USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.
-  **WARNING** *IF THE COVERS ARE REMOVED FROM AN OPERATING LOGIQ E9, SOME METAL SURFACES MAY BE WARM ENOUGH TO POSE A POTENTIAL HEAT HAZARD IF TOUCHED, EVEN WHILE IN SHUT DOWN MODE.*
-  **WARNING** *IF A LOGIQ E9 IS ENERGIZED, AND THE FRONT PROCESSOR (CARD CAGE) COVER IS REMOVED, THE VOLTAGE TEST POINTS POSE A POTENTIAL SHOCK HAZARD.*
-  **WARNING** *USE ALL PERSONAL PROTECTION EQUIPMENT (PPE) SUCH AS GLOVES, SAFETY SHOES, SAFETY GLASSES, AND KNEELING PAD, TO REDUCE THE RISK OF INJURY.*

Section 7-3

Gathering Troubleshooting Data

7-3-1 Purpose of this Section

Problem images and system data (logs) can be acquired at the device or through remote diagnostics (InSite ExC). These data can be used to perform service at the device, or can be sent back to the manufacturer for analysis.

7-3-2 Contents in this section

7-3-1	Purpose of this Section.	7-3
7-3-2	Contents in this section.	7-3
7-3-3	Collecting Vital System Information	7-4
7-3-4	Collecting a Screen Capture with Logs	7-5
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7-3-6	Capturing Network Logs with Network Sniffer (Software R1.x.x)	7-8
7-3-7	Capturing Network Logs with Network Sniffer (Software R2.x.x or later)	7-14

7-3-3 Collecting Vital System Information

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

NOTE: *This information is normally collected with the Alt+D or Gather Logs utility.*

- Product Name = LOGIQ E9

From the **Utility -> System -> About** screen:

Applications Software

- Software Version
- Software Part Number
- Build View
- Build Date

System Base Image Software

- Base Image Revision
- Image Part Number
- Image Date

7-3-4 Collecting a Screen Capture with Logs

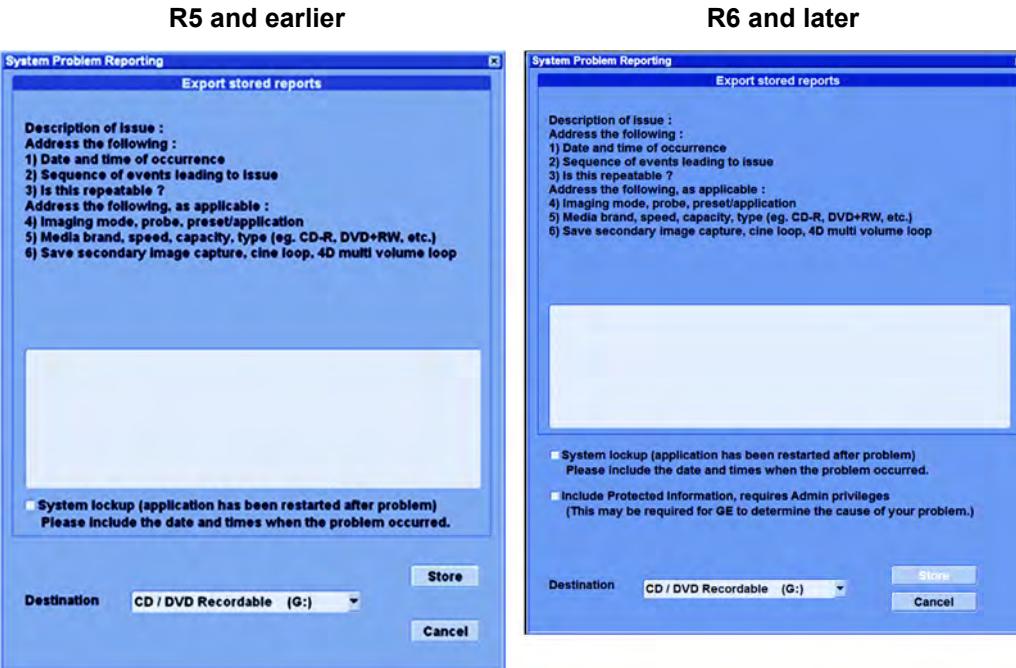
NOTE: In R6 the screen capture is no longer taken.

If the system malfunctions, press the Alt+D keys simultaneously. This Alt+D function is available at all times, and collects a screen capture of the image monitor, user-defined presets, and the following logs:

- Keyboard Shadow Log (restricted in R6 or later)
- Error Logs
- Crash Log (restricted in R6 or later)
- Vital Product Data
- DICOM Logs
- Windows Event Logs
- Diagnostic Logs
- Service Logs

For a detailed list of Service Logs captured,
see: [7-3-5 "Capturing Service Logs with ALT+D" on page 7-7](#).

Figure 7-1 ALT+D Dialog Box



When Alt+D is pressed, a menu box opens. Enter the following information:

- System ID serial number.
- Software version.
- System Date and time of occurrence.
- Sequence of events leading to issue.
- Is the issue repeatable?
- Imaging mode, probe, preset/application.
- Media brand, speed, capacity, type.
- Select the Destination (storage media or Service directory for remote viewing through InSite ExC) and click the Store button.

7-3-4 Collecting a Screen Capture with Logs (cont'd)

NOTE: For Application SW R3.x.x or later, the Service Directory is no longer located under the export folder, it is located in d:\ root directory (d:\service).

NOTE: Restart the application before resuming clinical scanning.

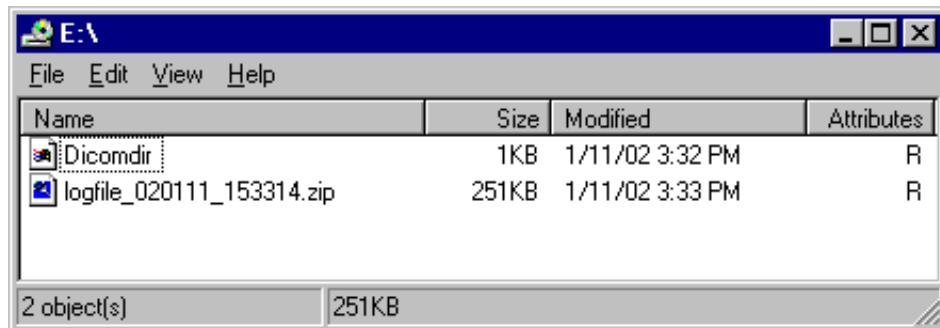
NOTE: To save to a CD/DVD you **MUST** select CD/DVD Recordable as the destination device, otherwise the data is written to the default Export/Service directory on the hard drive. The Export/Service directory is only used for InSite ExC. It is not intended for images or report storage use.

For CD/DVD; the system will automatically format if you insert an unformatted disk, gather logs and write it out to the disk.

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

Double check the media that you made to ensure it contains at least two files. An example is shown in [Figure 7-2 "Example of Zipped Trouble Image and Logs File" on page 7-6](#).

Figure 7-2 Example of Zipped Trouble Image and Logs File



NOTE: In R2.x.x or later, the name of the file includes the name of the system:
log_computerName_YYMMDD_HHMMSS.zip

In R6 and later, logs collected via Alt+D are divided in two groups, with and without patient information. The Alt+D dialog box will request the user to check the box authorizing the inclusion of logs that could possibly include protected information.

If box is checked, the system will create two log files with the following format name:

- log<SN>_<DATE>_<TIME>.zip
- log<SN>_<DATE>_<TIME>_ProtectedInfo.zip

Where <SN> is the serial number, <DATE> is the date in format YYMMDD and <TIME> is the time in format HHMMSS.

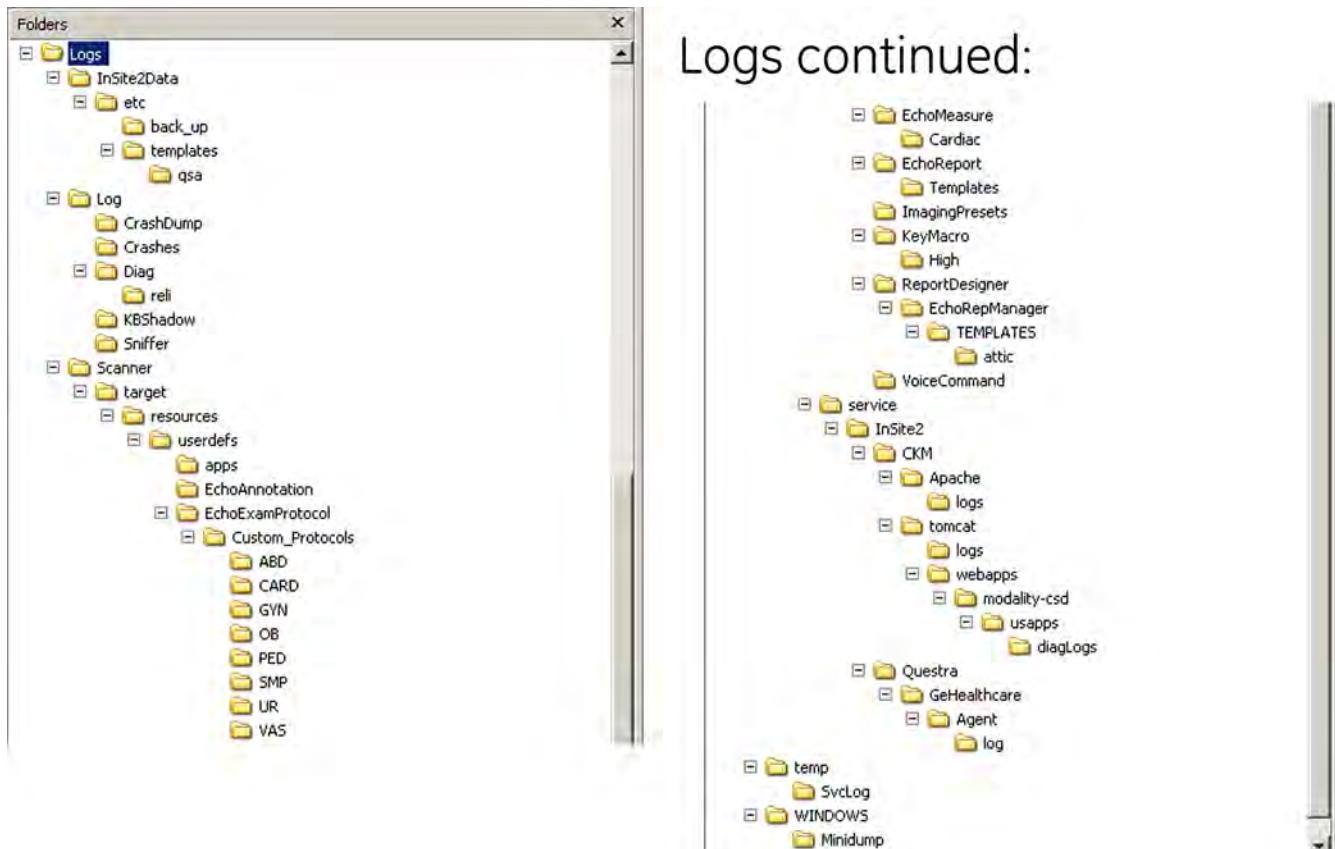
7-3-4-1 Marking Log files

If a customer is experiencing issues during operations, the event can be marked and logged by pressing Alt+1 or Alt+2 when they occur. When Alt+1 or Alt+2 are pressed, a marker is placed in the log to aid log analysis.

7-3-5 Capturing Service Logs with ALT+D

The following is a list of the Service logs captured during an ALT+D log capture:

Figure 7-3 Capture Service Example



7-3-6 Capturing Network Logs with Network Sniffer (Software R1.x.x)

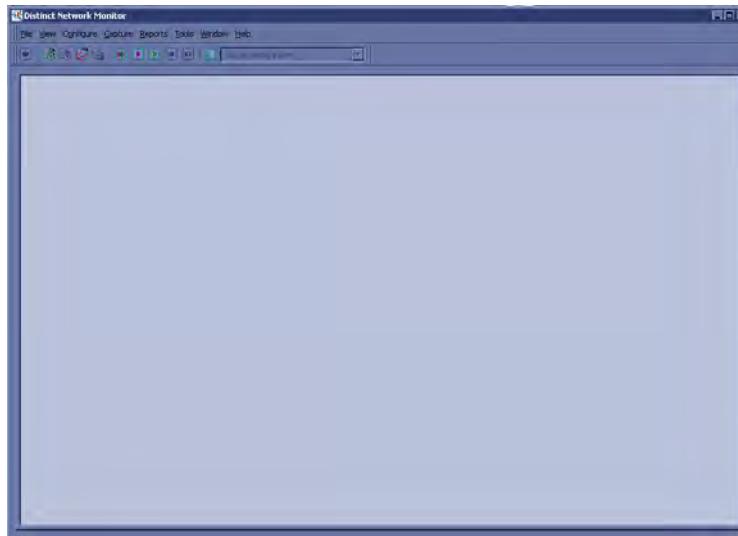
A sniffer monitors network traffic and allows you to capture network data without redirecting or altering it.

NOTE: If you are launching the network sniffer from the Utilities menu ([7-5-21-15 "Distinct Network Monitor R1.x.x" on page 7-148](#)), you can begin with step 1 of this procedure.

Launch the network sniffer application one of the following two ways:

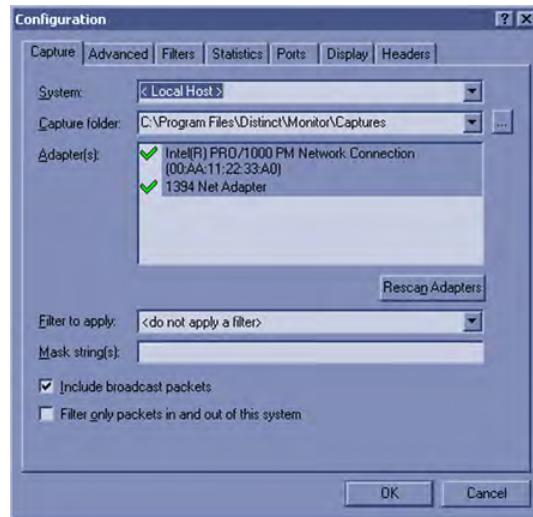
- 1.) On the Regular Scan Screen, press Alt+N. This launches the network sniffer application.
- 2.) Select Configure on the Distinct Network Monitor Window.

Figure 7-4 Distinct Network Monitor Window



- 3.) Click on Capture Settings after selecting the Configuration pull-down menu.
- 4.) The Configuration screen opens.

Figure 7-5 Configuration Screen



7-3-6 Capturing Network Logs with Network Sniffer (Software R1.x.x) (cont'd)

NOTE: Steps 5 - 12 describe how to filter the data so that you only record this system's network activity.

If you prefer, you may skip the filter section and start the data capture now. If you do, you will capture all network activity, not just this system's.

- 5.) On the Configuration screen ([Figure 7-6 "Configuration - Filters Tab" on page 7-9](#)), select the Filters tab
- 6.) In the New Filter section confirm “built-in templates” is selected, then click Create.

Figure 7-6 Configuration - Filters Tab

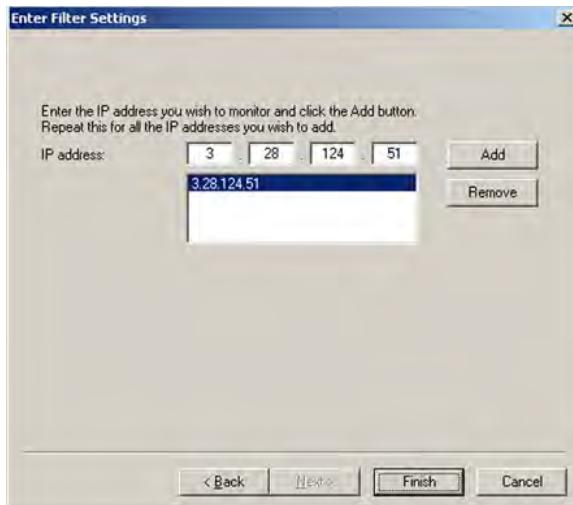


7-3-6 Capturing Network Logs with Network Sniffer (Software R1.x.x) (cont'd)

- 7.) On the Select Filter Task screen, select "Show only IP packets FROM/TO one or more IP addresses", then select Next.

The Enter Filter Settings screen opens.

Figure 7-7 Enter Filter Settings



- 8.) Enter the IP address you wish to monitor, and click the Add button (.). Repeat this step for all IP addresses you wish to add, then select Finish.

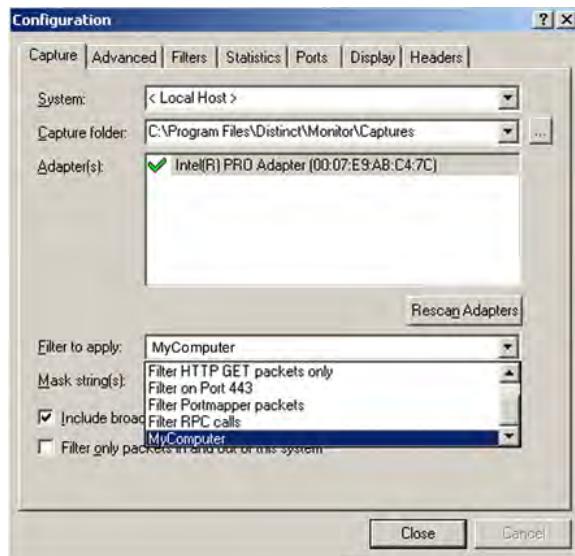
The Enter Filter Settings screen closes.

- 9.) On the Configuration Screen, select the Capture Tab ([Figure 7-8 "Capture Tab on Configuration Screen" on page 7-11](#)).

7-3-6 Capturing Network Logs with Network Sniffer (Software R1.x.x) (cont'd)

10.) In the Filter to Apply field, select "My Computer".

Figure 7-8 Capture Tab on Configuration Screen



11.) Select Close. The Configuration screen closes.

12.) On the Distinct Network Monitor Screen, select Capture > Packets and Statistics (Play).

NOTE: *The Network Sniffer will now collect data until you select Capture > Stop.*

13.) Double-click on the Go Ichiro icon to start the system application.

14.) Perform the DICOM transaction you want to troubleshoot (such as Worklist Query, Send to PACS, etc.). Perform the function several times to ensure the data is captured in the sniff.

7-3-6 Capturing Network Logs with Network Sniffer (Software R1.x.x) (cont'd)

15.) When the transaction finishes (or fails), select Ctrl+Alt+Del to open Task Manager.

Select Exit to close the application and return to Windows. Then open Windows Task Manager to open the Distinct Network Monitor screen.

Figure 7-9 Capture Tab on Configuration Screen



16.) From the Task Manager Applications tab, select Distinct, and then select the Switch To button.

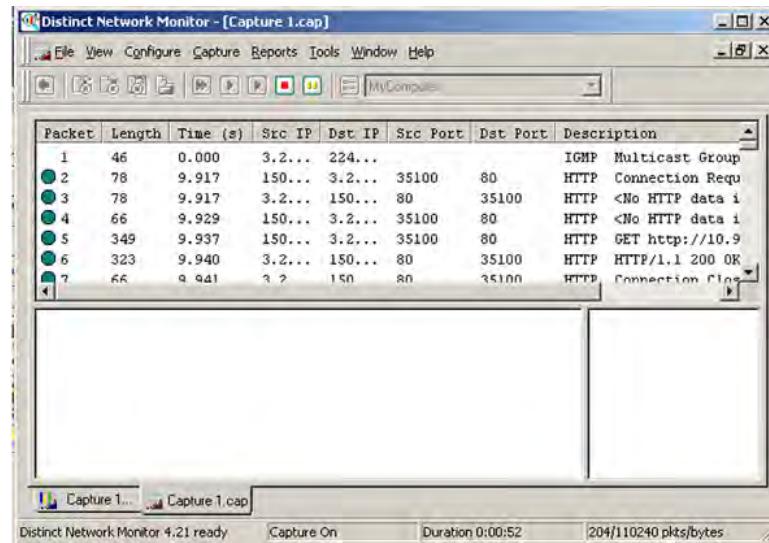
The Distinct Network Monitor screen opens.

7-3-6 Capturing Network Logs with Network Sniffer (Software R1.x.x) (cont'd)

17.) On the Distinct Network Monitor screen ([Figure 7-4 "Distinct Network Monitor Window" on page 7-8](#)), select Capture > Stop.

After stopping the data collection, a screen similar to [Figure 7-11 "Save As Capture File dialog box" on page 7-13](#) opens

Figure 7-10 Capture Data Sample

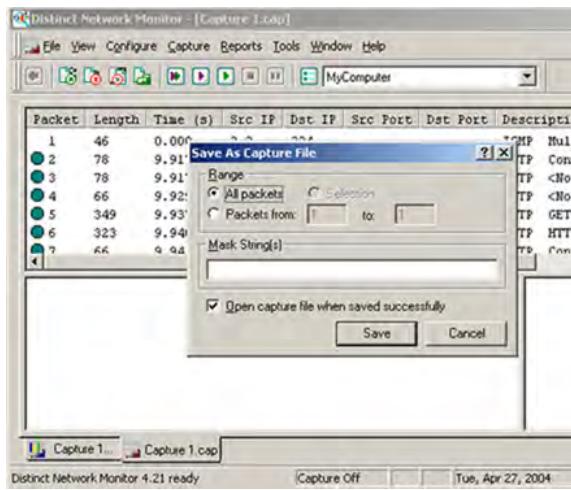


18.) Select File > Save As. Enter the file name "d:\log\Sniffer\MyLog".

19.) Select Save.

20.) On the Save As Capture File dialog (Figure 7-11), select Save.

Figure 7-11 Save As Capture File dialog box



21.) Check the d:\log\Sniffer directory. At a minimum, there should be the following two files: MyLog.cap, MyLog.num.

22.) Copy the files to media, or ask the OLC to upload the files if the system has remote connectivity.

7-3-7 Capturing Network Logs with Network Sniffer (Software R2.x.x or later)

Wireshark is a new network sniffer program that replaces Distinct in R2.x.x or later. Functionality is similar from previous software.

Logs collected should be stored under d:/log/Sniffer folder to ensure they form part of general log collection Alt+D or Collect Log.

- 1.) Press Alt+N.
- 2.) On the network sniffer screen, select **Capture -> Options**.

Figure 7-12 Network Sniffer Screen

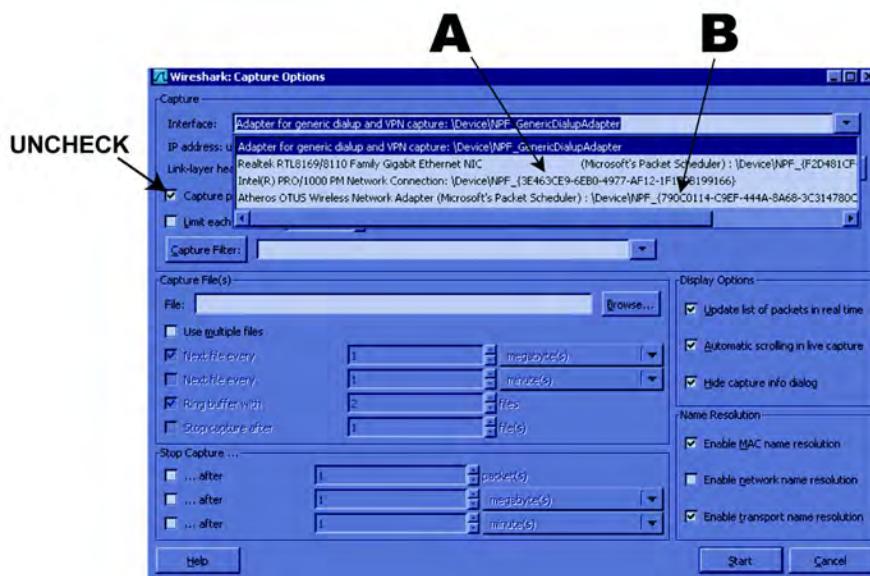


- 3.) Select the interface that will be receiving packets (Network card **A** or Wireless **B**).

NOTE: Remember, if the device has a DVR, it will show up in the list. Select either Intel Network connection or the Wireless network adapter.

If you are working with a Wireless connection, you must uncheck the “Capture packets in promiscuous mode”; the wireless option does not support this mode.

Figure 7-13 Sniffer Captions Options



7-3-7 Capturing Network Logs with Network Sniffer (Software R2.x.x or later) (cont'd)

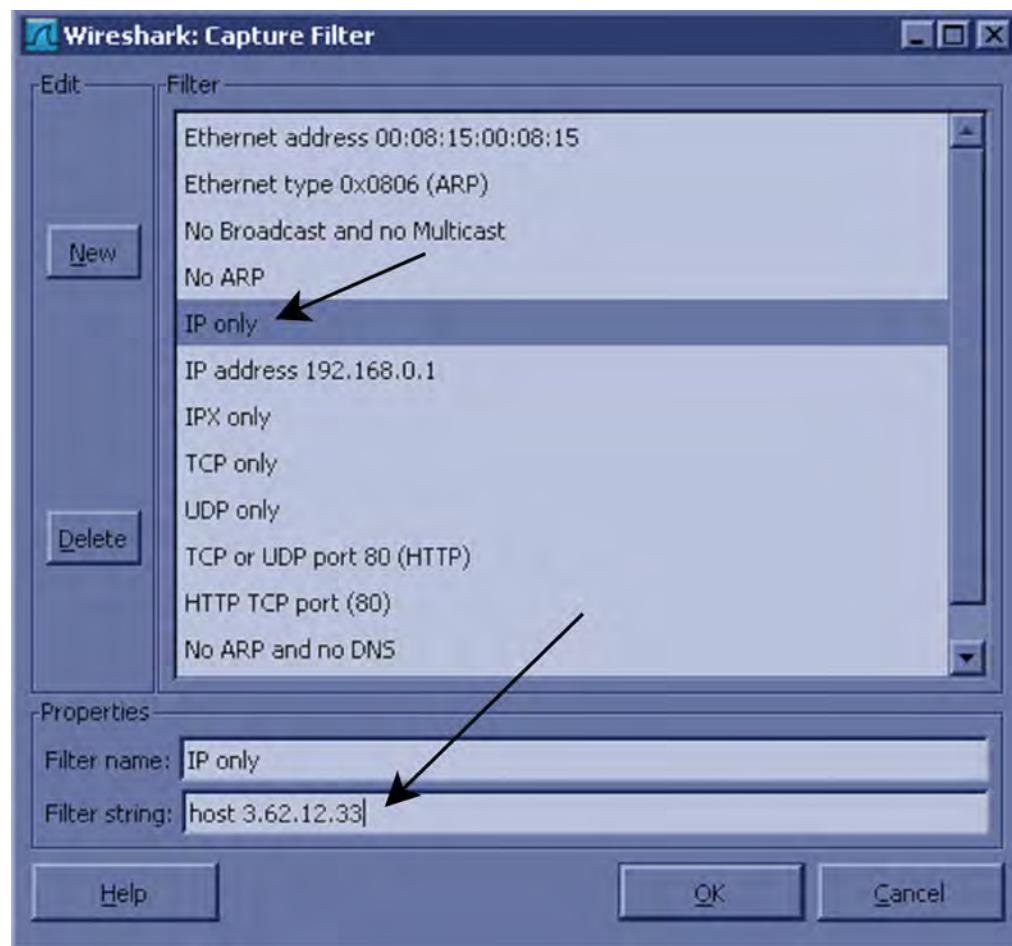
Use filters to limit the captured data. Filter by IP or by IP and port number.

By IP only: press on Capture Filter.

4.) Select IP only.

Use the IP address of the Scanner or the one from the DICOM device under test, on the Filter string field, using the following syntax: (example) host 3.62.12.33 as shown in [Figure 7-14 "Capture Filter IP Only" on page 7-15](#), press **OK**.

Figure 7-14 Capture Filter IP Only

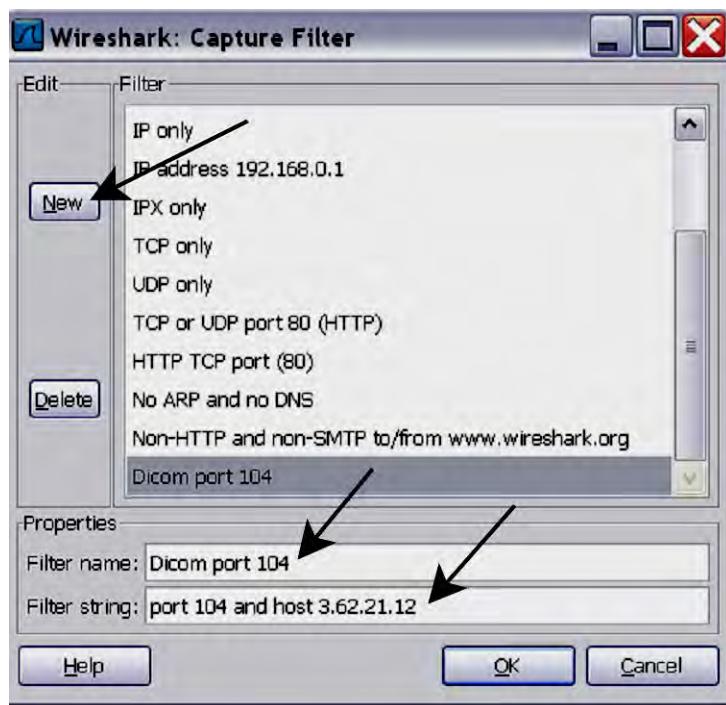


7-3-7 Capturing Network Logs with Network Sniffer (Software R2.x.x or later) (cont'd)

By IP and port: Select Capture filter.

- 5.) Select New.
- 6.) Edit name for example DICOM port 104.
- 7.) Enter the string with the following syntax: port xxx and host yy.yy.yy.yy, where xxx is the port number of "My Computer" in the scanner and yy.yy.yy.yy is the IP address of the device under test (PACS,server, etc).
- 8.) Press **OK**.

Figure 7-15 Sniffer Capture Filter IP and Port

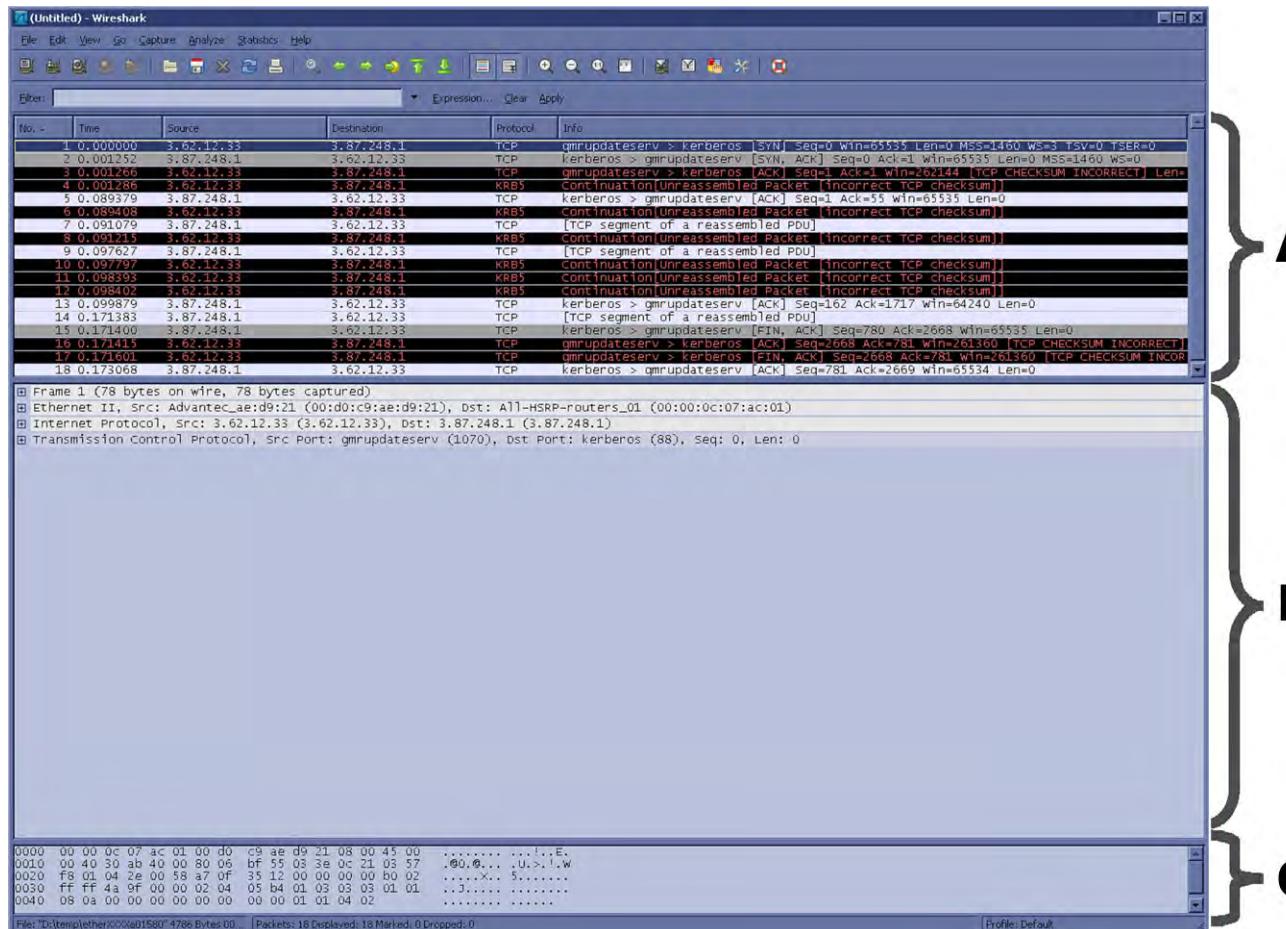


- 9.) Select Start.
- 10.) Minimize network sniffer window and initiate communication to the DICOM device (eg. send images to the storage device or query Worklist).

7-3-7 Capturing Network Logs with Network Sniffer (Software R2.x.x or later) (cont'd)

11.) Press Alt+N to restore Sniffer window and observe the network activity.

Figure 7-16 Sniffer Window and Network Activity



- A.) "Packet List" pane - the packet list pane displays all the packets in the current capture file. Each line in the packet list corresponds to one packet in the capture file.
- B.) "Packet Details" pane - shows the current packet (selected in the "Packet List" pane) in a more detailed form. This pane shows the protocols and protocol fields of the packet selected in the "Packet List" pane.
- C.) "Packet Bytes" pane - The packet bytes pane shows the data of the current packet (selected in the "Packet List" pane) in a hexdump style.

7-3-7 Capturing Network Logs with Network Sniffer (Software R2.x.x or later) (cont'd)

In addition to the pre capture filter, use the Filter tool on the screen to filter what is displayed.

Filter the DICOM packets, since they are the most probable for the troubleshooting.

12.) Type "dcm" and press **Apply**. The display should filter all DICOM packets, filtering out image data.

Figure 7-17 Filter Tool Display

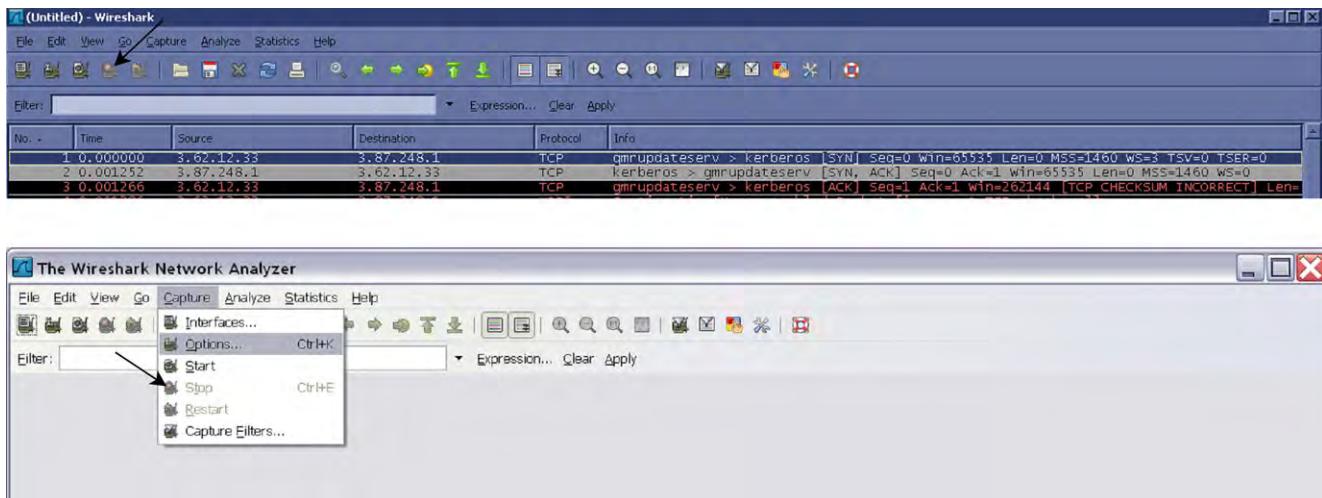


13.) Select Capture > Stop. Or, select the icon in the task bar to stop the capture.

14.) Select File > Save As. Enter the file name d:\log\Sniffer\MyLog. (MyLog can be changed to the name of your preference).

WireShark uses the libpcap (*.pcap, *.cap) file format as the default format to save captured packets. (If you need to open this file with D-Trace or DVTK, the capture can be re-saved in NA Sniffer Windows format).

Figure 7-18 Select Capture Stop Icon



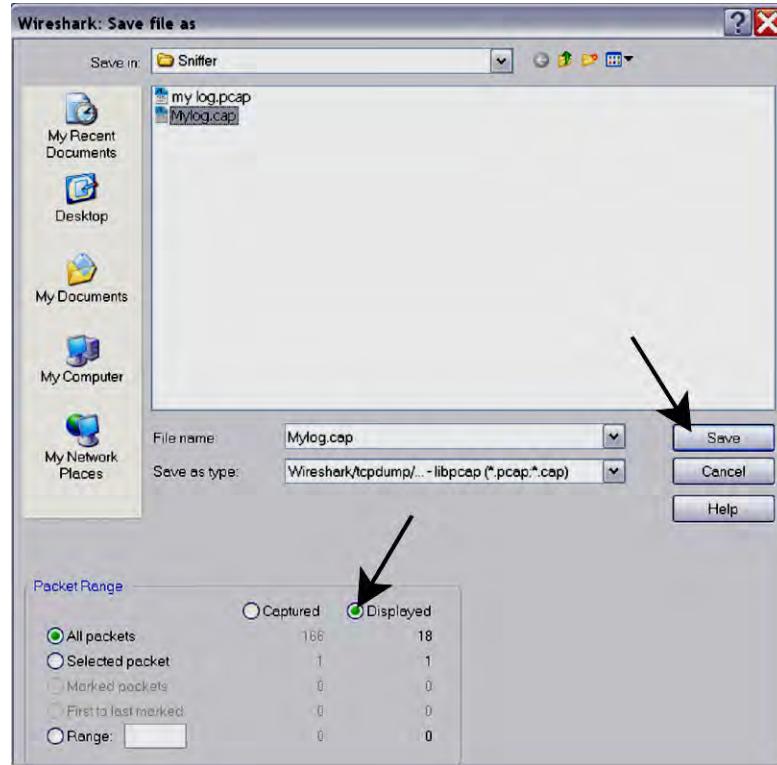
7-3-7 Capturing Network Logs with Network Sniffer (Software R2.x.x or later) (cont'd)

15.)Select Displayed. This will save only the filtered values rather than the entire capture.

16.)Select SAVE.

If you perform Alt+D or Gather Logs, these sniffer logs will be included in the zip file.

Figure 7-19 Select Capture Display



17.)Exit the sniffer application by clicking on the X in the upper right corner.

18.)If you have already performed Save as, you can continue without saving and quit the program. Make sure you have saved your data before exiting the program.

Figure 7-20 Save Capture Data Question



Section 7-4 Screen Captures

7-4-1 Purpose of this Section

To capture screen images that can be used for diagnostic and troubleshooting purposes.

7-4-2 Contents in this section

7-4-3 Ctrl+PrintScreen Shortcut	7-20
7-4-4 To Capture a Screen Image Using the Shortcut	7-20

7-4-3 Ctrl+PrintScreen Shortcut

A Ctrl+PrintScreen shortcut is available for quickly capturing the image displayed on the system. Images captured using this shortcut are saved in the d:\export\service\image (R2.x.x or earlier) or in d:\service\image (R3.x.x or later) directory using both the JPEG (.jpg) and raw DICOM (.dcm) formats.

The InSite ExC connection will have access to the export folder on the “D” drive to retrieve these images. This feature will allow the customer to quickly and easily acquire images that can then be viewed by the OLC.

7-4-4 To Capture a Screen Image Using the Shortcut

With the desired image displayed on the screen, press Ctrl and PrtSc (print screen) keys simultaneously.

If you want to compress or delete them:

- 1.) From the touchpanel, select **Utility -> Service -> Utilities -> Common Utilities -> Image Compress & Delete Utilities**. See: [7-5-21-13 "Image Compress & Delete Utility" on page 7-146](#).
- 2.) Select the checkbox for the image(s) you want to save, compress or delete.
- 3.) Select Compress or Delete Files, whatever function is desired.

A compressed file of the images is stored in d:\export (R2.x.x or earlier) or in d:\service (R3.x.x or later). You may rely on the date and time of the Ctrl+PrtSc procedure to identify the most recent image recorded. The uncompressed files are stored in d:\export\service\image (R2.x.x or earlier) or in d:\service\image (R3.x.x or later).

NOTE: For Application software R2.x.x or earlier, The Export\Service Directory may get deleted if the user clicks on the button **Delete Files For Transfer** on the **Save As dialog**. See: [7-9-13-3 "Cannot find d:\Export\Service folder" on page 7-238](#). The Directory MUST BE recreated after it is removed. For Application SW R3.x.x or later, the Service Directory is no longer located under the export folder, it is located in d:\ root directory (d:\service)

Section 7-5

Common Service Desktop

7-5-1 Purpose of this Section

This section describes the features of the Common Service Desktop (CSD).

NOTE: *To run diagnostics, you should detach all probes.*

NOTE: *Reboot the system after performing any diagnostics before returning the system to customer use.*

NOTE: *When using the Common Service Desktop do **NOT** minimize any of the Common Service Desktop windows. If you minimize them they end up in the lower left corner of the screen behind the Service Desktop Manager window and cannot be restored.*

7-5-2 Contents in this section

7-5-3	Common Service Desktop overview	7-23
7-5-4	Global Service User Interface (GSUI)	7-24
7-5-5	Home	7-26
7-5-6	Error Logs	7-28
7-5-7	Diagnostics Window Overview	7-30
7-5-8	Diagnostic Utility Freezes Up/Times Out	7-34
7-5-9	Diagnostic Symptom Guide	7-34
7-5-10	OP Panel Utilities - Op Panel Interface	7-45
7-5-10-2	Launching the Op Panel Test	7-46
7-5-10-3	Trackball Tab	7-50
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7-5-10-5	Slidepots Tab	7-52
7-5-10-6	Encoders Tab	7-53
7-5-10-7	Pushbuttons Tab	7-54
7-5-10-8	LEDs Tab	7-55
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7-5-22	Utilities - Scanner Utilities	7-154

7-5-3 Common Service Desktop overview

Introduction

The Service Platform contains a set of software modules that are common to all ultrasound and cardiology systems containing a PC backend. The Service Platform will increase service productivity and reduce training and service costs.

Insite ExC Platform Features

Many of the services of the Common Service Desktop come from its integration with Insite ExC. The following topics contain a brief introduction of Insite ExC's features.

Web Server/Browser

The Service platform and other Service software use the Insite ExC web server and the Internet Explorer browser.

Connectivity

NOTE: *This feature that allow the customer to contact the GE OnLine Center, are available for Warranty and Contract customers only.*

This feature provides basic connectivity between the scanner and the OnLine Center (OLC).

Configuration

This feature provides the interfaces to configure various Insite ExC parameters.

Contact GE

NOTE: *This feature that allow the customer to contact the GE OnLine Center, are available for Warranty and Contract customers only.*

Allows for an on-screen, one-touch button used to contact the OnLine Center and describe problems with their scanner in an easy and convenient way.

Refer to the appropriate version of the LOGIQ E9 Basic User Manual, Chapter 6, or the appropriate LOGIQ E9 Release Notes for more information about using Insite ExC.

7-5-4 Global Service User Interface (GSUI)**Internationalization**

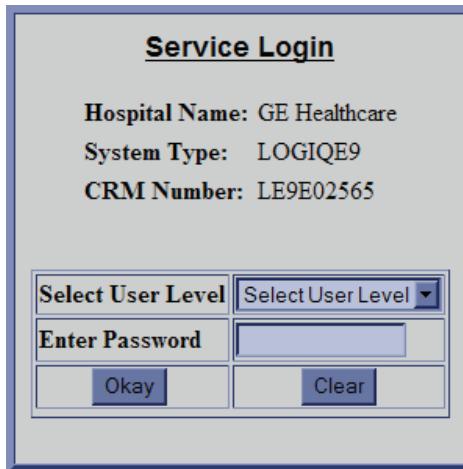
The user interface provided by the service platform is designed for GE personnel and is in English only. There is no multi-lingual capability built into the Service Interface.

Service Login

Select the phone icon in the status bar at the bottom of the scan display screen.

This icon links the user or the Field Engineer (FE) to the service login screen.

Figure 7-21 Service Login Screen- LOGIQ E9



7-5-4 Global Service User Interface (GSUI) (cont'd)

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.

Table 7-1 Access Authorization

USER LEVEL	ACCESS AUTHORIZATION	PASSWORD
Operator		uls
Administrator	Authorized access to specified diagnostics, error logs and utilities. Same acquisition diagnostic tests as GE Service.	uls
External Service		gogems
GE Service	Knowledge of the service level password.	rotating security password

NOTE: *For a GE Field Engineer, the password changes at specific intervals.*

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

Restart LOGIQ E9 after diagnostics

Always shutdown the system and reboot after a diagnostics session. A red message on the task bar will remind you that the system needs to be restarted after a diagnostic run or disruptive mode is enabled, before it is returned for customer use.

7-5-5 Home

The Home page displays a summary of information from various items that are monitored.

- System Information – hardware versions (Boards/FRU's, Console), software versions (Base Image and Application).
 - Click Details to view the Server History of all TCP/IP pages that have occurred to the system since the system was rehosted. See: [7-5-5-1 "Server History Log" on page 7-27](#).
- Connected Probes – probes connected, network devices connected, and peripherals connected.
- Options Installed – with status and expiration date.
- Windows Printers.
- System Health Information – alerts for temperature, FRUs, application, OS, and archive.
 - Check Auto Update and set the Frequency (in seconds) for the system to perform self-checks.
 - Click the Update link to manually refresh the System Health Information.

Figure 7-22 Home Window



7-5-5-1 Server History Log

Figure 7-23 Server History Log

The screenshot shows the GE LOGIQ Service Frame Page - Service Browser interface. The main title is "Server History Log". Below it are three log entries:

Change Made by ADM: 11/15/2005 1:51:04 PM

Parameter	Old Value	New Value
Name	3TimDensit	ClassPC
Address	0.0.0	3.28.127.41

Change Made by ADM: 11/15/2005 4:01:18 PM

Parameter	Old Value	New Value
ComputerName	My000	My961
OwnIP	192.168.124.9	3.28.125.4
SubnetMaskIP	255.255.255.0	255.255.252.0
DefaultGatewayIP	192.168.124.9	3.28.124.254
AESeth	LC00Q9-000001	LOGIQ-M8881

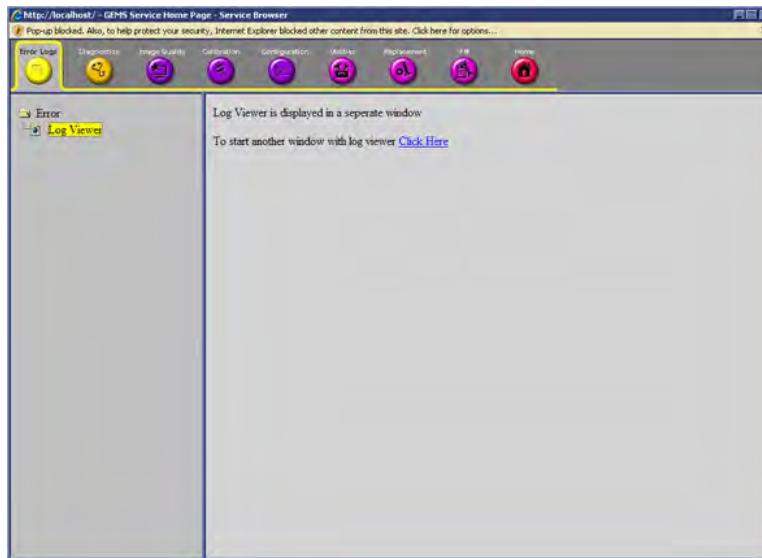
Change Made by ADM: 11/15/2005 4:01:20 PM

Parameter	Old Value	New Value
Name	NewDensit	3machi
Address	0.0.0	3.28.125.115

7-5-6 Error Logs

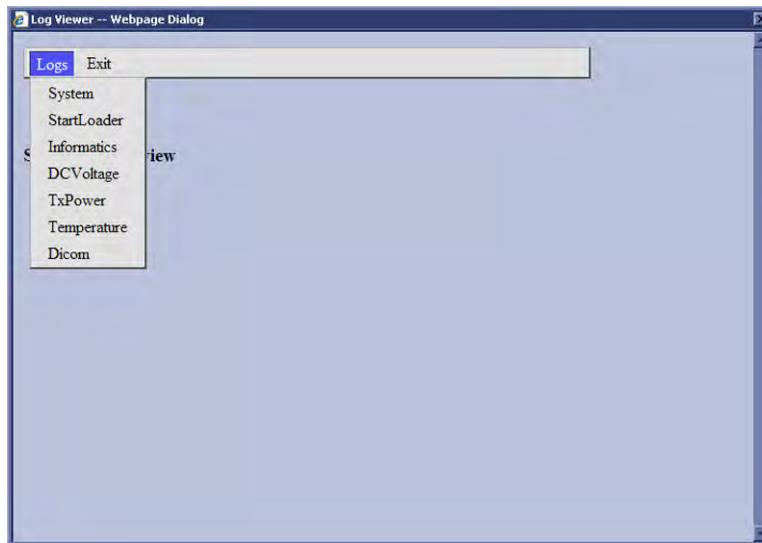
- 1.) From the Log Viewer page click the Click Here link.

Figure 7-24 Error Logs - Log Viewer



- 2.) Select the log you wish to view.

Figure 7-25 Log Viewer - Log Options



NOTE: *Informatics is no longer present for R4.x and later.*

7-5-6 Error Logs (cont'd)

Features of the log viewer include:

- Plot logs and pages using the Utilities menu.
- Text search using the Search menu.
- Color-coded log entries to identify severity levels:
 - Green: A Level 3 severity indicates that the parameter is within 0% - 50% of specified tolerance.
 - Orange/brown: A Level 2 severity indicates that the parameter is 50% - 100% of specified tolerance.
 - Red: A Level 1 severity indicates that the parameter is out of specification.

Figure 7-26 Log Viewer - Sample Page



The screenshot shows a Windows application window titled "Log Viewer -- Webpage Dialog" with the URL "http://localhost/service/LogViewerWrapper.html". The window has a menu bar with "Logs", "Utilities", "Search", and "Exit". Below the menu is a toolbar with "Previous Page", "Next Page", "Last Page", "Refresh", and "Get Page: []". A status bar at the bottom shows the URL "http://localhost/service/LogViewerWrapper.html" and the word "Internet".

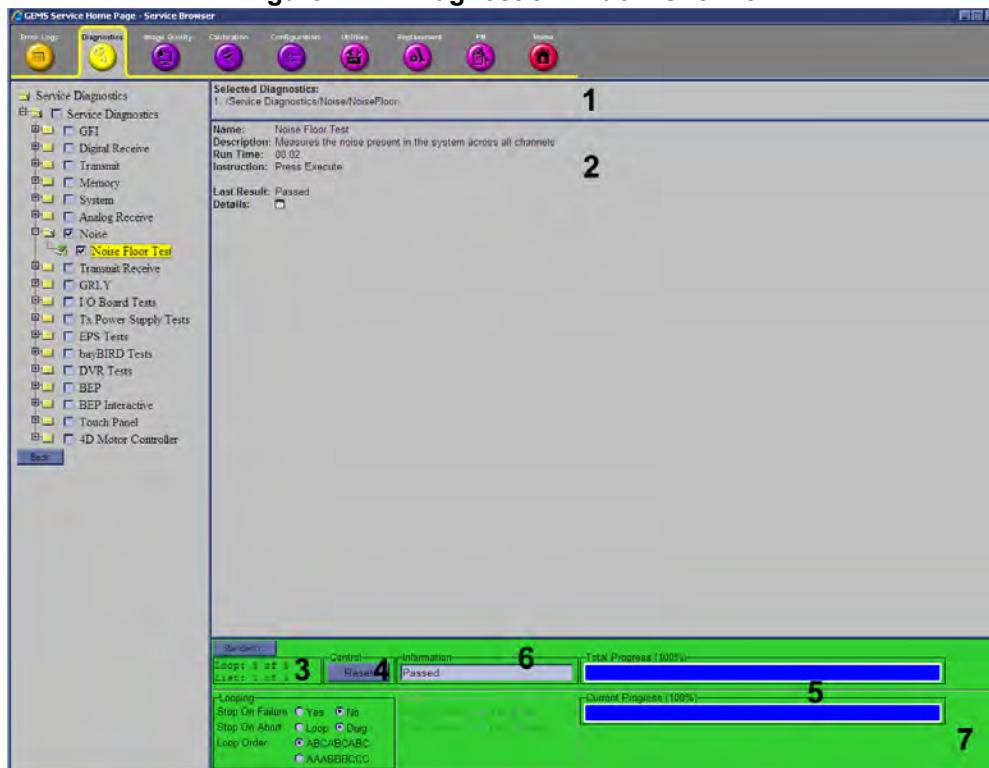
TimeStamp	ErrorLevel	Package	ErrorMessage
Friday,Jan 25 15:53:46,2008	Error	GcViewer.PluginLib	GcUdtFrameHandle::CreateFrame - Wrong frame gridSize. IPointValue : illegal cast to ScVenant expected. IPointValue : illegal cast to ScVenant
Friday,Jan 25 15:53:46,2008	Error	ScUdt.Generic	udt::Frame::checkSize: checkSize: this=1C2E6FD8, GeomError fsize=150822, usedSize=148470
Friday,Jan 25 15:53:46,2008	Debug	GcViewer.PluginLib	(EncoderWrap) Musashi Frame Name 29
Friday,Jan 25 15:53:46,2008	Error	GcViewer.SpatialFilter	GetInputFrame - Could not find input frame at time 62.651953
Friday,Jan 25 15:53:46,2008	Error	ScUdt.Generic	udt::Frame::checkSize: checkSize: this=1C2E6FD8, GeomError fsize=150822, usedSize=148470
Friday,Jan 25 15:53:46,2008	Debug	EScan.View	GV- GetP(100004,AoTgcPots1)- StringValue : 0.09804
Friday,Jan 25 15:53:46,2008	Info	EScan.View	ESStatus(0,Live); SetActiveRunState("Freeze") Modes ("2D") Probe("cla_4C") Appl("Abdomen")
Friday,Jan 25 15:53:45,2008	Info	HandleEvent -A-	localId = 1
Friday,Jan 25 15:53:45,2008	Info	UserEventLog	Activating package: Scanner.
Friday,Jan 25 15:53:45,2008	Info	ifmgr	EventLog_EchoTouchpanelPck(3), ButtonID_Utility (1311), (long)_1, (BSTR)OFF
Friday,Jan 25 15:53:45,2008	Info	EchoConfig	Clear remove list 0
Friday,Jan 25 15:53:45,2008	Info	HandleEvent -A-	localId = 2
Friday,Jan 25 15:53:45,2008	Info	UserEventLog	Deactivating package: EchoConfig.
Friday,Jan 25 15:53:45,2008	Info	HandleEvent -A-	localId = 81
Friday,Jan 25 15:53:45,2008	Info	UserEventLog	ButtonPress: name=ContrastBut, value=0
Friday,Jan 25 15:51:46,2008	Debug	PCBE.UserResources	GDI Object Count = 2285 , UserObjectCount = 1915, Total = 4200
Friday,Jan 25 15:51:46,2008	Debug	PCBE.ProcessMemory	PgFileCount: 132908, PeakWrkSet(KB): 236560, WrkSet (KB): 236352, PgFile(KB): 468964, PeakPgFile(KB): 469500
Friday,Jan 25 15:51:46,2008	Debug	PCBE.SystemMemory	AvailVirt percentLoad AvailPhys (Kbytes). - 2057408,55.457520
Friday,Jan 25 15:46:52,2008	Info	ifmgr	15:46:52 HandleEvent: EchoTouchpanelPck(3), ButtonID_Service(1201), (long)0, (long)0(4161) 32922.9ms }
Friday,Jan 25 15:46:52,2008	Info	ifmgr	EventLog_EchoTouchpanelPck(3), ButtonID_Service (1201), (long)0, (long)0
Friday,Jan 25 15:46:52,2008	Error	EchoStatusBar	Dialog timed out before Service Iling Brower started

7-5-7 Diagnostics Window Overview

- 1.) Instructions Frame
 - Displays either test-specific text or the default instructions.
- 2.) Status Frame
 - Initially displays the last known status for a selected diagnostic. Once the diagnostic starts, the frame displays the “current” status of all test results. Also see: [Figure 7-29 "Details Link on Diagnostic Window" on page 7-32](#) for more current status data reporting.
 - The Status Frame also contains the user interface elements used for Diagnostic Control and Operator Feedback.
- 3.) Loop Count
 - This is an editable text field that only accepts numeric values of 4 digits or less. When the switch is configured as an “execute” switch and pressed, the loop count field will be queried to determine the number of times to execute the diagnostic.
- 4.) Execute Button
 - This switch has two modes - each with appropriate text:
 - Execute - to start the diagnostic
 - Abort - to stop a diagnostic
- 5.) Progress Indicator
 - Displays a graphical progress indicator for the user.
- 6.) Short Text Message
 - Displays brief messages about the test’s progress during execution.
- 7.) Status Frame Background Color
 - Initially gray, the Status Frame background color changes upon completion of a diagnostic to indicate completion status.
 - Code Status Fail = Red
 - Code Status Pass = Green
 - Code Status Abort = Yellow

7-5-7 Diagnostics Window Overview (cont'd)

Figure 7-27 Diagnostic Window Overview



The Service Diagnostics windows have some advanced features.

NOTE: The Loop Count field must have a value of 2 or greater to activate the Advanced features.

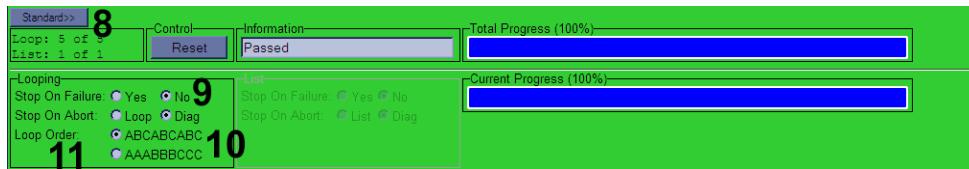
- 8.) This button toggles between Standard and Advanced mode. The window below shows the advanced features.
- 9.) Select the choice for Stop On Failure for the Looping and List sections:
 - Yes = the test will abort at the first failure
 - No = the test will complete even if there are failures
- 10.) Select the choice for Stop On Abort for the Looping and List sections:
 - List = the list will abort when you click the Abort button
 - Loop = the looping will abort when you click the Abort button
 - Diag = the diagnostic test will abort when you click the Abort button

7-5-7 Diagnostics Window Overview (cont'd)

11.)Select the Loop Order:

- ABCABCABC = Runs the selected diagnostics as one group and runs each group for the number of loops specified.
- AAABBBCCC = Runs the selected diagnostics one at a time for the maximum loop value then proceeds to the next diagnostic.

Figure 7-28 Advanced Features of Service Diagnostic Windows



Some diagnostic windows that verify the tolerance of known values compile the test data and display it in a table. You can access this data through the Details links.

12.)Click the Details icon to open the Details window.

13.)Click the See Details link to compile the Details data.

14.)The table displays the compiled detail data.

Figure 7-29 Details Link on Diagnostic Window



7-5-7 Diagnostics Window Overview (cont'd)

Figure 7-30 Details Window



Figure 7-31 Details Table

Beam	Rx Ch	DRX	RMS dB	Status
0	All	27.5		
0	32	12.0	4.2	
1	33	12.1	5.8	
2	34	12.2	4.4	
3	35	12.3	4.9	
4	36	12.4	4.7	
5	37	12.5	5.5	
6	38	12.6	3.7	
7	39	12.7	5.4	
8	40	12.8	5.8	
9	41	12.9	3.4	
10	42	12.10	6.4	
11	43	12.11	4.5	
12	44	12.12	3.5	
13	45	12.13	4.8	
14	46	12.14	3.6	
15	47	12.15	4.3	
16	48	13.0	6.5	
17	49	13.1	4.6	
18	50	13.2	4.5	
19	51	13.3	7.0	
20	52	13.4	6.0	
21	53	13.5	6.0	

Standards:	Control:	Information:
Loop 5 of 5	Reset	Total Diagnose (100%):
Last Log:	Passed	<div style="width: 100%;"> </div>
Looping:		Current Progress (100%):
Stop On Failure: <input checked="" type="radio"/> Yes <input type="radio"/> No		<div style="width: 100%;"> </div>
Stop On Abort: <input type="radio"/> Loop <input checked="" type="radio"/> Diag		<div style="width: 100%;"> </div>
Loop Order: <input checked="" type="radio"/> ABCABCABC <input type="radio"/> AAABBBCCC		<div style="width: 100%;"> </div>

7-5-8 Diagnostic Utility Freezes Up/Times Out

If the diagnostic utility has timed out (freezes up, will no longer run) you have to close the Common Service Desktop and launch it again. This may occur when issues with the scanner cause the diagnostic utility to fail completion of an executed test.

7-5-9 Diagnostic Symptom Guide

Use this Diagnostic Symptom Table to help match a symptom with the possible diagnostic test.

For additional troubleshooting help, see: [Section 7-8 "Troubleshooting Trees" on page 7-177](#) and [Section 7-9 "Troubleshooting Tips" on page 7-191](#).

Table 7-2 Diagnostic Symptom Table 1 of 2

Symptom	Diagnostic Test - see:
3D Positioning Problems	7-5-12-14 "bayBIRD Tests" on page 7-91
Audio - General/PC Audio Problems	7-5-12-11 "I/O Board Tests" on page 7-83
Audio - Doppler Problems	7-5-12-3 "GFI" on page 7-66 7-5-16-3 "Audio (Sound)" on page 7-129 7-5-12-11 "I/O Board Tests" on page 7-83 7-5-12-9 "Analog CW" on page 7-76
BEP Problems (Troubleshooting)	7-9-9 "Back End Processor (BEP) Troubleshooting" on page 7-223
Communication Problems	7-5-12-2 "Memory" on page 7-63
Connectivity/Network Problems	7-9-7 "Connectivity" on page 7-219 7-5-14-10 "Network Adapter" on page 7-121
Image - Artifacts/Noise	7-5-12-5 "Noise" on page 7-71 7-9-2 "Noise" on page 7-195 7-5-12-3 "GFI" on page 7-66
Image - Channel Failures/Noise	7-5-12-8 "Analog Receive" on page 7-74 7-5-12-5 "Noise" on page 7-71
Image Loss	7-9-13-2 "Image or Patient Data Loss" on page 7-238
Image - Pixelated/Jagged edges	7-5-12-1 "Digital Receive" on page 7-59
Image - Scanner Refresh is Slow/Image Hangs	7-5-14-6 "Video Card" on page 7-118
Intermittent General Problems	7-5-12-1 "Digital Receive" on page 7-59 7-5-14-12 "Memory" on page 7-123 7-5-12-3 "GFI" on page 7-66 7-5-12-2 "Memory" on page 7-63
Keyboard Not Typing Correct Characters	7-5-16-1 "Keyboard" on page 7-126
Main Power Supply Problems (Troubleshooting)	7-9-4 "Main Power Supply (MPS) Troubleshooting" on page 7-202
Monitor not working	7-5-12-11 "I/O Board Tests" on page 7-83
Printer Problems	7-8-8 "Printer Troubleshooting" on page 7-187
Scanning problems - Stops, interrupted, won't scan	7-5-12-12 "Tx Power Supply Test" on page 7-87
Simulator Mode - Scanner launches into Simulator Mode	7-5-12-11 "I/O Board Tests" on page 7-83

Table 7-2 Diagnostic Symptom Table (Continued) 2 of 2

Symptom	Diagnostic Test - see:
Slow Computing Speed	7-5-14-4 "Hard Disk Drive Surface Scan" on page 7-116 7-5-14-5 "Hard Disk Drive Quick Test" on page 7-117 7-5-21-10 "Disk Defragmenter" on page 7-143 7-5-21-3 "Disk Usage" on page 7-138
Sudden Shutdown of System	7-5-12-13 "EPS (Extended Power Shutdown) or CB (ChargeBoard used in BEP6) Tests" on page 7-89
Temperature - High/out of Spec	7-5-12-4 "System" on page 7-69 7-5-12-11 "I/O Board Tests" on page 7-83
TGC Problems	7-5-12-3 "GFI" on page 7-66
Trackball sticks, cursor hard to control	7-5-16-2 "Mouse (Trackball)" on page 7-128
USB Ports/Devices not working	7-5-12-11 "I/O Board Tests" on page 7-83
V Nav Issues	7-5-12-14 "bayBIRD Tests" on page 7-91
Voltage out of Spec	7-5-12-4 "System" on page 7-69
Footswitch problems	7-5-16-1 "Keyboard" on page 7-126
ECG trace issues	Table 7-21, "Patient I/O Test Table," on page 43 7-5-19 "Patient I/O Tests" on page 7-134 Table 7-3, "GFI FRU Tests Table," on page 36

7-5-9 Diagnostic Symptom Guide (cont'd)

Table 7-3 GFI FRU Tests Table

Test	FRU												
	GRLY	GRX64/ GRX128	GTX (slot2)	GTX (slot3)	GTX (slot4)	DRX (slot2)	DRX (slot3)	DRX (slot4)	GFI	Back End Processor	FREY Back- plane	Fan Tray	Main Power Supply
GFI Swept Demodulator Test									T	R	R		R
GFI Front End Interface Test									T	R	R		R
GFI Analog Test		T				R	R	R	T	R	R		R
GFI Memory Access Test									T	R	R		R
GFE Access Test									T	R	R		R
Probe LVDS Test	T								T	R	R		R
GFI Fan Test									T	R	R	T	R
Relay LVDS Test	T								T	R	R		R
GFI GTX Test			T	T	T				T	R	R		R
GFI Fixed Demod Test									T	R	R		R

Key:

T: The FRU is tested with the test.

R: The FRU is required for the test but is not specifically tested.

7-5-9 Diagnostic Symptom Guide (cont'd)

Table 7-4 Digital Receive Tests Table

Test	FRU					
	DRX (slot2)	DRX (slot3)	DRX (slot4)	GFI	Back End Processor	FREY Backplane
FDEMOD Signal Test	T	T	T	T	R	R
DRX High Speed Bit Error Test	T	T	T	R	R	R
DRX IF FPGA Test	T	T	T	R	R	R
DRX ASIC Test	T	T	T	R	R	R
DRX Signal Path Test	T	T	T	R	R	R
Nathan Channel Repeater	T	T	T	R	R	R
Nathan Alignment Test	T	T	T	R	R	R
Nathan Input TVG Alignment	T	T	T	R	R	R
Nathan MLA Data Alignment	T	T	T	R	R	R
Key:						
T: The FRU is tested with the test.						
R: The FRU is required for the test but is not specifically tested.						

Table 7-5 Memory Tests Table

Test	FRU								
	GTX (slot2)	GTX (slot3)	GTX (slot4)	DRX (slot2)	DRX (slot3)	DRX (slot4)	GFI	Back End Processor	FREY Backplane
GFI Memory Access Test							T	R	R
DRX IF FPGA Memory Test				T	T	T	R	R	R
DRX Memory Test				T	T	T	R	R	R
GTX IF FPGA Memory Test	T	T	T				R	R	R
GTX Memory Test	T	T	T				R	R	R
Key:									
T: The FRU is tested with the test.									
R: The FRU is required for the test but is not specifically tested.									

7-5-9 Diagnostic Symptom Guide (cont'd)

Table 7-6 System Tests Table

Test	FRU											
	GRLY	GRX64/ GRX128	GTX (slot2)	GTX (slot3)	GTX (slot4)	DRX (slot2)	DRX (slot3)	DRX (slot4)	GFI	Back End Processor	FREY Backplane	Fan Tray
System Temperature Test		T	T	T	T	T	T	T	T	R	R	T
System Voltage Test	T	T	T	T	T	T	T	T	R	R	R	
FPGA Version Test	T	T	T	T	T	T	T	T	T	R	R	

Key:
T: The FRU is tested with the test.
R: The FRU is required for the test but is not specifically tested.

Table 7-7 Noise Test Table

Test	FRU							
	GRLY	GRX64/ GRX128	DRX (slot2)	DRX (slot3)	DRX (slot4)	GFI	Back End Processor	FREY Backplane
Noise Floor Test	T	T	R	R	R	R	R	R

Key:
T: The FRU is tested with the test.
R: The FRU is required for the test but is not specifically tested.

Table 7-8 Analog Receive Tests Table

Test	FRU									
	GRLY	GRX64/ GRX128	DRX (slot2)	DRX (slot3)	DRX (slot4)	GFI	Back End Processor	FREY Backplane	Front Plane (upper)	Front Plane (lower)
DC Offset Calibration	R	R	T	T	T	R	R	R	R	R
Analog Rx Test (High gain)	R	T	T	T	T	R	R	R	R	R
Analog Rx Test (Medium gain)	R	T	T	T	T	R	R	R	R	R
Analog Rx Test (Low gain)	R	T	T	T	T	R	R	R	R	R

Key:
T: The FRU is tested with the test.
R: The FRU is required for the test but is not specifically tested.

7-5-9 Diagnostic Symptom Guide (cont'd)

Table 7-9 Analog CW Tests Table

Test	FRU					
	GRX128w/CW	GFI	Back End Processor	FREY Backplane	Front Plane (upper)	Front Plane (lower)
GRX aCW Dual Channel	T	T	R	R	R	R
GRX aCW Beam Forming	T	T	R	R	R	R
GRX aCW IQ Symmetry	T	T	R	R	R	R
GRX aCW Mixer Clock Sync	T	T	R	R	R	R
GRX aCW BP Filter/Mixer Clk	T	T	R	R	R	R
GRX aCW Post Mixer Gain	T	T	R	R	R	R
GRX aCW Doppler LPF	T	T	R	R	R	R
GRX aCW Dither Injection	T	T	R	R	R	R
GRX aCW Pedof	T	T	R	R	R	R
GRX ADC Digital LVDS	T	T	R	R	R	R
GRX Mixer Phase Setup	T	T	R	R	R	R

Key:

T: The FRU is tested with the test.

R: The FRU is required for the test but is not specifically tested.

Table 7-10 Transmit Tests Table

Test	FRU						
	GTX (slot2)	GTX (slot3)	GTX (slot4)	GFI	Back End Processor	FREY Backplane	Main Power Supply
GTX High Speed Bit Error Test	T	T	T	R	R	R	R
Tx P6 Illegal Waveform Test	T	T	T	R	R	R	R

Key:

T: The FRU is tested with the test.

R: The FRU is required for the test but is not specifically tested.

7-5-9 Diagnostic Symptom Guide (cont'd)

Table 7-11 Transmit and Receive Tests Table

Test	FRU												
	Loop Back Connect or (Service or Eng Tool)	GRLY	GRX64/ GRX128	GTX (slot2)	GTX (slot3)	GTX (slot4)	DRX (slot2)	DRX (slot3)	DRX (slot4)	GFI	Back End Processor	FREY Backplane	Front Plane (upper)
T/R Channel Test		T	T	T	T	T	T	T	T	R	R	R	R
Key:													
T: The FRU is tested with the test.													
R: The FRU is required for the test but is not specifically tested.													

Table 7-12 I/O Board Tests Table

Test	FRU					
	GFI	Back End Processor	I/O Board	FREY Backplane	Monitor	External Monitor (Mfg tool)
I/O Board Pwr Supply Test		R	T			
I/O Board GFI Voltage Test	T	R	T	R		
GFI Temperature Test	T	R	T	R		
I/O Board Self Test		R	T			
I/O Board Loop Back Test		R	T			
I/O Board Audio Test	T	R	T	R		
Video Status (Service)		R	T		T	
Key:						
T: The FRU is tested with the test.						
R: The FRU is required for the test but is not specifically tested.						

Table 7-13 Tx Power Supply Tests Table

Test	FRU			
	GFI	Back End Processor	FREY Backplane	Main Power Supply
TxPs Control Test		R		T
TxPs Watchdog Test	T	R	R	T
TxPs Alarm Test		R		T
TxPs Keep Alive Test		T		T
Key:				
T: The FRU is tested with the test.				
R: The FRU is required for the test but is not specifically tested.				

7-5-9 Diagnostic Symptom Guide (cont'd)

Table 7-14 Extended Power Shutdown Tests Table

Test	FRU		
	Back End Processor	I/O Board	Extended Power Shutdown
Extended Power Shutdown Detection Test	R	R	T
Extended Power Shutdown Voltage Test	R	R	T
Extended Power Shutdown Load Test	R	R	T
Extended Power Shutdown Charge State Test	R	R	T
Key:			
T: The FRU is tested with the test.			
R: The FRU is required for the test but is not specifically tested.			

Table 7-15 bayBIRD Tests Table

Test	FRU	
	Back End Processor	Bay Bird
Run All Tests	R	T
Sensor 1	R	T
Sensor 2	R	T
Sensor 3	R	T
Transmitter	R	T
System	R	T
Key:		
T: The FRU is tested with the test.		
R: The FRU is required for the test but is not specifically tested.		

7-5-9 Diagnostic Symptom Guide (cont'd)

Table 7-16 BEP Tests Table

Test	FRU
	Back End Processor
Essential Test	T
Hard Disk Long	T
Hard Disk Short	T
Memory	T
Network Adapter	T
System Board	T
Video	T
Key:	
T: The FRU is tested with the test.	
R: The FRU is required for the test but is not specifically tested.	

Table 7-17 BEP Interactive Tests Table

Test	FRU			
	Back End Processor	I/O Board	OP Panel	Monitor
AVI playback	T			
CD-R test	T			
CD-RW	T			
DVD-R	T			
DVD-RDL	T			
DVD-RW	T			
DVD+R	T			
DVD+RDL	T			
DVD+RW	T			
DVD_RAM	T			
DVD_READONLY	T			
Keyboard*	T		T	
Microphone	T			
Monitor	T		T	T
Trackball	T		T	
Sound	T			
USB Ports	T	T		
Key:				
T: The FRU is tested with the test.				
R: The FRU is required for the test but is not specifically tested.				
* When testing footswitch, footswitch connection is required.				

7-5-9 Diagnostic Symptom Guide (cont'd)

Table 7-18 Touch Panel Tests Table

Test	FRU	
	Back End Processor	OP Panel
TP Calibration	R	T
TP Cal Verification	R	T
Key:		
T: The FRU is tested with the test.		
R: The FRU is required for the test but is not specifically tested.		

Table 7-19 DVR Tests Table

Test	FRU	
	Back End Processor	DVR
Self Test	R	T
Version Information	R	T
Key:		
T: The FRU is tested with the test.		
R: The FRU is required for the test but is not specifically tested.		

Table 7-20 4D Motor Controller Tests Table

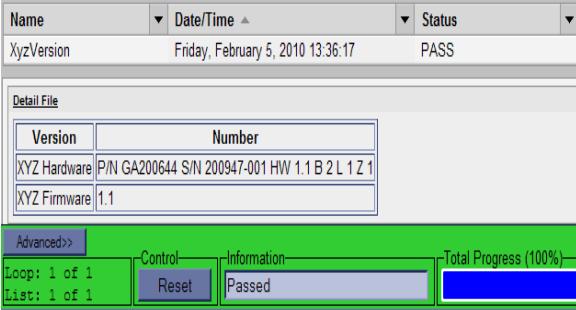
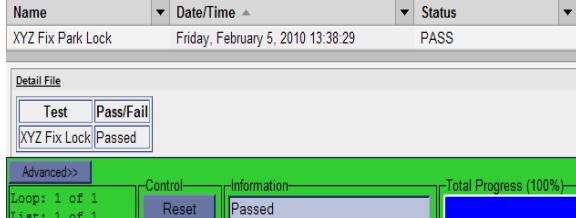
Test	FRU					
	GFI	Back End Processor	Main Power Supply	4D Motor Controller	GRLY	RAB2-5 Probe
Presence Test	R	R	R	T	R	R
Version Test	R	R	R	T	R	R
Static 3D Test	R	R	R	T	R	R
4D Test	R	R	R	T	R	R
Key:						
T: The FRU is tested with the test.						
R: The FRU is required for the test but is not specifically tested.						

Table 7-21 Patient I/O Test Table

Test	FRU			
	GFI	Back End Processor	Main Power Supply	Patient I/O
Patient I/O	T	T	R	T
Key:				
T: The FRU is tested with the test.				
R: The FRU is required for the test but is not specifically tested.				

7-5-9 Diagnostic Symptom Guide (cont'd)

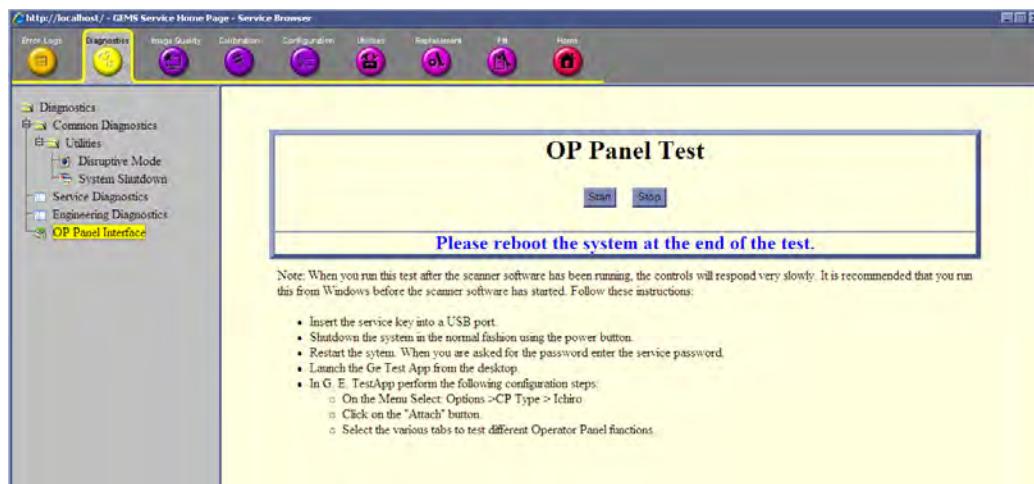
Table 7-22 Testing the XY Control

Steps	Corresponding Graphic
<p>1. XYZ Utilities Folder (XYZ Utils)</p> <p>Access Common Service Desktop as GE Service. Select Diagnostics tab.</p> <p>At the end of the list of available Service Diagnostics, you will find the XYZ Utils (XYZ Utilities) Folder.</p> <p>XYZ Utils provides two different tests: XYZ Version Test XYZ Fix Park Lock</p>	
<p>2. XYZ Version Test</p> <p>Run the XYZ Version Test.</p> <p>The system will retrieve the Hardware and Firmware versions as follows and will show status PASS.</p> <p><i>NOTE: The version displayed in the illustration may not match the one in the field. The pass status will indicate that the system can read the device.</i></p>	
<p>3. XYZ Fix Park Lock</p> <p>Run the XYZ Fix Park Lock Test.</p> <p>The system will release (Undock) the OP Panel and reset the position of the park lock. You will hear the motor moving, releasing the console. The status should show Passed.</p>	

7-5-10 OP Panel Utilities - Op Panel Interface

The Operator Panel functionality can be tested using a program (GE Test App) available through the Service Platform.

R4 or earlier



R5 and later, OP Panel Test only available on Windows desktop.

Although this diagnostic may be executed when the application software is running, its performance is greatly reduced and the controls will respond very slowly. It is recommended that this test be run from Windows before the application software has started. To access this test from Windows, see the instructions below.

7-5-10-1 Accessing the Service Platform from Windows

- 1.) Insert the Service Key into a USB port.
- 2.) Press the Standby (ON/OFF) button and select **Exit**.

NOTE: *If the system exit menu does not appear, press Alt F10.*

With the service dongle attached, a screen will be displayed to allow Maintenance Access.

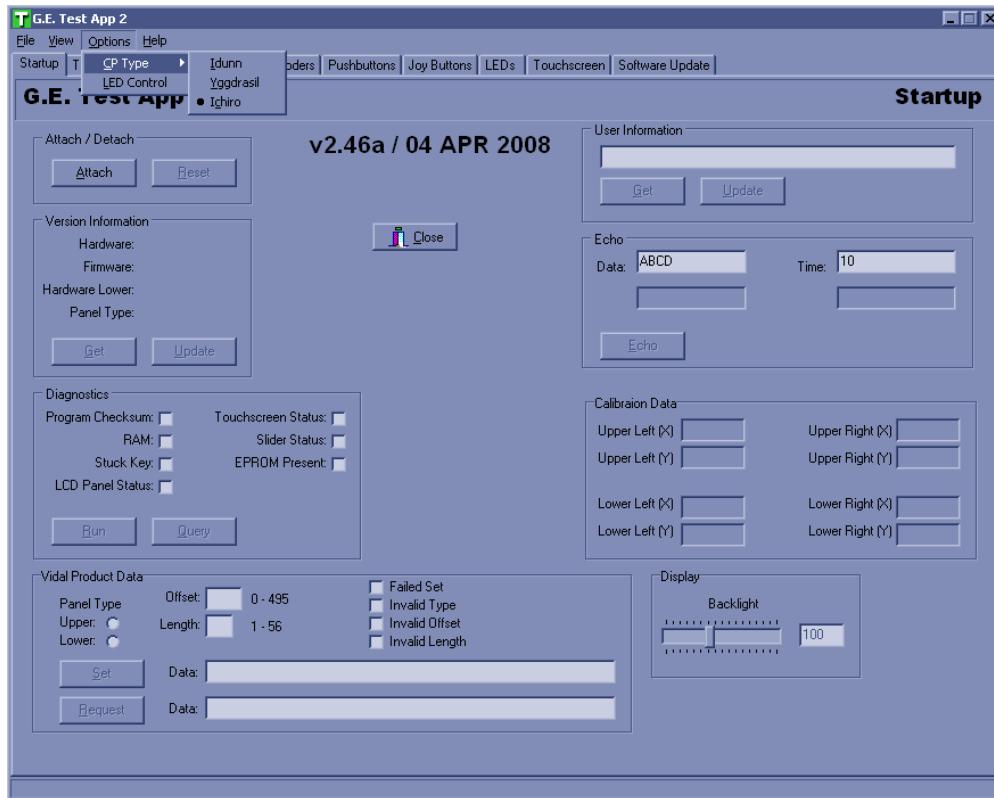
- 3.) In the Maintenance Access screen, leave the Username blank, enter the current Password and select **OK**.
- 4.) From the Start Application screen select **Maintenance**.
- 5.) In the Maintenance window select **Exit to Windows** to access the Windows Desktop.
- 6.) Click on the GETestApp for the operator panel test.

7-5-10-2 Launching the Op Panel Test

If the LOGIQ E9 is running R5 or later, see:

Figure 7-35 "OP Panel Test Start Up - R5 and later" on page 7-49.

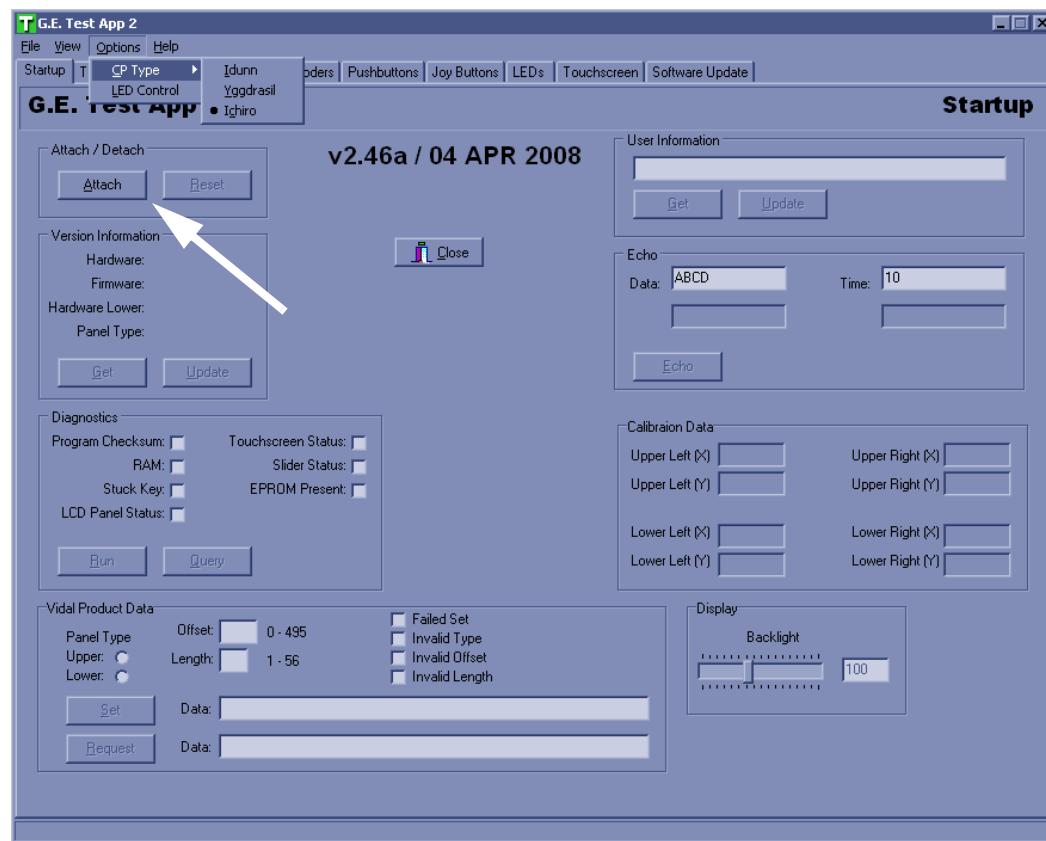
Figure 7-32 Select System Type - R4 or earlier



- 7.) In R4 or earlier, on the Startup tab, select the Attach button to connect the Op Panel to the test interface. The other buttons on the Startup tab will now be active. See: *Figure 7-33 and Figure 7-34 "Attach and GE Test App Startup Tab - Detach and Other Buttons Active - R4 and earlier" on page 7-48.*

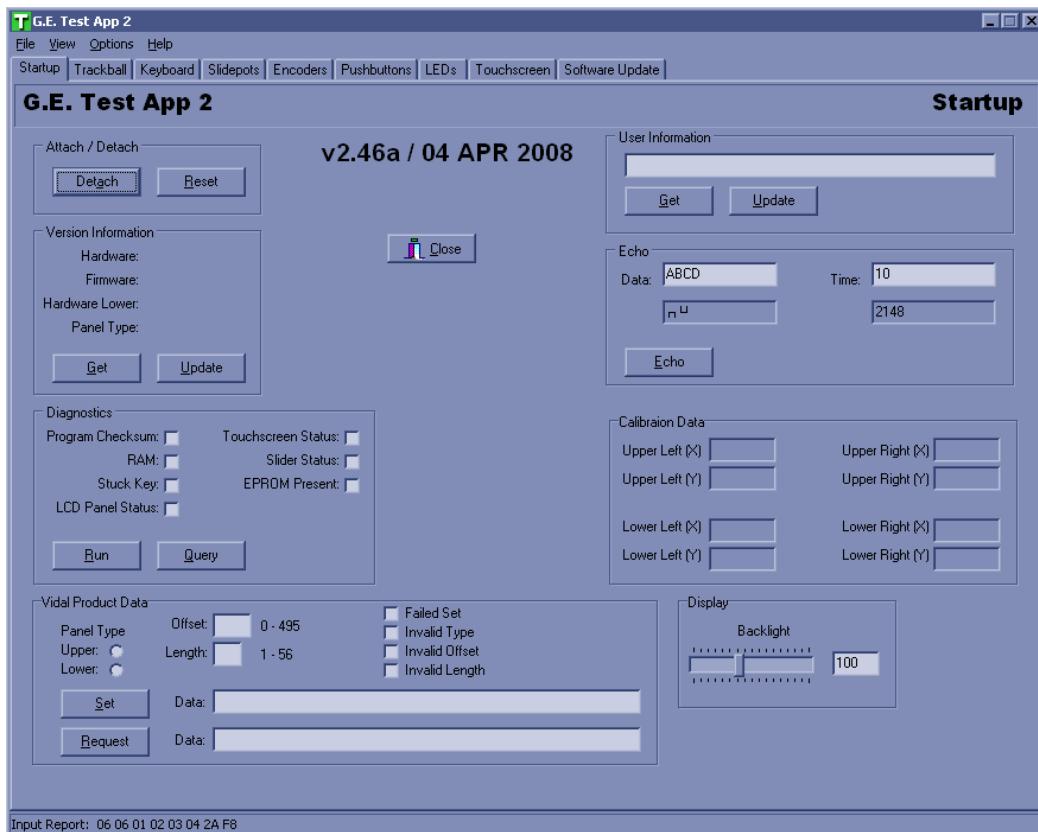
7-5-10-2 Launching the Op Panel Test (cont'd)

Figure 7-33 Attach and GE Test App Startup Tab - Attach Button Active - R4 and earlier



7-5-10-2 Launching the Op Panel Test (cont'd)

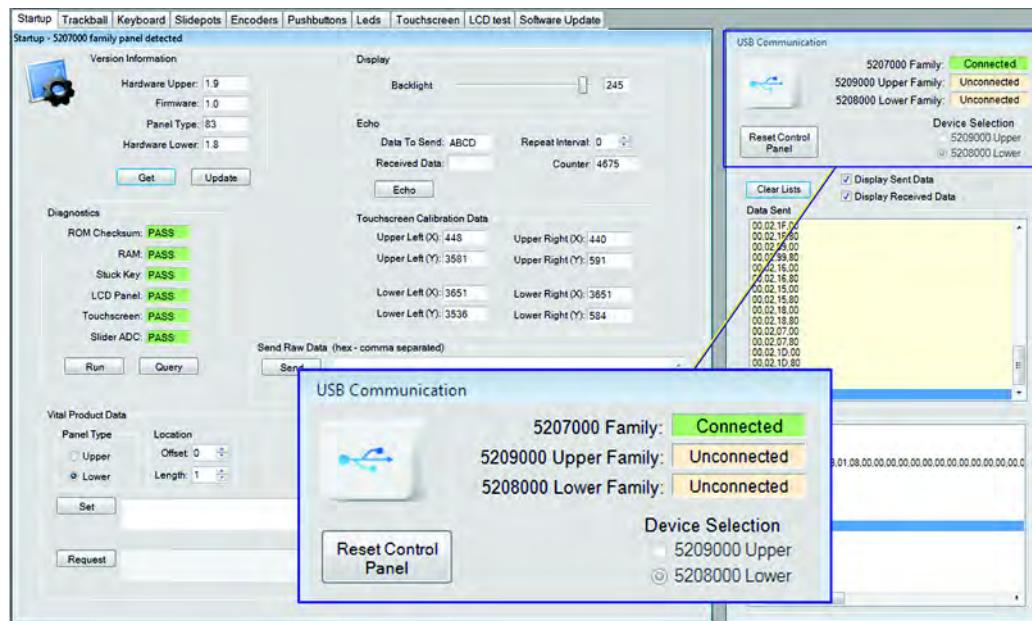
Figure 7-34 Attach and GE Test App Startup Tab - Detach and Other Buttons Active - R4 and earlier



- 8.) Select the tabs to test the various features of the Op Panel.

7-5-10-2 Launching the Op Panel Test (cont'd)

Figure 7-35 OP Panel Test Start Up - R5 and later



For R5 and later, the upper right corner indicates the type of Op Panel is detected (connected).

- 5207000 series (used in consoles 5205000-7 and earlier).
- Upper/Lower 5209000 / 5208000 series (used in consoles 5205000-8 and later) R5 or later.

7-5-10-3 Trackball Tab

Test the trackball functionality by moving the pointer over the blue box. Verify that the X and Y position are updated as the pointer is moved.

Test the Left and Right select buttons by pressing each button on the op panel. Verify that the corresponding button is highlighted when each button is pressed.

See: *Figure 7-36 or Figure 7-37.*

Figure 7-36 Trackball Tab - R4 and earlier

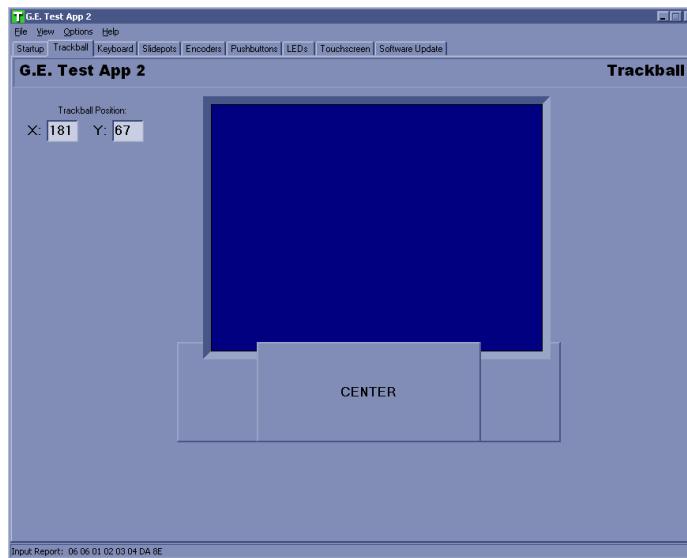
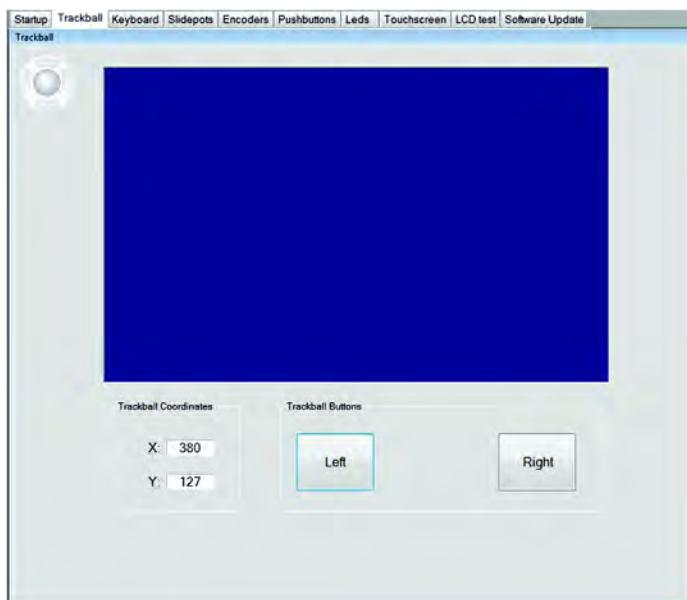


Figure 7-37 Trackball Tab - R5 and later



7-5-10-4 Keyboard Tab

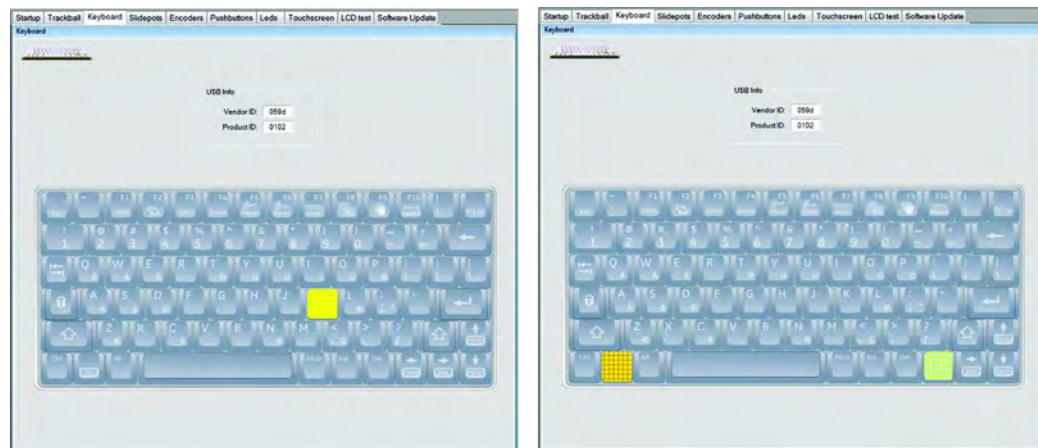
Test the keyboard functionality by typing on the keyboard. Verify that the corresponding key is highlighted when each key is pressed. See: [Figure 7-38](#) or [Figure 7-39](#).

NOTE: The keyboard test **does not** give an indication when the Print Screen button is pressed.

Figure 7-38 Keyboard Tab - R4 and earlier



Figure 7-39 Keyboard Tab - R5 and later



7-5-10-5 Slidepots Tab

Test the slidepot (TGC) functionality by moving each slidepot through its range. Verify that the visual and numeric position of the slide pot are updated as the slide pot is moved.

Test the LED for each slide pot by pressing on the LED buttons. See: [Figure 7-40](#) or [Figure 7-41](#). Visually verify the LED functionality on the upper operator panel.

Figure 7-40 Slidepots Tab - R4 and earlier

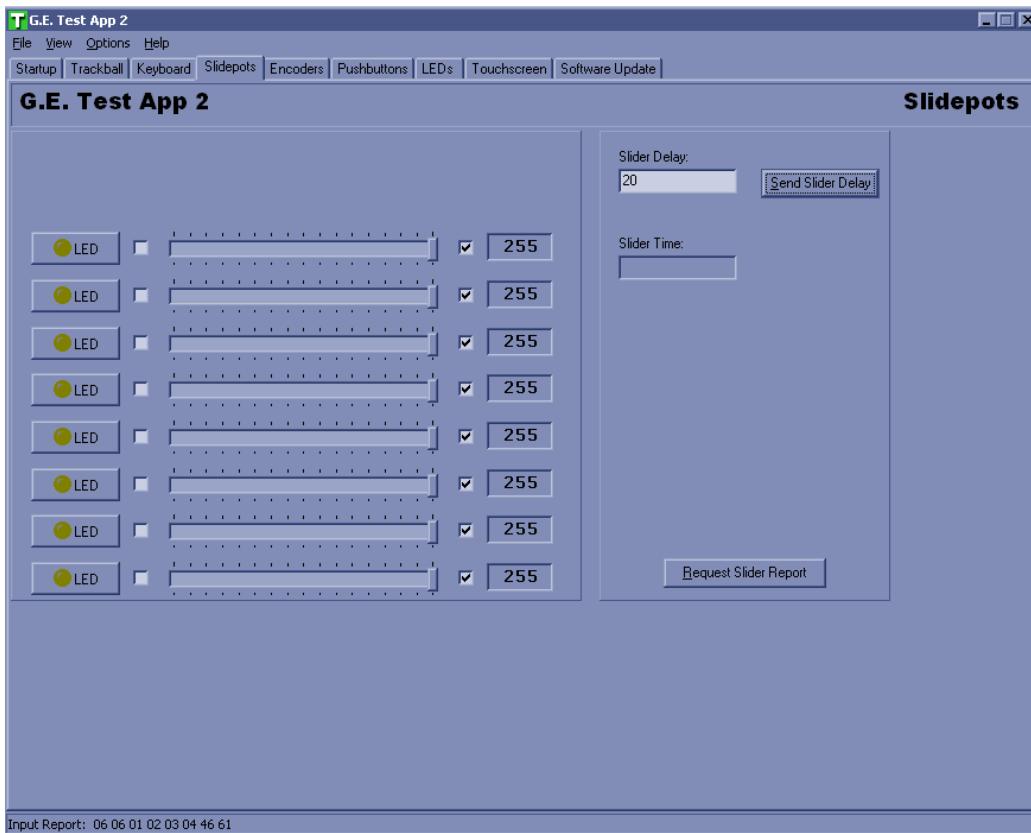
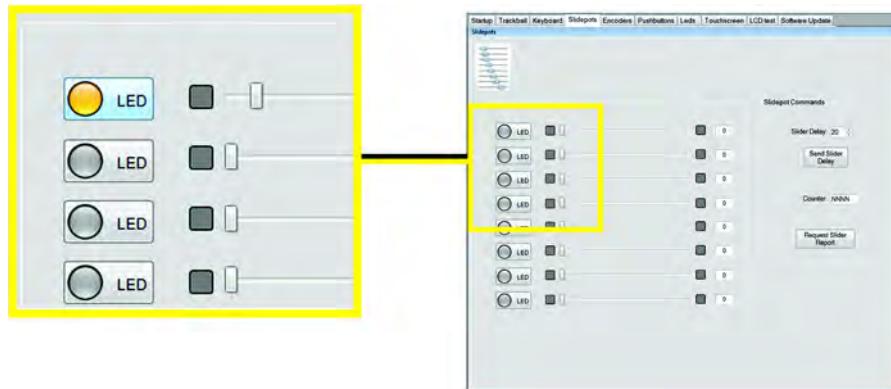


Figure 7-41 Slidepots Tab - R5 and later



7-5-10-6 Encoders Tab

Test the encoder functionality by rotating each encoder knob. Verify that the position is updated as the encoder is moved.

Test the encoder button selection function by pressing each knob on the op panel. Verify that the corresponding knob is highlighted when each knob is pressed. See: [Figure 7-42](#) or [Figure 7-43](#).

Figure 7-42 Encoders Tab - R4 and earlier

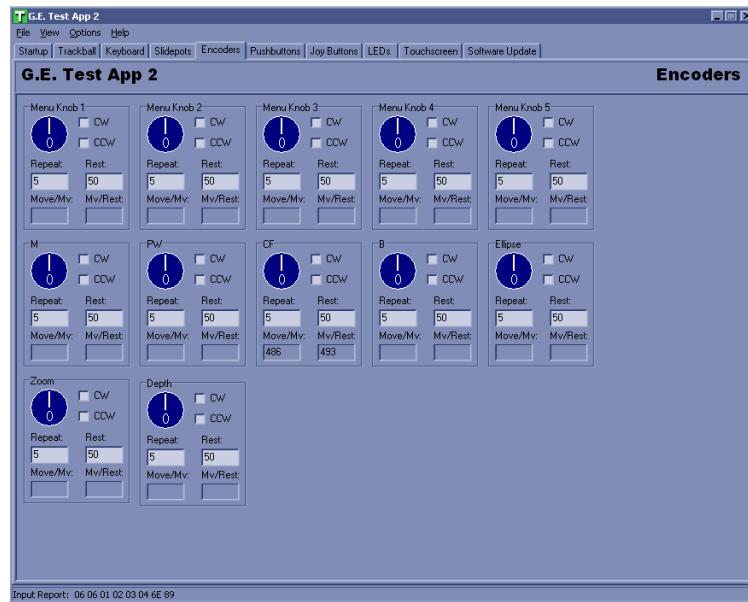
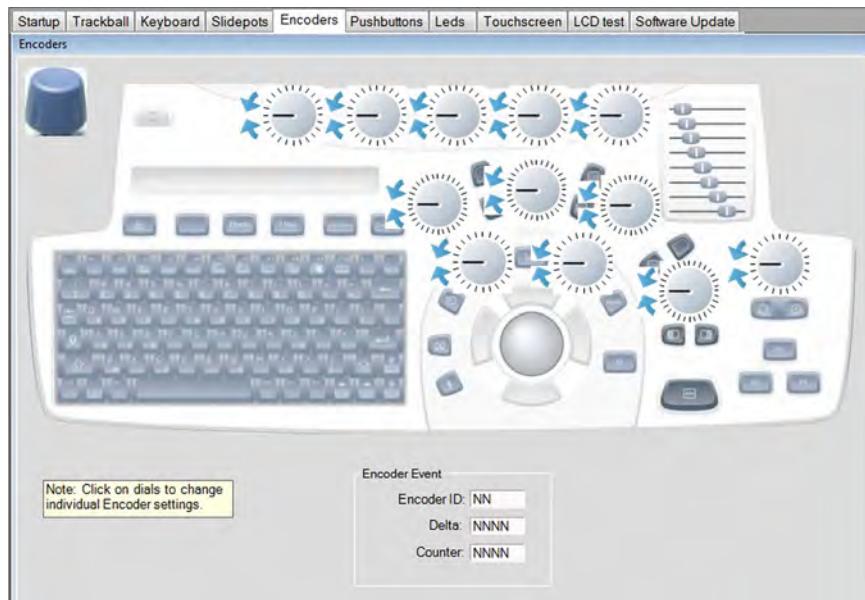


Figure 7-43 Encoders Tab - R5 and later



7-5-10-7 Pushbuttons Tab

Test the pushbutton functionality by pressing each button on the operator panel. Verify that the corresponding pushbutton is highlighted when each button is pressed. See: [Figure 7-44](#) or [Figure 7-45](#).

Figure 7-44 Pushbuttons Tab - R4 and earlier

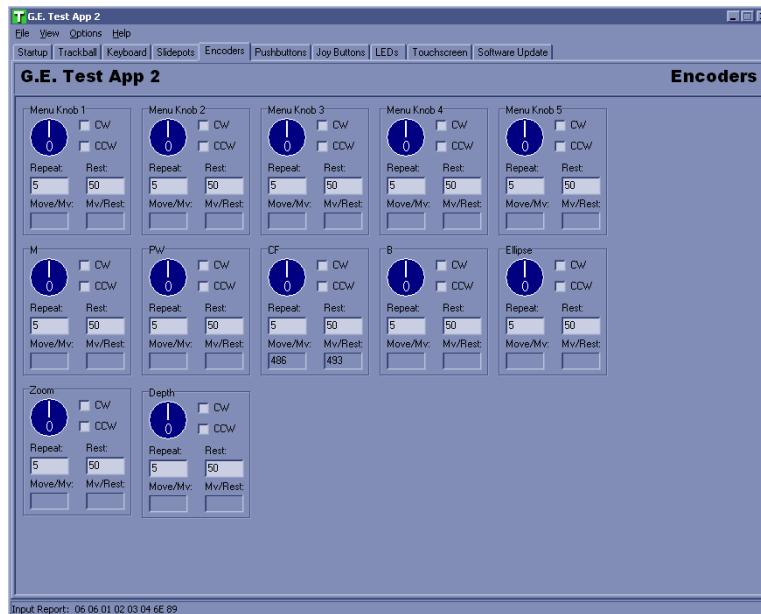
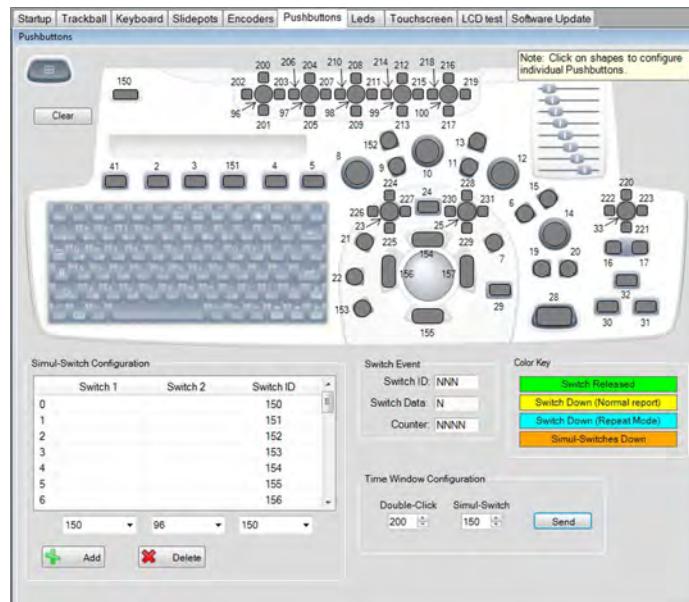


Figure 7-45 Pushbuttons Tab - R5 and later



7-5-10-8 LEDs Tab

Test the LED functionality by selecting each button or knob on the GE Test App. Verify that the corresponding LED is illuminated when each button or knob is selected. See: [Figure 7-46](#) or [Figure 7-47](#).

Figure 7-46 LEDs Tab - R4 and earlier

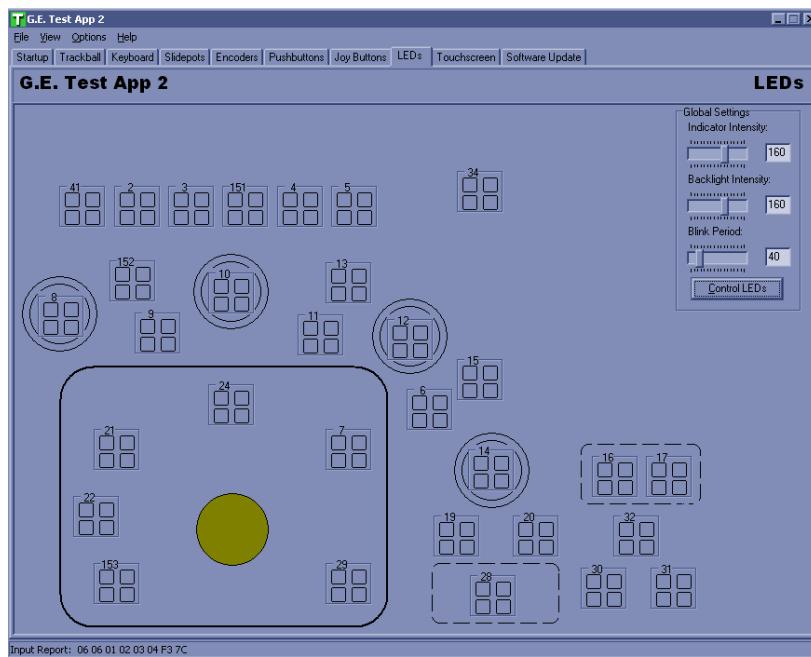
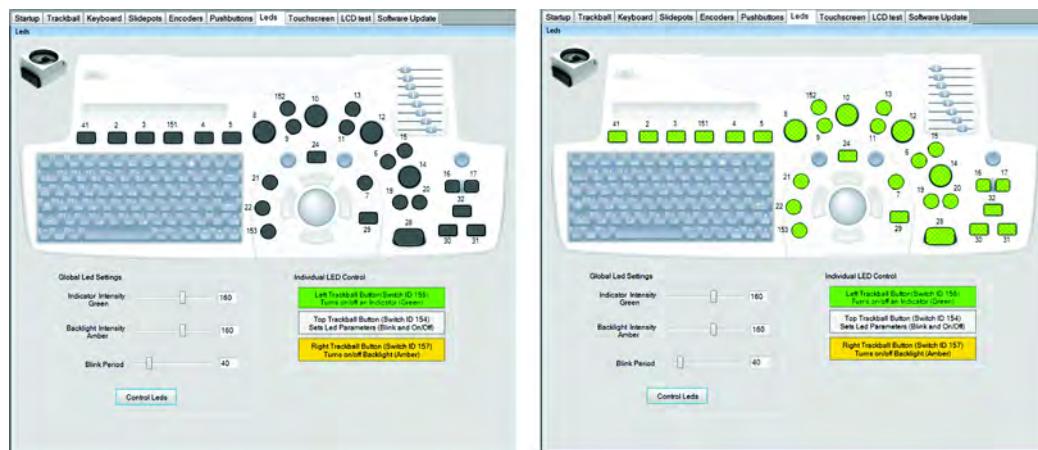


Figure 7-47 LEDs Tab - R5 and later



7-5-10-9 Touch Screen Tab

Test the Touch Screen functionality by pressing on the Touch Screen of the upper operator panel. Verify that the press is indicated in the black window by a highlighted circle. See: [Figure 7-48](#) or [Figure 7-49](#).

Figure 7-48 Touch Screen Tab - R4 and earlier

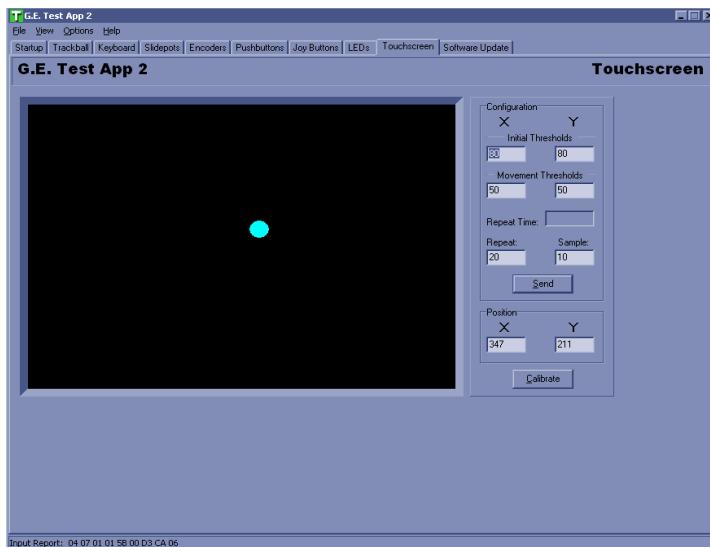
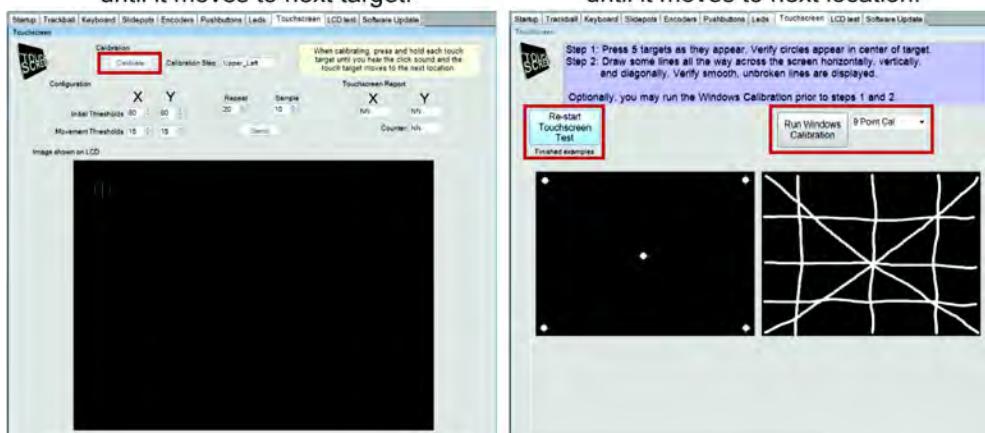


Figure 7-49 Touch Screen Tab - R5 and later

Check Calibration:

Select Touch screen test,
press each target as they
appear/Calibrate:

Press Run Windows calibration.
Press very lightly on each target
until it moves to next location.



7-5-10-10 Ending the Program

- 1.) When you have finished testing the Op Panel, close the GE Test App.
- 2.) Shutdown the system and reboot.

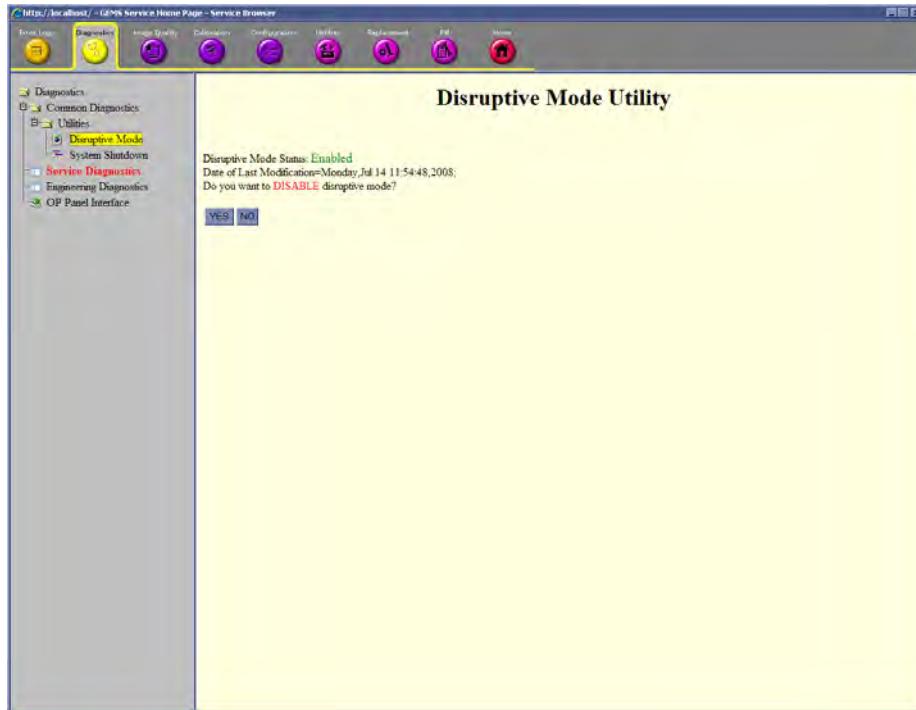
7-5-11 Diagnostics - Common Diagnostics

7-5-11-1 Disruptive Mode

The customer enables this feature by choosing “Disruptive Mode” and confirming “Yes”, before a GE Service FE can access the customer’s ultrasound scanner remotely. “Disruptive Mode” can be requested remotely by the service technician or OLC, or it can be selected by the customer directly on the scanner or workstation.

See: [Section 7-6 "Troubleshooting using InSite ExC" on page 7-165](#) for details.

Figure 7-50 Disruptive Mode Utility Window



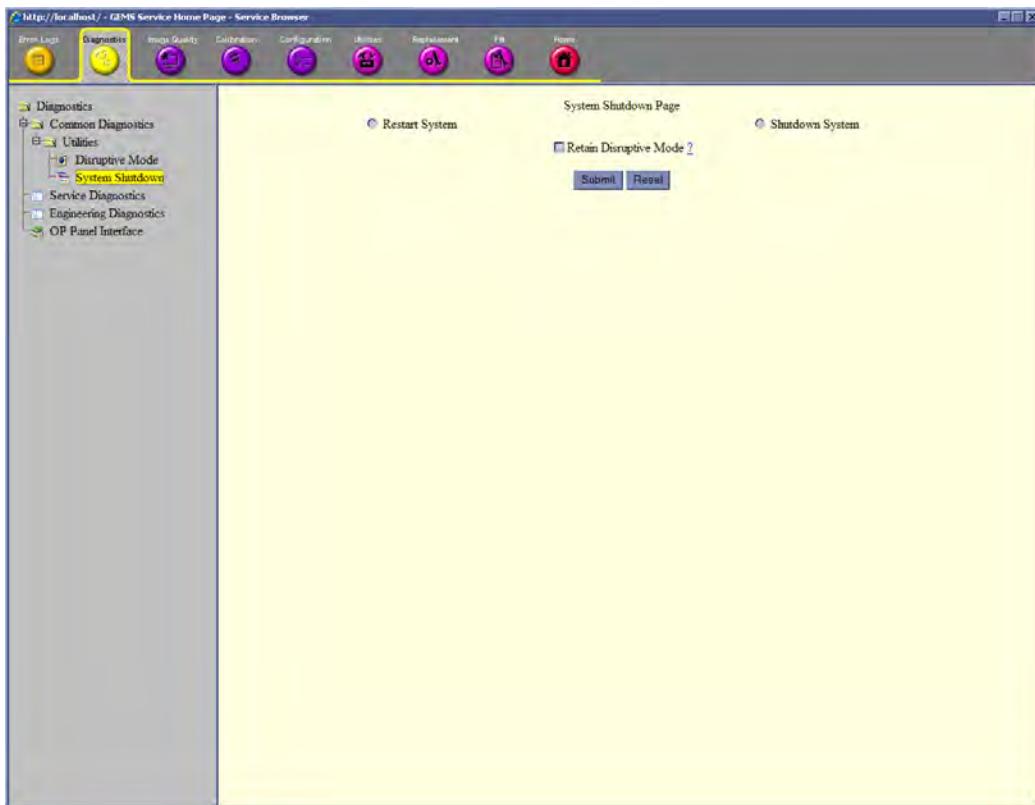
7-5-11-2 System Shutdown

System Shutdown is intended for use from a remote computer. The menu gives you the ability to either Restart or Shutdown the system.

NOTE: *Retain Disruptive Mode:*

- Retain Disruptive Mode MUST be checked if you are working from a remote computer.
- Retain Disruptive Mode should be unchecked if you are working locally on the scanner.

Figure 7-51 System Shutdown Window



7-5-12 Diagnostics for Service Diagnostics

Front End (Card Rack) diagnostics listed in this section are applicable for GFI configurations. For MRX configuration, see: [7-9-19 "LOGIQ E9 Transmit and Receive Signal Path Diagnostics" on page 7-275](#). Also for diagnostics for GFI Configurations running R3.x.x and later, and for MRX Configurations, see: [7-5-12-15 "Diagnostics Window Overview - R3.x.x and later" on page 7-95](#).

7-5-12-1 Digital Receive

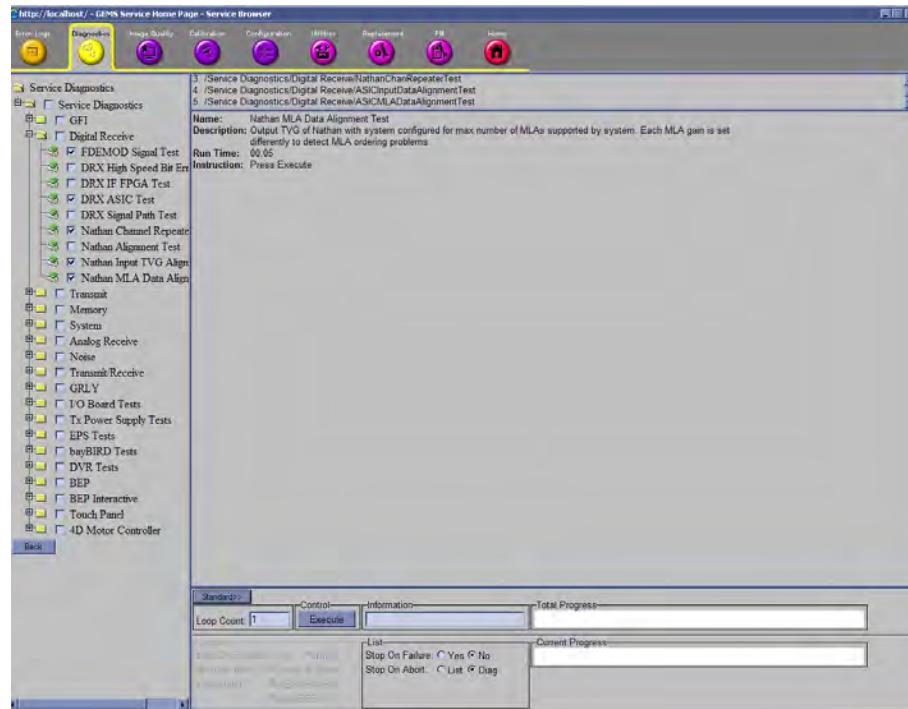
See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of the looping and list features.

Symptoms:

- Intermittent general problems (communication between DRX and GFI)
- Image artifacts - pixilated/jagged edges

- 1.) Select the **Digital Receive** checkbox to run all the tests, or select the individual subtests to run only the selected tests.
- 2.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 3.) Click Execute to run the test(s).

Figure 7-52 Digital Receive Window



7-5-12-1 Digital Receive (cont'd)

Tests the signal path from the DRX to the GFI to the BEP. Also tests for latency signals of the DRX or Nathan to the GFI.

Name: FDEMOD Signal Test

Description: Signal path test starting from the Fixed Demod on the GFI

Run Time: 00:03

If this test failed:

- 1.) Replace the PCIe cable.
- 2.) If GFI test above fails, replace the GFI board.
- 3.) Replace the BEP.

NOTE: *The DRX High Speed Bit Error Rate Diagnostic Test Fails intermittently (not reliable) when run on a system with MLA4 DRX3.1 (5301040-4) with production software revision R1.0.6 ONLY.*

The intermittent errors encountered by the diagnostic may not be due to real failure; therefore the DRX High Speed Bit Error Rate Diagnostic test results are not reliable when under this configuration.

This problem does not affect in any way the operation or performance of the LOGIQ E9, it is only related to the diagnostic result.

DO NOT REPLACE BOARDS DUE TO THIS FAILURE.

The Diagnostic "DRX Signal Path" tests the same functionality without being affected by the issue and will be a reliable test to troubleshoot any issue with the DRX board since it checks bit by bit all vector data send to the FE DRX back at the backend PC.

Name: DRX High Speed Bit Error

Description: High Speed Bit Error Test on the DRX

Run Time: 00:03

If this test failed:

- 1.) Swap DRX boards to determine if the failure point changes as the boards are moved.
- 2.) Replace any failed DRX boards.
- 3.) Interface to GFI may be cause of the failure. See: [7-5-12-3 "GFI" on page 7-66](#).

Name: DRX IF FPGA Test

Description: Signal path test starting from IF FPGA on DRX boards

Run Time: 00:03

If this test failed:

- 1.) Swap DRX boards to determine if the failure point changes as the boards are moved.
- 2.) Replace any failed DRX boards.
- 3.) Interface to GFI may be cause of the failure. See: [7-5-12-3 "GFI" on page 7-66](#).

Name: DRX ASIC Test

Description: Digital Signal path tests sourced from output of Nathan ASIC

Run Time: 00:03

- 1.) Swap DRX boards to determine if the failure point changes as the boards are moved.
- 2.) Replace any failed DRX boards.
- 3.) Interface to GFI may be cause of the failure. See: [7-5-12-3 "GFI" on page 7-66](#).

7-5-12-1 Digital Receive (cont'd)**Name: DRX Signal Path Test (this test provides the most coverage on the DRX)**

Description: Digital signal path sourced from input to Nathan. Does not test ADC. Sends simulated data across the signal path.

Run Time: 00:03

If this test failed:

- 1.) Swap DRX boards to determine if the failure point changes as the boards are moved.
- 2.) Replace any failed DRX boards.
- 3.) Interface to GFI may be cause of the failure. See: [7-5-12-3 "GFI" on page 7-66](#).

Name: Nathan Channel Repeater Test

Description: Tests the functionality of the Nathan channel repeater. Looks for latency signal communication issues analog signal path.

Run Time: 00:05

If this test failed:

- 1.) Swap DRX boards to determine if the failure point changes as the boards are moved.
- 2.) Replace any failed DRX boards.

Name: Nathan Alignment Test

Description: Output TVG of Nathan with system configured for max number of MLAs supported by system. Verifies the alignment (16 identical samples in a row) of IF to GFI.

Run Time: 00:05

If this test failed:

- 1.) Swap DRX boards to determine if the failure point changes as the boards are moved.
- 2.) Replace any failed DRX boards.

Name: Nathan Input TVG Alignment Test

Description: Input TVG of Nathan with system configured for max number of MLAs supported by system. (Internal and external test modes of Nathan.)

Run Time: 00:05

If this test failed:

- 1.) Swap DRX boards to determine if the failure point changes as the boards are moved.
- 2.) Replace any failed DRX boards.

7-5-12-1 Digital Receive (cont'd)**Name: Nathan MLA Data Alignment Test**

Description: Output TVG of Nathan with system configured for max number of MLAs supported by system. Each MLA gain is set differently to detect MLA ordering problems. Verifies the alignment (16 identical samples in a row) of IF to GFI.

Run Time: 00:05

If this test failed:

- 1.) Swap DRX boards to determine if the failure point changes as the boards are moved.
- 2.) Replace any failed DRX boards.

7-5-12-2 Memory

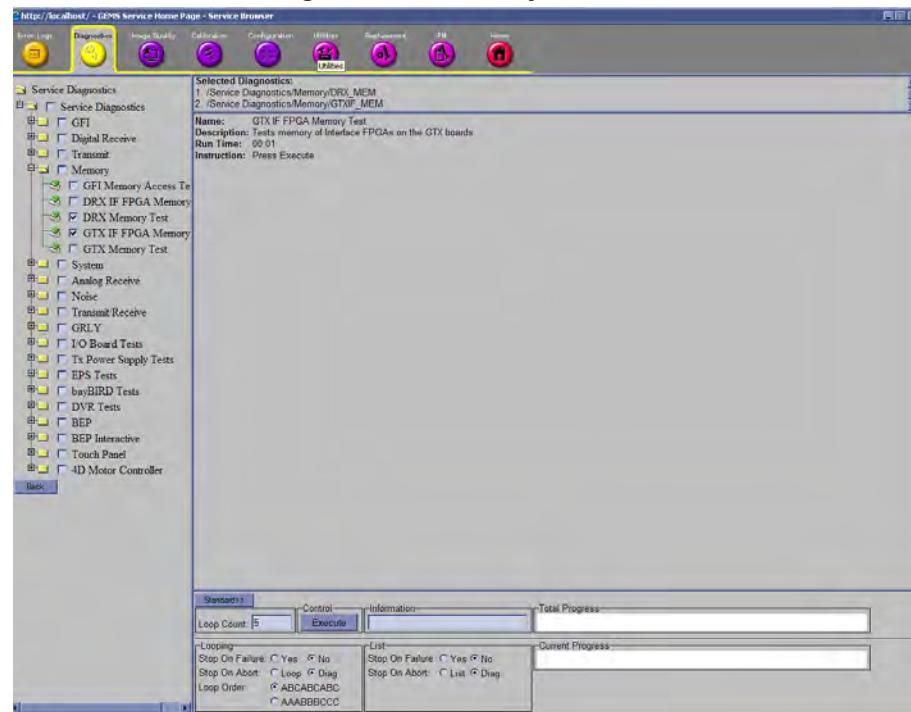
See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of the looping and list features.

Symptoms:

- Intermittent Problems
- Communication Problems

- 1.) Select the **Memory** checkbox to run all the tests, or select the individual subtests to run only the selected tests.
- 2.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 3.) Click Execute to run the test(s).

Figure 7-53 Memory Window



7-5-12-2 Memory (cont'd)

Assesses the general state of the system. Tests the integrity of memory and communication of the described boards. Tests all of the on-board memory, including registers. The utility fills the memory with data, retrieves the data, and compares it to the original data.

Name: GFI Memory Access Test

Description: Tests the internal and external RAM of the GFI Board.

NOTE: *There may be multiple board dependencies causing this test to fail. Also, see the FDEMOD Signal Test, 7-5-12-1 "Digital Receive" on page 7-59.*

Run Time: 00:01

If this test failed:

- 1.) Replace the GFI board.

Name: DRX IF FPGA Memory Test

Description: Tests memory of Interface FPGAs on the DRX boards

NOTE: *Also run the DRX Memory Test (next test below) for a full range of testing capacity.*

Run Time: 00:01

If this test failed:

- 1.) Replace the failed DRX board.

Name: DRX Memory Test

Description: Tests the memory of the Nathan ASICs on the DRX Boards.

Run Time: 00:01

If this test failed:

- 1.) Replace the failed DRX board.

7-5-12-2 Memory (cont'd)**Name: GTX IF FPGA Memory Test**

Description: Tests memory of Interface FPGAs on the GTX boards

NOTE: *Also run the GTX Memory Test (next test below) for a full range of testing capacity.*

Run Time: 00:01

If this test failed:

- 1.) Replace the failed GTX board.

Name: GTX Memory Test

Description: Tests memory of the David ASICs on the GTX Board

Run Time: 00:01

If this test failed:

- 1.) Replace the failed GTX board.

7-5-12-3 GFI

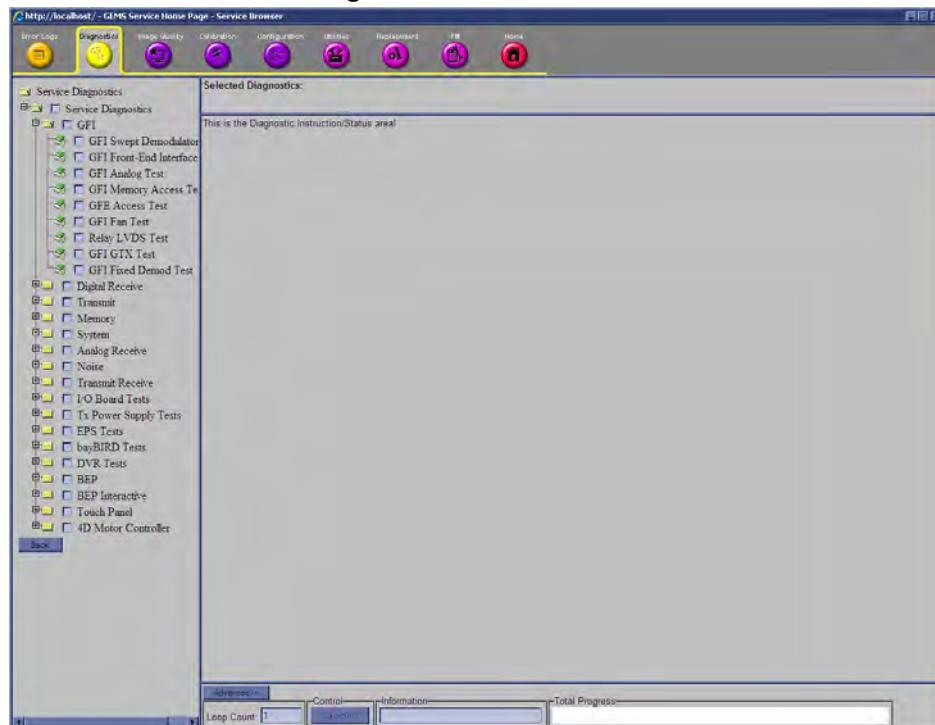
See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of the looping and list features.

Symptoms:

- TGC Problems
- Doppler Audio Problems
- Image Artifacts
- Intermittent Instability

- 1.) Select the **GFI** checkbox to run all the tests, or select the individual subtests to run only the selected tests.
- 2.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 3.) Click Execute to run the test(s).

Figure 7-54 GFI Window



7-5-12-3 GFI (cont'd)**Name: GFI Swept Demodulator Test**

Description: Performs a signal path test of the swept demodulator FPGA on the GFI

Run Time: 00:05

If this test failed:

- 1.) Replace the GFI board.

Name: GFI Swept Demodulator Engineering Test (Not used in the field)**Name: GFI Front End Interface Test**

Description: Test that the GFI can access Front End cards

Run Time: 00:06

If this test failed:

- 1.) Replace the GFI board.
- 2.) If the diagnostic identifies problems with other boards, run tests on those boards also.
- 3.) Replace any other failed boards as identified by the diagnostics for those boards.

Name: GFI Analog Test

Description: Tests the analog circuitry of the GFI Board.

NOTE: *Used for test purposes only. There may not be any symptoms displayed by the system.*

Run Time: 00:03

If this test failed:

- 1.) Also run the Analog RX Tests (high, medium, low gain) for a complete test of the GFI gain.
See: [7-5-12-8 "Analog Receive" on page 7-74](#).
- 2.) Replace the GFI board.

Name: GFI Memory Access Test

Description: Tests the internal and external RAM of the GFI Board. (Same as the GFI Memory Test)

Run Time: 00:01

If this test failed:

- 1.) Replace the GFI board.

7-5-12-3 GFI (cont'd)**Name: GFE Access Test**

Description: Reads the version of the GFE FPGA

Run Time: 00:01

If this test failed:

- 1.) Replace the GFI board.

Name: Relay LVDS Test

Description: Tests the LVDS connection between the GFI interface and the GRLY

Run Time: 00:02

If this test failed:

- 1.) Swap GFI boards and/or GRLY board to determine which board has failed.
- 2.) Replace the failed board.

Name: GFI Fan Test

Description: Test Front End card rack fan control and fan speed measurements

Run Time: 00:40

If this test failed:

- 1.) Check fan drawer in Front End Card Rack. Verify connection with backplane. Replace defective fan.
- 2.) Replace GFI board.

Name: GFI GTX Test

Description: Test communication with the GTX Board. (Same as the GFI Memory Test)

Run Time: 00:03

If this test failed:

- 1.) Based on failure information, replace the failed GTX or swap the GTX boards to isolated failure.

Name: GFI Fixed Demod Test

Description: GFI Fixed Demodulator signal path test. (Similar to the FDEMOD test with a slight variation on how the test is run.)

Run Time: 00:03

If this test failed:

- 1.) Replace the GFI board.

7-5-12-4 System

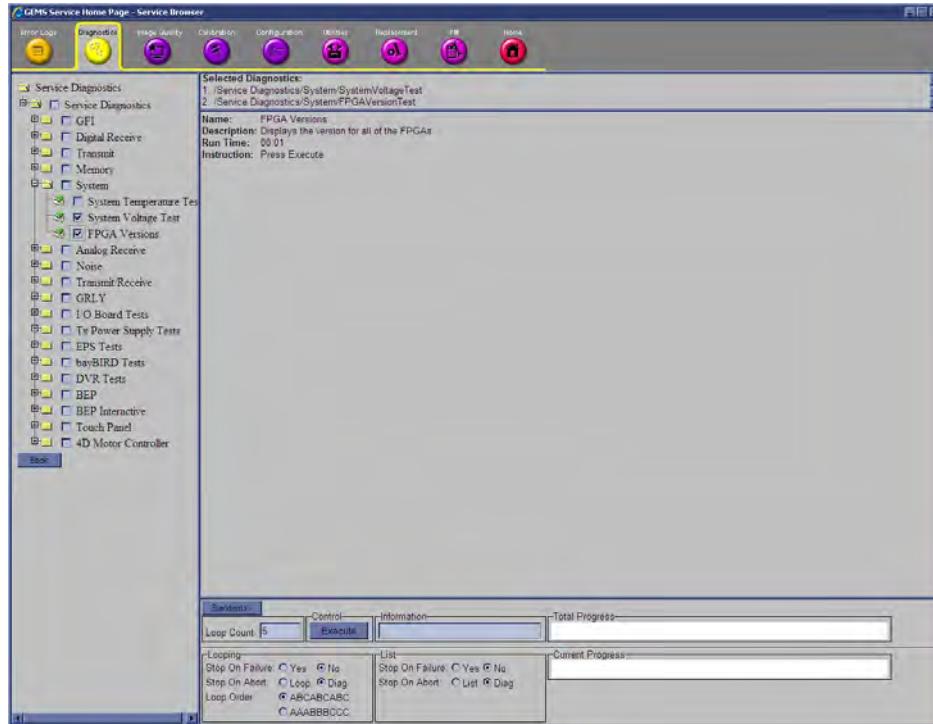
See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of the looping and list features.

Symptoms:

- High temperature reports on the Home page.
- Temperature specifications are out of tolerance.
- Voltage specifications are out of tolerance.

- 1.) Select the **System** checkbox to run all the tests, or select the individual subtests to run only the selected tests.
- 2.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 3.) Click Execute to run the test(s).

Figure 7-55 System Window



7-5-12-4 System (cont'd)

NOTE: You can also view temperature logs in the System Health Information section of the Home page. These logs may help identify a trend or subsystem where temperature and voltage have been high, low, or erratic. See: [7-5-5 "Home" on page 7-26](#) for temperature logs/reports.

Name: System Temperature Test

Description: Compares all system temperatures to their specified values

Run Time: 00:01

If temperature specifications are out of tolerance:

- 1.) The system should not be in a small enclosed space with other equipment that generates a lot of heat. Move the system away from walls and other equipment.
- 2.) Clean or replace any dirty fan filters.
- 3.) Replace the fan tray beneath the card rack if the tachometer readings are slow.
- 4.) Check the fan on the BEP and replace the fan if it is not working.
- 5.) Replace the GFI board if none of the above fixes the temperature problems.

Name: System Voltage Test

Description: Compares all system voltages to their specified values

Run Time: 00:01

If any system is out of tolerance:

- 1.) Check the voltage test points on the system boards.
- 2.) Replace the system boards that are out of tolerance.
- 3.) Check the power supply.
- 4.) Replace the power supply if it is out of tolerance.

Name: FPGA Versions

Description: Displays the version for all of the FPGAs

Run Time: 00:01

If this test failed:

- 1.) If the test fails to read every FPGA version, check the connection between the Host and the GFI board. Replace the GFI board.
- 2.) If the test fails to read the DRX IF FPGA version, check the DRX boards.
- 3.) If the test fails to read the GTX IF FPGA version, check the GTX boards.

7-5-12-5 Noise

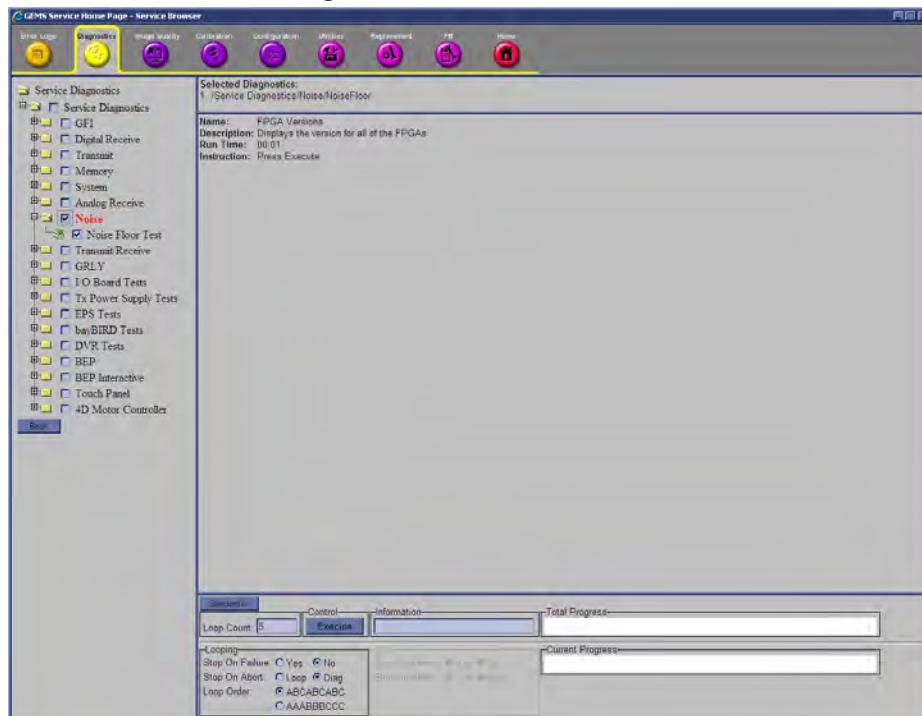
See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of the looping and list features.

Symptoms:

- Image artifacts
- Image noise
- Poor image quality
- Missing image channels

- 1.) Select the **Noise** checkbox or the individual subtest to run the test.
- 2.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 3.) Click Execute to run the test.

Figure 7-56 Noise Window



7-5-12-5 Noise (cont'd)**Name: Noise Floor Test**

Description: Measures the noise floor of the System. The entire system is required for this diagnostic. The noise floor is calculated from IQ data received without a signal source.

Run Time: 00:02

- 1.) See: [7-9-2 "Noise" on page 7-195](#) for information on minimizing environmental noise. If the problem continues:
- 2.) Try a new probe (channels in the probe may be faulty). If the problem continues:
- 3.) Run the tests for [7-5-12-8 "Analog Receive" on page 7-74](#).

7-5-12-6 Transmit**Name: GTX High Speed Bit Error Test**

Description: High Speed Bit Error Test on the GTX

Run Time: 00:03

If this test failed:

- 1.) Swap GTX boards to determine if the failure point changes as the boards are moved.
- 2.) Replace any failed GTX boards.
- 3.) Interface to GFI may be the cause of the failure. See: [7-5-12-3 "GFI" on page 7-66](#).

Name: Tx P6 Illegal Waveform Test

Description: Transmits an illegal waveform and checks the error registers.

Run Time: 03:21

If this test failed:

- 1.) Swap GTX boards to determine if the failure point changes as the boards are moved.
- 2.) Replace any failed GTX boards.
- 3.) Interface to GFI may be the cause of the failure. See: [7-5-12-3 "GFI" on page 7-66](#).

7-5-12-7 Transmit/Receive**Name: T/R Channel Test**

Description: Transmit and Receive Channel Test. Transmits on one at a time and received on one channel at a time using an open probe connector.

Run Time: 00:03

If this test failed:

- 1.) Swap front-plane boards to determine if the failure point changes as the boards are moved.
- 2.) Swap DRX boards to determine if the failure point changes as the boards are moved. Replace any failed DRX board.
- 3.) Run Analog Receive Tests from section [7-5-12-8 "Analog Receive" on page 7-74](#).
- 4.) Replace GRX boards.
- 5.) Replace GRLY.

NOTE: *Tx Rx Chain Test Tx1*

Tx Rx Chain Test Tx2

These tests will be removed from the Service Diagnostics folder. They will remain in the Engineering Diagnostics folder.

NOTE: *GRLY folder*

GRLY Receive Test conn 1

GRLY Receive Test conn 2

GRLY Receive Test conn 3

GRLY Receive Test conn 4

These tests will be removed from the Service Diagnostics folder. They will remain in the Engineering Diagnostics folder.

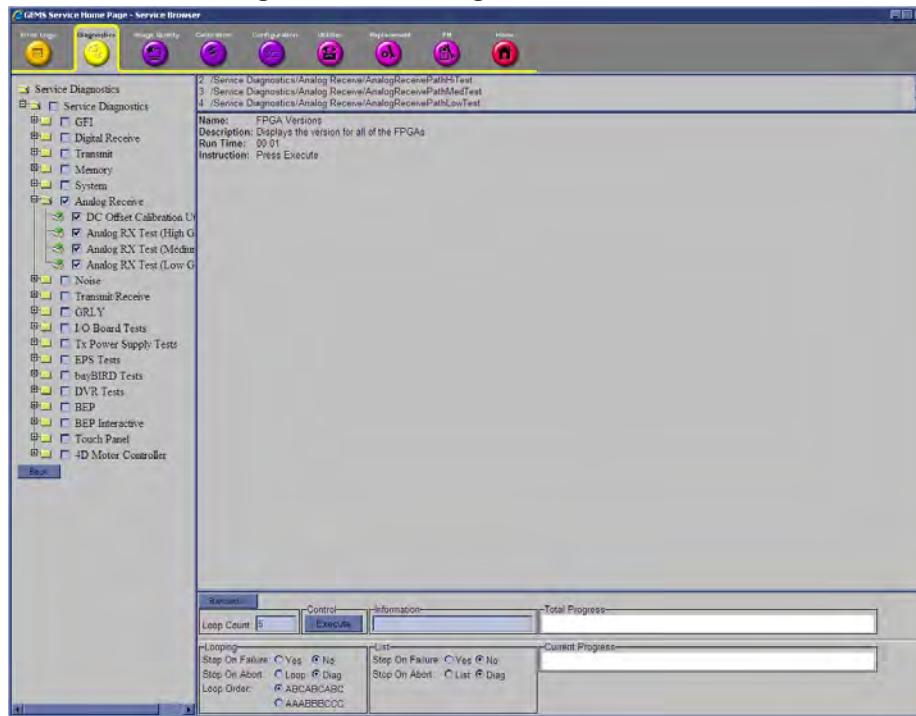
7-5-12-8 Analog Receive

See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of the looping and list features.

Symptoms:

- Image artifacts - channel failure/noise
- 1.) Select the **Analog Receive** checkbox to run all the tests, or select the individual subtests to run only the selected tests.
 - 2.) Enter the desired Loop Count (numeric value of 4 digits or less).
 - 3.) Click Execute to run the test(s).

Figure 7-57 Analog Receive Window



7-5-12-8 Analog Receive (cont'd)

Tests the signal path from the GFI to the backplane (GTX) to the GRX.

Name: DC Offset Calibration Utility

NOTE: *The DC Offset Calibration Utility diagnostic MUST be run when the DRX boards are replaced or moved. See: [Section 6-6 "DC Offset Calibration" on page 6-34](#).*

Description: Measures and corrects for the DC offset of the ADCs on the DRX.

Run Time: 00:02

Run this utility to calibrate the correct DC offset after replacing or moving DRX boards. A popup message alerts the user to run this utility after DRX boards have been replaced or moved.

Name: Analog RX Test (High Gain)

Description: Signal path test of the GRX boards with a TGC set to high (peak) gain. Failures could be channel in DRX boards, Nathan, GRX to DRX communication.

Run Time: 00:02

If this test failed:

- 1.) Swap DRX boards to determine if the failure point changes as the boards are moved.

NOTE: *A block of 8 dead channels indicates a failed DRX board.*

- 2.) Replace any failed boards.

- 3.) Replace GRX boards (these cannot be swapped as one is 64 channel and one is 128 channel).

Name: Analog RX Test (Medium Gain)

Description: Signal path test of the GRX boards with a TGC set to medium gain.

Run Time: 00:02

If this test failed:

- 1.) Swap DRX boards to determine if the failure point changes as the boards are moved.

NOTE: *A block of 8 dead channels indicates a failed DRX board.*

- 2.) Replace any failed boards.

- 3.) Replace GRX boards (these cannot be swapped as one is 64 channel and one is 128 channel).

7-5-12-8 Analog Receive (cont'd)**Name: Analog RX Test (Low Gain)**

Description: Signal path test of the GRX boards with a TGC set to low gain.

Run Time: 00:02

If this test failed:

- 1.) Swap DRX boards to determine if the failure point changes as the boards are moved.

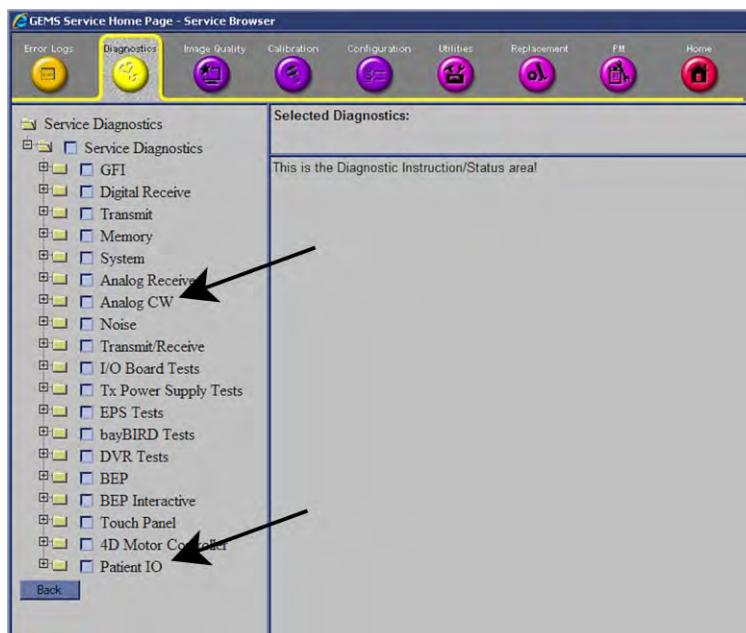
NOTE: *A block of 8 dead channels indicates a failed DRX board.*

- 2.) Replace any failed boards.
- 3.) Replace GRX boards (these cannot be swapped as one is 64 channel and one is 128 channel).

7-5-12-9 Analog CW

NOTE: *Disconnect all probes before running diagnostics. Only connect a probe or test connector if instructed for a specific test.*

Figure 7-58 Analog CW and Patient I/O Service Diagnostics Options



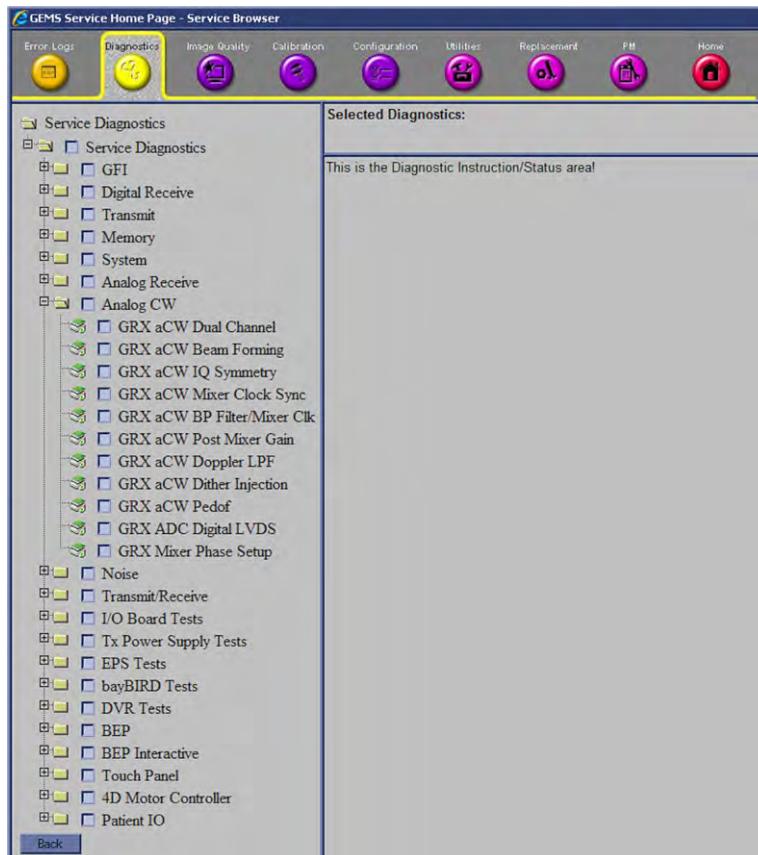
7-5-12-10 Analog CW**Analog Continuous Wave (CW) Doppler Tests.**

Under Service Diagnostics / Analog CW.

INPUT > a sine wave generated on the GFI test vector generator and injected on the GRX board(-s).

OUTPUT > The signal passes through the analog Doppler circuitry of the GRX board and into the GFI.

Figure 7-59 Analog Continuous Wave (CW) Doppler Tests



The test input signal is a sine wave generated on the GFI test vector generator (TVG) and injected on the GRX board (-s). The setup of the analog Doppler is done through a 512-bit setup word. The output signal from the GRX will depend on the Doppler setup. For example the frequency will be determined by the frequency of the signal in and the Mixer clock setup.

The signal passes through the analog Doppler circuitry of the GRX board and into the GFI. The GFE is setup to receive CW data and the GFI processing in bypass mode.

The level is adjusted with the TSIG_GAIN and IQ_GAIN parameters to avoid saturation through the GRX Doppler circuit.

7-5-12-10 Analog CW (cont'd)

The 3-term Blackman-Harris window function is used for the analog CW tests. The input frequency is 2.521 MHz for a number of the tests and with the Mixer clock at 2.5 MHz; a Doppler frequency at 21 kHz should result. To be able to find such low frequencies a vector is acquired that enables the Fast Fourier Transform (FFT) of 16Ksamples (I-data) or 8K (I- & Q-data). This will give bin spacing of approximately 3 kHz (8K samples) and 1.5 kHz (16K samples).

The following tests will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics. Only connect a probe or test connector if instructed for a specific test.

Name: Service Diagnostics / Analog CW / GRX aCW Dual Channel

For each channel pair, a signal is set up with $f_0=2.521$ MHz, the Band Pass (BP) filter at 3.1 MHz and a mixer frequency of 2.5 MHz. The dither and Pedof probe inputs are disabled. The Doppler channel pairs are measured for the parameters: fdop, spectrum peak, RMS, SNR and THD. This is calculated for I & Q data separately.

Disconnect all probes before running diagnostics.

Run Time: 00:05

If this test fails:

1.) Verify the following tests pass:

- GFI est\$
- Analog Receive Tests

If these tests pass, and the GRX aCW Dual Channel test fails:

2.) Replace the CW GRX board.

Name: Service Diagnostics / Analog CW / GRX aCW Beam Forming

A sum of sine waves with the same frequency, but different phase, gives a sine wave output where the amplitude is a function of the different phase settings.

The test uses small overlapping groups (4 channels) where the channel pairs have different phase settings. Any amplitude deviation detected in this test, should indicate that there is something wrong with phase setup. For each subtest, a signal is set up with $f_0=2.521$ MHz, the BP filter at 3.1 MHz and a mixer frequency of 2.5 MHz. The dither and Pedof probe inputs are disabled. The parameters tested are: fdop, spectrum peak, RMS and SNR on the I-data.

Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.

Run Time: 00:05

1.) Verify the following tests pass:

- GFI est\$
- Analog Receive Tests

If these tests pass, and the GRX aCW Beam Forming test fails:

2.) Replace the CW GRX board.

7-5-12-10 Analog CW (cont'd)**Name: Service Diagnostics / Analog CW / GRX aCW IQ Symmetry**

For each subtest, a signal is setup with $f_0=2.521$ MHz, the BP filter at 3.1 MHz and a mixer frequency of 2.5 MHz. The dither and Pedof probe inputs are disabled. The number of sub-test, with identical setup, is by default, eight. For the I/Q- symmetry test, the DC-component and RMS value for both the I- and Q-part of the data set are measured. The symmetry quality measurement for this test is calculated from the RMS values for each sub-test.

Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.

Run time: 00:05

1.) Verify the following tests pass:

- GFI est~~S~~
- Analog Receive Tests

If these tests pass, and the GRX aCW IQ Symmetry test fails:

2.) Replace the CW GRX board.

Name: Service Diagnostics / Analog CW / GRX aCW Mixer Clock Sync

For the Mixer Clock Sync test, a signal is set up with $f_0=2.521$ MHz, the BP filter at 3.1 MHz and a mixer frequency of 2.5 MHz. The dither and Pedof probe inputs are disabled. The test enables one channel pair, plus each of the other channel pairs per sub test, one at the time. The parameters to test for are fdop, spectrum peak, RMS and SNR on the I-data.

Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.

Run Time: 00:05

1.) Verify the following tests pass:

- GFI est~~S~~
- Analog Receive Tests

If these tests pass, and the GRX aCW Mixer Clock Sync test fails:

2.) Replace the CW GRX board.

Name: Service Diagnostics / Analog CW / GRX aCW BP Filter / Mixer Clk

In the Band Pass Filter / Mixer Dock Test, for each channel pair, a signal is set up with combinations of input signal frequency, Band Pass (BP) filters and mixer frequencies. The dither and Pedof probe inputs are disabled. The Doppler channel pairs are measured for the parameters: fdop, spectrum peak, RMS on I-data.

Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.

Run Time: 00:08

1.) Verify the following tests pass:

- GFI est~~S~~
- Analog Receive Tests

If these tests pass, and the GRX aCW BP Filter / Mixer Clk test fails:

2.) Replace the CW GRX board.

7-5-12-10 Analog CW (cont'd)**Name: Service Diagnostics / Analog CW / GRX aCW Post Mixer Gain**

For each subtest, a signal is set up with $f_0=2.521$ MHz, the BP filter at 3.1 MHz and a mixer frequency of 2.5 MHz. The dither and Pedof inputs are disabled. The TSIG_GAIN parameter is set to give -26.1 dB gain. The test is run by setting up the four different IQ_GAIN parameter settings that corresponds to the 4 post mixer gain setting of 0 dB, -4 dB, -8 dB and -12 dB. The RMS and RMS attenuation between the four mixers gain settings on both I- and Q-data are tested.

Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.

Run Time: 00:05

1.) Verify the following tests pass:

- GFI esf\$
- Analog Receive Tests

If these tests pass, and the GRX aCW Post Mixer Gain test fails:

2.) Replace the CW GRX board.

Name: Service Diagnostics / Analog CW / GRX aCW Doppler LPF

For the Low Pass Filter test, Doppler test frequencies, both in the filter pass band and the stop band are set up. The mixer clock frequency is set to 2.5 MHz and the band pass filter to 3.1 MHz. The dither and Pedof inputs are disabled. The LP-filter 3 dB frequency will typically be at about 40 kHz. The following parameters are tested: fdop, spectrum peak and RMS both in the I- and Q-data.

Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.

Run Time: 00:05

1.) Verify the following tests pass:

- GFI esf\$
- Analog Receive Tests

If these tests pass, and the GRX aCW Doppler LPF test fails:

2.) Replace the CW GRX board.

7-5-12-10 Analog CW (cont'd)**Name: Service Diagnostics / Analog CW / GRX aCW Dither Injection**

A signal is injected in the dither input and result in the received I/Q data is checked. The test signal generator is used for signal injection where the input signal is $f_0=2.521$ MHz, the BP filter at 3.1 MHz and a mixer frequency of 2.5 MHz. The dither input is enabled for this test, while the Pedof inputs are disabled. The DITHER_GAIN parameter values are set to 0, 1, 2 and 3. The parameter values corresponds to Dither gain of 0 dB, -7 dB, -19 dB and -30 dB respectively. The RMS and the RMS attenuation between the different gain settings in both I- and Q-data are tested.

Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.

Run Time: 00:05

- 1.) Verify the following tests pass:
 - GFI est\$
 - Analog Receive Tests

If these tests pass, and the GRX aCW Dither Injection test fails:

- 2.) Replace the CW GRX board.

Name: Service Diagnostics / Analog CW / GRX aCW Pedof

In the test, the two center frequencies of 2 MHz and 6 MHz are verified. These frequencies are set by switching the Pedof band pass filter. The GFI test signal generator is used to input sine waves. The Pedof test signal input is enabled. The dither and Pedof probe inputs are disabled. Sub tests using combinations of input signal frequency, Pedof band pass filter settings, mixer clock frequency, test signal gain, and IQ gains are run.

Parameters tested: fdop, spectrum peak, RMS, SNR and THD on both I- & Q-data. With this test the Pedof (SD probe) CW path on the GRX board is tested.

The aCW Pedof Test will only be run on the CW64 board.

Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.

Run Time: 00:05

- 1.) Verify the following tests pass:
 - GFI est\$
 - Analog Receive Tests

If these tests pass, and the GRX aCW Pedof test fails:

- 2.) Replace the CW GRX board.

7-5-12-10 Analog CW (cont'd)**Name: Service Diagnostics / Analog CW / GRX ADC Digital LVDS**

For the Analog-to-Digital Converter Digital Low-Voltage Differential Signaling test, the digital link from the Doppler ADC and to the GFI board is verified. To verify signal integrity, the ADC is set up to continuously transmit a predefined bit-pattern. Both I- and Q-data are acquired and each sample value is tested. Port 0 on the PCA9554 I2C register on the GRX board is used to turn the ADC test pattern on/off. The test signal generator on GFI is disabled for this test.

Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.

Run Time: 00:05

1.) Verify the following tests pass:

- GFI esf\$
- Analog Receive Tests

If these tests pass, and the GRX ADC Digital LVDS test fails:

2.) Replace the CW GRX board.

Name: Service Diagnostics / Analog CW / GRX Mixer Phase Setup

This test utilizes a PCA9554 I2C register on the GRX board. All phase bits are set to one in the analog Doppler setup data, before reading back from the I2C register and test bits 6 and 7 in the returned byte. Next, all zeroes are sent to the analog Doppler, read back again and bits 6 and 7 appear in the returned byte. The test passes if the bits of interest in the read back byte match the phase values that were setup. Bit 6 and 7 are the last bits in the two shift register chains and if the correct value were read, the chains must be intact. The test signal generator on GFI is disabled for this test.

Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.

Run Time: 00:05

1.) Verify the following tests pass:

- GFI esf\$
- Analog Receive Tests

If these tests pass, and the GRX Mixer Phase Setup test fails:

2.) Replace the CW GRX board.

7-5-12-11 I/O Board Tests

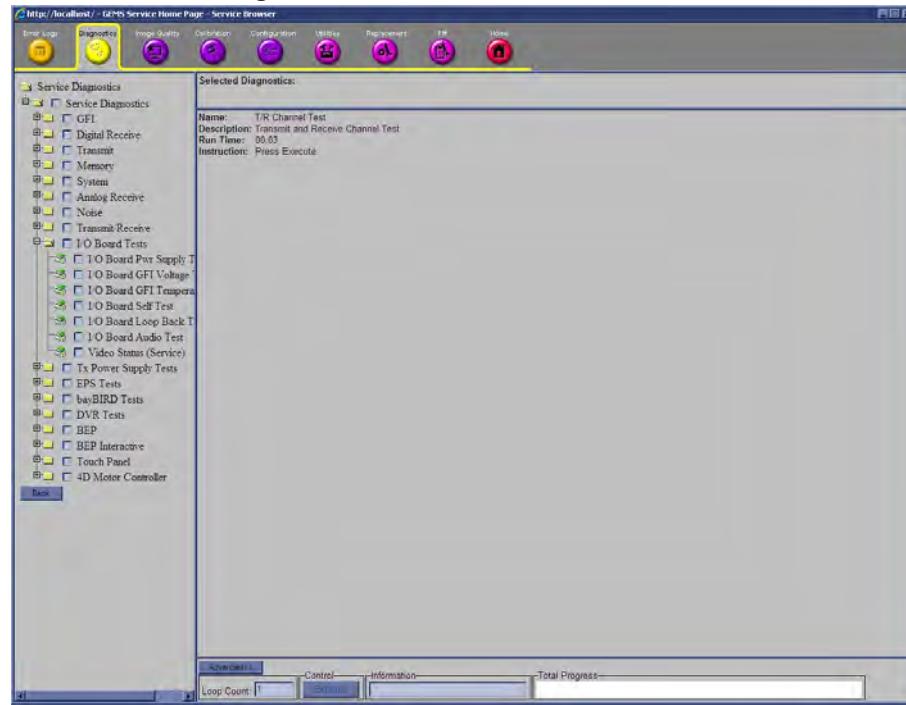
See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of the looping and list features.

Symptoms:

- Intermittent Problems
- Popup messages warning of system voltage problems - I/O Board Pwr Supply Test
- System comes up in simulator mode - run I/O Board GFI Voltage Test
- Unable to run diagnostics
- No doppler audio/system audio/general audio sounds - run I/O Board Audio Test
- No display on the monitor

- 1.) Select the **I/O Board Tests** checkbox to run all the subtests, or select the individual subtests to run only the selected tests.
- 2.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 3.) Click Execute to run the test(s).

Figure 7-60 I/O Board Tests Window



7-5-12-11 I/O Board Tests (cont'd)**Name: I/O Board Pwr Supply Test**

Description: Compares all local I/O Board voltages to their specified values.

NOTE: *This is part of the self-monitoring process reported in the System Health Information section of the Home page. See: [7-5-5 "Home" on page 7-26](#).*

Run Time: 00:01

If this test failed:

- 1.) Replace the I/O Board.

Name: I/O Board GFI Voltage Test

Description: Compares all voltages on the GFI to their specified values. The GFI may not be working, therefore the BEP cannot communicate with the Front End.

Run Time: 00:01

If this test failed:

- 1.) Verify that the BEP to Backplane cable is properly connected and/or swap the cable with a known good cable. If the problem continues:
- 2.) Run the GFI tests to determine if the GFI is faulty. See: [7-5-12-3 "GFI" on page 7-66](#).

Name: I/O Board GFI Temperature Test

Description: Reads temperature sensors on the GFI board and compares the values against specified limits.

Run Time: 0:05

If this test failed:

- 1.) Verify that the BEP to Backplane cable is properly connected and/or swap the cable with a known good cable. If the problem continues:
- 2.) Check the Front End card rack cooling fans.
- 3.) Run the GFI Tests to determine if the GFI is faulty. See: [7-5-12-3 "GFI" on page 7-66](#).

Name: I/O Board Self Test

Description: The processor on the I/O Board performs a check of its basic functions.

Run Time: 00:01

If this test failed:

- 1.) Verify that the BEP to Backplane cable is properly connected and/or swap the cable with a known good cable. If the problem continues:
- 2.) Replace the I/O Board.

7-5-12-11 I/O Board Tests (cont'd)**Name: I/O Board Loop Back Test**

Description: Basic test of the USB communications with the I/O Board

Run Time: 00:01

If this test failed:

- 1.) Verify that the USB cable/connections are properly connected. If the problem continues:
- 2.) Swap the USB cable/device with a known working cable/device. If the problem continues:
- 3.) Replace the I/O Board.

Name: I/O Board Audio Test

Description: Test all the audio channels on the I/O board.

Run Time: 00:03

If this test failed:

- 1.) Verify that the BEP to Backplane cable is properly connected and/or swap the cable with a known good cable. If the problem continues:
- 2.) Run the GFI tests on [7-5-12-3 "GFI" on page 7-66](#) to verify that the GFI is working correctly. If the GFI board is OK and the problem continues:
- 3.) Replace the I/O Board.

7-5-12-11 I/O Board Tests (cont'd)

NOTE: *The following Video tests can be used when the Touch Panel and the keys on the control panel are on/illuminated, but the monitor does not come on.*

Name: Video Status (Manufacturing)

Description: Tests if the I/O can detect a primary, secondary monitor and mother board video signal.

Run Time: 00:01

If this test failed:

- 1.) Verify that the BEP to Backplane cable is properly connected and/or swap the cable with a known good cable. If the problem continues:
- 2.) Swap monitors with a known working monitor. If the problem continues:
- 3.) Replace the monitor.

Name: Video Status (Service)

Description: Tests if the I/O can detect the primary monitor and the mother board video signal.

Run Time: 00:01

If this test failed:

- 1.) Verify that the BEP to Backplane cable is properly connected and/or swap the cable with a known good cable. If the problem continues:
- 2.) Swap monitors with a known working monitor. If the problem continues:
- 3.) Replace the monitor.

7-5-12-12 Tx Power Supply Test

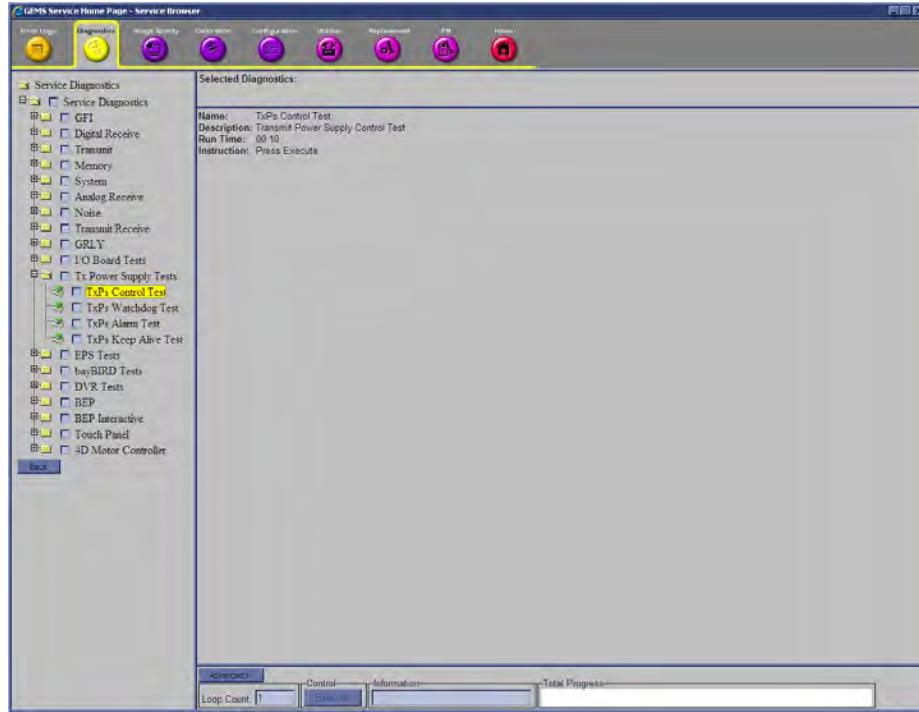
See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of the looping and list features.

Symptoms:

- System will not scan
- Interrupted scanning
- Scan unexpectedly stops

- 1.) Select the **Tx Power Supply Test** checkbox to run all the subtests, or select the individual subtests to run only the selected tests.
- 2.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 3.) Click Execute to run the test(s).

Figure 7-61 Tx Power Supply Tests Window



7-5-12-12 Tx Power Supply Test (cont'd)**Name: TxPs Control Test**

Description: Transmit Power Supply Control Test (Verifies the voltage points are within specifications)

Run Time: 00:10

If this test failed:

- 1.) Replace the power supply

Name: TxPs Watchdog Test

Description: Transmit Power Supply GFI Watchdog Test (Tests that the power supply watchdog is working)

Run Time: 00:07

If this test failed:

- 1.) Replace the power supply

Name: TxPs Alarm Test

Description: Transmit Power Supply Alarm Test (Tests the fault detection of power supply)

Run Time: 00:04

If this test failed:

- 1.) Replace the power supply

Name: TxPs Keep Alive Test

Description: Transmit Power Supply Keep Alive Test (Tests the communication between BEP and power supply and fault detection)

Run Time: 00:07

If this test failed:

- 1.) Replace the power supply

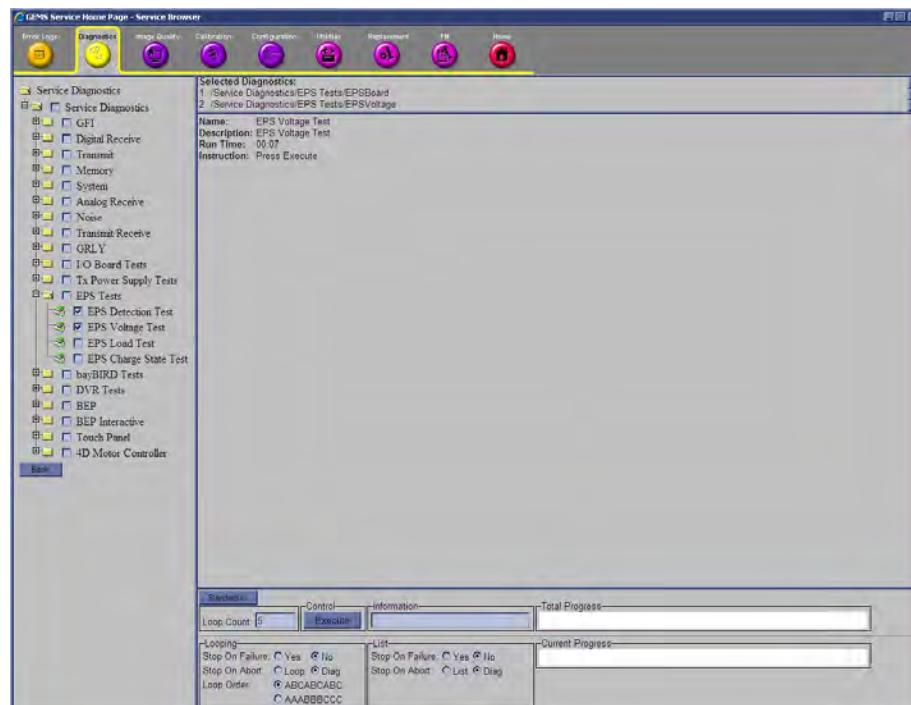
7-5-12-13 EPS (Extended Power Shutdown) or CB (ChargeBoard used in BEP6) Tests

See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of the looping and list features.

Symptoms:

- System shuts down immediately after power loss/interruption
- 1.) Select the **Extended Power Shutdown Tests** checkbox to run all the tests, or select the individual subtests to run only the selected tests.
 - 2.) Enter the desired Loop Count (numeric value of 4 digits or less).
 - 3.) Click Execute to run the test(s).

Figure 7-62 EPS or CB Tests Window



7-5-12-13 EPS (Extended Power Shutdown) or CB (ChargeBoard used in BEP6) Tests (cont'd)**Name: Extended Power Shutdown Detection Test**

Description: Extended Power Shutdown Detection Test (Verifies the BEP can communicate with the Extended Power Shutdown through the I/O board)

Run Time: 00:03

If this test failed:

- 1.) Run the I/O board tests: see: [7-5-12-11 "I/O Board Tests" on page 7-83](#).
- 2.) Replace the I/O board if there are any problems. If the I/O board tests are OK:
- 3.) Replace the Extended Power Shutdown.

Name: Extended Power Shutdown Voltage Test

Description: Extended Power Shutdown Voltage Test (Tests the specified voltages of the Extended Power Shutdown)

Run Time: 00:05

If this test failed:

- 1.) Run the I/O board tests: see: [7-5-12-11 "I/O Board Tests" on page 7-83](#).
- 2.) Replace the I/O board if there are any problems. If the I/O board tests are OK:
- 3.) Replace the Extended Power Shutdown.

Name: Extended Power Shutdown Load Test

NOTE: *Run this test with only one (1) loop. Do not run multiple loops on this test. Each loop will cause the battery to discharge power, requiring a longer time to recharge after the test.*

Description: Extended Power Shutdown Load Test (tests the battery load capacity)

Run Time: 00:30

If this test failed:

- 1.) Replace the Extended Power Shutdown battery

Name: Extended Power Shutdown Charge State Test

Description: Reads the charge state of the Extended Power Shutdown unit and displays it.

Run Time: 00:06

If this test failed:

- 1.) Run the I/O board tests. See: [7-5-12-11 "I/O Board Tests" on page 7-83](#).
- 2.) Replace the I/O Board if there any problems. If the I/O Board tests are OK:
- 3.) Replace the Extended Power Shutdown board and the battery pack.

7-5-12-14 bayBIRD Tests

See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of the looping and list features.

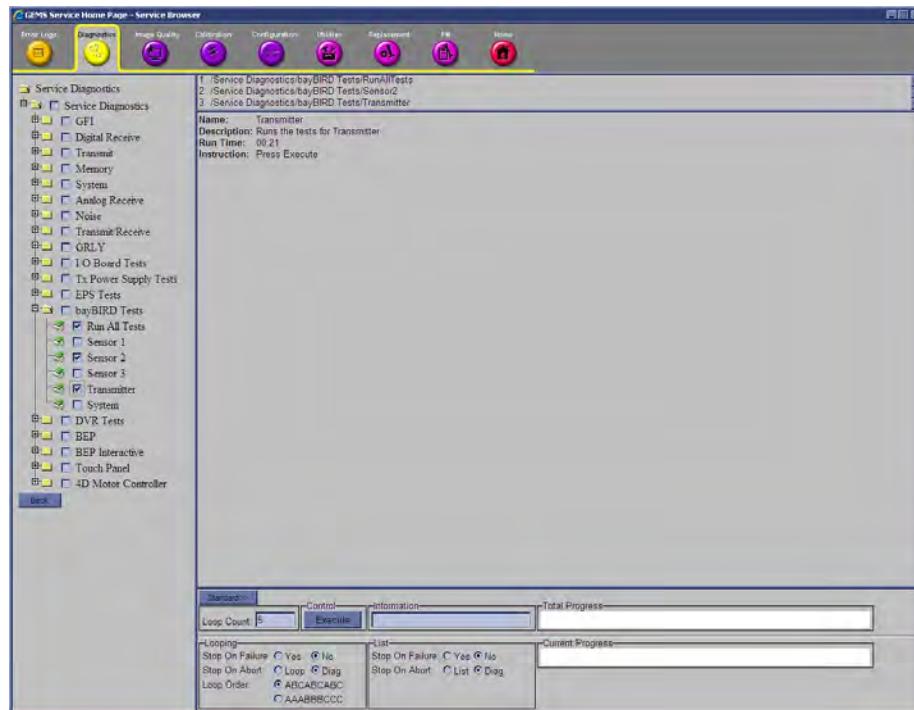
Symptoms:

- 3D triangulation position is off/wrong
- V Nav Issues/poor tracking

NOTE: RF/EMI interference may also cause conditions of these symptoms. See: [2-2-4 "EMI limitations" on page 2-5](#).

- 1.) Select the **bayBIRD Tests** checkbox to run all the tests, or select the individual subtests to run only the selected tests.
- 2.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 3.) Click Execute to run the test(s).

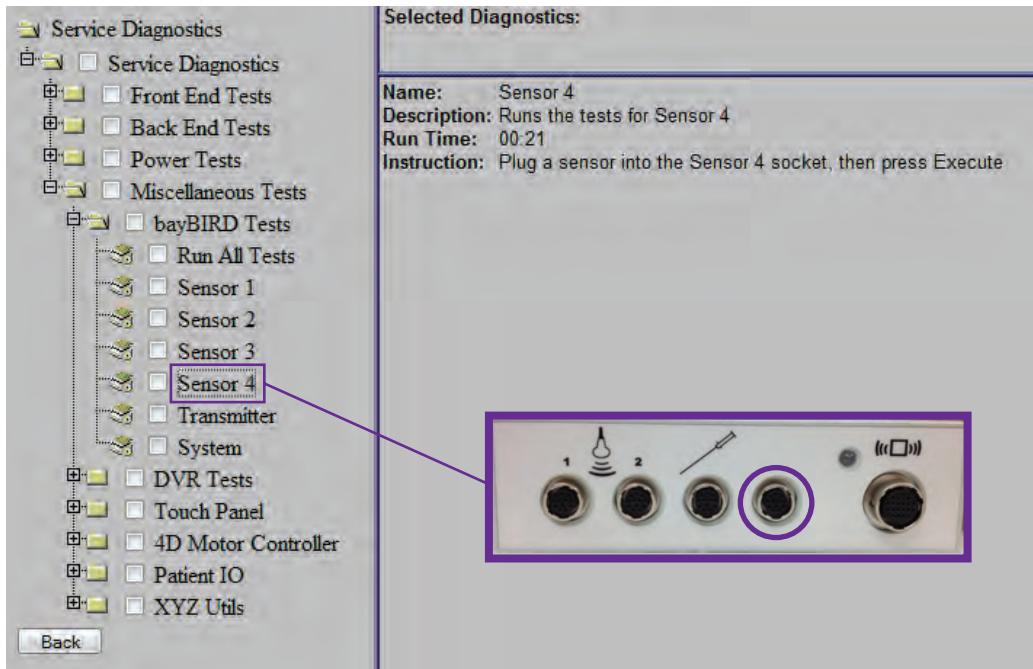
Figure 7-63 bayBIRD Tests Window



7-5-12-14 bayBIRD Tests (cont'd)

Sensor 4 added for DriveBay2+ 3D Tracking System, introduced in R4.

Figure 7-64 Miscellaneous Tests - bayBIRD (V Nav change)



7-5-12-14 bayBIRD Tests (cont'd)**Name: Run All Tests**

Description: Runs all of the tests that are in the box

Run Time: 00:24

If this test failed:

- 1.) Run subsequent tests as identified in the failed test results

Name: Sensor 1

Description: Runs the tests for Sensor 1

Run Time: 00:21

If this test failed:

- 1.) Move the sensor (transducer) to a different port. If the transducer fails, replace the transducer.
- 2.) If the problem still persists, replace the bayBIRD.

Name: Sensor 2

Description: Runs the tests for Sensor 2

Run Time: 00:21

If this test failed:

- 1.) Move the sensor (transducer) to a different port. If the transducer fails, replace the transducer.
- 2.) If the problem still persists, replace the bayBIRD.

Name: Sensor 3

Description: Runs the tests for Sensor 3

Run Time: 00:21

If this test failed:

- 1.) Move the sensor (transducer) to a different port. If the transducer fails, replace the transducer.
- 2.) If the problem still persists, replace the bayBIRD.

Name: Sensor 4 (R4 and bayBird2+)

Description: Runs the tests for Sensor 4

Run Time: 00:21

If this test failed:

- 1.) Move the sensor (transducer) to a different port. If the transducer fails, replace the transducer.
- 2.) If the problem still persists, replace the bayBIRD.

7-5-12-14 bayBIRD Tests (cont'd)**Name: Transmitter**

Description: Runs the tests for Transmitter

Run Time: 00:21

If this test failed:

- 1.) If the problem still persists, replace the bayBIRD.

Name: System

Description: Runs the tests for System

Run Time: 00:25

- 1.) If the problem still persists, replace the bayBIRD.

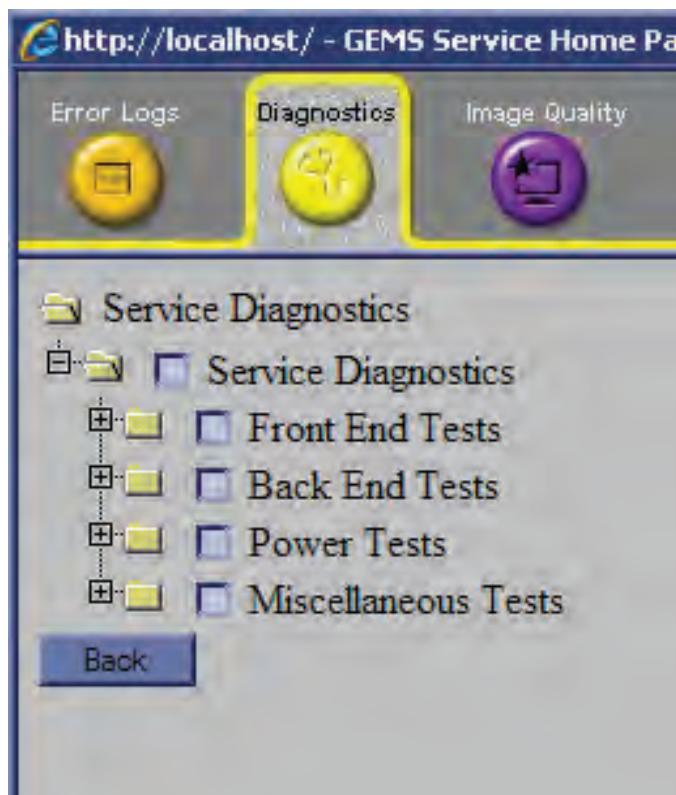
7-5-12-15 Diagnostics Window Overview - R3.x.x and later

Diagnostics for GFI Configurations running R3.x.x and later, and for MRX Configurations.

7-5-12-16 Diagnostics Menus on R3.x.x and later

In R 3.x.x and later, Service Diagnostics have been grouped in 4 major functional areas:

Figure 7-65 Diagnostics Menu - MRX



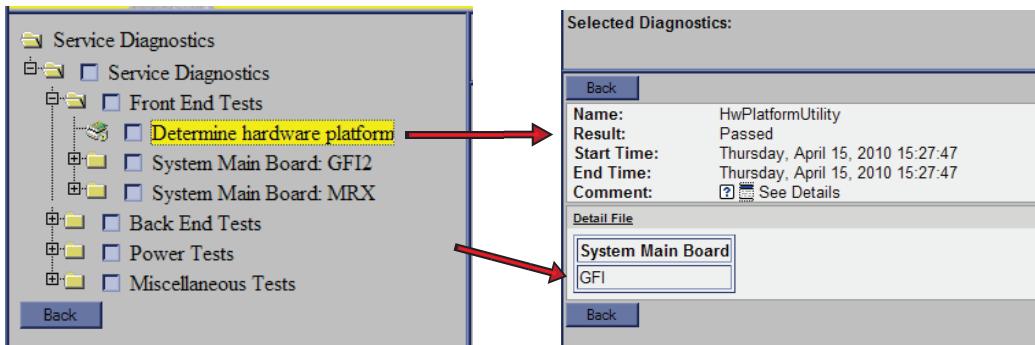
- **Front End Tests** - All Diagnostics related to Card Rack Boards.
- **Back End Tests** - All Diagnostics related to Back End Processor.
- **PowerTests** - All Diagnostics related to Transmit Power Supply and EPS.
- **Miscellaneous Tests** - All Diagnostics related to other devices and options

7-5-12-17 Determine Hardware Platform

When running this diagnostic, the system will return a result with the type of Card Rack configuration:

- **GFI** as System Main Board = Card Rack Configuration based on GFI2.
- **MRX** as System Main Board = Card Rack Configuration based on MRX.

Figure 7-66 Determine Hardware Platform

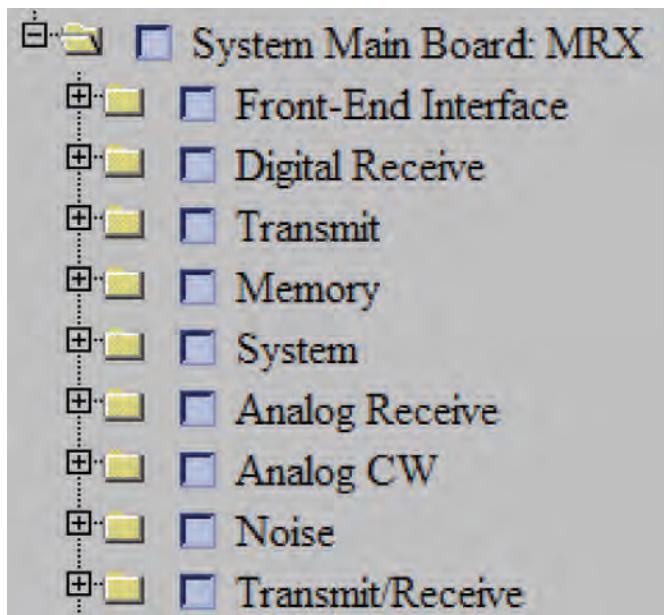


For GFI, run the test described in section 7-5-12 "Diagnostics for Service Diagnostics" on page 7-59.

7-5-12-18 System Main Board for MRX

For MRX Hardware platforms, run these tests.

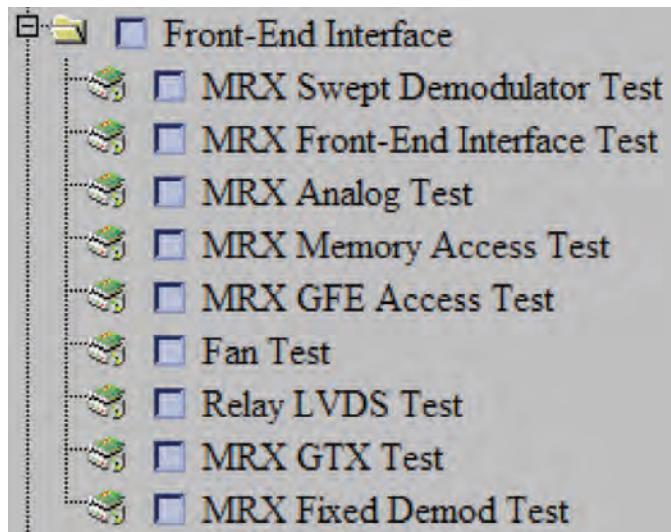
Figure 7-67 System Main Board Tests for MRX



NOTE: Same tests you find in R2.0.4 and later, but different naming conventions on some of the tests.

7-5-12-19 Front End Interface

This group of Diagnostics, test the MRX Board.

Figure 7-68 Front End Interface

NOTE: Same type of tests as the tests available for GFI.

Table 7-23 Front End Interface

Line	Name:	Description:	Run Time:	If this test failed:
1	MRX Swept Demodulator Test	Performs a signal path test of the swept demodulator FPGA on the MRX.	00:05	Replace the MRX board.
2	MRX Front End Interface Test	Test that the MRX can access Front End cards.	00:06	1.) Replace the MRX Board. 2.) If the diagnostic identifies problems with other boards, run tests on those boards also. 3.) Replace any other failed boards as identified by the diagnostics for those boards.
3	MRX Analog Test	Tests the analog circuitry of the MRX Board.	00:03	1.) Also run the Analog RX Tests (high, medium, low gain) for a complete test of the MRX gain. 2.) Replace the MRX Board.
4	MRX Memory Access Test	Tests the internal and external RAM of the MRX Board. (Same as the Memory Test folder).	00:01	Replace the MRX Board.
5	GFE Access Test	Reads the version of the GFE block in the MVP FPGA.	00:01	Replace the MRX Board.
6	Relay LVDS Test	Tests the LVDS connection between the MRX interface and the GRLY.	00:02	1.) Replace the GRLY Board. 2.) Replace the MRX Board.
7	Fan Test	Test Front End card rack fan control and fan speed measurements.	00:04	1.) Check fan tray in Front End Card Rack. Verify connection with backplane. Replace fan tray if any fan is defective. 2.) Replace PD board. 3.) Replace the MRX Board.
8	MRX GTX Test	Test communication with the GTX Board.	00:03	1.) Based on failure information, replace the failed GTX or swap the GTX Boards to isolate failure. 2.) Replace the MRX Board.
9	MRX Fixed Demod Test	MRX Fixed Demodulator signal path test.	00:03	Replace the MRX Board.

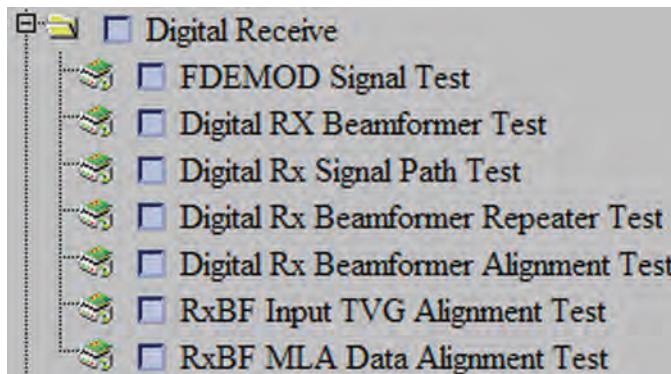
7-5-12-19 Front End Interface (cont'd)

Table 7-24 Front End Interface - Board Tested/Required Matrix for Diagnostics

Line	FRU - T = Tested / R = Required										
	GRLY	MRX	"GTX (slot2)"	"GTX (slot3)"	"GTX (slot4)"	PD	Back End Processor	"Front Plane Upper and Lower"	FREY Back Plane	"Fan Tray"	"Main Power Supply"
1		T				R	R		R		R
2		T				R	R		R		R
3		T				R	R		R		R
4		T				R	R		R		R
5		T				R	R		R		R
6	T	T				R	R		R		R
7		T				R	R		R	T	R
8		T	T	T	T	R	R		R		R
9		T				R	R		R		R

7-5-12-20 Digital Receive

This group of Diagnostics, test the MRX Board.

Figure 7-69 Digital Receive

NOTE: Same type of tests as the tests available for DRX.

Table 7-25 Digital Receive - Board Tested/Required Matrix for Diagnostics

Line	Name:	Description:	Run Time:	If this test failed:
1	FDEMOD Signal Test	Signal path test starting from the Fixed Demod on the MRX	00:03	1.) Replace the PCIe cable (BEP5 to MRX Backplane) 2.) If MRX test above fails, replace the MRX Board. 3.) Replace the BEP.
2	Digital RX Beamformer Test	High Speed Bit Error Test on the MRX	00:03	Replace the MRX Board.
3	Digital Rx Signal Path Test	Digital signal path sourced from input to RxBF. Does not test ADC. Sends simulated data across the signal path.	00:03	Replace the MRX Board.
4	Digital Rx Beamformer Repeater Test	Tests the functionality of the RxBF channel repeater. Looks for latency signal communication issues along the signal path.	00:05	Replace the MRX Board.
5	Digital Rx Beamformer Alignment Test	Output TVG of RxBF with system configured for max number of MLAs supported by the system. Verifies the alignment (4 identical samples in a row) of IF to MRX.	00:05	Replace the MRX Board.
6	RxBF Input TVG Alignment Test	Input TVG of RxBF with system configured for max number of MLAs supported by the system. (Internal and external test modes of RxBF.)	00:05	Replace the MRX Board.
7	RxBF MLA Data Alignment Test	Output TVG of RxBF with system configured for max number of MLAs supported by system. Each MLA gain is set differently to detect MLA ordering problems. Verifies the alignment (4 identical samples in a row) of IF to MRX.	00:05	Replace the MRX Board.

7-5-12-20 Digital Receive (cont'd)

Table 7-26 Digital Receive - Board Tested/Required Matrix for Diagnostics

Line	FRU - T = Tested / R = Required										
	GRLY	MRX	"GTX (slot2)"	"GTX (slot3)"	"GTX (slot4)"	PD	Back End Processor	"Front Plane Upper and Lower"	FREY Back Plane	"Fan Tray"	"Main Power Supply"
1		T				R	R		R		R
2		T				R	R		R		R
3		T				R	R		R		R
4		T				R	R		R		R
5		T				R	R		R		R
6		T				R	R		R		R
7		T				R	R		R		R
8		T				R	R		R		R

7-5-12-21 Transmit

Figure 7-70 Transmit

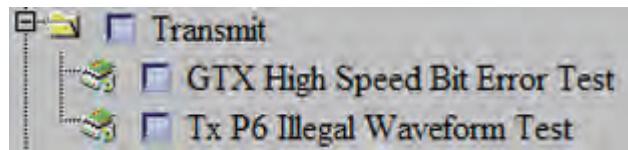


Table 7-27 Transmit

Line	Name:	Description:	Run Time:	If this test failed:
1	GTX High Speed Bit Error Test	High Speed Bit Error Test on the GTX	00:03	1.) Swap GTX Boards to determine if the failure point changes as the boards are moved. 2.) Replace any failed GTX boards. 3.) Interface to MRX may be the cause of the failure.
2	Tx P6 Illegal Waveform Test	Transmits an illegal waveform and checks the error registers.	03:21	1.) Swap GTX boards to determine if the failure point changes as the boards are moved. 2.) Replace any failed GTX boards. 3.) Interface to MRX may be the cause of the failure.

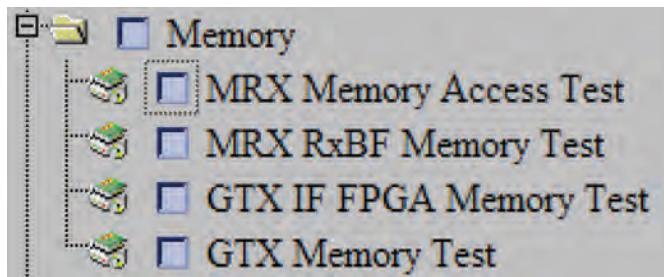
Table 7-28 Transmit - Board Tested/Required Matrix for Diagnostics

Line	FRU - T = Tested / R = Required										
	GRLY	MRX	"GTX (slot2)"	"GTX (slot3)"	"GTX (slot4)"	PD	Back End Processor	"Front Plane Upper and Lower"	FREY Back Plane	"Fan Tray"	"Main Power Supply"
1		T	T	T	T	R	R		R		R
2		T	T	T	T	R	R		R		R

7-5-12-22 Memory

Assesses the general state of the system. Tests the integrity of memory and communication of the described boards. Tests all of the on-board memory, including registers.

The utility fills the memory with data, retrieves the data, and compares it to the original data.

Figure 7-71 Memory - MRX**Table 7-29 Memory**

Line	Name:	Description:	Run Time:	If this test failed:
1	MRX Memory Access Test	Tests the internal and external RAM of the MRX Board.	00:01	Replace the MRX Board.
2	RxBF Memory Test	Tests the RxBF memory on the MRX Board.	00:01	Replace the MRX Board.
3	GTX IF FPGA Memory Test	Tests memory of Interface FPGAs on the GTX boards	00:01	Replace the failed GTX Board.
4	GTX Memory Test	Tests memory of the TxBF on the GTX Board	00:01	Replace the failed GTX Board.

Table 7-30 Memory - Board Tested/Required Matrix for Diagnostics

Line	FRU - T = Tested / R = Required										
	GRLY	MRX	"GTX (slot2)"	"GTX (slot3)"	"GTX (slot4)"	PD	Back End Processor	"Front Plane Upper and Lower"	FREY Back Plane	"Fan Tray"	"Main Power Supply"
1		T				R	R		R		R
2		T				R	R		R		R
3		R	T	T	T	R	R		R		R
4		R	T	T	T	R	R		R		R

7-5-12-23 System

Figure 7-72 System

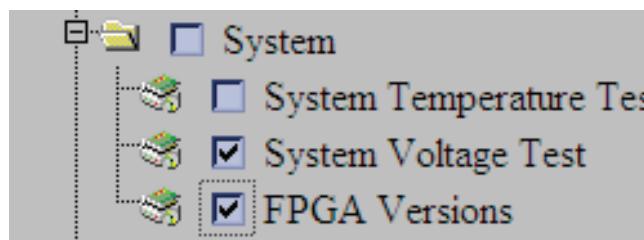


Table 7-31 System

Line	Name:	Description:	Run Time:	If this test failed:
1	System Temperature Test	Compares all system temperatures to their specified values	00:01	1.) The system should not be in a small enclosed space with other equipment that generates a lot of heat. Move the system away from walls and other equipment. 2.) Clean or replace any dirty fan filters. 3.) Replace the fan tray beneath the card rack if the tachometer readings are slow. Perform the Fan test to confirm issue. 4.) Check the fan on the BEP and replace the fan if it is not working. 5.) Replace the MRX Board if none of the above fixes the temperature problems.
2	System Voltage Test	Compares all system voltages to their specified values	00:01	1.) Check the voltage test points on the system boards. 2.) Replace the system boards that are out of tolerance. 3.) Check the main power supply. 4.) Replace the main power supply if it is out of tolerance.
3	FPGA Versions	Displays the version for all of the FPGAs	00:01	1.) If the test fails to read every FPGA version, check the connection between the Host and the MRX Board. Replace the MRX Board. 2.) If the test fails to read the GTX IF FPGA version, check the GTX boards.

Table 7-32 System - Board Tested/Required Matrix for Diagnostics

Line	FRU - T = Tested / R = Required										
	GRLY	MRX	"GTX (slot2)"	"GTX (slot3)"	"GTX (slot4)"	PD	Back End Processor	"Front Plane Upper and Lower"	FREY Back Plane	"Fan Tray"	"Main Power Supply"
1	T	T	T	T	T	T	R		R	T	R
2	T	T	T	T	T	R	R		R		R
3		T	T	T	T	R	R		R		R

7-5-12-24 Analog Receive

Figure 7-73 Analog Receive

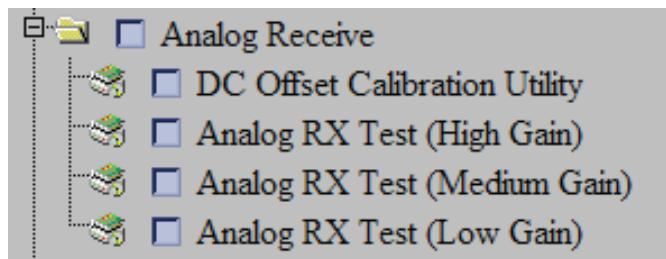


Table 7-33 Analog Receive

Line	Name:	Description:	Run Time:	If this test failed:
1	DC Offset Calibration Utility	Measures and corrects for the DC offset of the ADCs on the MRX. <i>NOTE: The DC Offset Calibration Utility diagnostic MUST be run when the MRX Board is replaced.</i>	00:02	Run this utility to calibrate the correct DC offset after replacing the MRX Board. A popup message alerts the user to run this utility after MRX Board has been replaced.
2	Analog RX Test (High Gain)	Analog signal path test of the MRX Board with a TGC set to high (peak) gain.	00:02	Replace the MRX Board.
3	Analog RX Test (Medium Gain)	Analog signal path test of the GRX boards with a TGC set to medium gain.	00:02	Replace the MRX Board.
4	Analog RX Test (Low Gain)	Analog signal path test of the GRX boards with a TGC set to low gain.	00:02	Replace the MRX Board.

Table 7-34 Analog Receive - Board Tested/Required Matrix for Diagnostics

Line	FRU - T = Tested / R = Required										
	GRLY	MRX	"GTX (slot2)"	"GTX (slot3)"	"GTX (slot4)"	PD	Back End Processor	"Front Plane Upper and Lower"	FREY Back Plane	"Fan Tray"	"Main Power Supply"
1	R	T				R	R	R	R		R
2	R	T				R	R	R	R		R
3	R	T	T	T	T	R	R	R	R		R
4	R	T	T	T	T	R	R	R	R		R

7-5-12-25 Analog CW

Figure 7-74 Analog CW

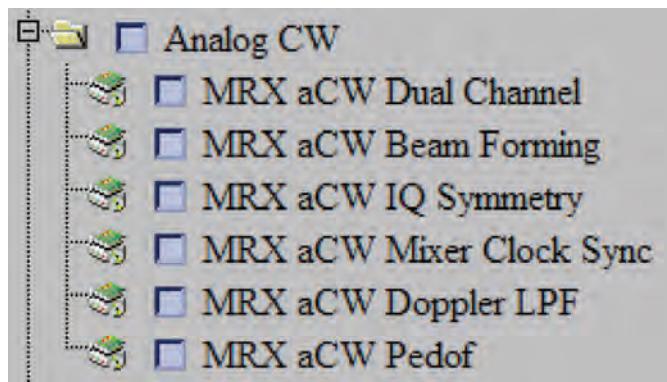


Table 7-35 Analog CW

Line	Name:	Description:	Run Time:	If this test failed:
1	MRX aCW Beam Forming	<p>A sum of sine waves with the same frequency, but different phase, gives a sine wave output where the amplitude is a function of the different phase settings.</p> <p>The test uses small overlapping groups (4 channels) where the channel pairs have different phase settings. Any amplitude deviation detected in this test, should indicate that there is something wrong with phase setup. For each subtest, a signal is set up with $f_0=2.521$ MHz, the BP filter at 3.1 MHz and a mixer frequency of 2.5 MHz. The dither and Pedof probe inputs are disabled. The parameters tested are: fdop, spectrum peak, RMS and SNR on the I-data.</p> <p>Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.</p>	00:05	Replace the MRX Board.
2	MRX aCW IQ Symmetry	<p>For each subtest, a signal is setup with $f_0=2.521$ MHz, the BP filter at 3.1 MHz and a mixer frequency of 2.5 MHz. The dither and Pedof probe inputs are disabled. The number of sub-test, with identical setup, is by default, eight. For the I/Q-symmetry test, the DC-component and RMS value for both the I and Q-part of the data set are measured. The symmetry quality measurement for this test is calculated from the RMS values for each sub-test.</p> <p>Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.</p>	00:05	Replace the MRX Board.
3	MRX aCW Mixer Clock Sync	<p>For the Mixer Clock Sync test, a signal is set up with $f_0=2.521$ MHz, the BP filter at 3.1 MHz and a mixer frequency of 2.5 MHz. The dither and Pedof probe inputs are disabled. The test enables one channel pair, plus each of the other channel pairs per sub test, one at the time. The parameters to test for are fdop, spectrum peak, RMS and SNR on the I-data.</p> <p>Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.</p>	00:05	Replace the MRX Board.

Table 7-35 Analog CW

Line	Name:	Description:	Run Time:	If this test failed:
4	MRX aCW BP Filter / Mixer Clk	In the Band Pass Filter / Mixer Clock Test, for each channel pair, a signal is set up with combinations of input signal frequency, Band Pass (BP) filters and mixer frequencies. The dither and Pedof probe inputs are disabled. The Doppler channel pairs are measured for the parameters: fdop, spectrum peak, RMS on I-data. Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.	00:08	Replace the MRX Board.
5	MRX aCW Doppler LPF	For the Low Pass Filter test, Doppler test frequencies, both in the filter pass band and the stop band are set up. The mixer clock frequency is set to 2.5 MHz and the band pass filter to 3.1 MHz. The dither and Pedof inputs are disabled. The LP-filter 3 dB frequency will typically be at about 40 kHz. The following parameters are tested: fdop, spectrum peak and RMS both in the I- and Q-data. Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.	00:05	Replace the MRX Board.
6	MRX aCW Pedof	In the test, the two center frequencies of 2 MHz and 6 MHz are verified. These frequencies are set by switching the Pedof band pass filter. The MRX test signal generator is used to input sine waves. The Pedof test signal input is enabled. The dither and Pedof probe inputs are disabled. Sub tests using combinations of input signal frequency, Pedof band pass filter settings, mixer clock frequency, test signal gain, and IQ gains are run. Parameters tested: fdop, spectrum peak, RMS, SNR and THD on both I- & Q-data. With this test the Pedof (SD probe) CW path on the MRX Board is tested. Are the probes connected? The test will run with probes connected to the scanner, but it is recommended to disconnect all probes before running diagnostics.	00:05	Replace the MRX Board.

Table 7-36 Analog CW - Board Tested/Required Matrix for Diagnostics

Line	FRU - T = Tested / R = Required										
	GRLY	MRX	"GTX (slot2)"	"GTX (slot3)"	"GTX (slot4)"	PD	Back End Processor	"Front Plane Upper and Lower"	FREY Back Plane	"Fan Tray"	"Main Power Supply"
1	T	T				R	R	R	R		R
2	T	T				R	R	R	R		R
3	T	T	T	T	T	R	R	R	R		R
4	T	T	T	T	T						
5	T	T	T	T	T						
6	T	T	T	T	T	R	R	R	R		R

7-5-12-26 Noise

Table 7-37 Noise

Line	Name:	Description:	Run Time:	If this test failed:
1	Noise Floor Test	Measures the noise floor of the System. The entire system is required for this diagnostic. The noise floor is calculated from IQ data received without a signal source.	00:02	1.) See: 7-9-2 "Noise" on page 7-195 for information on minimizing environmental noise. If the problem continues: 2.) Try a new probe (channels in the probe may be faulty). If the problem continues: 3.) Run the tests for Analog Receive

Table 7-38 Noise - Board Tested/Required Matrix for Diagnostics

Line	FRU - T = Tested / R = Required										
	GRLY	MRX	"GTX (slot2)	"GTX (slot3)"	"GTX (slot4)"	PD	Back End Processor	"Front Plane Upper and Lower"	FREY Back Plane	"Fan Tray"	"Main Power Supply"
1	T	R				R	R		R		R

7-5-12-27 Transmit/Receive**Table 7-39 Transmit/Receive**

Line	Name:	Description:	Run Time:	If this test failed:
1	T/R Channel Test	Transmit and Receive Channel Test. Transmits on one at a time and received on one channel at a time using an open probe connector.	00:03	1.) Swap front-plane boards to determine if the failure point changes as the boards are moved. Replace Front Plane is determined to be failing. 2.) Swap GTX boards around to check if the failure follows one of the boards. Replace if determined to be failing. 3.) Replace GRLY. 4.) Replace the MRX Board.

Table 7-40 Transmit/Receive - Board Tested/Required Matrix for Diagnostics

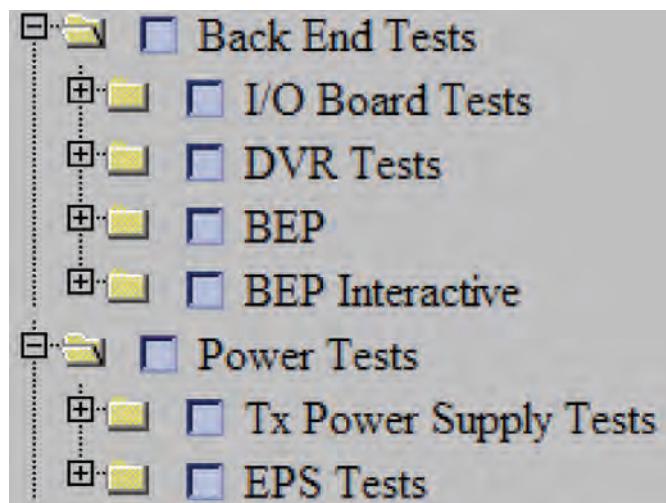
Line	FRU - T = Tested / R = Required										
	GRLY	MRX	"GTX (slot2)	"GTX (slot3)"	"GTX (slot4)"	PD	Back End Processor	"Front Plane Upper and Lower"	FREY Back Plane	"Fan Tray"	"Main Power Supply"
1	T	T	T	T	T	R	R	R	R		R

7-5-12-28 Back End Tests

Back End test includes tests on devices inside the BEP.

7-5-12-29 Power test includes tests on the Transmit Power Supply and the EPS

NOTE: No Changes for MRX Configurations. Same tests found in R2.0.4 or later. See: [7-5-14 "Diagnostics - BEP" on page 7-112](#).

Figure 7-75 Back End Tests - MRX

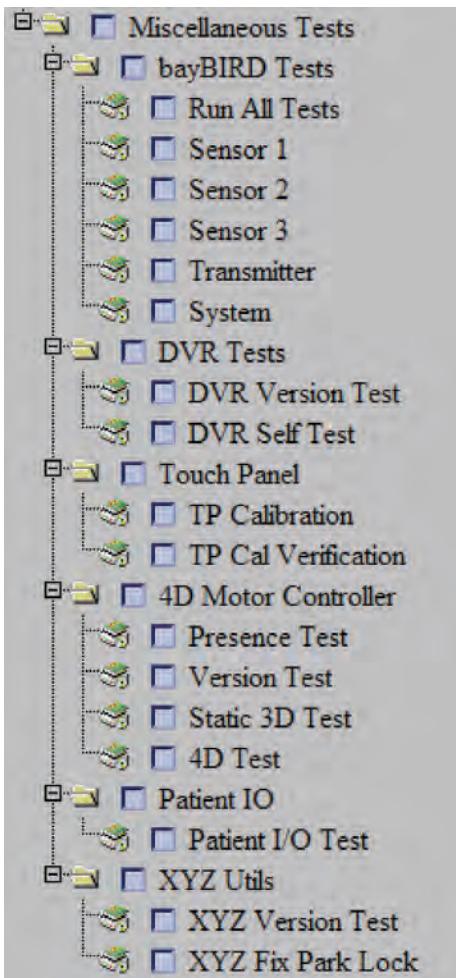
7-5-12-30 Miscellaneous Tests

This group of Diagnostics, test the VNAV Drive bay (bayBIRD), DVR, 4D options and Touch Panel and XYZ tests.

NOTE: *No Changes for MRX Configurations. Same tests found in R2.0.4 or later. See:*

- 7-5-12-14 "bayBIRD Tests" on page 7-91.
- Table 7-18 "Touch Panel Tests Table" on page 7-43.
- Table 7-19 "DVR Tests Table" on page 7-43.
- Table 7-20 "4D Motor Controller Tests Table" on page 7-43.
- Table 7-21 "Patient I/O Test Table" on page 7-43.
- Table 7-22 "Testing the XY Control" on page 7-44.

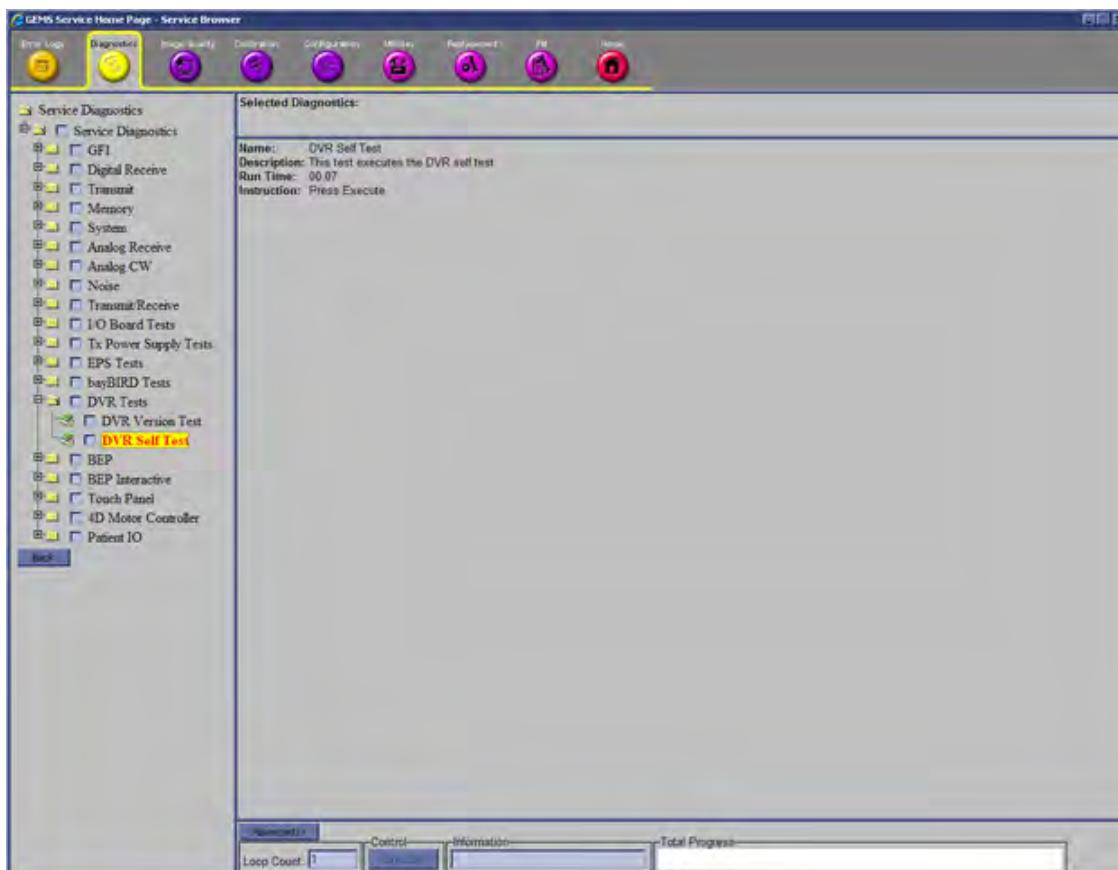
Figure 7-76 Miscellaneous Tests - MRX



7-5-13 DVR Tests

NOTE: R6 and later will not have this test since the hardware DVR Option is not supported, only software DVR. See: [4-3-19-7 "Software DVR \(Option\) Configuration Functional Checks" on page 4-52.](#)

Figure 7-77 DVR Test Screen



Name: DVR Version Test

Description: Reads the current version of the DVR board if installed

Run Time: 00:01

- 1.) If fails, re-seat board and run DVR self test
- 2.) If problem persist, replace DVR Board

Name: DVR self Test

Description: This test executes a self test of the DVR Board if installed

Run Time: 00:07

- 1.) If fails, re-seat board
- 2.) If problem persist, replace DVR Board

7-5-14 Diagnostics - BEP

For Diagnostic differences, see [7-5-16 "Diagnostics - BEP Interactive Tests - R4.x and later" on page 7-125.](#)

Table 7-41 BEP Test Description Table for R3.x and earlier

Test	Description
Essential test	PCI, PCI Express, CPU, Memory, HD Disk, and Video.
Hard Disk Long	Extensive test of Hard Disk Drive.
Hard Disk Short	Abbreviated test of Hard Disk Drive.
Memory	Tests the memory on the mother board.
Network Adapter	Tests connectivity to other devices on the network.
System board	Tests the real time clock.
Video	Tests the video boards.

Table 7-42 BEP Test Description Table for R4.x and later

Test	Description
Essential test	PCI, PCI Express, CPU, Memory, HD Disk, and Video with or without Network.
Hard Disk Long	Extensive test of Hard Disk Drive.
Hard Disk Short	Abbreviated test of Hard Disk Drive.
Memory	Tests the memory on the mother board.
Network Adapter	Tests connectivity to other devices on the network.
System board	Tests the real time clock.
Video	Tests the video boards.

7-5-14-1 Essential Tests

See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of this window's features.

Runs tests on essential functions of the BEP. This is a good starting point for isolating issues that may originate from the BEP. The test results are displayed in the Status portion of the window.

Run Time: About 2 minutes.

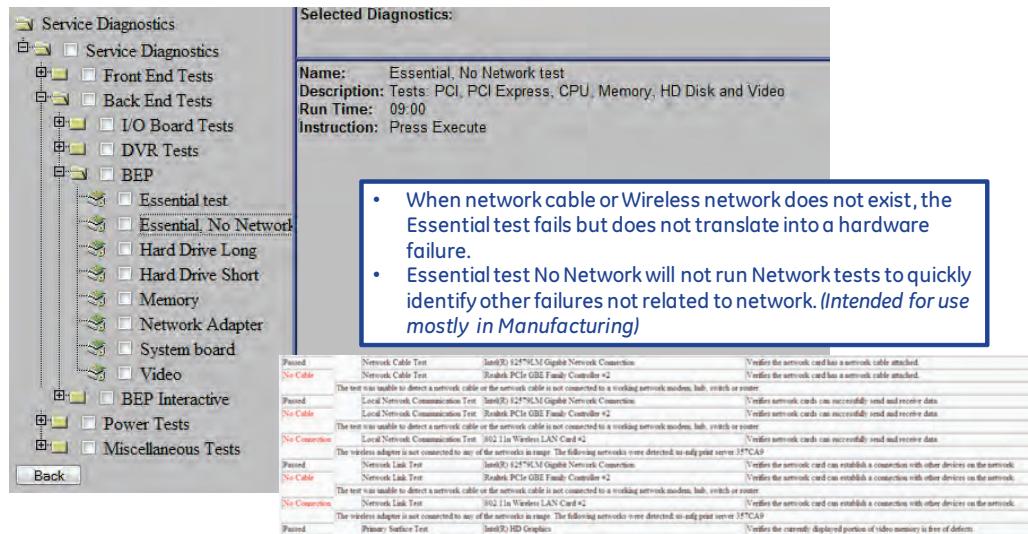
- 1.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 2.) Click the Execute button.
- 3.) Failed tests may have another diagnostic test that can help isolate the failure, or will indicate which part to replace. For:
 - PCI Bus configuration
 - CMOS memory
 - CPU - run [7-5-14-3 "System Board" on page 7-115](#)
 - RAM - run [7-5-14-12 "Memory" on page 7-123](#)
 - Hard Drive status and Random Seek - run [7-5-14-4 "Hard Disk Drive Surface Scan" on page 7-116](#) and run [7-5-14-5 "Hard Disk Drive Quick Test" on page 7-117](#)
 - Network Interface (loopback only) - run [7-5-14-10 "Network Adapter" on page 7-121](#).

7-5-14-2 Essential Tests differences in R4 and later

Essential test in R4 has two versions:

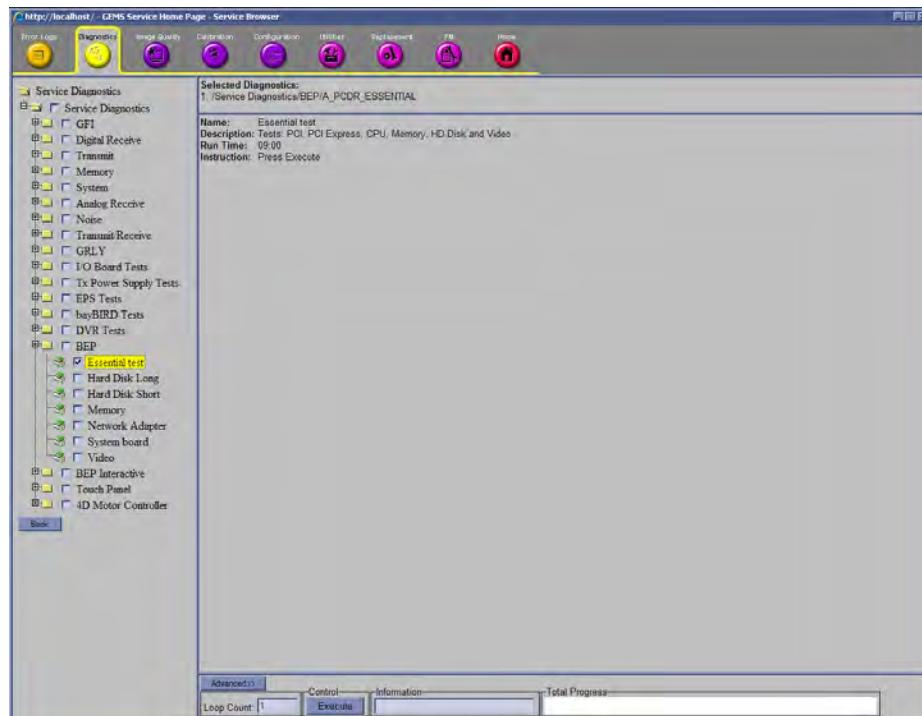
- Essential test: Complete test, same as R3 or earlier
- Essential test, No network: same test, except it does not run the network tests for wired or wireless connection.

Figure 7-78 Essential Tests Window



7-5-14-1 Essential Tests (cont'd)

Figure 7-79 Essential Tests Window



7-5-14-3 System Board

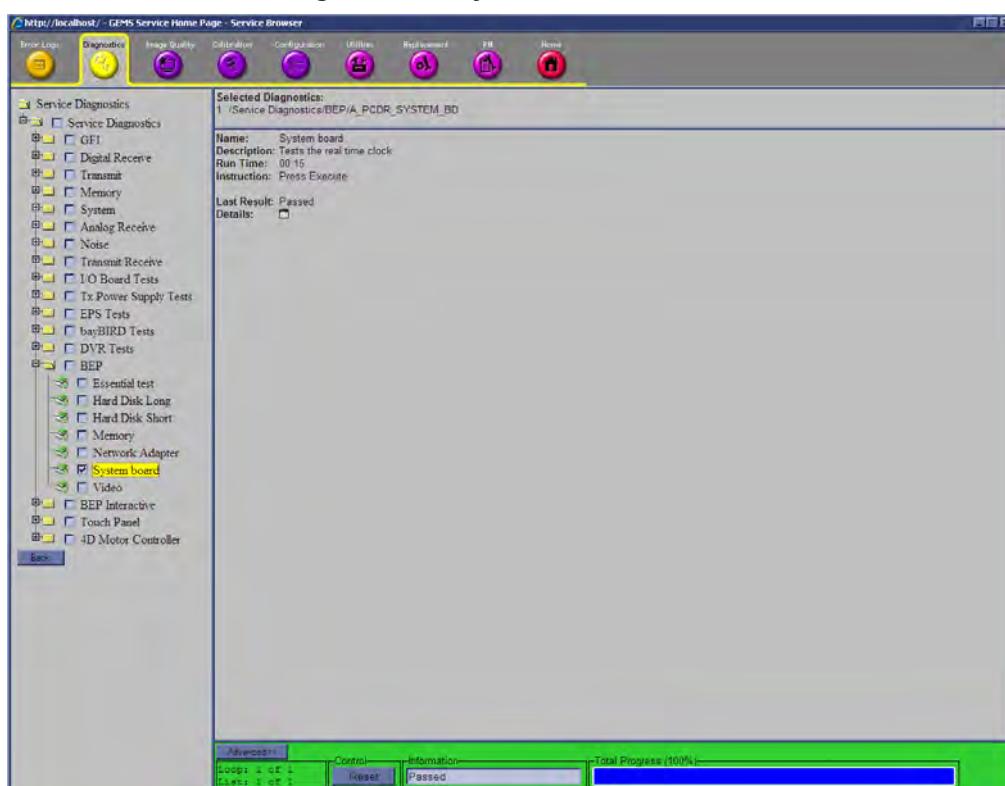
See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of this window's features.

Runs tests on essential functions of the PC Mother Board. The test results are displayed in the Status portion of the window.

Run Time: About 1 minute.

- 1.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 2.) Click the Execute button. If there are any failures:
 - 3.) Check the Motherboard Harness. Swap with a known good harness. If the problem continues:
 - 4.) Replace the Motherboard. If the problem continues:
 - 5.) Replace the BEP.

Figure 7-80 System Board Window



7-5-14-4 Hard Disk Drive Surface Scan

See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of this window's features.

Runs tests on essential functions of the Hard Disk Drive. The test results are displayed in the Status portion of the window. This test can take a long time to complete. For a quick test to determine if there are possible problems with the Hard Disk Drive, run

[7-5-14-5 "Hard Disk Drive Quick Test" on page 7-117](#) before running this test.

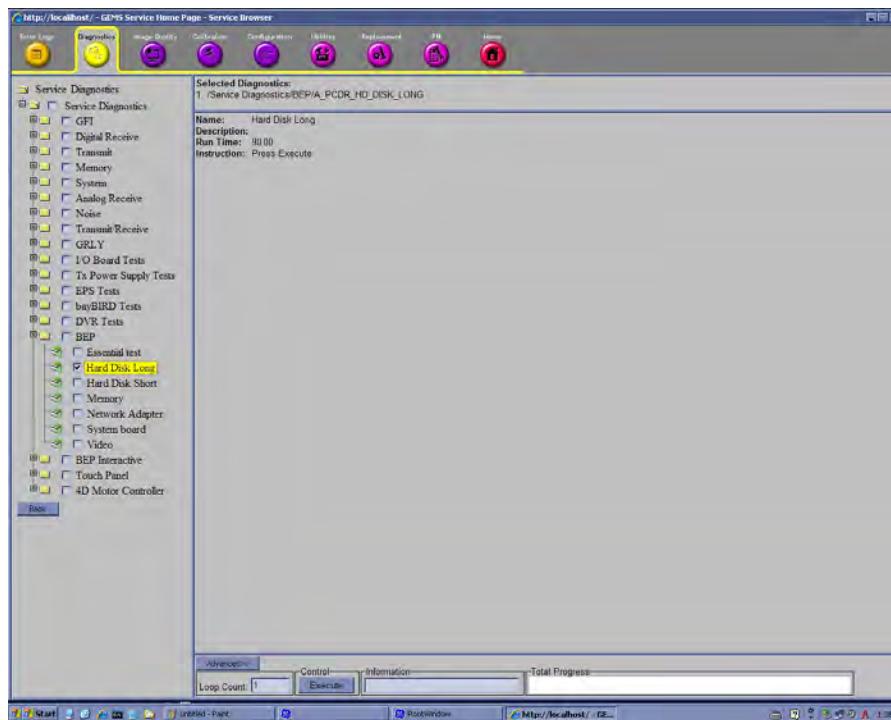
The following tests are performed on your hard drive to ensure the Hard Disk Drive controller and the drive mechanism are working correctly. The disk surface itself is also checked.

- Drive Status - Hard Disk Drive heads are moved from track 0 to the maximum track one track at a time.
- Random Seek - Hard Disk Drive heads are moved randomly several hundred times.
- Surface Scan - This test scans for surface defects on the Hard Disk Drive.

Run Time: May take over an hour.

- 1.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 2.) Click the Execute button. If there are any failures:
- 3.) Replace the Hard Disk Drive.

Figure 7-81 Hard Disk Drive Surface Scan Window



7-5-14-5 Hard Disk Drive Quick Test

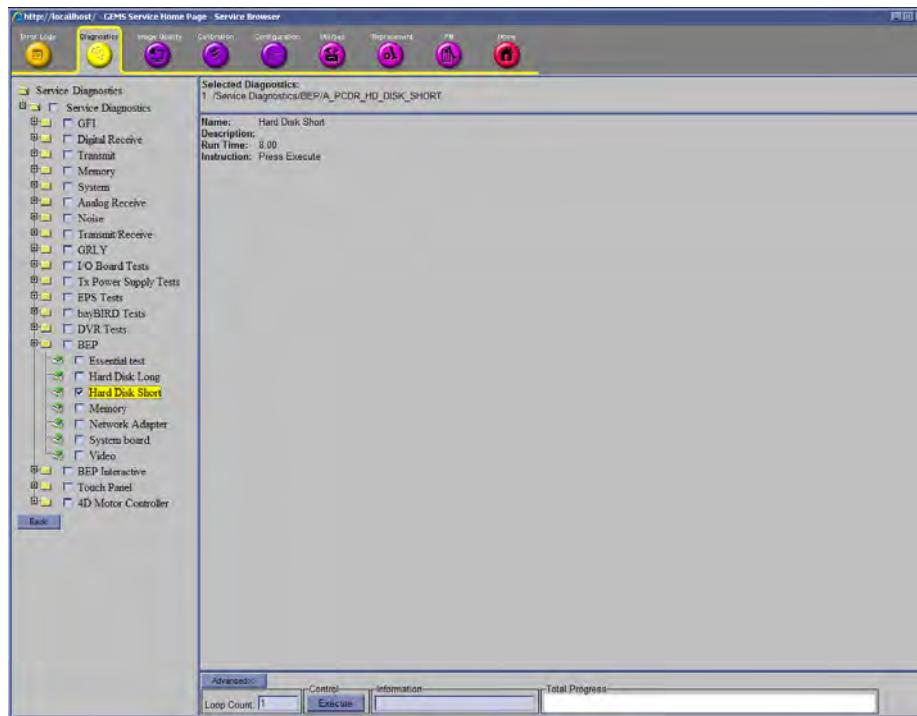
See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of this window's features.

Runs an overview set of tests on essential functions of the Hard Disk Drive. The test results are displayed in the Status portion of the window. Run this test before running the [7-5-14-4 "Hard Disk Drive Surface Scan" on page 7-116](#).

Run Time: May take about 6 minutes.

- 1.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 2.) Click the Execute button. If there are any failures:
- 3.) Defragment the Hard Disk Drive. See: [7-5-21-10 "Disk Defragmenter" on page 7-143](#). If the problem continues:
- 4.) Run the [7-5-14-4 "Hard Disk Drive Surface Scan" on page 7-116](#). If the problem continues:
- 5.) Replace the Hard Drive.

Figure 7-82 Hard Disk Drive Quick Test Window



7-5-14-6 Video Card

See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of this window's features.

Runs a test on essential functions of the Video Card. The test results are displayed in the Status portion of the window.

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.

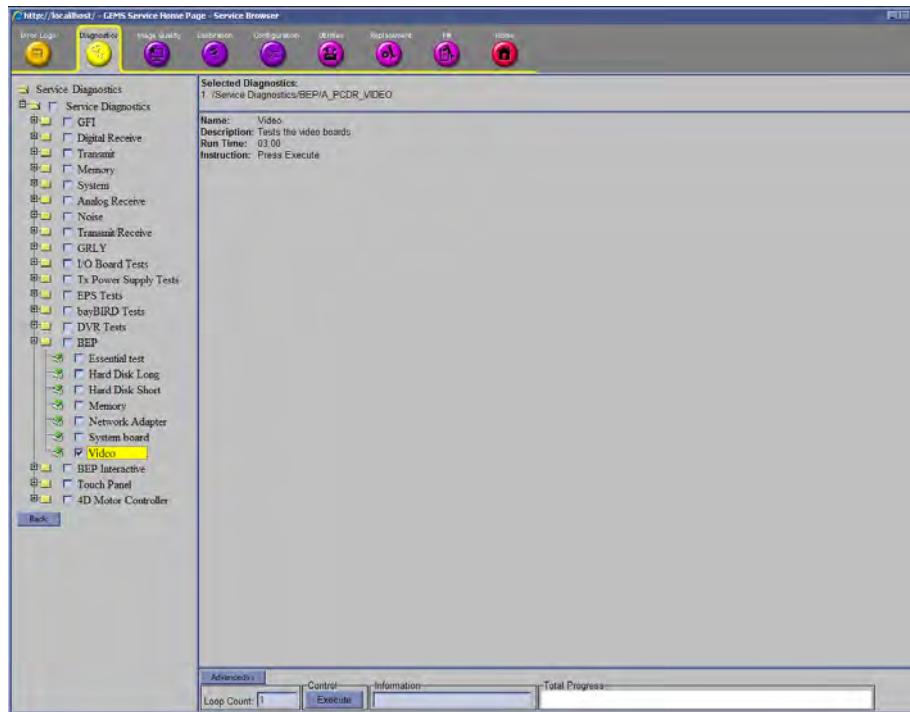
The following tests are performed on your monitor:

- 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.
- 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.
- Text Output - This test prints a text string in random sizes and colors to test your video device driver and video controller.

Run Time: May take about 10 minutes.

- 1.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 2.) Click the Execute button.
- 3.) Replace the Video Card if there are any errors. If the problem continues:
- 4.) Replace the BEP.

Figure 7-83 Video Card Window



7-5-14-7 S-Video Image displays a portion of the Main Display

The S-Video image displays a portion of the main display that includes the probe image in both single and dual probe display modes. To provide increased resolution and maintain the proper aspect ratio on the S-Video display, the entire main display image is not projected on the S-Video monitor. The S-Video crop area was selected to optimize the probe image so when the LOGIQ E9 is not in an imaging mode, the S-Video will continue to display a cropped portion of the screen which may appear incorrect.

7-5-14-8 The Monitor Measurement Summary Sidebar does not appear after Upgrading to R6

After upgrading to R6, the monitor Measurement Summary Sidebar does not appear, and the image uses the same space it would for Dual, all the time. So the image will go right up to the left edge of the screen.

When upgrading to R6 software in a LOGIQ E9 with a 19 inch LCD, the following steps must be completed to have the correct layout for 19 inch Monitors. DO NOT skip this step, or the monitor layout will not be correct.

- Go to **Utilities -> System -> System Display:**
 - Set the drop-down menu in Use Wide Screen for... > Single Image to OFF
 - Make sure the checkbox in Side Panel Content > Measurement Summary is checked.

7-5-14-9 Monitor Adjustment Controls do not show for the OLED Monitor

Symptom: Monitor Adjustment Controls do not show for the OLED Monitor.

Description: LOGIQ E9 boots up normally but no Room profile, color profile, gamma or color space controls are visible on the Touch Panel Utility pages. This is an indication that the LOGIQ E9 has not identified the OLED Monitor USB device, although is able to display video.

Log file may display an entry as in the following example:

Info ; CSonyOled(3904); Sony OLED S/N 0x8000261 found;

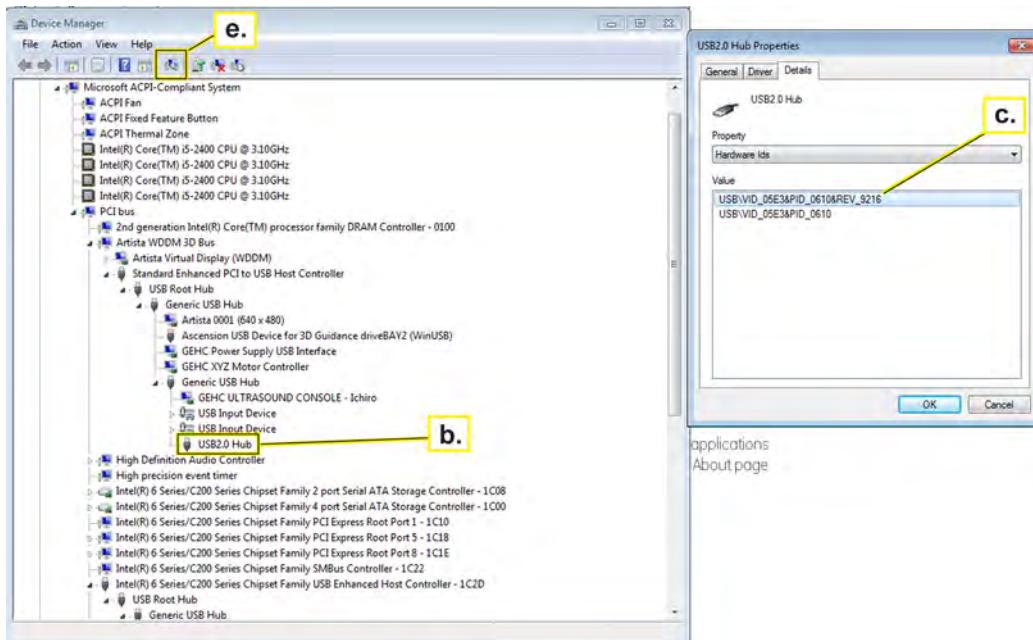
Error ; CSonyOled(3904); Unable to connect to Sony OLED S/N 0x8000261;

Workaround: Rebooting the LOGIQ E9 should re-connect the OLED.

If the problem persist, the driver may be corrupted and may need to be un-installed and re-installed again. You can accomplish this in two ways:

- 1.) Re-ghosting C partition only. You could use software reload feature in the common service desktop to accomplish the C partition plus application load automatically. Or, you can load it from disks.
- 2.) Un-install and re-install the driver manually.
 - a.) Exit to Windows
 - b.) Open device manager, select the USB2.0 Hub under the Generic USB Hub that contains the console. See illustration.
 - c.) Right click on properties for the USB2.0 Hub, under details tab verify that it is the VID 05E3 USB Hub
 - d.) Right click uninstall. Note: do not remove any device, only click on uninstall. Removing the device will require to re-ghost to recover the driver.
 - e.) Then click on “scan for hardware changes” icon. Install the driver and reboot. You may need to reboot twice for the change to work.

Figure 7-84 Un-install and re-install the driver manually



7-5-14-10 Network Adapter

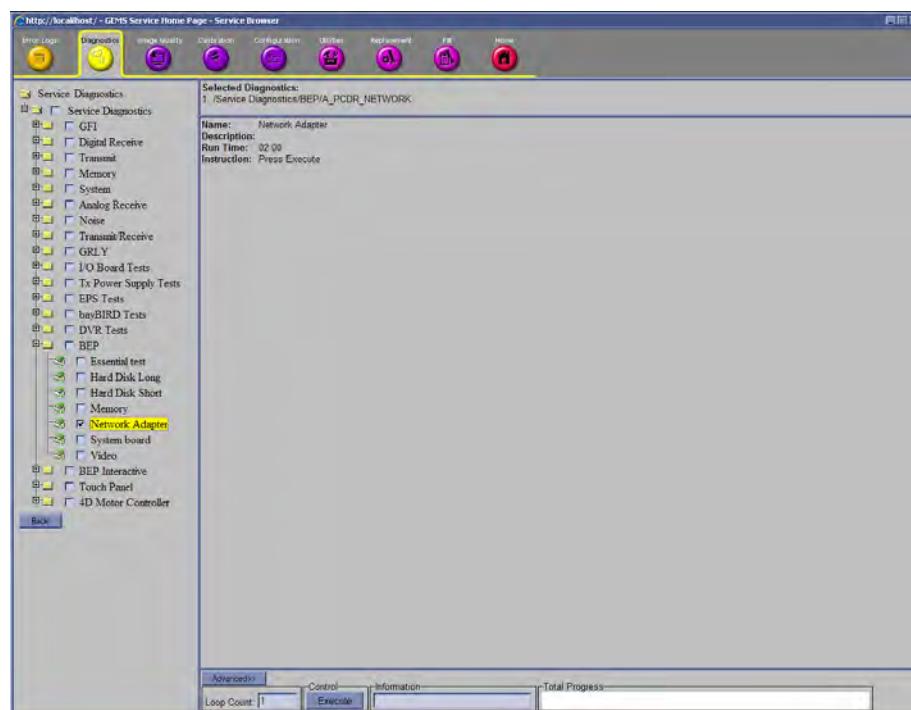
See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of this window's features.

Runs a test on essential functions of the Network Interface. The test requires the system to be connected to a network. The test results are displayed in the Status portion of the window.

This test gives the current status of the network and provides the option to restart the network components in the BEP.

- 1.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 2.) Click the Execute button.

Figure 7-85 Network Interface Window



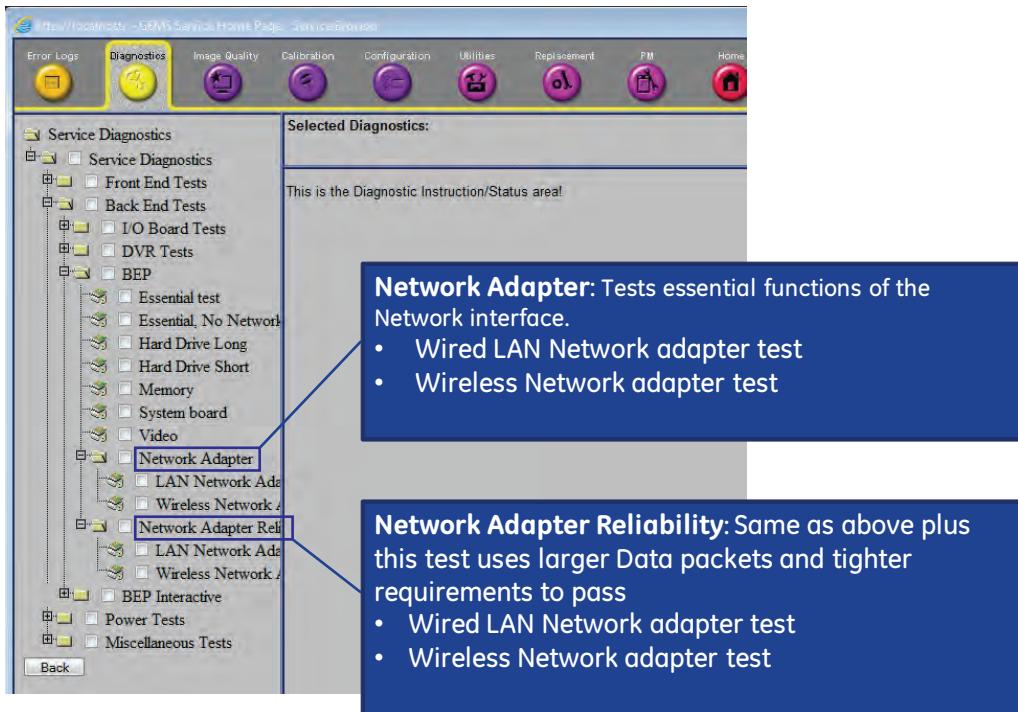
7-5-14-11 Network Adapter Diagnostic Changes for R4

Network Adapter Test is split into 2 folders:

- Network Adapter - see: [Table 7-128 on page 7-161](#) and [Table 7-129 on page 7-162](#)
- Network Adapter Reliability - see: [Table 7-130 on page 7-163](#) and [Table 7-131 on page 7-164](#)

Each folder contains separate tests for Wired and Wireless Adapters.

Figure 7-86 Network Adapter Diagnostics Window - R4



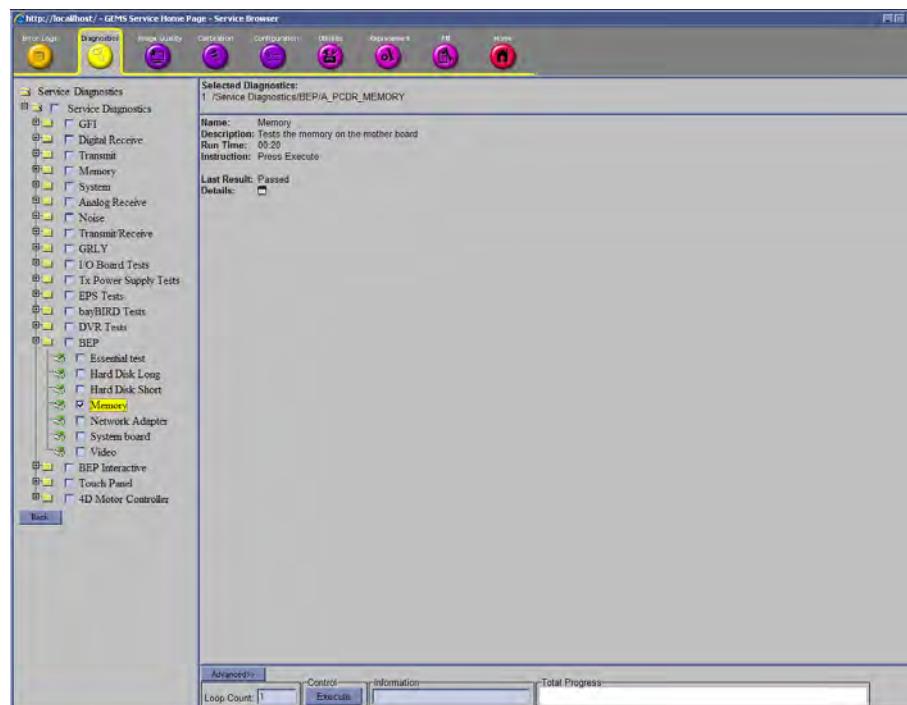
7-5-14-12 Memory

See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of this window's features.

Runs a test on essential functions of the Memory. The test results are displayed in the Status portion of the window.

- 1.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 2.) Click the Execute button.
- 3.) Replace the BEP if any tests fail.

Figure 7-87 Memory Window



7-5-15 Diagnostics - BEP Interactive Tests

Table 7-43 BEP Interactive Test Description Table - R3.x and earlier

Test	Description
AVI playback	Tests playing back an AVI file.
CD-R test	Tests writing and reading to a CDR
CD-RW	Not supported - Tests writing and reading data to a CD-ROM
DVD-R	Tests writing and reading data to a DVD-R disk
DVD-RDL	Not supported - Tests writing and reading to a DVD-R double layer disk
DVD-RW	Not supported - Tests writing and reading a DVD-RW disk
DVD+R	Not supported - Tests writing and reading to DVD+R media.
DVD+RDL	Not supported - DVD+R double layer
DVD+RW	Not supported - DVD+RW read write test
DVD_RAM	Not supported - DVD RAM read and write test
DVD_READONLY	Not supported - DVD RAM read and write test
Keyboard	N/A
Microphone	N/A
Monitor	Monitor test patterns
Trackball	N/A
Sound	Generates sounds for testing the speakers
USB Ports	Lists USB Devices

7-5-16 Diagnostics - BEP Interactive Tests - R4.x and later

Interactive tests in R4 and later have been reduced. Tests that are not supported are no longer listed.

Table 7-44 BEP Interactive Test Description Table - R4.x

Test	Description
AVI playback	Tests playing back an AVI file.
CD-R test	Tests writing and reading to a CDR
DVD-R	Tests writing and reading data to a DVD-R disk
DVD READONLY	Not supported - DVD RAM read and write test
Keyboard	N/A
Microphone	N/A
Monitor	Monitor test patterns
Trackball	N/A
Sound	Generates sounds for testing the speakers
USB Ports	Lists USB Devices

If you want to run these tests, it is recommended to run on a DOS prompt instead of CDS. This test will take approximately 70 seconds.

- Insert the service ky
- Exit from the scanner software and exit to Windows
- Start a DOS prompt
- Insert a blank DVD-R into the drive
- Enter the command:
 cd %insite_home%\PCDoctor\bin
 pcd run --file scripts\dvdminusr.xml

There is another test with a CD-R disk. It is not recommended because it takes over 30 minutes. If you want to run the CD-R test, enter the command:

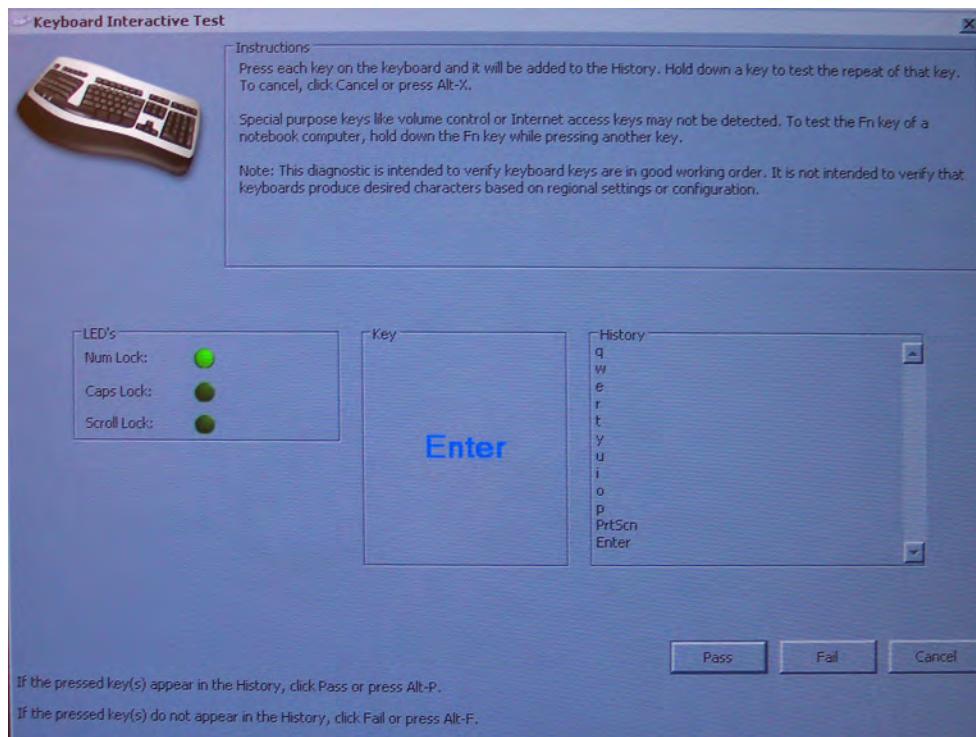
```
pcd run --file scripts\cdr.xml-R
```

7-5-16-1 Keyboard

See: 7-5-7 "Diagnostics Window Overview" on page 7-30 for a description of this window's features.

- 1.) Click the Execute button on the Keyboard window. The PC-Doctor Keyboard Test opens.
- 2.) Select your keyboard type from the drop-down menu. Usually the default choice is the correct one.
- 3.) Click the Start button.
- 4.) Press each key on the system's keyboard once and make sure the corresponding keys on-screen are removed from view.
 - Click the Pass button if all the keys are removed from the PC-Doctor Keyboard Test.
 - Click the Fail button if any key is not removed from the on-screen keyboard. Failed keys may be damaged and you may have to have your keyboard repaired or replaced.
 - Click the Abort button to exit the test.
- 5.) The test status is displayed in the Current Status portion of the window.

Figure 7-88 Keyboard Window



7-5-16-1 Keyboard (cont'd)

Footswitch Tests

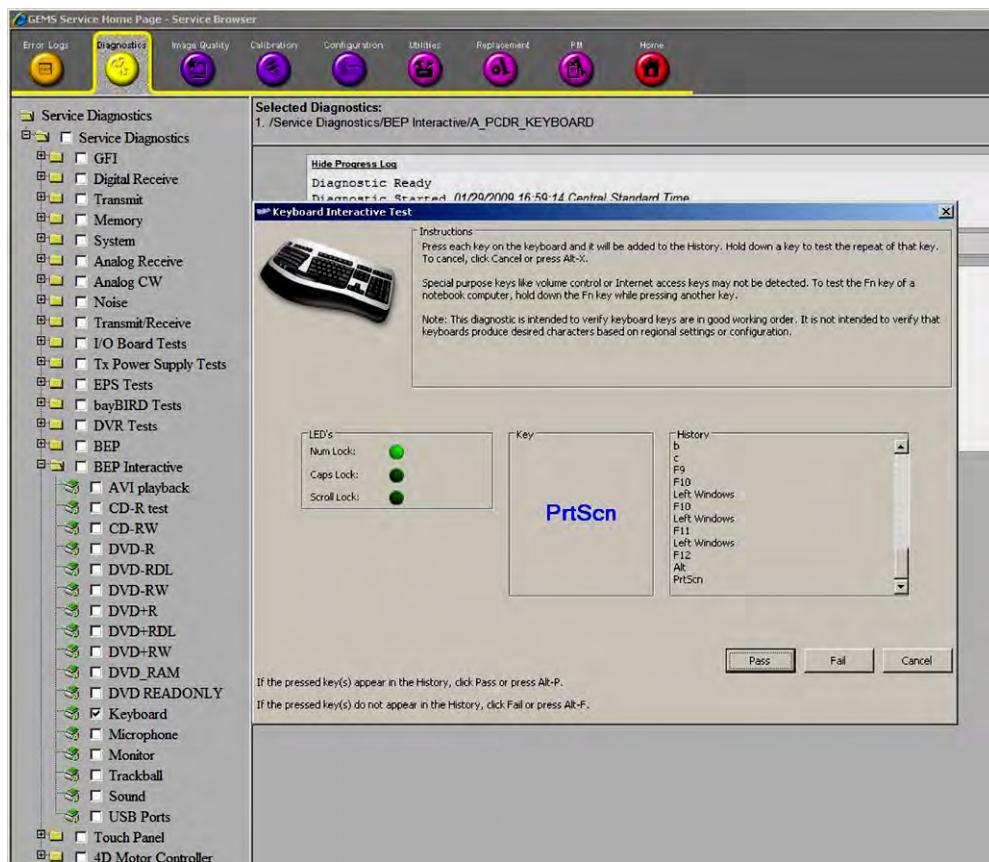
Under Service Diagnostics / BEP Interactive/ Keyboard

INPUT > Press left, middle or right footswitch keys.

OUTPUT > Keys will be registered as follows:

- Left Footswitch = Left Windows + F10
- Middle Footswitch = Left Windows + F11
- Right Footswitch = Left Windows + F12

Figure 7-89 Footswitch Tests



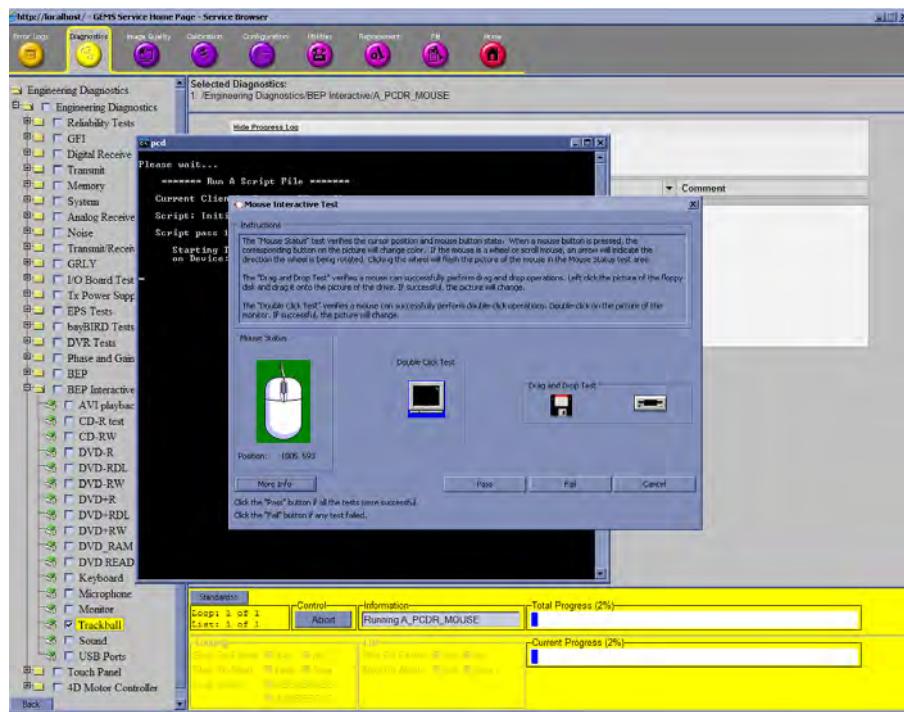
7-5-16-2 Mouse (Trackball)

See: 7-5-7 "Diagnostics Window Overview" on page 7-30 for a description of this window's features.

Runs a test on essential functions of the Trackball. The test results are displayed in the Status portion of the window.

- 1.) Enter the desired Loop Count (numeric value of 4 digits or less).
- 2.) Click the Execute button.
- 3.) Verify the signal cable is connected securely.
- 4.) Clean the Trackball. If the problem continues:
- 5.) Replace the Trackball.

Figure 7-90 Mouse Window

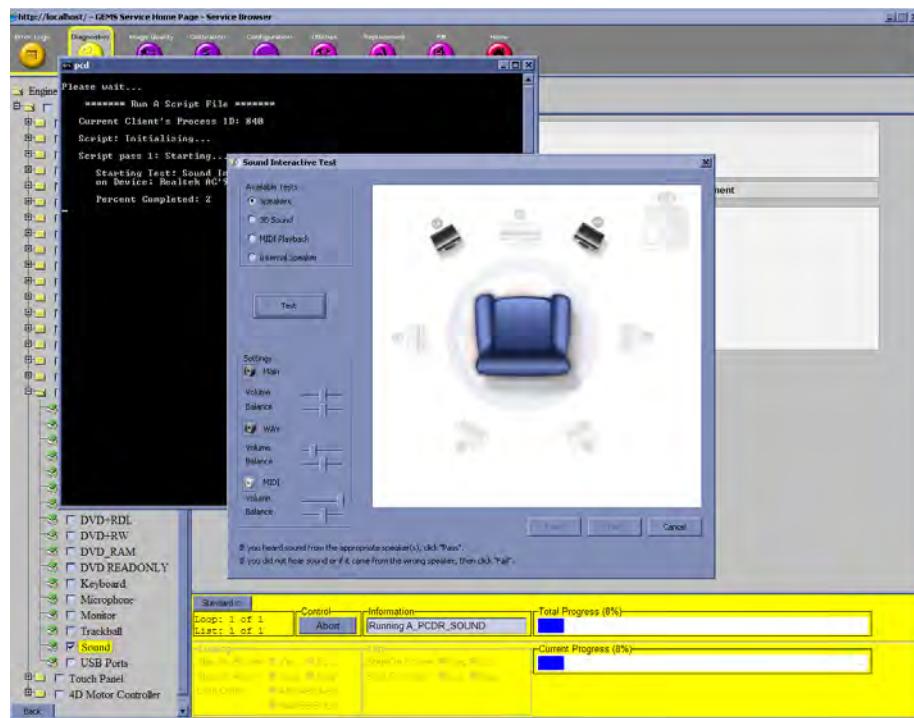


7-5-16-3 Audio (Sound)

See: [7-5-7 "Diagnostics Window Overview" on page 7-30](#) for a description of this window's features.

- 1.) Click the Execute button at the bottom of the screen. Wait approximately 30 seconds for the first test screen to open.
- 2.) Click Left Front and Right Front buttons to test your speakers. You should hear a recorded message from each speaker.
- 3.) Click on the Beep button. You should hear a low "beep" from your PC.
- 4.) If all work, click the Pass button. Click the Close button.
- 5.) Do not perform the Microphone Interactive Test. Click the Close button.
- 6.) To test the WAV sound reproduction, click Left Channel, Right Channel, or Both Channels to test your speakers. You should hear a guitar chord.
- 7.) Click on the Beep button. You should hear a low "beep" from your PC.
- 8.) Click the Close button.
- 9.) When you return to the Audio Test screen, click the Abort button.
- 10.) After closing the Service screen, you may see a Runtime Error screen(s). Close the screen(s).
- 11.) Before returning the system to the customer, always remember to reboot.
- 12.) 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.

Figure 7-91 Audio Window



7-5-17 Touch Panel

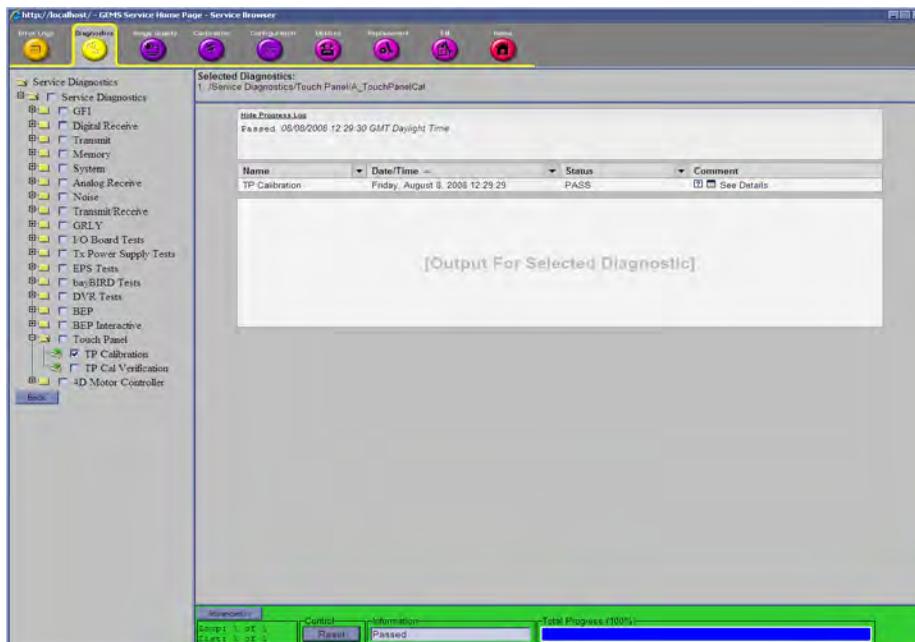
7-5-17-1 Calibration

NOTE: Always try TP calibration verification before attempting to calibrate. [7-5-17-2 "Calibration Verification" on page 7-131](#). If the Touch Panel is so far out of calibration, hangs or does not calibrate and the normal calibration procedure does not work, it may be necessary to do a complete Pre-calibration. See: [Section 6-5 "Touch Panel Calibration" on page 6-19](#).

To do a Touch Screen Calibration, follow the directions on the Touch Screen. As each of the cross-hairs appear, touch them with your finger or a pencil eraser.

NOTE: You MUST hold your finger on the cross-hair until it moves to the next location. If you just tap the calibration cross-hair, there is a good chance your calibration will be corrupt.

Figure 7-92 Touch Panel Calibration Screen

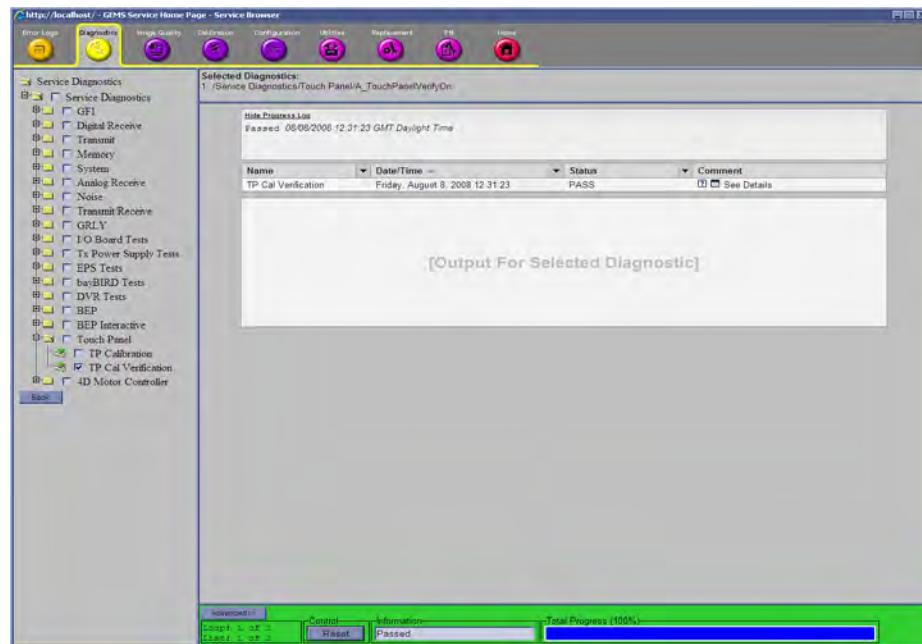


7-5-17-2 Calibration Verification

The Start Touch Screen Verification brings up a grid. Each time you touch the screen a small red dots appears where you touch, this will indicate that the calibration is correct and you do not need to re-calibrate.

If the red dots do not show up at the touched places, you need to run the Touch Panel calibration. To terminate the verification, move the trackball pointer into the grid and press the set key.

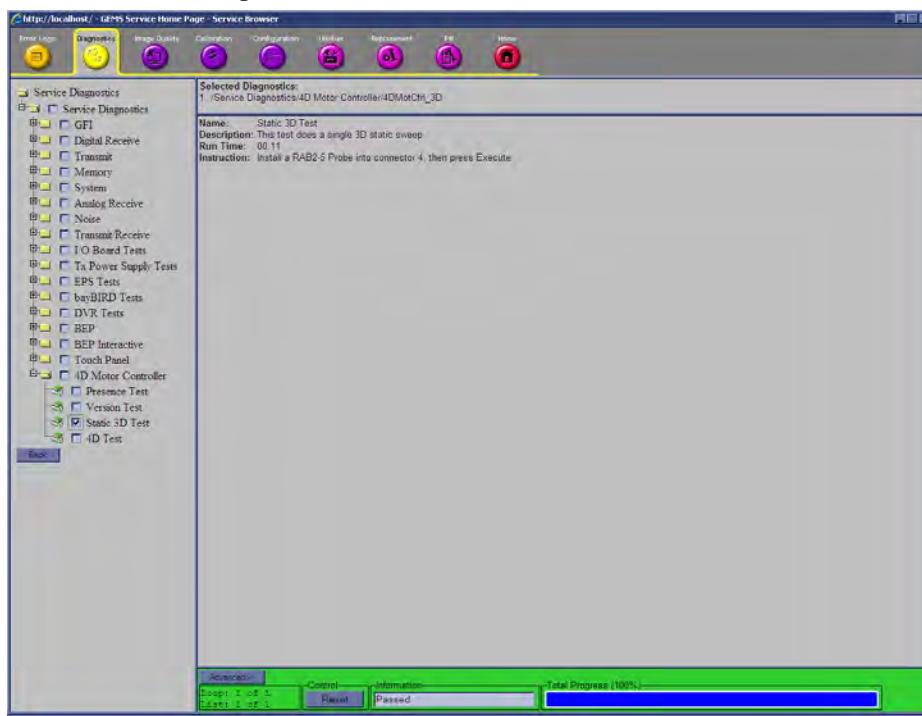
Figure 7-93 Touch Panel Calibration Verification Screen



7-5-18 4D Motor Controller

NOTE: This test requires a 4D probe be connected to the system. This test requires a 4D probe to be connected to the system. Refer to on-screen Instructions for details. See: Figure 7-94 "4D Motor Controller Screen" on page 7-132.

Figure 7-94 4D Motor Controller Screen



Name: Presence Test

Description: This test detects the presence of the 4D Motor Controller.

Run Time: 00:01

If this test failed:

- 1.) Verify USB connection between the Host and the Main Power Supply.
- 2.) Verify 4D Motor Controller connections in Main Power Supply.
- 3.) Replace 4D Motor Controller.

Name: Version Test

Description: Displays the 4D Motor Controller version number.

Run Time: 00:01

If this test failed:

- 1.) Verify USB connection between the Host and the Main Power Supply.
- 2.) Verify 4D Motor Controller connections in Main Power Supply.
- 3.) Replace 4D Motor Controller.

7-5-18 4D Motor Controller (cont'd)**Name: Static 3D Test**

Description: Performs a basic static 3D scan using the RAB2-5 probe connected in probe socket 4.

Run Time: 00:11

If this test failed:

- 1.) Verify an RAB2-5 probe is connected to probe socket 4 (right-most probe socket).
- 2.) Verify the correct probe icon appears on the touch panel.
- 3.) Verify there is no red arrow in the icon indicating that no 4D Motor Controller was detected. Re-run the 4D Motor Controller Presence Test in this case.
- 4.) Replace the 4D Motor Controller board.

Name: 4D Test

Description: Performs a basic 4D scan using the RAB2-5 probe connected in probe socket 4.

Run Time: 00:11

If this test failed:

- 1.) Verify an RAB2-5 probe is connected to probe socket 4 (right-most probe socket).
- 2.) Verify the correct probe icon appears on the touch panel.
- 3.) Verify there is no red arrow in the icon indicating that no 4D Motor Controller was detected. Re-run the 4D Motor Controller Presence Test in this case.
- 4.) Replace the 4D Motor Controller board.

7-5-19 Patient I/O Tests

Under Service Diagnostics / Patient I/O.

This procedure provides a basic test of the ability of the system to start and stop the acquisition of data from the Patient I/O Module to the Host via the GFI.

INPUT > The connection of ECG leads, PHONO (PCG) or AUX is optional.

OUTPUT > The results display information about the signal data acquired from the ECG input to the Patient I/O Module. The information includes the minimum signal value, maximum signal value and mean signal value.

If this test fails:

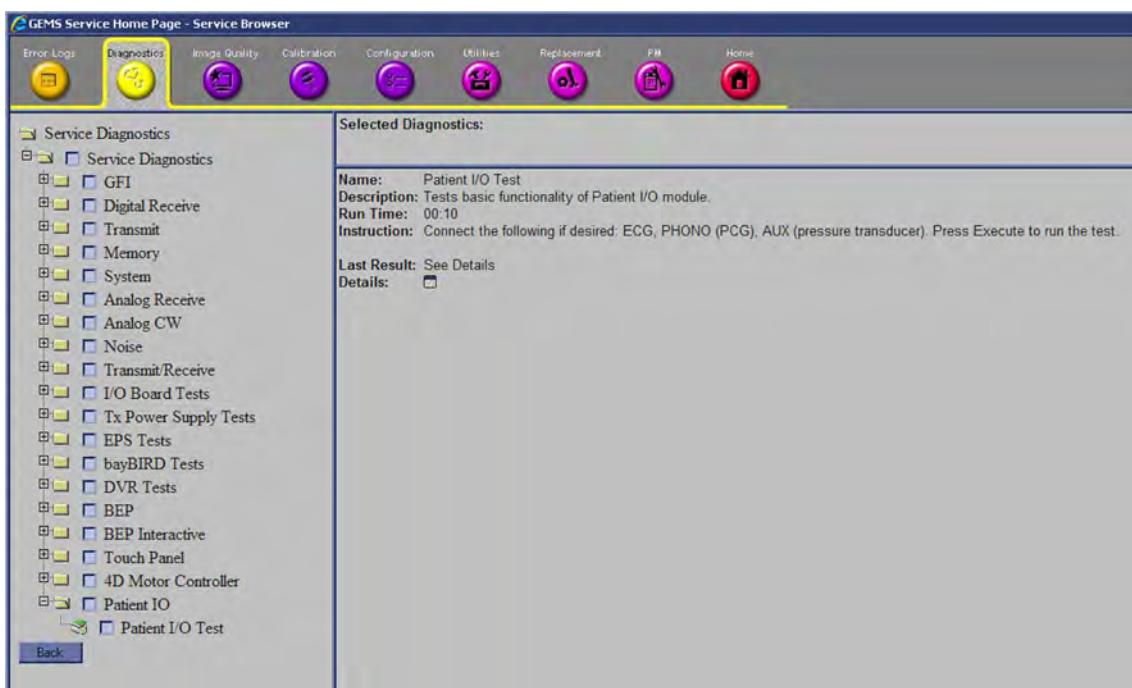
1.) Run GFI tests

If GFI is ok:

2.) Replace Patient I/O module

If this test passes and there are still issues with poor or no ECG trace, replace ECG leads.

Figure 7-95 Patient I/O Tests



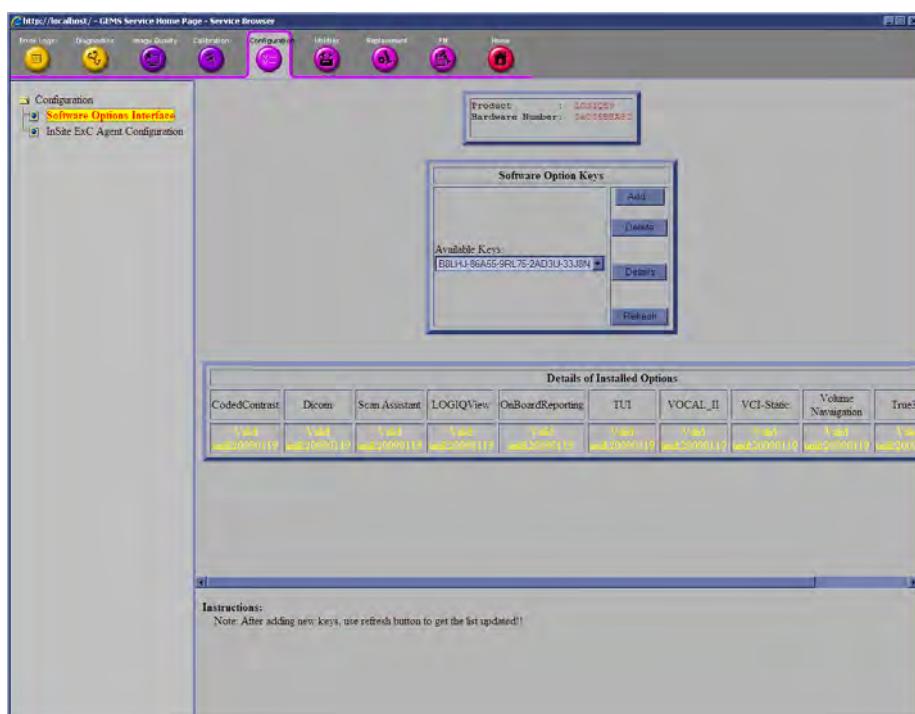
7-5-20 Configuration

7-5-20-1 Software Options Interface

Use this window to add, delete, and view details for software options.

- Add = Click the Add button to enter a new Software Option Key.
- Delete = Select a Software Option Key and click the Delete button to remove a Software Option Key.
- Details = Select a Software Option Key and click the Details button. A table at the bottom of the screen displays information for Hardware ID, Product Code, Version, Options Serial Number, and Key Life. *For LOGIQ E9 the Product code must be 32, and the Version must be 1. (See: Figure 7-96 "Software Options Interface Window" on page 7-135 the Details table at the bottom of the window.)*
- Refresh = Click the Refresh button to update the list after adding or deleting Software Option Keys.

Figure 7-96 Software Options Interface Window



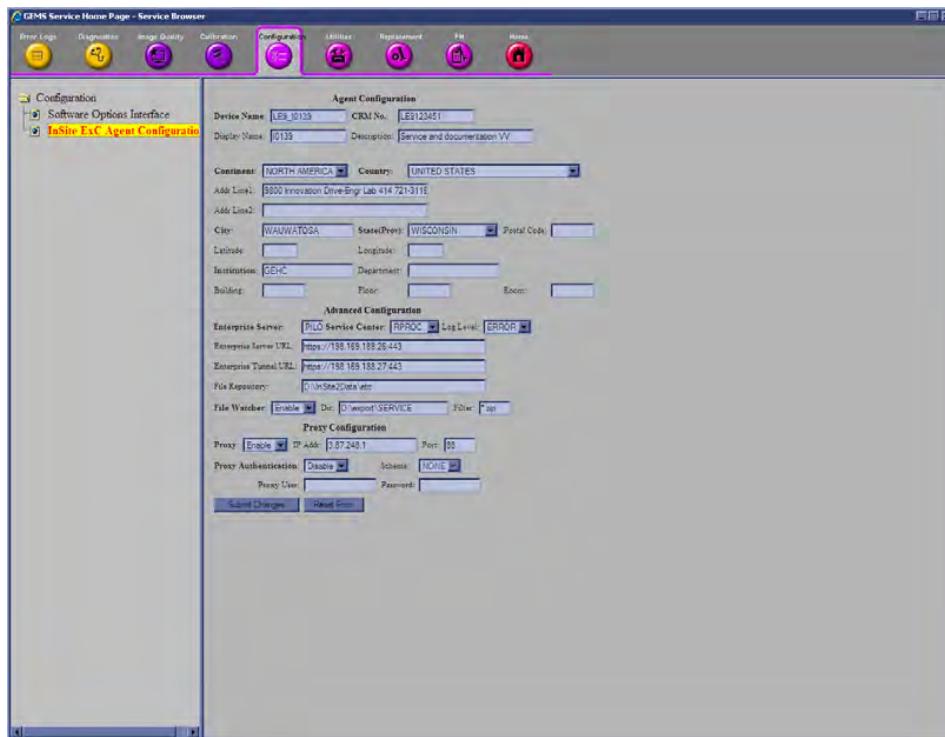
7-5-20-2 InSite ExC Agent Configuration

- Device Name = LE9_<the serial number>
- CRM Name = may be different in different countries (poles) (equivalent to the System ID)
- Enter the appropriate data for the InSite ExC configuration and click the Submit Changes button.

NOTE: If data is missing from any required fields the form will refresh and the required fields will be identified by red labels when you click Submit Changes.

- Click the Reset Form button to clear the current data.

Figure 7-97 InSite ExC Agent Configuration Window



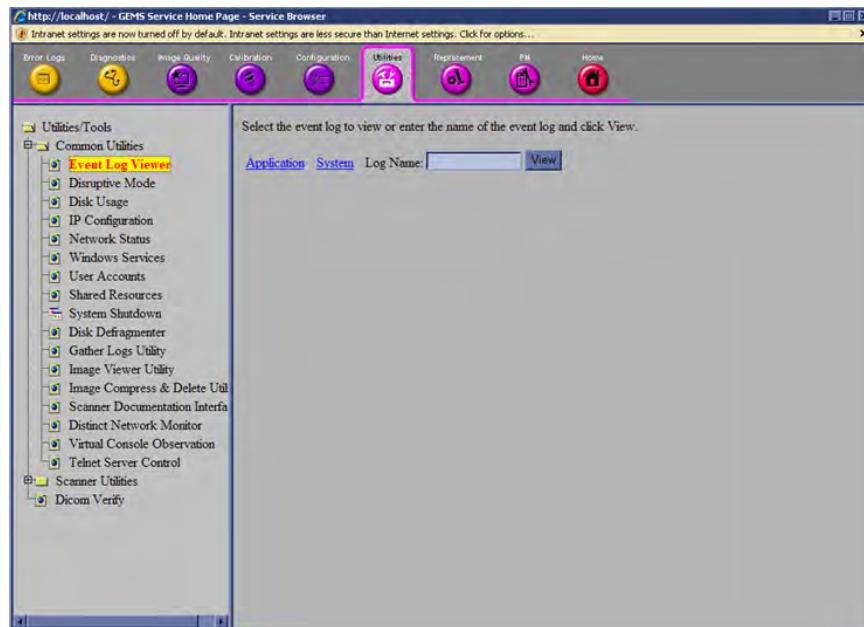
For more information on how to configure InSite ExC, go to Section 7-7 "Troubleshooting Insite ExC Configuration" on page 7-175.

7-5-21 Utilities - Common Utilities

7-5-21-1 Event Log Viewer

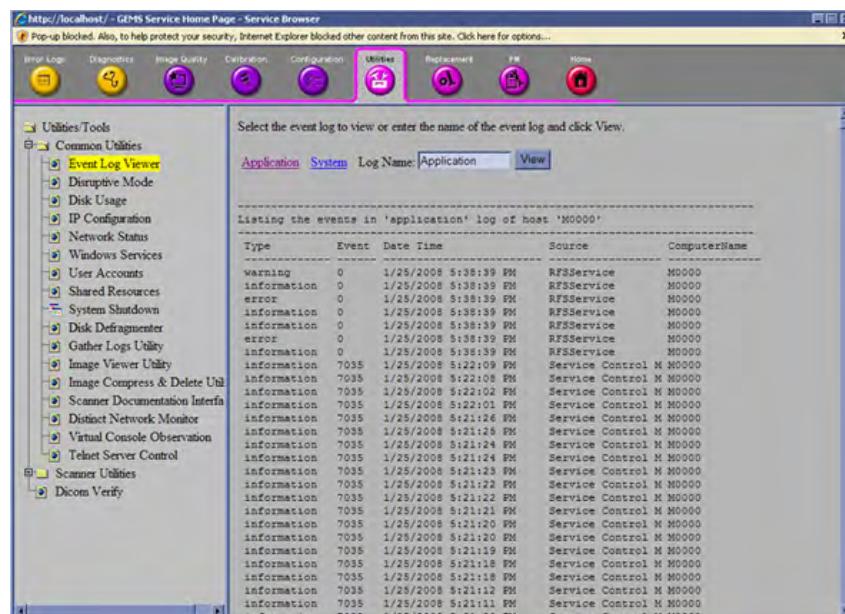
- 1.) Select the log you wish to view:
 - Application link = an event log relative to application events
 - System link = an event log relative to system events
 - Log Name = enter the Log Name you want to view and click the View button

Figure 7-98 Event Log Viewer Window



This is an example of the Application Log.

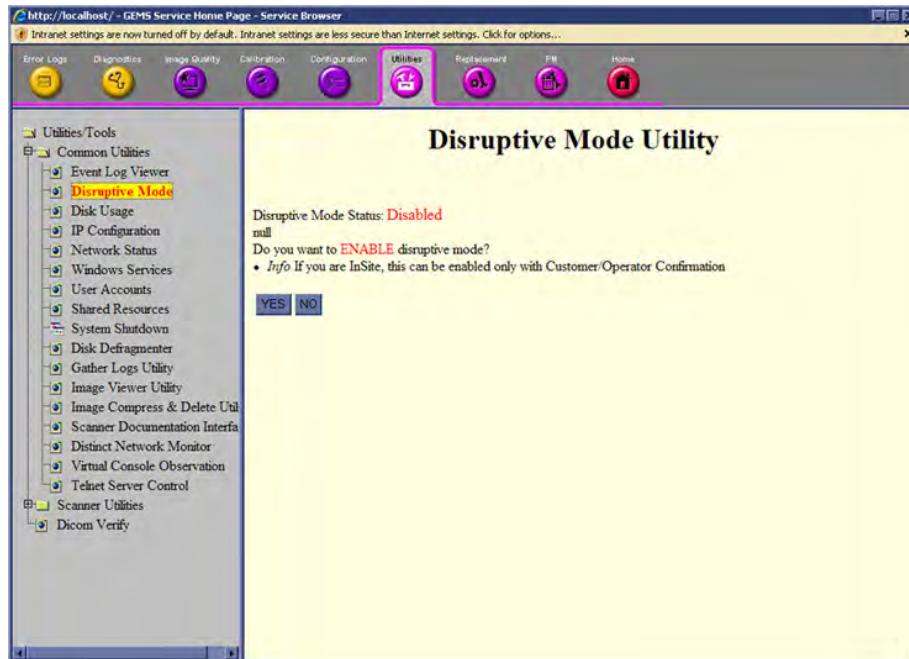
Figure 7-99 Application Log Window Example



7-5-21-2 Disruptive Mode

Allows you to enable or disable disruptive mode troubleshooting. If you are accessing through InSite ExC, this can only be enabled with the customer/operator confirmation. See: *Section 7-6 "Troubleshooting using InSite ExC" on page 7-165.*

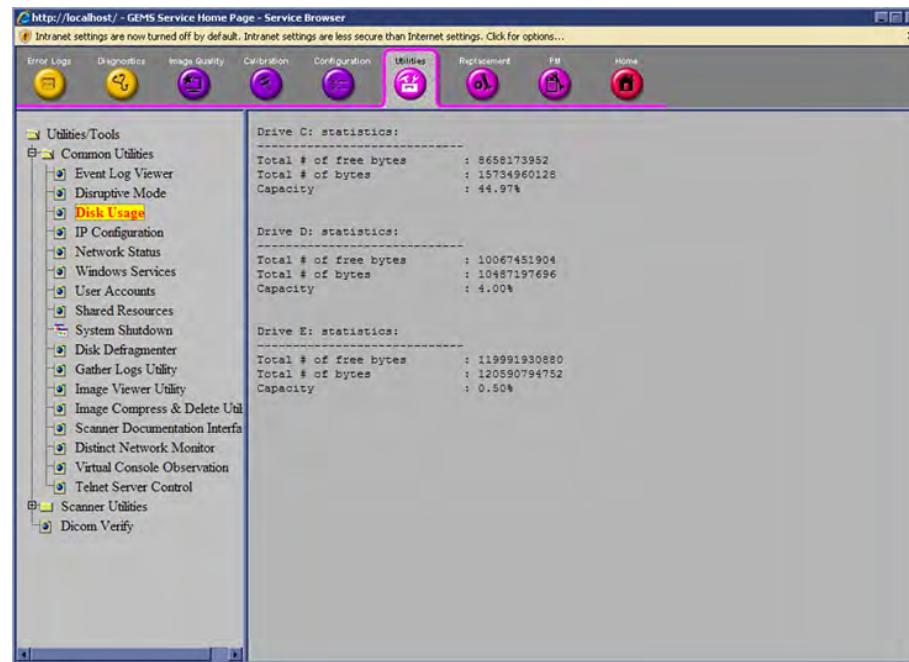
Figure 7-100 Disruptive Mode Window



7-5-21-3 Disk Usage

View capacity and usage statistics for the different disk drives.

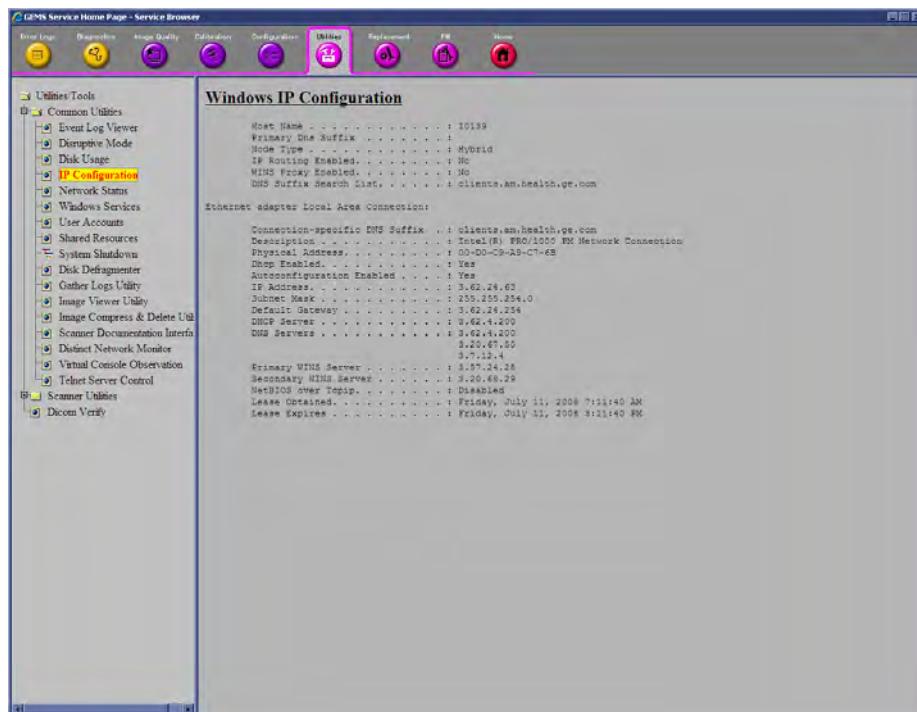
Figure 7-101 Disk Usage Window



7-5-21-4 IP Configuration

View Windows IP configuration and LAN connection data.

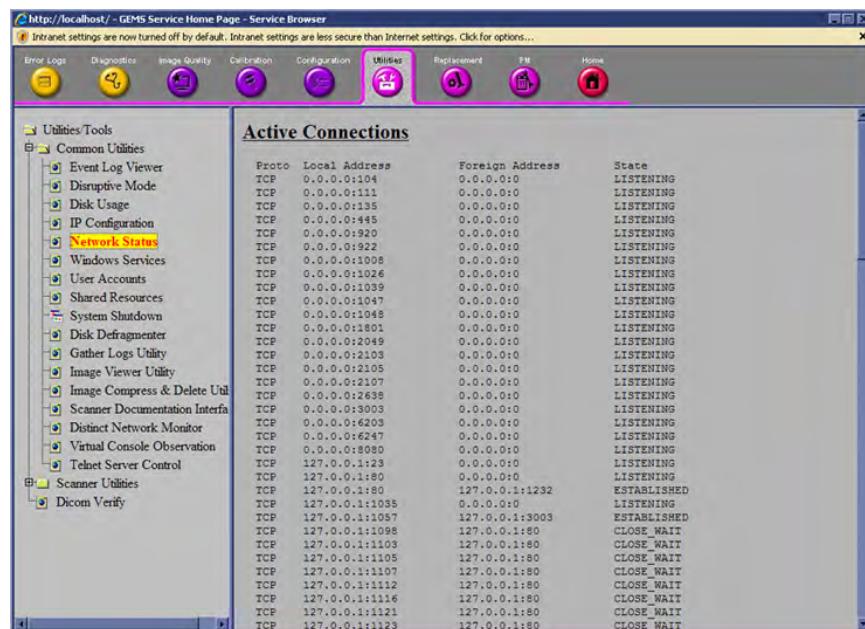
Figure 7-102 IP Configuration Window



7-5-21-5 Network Status

View data for active network connections.

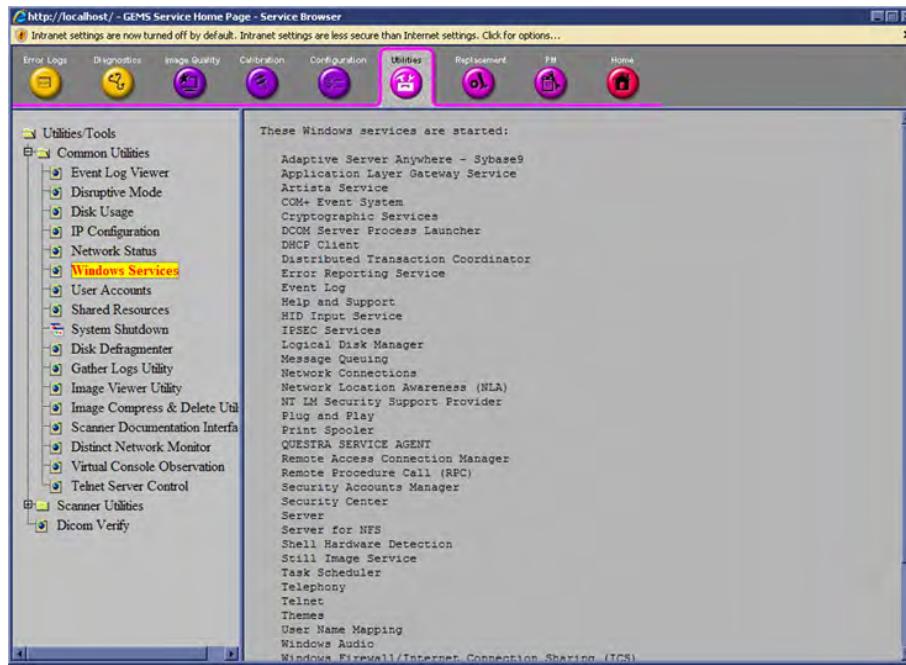
Figure 7-103 Network Status Window



7-5-21-6 Windows Services

View the Windows Services that are started and running. A Windows Service is a computer program that has been automatically started and is running in the background on the computer.

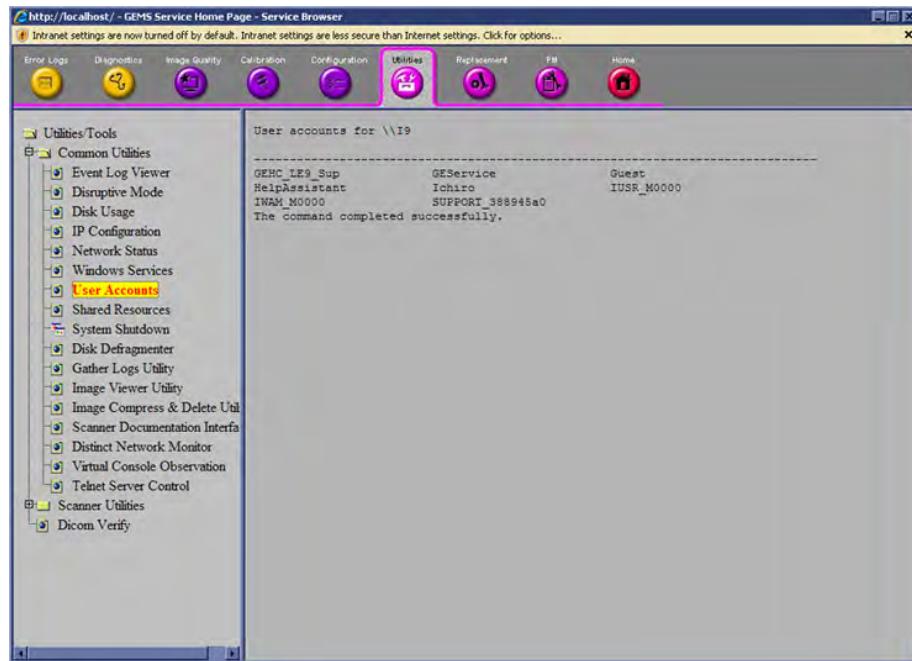
Figure 7-104 Windows Services Window



7-5-21-7 User Accounts

View the user accounts that have been given access to this system.

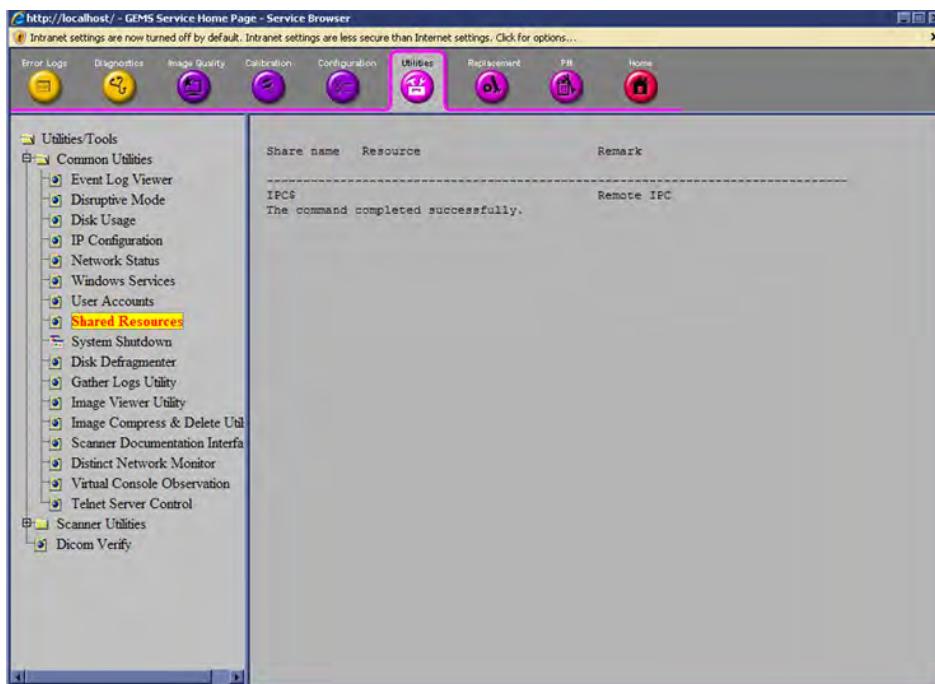
Figure 7-105 User Account Window



7-5-21-8 Shared Resources

This screen displays all shared network resources on this system.

Figure 7-106 Shared Resources Window



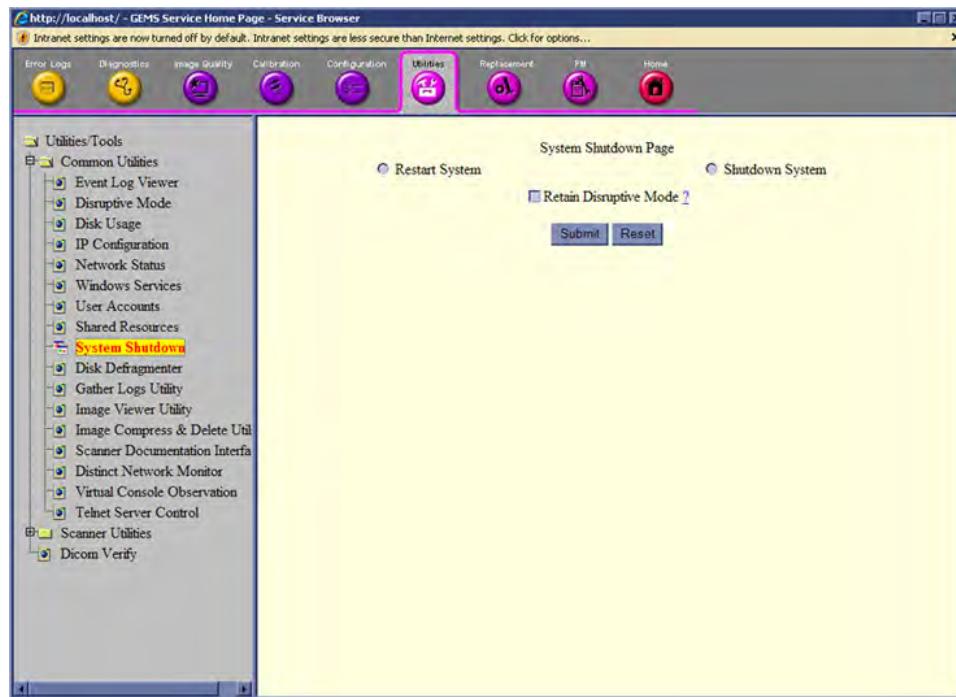
7-5-21-9 System Shutdown

System Shutdown gives you the ability to Restart or Shutdown the system when using Virtual Console Observation from a remote computer. See: Section 7-6 "Troubleshooting using InSite ExC" on page 7-165.

NOTE: Retain Disruptive Mode checkbox:

- *MUST be checked if you are working from a remote computer.*
- *Should be unchecked if you are working locally on the scanner.*

Figure 7-107 System Shutdown Window



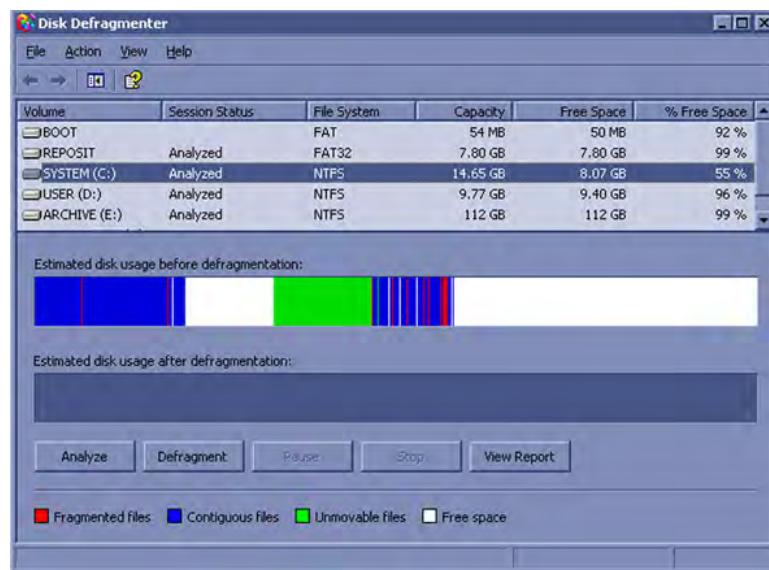
7-5-21-10 Disk Defragmenter

Disk fragmentation can reduce the amount of disk space available, and slow computing speed. Use the disk defragmenter to restore optimum disk space and speed performance.

NOTE: *System performance can be significantly reduced while the Disk Defragmenter is running.*

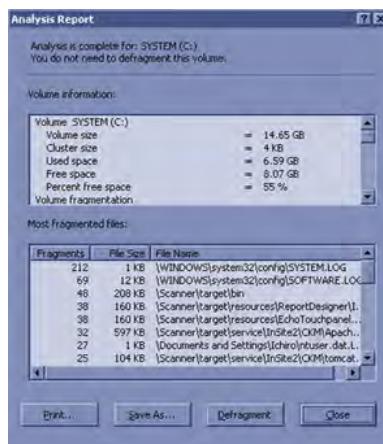
- 1.) Select the Volume (drive) you want to defragment, or analyze for fragmentation.
 - Click the Defragment button to defragment the selected volume.
 - Click the Analyze button to generate an Analysis Report that identifies any files that require de-fragmenting. Continue with step 2 below.

Figure 7-108 Disk Defragmenter Window



NOTE: *The Disk Defragmenter Window may hide behind the service browser.*

- 2.) Select the file(s) you wish to defragment and click the Defragment button on the Analysis Report window.

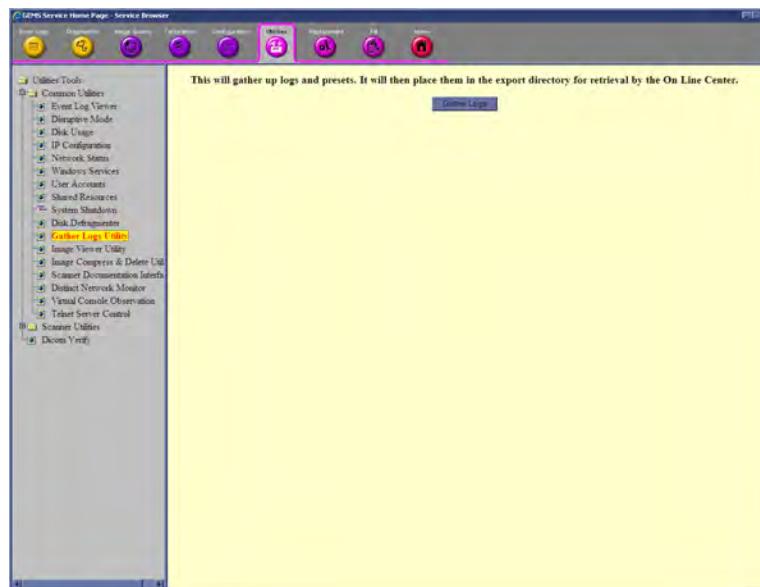


7-5-21-11 Gather Logs Utility

Click the Gather Logs button to prepare them for retrieval by the On Line Center. The logs are compressed into a .zip file and the filepath and file name is displayed on the window.

If the application is not running, logs can be gathered using the Gather Logs shortcut on the Windows desk top.

Figure 7-109 Gather Logs Utility Window



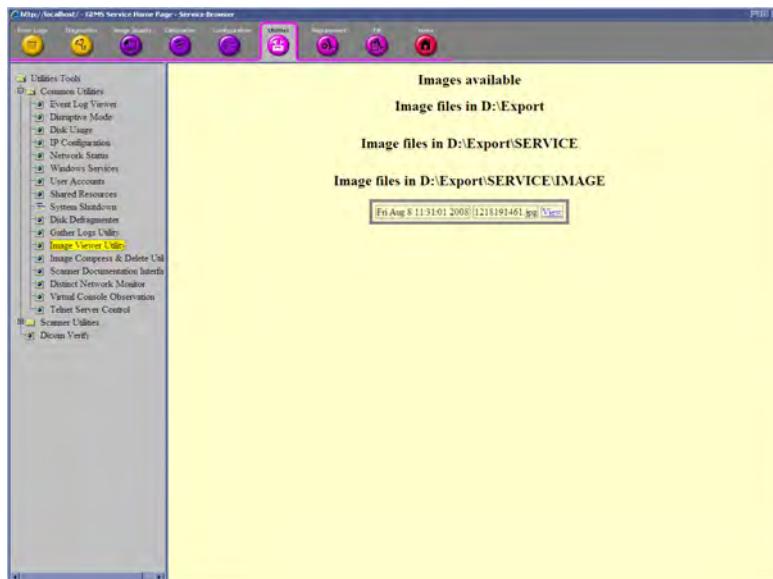
In R6 and later, GatherLogs Utility will not be collecting logs that contain protected information. If those logs are needed, the OnLine Engineer will have to request the user to perform an Alt D function, authorizing the inclusion of protected information in the logs.

7-5-21-12 Image Viewer Utility

The Image Viewer Utility lists the availability of images for export. This example shows no images available for export.

NOTE: *For Application SW R3.x.x or later, the Service Directory is no longer located under the export folder, it is located in d:\ root directory (d:\service).*

Figure 7-110 Image Viewer Utility Window



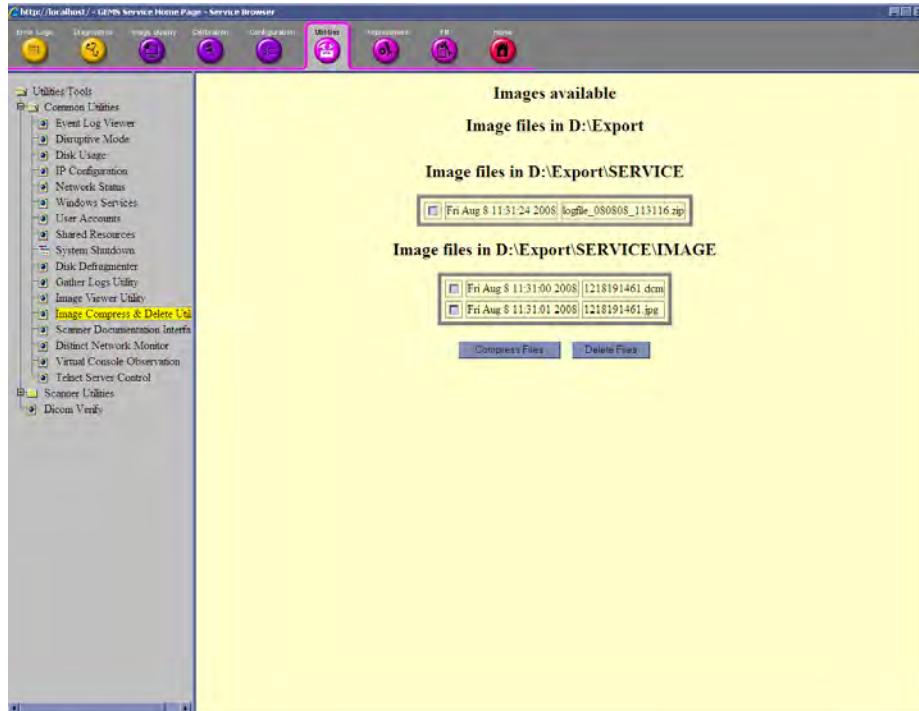
7-5-21-13 Image Compress & Delete Utility

Select the images you want to compress or delete. This example shows no images available at this time.

- Compress Files = compresses images into a .zip file.
- Delete Files = deletes the images from the image Export/Service directory.

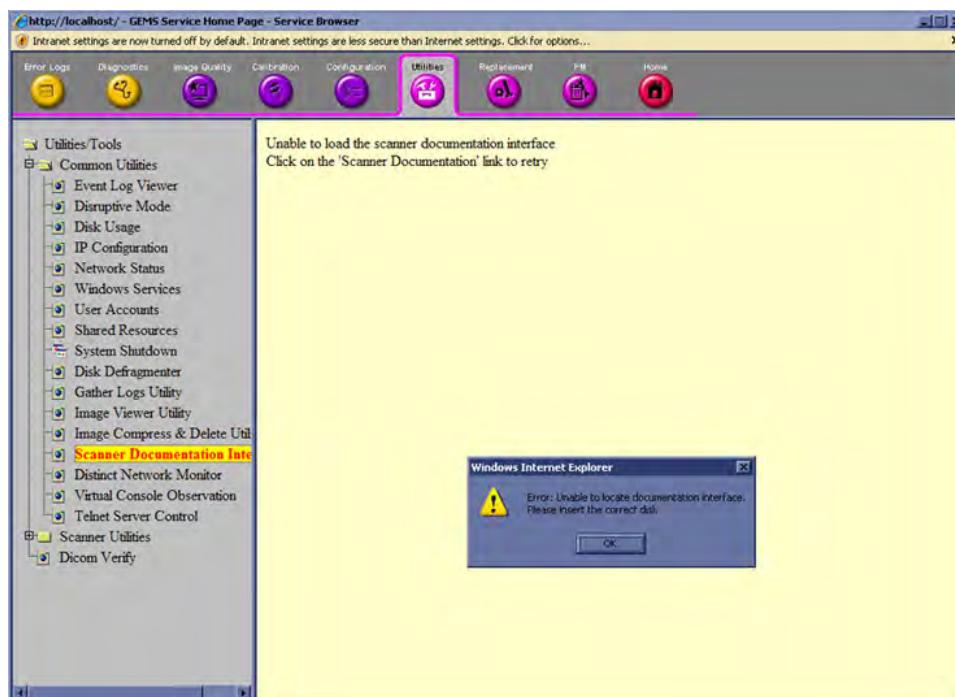
NOTE: For Application SW R3.x.x or later, the Service Directory is no longer located under the export folder, it is located in d:\ root directory (d:\service).

Figure 7-111 Image Compress & Delete Utility Window



7-5-21-14 Scanner Documentation Interface

Use this to view the user and service documentation for the system. You need to have your documentation disk inserted in the drive in order to open it. Otherwise you will see the message displayed in *Figure 7-112 "Scanner Documentation Interface Window"*.

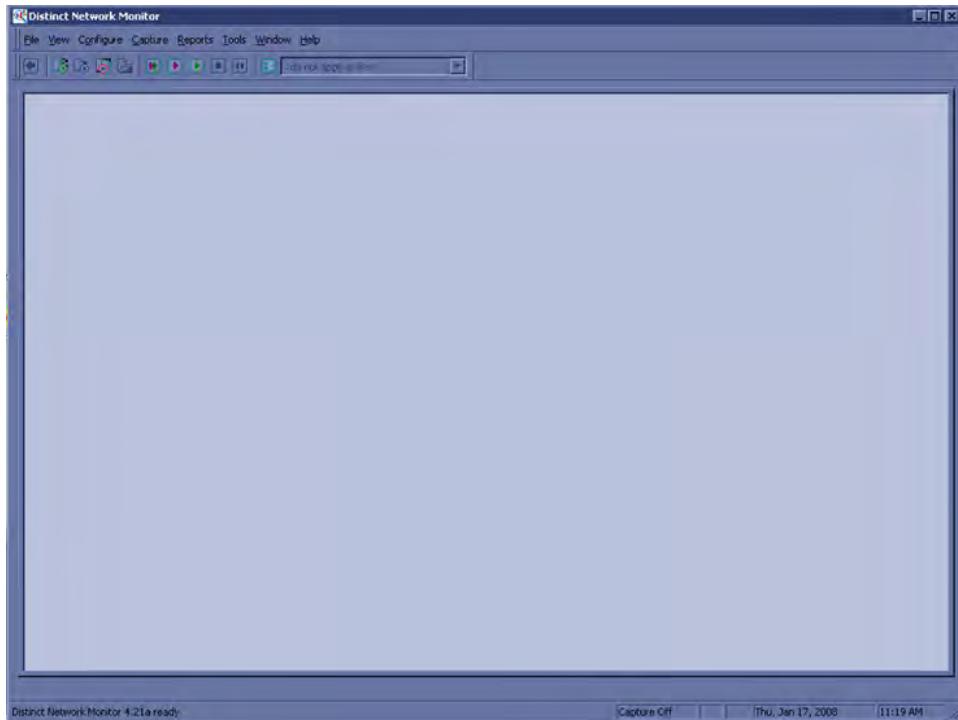
Figure 7-112 Scanner Documentation Interface Window

7-5-21-15 Distinct Network Monitor R1.x.x

The Distinct Network Monitor has a sniffer that monitors network traffic and allows you to capture network data without redirecting or altering it.

For directions on how to configure the sniffer go to "["Capturing Network Logs with Network Sniffer \(Software R1.x.x\)" on page 7-8.](#)

Figure 7-113 Distinct Network Monitor Window

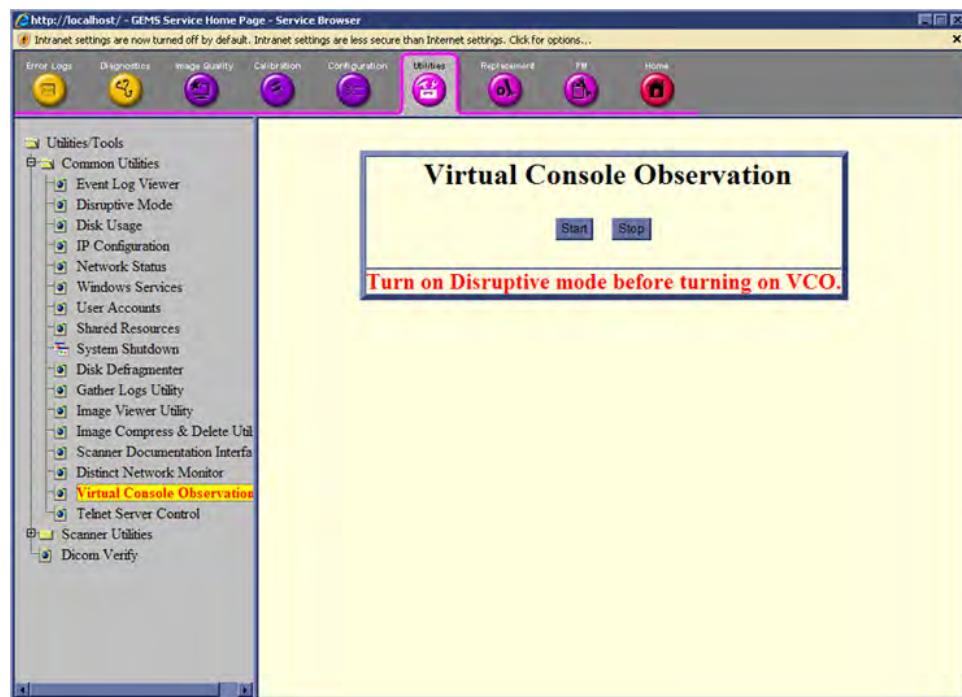


NOTE: *The Distinct Network Monitor Window may hide behind the service browser.*

LOGIQ E9 R2.x.x or later Distinct was replaced by Wireshark. This menu is no longer available. Use Alt+N to open the sniffer application.

7-5-21-16 Virtual Console Observation (VCO)

VCO is used by a remote service technician or the Online Center (OLC) to access and modify all scanner settings and programs on the customer's ultrasound scanner. See: Section 7-6 "Troubleshooting using InSite ExC" on page 7-165.

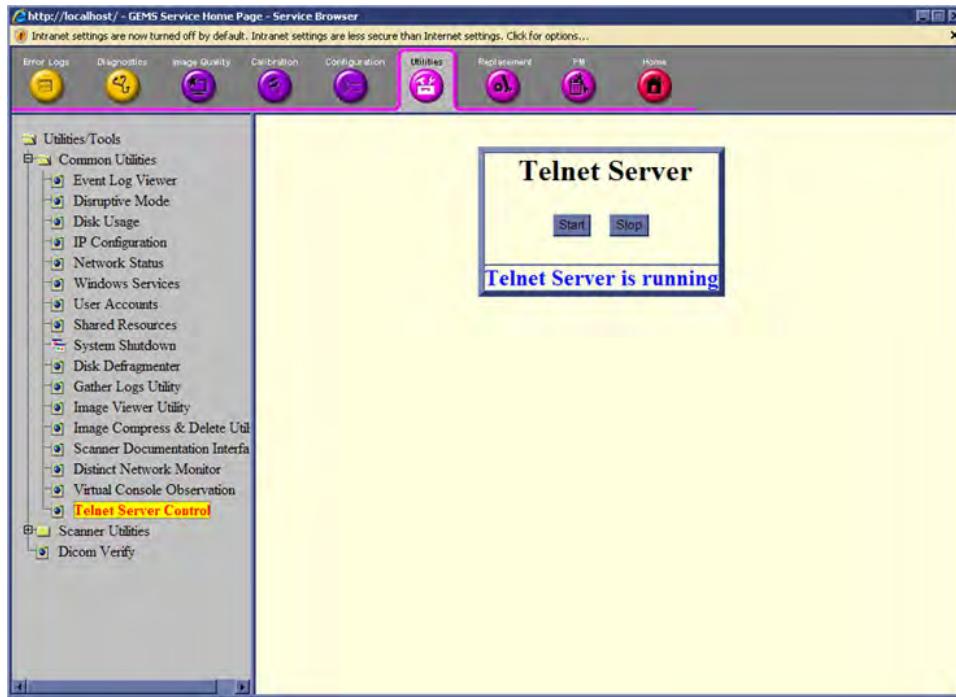
Figure 7-114 Virtual Console Observation Window

7-5-21-17 Telnet Server Control

Telnet Server must be running to allow remote access to the DOS command prompt window. Click the Start button to run Telnet Server.

NOTE: *Telnet Server is a Windows service that runs in the background. Stop Telnet Server when you are not using it to perform a service action. It can slow the system down if left running in the background.*

Figure 7-115 Telnet Server Control Window

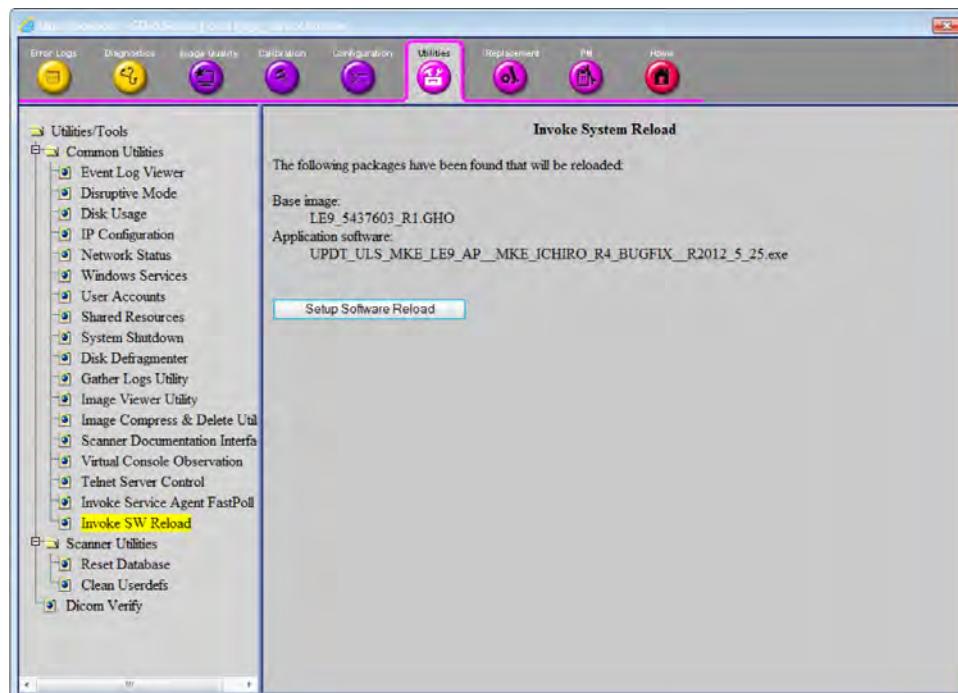


To access Telnet, use the following information:

- User: insite
- Password: 2getin

7-5-21-18 Invoke Software Reload

Active remote software reload. See: Section 8-4-12-8 "Software Reload" on page 8-40.

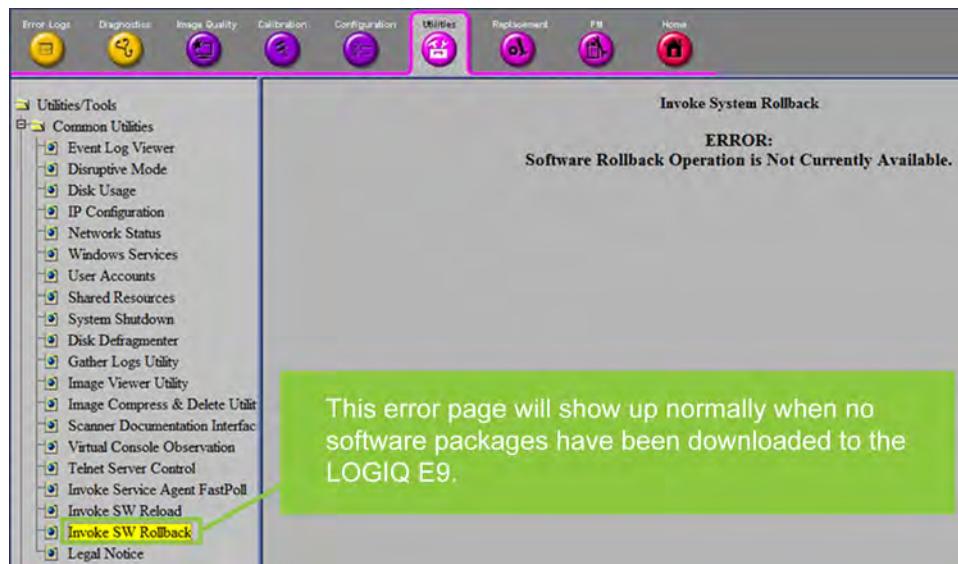
Figure 7-116 Invoke Software Reload - R2.x.x and R3.x**Figure 7-117 Invoke Software Reload - R4 and later**

7-5-21-19 Invoke Software Rollback

Due to changes for Software Download capabilities, you will see an additional function on the utilities tab.

Rollback function will be used by the On Line Engineer to roll back to the original software in cases where the downloaded software is not working correctly. Active only when there has been a software download.

Figure 7-118 Invoke Software Rollback

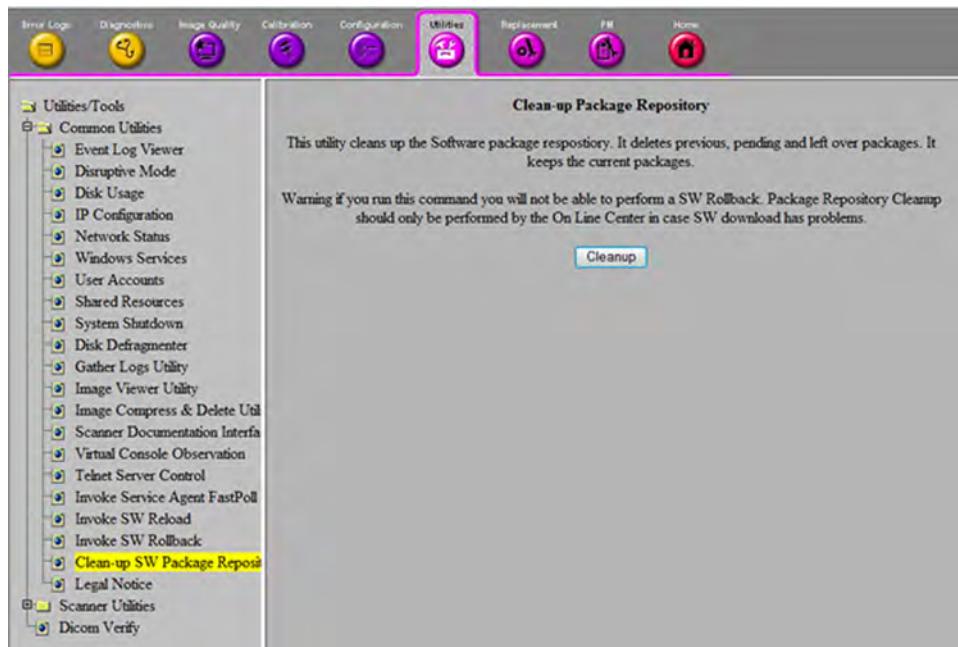


7-5-21-20 Clean-up SW package Repository

This utility cleans up the Software package repository. It deletes previous, pending and left over packages. It keeps the current packages.

Warning if you run the command you will not be able to perform a SW Rollback. Package Repository Cleanup should only be performed by the On Line Center in case SW download has problems.

Figure 7-119 Clean-up SW package Repository



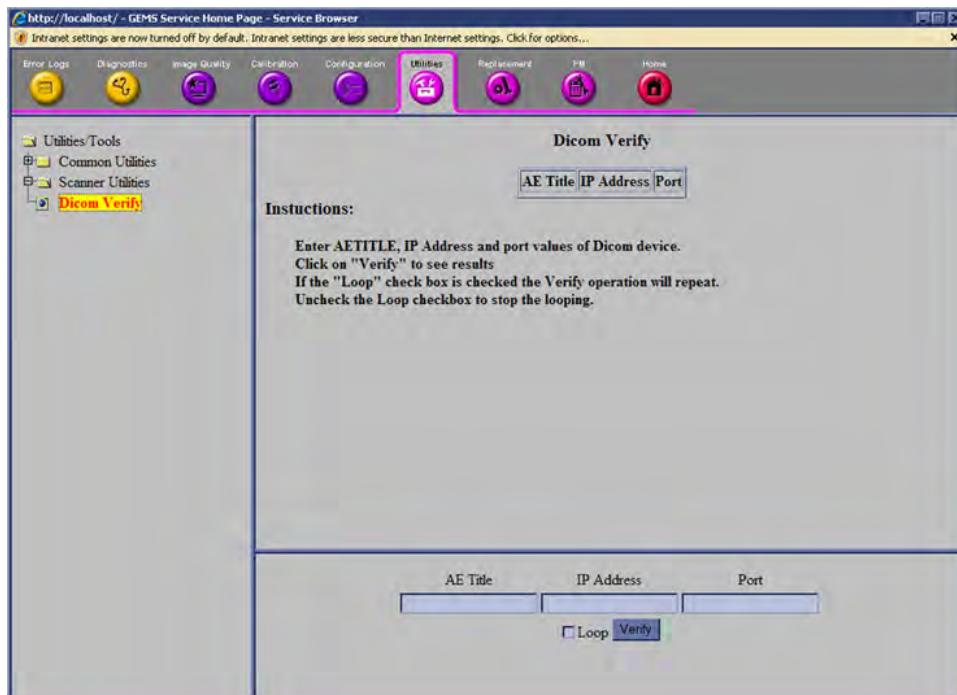
7-5-22 Utilities - Scanner Utilities

7-5-22-1 DICOM Verify

This utility provides an easy way to verify DICOM connectivity between the scanner and DICOM devices on the network.

- 1.) Enter AE Title, IP Address, and Port values of the DICOM device.
- 2.) Check the Loop checkbox to repeat the operation, or leave it unchecked to perform the operation once.
- 3.) Click the Verify button to see the results.
- 4.) Uncheck the Loop checkbox to stop the operation.

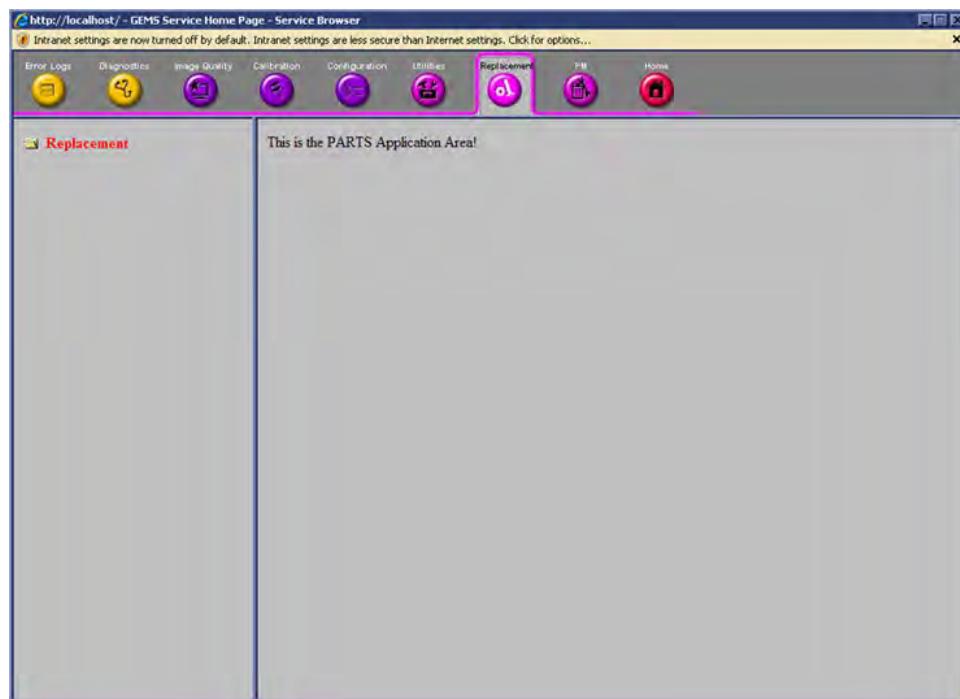
Figure 7-120 DICOM Verify Window



7-5-22-2 Replacement

Field is not populated on the LOGIQ E9.

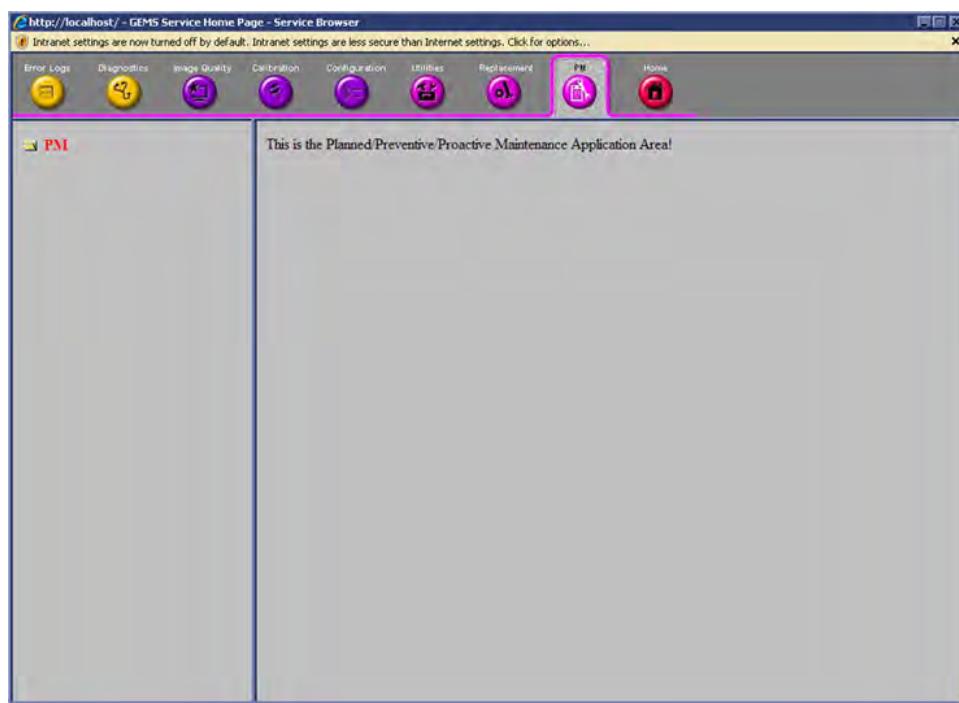
Figure 7-121 Replacement Window

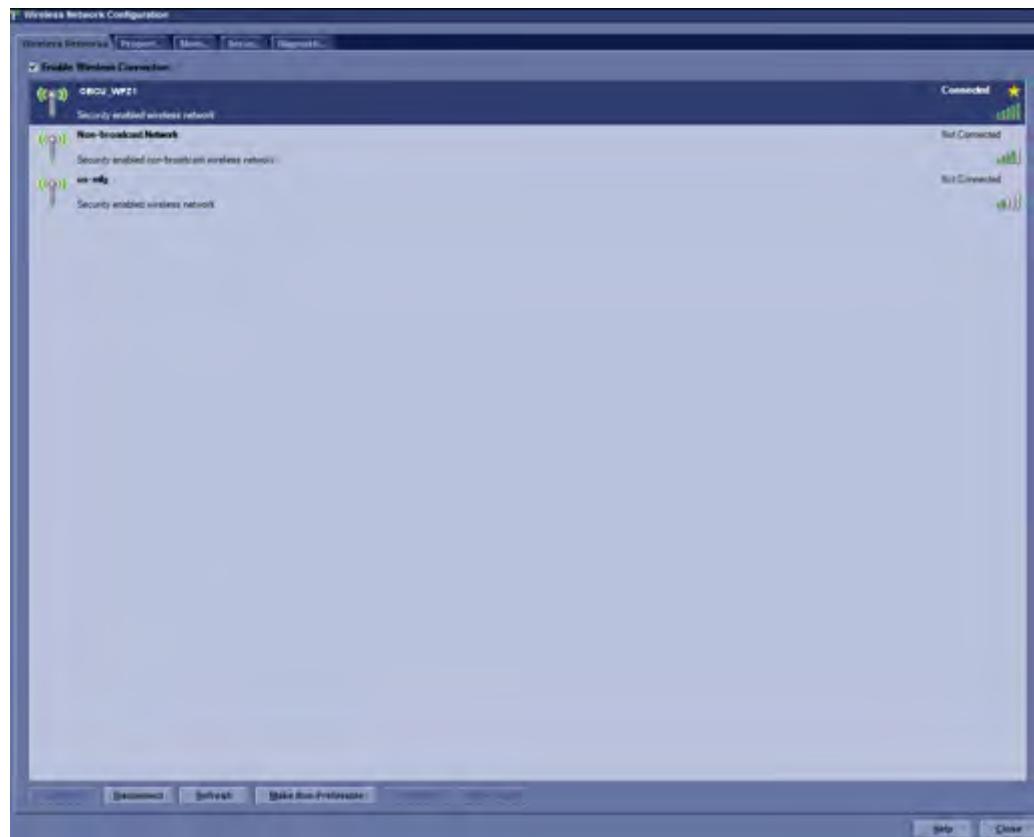


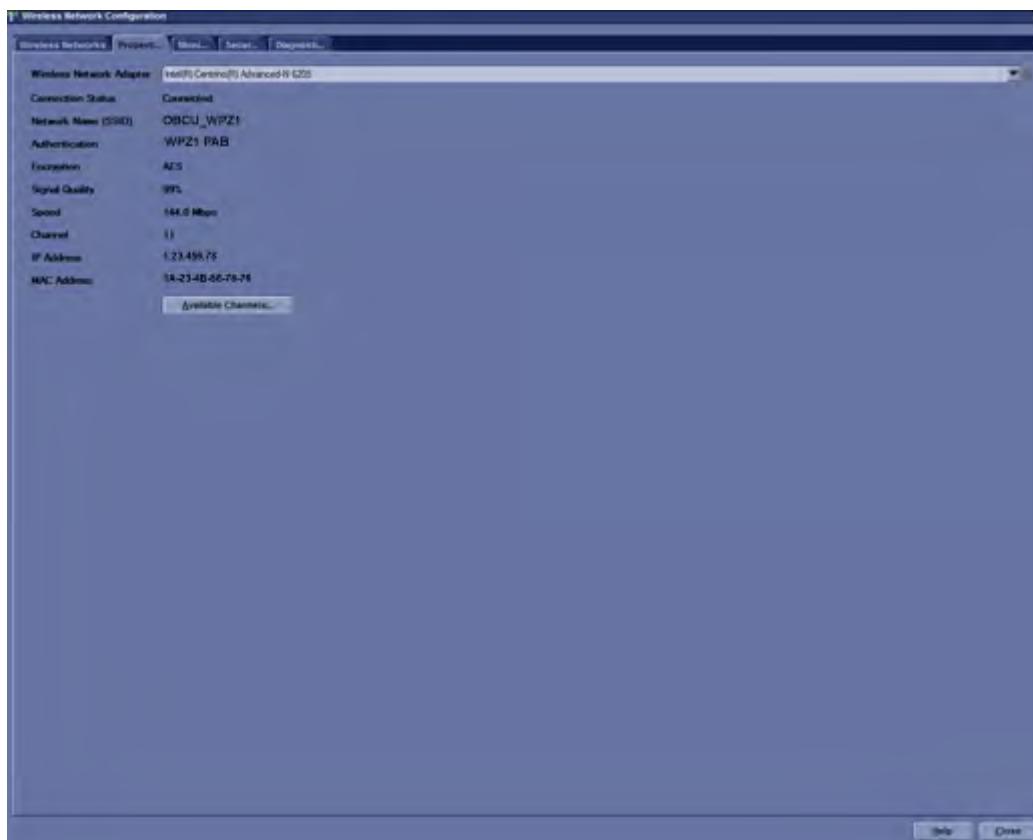
7-5-22-3 PM

Field is not populated.

Figure 7-122 PM Window



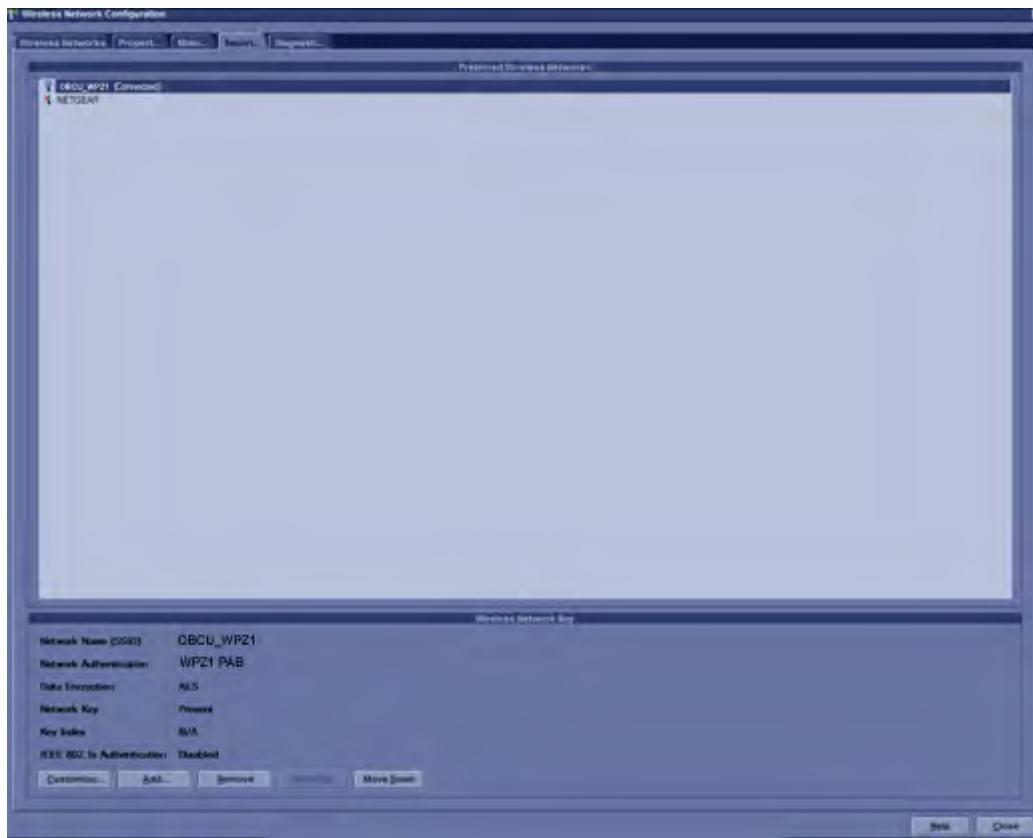
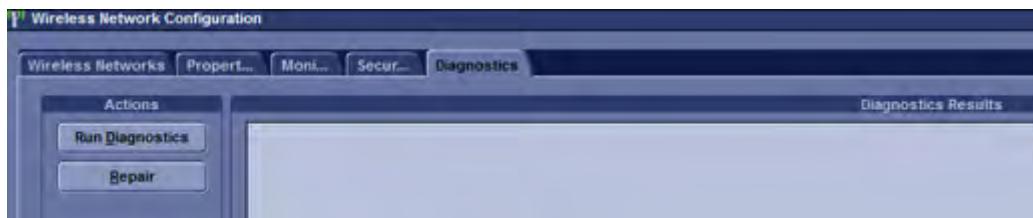
7-5-23 Wireless Network Configuration (WLAN Diagnostics)**7-5-23-1 Wireless Networks****Figure 7-123 Wireless Networks Window**

7-5-23-2 Wireless Properties**Figure 7-124 Wireless Properties Window**

7-5-23-3 Wireless Monitor

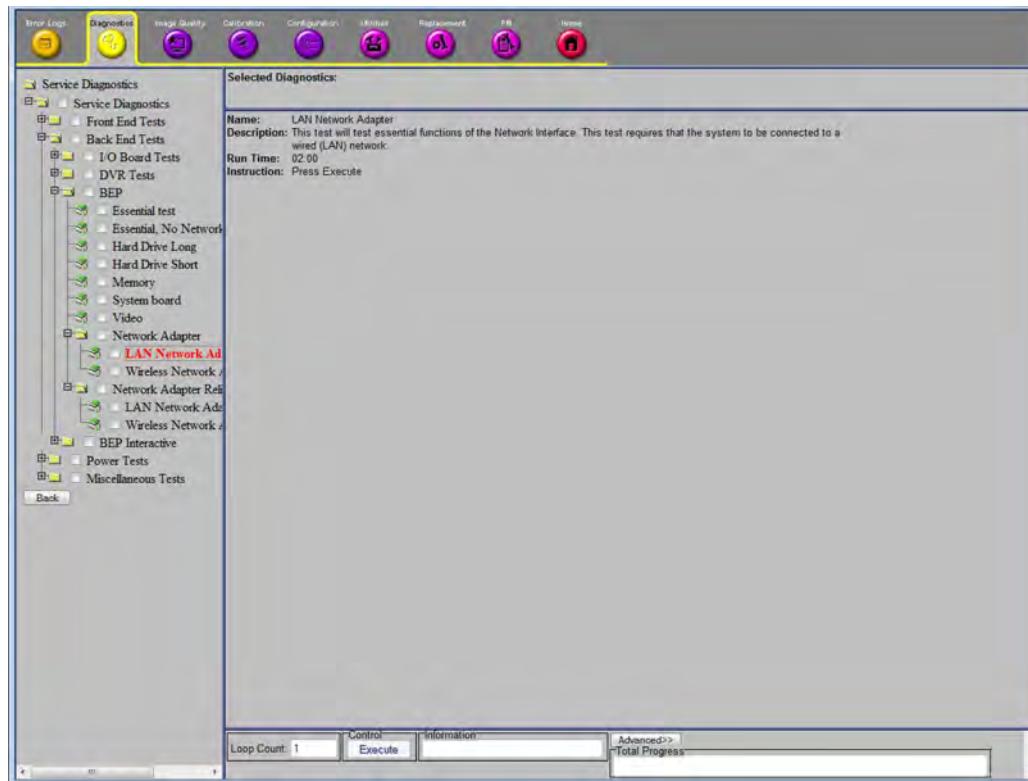
Figure 7-125 Wireless Monitor Window



7-5-23-4 Wireless Securities**Figure 7-126 Wireless Securities Window****7-5-23-5 Wireless Diagnostics****Figure 7-127 Wireless Diagnostics Window**

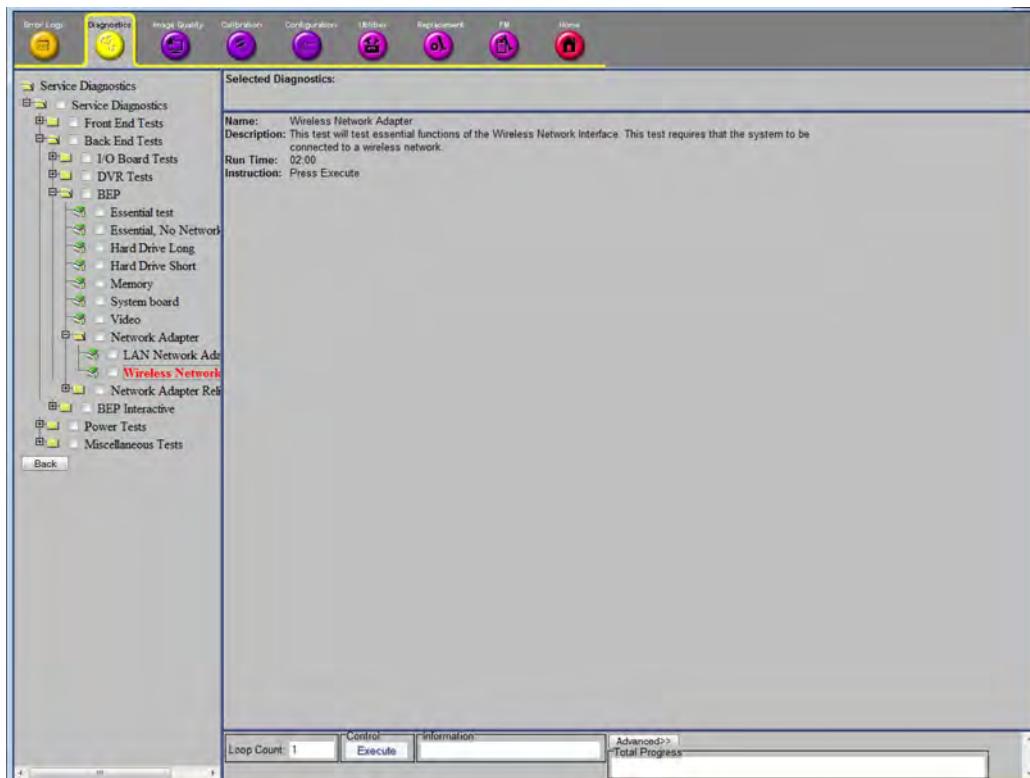
7-5-23-6 Network Adapter Diagnostic Changes for R4 and later

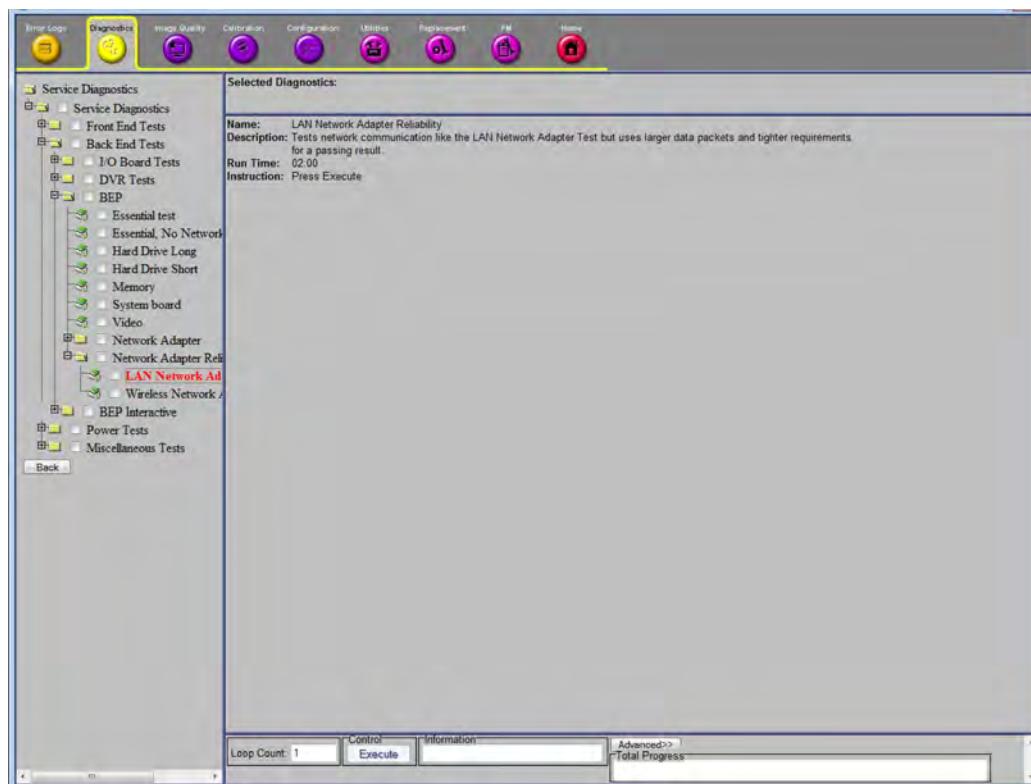
Figure 7-128 Wired LAN Network adapter test Window



7-5-23-6 Network Adapter Diagnostic Changes for R4 and later (cont'd)

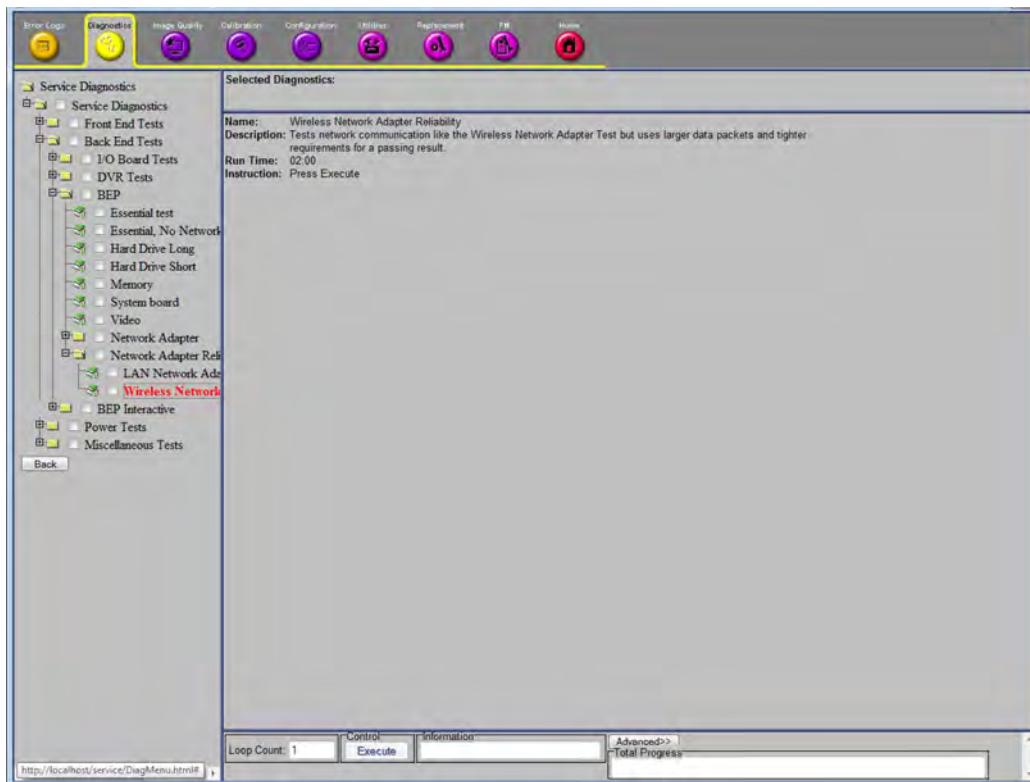
Figure 7-129 Wireless Network adapter test Window



7-5-23-6 Network Adapter Diagnostic Changes for R4 and later (cont'd)**Figure 7-130 Wired LAN Network adapter test Window**

7-5-23-6 Network Adapter Diagnostic Changes for R4 and later (cont'd)

Figure 7-131 Wireless Network adapter test Window



Section 7-6

Troubleshooting using InSite ExC

7-6-1 Purpose of this Section

This section describes how to use the InSite ExC remote service features of the Common Service Desktop.

7-6-2 Contents in this section

7-6-1	Purpose of this Section.	7-165
7-6-2	Contents in this section.	7-165
7-6-3	General.	7-165
7-6-4	How FE Remotely Enables Disruptive Mode and VCO	7-167
7-6-5	How Customer Enables Disruptive Mode.	7-172
7-6-6	Customer Enables VCO	7-174

7-6-3 General

InSite ExC allows the Online Engineer or Field Engineer to connect remotely into the LOGIQ E9 and access the Common Service Desktop to check system health and collect system information, as well as run Diagnostics, activate VCO and Telnet features.

Most of the InSite ExC Remote Service features are the same as described in *Section 7-5 "Common Service Desktop" on page 7-21*. However, some may require enabling disruptive mode.

NOTE: *Only GE Service personnel have access to this feature. A password is required. All actions and changes should be documented.*

7-6-3-1 How to access CSD remotely

To configure InSite ExC, see: *Section 3-11 "Configuring Insite ExC" on page 3-86.*

To connect to the device, use the search tool on the left-hand side of the Questra page or on the InSite Remote Services Platform (RSvP).

- 1.) Have the customer activate fast poll on their device (left click on the InSite ExC icon and select **Connect to GE**), to establish a quicker connection.
- 2.) Select **Connect to device**.
- 3.) Select **Connect** under **UL_CSD** (Questra) or **CIS_CSD** (RSvP).
- 4.) Log in as GE Service.

Figure 7-132 Reconnect to the Device

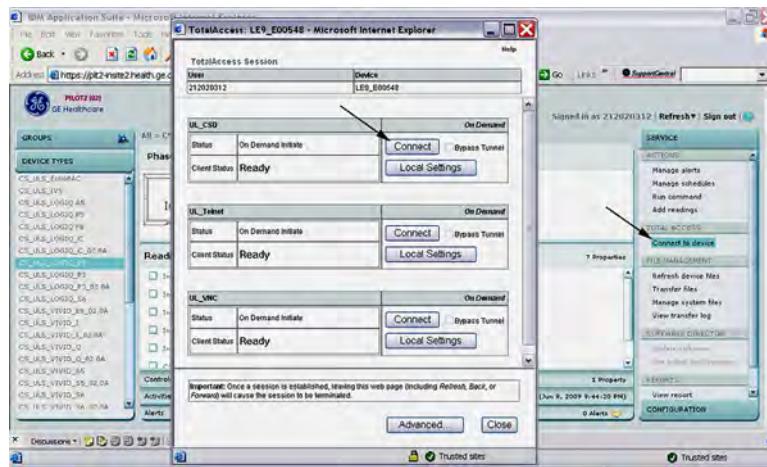
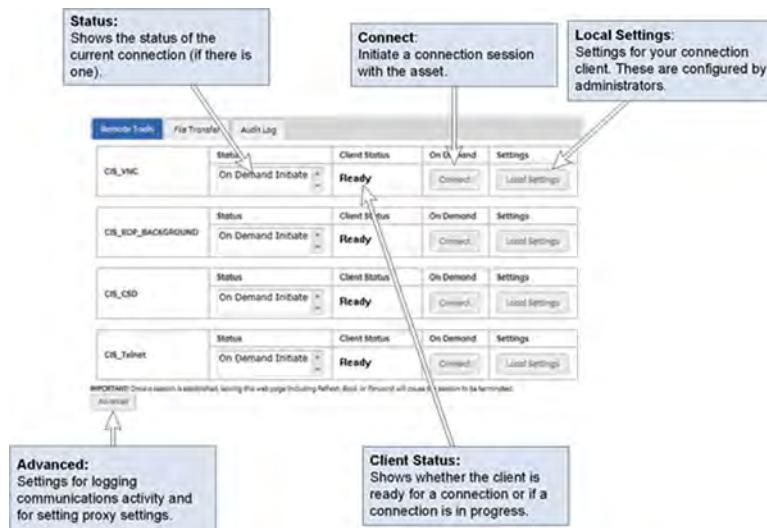


Figure 7-133 CIS_CSD (RSvP) Remote Tools tab



If you need to run diagnostics, VCO, Telnet or any other feature considered disruptive for the user, you may be asked to active disruptive mode.

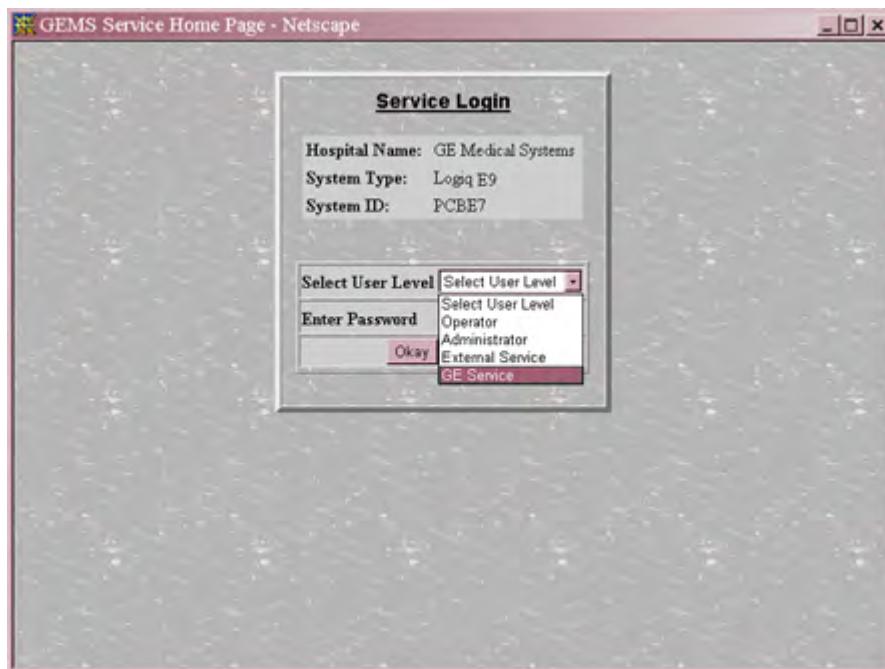
7-6-4 How FE Remotely Enables Disruptive Mode and VCO

- 1.) The OLC or FE connects to the remote scanner or workstation through a Remote Service Tool (RST).

NOTE: *The behavior of the Remote Service Tool (RST) is beyond the scope of this manual. The following steps describe the activities that take place once the OLC or FE remotely enables connection to the scanner or workstation.*

Once connected to the remote scanner the OLC or FE will sign in at the Service Login Screen (See: *Figure 7-134 "Service Log Screen" on page 7-167*).

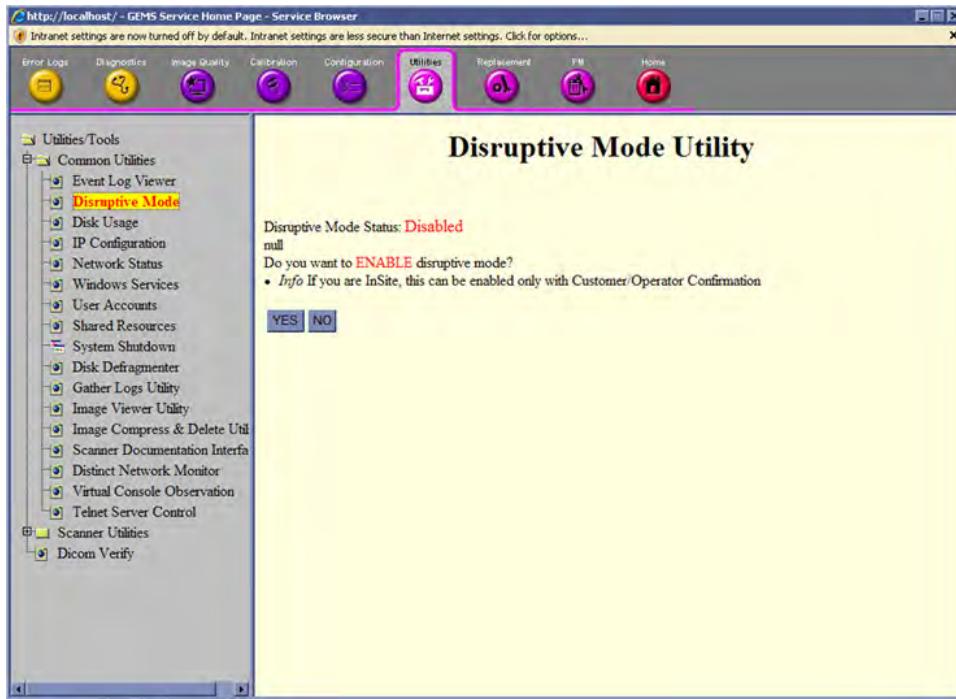
Figure 7-134 Service Log Screen



- 2.) Select "GE Service", enter the current password, and select Okay.
- 3.) Select **Utility -> Common Utilities -> Disruptive Mode** (See: *Figure 7-135 "Disruptive Mode" on page 7-168*).

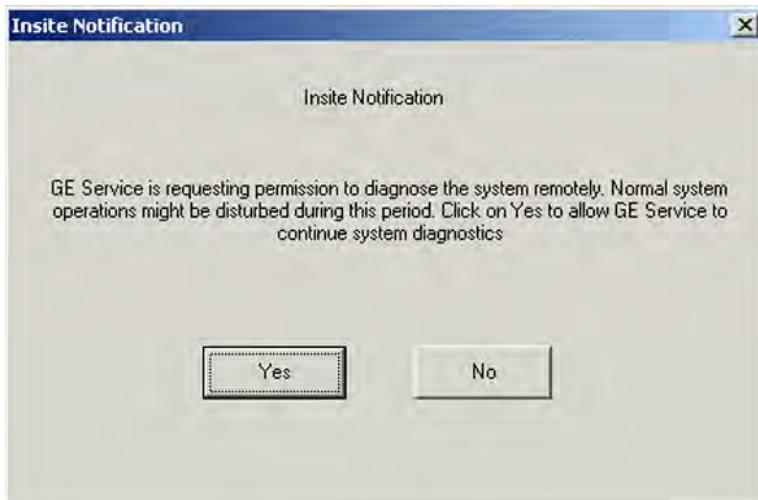
7-6-4 How FE Remotely Enables Disruptive Mode and VCO (cont'd)

Figure 7-135 Disruptive Mode



- 4.) To Enable “Disruptive Mode” select Yes.
- 5.) A request is sent to the scanner or workstation asking permission to diagnose the system remotely. The customer receives the InSite ExC Notification shown in Figure 7-136.

Figure 7-136 InSite ExC Notification



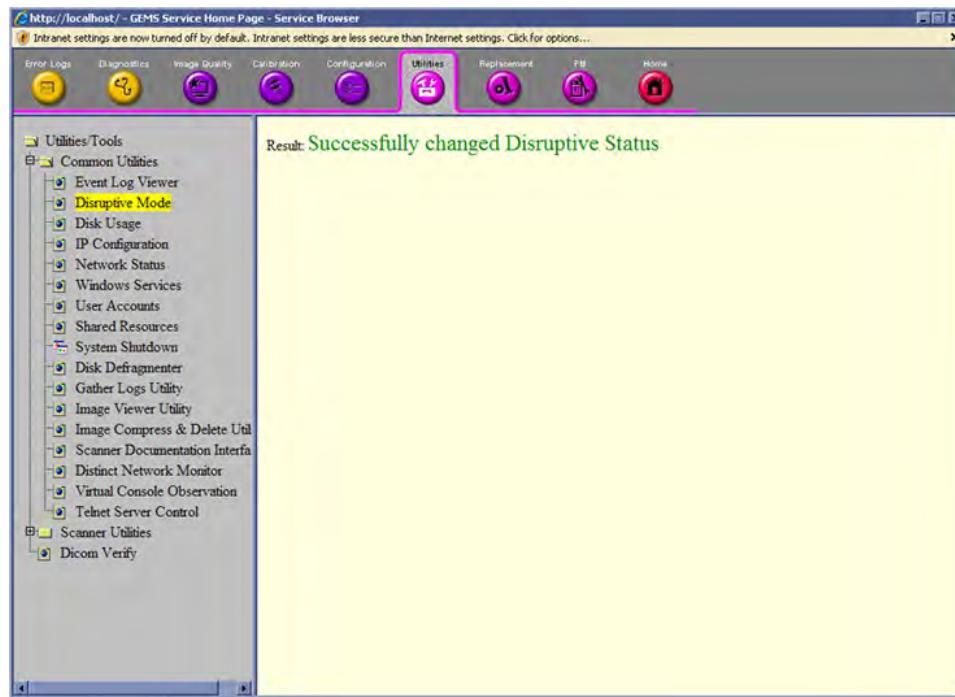
7-6-4 How FE Remotely Enables Disruptive Mode and VCO (cont'd)

- 6.) The customer selects Yes.

NOTE: If the customer does not wish to have diagnostics running at the time of the request, they select No. A message is sent back to the OLC or FE that "Disruptive Mode" is not enabled.

The screen below confirms the Disruptive Mode status change.

Figure 7-137 Disruptive Mode Enabled



- 7.) After "Disruptive Mode" is enabled, "Virtual Console Observation" can be activated by selecting **Utilities** -> **Common Utilities** -> **Virtual Console Observation**, and then pressing the "**Start**" button.

If "Virtual Console Observation" has been activated successfully, the following display is shown to the OLC or FE:

Figure 7-138 Virtual Console Observation is Running



- 8.) To terminate "Virtual Console Observation", the OLC or FE can press the "Stop" button.

7-6-4 How FE Remotely Enables Disruptive Mode and VCO (cont'd)

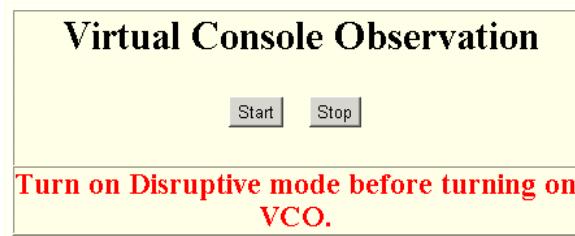
- 9.) Once the OLC or FE selects Stop, Figure 7-139 is displayed.

Figure 7-139 Virtual Console Observation is stopped



NOTE: An attempt to activate the Virtual Console Observation Tool without first enabling “Disruptive Mode” will result in the screen display shown in Figure 7-140:

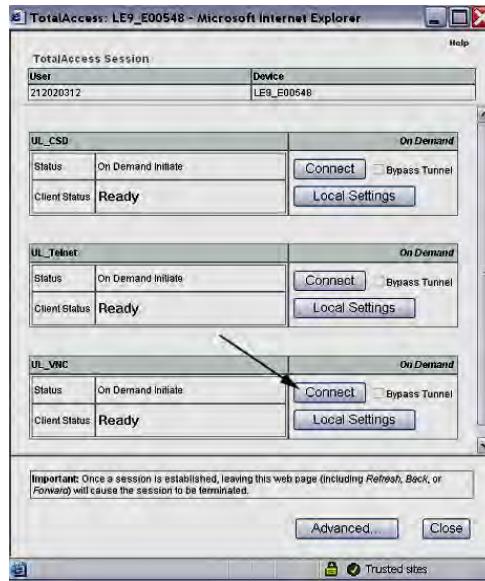
Figure 7-140 Virtual Console Observation “Warning”



7-6-4 How FE Remotely Enables Disruptive Mode and VCO (cont'd)

To connect to the system via VNC, go to the TotalAccess window on your laptop/computer and select Connect under **UL_VNC**, **CIS_VNC** (RSvP).

Figure 7-141 “TotalAccess” Window



Click **OK** on the message displayed for the connection and wait to get the Virtual Console Observation widow. This window will display the main application and touch panel screens.

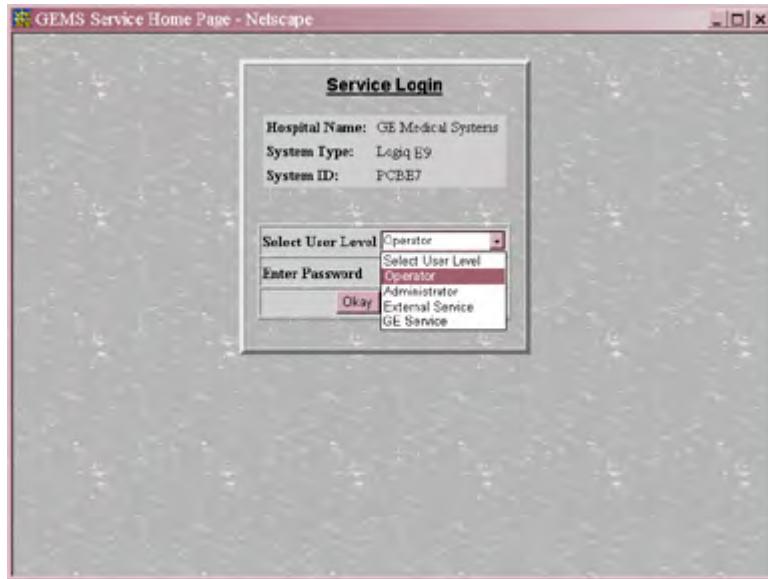
7-6-5 How Customer Enables Disruptive Mode

Perform these steps for a **customer** to enable Disruptive Mode.

- 1.) On the Touch Screen, click on the Utilities button, then the Service button. This icon links the User or Field Engineer (FE) to the Service Login screen shown in Figure 7-142.

NOTE: *The screen in Figure 7-142 is an example from a LOGIQ E9 Engineering system. The System Type and/or System ID will vary between scanners and workstations.*

Figure 7-142 Service Login Screen



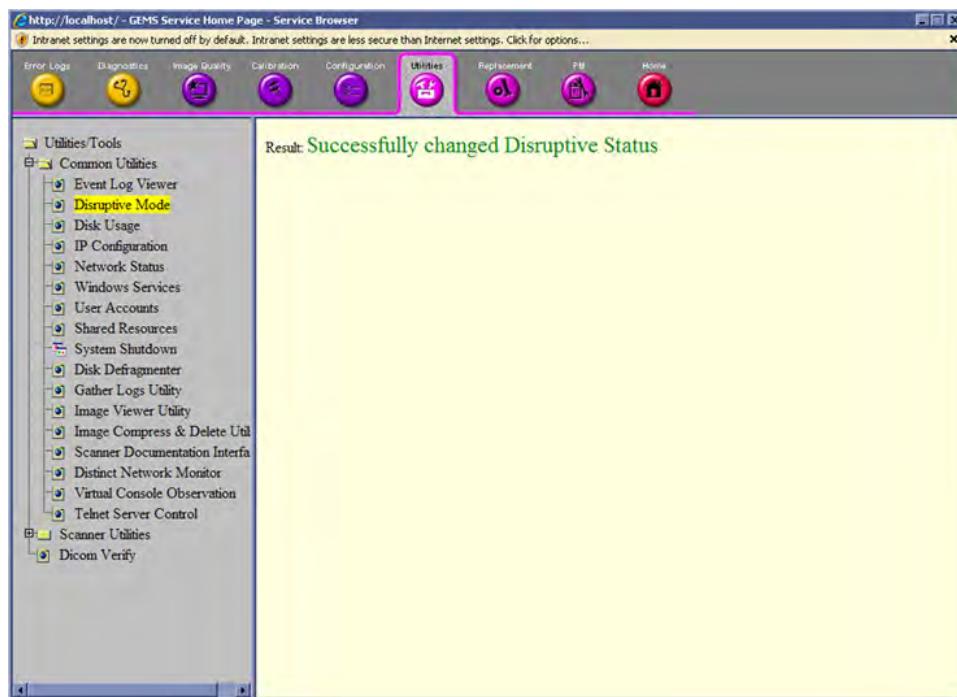
- 2.) Select Operator and enter the password ULS, then click Okay.
- 3.) Select **Utility -> Common Utilities -> Disruptive Mode** (See: *Figure 7-143 "Disruptive Mode Enabled" on page 7-173*).

7-6-5 How Customer Enables Disruptive Mode (cont'd)

- 4.) To Enable "Disruptive Mode" select Yes.

The Figure 7-143 screen below confirms the Disruptive Mode status change.

Figure 7-143 Disruptive Mode Enabled



7-6-6 Customer Enables VCO

Perform these steps for a customer to enable VCO:

- 1.) Left click on the InSite ExC icon.
- 2.) Select **Clinical Life Line**. This will activate disruptive mode and VCO for the application OLC to quickly assist the customer.
- 3.) If you select **Clinical Life Line** again, it will turn off disruptive mode and VCO.
- 4.) A Red message indicating that the system should be rebooted will remain until the system is rebooted.

Section 7-7

Troubleshooting Insite ExC Configuration

7-7-1 Contents in this section

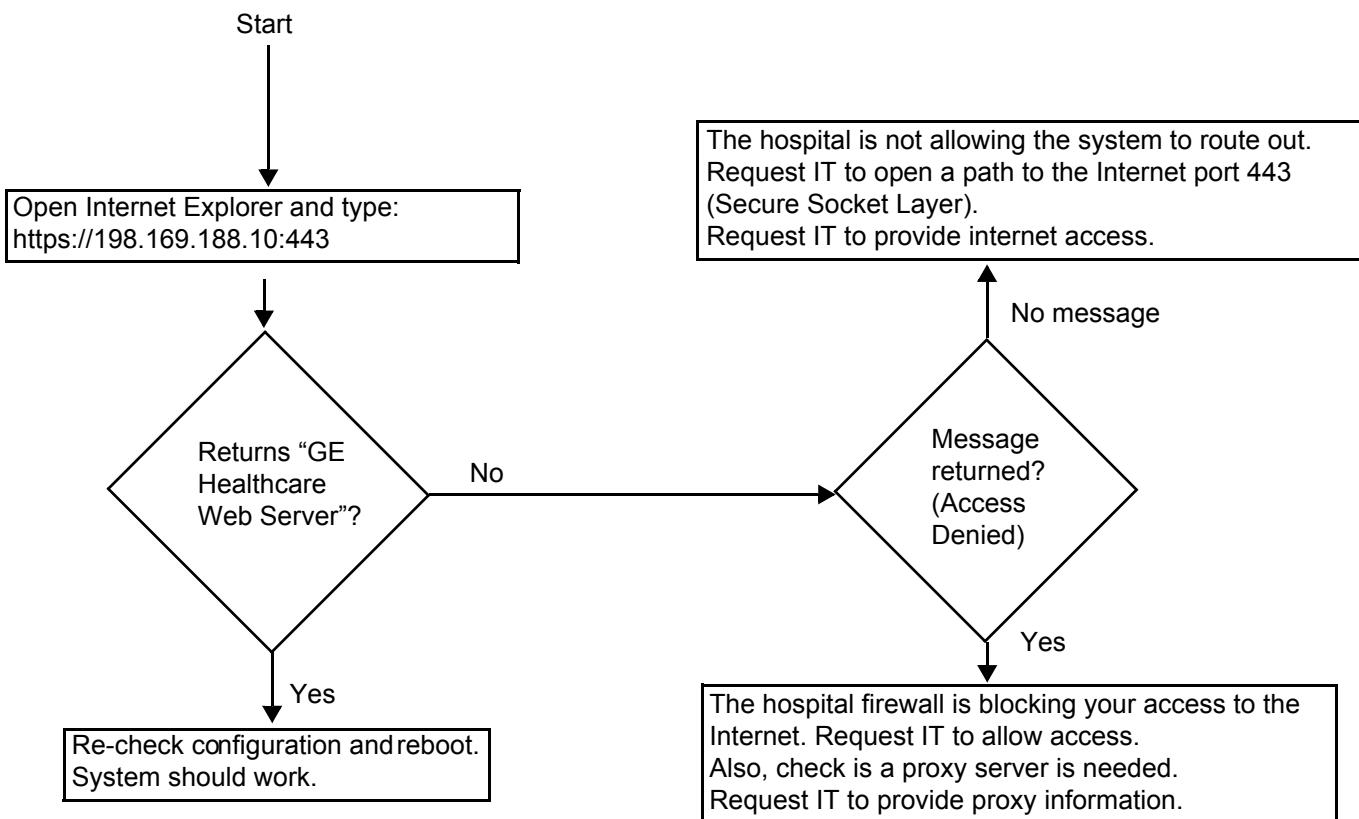
7-7-2 Verify Configuration Steps	7-175
7-7-3 Troubleshooting flowchart.....	7-176

7-7-2 Verify Configuration Steps

See: Section 3-11-4 "Configuring InSite ExC" on page 3-87.

7-7-3 Troubleshooting flowchart

Figure 7-144 Troubleshooting flowchart



Section 7-8

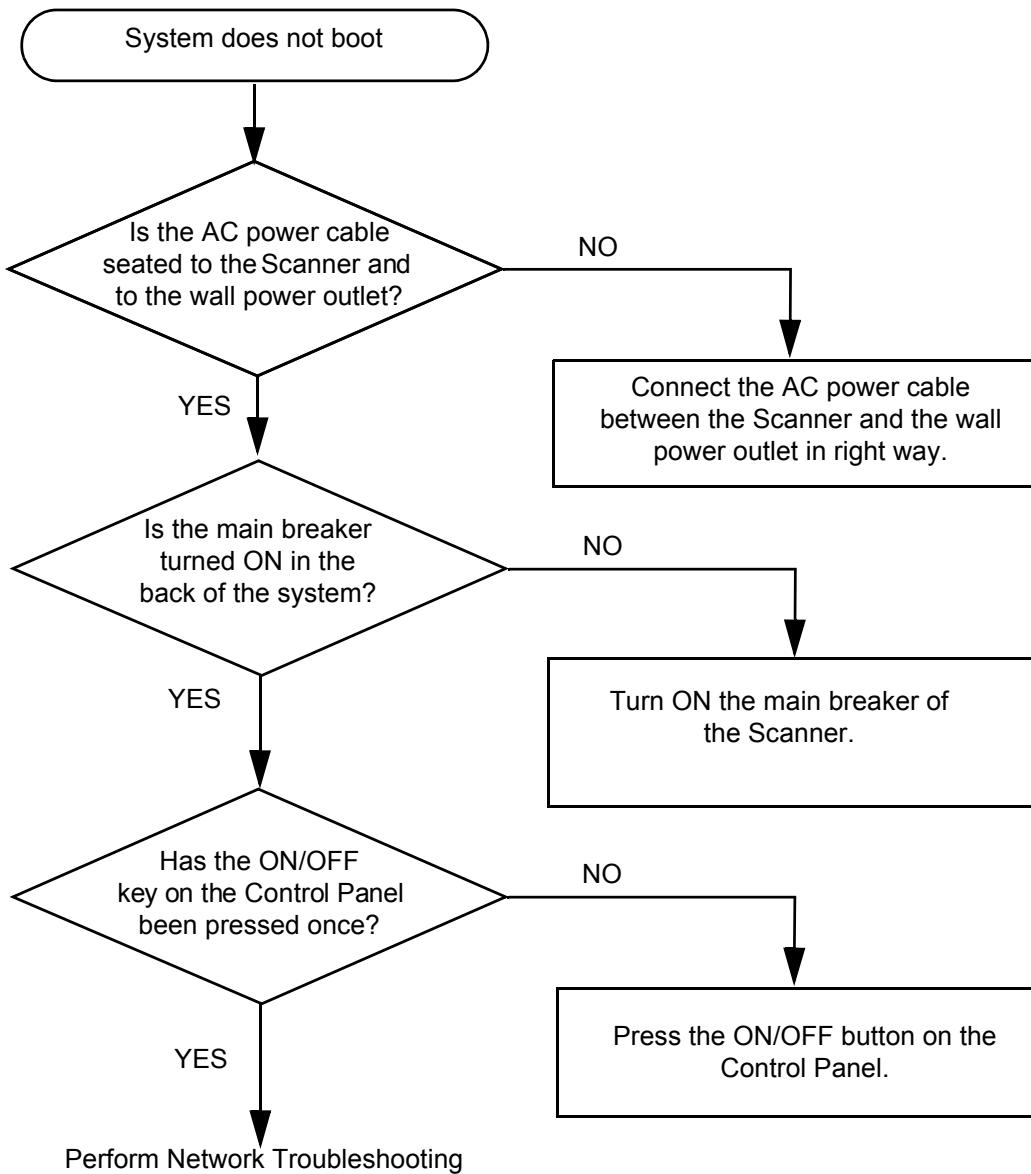
Troubleshooting Trees

7-8-1 Contents in this section

7-8-2	LOGIQ E9 Does Not Power On / Boot Up	7-178
7-8-3	Noise in Image	7-181
7-8-4	Unable to Scan	7-182
7-8-5	Trackball	7-183
7-8-6	System Does Not Power Off / Shutdown	7-184
7-8-7	Monitor Troubleshooting	7-185
7-8-8	Printer Troubleshooting	7-187
7-8-9	CD/DVD Troubleshooting	7-189
7-8-10	Network Troubleshooting	7-190
7-8-11	Volume Navigation (V Nav) Troubleshooting	7-191

7-8-2 LOGIQ E9 Does Not Power On / Boot Up

Figure 7-145 Power On / Boot Up Flowchart - Page 1



If the System is not booting and the BIOS screen does not appear, try resetting the BIOS using the jumper on the motherboard. The jumper is located just below the Battery (Silver disk) in the upper-left corner of the BEP Motherboard.

If the BEP has been replaced and just turned on for the first time, and no video is coming out of the main monitor, open the BEP and ensure that the Video Card is seated properly. Although the packaging is made to resist several drops, packaging being mishandled in transportation may result in unseated boards.

7-8-2-1 Resetting the BEP BIOS Memory

- 1.) Turn off the system breaker on the back of the system.
- 2.) Open the BEP cover and unplug battery pack (J3) from Extended Power Shutdown board J3, or the battery from the Chargeboard at PCN1.
- 3.) If you have a BEP5, remove the HDD Drive mounting frame and remove HDD assembly per steps of procedure in section 8-11-12 "BEP HDD (Hard Disk Drive) replacement - BEP5.x" on page 8-491.
- 4.) Disconnect J46 Ethernet cable from BEP I/O Board (this provides much easier access to Jumper J1).
- 5.) If you have a BEP5, locate the Yellow Jumper (J1) in the upper left corner of the BEP Mother board just below the BIOS Battery and the ATX Power connection to the Motherboard. If you have a BEP6, locate JCMOS1 from 1/2 to 2/3.
- 6.) Using a pair of fine (long and narrow), needle nose pliers or tweezers, move Jumper J1 (the yellow jumper just below the battery in the upper left corner of the BEP Motherboard) to the left by one pin.
- 7.) J1 is normally across pins 1 and 2 (two pins that are on the right side of the three pins).
- 8.) Move J1 left one pin so it is across pins 2 and 3 (two pins on the left side of the three pins).
- 9.) Turn on the system breaker. Wait 2 full minutes.
- 10.) Turn off the system breaker.
- 11.) Move the jumper (J1) back to Normal position.
- 12.) Reconnect J46 Ethernet cable to BEP I/O Board.
- 13.) If you have a BEP5, install HDD Drive per steps 1-4 of the procedure in section 8-11-12 "BEP HDD (Hard Disk Drive) replacement - BEP5.x" on page 8-491.
- 14.) Plug in the battery on the Extended Power Shutdown board (J3), or the battery to the Chargeboard at PCN1.
- 15.) Close the BEP cover and tighten the screw on the top of the cover.

NOTE: *Be careful not to pinch the wires as you close the cover.*

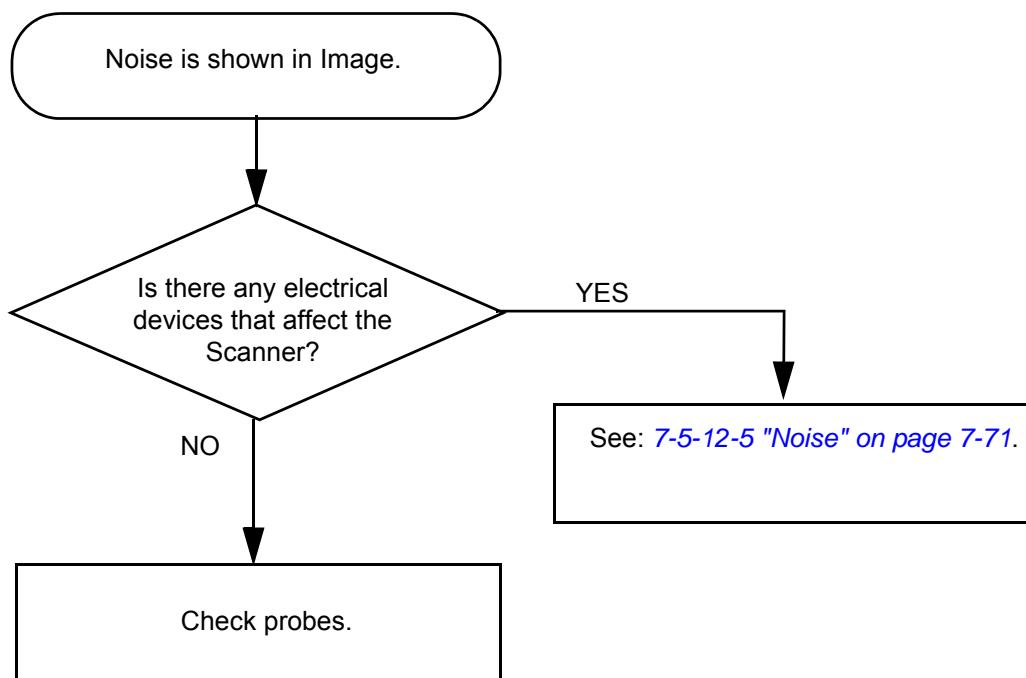
- 16.) Turn on the system breaker.
- 17.) Push the Power Button.
- 18.) Flash BIOS Memory per procedure in section 8-4-9 "Flashing the BIOS memory" on page 8-31.
- 19.) Boot up the system and set the system time and date per section 7-9-10-5 "Incorrect System Time When Daylight Savings Time Changes" on page 7-236.

7-8-2-2 Boot Sequence

- 1.) Press the I/O (On/Off) button. Upon releasing the button the light turns from amber to green.
- 2.) A few beeps are heard and the BEP and card rack fans come on.
- 3.) The BIOS screen appears on the LCD screen.
- 4.) The keyboard backlights flash momentarily.
- 5.) The Device Screen appears on the LCD.
- 6.) The Starting Scanner completion bar appears on the LCD screen.
- 7.) The blue screen appears on the image monitor, the LCD screen is blank.
- 8.) The completion bar measures the progress of the boot up.
- 9.) The ultrasound application screen appears on the image monitor and the Touch Panel graphics appear on the LCD screen.

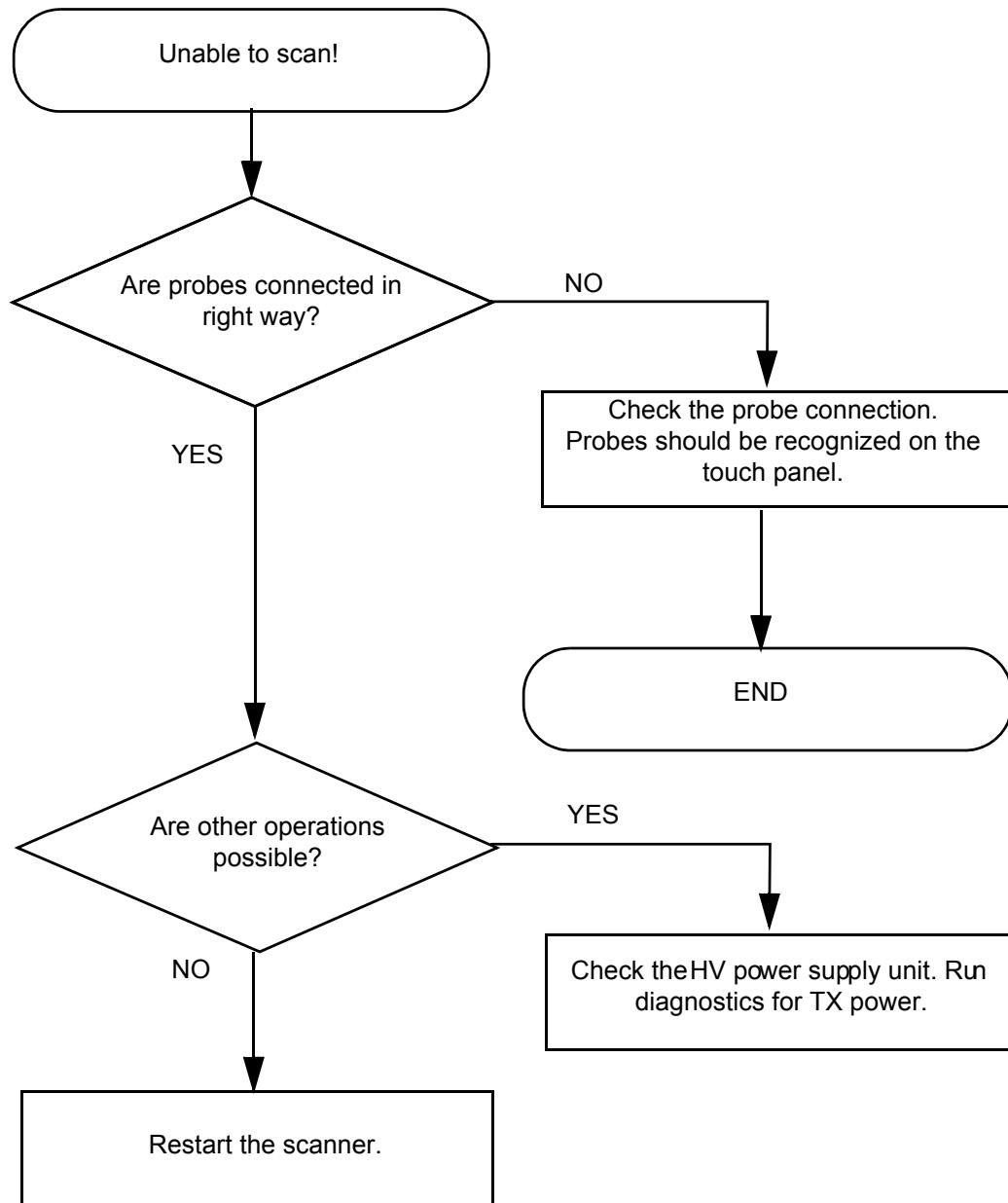
7-8-3 Noise in Image

Figure 7-146 Noise in Image



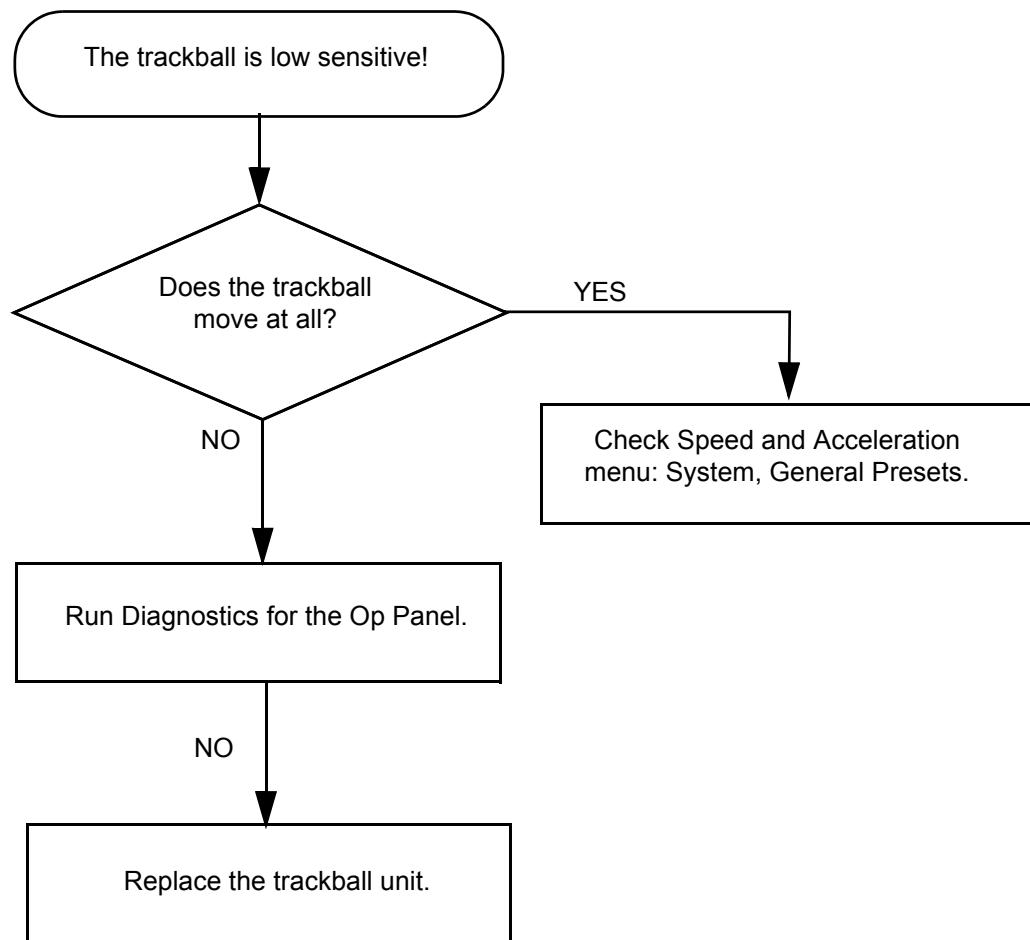
7-8-4 Unable to Scan

Figure 7-147 Unable to Scan



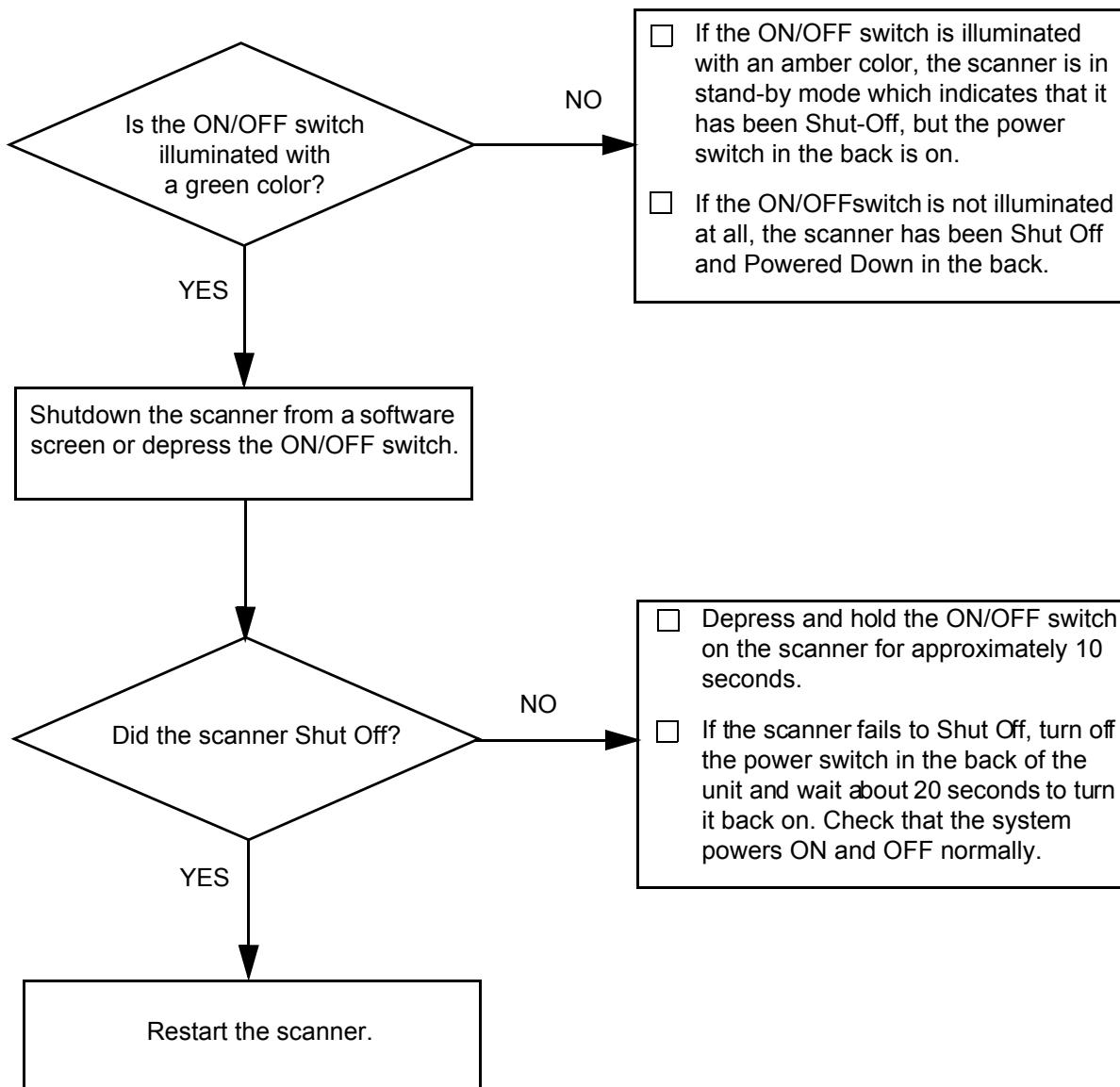
7-8-5 Trackball

Figure 7-148 Trackball Troubleshooting



7-8-6 System Does Not Power Off / Shutdown

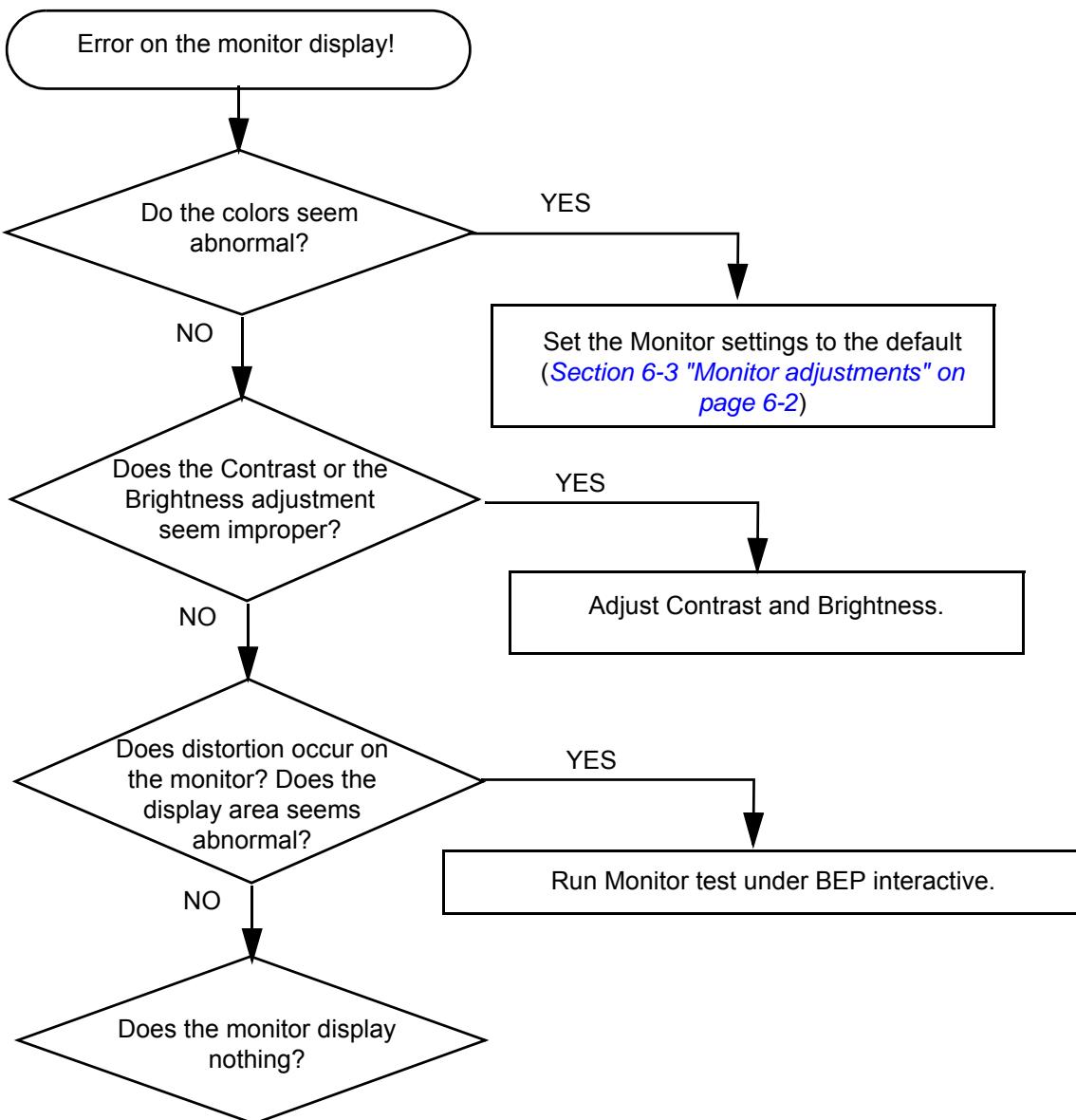
Figure 7-149 Power Off / Shutdown Flowchart



7-8-7 Monitor Troubleshooting

NOTE: Reset the monitor settings to the factory defaults prior to troubleshooting the monitor.

Figure 7-150 Monitor Troubleshooting



7-8-7 Monitor Troubleshooting (cont'd)

- Monitor does not work
 - Verify power is present to monitor
 - Check if video is present at external DVI connection (you may need an external monitor)
- Prints do not match monitor
 - Verify factory default settings. Chapter 3 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

The LCD monitor used for LOGIQ E9 has a custom color profile (ICC Profile) programmed into the LCD itself, which is designed to reduce noise in the image by suppressing low-level and very high-level gray values. Due to this, the contrast setting also plays a role along with the brightness setting in the 'brightness calibration' test pattern. When using the SMPTE Pattern on systems running R4.3.0 or earlier, please be aware that the LOGIQ E9 monitor gray level does not display falls in the noise range (< 6 or > 225 on a 0-255 range of 8-bit gray scale values). **The LOGIQ E9 intentionally displays a gray value of < 6 as 0 (darkest) or a gray value above 225 as 255 (brightest).** Although the instructions on the SMPTE pattern screen may indicate that the display is not showing all the gray levels, this behavior is normal. The SMPTE pattern version used on R4.3.0 and earlier was not fully suitable for LCD technology.

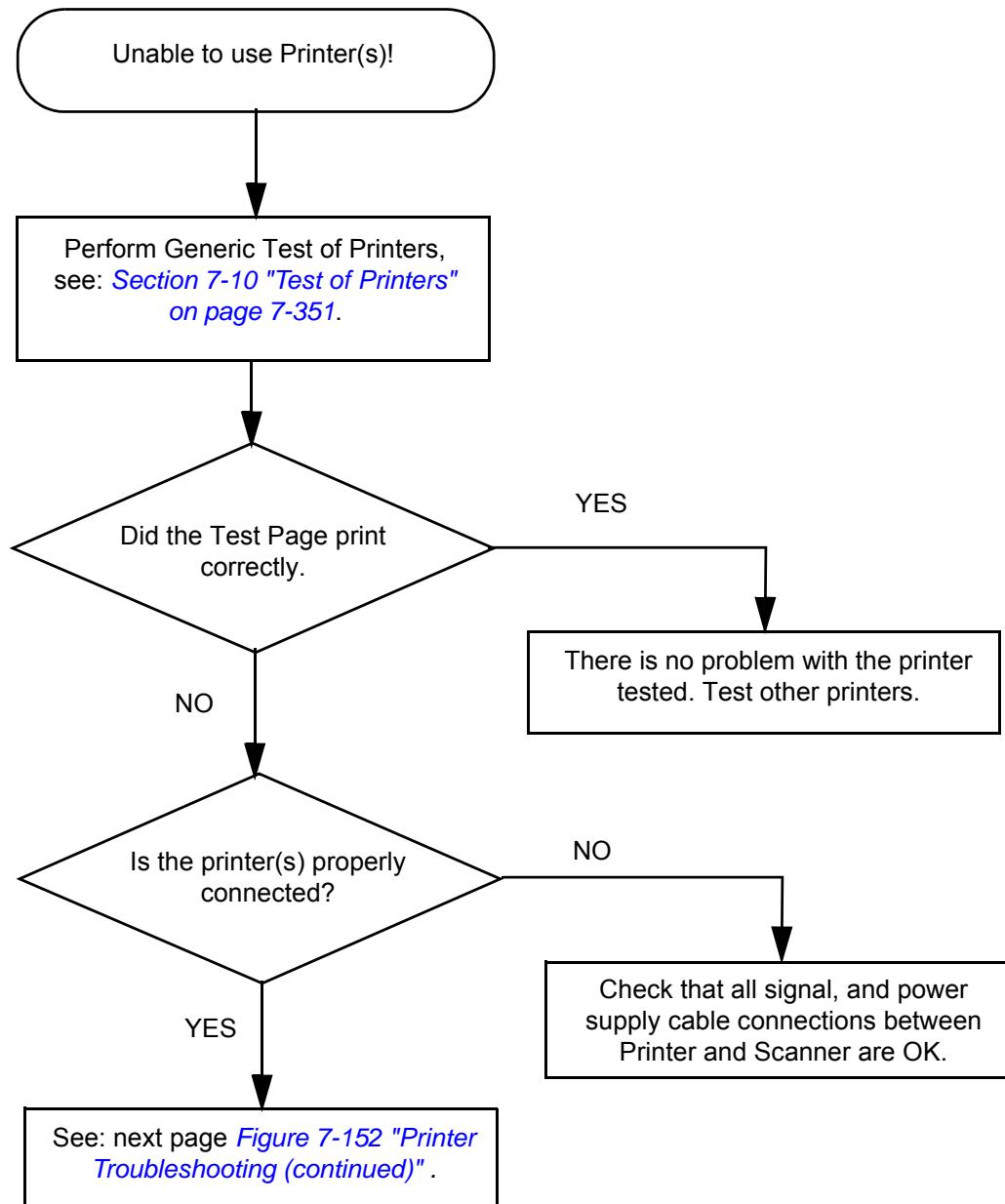
In R5 and later versions, the pattern used to check calibration have been updated to suit the latest Monitor technology.

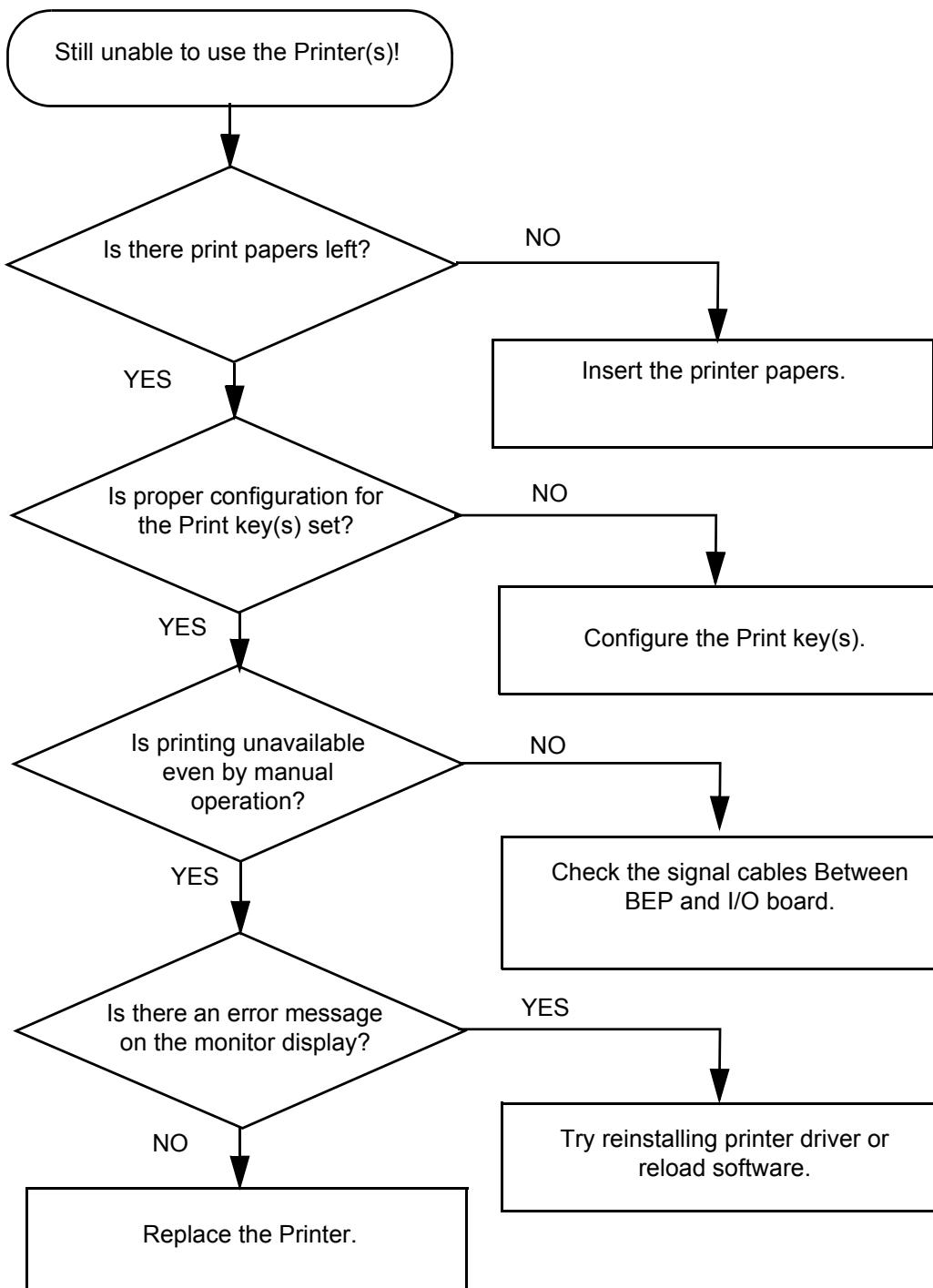
R6 and later:

For further information about test patterns available on the, refer to the appropriate version of the LOGIQ E9 Basic User Manual, Chapter 3. See: *Table 1-8 "Basic User Manual and Release Notes per LOGIQ E9 console" on page 1-22.*

7-8-8 Printer Troubleshooting

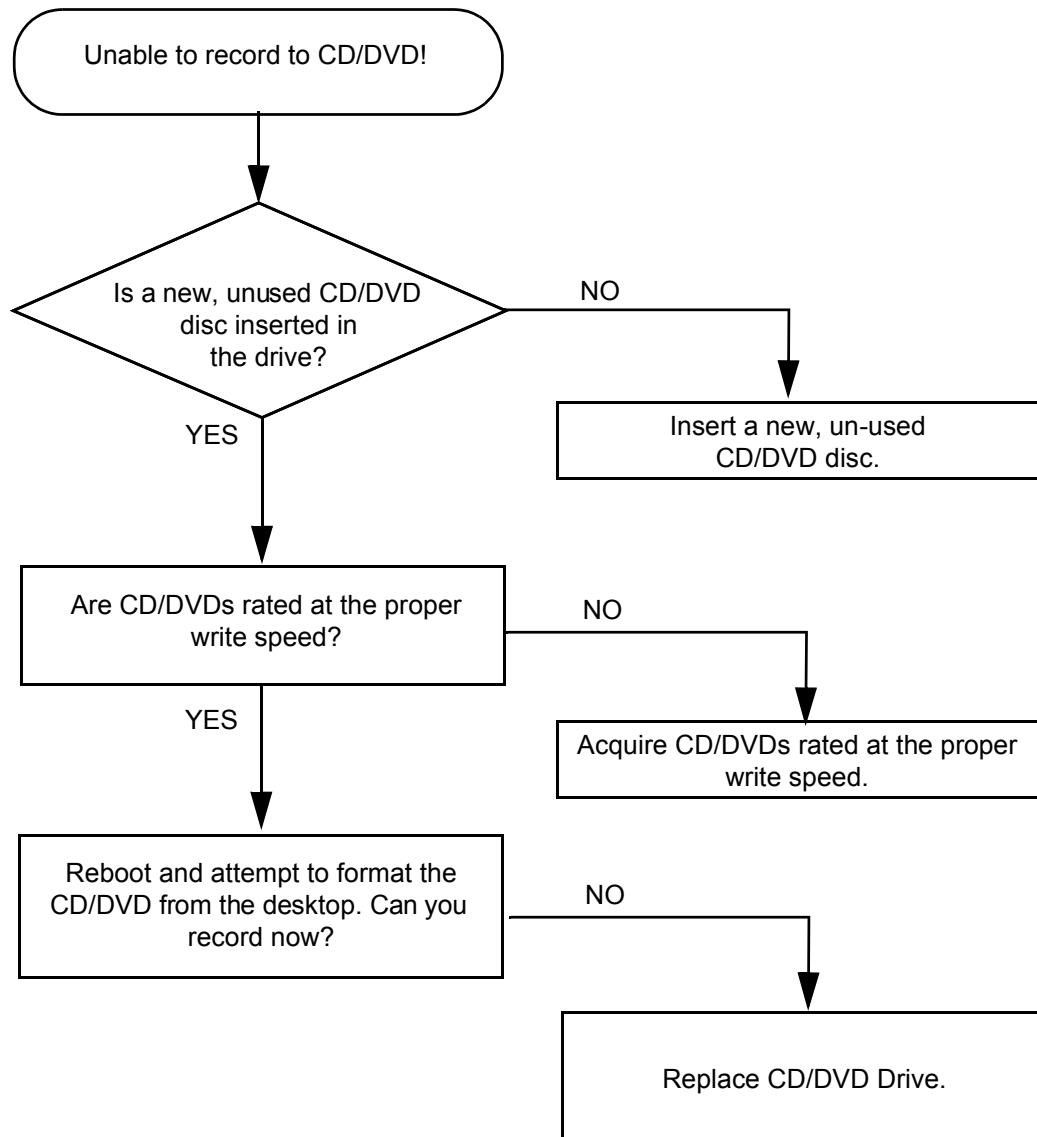
Figure 7-151 Printer Troubleshooting



7-8-8 Printer Troubleshooting (cont'd)**Figure 7-152 Printer Troubleshooting (continued)**

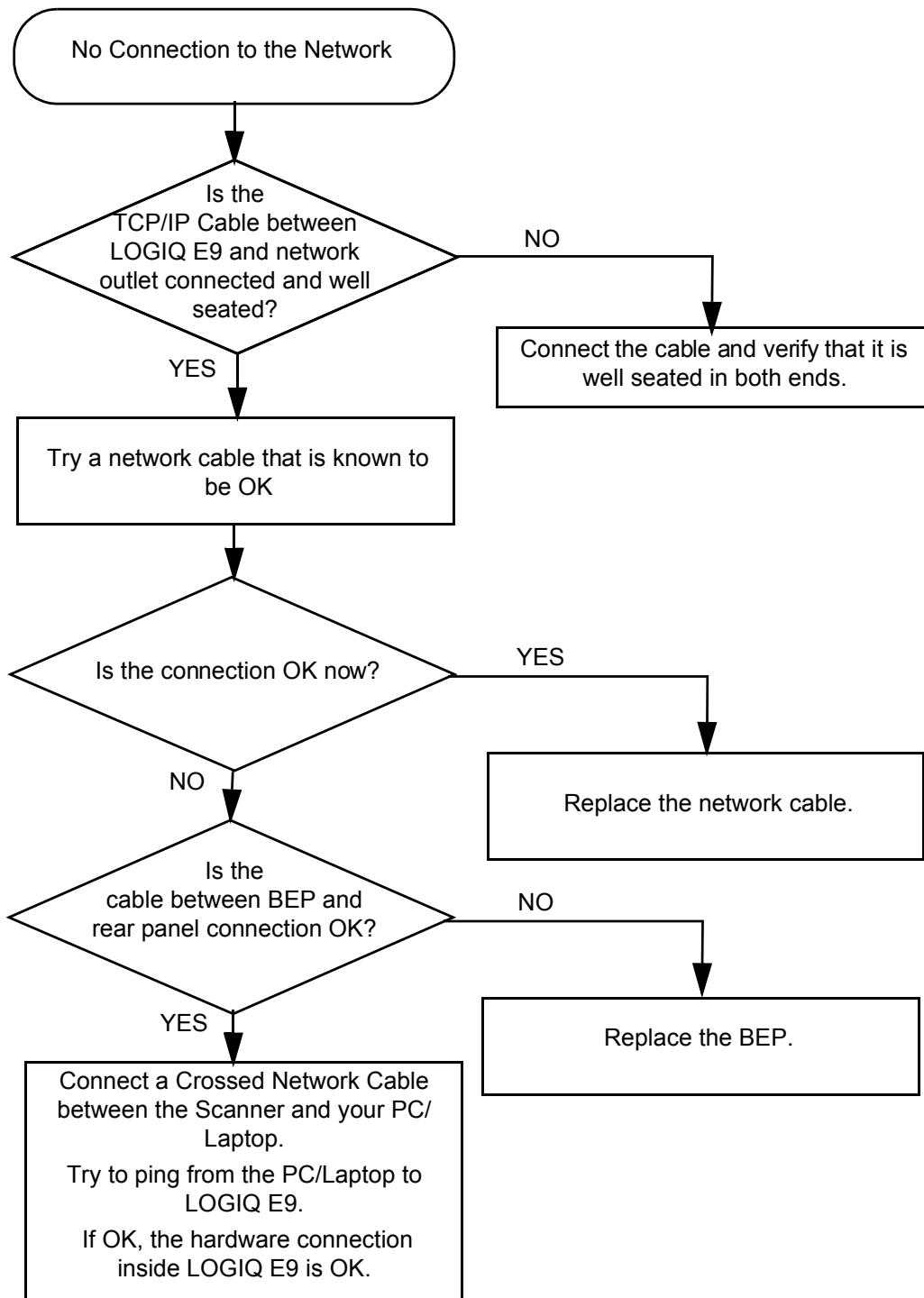
7-8-9 CD/DVD Troubleshooting

Figure 7-153 CD/DVD Troubleshooting



7-8-10 Network Troubleshooting

Figure 7-154 Network Troubleshooting



7-8-10 Network Troubleshooting (cont'd)

7-8-10-1 No Contact With Server, But Connection to Network is OK

Check Network setup on the scanner. See: [7-5-21-5 "Network Status" on page 7-139](#).

7-8-11 Volume Navigation (V Nav) Troubleshooting

If the distortion is not corrected by following the calibration instructions, you can check the functionality of the sensors without the application running by using the following utility and observing the behavior of the sensors:

C:\HARDWARE_DRIVERS\drivebay\Cubes.exe

Section 7-9 Troubleshooting Tips

Each entry in the table will hyper-link to the issue and resolution.

Table 7-45 Troubleshooting Tips Table

Sub-System	Issue
4D	See: 7-9-14 "4D Option Troubleshooting" on page 7-238
Backend Isolation from Front End (Simulator Mode)	To isolate the Front End from the Backend and boot up into Simulator Mode, you must: <ul style="list-style-type: none"> • Power Down the System, • GFI Configuration - Disconnect the PCIe cable on both the GFI Board and BEP. • MRX Configuration - Disconnect the PCIe cable to the Motherboard (J3). • Disconnect the USB cable to the Patient I/O Module if present. This step may be necessary since the Patient I/O Board is a self-powered USB device and back powers the USB data lines causing boot up issues while the system is disconnected from the front end. In simulator mode, the scan screen may display pulsatile circles or no scan at all, but will allow other application functions to run normally.
Back End Processor <small>Also see: 7-9-9 "Back End Processor (BEP) Troubleshooting" on page 7-223.</small>	See: 7-9-8-1 "System Halt Errors - Lock ups or Intermittent Problems" on page 7-221 (continued) See: 7-9-8-2 "CD/DVD Drive Failures" on page 7-221 See: 7-9-8-3 "Image CD/DVD not read" on page 7-221 See: 7-9-8-4 "BEP Arrives Without Video" on page 7-221 See: 7-9-8-5 "Simulator Mode" on page 7-222 See: 7-9-8-6 "Lockups or Blue screens" on page 7-222 See: 7-9-8-7 "Files corrupt on boot" on page 7-222 See: 7-9-8-8 "Here's a way to power on the BEP" on page 7-222 See: 7-9-8-9 "Hard Drive Failure" on page 7-222

Table 7-45 Troubleshooting Tips Table

Sub-System	Issue
Connectivity	See: 7-9-7-1 "Cannot connect to something via the network" on page 7-219
	See: 7-9-7-2 "No Ping" on page 7-219
	See: 7-9-7-3 "No Verify" on page 7-219
	See: 7-9-7-4 "System Pings and Verifies but does NOT Send" on page 7-220
	See: 7-9-7-6 "Adjust time-out for DICOM servers" on page 7-220
Diagnostics Window Overview - R3.x.x and later	See: 7-5-12-15 "Diagnostics Window Overview - R3.x.x and later" on page 7-95
EMI Prevention/Abatement	See: 7-9-5 "EMI Prevention/Abatement" on page 7-217
	See: 7-9-5-1 "Different Power Outlet" on page 7-217
	See: 7-9-5-2 "Different System" on page 7-217
	See: 7-9-5-3 "Different Location" on page 7-217
Image Artifacts	See: 7-9-6 "Image Artifacts Caused by Front End Boards" on page 7-218
Log Analysis	See: 7-9-16 "Log Analysis - R3.x and earlier" on page 7-240
Log File Reading	See: 7-9-18 "LOGIQ E9 Log File Reading" on page 7-250
Main Power Supply Also see 7-9-4 "Main Power Supply (MPS) Troubleshooting" on page 7-202 .	See: 7-9-2 "Noise" on page 7-195
Monitor	See: 7-5-14-8 "The Monitor Measurement Summary Sidebar does not appear after Upgrading to R6" on page 7-119
No Boot	See: 7-8-2 "LOGIQ E9 Does Not Power On / Boot Up" on page 7-178
Noise	See: 7-9-2 "Noise" on page 7-195
	See: 7-9-2-1 "Noise Picked up from the Air" on page 7-196
	See: 7-9-2-2 "Noise Received via the External Cables" on page 7-196
	See: 7-9-2-4 "Intermittent Noise" on page 7-197
	See: 7-9-2-5 "Motor Boat" Noise" on page 7-197
	See: 7-9-2-6 "Self-Generated Noise (Noise Generated Inside the LOGIQ E9)" on page 7-197
	See: 7-9-2-7 "Heat-Related Noise Problems" on page 7-197
OLED Monitor	See: 7-5-14-9 "Monitor Adjustment Controls do not show for the OLED Monitor" on page 7-120

Table 7-45 Troubleshooting Tips Table

Sub-System	Issue
Operator Panel	See: 7-9-10-1 "No Audio" on page 7-235
	See: 7-9-10-2 "No Video on Touch Panel Display" on page 7-235
	See: 7-9-10-3 "Wrong Key Activated on the Touch Panel" on page 7-235
	See: 7-9-10-4 "Wrong System Date and Time" on page 7-235
	See: 7-9-10-5 "Incorrect System Time When Daylight Savings Time Changes" on page 7-236
	See: 7-9-10-6 "Touch Panel Not Responding" on page 7-236
Operator Panel Keyboard	See: 7-9-1 "Shortcut Keys" on page 7-194
Probes	See: 7-9-11-1 "Probe Recognition" on page 7-236
Replacing New Fan Tray - Fails "GFI Fan Test"	See: 7-9-30 "LOGIQ E9 Replacing New Fan Tray - Fails "GFI Fan Test"" on page 7-345
Software	See: 7-9-13-1 "Base Image Load Troubleshooting" on page 7-238
	See: 7-9-13-2 "Image or Patient Data Loss" on page 7-238
S-Video in output in R6 with Wide Screen Monitors	See: 7-5-14-7 "S-Video Image displays a portion of the Main Display" on page 7-119
System boots, but cannot scan	See: 7-9-2-7 "Heat-Related Noise Problems" on page 7-197
System not booting up	See: 7-9-2-7 "Heat-Related Noise Problems" on page 7-197
System Temperature Too High (System Overheating)	See: 7-9-12 "System Temperature Too High (System Overheating)" on page 7-237
Transmit and Receive Signal Path Diagnostics	See: 7-9-19 "LOGIQ E9 Transmit and Receive Signal Path Diagnostics" on page 7-275
VPD Editor "Not Opening" (console models running Application Software R3.1.0)	See: 7-9-31 "LOGIQ E9 VPD Editor "Not Opening"" on page 7-346
V Nav Inside Probes	See: 7-9-11-2 "V Nav Inside Sensors Failure" on page 7-236
Z-Axis Stuck Down	See: 7-9-28 "LOGIQ E9 Z-Axis Stuck Down" on page 7-337
Audio Audio DOES NOT Play after Upgrade from R2 to R5	See: 7-9-29 "Audio DOES NOT Play after Upgrade from R2 to R5" on page 7-341
LOGIQ E9 Replacing New Fan Tray - Fails "GFI Fan Test"	See: 7-9-30 "LOGIQ E9 Replacing New Fan Tray - Fails "GFI Fan Test"" on page 7-345
LOGIQ E9 VPD Editor "Not Opening"	See: 7-9-31 "LOGIQ E9 VPD Editor "Not Opening"" on page 7-346
Brakes	See: 7-9-32 "Sticking Brakes" on page 7-348
	See: 7-9-33 "Brake Functionality (not effectively stopping the LOGIQ E9)" on page 7-350
Test of Printers	See: Section 7-10 "Test of Printers" on page 7-351

7-9-1 Shortcut Keys

There are several Shortcut keys to be utilized on the LOGIQ E9:

- **Alt + 1 or Alt + 2** to mark events in the log file. Used for the flagging issues during operation.
- **Alt + F10** = is the SW Shut Down.
If the system can be shut-down by using these keys it means that SW is working and the problem could be the ON/OFF switch or the wire that carries the shut-down signal.
- **Alt + F5 or F11** for the echo simulator (keyboard simulation), brings up or removes the frontpanel simulator. It may be used with VCO to press buttons on the frontpanel that are not a standard key on your PC.
- **Alt + A** bring up a cursor (Alt + A stands for "Arrow").
- **Alt + D** to capture the scanner logs (See:
["7-3-4 Collecting a Screen Capture with Logs \(cont'd\)" on page 7-6.](#)
- **Alt + N** activates the Network Sniffer monitor, or restores it if it is minimized or hidden.

R4.x and later

With the Service Key connected:

- **Alt - ctrl - D** -> brings up the Debug command window. This can be used to run Sclogs. See:
["7-3-4 Collecting a Screen Capture with Logs \(cont'd\)" on page 7-6.](#)
- **Alt - Tab** -> allows you to switch between task screens. You must access Windows first, then re-launch the application to be able to use this combination of screens.

7-9-2 Noise

Ultrasound machines are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the air or wiring. They also generate EMI. Possible EMI sources should be identified before the unit is installed. See: [7-5-12-5 "Noise" on page 7-71](#) for the diagnostic Noise Floor test.

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

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

The presence of a broadcast station or broadcast van may also cause interference.

When talking to the customer, try to gather as much information as possible about the conditions when the noise appear:

Is the noise present...

... all the time?

(See: [7-9-2-1 "Noise Picked up from the Air" on page 7-196](#) and [7-9-2-2 "Noise Received via the External Cables" on page 7-196](#).)

... after some time of use? (After how long time?)

(See: [7-9-2-6 "Self-Generated Noise \(Noise Generated Inside the LOGIQ E9\)" on page 7-197](#).)

... at special times of the day (or night)? When?

(See: [7-9-2-1 "Noise Picked up from the Air" on page 7-196](#) and [7-9-2-2 "Noise Received via the External Cables" on page 7-196](#).)

... at all locations in the hospital, or only in one room/area?

- All locations:

(See: [7-9-2-6 "Self-Generated Noise \(Noise Generated Inside the LOGIQ E9\)" on page 7-197](#).)

- Only in one room/area:

(See: [7-9-2-1 "Noise Picked up from the Air" on page 7-196](#) and [7-9-2-2 "Noise Received via the External Cables" on page 7-196](#).)

... from time to time, no special pattern of time is observed?

(See: [7-9-2-1 "Noise Picked up from the Air" on page 7-196](#) and [7-9-2-2 "Noise Received via the External Cables" on page 7-196](#).)

7-9-2-1 Noise Picked up from the Air

Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the air.

If picked up by a probe cable, the noise will be coherent - "penlight noise" pointing down in the picture-due to the fact that the noise is received on all channels)

Is it a problem on one probe only?

- Try another probe.

Is it a problem on one of the probe connectors only?

- Move the scanner to another location and verify any changes.

7-9-2-2 Noise Received via the External Cables

Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the wiring. The noise can enter the system via the mains power cable, probe cable(s) or any other external connected cable(s).

Disconnect cables that are not needed for the basic use of the scanner:

- Network cable
- Cables to any external peripherals
- ECG cables and other cables connected to the Patient I/O
- Verify if the noise change or disappear when the cables are removed.

Often, this type of noise is due to grounding problems in the mains power system or that the scanner is sharing a power line with other equipment.

7-9-2-3 Doppler Noise

- Horizontal stripes:
This is typically an analog problem on either of these boards:
 - Transmitter board (GTX)
 - Receiver board (GRX)
- Spikes
This is a typical digital problem and may be caused by an issue on:
 - Digital Receiver board (DRX)
 - Front End Interface Board (GFI)

7-9-2-4 Intermittent Noise

- Is there any equipment that is turned on and off near the scanner?
- Is the noise present around the clock or only at certain times?

7-9-2-5 "Motor Boat" Noise

May be hardware failure on GTX card or on the TX (Main Power supply).

7-9-2-6 Self-Generated Noise (Noise Generated Inside the LOGIQ E9)

Example: Color Noise in the near field.

- Self generated noise will not change if you touch the scanner or the probes.
- Self generated noise may be due to either:
 - heat problems
 - hardware problems
 - software problems

7-9-2-7 Heat-Related Noise Problems

Heat problems are usually starting when LOGIQ E9 has been ON for some time.

If LOGIQ E9 has been used for scanning for some time before the noise appears, it may be due to either heat problems or some software related issues. By doing a restart as described here, you may learn some more about the cause:

Select **Ctrl+Alt+R** to restart the back end Processor without power-cycling the unit.

- If the noise is present after the restart, the cause is most likely due to heat problems.
- If the noise is gone after the restart, it may be due to either the setup/adjustments of the LOGIQ E9 or a software failure

Some possible causes for heat problems:

- Fan filters need to be cleaned or replaced.
- Use of the LOGIQ E9 at room temperatures outside the allowed temperature limits.
- Fans are worn out.
- Hardware problems.

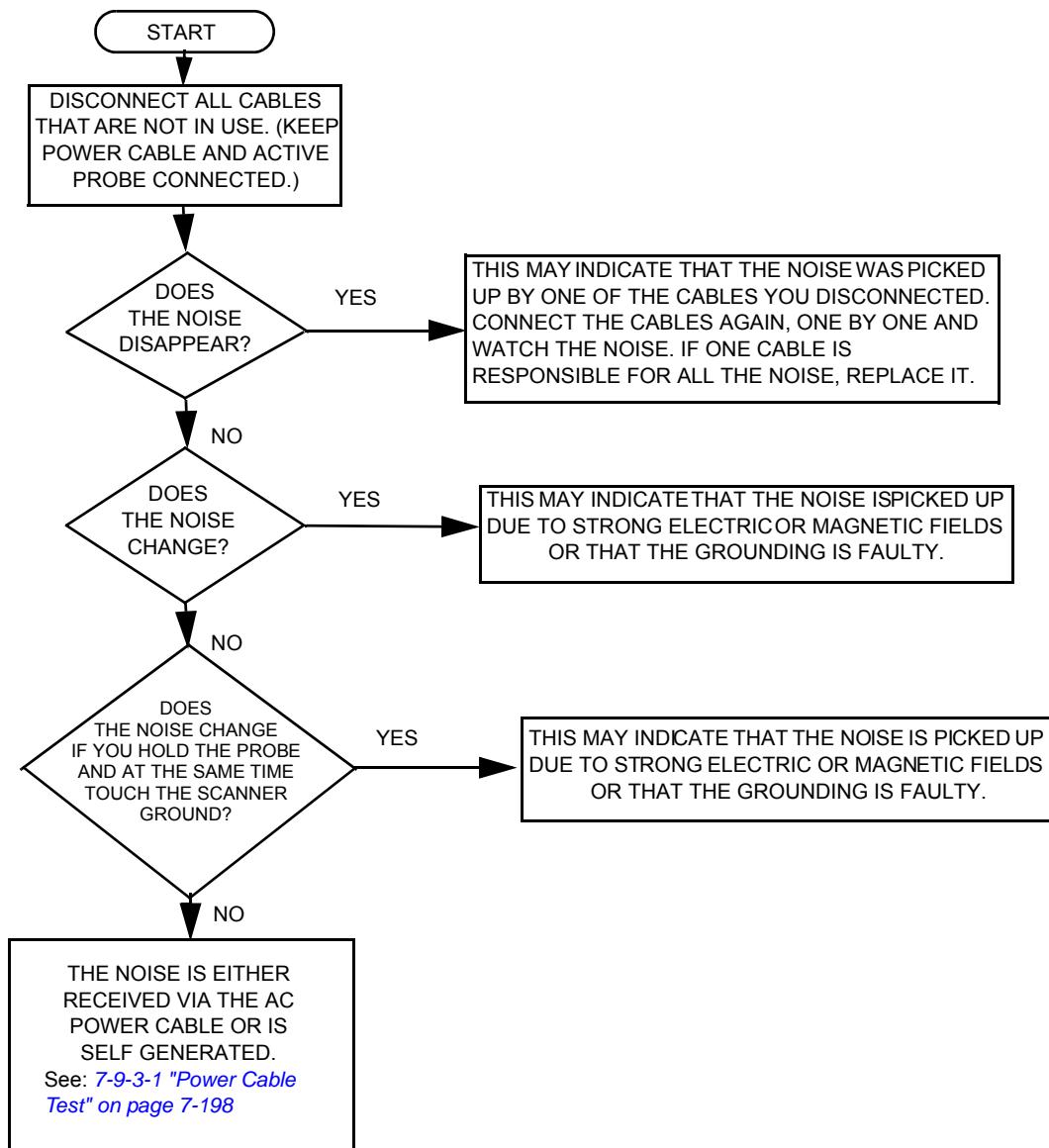
7-9-2-8 Hardware Problems

A hardware issue will typically be an error/malfunction on a card.

7-9-3 Investigate the Type of Noise

Use the flow chart below to investigate the type of noise.

Figure 7-155 Noise Type



7-9-3-1 Power Cable Test

Use a ferrite core on the AC power cable to verify if the noise is picked up by the AC power cable.

7-9-3-2 Noise in 2D Mode**Table 7-46 Noise in 2D Mode**

STEP	TASK
1	Noise is shown in 2D Mode. Is there any electrical devices that affect the LOGIQ E9? <ul style="list-style-type: none"> • If Yes, continue with step 2. • If No, continue with step 3.
2	Keep the LOGIQ E9 away from those electrical devices.
3	Check the Probe(s).

7-9-3-3 Noisy Images

Typical noise problems:

- coherent noise patterns straight down in the image field.
- flashes of noise straight down.

Usually the noise is only picked up when coupling the probe to your body.

Table 7-47 Noisy Images

STEP	TASK
1	Try another probe (same model). Does it help? <ul style="list-style-type: none"> • If Yes, replace the original probe. • If No, continue with the next step.
2	Disconnect all probes that are not in use. Keep only the active probe connected. Does it help? <ul style="list-style-type: none"> • If Yes: The noise is most likely from an external source. If possible, try to locate and remove the source. • If No, continue with the next step.
3	Disconnect all external cables from the I/O (on the rear side of LOGIQ E9) and from the Patient I/O, to establish whether the noise is due to interference from external devices. Does it help? <ul style="list-style-type: none"> • If Yes, continue with step 4. • If No, continue with step 5.
4	There are possible ferrite solutions to most of the cable connections. <ul style="list-style-type: none"> • On USB cables: Wind the cable 5-6 times through a ferrite ring, GE Part Number 038X0028. • Verify that the shielding is connected to Ground on the Patient I/O Cable(s)
5	Do the DC Offset Calibration, see: Section 6-6 "DC Offset Calibration" on page 6-34 .
6	Other possible internal noise sources: <ul style="list-style-type: none"> • Main Power Supply, • Peripherals. • Disconnect devices from the USB ports on the Op.

7-9-3-4 Noise in Color Flow

Typical noise problems:

- coherent noise patterns straight down in the image field.
- flashes of noise straight down.

Usually the noise is only picked up when coupling the probe to your body.

Table 7-48 Noise in Color Flow

STEP	TASK
1	Try another probe (same model). Does it help? <ul style="list-style-type: none"> • If Yes, replace the original probe. • If No, continue with the next step.
2	Disconnect all probes that are not in use. Keep only the active probe connected. Does it help? <ul style="list-style-type: none"> • If Yes: The noise is most likely from an external source. If possible, try to locate and remove the source. • If No, continue with the next step.
3	Disconnect all external cables from the I/O (on the rear side of LOGIQ E9) and from the Patient I/O, to establish whether the noise is due to interference from external devices. Does it help? <ul style="list-style-type: none"> • If Yes, continue with step 4. • If No, continue with step 5.
4	There are possible ferrite solutions to most of the cable connections. <ul style="list-style-type: none"> • On USB cables: Wind the cable 5-6 times through a ferrite ring, GE Part Number 038X0028. • Verify that the shielding is connected to Ground on the Patient I/O Cable(s)
5	Do the DC Offset Calibration, see: Section 6-6 "DC Offset Calibration" on page 6-34 .
6	Other possible internal noise sources: <ul style="list-style-type: none"> • Main Power Supply, • Peripherals • Disconnect devices from the USB ports on the Op.

7-9-3-5 Noise in Doppler Mode

Typical noise problems:

- Horizontal lines.

Usually the noise is only picked up when coupling the probe to your body.

Table 7-49 Noise in Doppler Mode

STEP	TASK
1	Try another probe (same model). Does it help? <ul style="list-style-type: none"> • If Yes, replace the original probe. • If No, continue with the next step.
2	Disconnect all probes that are not in use. Keep only the active probe connected. Does it help? <ul style="list-style-type: none"> • If Yes: The noise is most likely from an external source. If possible, try to locate and remove the source. • If No, continue with the next step.
3	Disconnect all external cables from the I/O (on the rear side of LOGIQ E9) and from the Patient I/O, to establish whether the noise is due to interference from external devices. Does it help? <ul style="list-style-type: none"> • If Yes, continue with step 4. • If No, continue with step 5.
4	There are possible ferrite solutions to most of the cable connections. <ul style="list-style-type: none"> • On video cables: Wind the cable twice through a split ferrite, GE Part Number 038X1012 / 038X1112. • On USB cables: Wind the cable 5-6 times trough a ferrite ring, GE Part Number 038X0028.
5	<ul style="list-style-type: none"> • Verify that the shielding is connected to Ground on the Patient I/O cable(s).
6	<ul style="list-style-type: none"> • Adjust Acoustic Power a few dB down in order to determine if the noise is coming from the Main Power Supply. If the noise disappears, the source is the main Power Supply.
7	Other possible internal noise sources: <ul style="list-style-type: none"> • Main Power Supply • Peripherals. • Disconnect devices from the USB ports on the Op

7-9-3-6 Excessive Noise Lines when the cursor is placed straight down**Table 7-50 Excessive noise lines when the cursor is placed straight down**

STEP	TASK
1	<ul style="list-style-type: none"> • Verify that the shielding is connected to Ground on the Patient I/O Cable(s).

7-9-4 Main Power Supply (MPS) Troubleshooting

NOTE: When troubleshooting procedures refer to the GFI, this should be the MRX Board in a MRX Configuration system. Troubleshooting procedures for a GFI Configuration MPS are essentially the same for MRX.

Topics of this Section:

- 1.) System not Booting Up - see:
7-9-4-1 "System not Booting Up" on page 7-203.
- 2.) System Boots, but cannot scan - see:
7-9-4-2 "System Boots, but cannot scan" on page 7-208.
- 3.) System boots, with hardware error - Lambda PS only - see:
7-9-4-3 "System boots, with hardware error - Lambda PS only" on page 7-210.
- 4.) Main Power Supply Troubleshooting Flow Chart - see:
7-9-4-4 "Main Power Supply Troubleshooting Flow Chart" on page 7-211.
- 5.) Main Power Supply Troubleshooting Flow Chart Procedures - see:
7-9-4-5 "Main Power Supply Troubleshooting Flow Chart Procedures" on page 7-212.
- 6.) Main Power Supply Logs (Examples of Main Power Supply Log) - see:
7-9-4-6 "Main Power Supply Logs" on page 7-214.
- 7.) Definition of Log Entries - see:
7-9-4-7 "Definition of Log Entries" on page 7-216.

7-9-4-1 System not Booting Up

NOTE: *Reset the rear panel Main Power Switch in order to de-energize the Main Power Supply before removing or installing any board or modifying the system.*

Table 7-51 System not booting up

Symptom	Task / Conclusion	
No Amber light on - ON/OFF button	Check DS6 5V Standby on EPS (BEP Door)	If LED is ON, Main PS is ok for 5Vstby. If OFF, Main PS may be defective.
	Check DS3 5Vstby BEP (BEP Door)	If ON, EPS is passing 5Vstby to BEP PS. If OFF, EPS may be defective.
	Check DS5 48V OK (BEP Door)	If ON, Main PS is ok for 48V. If OFF, check cable J1 that connects to the Main PS. If the cable is connected, the Main PS may be defective.
	Check LED on BEP PS 5Vstb	If ON, check the main cable from the BEP I/O (J22) to the Operator Panel. If OFF, short pin 12 to 24 momentarily (see: BEP Cover Label) on the Test Connector of the BEP I/O Board to by-pass the ON/OFF button. If that still does not turn on the BEP, unplug J22 and try again. The BEP PS may be defective. If BEP turns ON, replace the cable and/or ON/OFF button and/or OP Panel.

Table 7-51 System not booting up

Symptom	Task / Conclusion	
	<p>When there is a failure that forces the Main Power Supply to shutdown, you will only see the amber light trying to turn green once, until the rear panel Main Power Switch is reset.</p>	<p>Measure test connector, pin 12 and ground 5Vstb.</p> <p>Test connector pin (24V) to see if system turns ON.</p> <ul style="list-style-type: none"> - Use the Power ON/Off button on the Motherboard. <p>If system does not power up, replace:</p> <ol style="list-style-type: none"> 1. BEP PS 2. EPS 3. BEP <p>If system powers up, troubleshoot connection to OP Panel.</p>
Amber light ON but no green light (or briefly ON) when pressing ON/OFF button	<p>If there is no green light at all, even after resetting the main breaker</p> <p>If the green light appears momentarily</p>	<ul style="list-style-type: none"> - Main Power Supply Fan failure may cause this problem. Use a mirror to look at the fans; check if they try to rotate at boot up (two people may be needed to test this). <p>Mirror Viewing fans under Main Power Supply</p>  <p>If the fans do not move, tip the Main PS and gently move each fan with a screw driver to move them from their current position. Sometimes removing the PS is enough movement to move the fans.</p> <p>If the Main PS powers up after the fans are moved, you will see a failure message in the Log Files. See: 7-9-4-6 "Main Power Supply Logs" on page 7-214.</p> <p>If the fans do not move after this step, the Main PS needs replacement.</p> <p>NOTE: This is a rare occurrence. Monitor site for future occurrences.</p>

Table 7-51 System not booting up

Symptom	Task / Conclusion	
BEP PS isolation	Check LEDs for PS_ON, 5Vstb and 48V in.	If all are present and FPO is ON, BEP PS may be defective. If so, you should be able to have 48V measurable at Test connector of BEP I/O, pin 4. Pin 3 is the +24 V (there is no LED) if coming up in simulator mode.
	Troubleshoot the LCD on the Op Panel.	Disconnect J22 and short pins 12 to 24, or use Power Button to observe if the BEP powers up. If it does not turn ON, then disconnect the cable to the backplane. If not, check BEP devices.
	Disconnect the following devices to eliminate possible causes of over current: • DVD drive • V NAV drive bay • BEP I/O Board (Bottom connector inside the BEP) • DVR card (if present, not a likely problem)	If power is reestablished, troubleshoot individual devices disconnected. If no power, replace BEP PS.
	Attempt to reset the BIOS as described in Section 7-8-2-1 <i>"Resetting the BEP BIOS Memory"</i> on page 7-179.	If Resetting the BEP BIOS Battery does not restore display, replace the BEP.

7-9-4-1 System not Booting Up (cont'd)

Figure 7-156 BEP5 Power Supply Voltages

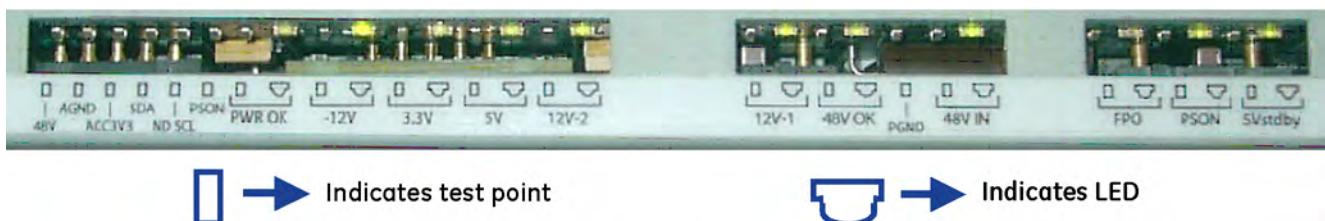


Figure 7-157

BEP PS Voltages	Description	Circuit Breaker OFF	Circuit Breaker ON and System OFF (Amber light on on/off button)	System ON (Green light on on/off button)	Fault condition indication	LED status	Comments
48 V	Test point after the fuse.	0V	0V	48V		N/A	
AGND	(Analog Ground)	0V	0V	0V		N/A	
ACC3V3	3.3 volts used in BEP PS	0V	0V	+3.3V		N/A	
SDA	IIC data line	0V	0V			N/A	
SCL	IIC Clock	0V	0V			N/A	
PSON ND	PS ON (Not used)	0V	0V			N/A	Not Used
PWR OK	5V signal tells the motherboard that all power is good.	0V	0V	+5V		Green when on	If power ok is not present, the MotherBoard does not turn on.
-12V	From BEP PS	0V	0V	-12V		Green * when on	This voltage is not used.
3.3V	From BEP PS	0V	0V	+3.3V		Green when on	
5V	From BEP PS	0V	0V	+5V		Green when on	
12V-2	From BEP PS	0V	0V	+12V		Green when on	
12V-1	From BEP PS	0V	0V	+12V		Green when on	
48VOK	5 volt signal from Main PS.	0V	0V	+5V		Green when on	
PGND	Power Ground	0V	0V	0V		N/A	
48V in	From Main PS.	0V	0V	+48V		Green when on	Measure between 48VIN and F
FPO	(Fault Protection Output)	0V	0V	0V	5V	Red during fault	LED is normally OFF.
PSON	Coming from motherboard. (active low)	0V	+5V	0V		Green when 0V	LED lit when system is ON and is 0V.

7-9-4-1 System not Booting Up (cont'd)

Figure 7-158 BEP6 Power Supply Voltages (BEP6 PowerBoard)

PLED2	ATX POWER OK	
PLED3	POWER ON	
PLED4	+3.3V	
PLED5	+5V STBY	
PLED6	+28V	
PLED1	+5V	
PLED7	POWER OK	
PLED2	+48V	
PLED2	+12V	

7-9-4-2 System Boots, but cannot scan

Table 7-52 System boots, but cannot scan

Symptom	Task / Conclusion	
Simulator mode/or no scan	Check if 24V is present	<p>If the system is booting, check error logs and run diagnostics.</p> <ul style="list-style-type: none"> • If 24V is present, then the simulator mode may be caused by problems with GFI board or cable. Check if the Fan Tray, under the Card Rack, is running (Fan Tray uses 24V to run). Fan Tray running means 24V is present. <p>If not running, try isolating the problem by removing all cards in the Card Rack, except the GFI.</p> <p>Observe the LEDs in the Card Rack. If no lights are observed, disconnect GFI and connect another board. Observe LEDs. If the Fan Tray is not running, go to isolate the Backplane.</p>
	Isolate cause	<ul style="list-style-type: none"> • If 24V is not present, see: <i>Figure 7-160 "Main Power Supply Troubleshooting Flow Chart" on page 7-211</i>.

7-9-4-2 System Boots, but cannot scan (cont'd)

Use Figure 7-159 and Table 7-53 to locate P4 Pins.

Figure 7-159 Main Power Supply P4 Location and P4 Pins Location (reference)

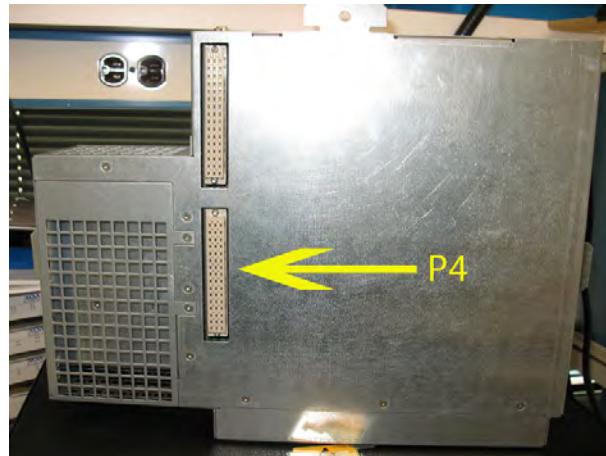


Table 7-53 Main Power Supply P4 Pins

Pin Number	Signal Name		
	Z	B	D
2	GND	GND	GND
4	+6V	+6V	+6V
6	GND	GND	GND
8	-6V	-6V	+6V
10	GND	GND	GND
12	+15V	AC_FAIL_N	EXT_SYNC
14	-15V	GND	not used
16	not used	not used	not used
18	GND	GND	GND
20	+11V	+11V	+11V
22	+24V	+24V	+24V
24	+24V	+24V	+24V
26	+24V	+24V	+24V
28	GND	GND	GND
30	GND	GND	GND
32	GND	GND	GND

7-9-4-3 System boots, with hardware error - Lambda PS only

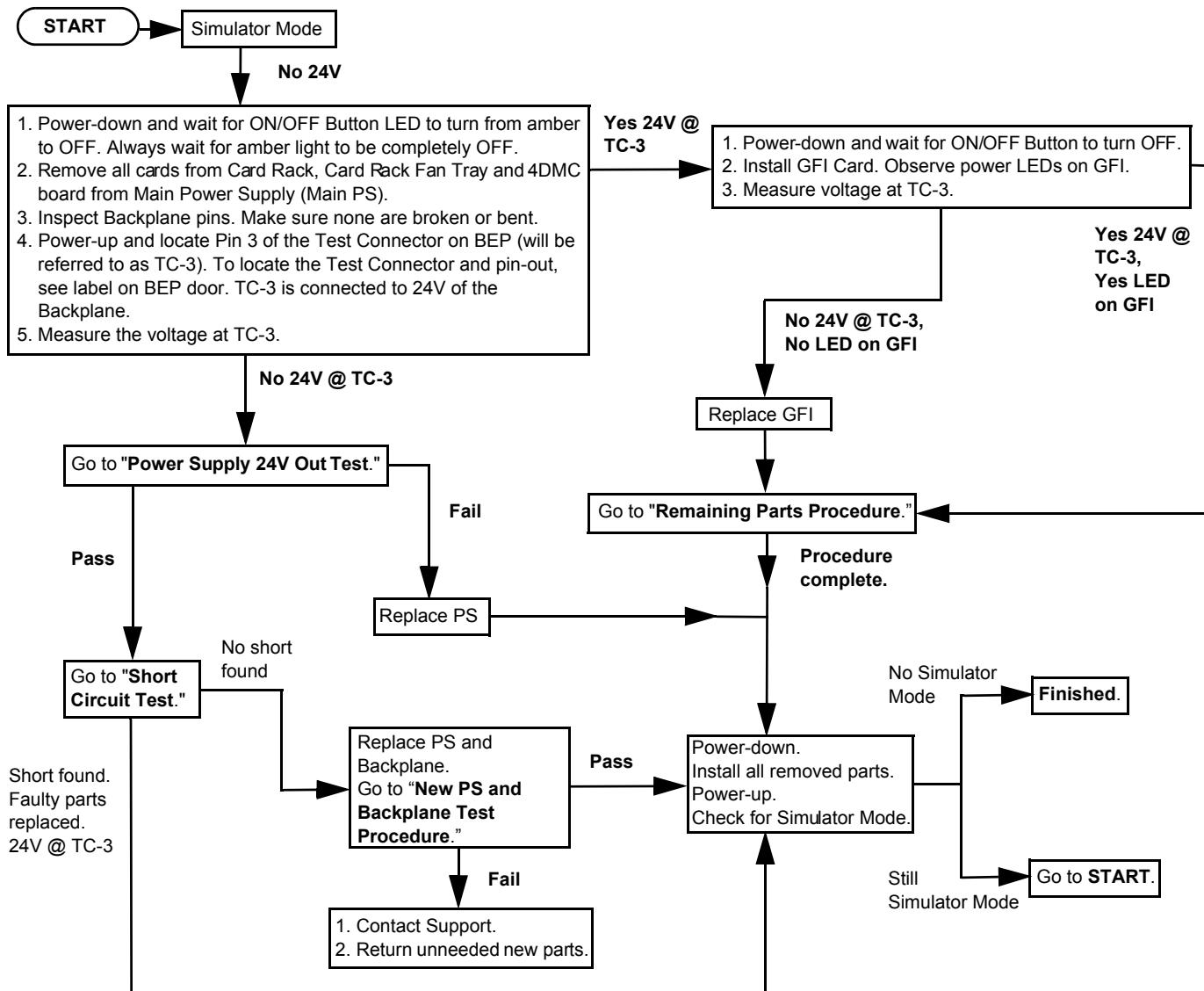
Table 7-54 System boots, with hardware error - Lambda PS only

Symptom	Task / Conclusion
System boots, with hardware error	<p>Replace the PS The latest Firmware Version is 1.21. Check Firmware Version on the PS label or check the SysCfg.Csv file in the Alt D logs. Check if 24V is present</p> <p>The firmware in the PS may have been corrupted and the system isnot able to control the power supply. The logfile.txt will report USB errors since it cannot see the PS USB device and will prevent scanning.</p> <p>Example: Monday,Jul 25 14:57:19,2011; Error ; acqTransLayer(288); CMicrochipUsbIf::Open Cannot open output pipe (last error 0x00000000) Monday,Jul 25 14:57:19,2011; Info ; ifmgr(208); 14:57:19 HandleEvent: IMLoader(0), EAErrorHandler(2467), (BSTR)HWCAP Invalid Hardware Configuration, (BSTR)Invalid Hardware Configuration(68) 6029.3ms }</p> <p>NOTE: A long term solution is already in place to prevent possible scenarios where the firmware may get corrupted. This solution has been implemented in production. Manufacturing believes that only 50 units shipped with this old firmware may be susceptible to this problem.</p>

7-9-4-4 Main Power Supply Troubleshooting Flow Chart

Use the Flow Chart and Troubleshooting Flow Chart Procedures to isolate cause/failure(s).

Figure 7-160 Main Power Supply Troubleshooting Flow Chart



7-9-4-5 Main Power Supply Troubleshooting Flow Chart Procedures

Use these procedures with the Troubleshooting Flow Chart to isolate cause/failure(s).

7-9-4-5-1 Power Supply 24V Out Test

Power-down the LOGIQ E9. Turn off the rear panel Main Power Switch. Wait for the ON/OFF Button LED to turn OFF. Unplug the MAINS Power supply cable from the Power Supply and the on-site MAINS Power System.

You will need to make DC voltage measurements with a DMM on the 24V pin, Z 22 of connector P4, on the Power Supply. See: *Figure 7-159 "Main Power Supply P4 Location and P4 Pins Location (reference)" on page 7-209*. Disconnect the Main Power Supply from the Backplane connectors, leaving all the other cables connected to the Power Supply. If you are unable to get the probes of the DMM into pin Z 22 on P4, you may need to insert some longer (non-braided) wires into the pinholes so that they extend far enough upward for you to make the measurements with the DMM probe. To do this, you may also need to disconnect the remaining cables on the Power Supply so you are able to view and locate pins Z 22 and ground pin Z 28 on P4 and insert the wires. Once the wires are in place, you MUST reconnect all cables that were removed.

With the Power Supply still disconnected from the Backplane and all other cables connected, power-up the system. Once the system has gone into simulator mode, measure the DC voltage between pins Z 22 and Z 28 (ground). If the nominal voltage measured is between 23V and 25V, then this test passes. If the voltage measured is not within that range, the test fails.

7-9-4-5-2 Short Circuit Test

With the system powered-down and the rear panel Main Power Switch off, disconnect the Power Supply from the Backplane. Remove the BEP I/O to Backplane cable from the BEP.

Use a DMM to measure resistance (ohms) to test for electrical isolation between the 24V rail and ground. Measure the resistance between the 24V pins of the Backplane and the ground pin. If the resistance is low - less than 10 Mega ohms, then there is a short circuit in the Backplane. Replace the Backplane and go to the beginning of the Short Circuit Test.

If there is no short between the 24V pins and ground, then go to the next step.

Measure the resistance between the TC-3 pin and the ground pin of the test connector. If the resistance is low - less than 10 Mega ohms, then there is a short circuit in the I/O Board. Replace the I/O Board and go to the beginning of this step. If there is no short found, go to the next step.

Reconnect the BEP I/O to Backplane cable. Measure the resistance between the TC-3 pin and the ground pin of the test connector. If the resistance is low - less than 10 Mega ohms, then there is a short circuit in the BEP I/O to Backplane cable. Replace the cable and go to the beginning of this step.

7-9-4-5 Main Power Supply Troubleshooting Flow Chart Procedures (cont'd)**7-9-4-5-3 New PS and Backplane Test Procedure**

Order a new Power Supply and Backplane.

With the system powered-down and the rear panel Main Power Switch off, install the new Backplane. Power-up the system, wait for simulator mode and measure the voltage at TC-3. If the voltage measured is between 23V and 25V, the test passes. Return the new Power Supply to service.

If the voltage at TC-3 is not in the acceptable range, power-down the system. Turn the rear panel Main Power Switch off and install the new Power Supply. Power-up the system, wait for simulator mode and measure the voltage at TC-3. If the voltage measured is between 23V and 25V, the test passes. Return the new Power Supply to service. If the voltage is not in the acceptable range, the test fails.

With the system powered-down and the rear panel Main Power Switch off, re-install the old Backplane. Power-up the system, wait for simulator mode and measure the voltage at TC-3. If the voltage measured is between 23V and 25V, the new Backplane can be returned to service. If not, re-install the new Backplane.

7-9-4-5-4 Remaining Parts Procedure

With the system powered-down and the ON/OFF Button LED OFF, install the Fan Tray. Power-up the system. If the fans don't run or the GFI power LED is OFF, replace the Fan Tray and repeat this step. If the fans are running and the GFI power LED is ON, go to the next step.

With the system powered-down and the ON/OFF Button LED OFF, install the next card in the rack. Power-up the system and check all power LED's on the cards. If any power LED's go out on any of the installed cards and/or 24V at TC-3 is no longer present, replace the card you installed and go to the beginning of this step. If all card LED's are ON, repeat this step for the next card to re-install, until all cards are in place. If you find that all cards need to be replaced, stop. It is very unlikely that all cards would be faulty. The problem is more likely the Power Supply. Replace the Power Supply and go to "START" on the Troubleshooting Flow Chart.

7-9-4-5-5 Troubleshooting log files:

Applies to Main Power Supply Part Numbers 5205052, 5205052-2 and 5205052-3/-4 and 5205054-3.

When the system is able to boot up to some degree, the log files may give you more information about voltage status.

The Main Power Supply has a log file that stores the last 10 Power Supply events in non-volatile memory. During a normal system startup, the Power Supply may record 3 or 4 events in the log. The log is circular, so the oldest entry will be over-written first. The Power Supply does not have a real time clock. The Power Supply gets the date and time from the BEP. If an event is recorded in the log before the Power Supply reads the date and time, the date and time fields will be filled with 0.

When the application software starts, the Power Supply Log is copied into logfile.txt. Possible log entries are:

Table 7-55 Possible log entries

0 = NoDetail	5 = MaxP	10 = HighVoltageOVP	15 = Inverter fail
1 = AC error	6 = Log full	11 = Strobe	16 = keepalive fail
2 = MinV	7 = Startup	12 = FanFail	
3 = MaxV	8 = LowVoltageOVP	13 = OverTemp	
4 = MinP	9 = 48VOVP	14 = OverCurrentPrimary	

7-9-4-6 Main Power Supply Logs**Examples of Main Power Supply Log**

```
acqHouseKeeping(3068); TxPs event log seq[00] date[00/00/00] time[00:00:03]
source[System (rack) supply] type[Error] detail[TS On Strobe]
```

Friday, Feb 12 07:26:43,2010; Info; acqHouseKeeping(3068); TxPs event log seq[01]
date[00/00/00] time[00:02:19] source[System (rack) supply] type[Error] detail[Fan
Failure] -- **REAL FAILURE** (This is related to the fans in the Main Power Supply.)

Friday, Feb 12 07:26:43,2010; Info; acqHouseKeeping(3068); TxPs event log seq[02]
date[02/11/10] time[11:08:22] source[System (rack) supply] type[No alarm] -- **NORMAL**
detail[Startup Date/Time]

Friday, Feb 12 07:26:43,2010; Info; acqHouseKeeping(3068); TxPs event log seq[03]
date[02/11/10] time[11:16:36] source[System (rack) supply] type[Error] detail[AC
Error] -- **NORMAL**

Friday, Feb 12 07:26:43,2010; Info; acqHouseKeeping(3068); TxPs event log seq[04]
date[00/00/00] time[00:00:03] source[System (rack) supply] type[Error] detail[TS On
Strobe] -- **NORMAL**

Friday, Feb 12 07:26:43,2010; Info; acqHouseKeeping(3068); TxPs event log seq[05]
date[02/12/10] time[07:26:12] source[System (rack) supply] type[No alarm]
detail[Startup Date/Time]

Friday, Feb 12 07:26:43,2010; Info; acqHouseKeeping(3068); TxPs event log seq[06]
date[02/12/10] time[07:26:15] source[System (rack) supply] type[No alarm] detail[TS
On Strobe] -- **NORMAL**

Friday, Feb 12 07:26:43,2010; Info; acqHouseKeeping(3068); TxPs event log seq[07]
date[02/12/10] time[07:26:39] source[System (rack) supply] type[No alarm] detail[AC
Error] -- **NORMAL**

Friday, Feb 12 07:26:43,2010; Info; acqHouseKeeping(3068); TxPs event log seq[08]
date[00/00/00] time[00:04:56] source[System (rack) supply] type[Error] detail[Fan
Failure] -- **REAL FAILURE**

Friday, Feb 12 07:26:43,2010; Info; acqHouseKeeping(3068); TxPs event log seq[09]
date[00/00/00] time[00:05:13] source[System (rack) supply] type[Error] detail[AC
Error] -- **NORMAL**

7-9-4-6 Main Power Supply Logs (cont'd)

Examples of Main Power Supply Information at Startup - Normal Messages

Friday, Feb 12 07:27:52, 2010; Info; acqHouseKeeping(3056); TxPs Alarm source[System (rack) supply] type[Error] detail[TS On Strobe]

Friday, Feb 12 07:27:52, 2010; Info; acqHouseKeeping(3056); TxPs TS On Strobe Event discarded (root cause of HW watchdog stop will handle the event)

Friday, Feb 12 07:27:52, 2010; Info; acqHouseKeeping(3060); TxPs alarm status AC-V[116.4 VAC] AC-Freq[60 Hz] ACErr[no] RackOn[48V ACinv]

Friday, Feb 12 07:27:52, 2010; Info; acqHouseKeeping(3060); +48V[48.02 Volts] +24V[3.64 Volts] +15V[0.00 Volts] -15V[-11.79 Volts] +12V[0.00 Volts] +6V[0.00 Volts] -6V[-1.86 Volts] +5V[4.96 Volts] -- THESE VOLTAGES WERE MEASURED AFTER THEY WERE TURNED OFF. (This is not considered a failure.)

Friday, Feb 12 07:27:52, 2010; Info; acqHouseKeeping(3060); inTemp[25 °C] outTemp[26 °C] +PMX V[27.11 Volts] -PMX V[-18.41 Volts] -- THESE VOLTAGES WERE MEASURED AFTER THEY WERE TURNED OFF. (This is not considered a failure.)

Friday, Feb 12 07:27:52, 2010; Info; acqHouseKeeping(3064); TxPs alarm info source[Transmit supply 1] V+[0.32 Volts] V-[0.00 Volts] Power[0.00 Watts] Current[0.000 Amps] Prgmd V[0.00 Volts]

Friday, Feb 12 07:27:52, 2010; Info; acqHouseKeeping(3064); TxPs alarm info source[Transmit supply 2] V+[0.32 Volts] V-[0.00 Volts] Power[0.00 Watts] Current[0.000 Amps] Prgmd V[0.00 Volts]

Additional Examples of Main Power Supply Information at Startup - Normal Messages

Friday, Feb 12 07:26:39, 2010; Info; acqHouseKeeping(3060); TxPs alarm status AC-V[116.1 VAC] AC-Freq[60 Hz] ACErr[yes] RackOn[48V LV ACinv]

ACErr[yes] = (Power Supply was disconnected from AC. Not an indication of an error, unless followed by battery operation message.)

[48V LV ACinv] = (Not an indication of an error, unless followed by battery operation message.)

Friday, Feb 12 07:26:39, 2010; Info; acqHouseKeeping(3060); +48V[48.02 Volts] +24V[24.07 Volts] +15V[15.00 Volts] -15V[-14.98 Volts] +12V[11.02 Volts] +6V[5.90 Volts] -6V[-6.03 Volts] +5V[4.95 Volts]

Friday, Feb 12 07:26:39, 2010; Info; acqHouseKeeping(3060); inTemp[24 °C] outTemp[24 °C] +PMX V[0.00 Volts] -PMX V[0.00 Volts]

Friday, Feb 12 07:26:39, 2010; Info; acqHouseKeeping(3064); TxPs alarm info source[Transmit supply 2] V+[0.32 Volts] V-[0.00 Volts] Power[0.00 Watts] Current[0.000 Amps] Prgmd V[0.00 Volts]

Friday, Feb 12 07:26:39, 2010; Info; acqHouseKeeping(3056); TxPs Alarm source[System (rack) supply] type[No alarm] detail[TS On Strobe]

Friday, Feb 12 07:26:39, 2010; Info; acqTransLayer(3048); CUsbPsAdapter:Init Power supply protocol version 4

7-9-4-6 Main Power Supply Logs (cont'd)

NOTE: Some power supplies may report a missing USB Hub. This is considered normal for MPS P/Ns 5205250-4 or later and 5205254-2 or later. This Hub is not used and has been depopulated.

USBConfig: Optional USB device "PowerSupply Hub" not found

7-9-4-7 Definition of Log Entries

The Power Supply reports information to the application software upon request. It eventually shows up in logfile.txt. The application software requests the information (shown in examples). Most of the information is self-explanatory. A few items need some explanation:

"ACErr" can be misleading. Whenever AC is removed from the Power Supply, it is considered to be an error. Even if the system is OFF (Power Supply is really in stand-by) and then AC is removed. This is normal operation and not really an error, but the Power Supply reports it as an error.

"TS On Strobe" error can also be misleading. The TS On Strobe comes from the GFI. This is a watchdog signal that should always be there. If the GFI "hangs", then TS On Strobe should stop. The Power Supply will then turn the TS supplies OFF and report an error to the application software. But during normal power-up, the Power Supply looks for the TS On Strobe signal. Because the GFI has not booted up completely yet, it does not send out TS On Strobe right away. The Power Supply considers this an error at every start-up (but it really is not). The application software clears this error before scanning.

Another area that is misleading is the reported voltage. For example, a system error occurs that requires the card rack voltages to turn OFF. The Power Supply turns the voltages OFF. Then the application software requests the system voltage information. The Power Supply will report some voltage between 0 volts and the normal voltage. This is not a voltage failure, but rather an effect of something else that happened. Think of it as a domino effect. You need to look for the first domino in order to find the root cause of the problem.

7-9-5 EMI Prevention/Abatement

For EMI rules and details, see: Section 2-2-4 "EMI limitations" on page 2-5.

7-9-5-1 Different Power Outlet

Connect the unit to another power outlet and verify if the noise changes or disappear.

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. See: Section 2-3-3 "Required facility needs" on page 2-8.*

7-9-5-2 Different System

Try another LOGIQ E9 at the same location and look for the same noise. If the noise is present on the new system too, the noise is most likely from an external source/equipment.

7-9-5-3 Different Location

Move the scanner to another location and verify if the noise changes or disappear. This may help you to locate an external noise source.

Try to move the scanner to:

- another location inside the room
- another room
- another floor

7-9-5-4 Disconnect External Cables

Disconnect all external cables (network, all unused probes, ECG leads etc.) and verify if the noise disappears.

7-9-6 Image Artifacts Caused by Front End Boards

Image artifacts can be caused by any of the boards on the Front End. Artifacts are frequently due to the Front End Power supply or board failures. It is important to use the Diagnostic tools on the service interface to try to narrow down the failure to one or two boards.

- Artifacts that look like white vertical lines, rain or snow cones in one or more areas of the image can be troubleshooted in different ways:
 - One troubleshooting technique is to swap DRXs around to see if the artifact moves. (Pulling out the boards will keep the system from booting up; all the boards must be present for the system to operate)
 - Another approach is to run the Diagnostic Utilities to establish which channel the artifact affects. A channel is a signal path sent through the system boards. Any of these boards in the path can be causing the failure.
 - Be aware that the problem may only appear with one mode, probe or preset.
 - Check all the probes on all the ports. Remove all the probes, and then check each probe singly in every port.
 - * If port-related, replace Connector board.
 - * If the artifact only occurs with one probe, replace probe.
 - * If the problem persists with the new probe, reload software. Do not reload presets until you have tested the system with the default settings and be sure that the problem does not persist. User Defined Presets can carry corruption back to the system.
 - If you suspect that the problem may be caused by software corruption, please note: Corrupt Presets can be identified by a problem in only one exam category using a specific probe, or a particular mode with a specific probe. Use the Clean Userdef function under Scanner Utilities, leaving the system with only the factory defaults. Be sure to back up the presets, including Connectivity configuration, TCP/IP page and Option strings before deleting the User defined files. DO NOT reload presets until you have tested the system.
 - * Before performing Clean User Defs function, perform an Alt+D to capture the logs and preset files. If the problem is corrected with Clean User Defs, send in the log to the OLC so that the corrupted preset files can be reviewed.
 - * After booting up the system, without starting any patient or accessing any menu, click on the Service and login. Click on Utilities, then on Scanner utilities and then on "Clean User Defs". Say OK and that will clean the folder. Shutdown the system immediately, using the System Shutdown function under Scanner Utilities. After rebooting, the system will come up with default settings. Only reload presets from disk if you are sure they were stored before the corruption occurred. If only Imaging Presets are affected you can restore the Connectivity presets by using the selective Restore function.

7-9-7 Connectivity

For more information on Connectivity Setup, see:
Section 3-9 "Connectivity Setup and Tips" on page 3-40.

7-9-7-1 Cannot connect to something via the network

- 1.) Open command prompt.
- 2.) "Ping 127.0.0.1", verify no lost packets. - error here try reimaging
- 3.) "Ping" machine IP address given by hospital or default in manual, verify no lost packets. - error here replace BEP
- 4.) "Ping" gateway if given one else skip to next, verify no lost packets. - error here verify network cable plugged in, and lights blink on BEP. Double check subunit and gateway are correctly entered. This point and beyond are hospital issues
- 5.) "Ping" another machine on the network, verify no lost packets. - error here try pinging from another computer on the same network

7-9-7-2 No Ping

- Check the speed of your connection. Media Type should be set for Auto Select. Remember that every time the system is re-ghosted, that setting goes back to the default value.
- Check cables. You need a crossover cable if you are connected directly to the device. Use a straight cable whenever you go through a hub. The use of a hub is highly recommended.
- Try connecting the network cable directly to the Ethernet port in the back of the BEP. If the connection works, troubleshoot the cabling to the external device.
- Check proper addressing. System should be under the same subnet or have a gateway address to be able to connect to another subnet.
- Verify that the network is active and running.
- Check with your laptop if you can ping the LOGIQ E9 and the device (Printer or PACs).

7-9-7-3 No Verify

- Check if the device supports Verify.
- Check port and AE title info.
- Check if device is up and running. It may be up but in an error status. Reboot the device if possible. You also may need to reboot the LOGIQ E9.
- Use Network Sniffer (**Alt N**).
- Clean User Defs before reloading software in case there is a corrupt Connectivity.res file. Be sure to do an Alt + D to capture logs before performing a Clean User Defs so that if the presets are corrupt the logs can be sent to OLC for Engineering to review.
- Reload software.

- 7-9-7-4 System Pings and Verifies but does NOT Send**
- Check if device is up and running. It may be up but in an error status. Reboot the device if possible. You also may need to reboot the LOGIQ E9.
 - Check device configuration.
 - Clean the spooler (F4). If the jobs in the spoller cannot be deleted, you need to do it in Windows. These jobs may be corrupted or may be using a lot of space in the disk and cause problems sending DICOM images. Insert the Service Key (Dongle), turn the system on and log in into maintenance and exit to Windows (the application should not be running). Then go to Windows Explorer and look for the file C:\Ichiro\target\jobqueue.res. Delete the file.
 - Delete the files from E:/Spoller and then the Recycle Bin. Reboot the system.
 - Check Connectivity configuration on the LOGIQ E9.
 - If it is a printer, check that the printer supports the film type and format. Some printers don't support different image sizes (or different formats, such as the Patient entry screen). If this is the case, the spoller may show the job in a "Done" status but the images never get printed. Try sending secondary capture.
 - If it is a storage device, check if the type of image selected is supported (color, gray, Multiframe)
 - If it is a Worklist broker, you must use a Dataflow in which your Worklist is the primary input. Otherwise it won't let you retrieve patients. Also check your Worklist search criteria configuration. **Refer to User Manual (Chapter 16).**
 - Use Network Sniffer (**Alt N**).
 - Clean User Defs before reloading software in case there is a corrupt Connectivity.res file. Be sure to do an Alt+D to capture logs before performing a Clean User Defs so that if the presets prove corrupt the logs can be sent to OLC for Engineering to review.
 - Reload software.

7-9-7-5 Images Exit Spoller, But Do Not Display on Destination

Symptom: Images exit spoller but do not display on destination. Sometimes affects only Cine or Secondary Capture.

Cause: Destination unable to view the particular photometric interpretation.

Solution: Check what compression and photometric interpretation the destination device supports and adjust (if possible) on the destination service to the settings, which results in successful viewing.

NOTE: Note that compression JPEG will give photometric interpretation YBR_FULL_422, RLE will give YBR_FULL and uncompressed will give RGB. The exception to this is if you enable B/W only, then you will get photometric interpretation MONOCHROME2 for all compressions.

7-9-7-6 Adjust time-out for DICOM servers

If you are experiencing problems with slow responses from DICOM servers, increase the time-out in the DICOM server properties dialog.

Problems with slow responses may result in images being re-sent automatically and low transfer rates.

The retry settings can be used to make jobs retry on bad networks. There is no need to set retries for mobile (off-line) use.

7-9-8 Back End Processor

Also see 7-9-9 "Back End Processor (BEP) Troubleshooting" on page 7-223.

7-9-8-1 System Halt Errors - Lock ups or Intermittent Problems

- Collect error Logs and send them to the OLC to be evaluated. Refer to 7-3-4 "Collecting a Screen Capture with Logs" on page 7-5. It is extremely important to give as much detail as possible about the occurrence of the problem and the date and time it showed up. On the scan screen, press ALT + D. Reload software.
- In the event of a hard drive failure, see: 7-9-8-9 "Hard Drive Failure" on page 7-222.

7-9-8-2 CD/DVD Drive Failures

- Check that the media (disk capacity and speed) is supported.
 - For the CD, the capacity is normally 700MB.
- Check Windows for driver issues. Go to Control Panel > Administrative tools > Computer management > Device Manager.
- Re-install drivers if necessary.
- If the CD drive is having problems, replace the CD Drive.
- If the problem persists, replace the BEP.

7-9-8-3 Image CD/DVD not read

- Put the CD or DVD in a laptop and see if it can be read. If it cannot be read, the disk is bad.
- If it can be read make a copy at a low burn speed (8X). If the copy does not work, replace CD-RW or DVD-R drive.

7-9-8-4 BEP Arrives Without Video

- If the BEP arrives without video, re-seat the video card. Note: this only occurs if the BEP has been dropped repeatedly in shipping.

7-9-8-5 Simulator Mode

- Check the connection of the PCIe cable on both the GFI board and BEP, or the connection of the PCIe cable to the motherboard (J3 on MRX Configuration).
- Check PS. You can visually check the LED status on the PS on the BEP. If any of the voltages is missing, replace PS.

7-9-8-6 Lockups or Blue screens

- Run the PC Diagnostics tests.

7-9-8-7 Files corrupt on boot

Possible error messages: "ntldr missing or corrupt", "c:\windows\system32\config corrupt", "hive corrupt"

- Reimage and advise clinicians not to power off system by holding Power Button down.
- In the event of a hard drive failure, see 7-9-8-9 "Hard Drive Failure" on page 7-222.

7-9-8-8 Here's a way to power on the BEP

Short pins B12 and B24 (PWR SW and 5V_STDBY) in the Test Connector on the I/O board.

7-9-8-9 Hard Drive Failure

These are some common symptoms of hard drive failure. See: 7-5-14-4 "Hard Disk Drive Surface Scan" on page 7-116, 7-5-14-5 "Hard Disk Drive Quick Test" on page 7-117 and 7-9-9 "Back End Processor (BEP) Troubleshooting" on page 7-223 for diagnostic tests.

- The results of hard drive diagnostics may indicate bad sectors on the hard drive.
- The system may not boot because of bad sectors on the hard drive.
- Attempts to re-image the C: partition may fail because of bad sectors on the C: partition.
- The system may not boot and displays blue screen stop errors (dark blue screen with white text - "blue screen of death").

In the event of a hard drive failure, determine whether or not the customer requires recovery of data. If the customer requires data recovery, collect the following information from the customer:

- Customer contact name
- Customer contact phone
- Customer contact address
- What data they require (e.g. studies for a date range or everything)
- Whether the customer wants their data on CD or DVD media

Tell the customer GE will attempt to recover as much data as possible. Write a complaint and include the above information, and do not discard or return the failed hard drive. A member of the Complaint Handling Unit or the Installed Base team will contact the author of the complaint and provide instructions for delivery of the failed hard drive to engineering. Engineering will then recover as much data as possible and send the recovered data directly to the customer.

7-9-9 Back End Processor (BEP) Troubleshooting

NOTE: When troubleshooting procedures refer to the GFI, this should be the MRX Board in a MRX Configuration system. Troubleshooting procedures for a GFI Configuration MPS are essentially the same for MRX.

Topics of this Section:

- 1.) System not booting up (or partially booting) - see:
7-9-9-1 "System not Booting Up (or partially booting)" on page 7-223.
- 2.) BEP Troubleshooting Flow Chart - see:
7-9-9-2 "BEP Troubleshooting Flow Chart" on page 7-227.
- 3.) Boot up sequence - see:
7-9-9-3 "Boot up sequence" on page 7-230.

7-9-9-1 System not Booting Up (or partially booting)

NOTE: Reset the rear panel Main Power Switch in order to de-energize the Main Power Supply before removing or installing any board or modifying the system.

Table 7-56 System not booting up (or partially booting)

Symptoms / Causes	Task / Resolutions
System Errors: Lock ups or Intermittent Problems.	<p>Collect error Logs and send them to the OLC to be evaluated. See: 7-3-4 "Collecting a Screen Capture with Logs" on page 7-5. It is extremely important to give as much detail as possible about the occurrence of the problem and the date and time it showed up. On the scan screen, press ALT + D.</p> <ul style="list-style-type: none"> • In the event of a Hard Drive failure, see: Table 7-56 "System not booting up (or partially booting)" on page 7-223, "Hard Drive Failure." • Perform BEP Diagnostics. Run several loops of BEP diagnostics. • If Cause / Symptom occurs frequent enough at the site, take the system to the Minimum Configuration and see if the Cause / Symptom goes away. <p>Lock-ups and system errors may occur from high temperatures in the Card Rack due to: a clogged air filter under the fan tray, clogged screens on the fan tray assembly, clogged air intake to the BEP, bad fans in the BEP, and/or a clogged, rear filter under the main power supply. Inspect and clean all of the above.</p> <p>If the filters were dirty or possibly clogged, reboot the system after cleaning the screens/filters and monitor for reoccurrence of the problem. Also, check Card Rack temperatures in the "logfile-TempMon.txt" file for abnormally high operating temperatures. Readings between 65 and 80 degrees C can cause lockups while readings of 80 degrees C or above will cause shut-downs. Also check the BEP CPU temperature for operating temperatures greater than 45 degrees C.</p> <p>If after cleaning the air filters, lock-ups and system errors continue to occur from high temperatures in the Card Rack, components will need to be replaced.</p> <p>If problems persist, reload Base Image and Application Software. See: 8-4-7 "Loading the Software" on page 8-10.</p>

Table 7-56 System not booting up (or partially booting)

Symptoms / Causes	Task / Resolutions
System boots up but reboots or shuts down without prompts, or locks up.	<p>1. If possible, run the BEP Diagnostics and Card Rack Diagnostics to try and identify the problem. Run several loops of diagnostics.</p> <p>2. If able to get into Windows, send the system logs to the OLC. If OLC finds nothing in logs, have OLC contact Engineering before replacing the BEP.</p> <p>3. Shutdowns may occur from overheating in the Card Rack due to: a clogged air filter under the fan tray, clogged screens on the fan tray assembly, and/or a clogged, rear filter under the main power supply. Inspect and clean all of the above.</p> <p>If the filters were dirty or possibly clogged, reboot the system after cleaning the screens/filters and monitor for reoccurrence of the problem. Also, check the Card Rack temperatures in the "logfile-TempMon.txt" file for any temperatures above 80 degrees C including erroneous temperatures (i.e 1000 degrees C). High temperatures persisting even with a clean filter or erroneous values will require replacing the particular board where the temperatures are too high. Use the temperatures in "logfile-TempMon.txt" file to identify which board needs replacement.</p> <p>4. BEP overheating. Check BEP CPU temperatures in the "logfile-TempMon.txt" file for any temperatures above 70 degrees C. Temperatures above 70 degrees C will cause the system to shutdown.</p> <p>5. If steps 1 through 4 did not identify the cause, proceed to Figure 7-161 "Rebooting or Shutting Down Troubleshooting Flow Chart" on page 7-227.</p>
System partially boots up, will not boot up, or is not powering on.	<p>1. If the system won't boot up/turn on at all, determine if the MPS or BEP PS is defective. To do this, see: 7-9-4 "Main Power Supply (MPS) Troubleshooting" on page 7-202 to determine if the Main PS is defective.</p> <p>2. If the system partially boots up, i.e. won't boot past BIOS or fails booting to application software or booting into Windows, see: Figure 7-162 "Troubleshooting Partial Boot - System is stuck in BIOS or the system boots past BIOS, then displays disk boot failure in DOS screen" on page 7-228.</p> <p>To power on the BEP without using the ON/OFF Button:</p> <ul style="list-style-type: none"> • Short pins B12 and B24 (PWR SW and 5V_STDBY) in the Test Connector on the I/O Board.
System fails to boot and BEP makes beeping noise.	See: 5-11-8-4 "BIOS Beep Codes" on page 5-120 .
Simulator Mode: "Bulls eyes" on imaging screen (black circles with white rings).	Check the connection of the PCIe cable on both the GFI board and BEP or the connection of the PCIe cable to the motherboard (J3 on MRX Configuration). Also see 7-9-4 "Main Power Supply (MPS) Troubleshooting" on page 7-202 .
CD/DVD Drive Failures.	<p>Check that the media (disk capacity and speed) is supported.</p> <ul style="list-style-type: none"> - For the CD, the capacity is normally 700MB. • Check Windows for driver issues. Go to Control Panel > Administrative tools > Computer management > Device Manager. • Re-install drivers if necessary. • If the CD Drive is having problems, replace the CD Drive. • If the problem persists, replace the BEP.

Table 7-56 System not booting up (or partially booting)

Symptoms / Causes	Task / Resolutions
Image CD/DVD is not being read.	Put the CD or DVD in a laptop and see if it can be read. If it cannot be read, the disk is bad. If it can be read, make a copy at a low burn speed (8X). If the copy does not work, replace the CD-RW or DVD-R Drive.
Files corrupt on boot up with: <ul style="list-style-type: none">• Possible error messages: "ntldr missing or corrupt",• "c:\windows\system32\config corrupt",• "hive corrupt"	Re-image and advise clinicians not to power off the system by holding down the power button. In the event of a Hard Drive failure, see: Table 7-56 "System not booting up (or partially booting)" on page 7-223 , "Hard Drive Failure."
Hard Drive Failure. These are some common symptoms of Hard Drive failure. See: 7-5-14-4 "Hard Disk Drive Surface Scan" on page 7-116 and 7-5-14-5 "Hard Disk Drive Quick Test" on page 7-117 for Diagnostic Tests. <ul style="list-style-type: none">• The results of Hard Drive Diagnostics may indicate bad sectors on the Hard Drive.• The system may not boot up because of bad sectors on the Hard Drive.• Attempts to re-image the C: partition may fail because of bad sectors on the C: partition.• The system may not boot up and displays a blue screen with stop errors (dark blue screen with white text).	In the event of a Hard Drive failure, determine whether or not the customer requires recovery of data. If the customer requires data recovery, collect the following information from the customer: <ul style="list-style-type: none">• Customer contact name• Customer contact phone• Customer contact address• What data they require (e.g. studies for a date range or everything)• Whether the customer wants their data on CD or DVD media Tell the customer GE will attempt to recover as much data as possible. Write a complaint and include the above information. DO NOT discard or return the failed Hard Drive. A member of the Complaint Handling Unit or the Installed Base team will contact the author of the complaint and provide instructions for delivery of the failed Hard Drive to engineering. Engineering will then recover as much data as possible and send the recovered data directly to the customer.

Table 7-56 System not booting up (or partially booting)

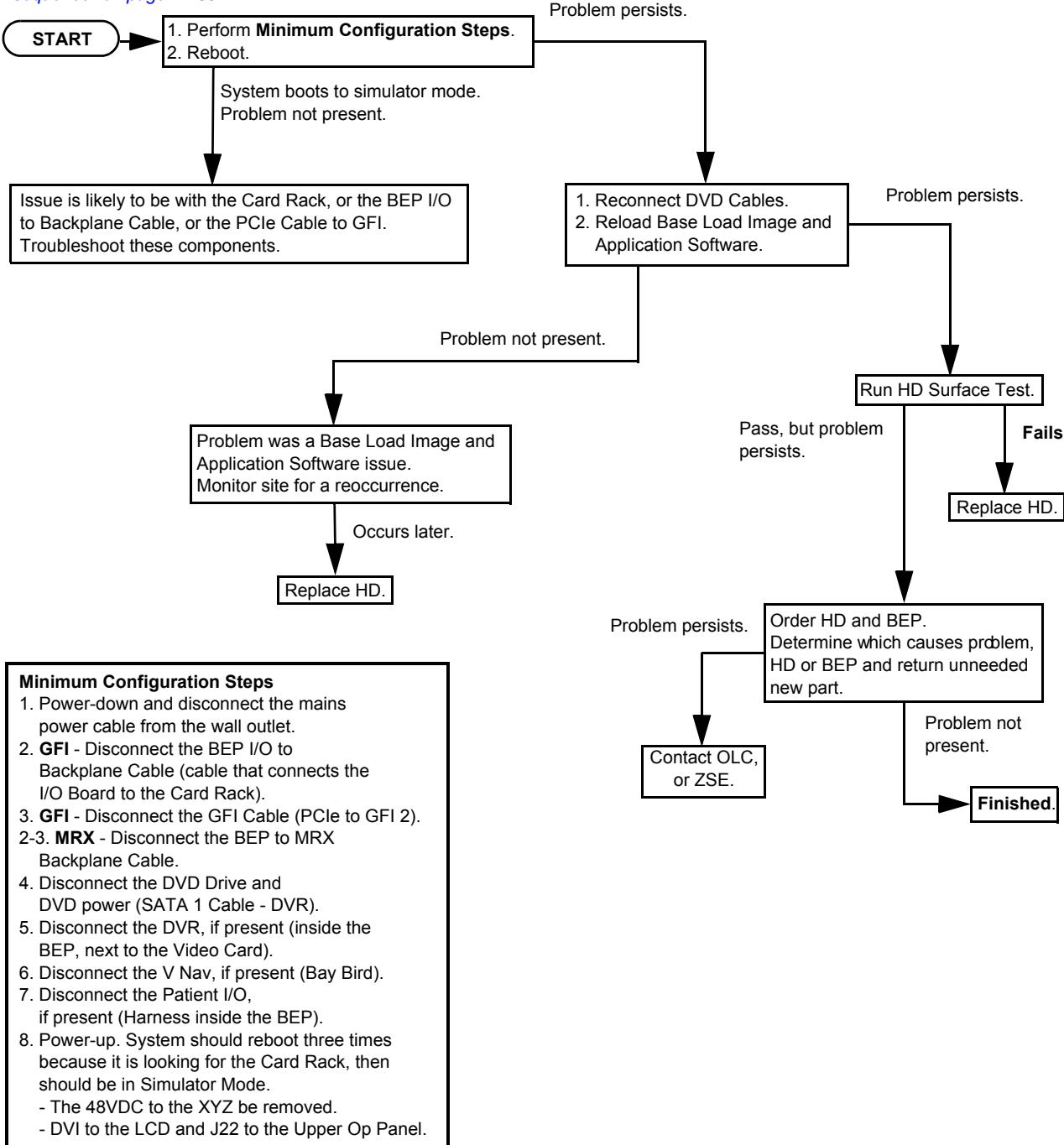
Symptoms / Causes	Task / Resolutions
System has no video.	<p>1. If the Touch Panel has no video, re-seat the USB cable on the J100 of the BEP. If there is still no video after 1 minute, power down the system. Open the upper OP Panel and re-seat all cables on the back of the Touch Panel, and re-seat all cables on the bulkhead board (small circuit board behind Touch Panel). Inspect all cables for pinching and/or damage. Replace anything damaged.</p> <p>Rule out the Touch Panel video port, J100 (See BEP Door Label.), as a problem by plugging in a mouse. If the mouse works, then troubleshoot the upper OP Panel and cables.</p> <p>If the Touch Panel video does not display, replace the Touch Panel and the main cable harness. Reload any drivers.</p> <p>2. If the LCD monitor has no video and the fans are running high, attempt to reset the BIOS as described in Section 7-8-2-1 "Resetting the BEP BIOS Memory" on page 7-179. If resetting the BIOS does not work, proceed to Step 3.</p> <p>3. If the LCD monitor has no video, power down the system. Re-seat the Video Card and flex cable in the BEP, on the motherboard and the I/O Board. If the system has a DVR Card, disconnect the flex cable from the DVR and connect it to the Video Card. If video returns, replace the DVR Card.</p> <p>If video is still not present, re-seat the video cable connector underneath the upper OP Panel and inspect the cable for any damage.</p> <p>If video is still not present after trying the above procedure, then plug a monitor into the rear DVI port on the BEP. Use a DVI or VGA monitor with an adapter. If video is present on the separate monitor, replace the flex cable. If video does not return, order a new flex cable, I/O Board, and BEP. Try the flex cable and I/O Board first to determine if they are the cause. Resort to replacing the BEP last.</p>
BEP5.x ONLY, not applicable to BEP6.x. <p>Ticking or Popping sound in speakers after system has fully booted (speaker noise during boot up is common and not a problem).</p> <p>1. Single tick - about every second that matches the blinking of the DS2 LED on the BEP door.</p> <p>2. Double ticks - about every two seconds, no blinking LEDs.</p>	<p>1. The known causes of this noise is a blown fuse in the BEP EPS or the EPS battery cable is not fully seated in the connector.</p> <p>Check the fuse in the EPS on the BEP. Replace the fuse if it is blown. If the fuse is not blown, re-seat the battery cable on the EPS circuit board. If the noise does not go away, order a new battery pack assembly with cable.</p> <p>2. Replace the I/O Board.</p>

7-9-9-2 BEP Troubleshooting Flow Chart

Use the Flow Chart isolate cause/failure(s).

Figure 7-161 Rebooting or Shutting Down Troubleshooting Flow Chart

NOTE: If unfamiliar with the Boot Up Sequence, see: 7-9-9-3 "Boot up sequence" on page 7-230.



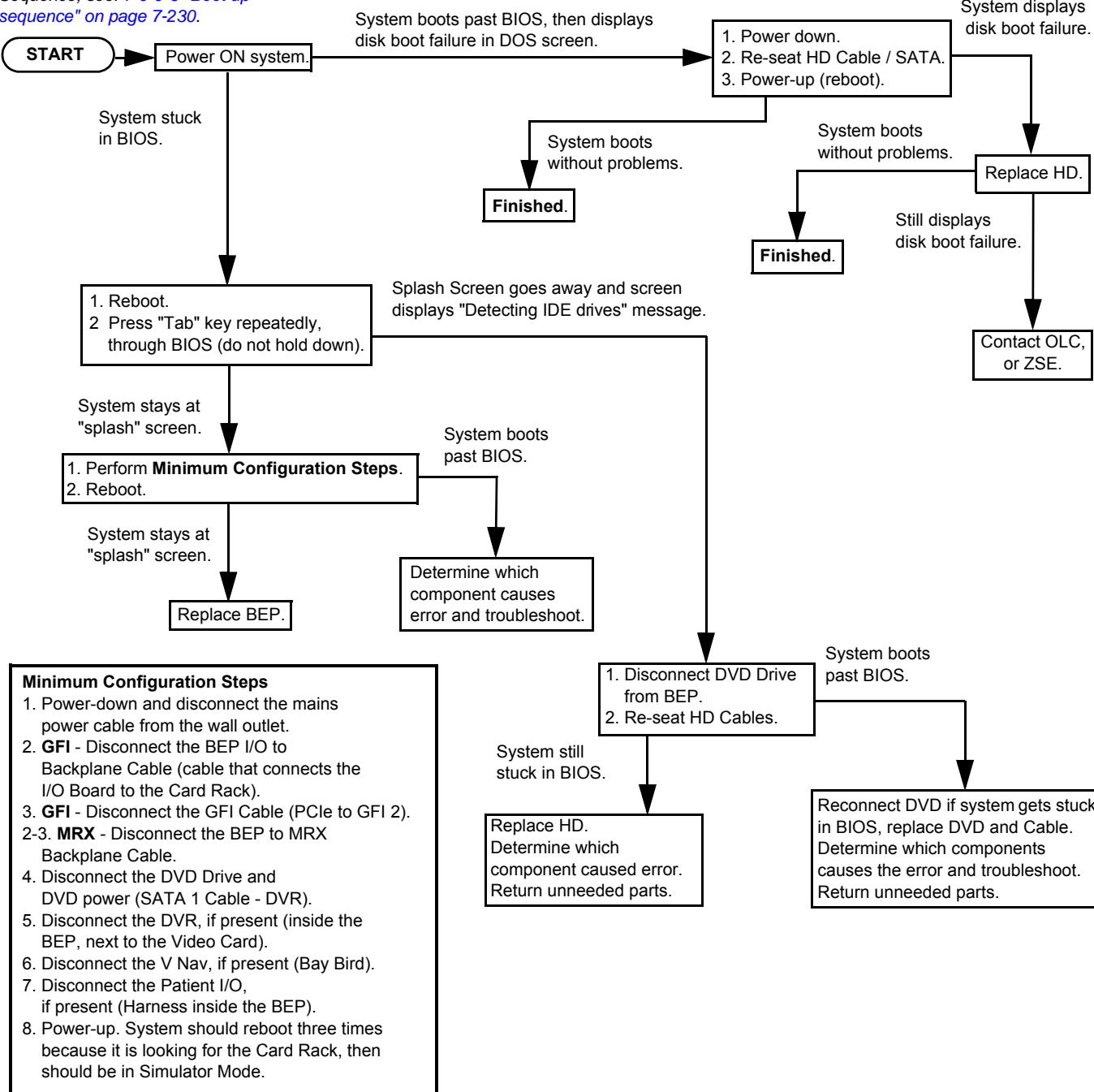
7-9-9-2 BEP Troubleshooting Flow Chart (cont'd)

Use this Flow Chart to Troubleshoot Partial Boot (system is stuck in BIOS or the system boots past BIOS, then displays disk boot failure in DOS screen) to isolate cause/failure(s).

Figure 7-162 Troubleshooting Partial Boot -

System is stuck in BIOS or the system boots past BIOS, then displays disk boot failure in DOS screen

NOTE: If unfamiliar with the Boot Up Sequence, see: 7-9-9-3 "Boot up sequence" on page 7-230.

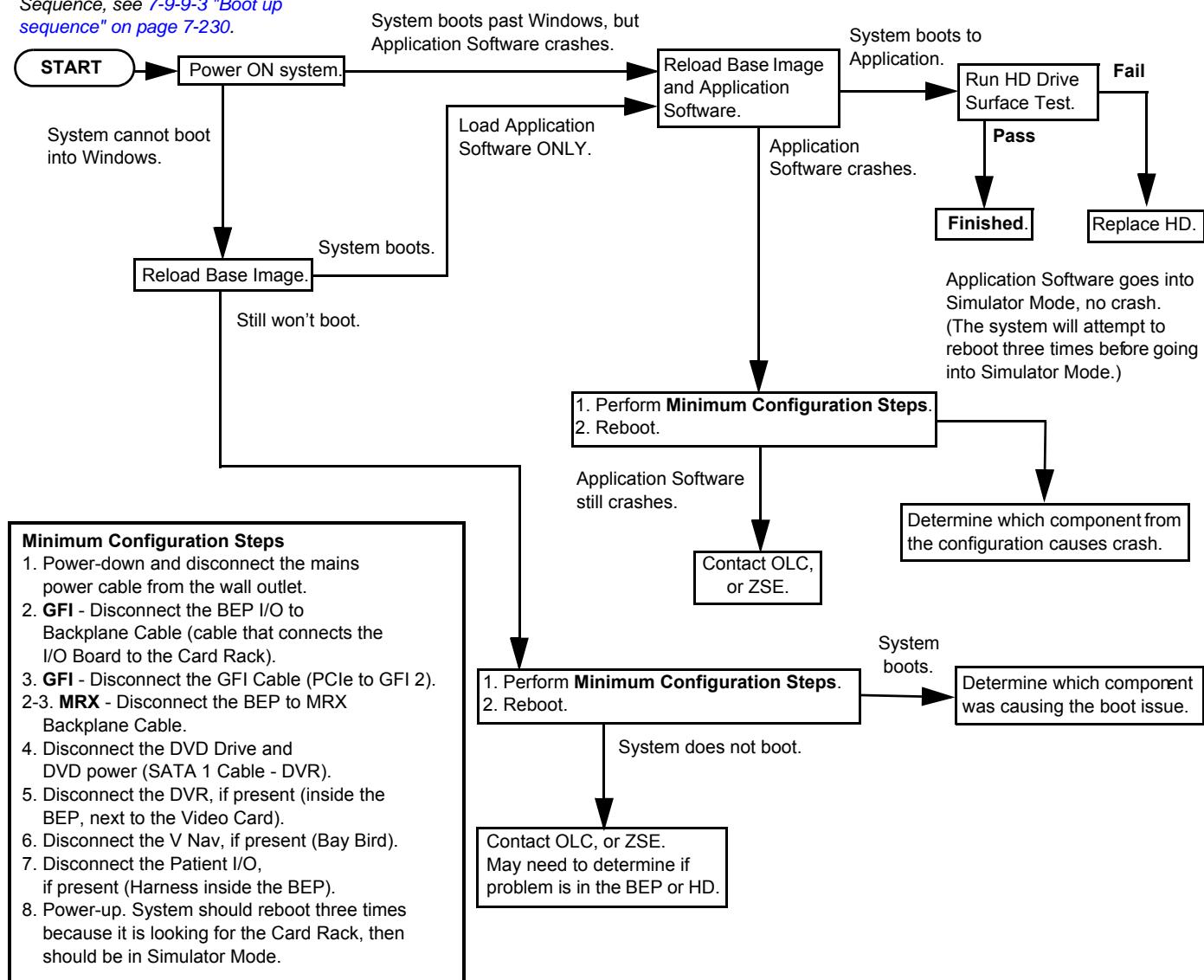


7-9-9-2 BEP Troubleshooting Flow Chart (cont'd)

Use the Flow Chart to Troubleshoot Partial Boot (system cannot boot into Windows or System boots past Windows, but Application Software crashes) to isolate cause/failure(s).

**Figure 7-163 Troubleshooting Partial Boot (continued) -
System cannot boot into Windows or System boots past Windows, but Application Software crashes**

NOTE: If unfamiliar with the Boot Up Sequence, see 7-9-9-3 "Boot up sequence" on page 7-230.



7-9-3 Boot up sequence

Table 7-57 Boot Up Sequence

Description of Function	Screen Information or Display
Pressing "DEL" key during the first part of the boot up sequence will bring up the BIOS Password Screen.	Optimize or change BIOS settings.
BIOS Load.	BIOS Information Screen  <p>GE Healthcare Ultrasound Loading - 5212471 Rev 5 BIOS © 2008 General Electric Company - All Rights Reserved</p>
Devices from CPU	System Information Screen  <p>GE Healthcare Ultrasound LOGIQ E9™ © 2008 General Electric Company - All Rights Reserved Starting Screen</p> <p>Violations of this document are covered by one or more patent claims, copyrights, trademarks and/or one or more of the U.S. or international patent offices. See the Home page.</p>
Blank Blue screen on Main LCD and Touch Panel display.	

Table 7-57 Boot Up Sequence

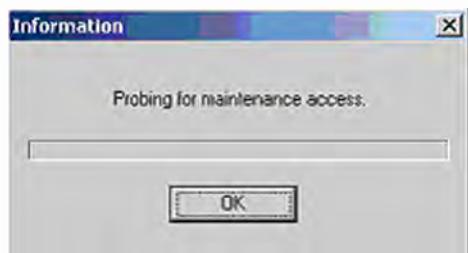
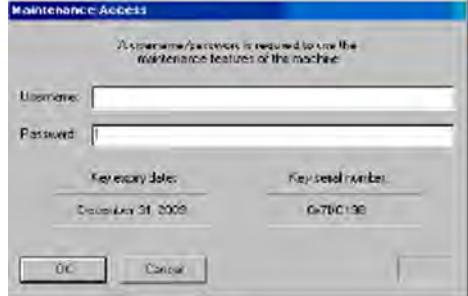
Description of Function	Screen Information or Display
Windows background splash on Main LCD Display — Windows load/boot process in progress.	<p>R3.x and earlier</p>  <p>R4.x and later</p> 
Message displays if Service Key is present and lights up during boot.	
Maintenance Access dialog if Service Key is present during boot. Select Cancel.	

Table 7-57 Boot Up Sequence

Description of Function	Screen Information or Display
Applications load/boot (a couple of flashes occur before it completes).	
Windows background splash on Touch Panel LCD Display.	<p>R3.x and earlier</p> <p>R4.x and later</p>

Table 7-57 Boot Up Sequence

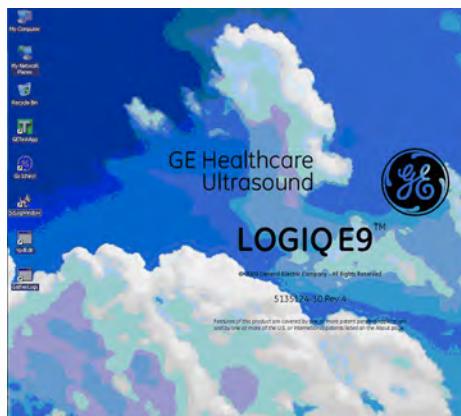
Description of Function	Screen Information or Display
<p>Scan Screen will display,</p> <p>or</p> <p>Simulator Mode Screen will display at Minimum Configuration or system problem. In Simulator Mode, the scan screen may display pulsatile circles or no scan at all, but will allow other application functions to run normally.</p>	
<p>Successful boot into Windows before Application installed or when using Service Key to access desktop.</p>	

Table 7-57 Boot Up Sequence

Description of Function	Screen Information or Display
<p>Ticking or Popping sound in speakers after system has fully booted (speaker noise during boot up is common and not a problem).</p> <p>1. Single tick - about every second that matches the blinking of the DS2 LED on the BEP door.</p> <p>2. Double ticks - about every two seconds, no blinking LEDs.</p>	<p>1. The known causes of this noise is a blown fuse in the BEP EPS or the EPS battery cable is not fully seated in the connector.</p> <p>Check the fuse in the EPS on the BEP. Replace the fuse if it is blown. If the fuse is not blown, re-seat the battery cable on the EPS circuit board. If the noise does not go away, order a new battery pack assembly with cable.</p> <p>2. Replace the I/O Board.</p>

7-9-10 Operator Panel

7-9-10-1 No Audio

See: 7-5-16-3 "Audio (Sound)" on page 7-129 and I/O Board Audio Test on 7-5-12-11 "I/O Board Tests" on page 7-83 for audio diagnostic tests.

- Check volume settings in the application and also in Windows.
- Use headphones, (the type that you use on a personal CD player or a laptop) to test the audio output directly from the back of the BEP.
 - If no Audio is present on the BEP, reload software. If the problem persists, replace the BEP.
 - If Audio is present, follow the audio signal to the Op Panel (the audio amplifier is located in the upper Op panel). The Audio output from the BEP goes to the Internal I/O and from there to the Op Assembly (use an adapter to plug the headphones to the RCA outputs of the Internal I/O). If Audio outputs are working, replace Upper Op Assembly. Otherwise replace Internal I/O board.
 - Always measure the speakers' impedance; it should measure approximately 7 ohms. If speakers are bad, it is possible that the amplifier on the Upper Op Assembly might be defective, too.

7-9-10-2 No Video on Touch Panel Display

See: 7-5-14-6 "Video Card" on page 7-118 and the video status test on 7-5-12-11 "I/O Board Tests" on page 7-83 for video card diagnostic tests.

- If the video is too dim, has dimmed areas or there is no video at all, replace the HV LCD inverter.
- If the HV LCD inverter is burnt, there is a possibility that the Digital Video Card on the PC also got damaged; in that case you can replace the Video Card.
- Replace the Back End Processor if the problem continues.
- Replace upper panel assembly.

7-9-10-3 Wrong Key Activated on the Touch Panel

- Perform Touch Screen Verification Utility, check first before calibrating. See: 7-5-16-1 "Keyboard" on page 7-126.
- Calibrate touch panel.
- Replace Upper Panel Assembly.

7-9-10-4 Wrong System Date and Time

- Order CMOS Battery and BIOS Blaster CD, refer to BEP parts Section 9-13 "Back End Processor (BEP) parts" on page 9-72.

7-9-10-5 Incorrect System Time When Daylight Savings Time Changes

- 1.) From the touch panel, press **Utility -> System**.
- 2.) Select Date/Time.
- 3.) On the Date and Time Properties screen, select the Time Zone tab.
- 4.) Disable the Automatically adjust clock for daylight saving changes checkbox, select Apply.
- 5.) Select the Date & Time tab.
- 6.) Set the proper time for the system's location, and then select OK.
- 7.) Select Save.

7-9-10-6 Touch Panel Not Responding

- Perform Touch Screen Verification Utility, check first before calibrating. Access the Service interface (Click on the Wrench) and go to Diagnostics > Service Diagnostics > Service Diagnostics > Touch Panel > TP Cal Verification.
- Calibrate touch panel. Access the Service interface and go to Diagnostics > Service Diagnostics > Service Diagnostics > Touch Panel > TP Calibration.
- Reload software.
- Replace Upper Panel Assembly.

7-9-10-7 Service Password Does Not Respond When System Set to Greek/Russian Language (SN 70392)

- Although you may change the language settings/keyboard to respond to different languages, the keyboard must be set to English to enter the password into the Service Browser or Maintenance Access window.
- If you enter the service password into the Service Browser login or Maintenance login, and it does not respond: select the link to return to the Login page, press ALT+SHIFT to toggle the keyboard to English, and enter the service password again.

7-9-10-8 Z Movement fails

- If the Top Console does not lower, but it can be raised, this indicates that one of the control switches is stuck in "Up" position.
- If you have to help the Top Console up when raising it, but the motor assistance works when lowering the Top Console, it indicates that the gas spring inside the Z Mechanism is failing.
 - Replace the Z Mechanism.

7-9-11 Probes**7-9-11-1 Probe Recognition**

- Check all the probes on all the ports. Remove all the probes, and then check each probe singly in every port.
 - If the problems persist with all the probes, replace the GRLY board.
 - If only one probe fails to be recognized, clean User Defs to check if the problem is caused by corrupted presets. If the problem is not resolved, replace the probe.

7-9-11-2 V Nav Inside Sensors Failure

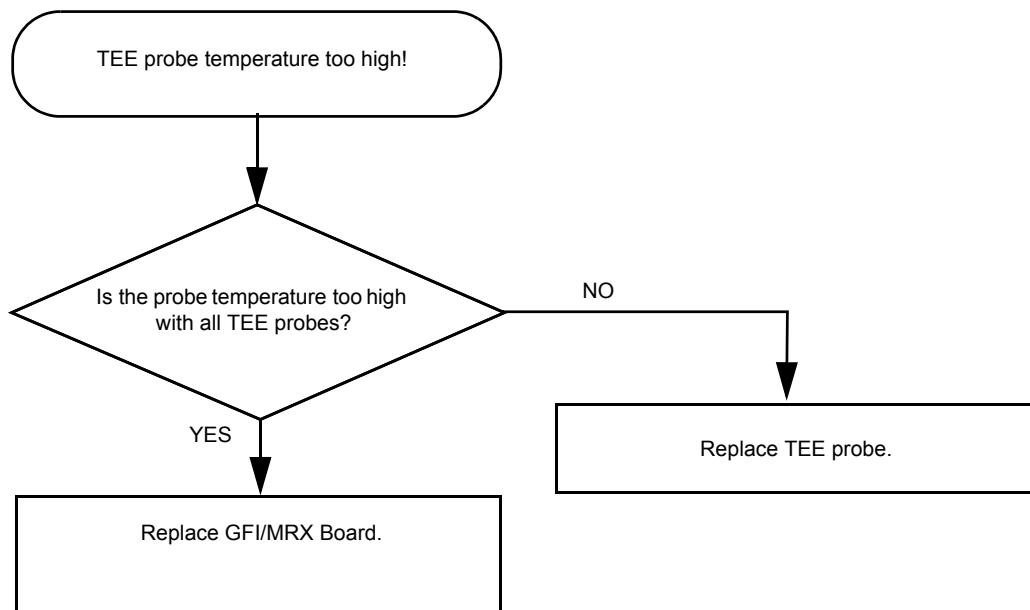
In the event that the V Nav Inside sensors would fail, the probe would continue to be recognized as a V Nav Inside probe and would continue to scan correctly. On entry into V Nav, the LOGIQ E9 would report a failure to initialize or connect to the V Nav sensors.

V Nav inside probes could be used with external sensors. In the event of an initialization / connection failure to the V Nav Inside sensor, the LOGIQ E9 will automatically switch to and try to initialize the external sensors.

7-9-11-3 TEE Probe Temperature Too High

Use the flow chart below to investigate the heat problem.

Figure 7-164 TEE Probe Temperature Too High

**7-9-12****System Temperature Too High (System Overheating)**

When the temperature inside the LOGIQ E9 increases, the fan speed will increase to cool down the system. If the air filters become too dusty, a higher fan speed is required to keep the air stream at the sufficient level. When the fan speed increases, the fan noise will also increase. If the cooling air stream is insufficient to stabilize the interior temperature within the operating margin, the system will stop operating.

Solution:

- Clear the BEP Fan(s) intake(s), all filters and the Fan Tray screen of any debris.
- Clean or replace the filters. See: 8-8-3 "Rear Filter and "handle type" Bottom Filter replacement / cleaning" on page 8-339 or 8-8-4 "Bottom Filter installation (looped type strap)" on page 8-344.

If a fan is worn out, it may be noisy, or stop working.

Solution: Replace the fan tray.

NOTE: Whenever the left Side Cover is removed, clear the BEP Fan(s) intake(s) of any debris.

7-9-13 Software**7-9-13-1 Base Image Load Troubleshooting**

If you have trouble while loading Base Image software try the following:

- Copy the software CD to your laptop.
 - Try to load this copy of the CD to the scanner.
 - If the copy doesn't load properly, the Base Image software CD is corrupt. You need to get a new CD.
- Read error on Base Image load - Replace HDD see: *8-11-12 "BEP HDD (Hard Disk Drive) replacement - BEP5.x" on page 8-491*.

7-9-13-2 Image or Patient Data Loss

If you experience image or patient data loss, generate an Alt+D log and/or if possible, generate a copy of the HDD data and submit a complaint to the appropriate make center.

7-9-13-3 Cannot find d:\Export\Service folder

For Application software R2.x.x or earlier, the common symptom is that Alt+D logs cannot be saved in the Export\Service directory or the OnLine Center cannot capture logs. In R1.x.x, if the customer deletes the content of the Export directory while in the Save As screen, the Service directory will be deleted. To prevent this from happening, make sure the customer deletes individual images while in Save As. If the folder has been deleted, ask the customer to go to scan screen and press CNTRL PRTSCRN, that will acquire an image for Service and the folder will be automatically created. This can also be done remotely.

NOTE: *For Application SW R3.x.x or later, the Service Directory is no longer located under the export folder, it is located in d:\ root directory (d:\service).*

7-9-14 4D Option Troubleshooting**Table 7-58 4D Option Troubleshooting**

Symptom	Action
Cannot select probe from touch panel	1. Make sure 4D option is installed 2. Try another 3D/4D probe. If the new probe works, you have a bad probe. 3. Run Diags on 4D Motor Controller. 4. Replace cable from motor control to PS (flex cable). 5. Replace motor controller
Probe will not "sweep". No image update.	1. Try another 3D/4D probe. If the new probe works, you have a bad probe. 2. Replace cable from motor control to PS (flex cable). 3. Replace motor controller.
Probe will "sweep" for a short time, then stops. Image update halts.	1. Try another 3D/4D probe. If the new probe works, you have a bad probe
"Black" image area in the 2D (B-Mode) image.	1. Try another 3D/4D probe of a different type. If the new probe shows the same IQ problem, this is probably not a 3D/4D specific issue. If the new probe does not have the IQ problem, go to number 2 below. 2. Try another 3D/4D probe of the same type. If the new probe images correctly, you have a bad probe.

7-9-15 Shear Wave Option Troubleshooting

Table 7-59 Shear Wave Option Troubleshooting

Symptom	Action
Shear Wave Control is not available on the Touch Screen.	Is Option Hardware installed properly and Option String present? User will not be able to select the Shear Wave Control on the Touch Screen (Control is not available).
Performance is poor. Fuse is blown or has blown while in Shear Wave (the fuse IS NOT replaceable).	Reboot to check if Shear Wave is still available. <ul style="list-style-type: none"> While the LOGIQ E9 is OFF and Capacitor Pack is discharged, check Capacitor Cable connections. <p><i>NOTE: Both Capacitor Pack Module LEDs (two modules, four LEDs total) should be lit after few seconds of booting up (visible through the Capacitor Pack Cover). BCM2 is only used during CW Doppler + Simultaneous.</i></p> <p><i>If all Capacitors are NOT charging, the charge time will be affected. Even if the LEDs are lit. At boot up the system should detect the failure and disable Shear Wave.</i></p>

7-9-16 Log Analysis - R3.x and earlier

NOTE: *The examples used in this section are from a GFI Configuration system.*

Here is an example of how to analyze a Log:

1.) Startup Logging

; Starting log system

Same familiar comment to denote startup of the system.

```
; ScDisplayType(364); Monitor found in registry: MFG: "ENC", Model: "GA700", Serial Number: "20037077"
; EchoLoader(364); Primary display resolution set to High by SmartVideoResolution (display = GA700)
; Preset reset(364); SaveToStream change[0] hospital [GE Healthcare]
; Warning; ScResCat(364); Couldn't find filename to save to.
; Info ; EchoLoader(364); Primary display resolution set to 1280 x 1024 (60 Hz refresh - fallback from 75)
; GFI 0x02280108 , GFI_P2P_filter 0x00021006 driver versions are opened
; Downloading LSW from file: gfireboot.out
```

Driver for communication with GFI started.

```
; Downloading LSW from file: gfi2tr.out
; Downloading FPGA contents from file: C:\Scanner\target\firmware\GFI/gfi2_fpga_1.bin
```

GFI FPGA and DSP firmware downloaded

; ScFEPProxy(364); FEPProxy::targetPresent() is true.

The card rack HW has been detected and system is being booted normally.

```
; ConfigLog(364); TARGET_ROOT: "C:\Scanner\target"
; ConfigLog(364); TEST_ROOT: "D:\Scanner\target"
; ConfigLog(364); TEMP: "D:\temp"
; ConfigLog(364); Overall SW version R1.0.3C
; ConfigLog(364); Overall SW Part Number 5193239-4
; ConfigLog(364); SW Build Version XP-Shadow_mke_LOGIQ E9_p1
; ConfigLog(364); SW Build Date Mon Jul 07 17:01:45 2008
; ConfigLog(364); Ghost Part Number 5135125-20 Rev 3
; ConfigLog(364); Ghost Date 2008-06-27 14:00
; ConfigLog(364); BEP Version in Ghost = 5
```

Report of the SW and Base load version.

```
; ConfigLog(364); Processor Identifier = x86 Family 6 Model 15 Stepping 2, GenuineIntel
; ConfigLog(364); Number of Processor = 2
; AcqLoader(364); Cannot find file none.dll
; ScFEPProxy(364); SSN: E00009
```

7-9-16 Log Analysis - R3.x and earlier (cont'd)

System serial number.

```
; acqHouseKeeping(1884); Vpd for GFI      Part Number (P/N): 5161631
; acqHouseKeeping(1884); Vpd for GFI  Functional Revision (FNRV): 2A
; acqHouseKeeping(1884); Vpd for GFI      Product Code (PRD): GFI
; acqHouseKeeping(1884); Vpd for GFI      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for GFI      Serial Number (SN): BEYTBK
; acqHouseKeeping(1884); Vpd for GFI Bar Code Serial Number (BCSN): BEYTBK
; acqHouseKeeping(1884); Vpd for DRX4      Part Number (P/N): 5301040-2
; acqHouseKeeping(1884); Vpd for DRX4  Functional Revision (FNRV): 2B
; acqHouseKeeping(1884); Vpd for DRX4      Product Code (PRD): DRX
; acqHouseKeeping(1884); Vpd for DRX4      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for DRX4      Serial Number (SN): BEYZK1
; acqHouseKeeping(1884); Vpd for DRX4 Bar Code Serial Number (BCSN): BEYZK1
; acqHouseKeeping(1884); Vpd for DRX3      Part Number (P/N): 5301040-2
; acqHouseKeeping(1884); Vpd for DRX3  Functional Revision (FNRV): 2B
; acqHouseKeeping(1884); Vpd for DRX3      Product Code (PRD): DRX
; acqHouseKeeping(1884); Vpd for DRX3      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for DRX3      Serial Number (SN): BEYZJH
; acqHouseKeeping(1884); Vpd for DRX3 Bar Code Serial Number (BCSN): BEYZJH
; acqHouseKeeping(1884); Vpd for DRX2      Part Number (P/N): 5301040-2
; acqHouseKeeping(1884); Vpd for DRX2  Functional Revision (FNRV): 2B
; acqHouseKeeping(1884); Vpd for DRX2      Product Code (PRD): DRX
; acqHouseKeeping(1884); Vpd for DRX2      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for DRX2      Serial Number (SN): BEYZJE
; acqHouseKeeping(1884); Vpd for DRX2 Bar Code Serial Number (BCSN): BEYZJE
; acqGfi(3272); hardwarepck:***HwConfig::RFI_GetHwConfig(3) offst 0 len=128 failed
; acqHouseKeeping(1884); Vpd for GTX4      Part Number (P/N): 5201044-01
; acqHouseKeeping(1884); Vpd for GTX4  Functional Revision (FNRV): 2A
; acqHouseKeeping(1884); Vpd for GTX4      Product Code (PRD): GTX
; acqHouseKeeping(1884); Vpd for GTX4      Pole (PLE): yms
; acqHouseKeeping(1884); Vpd for GTX4      Serial Number (SN): 00019
; acqHouseKeeping(1884); Vpd for GTX4 Bar Code Serial Number (BCSN): 00019
; acqHouseKeeping(1884); Vpd for GTX3      Part Number (P/N): 5201044-01
; acqHouseKeeping(1884); Vpd for GTX3  Functional Revision (FNRV): 2A
```

7-9-16 Log Analysis - R3.x and earlier (cont'd)

```

; acqHouseKeeping(1884); Vpd for GTX3          Product Code (PRD): GTX
; acqHouseKeeping(1884); Vpd for GTX3          Pole (PLE): yms
; acqHouseKeeping(1884); Vpd for GTX3          Serial Number (SN): 00020
; acqHouseKeeping(1884); Vpd for GTX3 Bar Code Serial Number (BCSN): 00020
; acqHouseKeeping(1884); Vpd for GTX2          Part Number (P/N): 5201044-01
; acqHouseKeeping(1884); Vpd for GTX2          Functional Revision (FNRV): 2A
; acqHouseKeeping(1884); Vpd for GTX2          Product Code (PRD): GTX
; acqHouseKeeping(1884); Vpd for GTX2          Pole (PLE): yms
; acqHouseKeeping(1884); Vpd for GTX2          Serial Number (SN): 00044
; acqHouseKeeping(1884); Vpd for GTX2 Bar Code Serial Number (BCSN): 00044
; acqGfi(3272); hardwarepck:**HwConfig::RFI_GetHwConfig(7) offst 0 len=128 failed
; acqHouseKeeping(1884); Vpd for GRX2          Part Number (P/N): GA200295
; acqHouseKeeping(1884); Vpd for GRX2          Functional Revision (FNRV): 2B
; acqHouseKeeping(1884); Vpd for GRX2          Product Code (PRD): GRX
; acqHouseKeeping(1884); Vpd for GRX2          Pole (PLE): nor
; acqHouseKeeping(1884); Vpd for GRX2          Serial Number (SN): 200710-014
; acqHouseKeeping(1884); Vpd for GRX2 Bar Code Serial Number (BCSN): WO0710107014
; acqHouseKeeping(1884); Vpd for GRX1          Part Number (P/N): GA200300
; acqHouseKeeping(1884); Vpd for GRX1          Functional Revision (FNRV): 2A
; acqHouseKeeping(1884); Vpd for GRX1          Product Code (PRD): GRX
; acqHouseKeeping(1884); Vpd for GRX1          Pole (PLE): nor
; acqHouseKeeping(1884); Vpd for GRX1          Serial Number (SN): 200715-024
; acqHouseKeeping(1884); Vpd for GRX1 Bar Code Serial Number (BCSN): WO0715106024
; acqHouseKeeping(1884); Vpd for GRLY          Part Number (P/N): GA200296
; acqHouseKeeping(1884); Vpd for GRLY          Functional Revision (FNRV): 2B
; acqHouseKeeping(1884); Vpd for GRLY          Product Code (PRD): GRLY
; acqHouseKeeping(1884); Vpd for GRLY          Pole (PLE): nor
; acqHouseKeeping(1884); Vpd for GRLY          Serial Number (SN): 200718-009
; acqHouseKeeping(1884); Vpd for GRLY Bar Code Serial Number (BCSN): WO0718093009
; acqGfi(3272); hardwarepck:**HwConfig::RFI_GetHwConfig(13) offst 0 len=128 failed
; acqGfi(3272); hardwarepck:**HwConfig::RFI_GetHwConfig(14) offst 0 len=128 failed
; acqGfi(3272); hardwarepck:**HwConfig::RFI_GetHwConfig(15) offst 0 len=128 failed

```

7-9-16 Log Analysis - R3.x and earlier (cont'd)

```
; acqGfi(3272); hardwarepck:***HwConfig::RFI_GetHwConfig(16) offst 0 len=128 failed
; acqGfi(3272); hardwarepck:HwConfig::RFI_GetHwConfig: Reading non-existing device(-1)
; acqHouseKeeping(1884); Vpd for TXPS      Part Number (P/N): 5205052
; acqHouseKeeping(1884); Vpd for TXPS  Functional Revision (FNRV): 1A
; acqHouseKeeping(1884); Vpd for TXPS      Product Code (PRD): TXPS
; acqHouseKeeping(1884); Vpd for TXPS      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for TXPS      Serial Number (SN): 00018
; acqHouseKeeping(1884); Vpd for TXPS Bar Code Serial Number (BCSN): 00018
; acqHouseKeeping(1884); Vpd for IOB      Part Number (P/N): 5141000-3
; acqHouseKeeping(1884); Vpd for IOB  Functional Revision (FNRV): 1A
; acqHouseKeeping(1884); Vpd for IOB      Product Code (PRD): IOB
; acqHouseKeeping(1884); Vpd for IOB      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for IOB      Serial Number (SN): BEYZMJ
; acqHouseKeeping(1884); Vpd for IOB Bar Code Serial Number (BCSN): BEYZMJ
; acqHouseKeeping(1884); Vpd for BP       Part Number (P/N): 5161814
; acqHouseKeeping(1884); Vpd for BP  Functional Revision (FNRV): 2A
; acqHouseKeeping(1884); Vpd for BP      Product Code (PRD): BP
; acqHouseKeeping(1884); Vpd for BP      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for BP      Serial Number (SN): 324699
; acqHouseKeeping(1884); Vpd for BP Bar Code Serial Number (BCSN): 324699
; acqHouseKeeping(1884); Vpd for BEPPS     Part Number (P/N): 5393800-2
; acqHouseKeeping(1884); Vpd for BEPPS  Functional Revision (FNRV): 1A
; acqHouseKeeping(1884); Vpd for BEPPS      Product Code (PRD): BEPPS
; acqHouseKeeping(1884); Vpd for BEPPS      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for BEPPS      Serial Number (SN): BEYZMG
; acqHouseKeeping(1884); Vpd for BEPPS Bar Code Serial Number (BCSN): BEYZMG

VPD Configuration Reads

; acqHWCap(1884); HW Rack Configuration Valid: LOGIQ E9 Configuration 2 (IC2) - NoCW, MLA4, GTX2.1 Lambda PS
```

7-9-17 Log Analysis - R4.x

NOTE: *The examples used in this section are from a GFI Configuration system.*

Here is an example of how to analyze a Log:

1.) Startup Logging

; Starting log system

Same familiar comment to denote startup of the system.

```
; ScDisplayType(364); Monitor found in registry: MFG: "ENC", Model: "GA700", Serial Number: "20037077"
; EchoLoader(364); Primary display resolution set to High by SmartVideoResolution (display = GA700)
; Preset reset(364); SaveToStream change[0] hospital [GE Healthcare]
; Warning; ScResCat(364); Couldn't find filename to save to.
; Info ; EchoLoader(364); Primary display resolution set to 1280 x 1024 (60 Hz refresh - fallback from 75)
; GFI 0x02280108 , GFI_P2P_filter 0x00021006 driver versions are opened
; Downloading LSW from file: gfireboot.out
```

Driver for communication with GFI started.

```
; Downloading LSW from file: gfi2tr.out
; Downloading FPGA contents from file: C:\Scanner\target\firmware/GFI/gfi2_fpga_1.bin
```

GFI FPGA and DSP firmware downloaded

; ScFEPProxy(364); FEPProxy::targetPresent() is true.

The card rack HW has been detected and system is being booted normally.

```
; ConfigLog(364); TARGET_ROOT: "C:\Scanner\target"
; ConfigLog(364); TEST_ROOT: "D:\Scannertarget"
; ConfigLog(364); TEMP: "D:\temp"
; ConfigLog(364); Overall SW version R1.0.3C
; ConfigLog(364); Overall SW Part Number 5193239-4
; ConfigLog(364); SW Build Version XP-Shadow_mke_LOGIQ E9_p1
; ConfigLog(364); SW Build Date Mon Jul 07 17:01:45 2008
; ConfigLog(364); Ghost Part Number 5135125-20 Rev 3
; ConfigLog(364); Ghost Date 2008-06-27 14:00
; ConfigLog(364); BEP Version in Ghost = 5
```

Report of the SW and Base load version.

```
; ConfigLog(364); Processor Identifier = x86 Family 6 Model 15 Stepping 2, GenuineIntel
; ConfigLog(364); Number of Processor = 2
; AcqLoader(364); Cannot find file none.dll
; ScFEPProxy(364); SSN: E00009
```

7-9-17 Log Analysis - R4.x (cont'd)**System serial number.**

```
; acqHouseKeeping(1884); Vpd for GFI      Part Number (P/N): 5161631
; acqHouseKeeping(1884); Vpd for GFI  Functional Revision (FNRV): 2A
; acqHouseKeeping(1884); Vpd for GFI      Product Code (PRD): GFI
; acqHouseKeeping(1884); Vpd for GFI      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for GFI      Serial Number (SN): BEYTBK
; acqHouseKeeping(1884); Vpd for GFI Bar Code Serial Number (BCSN): BEYTBK
; acqHouseKeeping(1884); Vpd for DRX4      Part Number (P/N): 5301040-2
; acqHouseKeeping(1884); Vpd for DRX4  Functional Revision (FNRV): 2B
; acqHouseKeeping(1884); Vpd for DRX4      Product Code (PRD): DRX
; acqHouseKeeping(1884); Vpd for DRX4      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for DRX4      Serial Number (SN): BEYZK1
; acqHouseKeeping(1884); Vpd for DRX4 Bar Code Serial Number (BCSN): BEYZK1
; acqHouseKeeping(1884); Vpd for DRX3      Part Number (P/N): 5301040-2
; acqHouseKeeping(1884); Vpd for DRX3  Functional Revision (FNRV): 2B
; acqHouseKeeping(1884); Vpd for DRX3      Product Code (PRD): DRX
; acqHouseKeeping(1884); Vpd for DRX3      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for DRX3      Serial Number (SN): BEYZJH
; acqHouseKeeping(1884); Vpd for DRX3 Bar Code Serial Number (BCSN): BEYZJH
; acqHouseKeeping(1884); Vpd for DRX2      Part Number (P/N): 5301040-2
; acqHouseKeeping(1884); Vpd for DRX2  Functional Revision (FNRV): 2B
; acqHouseKeeping(1884); Vpd for DRX2      Product Code (PRD): DRX
; acqHouseKeeping(1884); Vpd for DRX2      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for DRX2      Serial Number (SN): BEYZJE
; acqHouseKeeping(1884); Vpd for DRX2 Bar Code Serial Number (BCSN): BEYZJE
; acqGfi(3272); hardwarepck:***HwConfig::RFI_GetHwConfig(3) offst 0 len=128 failed
; acqHouseKeeping(1884); Vpd for GTX4      Part Number (P/N): 5201044-01
; acqHouseKeeping(1884); Vpd for GTX4  Functional Revision (FNRV): 2A
; acqHouseKeeping(1884); Vpd for GTX4      Product Code (PRD): GTX
; acqHouseKeeping(1884); Vpd for GTX4      Pole (PLE): yms
; acqHouseKeeping(1884); Vpd for GTX4      Serial Number (SN): 00019
; acqHouseKeeping(1884); Vpd for GTX4 Bar Code Serial Number (BCSN): 00019
; acqHouseKeeping(1884); Vpd for GTX3      Part Number (P/N): 5201044-01
; acqHouseKeeping(1884); Vpd for GTX3  Functional Revision (FNRV): 2A
```

7-9-17 Log Analysis - R4.x (cont'd)

```

; acqHouseKeeping(1884); Vpd for GTX3          Product Code (PRD): GTX
; acqHouseKeeping(1884); Vpd for GTX3          Pole (PLE): yms
; acqHouseKeeping(1884); Vpd for GTX3          Serial Number (SN): 00020
; acqHouseKeeping(1884); Vpd for GTX3 Bar Code Serial Number (BCSN): 00020
; acqHouseKeeping(1884); Vpd for GTX2          Part Number (P/N): 5201044-01
; acqHouseKeeping(1884); Vpd for GTX2          Functional Revision (FNRV): 2A
; acqHouseKeeping(1884); Vpd for GTX2          Product Code (PRD): GTX
; acqHouseKeeping(1884); Vpd for GTX2          Pole (PLE): yms
; acqHouseKeeping(1884); Vpd for GTX2          Serial Number (SN): 00044
; acqHouseKeeping(1884); Vpd for GTX2 Bar Code Serial Number (BCSN): 00044
; acqGfi(3272); hardwarepck:**HwConfig::RFI_GetHwConfig(7) offst 0 len=128 failed
; acqHouseKeeping(1884); Vpd for GRX2          Part Number (P/N): GA200295
; acqHouseKeeping(1884); Vpd for GRX2          Functional Revision (FNRV): 2B
; acqHouseKeeping(1884); Vpd for GRX2          Product Code (PRD): GRX
; acqHouseKeeping(1884); Vpd for GRX2          Pole (PLE): nor
; acqHouseKeeping(1884); Vpd for GRX2          Serial Number (SN): 200710-014
; acqHouseKeeping(1884); Vpd for GRX2 Bar Code Serial Number (BCSN): WO0710107014
; acqHouseKeeping(1884); Vpd for GRX1          Part Number (P/N): GA200300
; acqHouseKeeping(1884); Vpd for GRX1          Functional Revision (FNRV): 2A
; acqHouseKeeping(1884); Vpd for GRX1          Product Code (PRD): GRX
; acqHouseKeeping(1884); Vpd for GRX1          Pole (PLE): nor
; acqHouseKeeping(1884); Vpd for GRX1          Serial Number (SN): 200715-024
; acqHouseKeeping(1884); Vpd for GRX1 Bar Code Serial Number (BCSN): WO0715106024
; acqHouseKeeping(1884); Vpd for GRLY          Part Number (P/N): GA200296
; acqHouseKeeping(1884); Vpd for GRLY          Functional Revision (FNRV): 2B
; acqHouseKeeping(1884); Vpd for GRLY          Product Code (PRD): GRLY
; acqHouseKeeping(1884); Vpd for GRLY          Pole (PLE): nor
; acqHouseKeeping(1884); Vpd for GRLY          Serial Number (SN): 200718-009
; acqHouseKeeping(1884); Vpd for GRLY Bar Code Serial Number (BCSN): WO0718093009
; acqGfi(3272); hardwarepck:**HwConfig::RFI_GetHwConfig(13) offst 0 len=128 failed
; acqGfi(3272); hardwarepck:**HwConfig::RFI_GetHwConfig(14) offst 0 len=128 failed
; acqGfi(3272); hardwarepck:**HwConfig::RFI_GetHwConfig(15) offst 0 len=128 failed

```

7-9-17 Log Analysis - R4.x (cont'd)

```
; acqGfi(3272); hardwarepck:***HwConfig::RFI_GetHwConfig(16) offst 0 len=128 failed
; acqGfi(3272); hardwarepck:HwConfig::RFI_GetHwConfig: Reading non-existing device(-1)
; acqHouseKeeping(1884); Vpd for TXPS      Part Number (P/N): 5205052
; acqHouseKeeping(1884); Vpd for TXPS  Functional Revision (FNRV): 1A
; acqHouseKeeping(1884); Vpd for TXPS      Product Code (PRD): TXPS
; acqHouseKeeping(1884); Vpd for TXPS      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for TXPS      Serial Number (SN): 00018
; acqHouseKeeping(1884); Vpd for TXPS Bar Code Serial Number (BCSN): 00018
; acqHouseKeeping(1884); Vpd for IOB      Part Number (P/N): 5141000-3
; acqHouseKeeping(1884); Vpd for IOB  Functional Revision (FNRV): 1A
; acqHouseKeeping(1884); Vpd for IOB      Product Code (PRD): IOB
; acqHouseKeeping(1884); Vpd for IOB      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for IOB      Serial Number (SN): BEYZMJ
; acqHouseKeeping(1884); Vpd for IOB Bar Code Serial Number (BCSN): BEYZMJ
; acqHouseKeeping(1884); Vpd for BP       Part Number (P/N): 5161814
; acqHouseKeeping(1884); Vpd for BP  Functional Revision (FNRV): 2A
; acqHouseKeeping(1884); Vpd for BP      Product Code (PRD): BP
; acqHouseKeeping(1884); Vpd for BP      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for BP      Serial Number (SN): 324699
; acqHouseKeeping(1884); Vpd for BP Bar Code Serial Number (BCSN): 324699
; acqHouseKeeping(1884); Vpd for BEPPS     Part Number (P/N): 5393800-2
; acqHouseKeeping(1884); Vpd for BEPPS  Functional Revision (FNRV): 1A
; acqHouseKeeping(1884); Vpd for BEPPS      Product Code (PRD): BEPPS
; acqHouseKeeping(1884); Vpd for BEPPS      Pole (PLE): mke
; acqHouseKeeping(1884); Vpd for BEPPS      Serial Number (SN): BEYZMG
; acqHouseKeeping(1884); Vpd for BEPPS Bar Code Serial Number (BCSN): BEYZMG

VPD Configuration Reads

; acqHWCap(1884); HW Rack Configuration Valid: LOGIQ E9 Configuration 2 (IC2) - NoCW, MLA4, GTX2.1 Lambda PS
```

7-9-17 Log Analysis - R4.x (cont'd)

HW Configuration Valid and boot will continue

```

; acqHWCap(1884); HWRH::AddToPartNumToBoardMap(): part num BP_FuncRev2A board name BP board revision 2A
; acqHWCap(1884); HWRH::AddToPartNumToBoardMap(): part num DRX_FuncRev2B board name DRX board revision 2B
; acqHWCap(1884); HWRH::AddToPartNumToBoardMap(): part num FECache board name FECache Configuration Settings
board revision 1
; acqHWCap(1884); HWRH::AddToPartNumToBoardMap(): part num GFI_FuncRev2A board name GFI board revision 2A
; acqHWCap(1884); HWRH::AddToPartNumToBoardMap(): part num GRLY_FuncRev2B board name GRLY board revision 2B
; acqHWCap(1884); HWRH::AddToPartNumToBoardMap(): part num GRX_FuncRev2A board name GRX board revision 2A
; acqHWCap(1884); HWRH::AddToPartNumToBoardMap(): part num GRX_FuncRev2B board name GRX board revision 2B
; acqHWCap(1884); HWRH::AddToPartNumToBoardMap(): part num GTX_FuncRev2A board name GTX board revision 2A
; acqHWCap(1884); HWRH::AddToPartNumToBoardMap(): part num MotCtrl board name MEC board revision 3.0
; acqHWCap(1884); HWRH::AddToPartNumToBoardMap(): part num TXPS_FuncRev1A board name TXPS board revision 1A
; acqHWCap(1884); HWRH::AddToPartNumToBoardMap(): part num system_hw board name Generic System HW Settings
board revision 1
; acqGfi(3272); hardwarepck:GTX-GTXIF FPGA version: 0xd20d
; acqHousekeeping(1884); CHousekeeping::LogVersionInfo: I/O Board Hardware version 2.0
; acqHousekeeping(1884); CHousekeeping::LogVersionInfo: I/O Board Firmware version 2.23
; acqGfi(3272); hardwarepck:GTX-David FPGA version: 0x0000
; acqGfi(3272); hardwarepck:DRX-GDIF FPGA version: 0xdf10
; acqGfi(3272); hardwarepck:DRX-Nathan FPGA version: 0xa51c
; acqHousekeeping(1884); CHousekeeping::LogVersionInfo: TxPs Firmware version 0.27
; acqHousekeeping(1884); CHousekeeping::LogVersionInfo: GFI SW version GFI: NOR_ROSETTA_2005_DEC_22.0.0.0 07/
07/2008
; acqHousekeeping(1884); CHousekeeping::LogFpgaVersion: CEDSDEM FPGA version 0x0085
; acqHousekeeping(1884); CHousekeeping::LogFpgaVersion: GFECTRL FPGA version 0x0040
; acqHousekeeping(1884); CHousekeeping::LogFpgaVersion: GDIF FPGA version 0xDF10
; acqHousekeeping(1884); CHousekeeping::LogFpgaVersion: GTXIF FPGA version 0xD20D

```

Report of FPGA Versions

2.) Logfile Annotation

```

; EchoDebugPck::HandleEvent(3036); UserEvent1 User pressed event 1 button (Alt-1)
; EchoDebugPck::HandleEvent(3036); UserEvent2 User pressed event 2 button (Alt-2)

```

7-9-17 Log Analysis - R4.x (cont'd)

3.) Power Supply Errors

```
; Info ; acqHouseKeeping(3016); TxPs Alarm source[System (rack) supply] type[No alarm] detail[TS On Strobe]
; Info ; acqHouseKeeping(3020); TxPs alarm status AC-V[118.6 VAC] AC-Freq[60 Hz] ACErr[no] RackOn[48V LV ACinv]
; Info ; acqHouseKeeping(3020); +48V[48.02 Volts] +24V[24.01 Volts] +15V[15.03 Volts] -15V[-15.08 Volts]
+12V[11.01 Volts] +6V[5.90 Volts] -6V[-5.99 Volts] +5V[4.99 Volts]
; Info ; acqHouseKeeping(3024); TxPs alarm info source[Transmit supply 2] V+[0.32 Volts] V-[0.00 Volts] Power[0.00 Watts]
Current[0.000 Amps] Prgmd V[0.00 Volts]
; Info ; acqHouseKeeping(3020); inTemp[38 °C] outTemp[42 °C] +PMX V[0.00 Volts] -PMX V[0.00 Volts]
; EScan.View(2004); ESStatus(0,Live): SetState RunState("Freeze" -> "Live") Modes("2D (B-Mode)") Probe("fla_M6-15L")
Appl("MscSkel")
; acqGfi(3860); scanctrl:ScanControl::startScan: still waiting for TS_LEVEL_OK after 200 ms
; acqGfi(3860); scanctrl:ScanControl::startScan: still waiting for TS_LEVEL_OK after 400 ms
; acqGfi(3860); scanctrl:ScanControl::startScan: still waiting for TS_LEVEL_OK after 600 ms
; acqGfi(3860); scanctrl:ScanControl::startScan: still waiting for TS_LEVEL_OK after 800 ms
; acqGfi(3860); scanctrl:ScanControl::startScan: still waiting for TS_LEVEL_OK after 1000 ms
; DFEManager(3900); HandleRunFlag: setting RunBlock flag to false!
; ScanGeneric(2004); SetParam: scanID=1, paramId=23, LookupPort returned NULL!
; EScan.Main(2004); GetParam("RunState") should be replaced by GetParam("InLive")!
; EAErrorHandler(3900); Stops scan
; EAErrorHandler(3900); Error from HouseKeeping: GFI Processing Exception: SubType 101: scanctrl ScanControl::startScan:
Tx Power Supply is not ready. TS_LEVEL_OK tmeout after 1002 ms, ScanSequencer NOT started! Hardware Status:-GFE Ch0
empty-GFE Ch1 empty-GTX1 HVFAULT-TS_OK_N-TS_LEVEL_OK_N-ACFAIL-THOR_PROBE_ERROR
; acqHouseKeeping(2004); CHouseKeeping::HandleGfiErrorEvents: Gfi Error Event Received: GFI Processing Exception:
SubType 101: scanctrl ScanControl::startScan: Tx Power Supply is not ready. TS_LEVEL_OK timeout after 1002 ms,
ScanSequencer NOT started! Hardware Status:-GFE Ch0 empty-GFE Ch1 empty-GTX1 HVFAULT-TS_OK_N-
TS_LEVEL_OK_N-ACFAIL-THOR_PROBE_ERROR
```

7-9-18 LOGIQ E9 Log File Reading

NOTE: *The examples used in this section are from a GFI Configuration system.*

7-9-18-1 Introduction

This section is intended to assist anyone who needs to read log files when troubleshooting a problem.

ALT-D

- What: Packages, log files and user comments for service review.
- When: As quickly as possible after a problem occurs.
- Who: Everyone! Teach your customers this valuable tool!
- Tip: With R2.0.4 or later, the DOS window will no longer appear on the screen.

The naming convention for Log File Backup has changed in R5 and later.

In R4 and earlier Log File Backup appeared as this:

- logfile.txt
- logfile.txt.bak1
- logfile.txt.bak3
- logfile-Scope.txt
- logfile-Scope.txt.bak2

In R5 and later Log File Backup appear as this:

- logfile.txt
- logfile20130624_072108.txt
- logfile20130703_144734.txt
- logfile-Scope.txt
- logfile-Scope20130611_095646.txt

NOTE: *Also, the rate of logging was reduced and extra whitespace in each log message was removed so roll over to backup is less frequent.*

7-9-18-2 Customer Interaction

- Was there a pop-up stating a problem?
 - What did it say?
 - Did you restart the system immediately?
- Did you do ALT-D when the problem occurred?

7-9-18-2-1 Customer Interaction - Hangs

Key questions to ask:

- Logs (ALT-D)
- Exact time/date as indicated on the machine when the problem occurred.
- What activity were they performing on the system? (Archive, Carotid scan, printing, etc).
- Does the image and clock on the monitor keep updating?
- What button did they try that did not work?
 - TP buttons (one or more)
 - A/N Keyboard
 - Trackball
 - Lower OP
- How long did they wait before declaring the system hung and pressing Power Button?
- Did they press and hold the Power Button or did the shutdown pop up appear?
- Could they select buttons on the pop up?
- Did the system shut down gracefully?
- How often does this happen?
- Is it reproducible?
- Does the site use DICOM print/storage?
- Do they do batch sends at the end of exams or do they send immediately?

7-9-18-2-2 Customer Interaction - Tips

NOTE: For Application SW R3.x.x or later, the Service Directory is no longer located under the export folder, it is located in d:\ root directory (d:\service).

- What: ALT-PrintScreen
 - Captures entire screen to d:\export\service\image
- What: ALT-1/ALT-2
 - Inserts a marker into log file.

Example:

```
Info ; UserEventLog(1928); ButtonPress: name=Alt1But, value=0
Debug ; EchoDebugPck::HandleEvent(1928); UserEvent1 User pressed event 1
button (Alt-1)
```

7-9-18-3 Key Log Files

- Log/logfile.txt
 - All the system messages and errors
- Log/StartLoader.txt
 - Summary of start and stop activity
 - Example: Normal
 - Example: Reboot
 - Example: Hibernate
 - Example: Abnormal Shutdown

Startloader.txt: Normal

```
Friday,Jan 15 20:46:24,2010; info ; StartLoader(0x0); *****
***** START
*****
Friday,Jan 15 20:46:24,2010; info ; StartLoader(0x0); StartLoader Version: "V
3.0.0.1"
Friday,Jan 15 20:46:25,2010; info ; StartLoader(0x0); Turning Rack Power On
Friday,Jan 15 20:46:27,2010; info ; StartLoader(0x0); Starting Echoloader
Friday,Jan 15 20:46:27,2010; info ; StartLoader(0x0); CreateProcess returned
success: ProcessId = 0x31C (796)
Friday,Jan 15 20:46:27,2010; info ; StartLoader(0x0); Echoloader process started
Friday,Jan 15 20:46:59,2010; info ; StartLoader(0x0); WMI Reports Processor "CPU0"
ClockSpeed is 2133 (max 2133)
Friday,Jan 15 20:46:59,2010; info ; StartLoader(0x0); MSR 408 reports highpart
0x082A082A lowpart 0x0600082A
Friday,Jan 15 20:46:59,2010; info ; StartLoader(0x0); PerformanceState 2090 (0x82A)
Friday,Jan 15 21:30:30,2010; info ; StartLoader(0x0); Process stopped, exit code =
0/2 (Shutdown OS)
Friday,Jan 15 21:30:30,2010; info ; StartLoader(0x0); Shutdown OS
Friday,Jan 15 21:30:30,2010; info ; StartLoader(0x0); Terminating
Friday,Jan 15 21:30:30,2010; info ; StartLoader(0x0); Killing BlockWindowsKeys
Friday,Jan 15 21:44:05,2010; info ; StartLoader(0x0); *****
***** START
*****
```

7-9-18-3 Key Log Files (cont'd)**Startloader.txt: Hibernate**

```

Friday,Jan 15 11:24:35,2010; info ; StartLoader(0x0); **** START ****
*****
Friday,Jan 15 11:24:35,2010; info ; StartLoader(0x0); StartLoader Version: "V
3.0.0.1"
Friday,Jan 15 11:24:36,2010; info ; StartLoader(0x0); Turning Rack Power On
Friday,Jan 15 11:24:37,2010; info ; StartLoader(0x0); Starting Echoloader
Friday,Jan 15 11:24:37,2010; info ; StartLoader(0x0); CreateProcess returned
success: ProcessId = 0x310 (784)
Friday,Jan 15 11:24:37,2010; info ; StartLoader(0x0); Echoloader process started
Friday,Jan 15 11:25:12,2010; info ; StartLoader(0x0); WMI Reports Processor "CPU0"
ClockSpeed is 2133 (max 2133)
Friday,Jan 15 11:25:12,2010; info ; StartLoader(0x0); MSR 408 reports highpart
0x082A082A lowpart 0x0600082A
Friday,Jan 15 11:25:12,2010; info ; StartLoader(0x0); PerformanceState 2090 (0x82A)
Friday,Jan 15 13:13:54,2010; info ; StartLoader(0x0); Process stopped, exit code =
0/11 (Hibernate)
Friday,Jan 15 13:13:54,2010; info ; StartLoader(0x0); Entering Hibernate
Friday,Jan 15 13:13:54,2010; info ; StartLoader(0x0); Enter hibernate mode
Friday,Jan 15 13:14:50,2010; info ; StartLoader(0x0); Return from hibernate
Friday,Jan 15 13:14:50,2010; info ; StartLoader(0x0); Leaving Hibernate
Friday,Jan 15 13:14:53,2010; info ; StartLoader(0x0); No EchoLoader running, start
one
Friday,Jan 15 13:14:53,2010; info ; StartLoader(0x0); And RunSelectedConfig()
Friday,Jan 15 13:14:53,2010; info ; StartLoader(0x0); Starting Echoloader
Friday,Jan 15 13:14:53,2010; info ; StartLoader(0x0); CreateProcess returned
success: ProcessId = 0x5A8 (1448)
Friday,Jan 15 13:14:53,2010; info ; StartLoader(0x0); Echoloader process started
Friday,Jan 15 13:14:57,2010; info ; StartLoader(0x0); WMI Reports Processor "CPU0"
ClockSpeed is 2133 (max 2133)
Friday,Jan 15 13:14:57,2010; info ; StartLoader(0x0); MSR 408 reports highpart
0x082A082A lowpart 0x0600082A
Friday,Jan 15 13:14:57,2010; info ; StartLoader(0x0); PerformanceState 2090 (0x82A)
Friday,Jan 15 15:20:58,2010; info ; StartLoader(0x0); Process stopped, exit code =
0/2 (Shutdown OS)
Friday,Jan 15 15:20:58,2010; info ; StartLoader(0x0); Shutdown OS
Friday,Jan 15 15:20:58,2010; info ; StartLoader(0x0); Terminating
Friday,Jan 15 15:20:58,2010; info ; StartLoader(0x0); Killing BlockWindowsKeys
Friday,Jan 15 15:20:58,2010; info ; StartLoader(0x0); BlockWindowsKeys killed (0)

```

7-9-18-3 Key Log Files (cont'd)**Startloader.txt: Reboot**

```

Monday,Jan 18 17:03:56,2010; info    ; StartLoader(0x0); **** START ****
*****
Monday,Jan 18 17:03:56,2010; info    ; StartLoader(0x0); StartLoader Version: "V
3.0.0.1"
Monday,Jan 18 17:03:58,2010; info    ; StartLoader(0x0); Turning Rack Power On
Monday,Jan 18 17:03:59,2010; info    ; StartLoader(0x0); Starting Echoloader
Monday,Jan 18 17:03:59,2010; info    ; StartLoader(0x0); CreateProcess returned
success: ProcessId = 0x4C8 (1224)
Monday,Jan 18 17:03:59,2010; info    ; StartLoader(0x0); Echoloader process started
Monday,Jan 18 17:04:31,2010; info    ; StartLoader(0x0); WMI Reports Processor "CPU0"
ClockSpeed is 2133 (max 2133)
Monday,Jan 18 17:04:31,2010; info    ; StartLoader(0x0); MSR 408 reports highpart
0x082A082A lowpart 0x0600082A
Monday,Jan 18 17:04:31,2010; info    ; StartLoader(0x0); PerformanceState 2090 (0x82A)
Monday,Jan 18 17:04:31,2010; info    ; StartLoader(0x0); Process stopped, exit code =
0/4 (Reboot OS)
Monday,Jan 18 17:04:34,2010; info    ; StartLoader(0x0); Turning Rack Power On
Monday,Jan 18 17:04:37,2010; info    ; StartLoader(0x0); Restart OS
Monday,Jan 18 17:04:37,2010; info    ; StartLoader(0x0); Terminating
Monday,Jan 18 17:04:37,2010; info    ; StartLoader(0x0); Killing BlockWindowsKeys
Monday,Jan 18 17:06:12,2010; info    ; StartLoader(0x0); **** START ****
*****

```

Startloader.txt: Abnormal

```

Monday,Jan 18 08:33:45,2010; info    ; StartLoader(0x0); **** START ****
*****
Monday,Jan 18 08:33:45,2010; info    ; StartLoader(0x0); StartLoader Version: "V
3.0.0.1"
Monday,Jan 18 08:33:46,2010; info    ; StartLoader(0x0); Turning Rack Power On
Monday,Jan 18 08:33:47,2010; info    ; StartLoader(0x0); Starting Echoloader
Monday,Jan 18 08:33:47,2010; info    ; StartLoader(0x0); CreateProcess returned
success: ProcessId = 0x4B4 (1204)
Monday,Jan 18 08:33:47,2010; info    ; StartLoader(0x0); Echoloader process started
Monday,Jan 18 08:34:29,2010; info    ; StartLoader(0x0); WMI Reports Processor "CPU0"
ClockSpeed is 2133 (max 2133)
Monday,Jan 18 08:34:29,2010; info    ; StartLoader(0x0); MSR 408 reports highpart
0x082A082A lowpart 0x0600082A
Monday,Jan 18 08:34:29,2010; info    ; StartLoader(0x0); PerformanceState 2090 (0x82A)
Monday,Jan 18 09:47:42,2010; info    ; StartLoader(0x0); **** START ****
*****

```

***** START *****

Missing lines:

```

info    ; StartLoader(0x0); Process stopped, exit code = 0/2 (Shutdown OS)
info    ; StartLoader(0x0); Shutdown OS
info    ; StartLoader(0x0); Terminating

```

7-9-18-3 Key Log Files (cont'd)**Startloader.txt: Hang**

```
Monday,Mar 29 15:15:14,2010; info ; StartLoader(0x0); ***** START
*****
Monday,Mar 29 15:15:14,2010; info ; StartLoader(0x0); StartLoader Version: "V
3.0.0.1"
Monday,Mar 29 15:15:16,2010; info ; StartLoader(0x0); Turning Rack Power On
Monday,Mar 29 15:15:18,2010; info ; StartLoader(0x0); Starting Echoloader
Monday,Mar 29 15:15:18,2010; info ; StartLoader(0x0); CreateProcess returned
success: ProcessId = 0x778 (1912)
Monday,Mar 29 15:15:18,2010; info ; StartLoader(0x0); Echoloader process started
Monday,Mar 29 15:15:42,2010; info ; StartLoader(0x0); WMI Reports Processor "CPU0"
ClockSpeed is 2133 (max 2133)
Monday,Mar 29 15:15:42,2010; info ; StartLoader(0x0); MSR 408 reports highpart
0x082A082A lowpart 0x0600082A
Monday,Mar 29 15:15:42,2010; info ; StartLoader(0x0); PerformanceState 2090 (0x82A)
Monday,Mar 29 15:52:32,2010; info ; StartLoader(0x0); Dumping call stack
Monday,Mar 29 15:52:35,2010; info ; StartLoader(0x0); Killing process
Monday,Mar 29 15:52:35,2010; info ; StartLoader(0x0); Killing Echoloader
Monday,Mar 29 15:52:46,2010; info ; StartLoader(0x0); Unable to kill echoloader
process (100)
Monday,Mar 29 15:52:46,2010; info ; StartLoader(0x0); Unable to kill abberant
EchoLoader process - shutting down system
Monday,Mar 29 15:52:46,2010; info ; StartLoader(0x0); Shutdown OS
Monday,Mar 29 15:57:05,2010; info ; StartLoader(0x0); ***** START
*****
```

Will see log\CrashDumps\SLMiniDump-* files.

7-9-18-3 Key Log Files (cont'd)**Startloader.txt: Crash**

```
Monday,May 03 11:20:16,2010; info ; StartLoader(0x0); ***** START
*****
Monday,May 03 11:20:16,2010; info ; StartLoader(0x0); StartLoader Version: "V
3.0.0.1"
Monday,May 03 11:20:18,2010; info ; StartLoader(0x0); Turning Rack Power On
Monday,May 03 11:20:19,2010; info ; StartLoader(0x0); Starting Echoloader
Monday,May 03 11:20:19,2010; info ; StartLoader(0x0); CreateProcess returned
success: ProcessId = 0xBC (188)
Monday,May 03 11:20:19,2010; info ; StartLoader(0x0); Echoloader process started
Monday,May 03 11:20:44,2010; info ; StartLoader(0x0); WMI Reports Processor "CPU0"
ClockSpeed is 2133 (max 2133)
Monday,May 03 11:20:44,2010; info ; StartLoader(0x0); MSR 408 reports highpart
0x08220822 lowpart 0x06000822
Monday,May 03 11:20:44,2010; info ; StartLoader(0x0); PerformanceState 2082 (0x822)
Monday,May 03 11:24:00,2010; info ; StartLoader(0x0); Process stopped, exit code =
-1073741819/-1073741819 (Unknown)
Monday,May 03 11:24:00,2010; info ; StartLoader(0x0); Unknown return from
EchoLoader, querying user on response
Monday,May 03 11:24:16,2010; info ; StartLoader(0x0); Restart Dialog: User Selected
to Shutdown the system. Or No Input from user.
Monday,May 03 11:24:16,2010; info ; StartLoader(0x0); Shutdown OS
Monday,May 03 11:24:16,2010; info ; StartLoader(0x0); Terminating
Monday,May 03 11:24:16,2010; info ; StartLoader(0x0); Killing BlockWindowsKeys
Monday,May 03 11:26:44,2010; info ; StartLoader(0x0); ***** START
*****
```

7-9-18-3 Key Log Files (cont'd)**7-9-18-3-1 Logfile-TempMon.txt**

- Should be imported into Excel for easier reading
 - Example covered later in Appendix B
- Key Items: DRX3_TOP

```

Friday,Mar 19 07:52:14,2010; Info ; Starting log system
Friday,Mar 19 07:52:14,2010; Info ; TempMonColumnHeadings(1920); TXPS Temp In;TXPS
Temp
Out;DRX2_LM83;DRX2_BOT;DRX2_TOP;DRX2_DCDC;DRX2_GDIF;DRX2_1062;DRX3_LM83;DRX3_BOT;DR
X3_TOP;DRX3_DCDC;DRX3_GDIF;DRX3_1062;DRX4_LM83;DRX4_BOT;DRX4_TOP;DRX4_DCDC;DRX4_GDI
F;DRX4_1062;GFI_LM83;GFI_GFE;GFI_SDEM;GFI_BOT;GRX1_LM83;GRX1_TOP;GRX1_BOT;GRX2_LM83
;GRX2_TOP;GRX2_BOT;GTX2_TOP;GTX2_1062;GTX3_TOP;GTX3_1062;GTX4_TOP;GTX4_1062;EPS
Temp;Fan_Control;Rack Fan 1;Rack Fan 2;Rack Fan 3;Rack Fan
4;BEP_SYS_TEMPERATURE;BEP_CPU_TEMPERATURE;BEP_AUX_TEMPERATURE;BEP_SYS_FANSPEED;BEP_
CPU_FANSPEED;GFI External Temperature;GFI Internal Temperature

Friday,Mar 19 07:53:25,2010; Info ; TempMon(3372); 27; 29; 26; 29; 40;
25; 36; 26; 26; 27; 40; 24; 39; 29; 26; 28; 40; 25; 36;
27; 33; 39; 39; 28; 26; 25; 23; 29; 29; 28; 32; 34; 32;
34; 33; 35; !!1374357529; @@76; 1712; 1945; 1988; 1955; 29.00; 26.00;
19.00; 2280.00; 917.00; !!21.61; !!27.86

```

Key

Values in file are preceded by:

No tag - Value is within normal operating range

^^ - Value is at first warning level (logging only)

@@ - Value is at second warning level(near limit – Entry placed in logfile.txt)

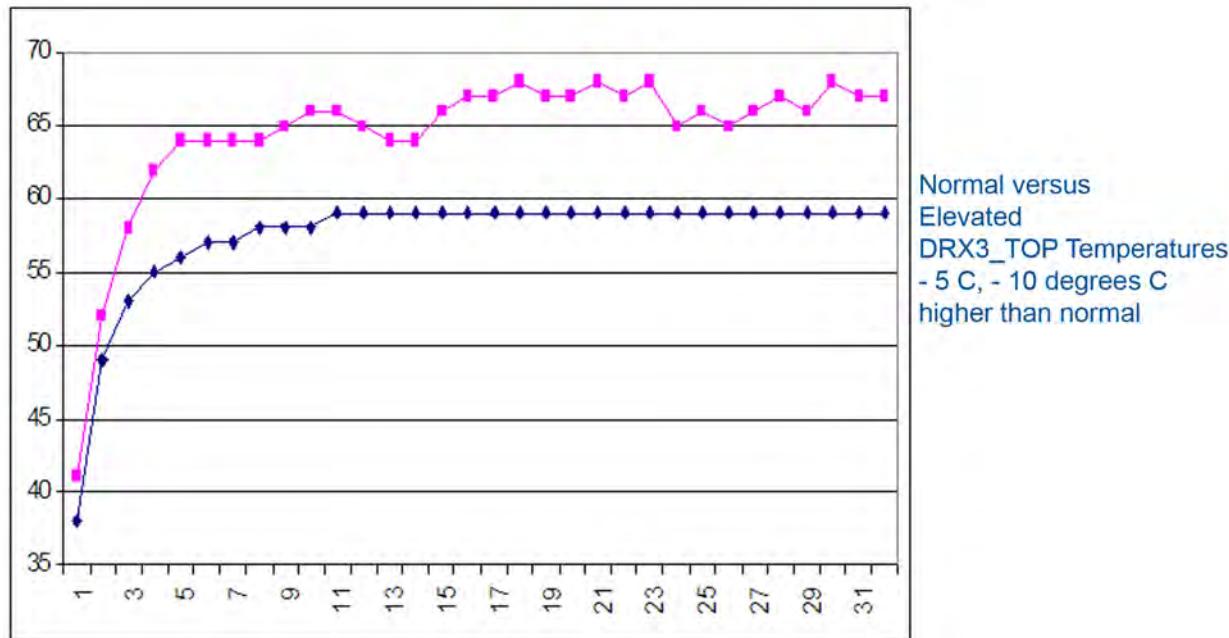
!! - Value is over the set limits (may cause shutdown or loss of scanning) Operator Pop-up appears every 5 minutes

NOT ALL VALUES IN LOG ARE PROPERLY MONITORED.

7-9-18-3 Key Log Files (cont'd)

LogFile-TempMon.txt: Normal versus Elevated

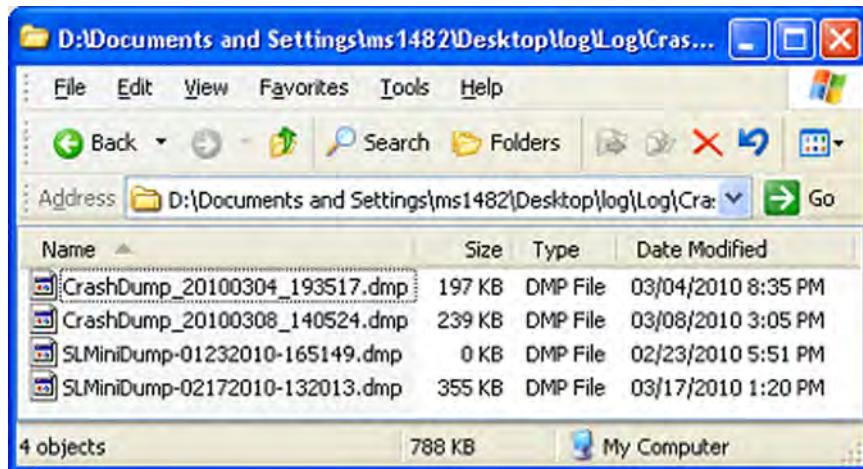
Figure 7-165 Logfile-TempMon.txt: Normal versus Elevated



7-9-18-3-2 Log\CrashDumps & log\Crashes

- Look for presence of files (normally empty)
- Application software crashes
- More on Log\CrashDumps & log\Crashes follow.

Figure 7-166 Example of Log\CrashDumps & log\Crashes



7-9-18-3 Key Log Files (cont'd)

Table 7-60 Log File List

File/Directory Name	Contents
CrashDump	Crash Dump files & SLMiniDump* files
Crashes	Text files describing crash dumps
Diag	Diagnostics logs
KBShadow	Keyboard Shadow logs
logfile-CSDHomePage-ColNames.txt	Column headers for Common Service Desktop page logs
logfile-CSDHomePage.txt	CSD page log (semicolon delimited, level tagged)
logfile-DCVoltMon-ColNames.txt	Column headers for DC Voltage Monitoring log
logfile-DCVoltMon.txt	DC Voltage Monitoring log (semicolon delimited, level tagged)
logfile-dicom.txt	DICOM transaction logging
logfile-infor.txt	Informatics log (deprecated, not accurate) <i>NOTE: Informatics is no longer present for R4.x and later.</i>
logfile-Kretz4D.txt	Kretz 4D package log
logfile-ScanAssistantCreator.txt	Scan Assistant Creator log
logfile-SvcHistory.css	Service History style sheet (for rendering, no data)
logfile-SvcHistory.xsl	Service History style sheet (for rendering, no data)
logfile-SvcHistory.xml	Service History log (DICOM services related configuration changes)
logfile-TempMon-ColNames.txt	Column headers for Temperature Monitoring log
logfile-TempMon.txt	Temperature Monitoring log (semicolon delimited, level tagged)
logfile-TxPsMon-ColNames.txt	Column headers for Transmit PS (HV) Monitoring log
logfile-TxPsMon.txt	Transmit PS (HV) Monitoring log
logfile-VpdEditRemote.txt	Used by VPD Editor (no data)
logfile-WirelessNetwork.txt	Log from Wireless Networking – Redundant to info in Wireless Config tool
logfile-WirelessNetworkConfiguration.txt	Log from Wireless Networking – Redundant to info in Wireless Config tool
logfile.txt	Everything that doesn't fit anywhere else, and then some
nfssvr.log	Log file for NFS server (used to boot DVR, not used otherwise)
StartLoader.txt	Log file for the low level process that starts the main application
SysCfg.csv	Dump of the current system VPD config in Comma Separated Value format
Test.txt	Scratch file (no data)
USBConfigLog.xml	Dump of the current USB config (in XML format)
USBLog.log	Log file for the USB device monitoring process (redundant to USBLog.xml)
USBLog.xml	Running log of all USB device changes (and media changes) in the system

7-9-18-4 Log file changes in R4

Figure 7-167 Log file changes in R4

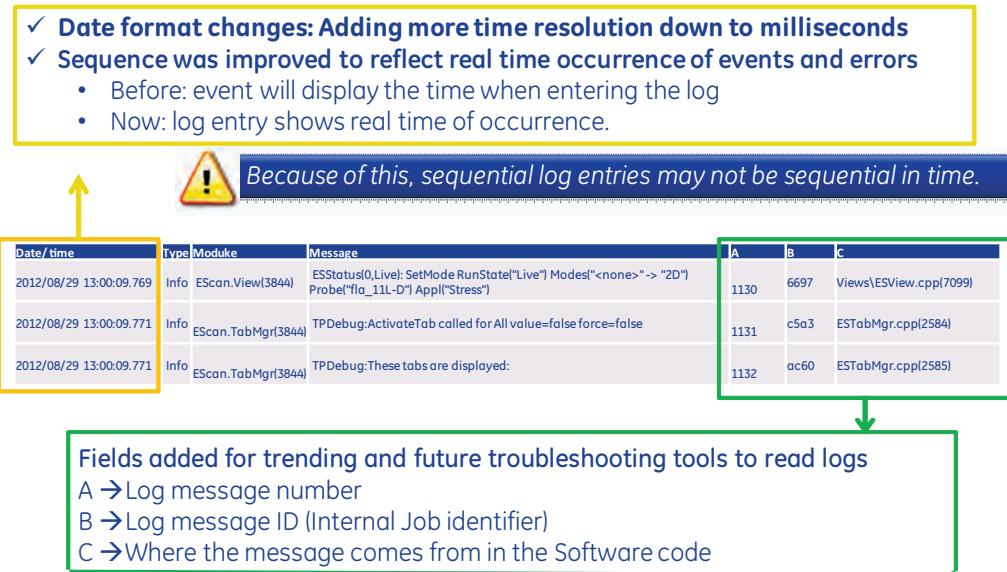
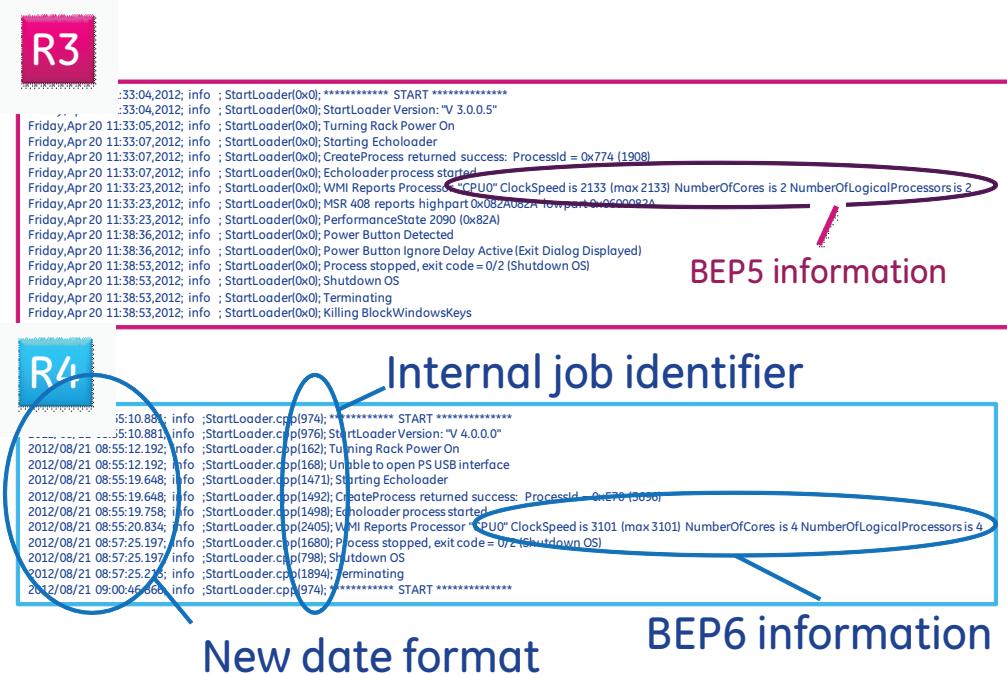


Figure 7-168 Log file changes in R4 (cont.)



7-9-18-4 Log file changes in R4 (cont'd)

Figure 7-169 Temperature – log file improvements

R3.x and earlier → misreading

		TempMonC olumnHead dings(204)	TXPS Temp In	TXPS Temp Out	MRX_LM83		
Monday,May 07 17:44:53,2012	Info						
Monday,May 07 17:46:00,2012	Info	TempMon(3700)	@@0	@@0	45	!!618465317	@@76

In R4 Logs are indicating real readings

		TempMon(0)	TXPS Temp In	TXPS Temp Out		EPS Temp	Fan_ Control
Wednesday,Aug 29 12:59:44,2012	info						
8/20/2012 17:45	Info	TempMon(4160)	30	32		26	@@76

Figure 7-170 DC Voltage log – VAC logging tip

Lambda PS does NOT log
the AC input

		DCVoltMonColumnHeadings(1 628)	VAC	48V Rail	24V Rail	+15V Rail
Friday,Apr 20 09:57:58,2012	Info		!!0.00			
Friday,Apr 20 09:59:14,2012	Info	DCVoltMon(3824)	!!0.00	48.23	23.96	15.11
Friday,Apr 20 10:04:15,2012	Info	DCVoltMon(3824)	!!0.00	48.23	24.06	15.13
Friday,Apr 20 10:09:16,2012	Info	DCVoltMon(3824)	!!0.00	48.23	24.06	15.11

Cherokee/Mitra/ Alpha PS logs
the AC input

		DCVoltMon(0)	VAC	48V Rail	24V Rail	+15V Rail
Wednesday,Aug 29 12:59:44,2012	info	DCVoltMon(4160)	112.85	48.08	24.01	15.05
8/20/2012 17:45	Info	DCVoltMon(4160)	112.85	48.13	24.01	15.05
8/20/2012 17:50	Info	DCVoltMon(4160)				

This applies for all LOGIQ E9s versions. Although both Power Supplies monitor AC input, only one logs the values.

7-9-18-4 Log file changes in R4 (cont'd)

Figure 7-171 DC Voltage log - improvement

Spurious entries

EPS 5V	BEP_VCO	BEP_VCO	BEP_P_1	REB	V5	BE													
Stby PS																			
4.90	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	2.46	
4.90	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	!!0.00	2.46	

Cleaner log

EPS 48V_OK	EPS +V5_CH	BEP_VCORE_A	BEP_P_3V3	BEP_P_5V	BEP_P_12V	BEP_V_BATTERY	IOB_AUDIO_VOLTAGE											
3.67	4.9	0.99	3.3	5.09	12.16 @@3.02		2.38	886 fed										
3.67	4.9	1.06	3.31	5.12	12.16 @@3.04		2.38	1420										

**MonitorManager.cpp(462)
MonitorManager.cpp(4155962)**

Future use for log analysis and trending

Figure 7-172 Main Power supply USB device Tip

Log entry for Power Supply with Hub

USBConfig: Required USB device "Power Supply Microcontroller": ("GEHC Power Supply USB Interface" "GE SOFT By De Mets Francois ") **found**;
USBConfig: Optional USB device "PowerSupply Hub": ("External Hub" "Unknown USB Device") **not found**;

Both Supply and Hub are found

Log entry for Power Supply without Hub

USBConfig: Required USB device "Power Supply Microcontroller": ("Microchip Custom USB Device" "GE SOFT By De Mets Francois ") **found**
USBConfig: Optional USB device "PowerSupply Hub" **not found**

The supply is found but not the hub

This applies for both Lambda and Cherokee/Mitra/Alpha power supplies.

New versions of Main Power Supply will not have their internal USB Hub populated, since the HUB was never used.

NOTE: *The log may show the device as not found, but does not constitute a failure. See Alpha PS example.*

7-9-18-4 Log file changes in R4 (cont'd)

Figure 7-173 New logs

Name	Description	Use
Logfile-PresetUpdate	Output from importing presets	If importing presets fails (for example, importing presets from another release), check this file to see what happened.
Logfile-ResetDb	Output from the utility that resets the Patient Database	If the utility failed, check this log for errors
Logfile-Scope	Tracking track of initiating events	This log will be used to determine when a process started and ended. It will help Engineering understanding normal behavior vs. anomalies. For future use on trending and log analysis

7-9-18-5 Errors versus Logs

- What the user sees
- What to look for in the logs

7-9-18-5-1 No Boot

- Condition: System does not fully power on
- See: 7-9-4 "Main Power Supply (MPS) Troubleshooting" on page 7-202.

7-9-18-5-2 POP-UP: Invalid Hardware Configuration**System will NOT Scan**

- Condition: System has found critical hardware that is not functioning or not configured correctly.
- Correction: Inspect logs for errors and replace or reconfigure.

Examples:

USB Related

- USB configuration is in log\USBConfigLog.xml
- Log\logfile.txt near start of every boot:

```
Info ; acqHWCap(3132); USBConfig: Optional USB device "3D Position Sensor
Controller" (Ascension USB Device for DRIVEBAY) found
Info ; acqHWCap(3132); USBConfig: Optional USB device "4D Motor Controller"
(FTDI FT8U2XX Device) found
Info ; acqHWCap(3132); USBConfig: Required USB device "I/O Board First Level
Hub" (External Hub) found
Info ; acqHWCap(3132); USBConfig: Required USB device "I/O Board
Microcontroller" (GE Healthcare BEP IO Card) found
```

- Error Example:

```
Error ; acqHWCap(184); USBConfig: USB Port "OP I/O Port #4" should be empty
but device "External Hub" is present
.....
Error ; EAErrorHandler(284); Error from HWCAP: HWCAP Invalid USB
Configuration. Severity : FatalHW
```

7-9-18-5 Errors versus Logs (cont'd)

Bad Hardware

- From logfile.txt:


```
Error ; EAErrorHandler(2168); Error from HouseKeeping: GFI Hardware Exception:  
SubType 62: Monitoring : RFIMonitor::handleMonitoring() - Failed reading  
temperature[37] RX2_TOP. Severity : FatalHW
```
- System tried to read the temperature but got no or invalid response
- Can be temperature or voltages
- Voltage reading errors are usually NOT hardware failures, but single failures of the system to read a voltage. Replace hardware only when repeated errors are seen.
- Log\logfile.txt Example:

```
Error ; acqHWCAP(228); ****  
Error ; acqHWCAP(228); *** ***  
Error ; acqHWCap(228); *** HW RACK CONFIGURATION INVALID!!! ***  
Error ; acqHWCAP(228); *** ***  
Error ; acqHWCAP(228); ****  
Error ; acqHWCAP(228); *** ***  
Error ; acqHWCAP(228); *** Board FuncRevs Provided ***  
Error ; acqHWCAP(228); *** ----- ***  
Error ; acqHWCAP(228); *** BP_FuncRev2A (qty=1)  
Error ; acqHWCAP(228); *** DRX_FuncRev3E (qty=3)  
Error ; acqHWCAP(228); *** GFI_FuncRev2A (qty=1)  
Error ; acqHWCAP(228); *** GRLY_FuncRev2C (qty=1)  
Error ; acqHWCAP(228); *** GRX_FuncRev2A (qty=1)  
Error ; acqHWCAP(228); *** GRX_FuncRev2B (qty=1)  
Error ; acqHWCAP(228); *** GTX_FuncRev2C (qty=3)  
Error ; acqHWCAP(228); *** ***  
Error ; acqHWCAP(228); ****  
Info ; DFEManager(228); HandleRunFlag: setting RunDfe and RunBlock flags to true!  
Error ; EAErrorHandler(228); Error from acqHWCAP: Invalid Hardware Rack Configuration - Check logs. Severity : FatalHW  
Info ; DFEManager(228); HandleRunFlag: setting RunBlock flag to false!  
Warning; EAErrorHandler(228); Stops scan
```

ONLY SHOWS WHAT WAS FOUND, NOT WHAT WAS BAD!

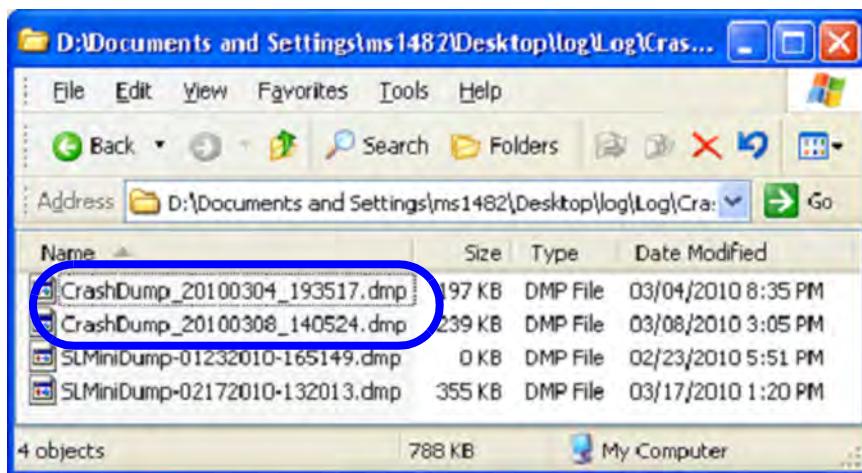
7-9-18-3 Key Log Files (cont'd)**7-9-18-5-3 LCD Suddenly Goes Black**

- Condition: System is performing emergency shutdown due to loss of power
- Action: Check log\logfile.txt for message about battery operation
- Ensure operator waits for LED to go off before trying to turn system on
- Example:

```
Error ; acqTransLayer(316); AC Failure detected - System will shut down
Info ; acqHouseKeeping(192); CHousekeeping::HandleAcFailEvent() called
Info ; acqHouseKeeping(192); Signaling event "SYSTEM_ON_BATTERY_BACKUP"
Info ; EchoSysmon::BatteryPower(3548); Battery Event signaled, beginning shutdown
process
```

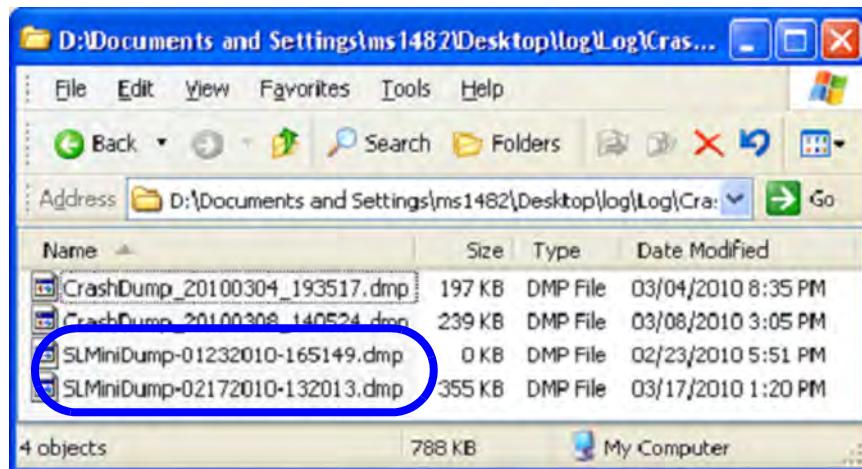
7-9-18-5-4 POP-UP: Application has Performed an Unexpected Halt

- Condition: Application Software Crash
- Action: Check for files log\CrashDumps\CrashDump_*.dmp
- Correction: Not usable in field – refer to engineering for diagnosis
- Example:

Figure 7-174

7-9-18-3 Key Log Files (cont'd)

- 7-9-18-5-5 POP-UP: Application has Stopped Responding and Needs to Restart
- Condition: Application is hung or performing very slowly.
 - Customer pushes Power Button interrupting application and forcing shutdown
 - Correction: Not usable in field. Determine what customer was doing when slowdown/hang occurred.
 - Look for files in log\CrashDumps\SLMiniDump-*

Figure 7-175

NOTE: One common cause of hang/slowdown symptom is system waiting communicate with PACs.

- 7-9-18-5-6 POP-UP: System Error. Please Reboot the system

- Condition: Fatal scanning or configuration error has occurred – Application will keep running.
- Cause: Many and varied
- Action: Search logfile.txt for EAErrorHandler
- Example: Inside Next

```
Error ; EAErrorHandler(3660); Error from HouseKeeping: GFI Processing Exception:  
SubType 166: scanseq Halting scan: s_current_iq_addr(0093ebc0) inside next  
[0093ebc0,00941ff8> vector! (b=56, s=280). No of firings done: 65576, no of beams  
received: 65548. Severity : NonFatalSW
```
- Example: Power Supply Comm. Error

```
Debug ; acqGfi(3600); WatchDog:Watchdog still alive, errors=0x0060 [ -- (ACFAIL)  
- (TS_LEVEL_OK) - - - - ]
```

7-9-18-3 Key Log Files (cont'd)**7-9-18-5-7 POP-UP: System Voltage Fault – System will Shutdown**

- Condition: An internal voltage is above or below preset limits
- Example: Voltages cannot be read:

```
Error ; acqHouseKeeping(3400); GRLY_AVEE = -2147483.750 outside tolerance
limits. UpperBound = -4.000 [...]
Error ; acqHouseKeeping(3400); GRLY_DLP_AUX = -2147483.750 outside tolerance
limits. UpperBound = 0.000 [...]
Error ; acqHouseKeeping(3400); GRLY_PMX_VNN = -2147483.750 outside tolerance
limits. UpperBound = 5.000 [...]
Error ; acqHouseKeeping(3400); GRLY_PMX_VPP = -2147483.750 outside tolerance
limits. UpperBound = 112.000 [...]
Error ; acqHouseKeeping(3400); GRLY_12V = -2147483.750 outside tolerance limits.
UpperBound = 12.600 [...]
Error ; acqHouseKeeping(3400); GRLY_VCC = -2147483.750 outside tolerance limits.
UpperBound = 5.250 [...]
Error ; acqHouseKeeping(3400); GRLY_3V3 = -2147483.750 outside tolerance limits.
UpperBound = 3.465 [...]
Error ; acqHouseKeeping(3400); GRLY_LVDC = -2147483.750 outside tolerance
limits. UpperBound = 3.900 [...]
Error ; acqHouseKeeping(3400); GRLY_LVDC = -2147483.750 outside tolerance
limits. UpperBound = 3.900 [...]
Error ; acqHouseKeeping(1928); voltageDataOk = true
Error ; acqHouseKeeping(1928); voltageErrorCount = 0
Info ; acqHouseKeeping(1928); CHouseKeeping::GenerateMonitoringEvent:
monitoring event (strObjId = SYS_VOLTAGE_UNREADABLE, strData = SystemVoltage:
GRLY_LVDC = -2147483.750 Volt is outside tolerance. Voltage is unreadable!
UpperLimit = 3.900 LowerLimit = -1.000)
Error ; acqHouseKeeping(1928); Fatal error detected by HouseKeeping, prompting
the user to shutdown the system
```

- In reality – voltages could not be read – monitor for further failures and take action if repeatable.

7-9-18-3 Key Log Files (cont'd)**7-9-18-5-8 Application Keeps Restarting**

- Condition: System attempts to clear some errors by restarting.
- After THREE tries, system will be in simulator mode.
- Example: Cannot talk to Front End
 - From loglogfile.txt:

```
Error ; EchoRootPck(188); targetPresent() is false, rebooting 1 of 3 times
to attempt to reconnect to hardware
```

- Example: USB Configuration Error

```
Error ; EAErrorHandler(284); Error from HWCap: HWCAP Invalid USB
Configuration. Severity : FatalHW
```

- Example: Detailed USB Configuration Error

```
Error ; acqHWCap(328); USBCConfig: *** Required USB device "OP I/O
Microcontroller" not found ***
```

```
.....
Error ; HWCap(1916); USB configuration is incorrect, rebooting 1 of 2 times to
attempt to normalize hardware
```

```
.....
Error ; HWCap(328); USB configuration is incorrect, 2 reboots exhausted, system
will post a user error
```

```
.....
Error ; EAErrorHandler(328); Error from HWCap: HWCAP USB Configuration Error.
Severity : FatalSW
```

7-9-18-5-9 Slowdowns - DICOM

- Items in spooler waiting to send – Usually seen near shutdown
- Can cause slow shutdowns or operation

```
Error ; ScDicom(3152); ERROR : Open_Association - Failed to connect to remote
host:
```

```
Error ; ScDicom(3152); DCM_FAILED : DcmCommand
```

```
Error ; ScDicom(3152); DCM_FAILED : DcmCommand
```

```
Error ; ScDicom(3152); DCM_FAILED : DicomJob::flush dcm_cmd_OpenArchive failed
Debug ; EchoSpooler(3172); Spooler status is 2
```

7-9-18-6 Keywords – logfile.txt

- “Starting Log System”
 - First line written whenever application starts
- EAErrorHandler
 - Indicates serious error has occurred. Usually seen several times for each failure.
- “Inside Next”
 - Never seen except when Diags are run.

```
Error ; EAErrorHandler(3660); Error from HouseKeeping: GFI Processing
Exception: SubType 166: scanseq Halting scan: s_current_iq_addr(0093ebc0)
inside next [0093ebc0,00941ff8> vector! (b=56, s=280). No of firings done:
65576, no of beams received: 65548. Severity : NonFatalSW
```

- Power Button Press

```
Info ; UserEventLog(304); ButtonPress: name=PowerBut, value=0
.....
Info ; SysExitDlg(1912); System Exit Dialog Displayed
Info ; SysExitDlg(1912); System Exit Dialog - Shutdown Selected
```

- Print Button Press

```
Info ; UserEventLog(168); ButtonPress: name=PrintBut1, value=0
```

- Scan state, Probe Connected, etc.

- Look for ESStatus

```
Info ; EScan.View(1288); ESStatus(0,Live): SetState RunState("Live" ->
"Freeze") Modes("2DHAR") Probe("cla_15C-D") Appl("Abdomen")
```

- System Hardware ID

- Stored on the backplane – Should not be ZEROS!

```
Info ; EchoRoot(1288); HW Serial Number = 0x005E3250 = 6173264, 96348US8
```

- Front End Card Crack Configuration

```
acqHWCap(200); HW Rack Configuration Valid: Ichiro Phase 2 - CW (2A/2C), DRX MLA4
(3E), GTX (2E), GRLY (2C), MLP PS (1C)
OR
```

```
Info ; acqHWCap(1904); HW Rack Configuration Valid: Ichiro Phase 1 - NoCW (2A/
2B), DRX MLA4 (3B), GTX (2C), GRLY (2C), MLP PS (1A)
```

7-9-18-7 Errors That May Not Be Errors

No DVR found in system – OK if there is not a DVR!

```
Info ; EchoVcr.GEdvrRecordUnit(3716); Failed to start process[net use  
\\192.0.2.178 /user:root ""] ExitCode=2: GetLastError returned 0Info ;  
EchoVcr.GEdvrRecordUnit(3716); Waiting till DVR board become  
alive...Error ; EchoVcr.GEdvrRecordUnit(3716); DVR Board is not found!!
```

No PatIO found in system – OK if there is not a Patient I/O!

```
Error ; PatioUsb(2300); OpenDriver Failed; 2
```

7-9-18-8 Tips

- If the application does not allow the use of ALT-D (crashes quickly or will not start) the desktop icon “GatherLogs” performs the same function.
 - In extreme circumstances, reload the C: partition only. This allows access to the desktop and use of “GatherLogs”.
- Search for “Starting log system” to find start of session.
- Logfile.txt only grows to ~100MB then copied to logfile.txt.bak.
- Image Quality issues usually do not show up in log files.
- Log files do not show everything.

7-9-18-9 ScLogWindow

ScLogWindow application will help identify errors while the system is running.

There are two ways you can access this application:

- 1.) From Windows Desktop
- 2.) From Task Manager

From the Windows Desktop

Figure 7-176 ScLogWindow from Windows desktop

Insert Service Key

- Exit to Windows
- Once in Windows desktop, click on the ScLogWindow icon
- After the ScLogWindow opens, double-click on the Ichiro icon on the desktop



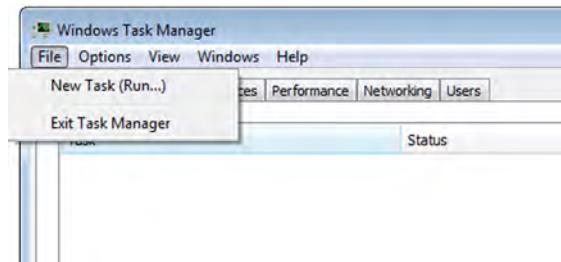
Figure 7-177 Logging in the ScLogWindow

While the application is booting up, you can observe logging in the SgLoG window. (Press Alt Tab to put the ScLogWindow in front.)

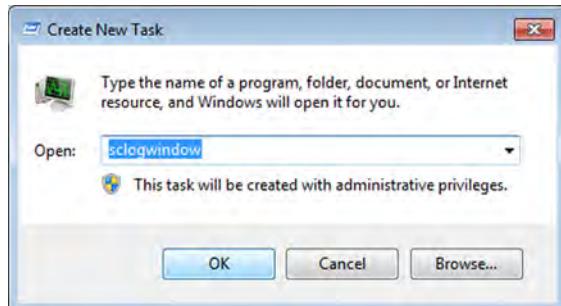


7-9-18-9 ScLogWindow (cont'd)**ScLogWindow from Task Manager****Figure 7-178 ScLogWindow from Task Manager****Insert Service Key**

- Press Cntrl+Alt+Del
- Select Task Manager
- Once Task Manager opens, select New Task

**Type SclogWindow and press OK**

- The ScLogWindow will open
- You can close task manager window

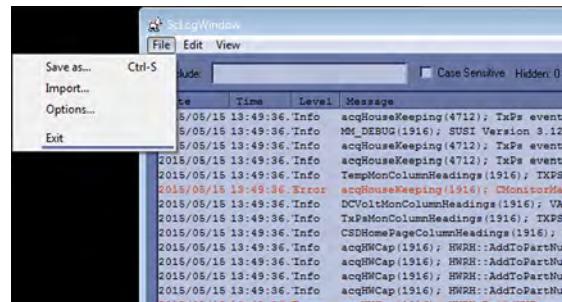


7-9-18-9 ScLogWindow (cont'd)

Saving logs in ScLogWindow

Figure 7-179 Saving logs in ScLogWindow

To Save the log in ScLogWindow, select File, then Save as.

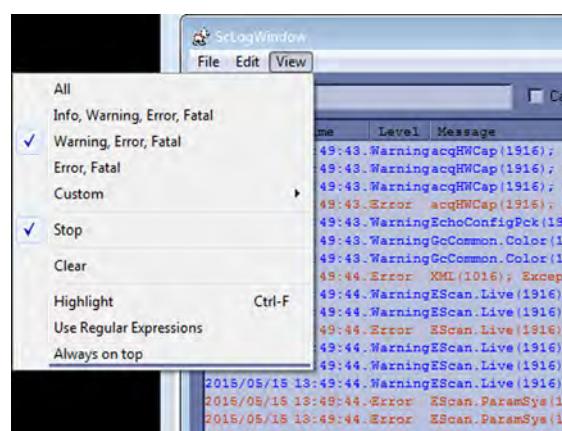


Filtering logs in ScLogWindow

Figure 7-180 Filtering logs in ScLogWindow

To filter by errors or other log entries, select view and check the entries desired.

- Select stop, to stop the logging.
- Select clear, if you want to clear the window and start a fresh log capture.



7-9-19 LOGIQ E9 Transmit and Receive Signal Path Diagnostics

Use this to troubleshoot LOGIQ E9 DRX or MRX Boards, GTX Boards and/or Front Planes (Transmit and Receive Signal Paths), and to identify Transmit and Receive Signal Path problems from other system problems.

NOTE: *Label the DRX and GTX Boards prior to removal to reflect which slot each board was removed from. Install the boards back in the original locations throughout the troubleshooting process.*

Label the Front Planes prior to removal to reflect which is the upper and which is the lower. Install the Front Planes back in the original locations throughout the troubleshooting process.

NOTE: *GTX "numbers" use 1, 2, 3 and 4 as nomenclature in VPD, but 0 (zero), 1, 2 and 3 are used as nomenclature in diagnostics. In this Section, 1, 2, 3 and 4 nomenclature is used to identify board, based on location in the Card Rack. See: Figure 7-181 "Card Rack - GFI Configuration" on page 7-276, Figure 7-183 "Card Rack - GFI configuration" on page 7-278 or Figure 7-185 "Card Rack - MRX Configuration" on page 7-280.*

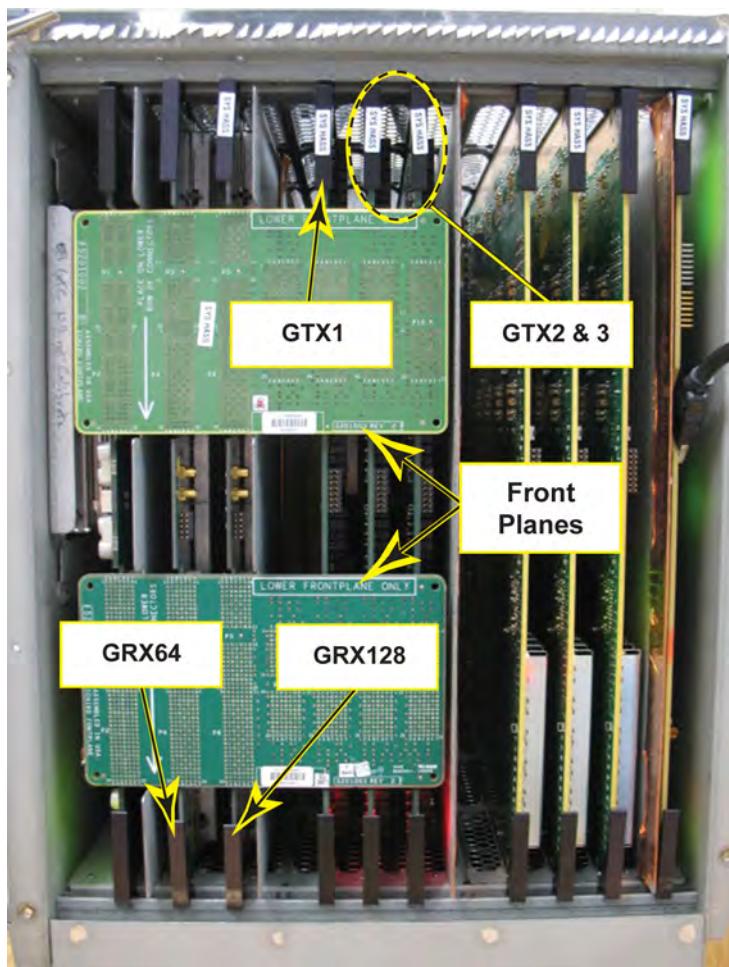
Topics in this Section:

- 1.) Transmit Signal Path Description - see:
7-9-19-1 "Transmit Signal Path and Transmit/Receive (T/R) Signal Path" on page 7-276.
- 2.) Analog Receive Path Description - see:
7-9-19-2 "Analog Receive Signal Path and Analog Rx Path" on page 7-278.
- 3.) Signal Flow Path for MRX Configuration - see:
7-9-19-3 "Signal Flow Path for MRX Configuration" on page 7-280.
- 4.) How to read Diagnostic Results on T/R Channel Tests - see:
7-9-19-4 "T/R Channel Diagnostic Results" on page 7-282.
- 5.) How to read Diagnostic Results on Analog Rx Channel Tests - see:
7-9-19-5 "Analog RX Diagnostic Results" on page 7-283.
- 6.) Troubleshooting Tips For Suspected GTX Transformer Failure - see:
7-9-19-6 "Troubleshooting Tips for Suspected GTX Transformer Failure" on page 7-284.
- 7.) Visual Inspection of GTX Damage (what to look for) - see:
7-9-19-7 "Visual Inspection of Board" on page 7-285.
 - Troubleshooting Step 1 - Upper Bank of Transmitter Channels - see:
"Troubleshooting Step 1 - Upper Bank of HV FET Section (cont'd)." on page 7-290.
 - Troubleshooting Step 2 - Upper and Lower Transmit Bank - see:
"Troubleshooting Step 2 - Upper and Lower Transmit Bank" on page 7-292.

NOTE: *A magnifying glass may be required to view and locate test points and grounds.*

7-9-19-1 Transmit Signal Path and Transmit/Receive (T/R) Signal Path

Figure 7-181 Card Rack - GFI Configuration



The transmit signal is generated on the GTX Boards, then passes across the Front Planes to the GRLY Board.

The GRLY Board passes the transmit signal to the transducer.

The echoes the transducer receives from the transmit signals generated on GTX1, are passed on to the GRX64 Board.

GTX1 Board passes transmit signals to the Front Planes, the Front Planes pass signals to the GRLY Board, GRLY Board passes signals to the transducer, the transducer passes signals to the GRX64.

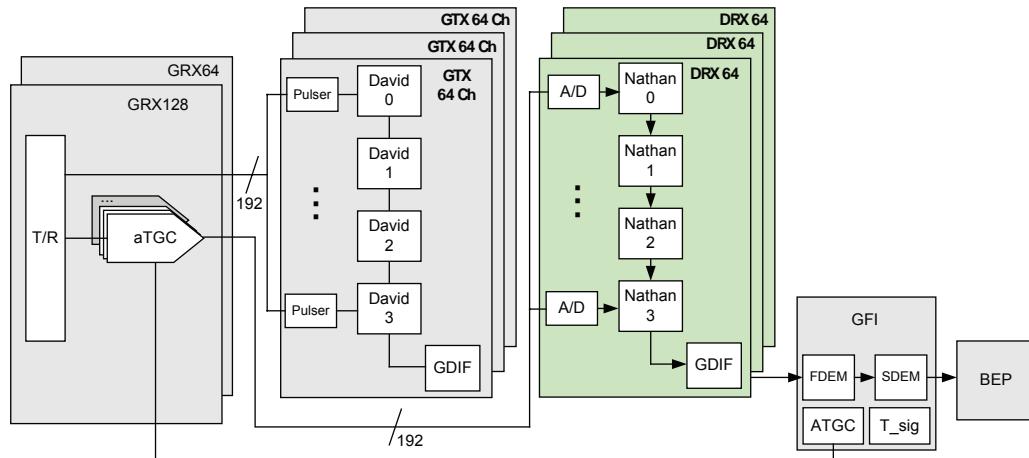
The echoes the transducer receives from the transmit signals generated on GTX2 and GTX3, are passed on to the GRX128 Board.

GTX2 and 3 Boards pass transmit signals to the Front Planes, the Front Planes pass signals to the GRLY Board, GRLY Board passes signals to the transducer, the transducer passes signals to the GRX128.

7-9-19-1 Transmit Signal Path and Transmit/Receive (T/R) Signal Path (cont'd)

7-9-19-1-1 Transmit/Receive (T/R) Signal Path

Figure 7-182 T/R Signal Path

**T/R Test**

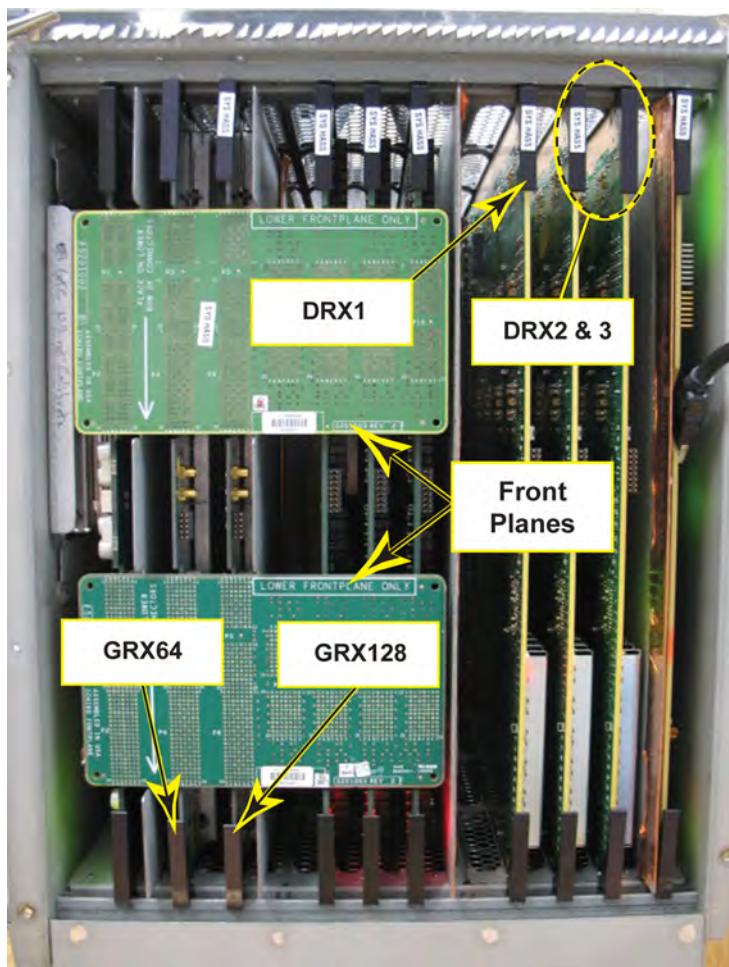
- Uses pulsers to inject signal into the front-end.
- Measures amplitude and frequency.
- Dead channel detection.
- Reports failures at channel level.

Analog Rx tests should be run first.

Failure indicates problem with GTX.

7-9-19-2 Analog Receive Signal Path and Analog Rx Path

Figure 7-183 Card Rack - GFI configuration



Echoes received by transducer pass through the GRLY Board, across the Front Planes and to the GRX Board.

The GRX Board amplifies the signal and passes it to the DRX Boards via the Backplane.

The DRX Boards convert the analog signal to a digital signal which then gets passed on to the GFI Board.

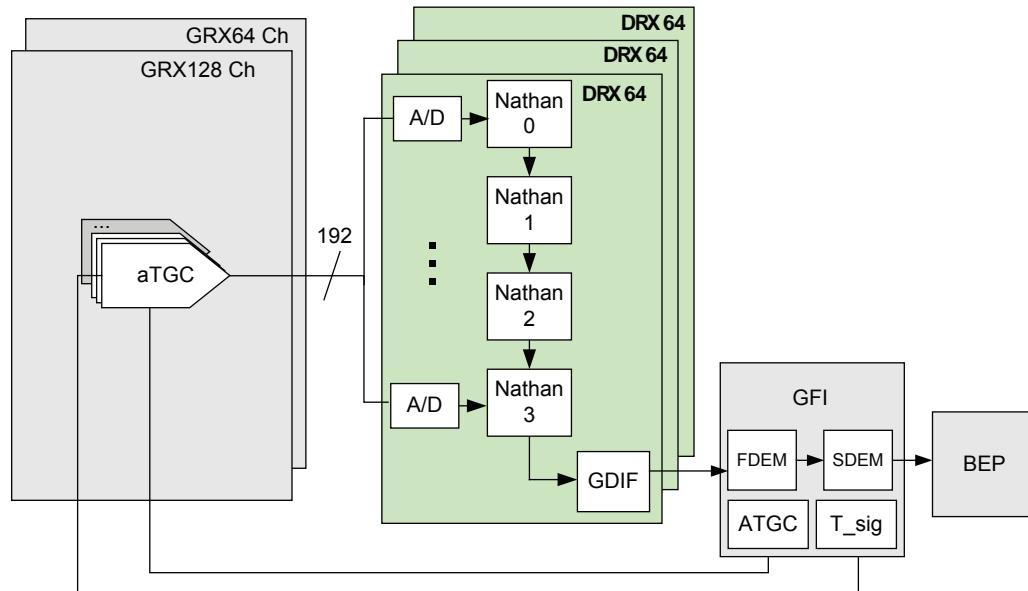
The GRX64 Board passes signals to the DRX1 Board.

The GRX128 Board passes signals to DRX2 and DRX3 Boards.

7-9-19-2 Analog Receive Signal Path and Analog Rx Path (cont'd)

7-9-19-2-1 Analog Rx Signal Path

Figure 7-184 Analog Rx Signal Path

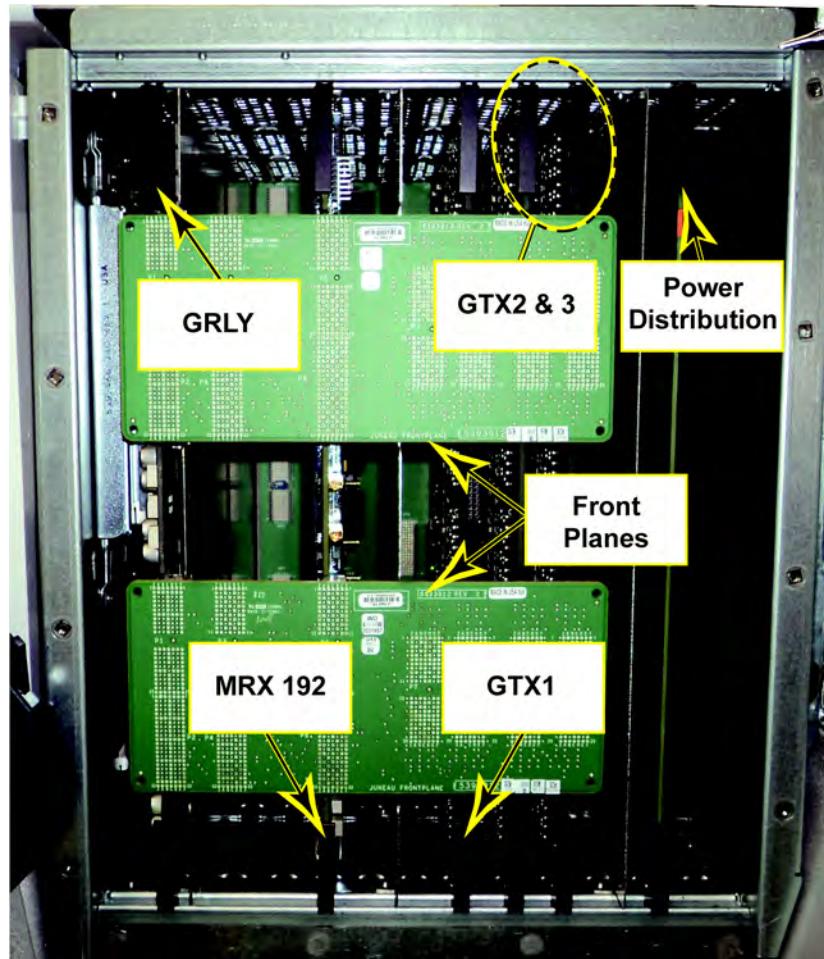
**Analog Rx Tests (High, Medium and Low)**

- Test signal generated on GFI, and injected into GRX.
- Tests frequency, amplitude, SNR, THD.
- Reports failures at channel level.

Test both GRX Boards and A/D Converter on DRX Boards.

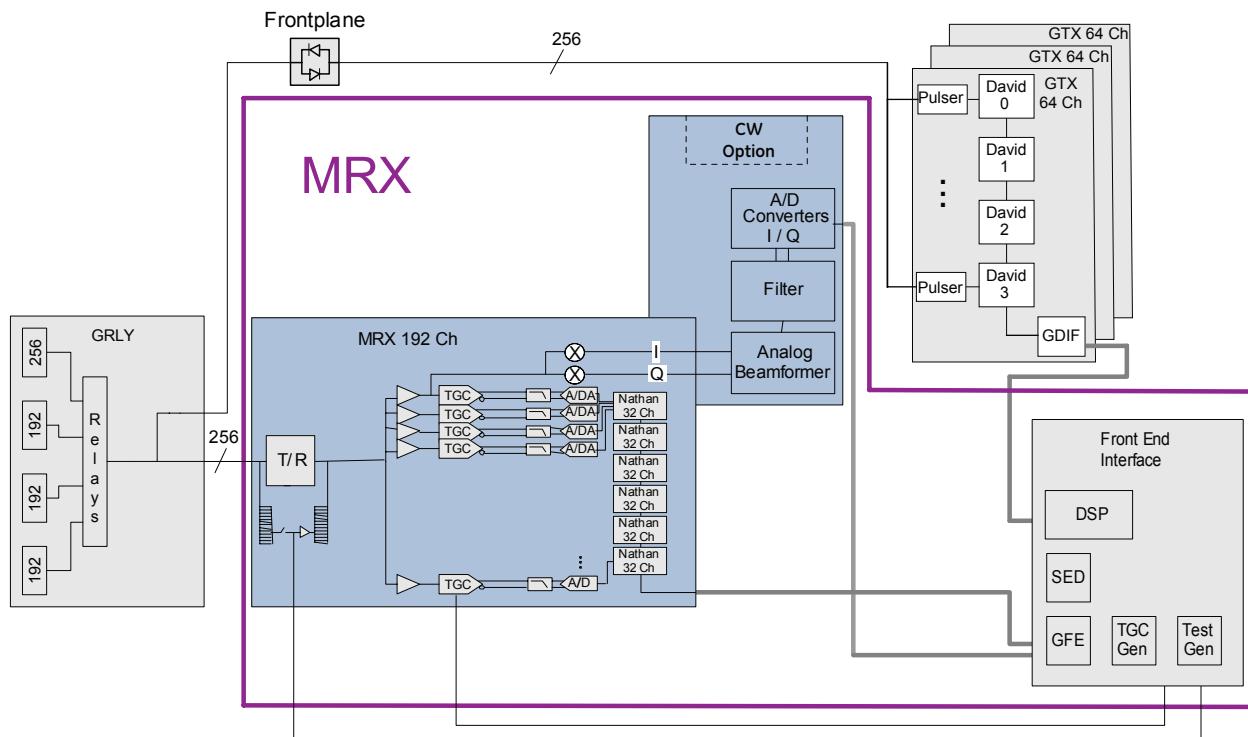
7-9-19-3 Signal Flow Path for MRX Configuration

The MRX Board combines the functionality of the Receiver Boards (DRX and GRX) and the GFI.

Figure 7-185 Card Rack - MRX Configuration

7-9-19-3 Signal Flow Path for MRX Configuration (cont'd)

Figure 7-186 LOGIQ E9 Signal Flow for MRX configuration

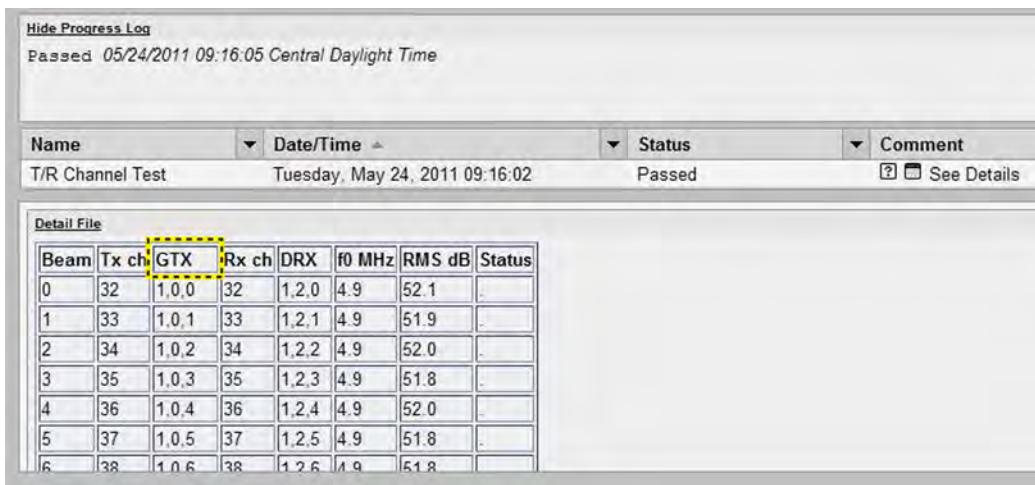


The Transmit Pulse bursts transmitted, are still routed from the GTX board(s) via the XD bus to the Relay board where the ultrasound probes send the energy into the body. Weak ultrasound echoes from body structures and blood cells are received by the probes and routed via the Relay board and the XD bus to the MRX board. The MRX board amplifies the ultrasound signal and connects it with an A/D converter to the digital domain. The digital signals are then further processed on the MRX boards.

All the processing is the same as a GFI configuration, but now the DRX and GFI are no longer used.

7-9-19-4 T/R Channel Diagnostic Results

Figure 7-187 T/R Channel Diagnostic Results



The screenshot shows a software window titled "T/R Channel Diagnostic Results". At the top, it says "Passed 05/24/2011 09:16:05 Central Daylight Time". Below this is a table with columns: Name, Date/Time, Status, and Comment. The "Name" row contains "T/R Channel Test", "Tuesday, May 24, 2011 09:16:02", "Passed", and a "See Details" link. The "Status" column shows "Passed" for all rows. The "Comment" column is empty. Below the table is a section titled "Detail File" containing another table. This second table has columns: Beam, Tx ch, GTX, Rx ch, DRX, f0 MHz, RMS dB, and Status. The "GTX" column is highlighted with a yellow dashed box. The data in the "Detail File" table is as follows:

Beam	Tx ch	GTX	Rx ch	DRX	f0 MHz	RMS dB	Status
0	32	1,0,0	32	1,2,0	4.9	52.1	
1	33	1,0,1	33	1,2,1	4.9	51.9	
2	34	1,0,2	34	1,2,2	4.9	52.0	
3	35	1,0,3	35	1,2,3	4.9	51.8	
4	36	1,0,4	36	1,2,4	4.9	52.0	
5	37	1,0,5	37	1,2,5	4.9	51.8	
6	38	1,0,6	38	1,2,6	4.9	51.8	

The **GTX** column numbers, refer to “GTX Board number, David ASIC, channel within David.”

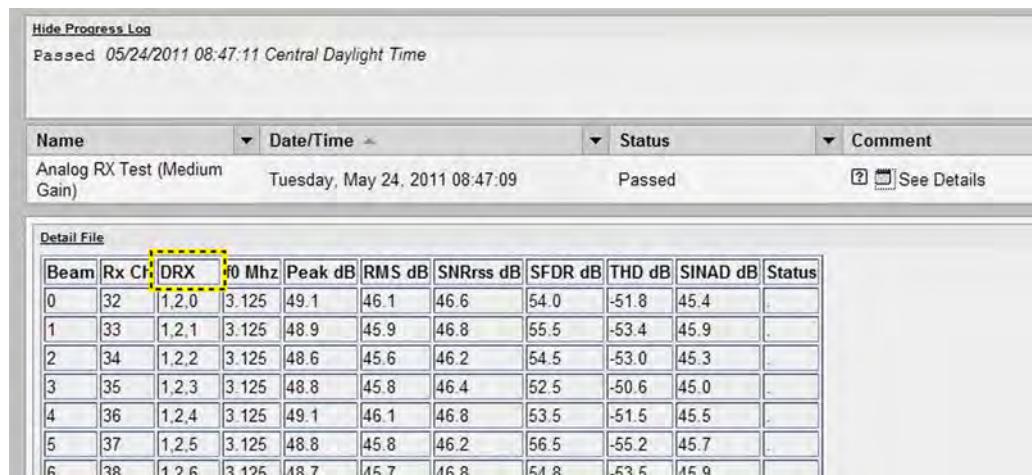
For example: If under the **GTX** column, you see 1,0,0 - this is referring to **GTX1**, David ASIC number 0, channel 0 within David.

Transmit signals generated on GTX1, are received back on the GRX64 and passed via the Backplane to DRX1. Transmit channels generated on GTX2, are received back on the GRX128 and passed via the Backplane to DRX2. Transmit channels generated on GTX3, are received back on the GRX128 and passed via the Backplane to DRX3.

For service, the relevant information is the board number. If any channel fails, the board in that path can be identified.

7-9-19-5 Analog RX Diagnostic Results

Figure 7-188 Analog Rx Diagnostic Results



The screenshot shows a software interface for 'Analog RX Test (Medium Gain)'. At the top, it says 'Passed 05/24/2011 08:47:11 Central Daylight Time'. Below is a table with columns: Name, Date/Time, Status, and Comment. The 'Name' row shows 'Analog RX Test (Medium Gain)' with 'Tuesday, May 24, 2011 08:47:09' in the Date/Time column and 'Passed' in the Status column. A 'See Details' link is next to the status. The main table is titled 'Detail File' and has columns: Beam, Rx CH, DRX, 10 Mhz, Peak dB, RMS dB, SNRrss dB, SFDR dB, THD dB, SINAD dB, and Status. The DRX column is highlighted with a yellow box. The data rows are as follows:

Beam	Rx CH	DRX	10 Mhz	Peak dB	RMS dB	SNRrss dB	SFDR dB	THD dB	SINAD dB	Status
0	32	1,2,0	3.125	49.1	46.1	46.6	54.0	-51.8	45.4	
1	33	1,2,1	3.125	48.9	45.9	46.8	55.5	-53.4	45.9	
2	34	1,2,2	3.125	48.6	45.6	46.2	54.5	-53.0	45.3	
3	35	1,2,3	3.125	48.8	45.8	46.4	52.5	-50.6	45.0	
4	36	1,2,4	3.125	49.1	46.1	46.8	53.5	-51.5	45.5	
5	37	1,2,5	3.125	48.8	45.8	46.2	56.5	-55.2	45.7	
6	38	1,2,6	3.125	48.7	45.7	46.8	54.8	-52.5	45.9	

The **DRX** column numbers refer to “DRX Board number, Nathan ASIC, channel within Nathan.”

For example: If under the **DRX** column, you see 1,2,0 - this is referring to **DRX1**, Nathan ASIC number 0, channel 0 within Nathan.

GRX64 passes signal to DRX1. GRX128 passes signals to DRX2 and DRX3. The Analog Receive tests may be run with the Front Planes removed. There is Front Plane failure mode which can cause this diagnostic to fail.

For service, the relevant information is the board number. If any channel fails, the board in that path can be identified.

7-9-19-6 Troubleshooting Tips for Suspected GTX Transformer Failure

Typical customer complaint: a burning smell followed by a system error pop up during applications boot up.

If this occurs, avoid any further live scanning, as probe damage can occur.

NOTE: *DO NOT introduce additional probes onto the system until diagnostics have been successfully run.*

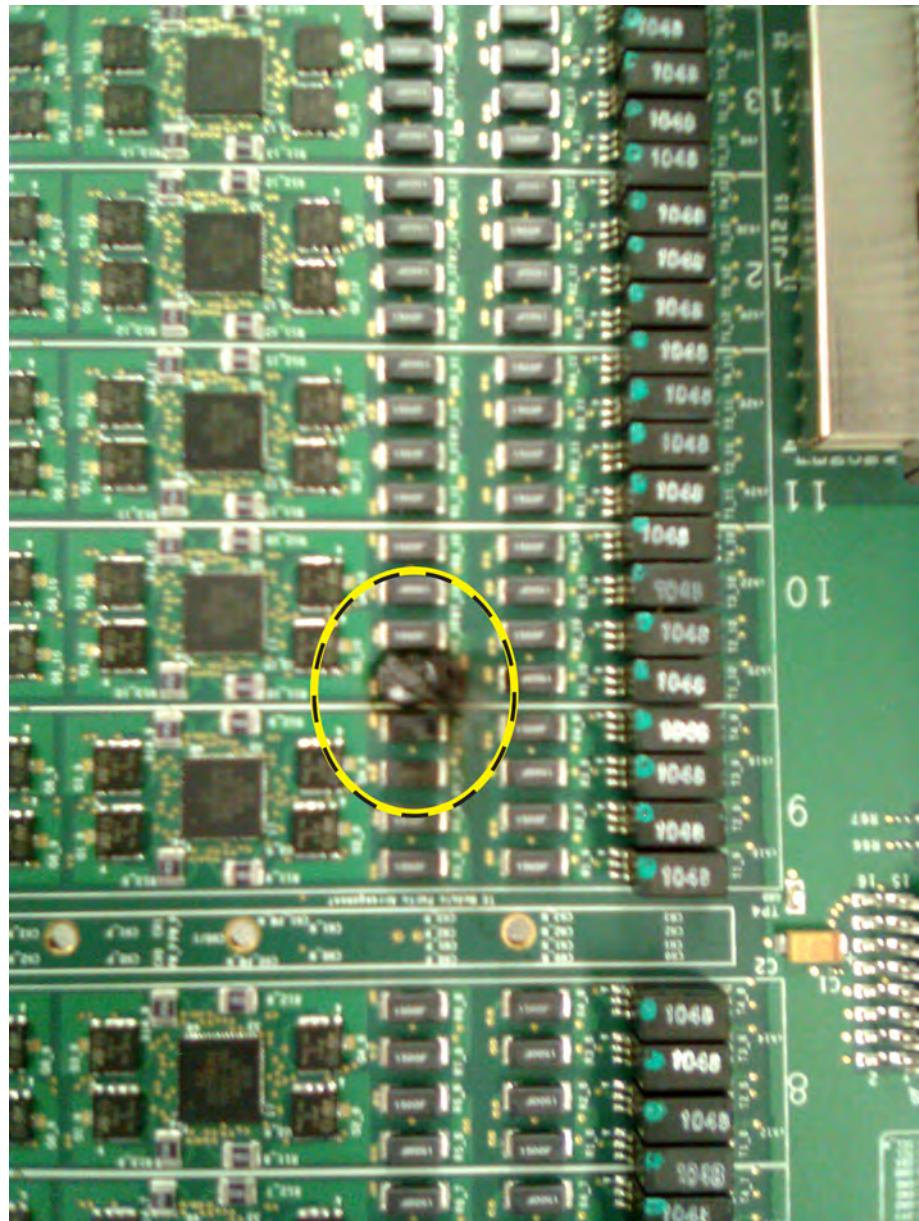
Remove GTX Boards one at a time and perform a visual inspection. Make sure to label the boards to reflect which slot each board was removed from. Remember to install the GTX Boards back in their original locations throughout the troubleshooting process.

Perform visual inspection of the diodes on the upper and lower Front Planes. Make sure to label the Front Planes to reflect which is the upper and which is the lower. Remember to install the Front Planes back in their original locations throughout the troubleshooting process.

7-9-19-7 Visual Inspection of Board

Figure 7-189 shows a damaged GTX Board. This damage may not be evident on systems running R3 Application Software.

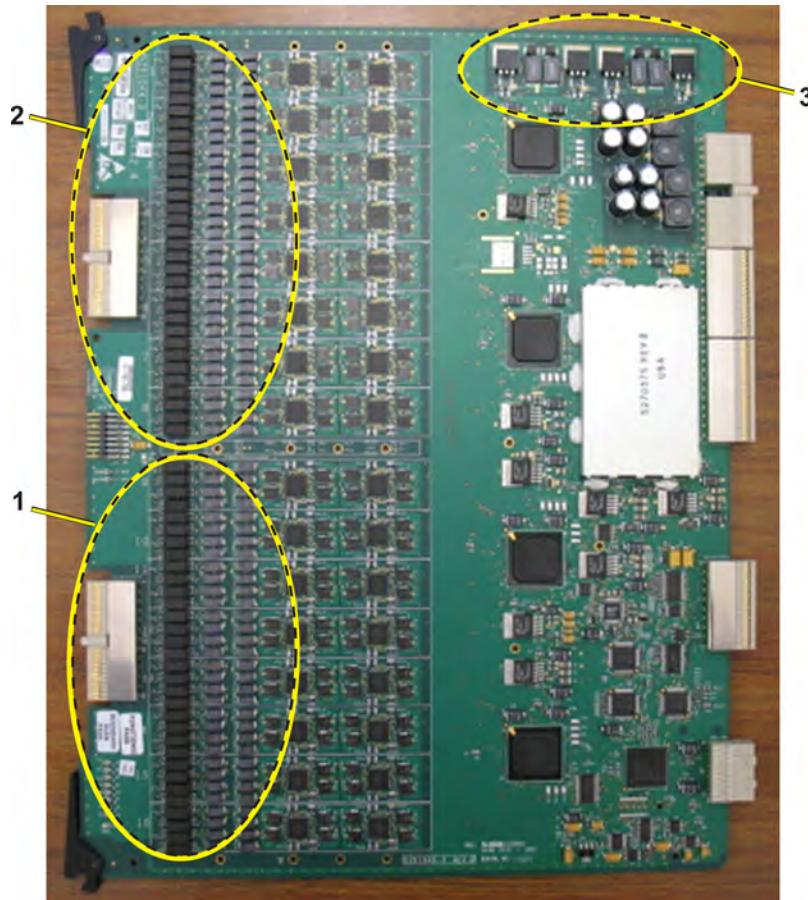
Figure 7-189 Damaged GTX Board



7-9-19-7 Visual Inspection of Board (cont'd)

Typically one of the local channel power resistors shows physical burn damage. The HV FET Switch section (3) of the board can also exhibit visual signs of damage as well.

Figure 7-190 Visual Inspection of Board

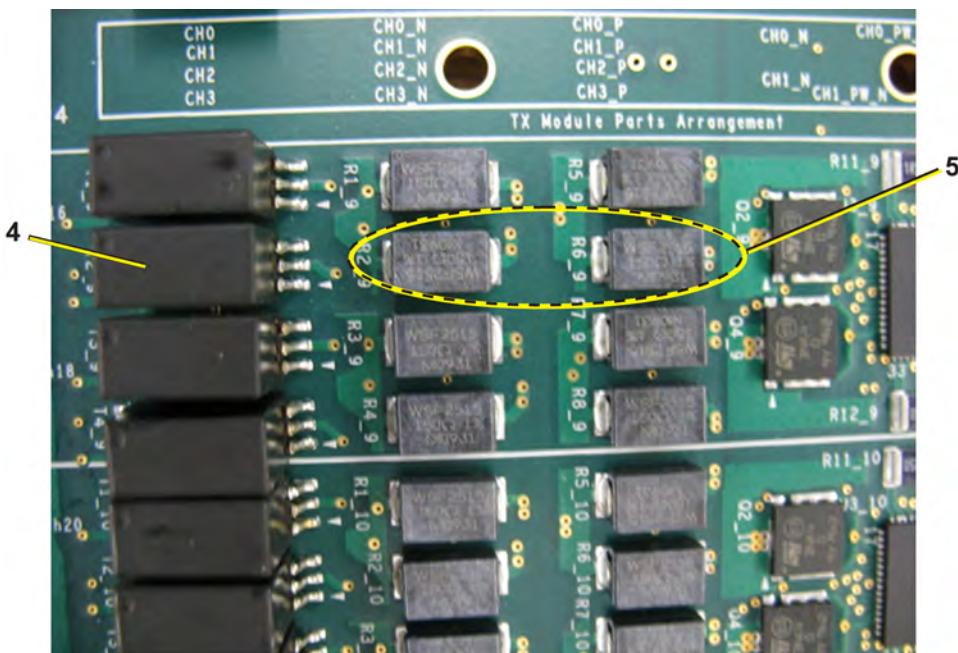


- 1) Lower Transmit Bank
- 2) Upper Transmit Bank
- 3) HV FET Switch section

7-9-19-7 Visual Inspection of Board (cont'd)

Transmit Channel

Figure 7-191 Close up of Transmit Channel



- 4) Transmit Transformer
5) Local Power Resistors

When Visual Inspection Reveals Physical Damage

Replace the GTX Board that shows evidence of burn damage. Then run the following diagnostics:

- Run T/R Channel diagnostic
- Run Analog Rx diagnostics

Failure of one of these diagnostics, following the replacement of the defective GTX Board, will typically mean damage to one of the Front Planes. Swap locations of the Front Planes and re-run the tests to see if the failure follows the Front Plane. In rare occurrences damage has occurred to the GRX Board. Damage to the GRX Board may show as a bright or dark spot in the near field image. See:
Figure 7-192 "Check in near Field Image" on page 7-288.

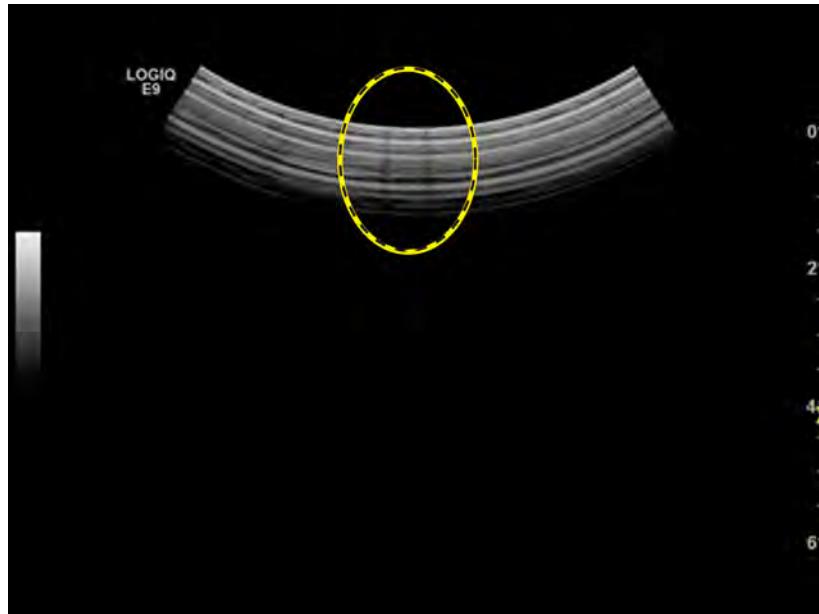
If these diagnostics pass check image quality in the near field:

- Install and check image quality on all probes that may have been used during the time period that the system began to show the transformer failure issue.

7-9-19-7 Visual Inspection of Board (cont'd)

Transmit Channel (cont'd)

Figure 7-192 Check in near Field Image



A dark streak in the near field indicates either a defective Front Plane or the transducer itself has been damaged. Save image to the clipboard, swap the Front Plane locations, reproduce the saved image and compare. If images are the same, the transducer is bad. If there is one dark streak and it moved, the Front Plane is bad. If two dark streaks appear, both the Front Plane and transducer are most likely defective.

When Visual Inspection does not show Damage

There are two levels of impedance testing that can be performed to identify which GTX Board is defective.

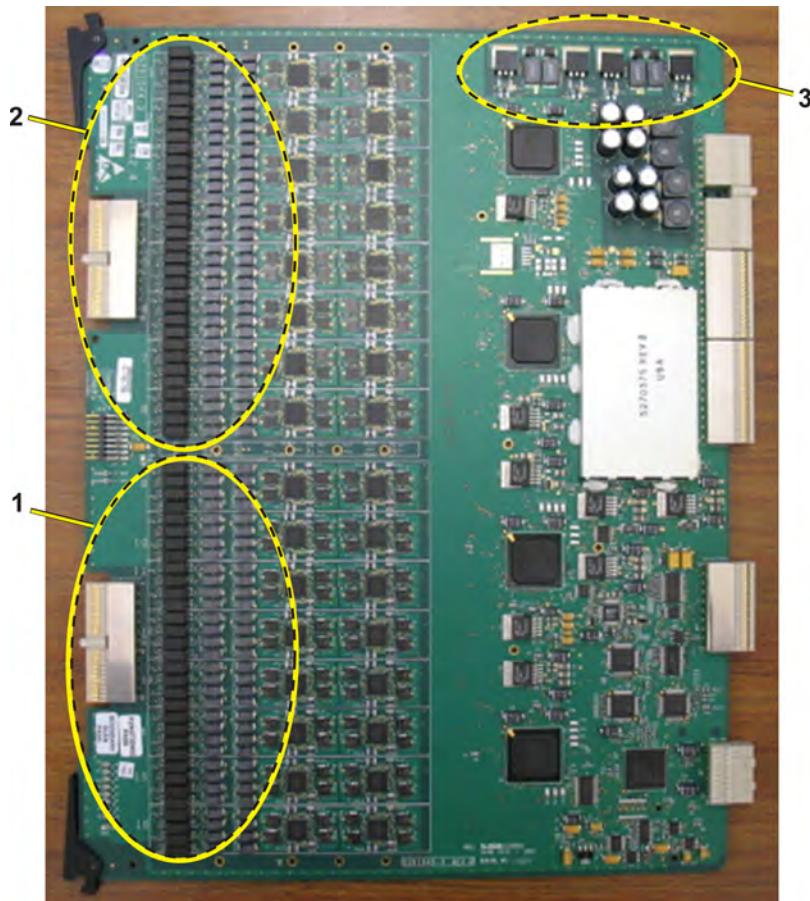
- 1.) Check resistance value from the HV FET switch section to ground. See "*Troubleshooting Step 1 - Upper Bank of HV FET Section (cont'd).*" on page 7-290.
- 2.) Check resistance value from pin 6 via of each of the output transformers to ground. See: "*Troubleshooting Step 2 - Upper and Lower Transmit Bank*" on page 7-292.

NOTE: Always label the Front Planes and GTX Boards prior to removal. Remove GTX Boards one at a time and perform the impedance checks in order, as detailed in the following pages.

7-9-19-7 Visual Inspection of Board (cont'd)

Troubleshooting Step 1 - Upper Bank of HV FET Section

Figure 7-193 Visual Inspection of Board



- 1) Lower Transmit Bank
- 2) Upper Transmit Bank
- 3) HV FET Switch section

7-9-19-7 Visual Inspection of Board (cont'd)

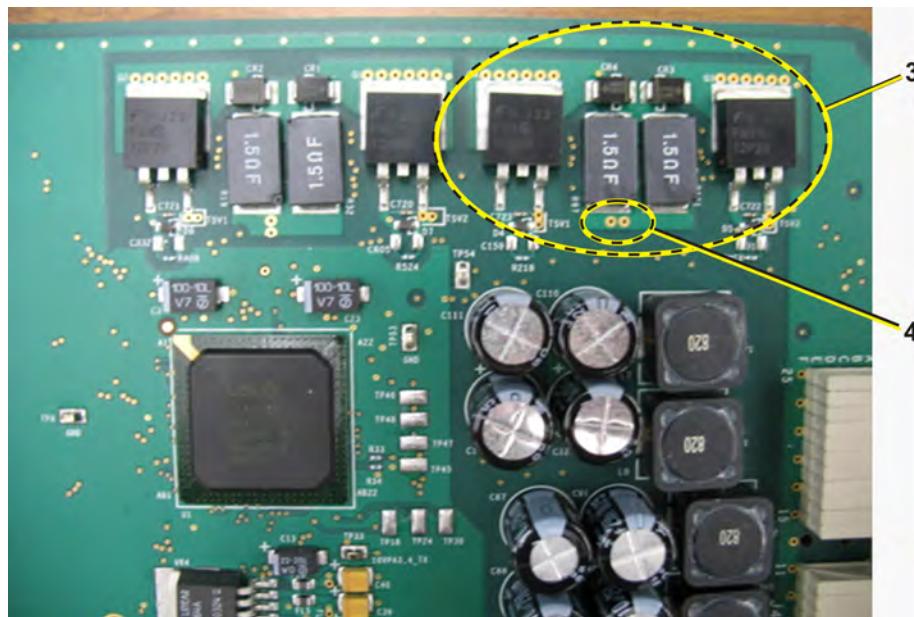
Troubleshooting Step 1 - Upper Bank of HV FET Section (cont'd).

If no Visual Damage is found on Upper Bank of Transmitter Channels

Measure resistance from output of HV feed resistors R97 and R131 to ground.

NOTE: *Measured resistance of a good board should be ~ 90 - 110K ohms, with a calibrated ohm meter.*

If measured resistance is less than ~ 90 - 110K (typically 5 ohms or less) this is indicative of a transmit transformer with a primary to secondary short.

Figure 7-194 Upper Bank HV Switch Section (3) and Vias to ground (4)

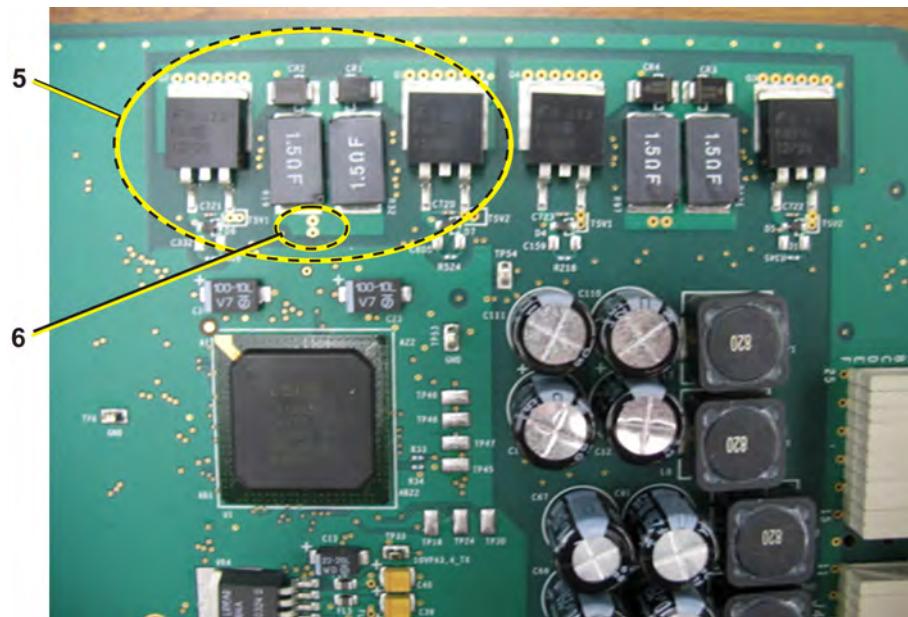
Measure from these vias to ground (4) to test for possible transmit transformer short on the upper bank.

7-9-19-7 Visual Inspection of Board (cont'd)**Troubleshooting Step 1 - Upper Bank of HV FET Section (cont'd).****If no Visual Damage is found on Lower Bank of Transmitter Channels**

Measure resistance from output of HV feed resistors R19 and R32 to ground.

NOTE: *Measured resistance of a good board should be ~ 90 - 110K ohms, with a calibrated ohm meter.*

If measured resistance is less than ~ 90 - 110K (typically 5 ohms or less) this is indicative of a transmit transformer with a primary to secondary short.

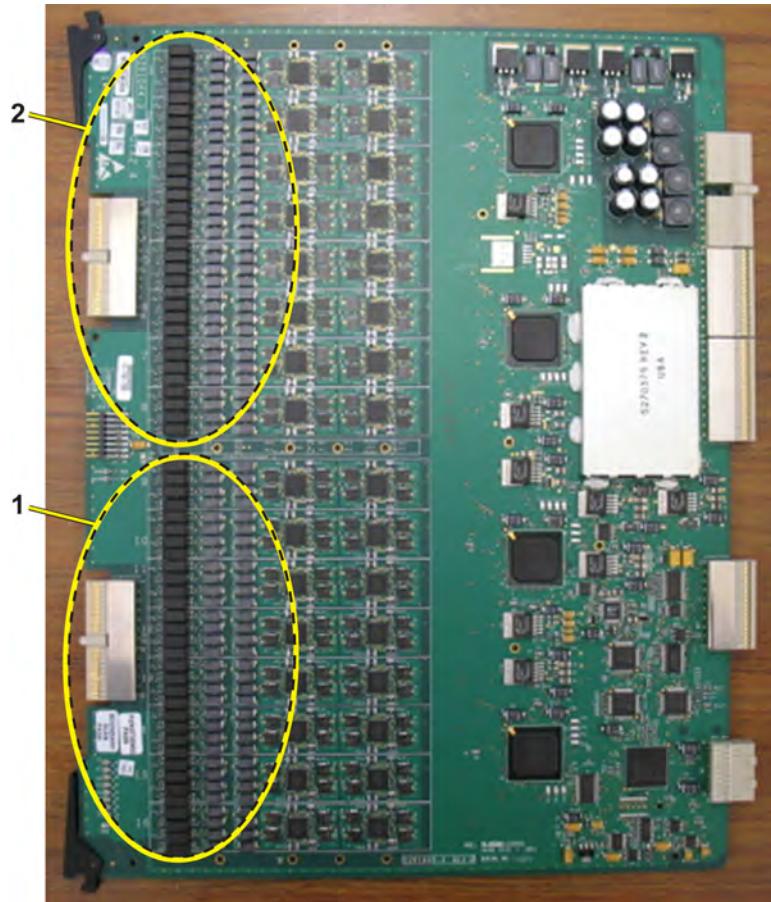
Figure 7-195 Lower Bank HV Switch Section (5) and Vias to ground (6)

Measure from these vias to ground (6) to test for possible transmit transformer short on the lower bank.

7-9-19-7 Visual Inspection of Board (cont'd)

Troubleshooting Step 2 - Upper and Lower Transmit Bank

Figure 7-196 Visual Inspection of Board



- 1) Lower Transmit Bank
- 2) Upper Transmit Bank

7-9-19-7 Visual Inspection of Board (cont'd)**Troubleshooting Step 2 - Upper and Lower Transmit Bank (cont'd)**

With a calibrated ohm meter, measure from the pin 6 via of each transmit transformer to ground.

- 1.) Place the negative lead of the meter on board ground.
- 2.) Place the positive lead of the meter on the pin 6 via of the transmit transformer.

A good transmit channel should read close to zero ohms. Typically five ohms or less, with a calibrated ohm meter.

A defective transmit channel will have a significantly higher reading. Typically in the mega-ohms or the reading simply will not settle to a distinct level.

Repeat steps for each transmit transformer on each GTX board until the defective channel is identified

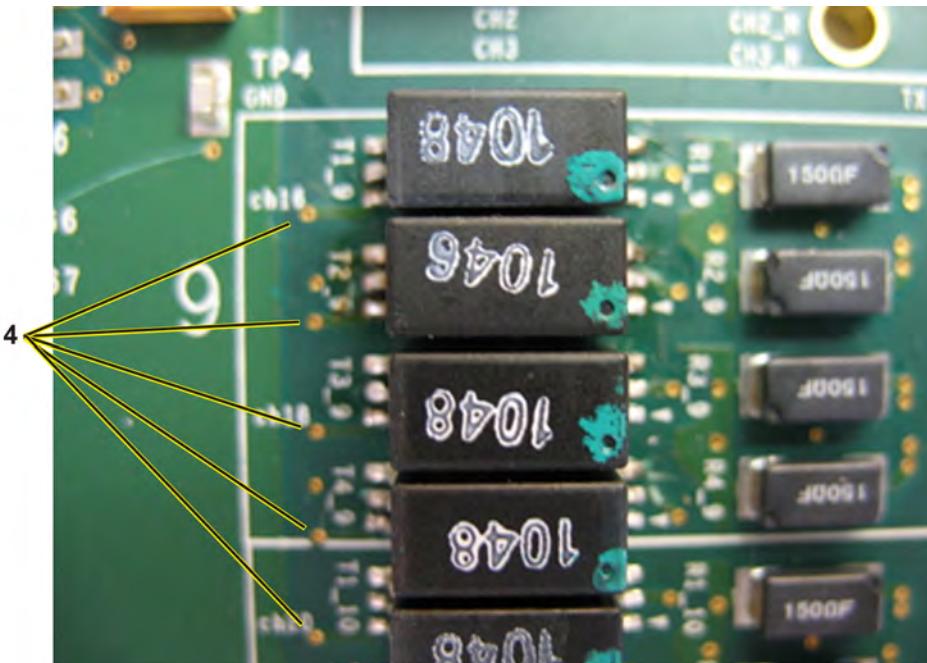
Figure 7-197 Upper Transmit Bank - Pin 6 Vias (3)



7-9-19-7 Visual Inspection of Board (cont'd)

Troubleshooting Step 2 - Upper and Lower Transmit Bank (cont'd)

Figure 7-198 Lower Transmit Bank - Pin 6 Vias (4)



Replace the GTX Board that shows evidence of burn damage. Then run the following diagnostics:

- Run T/R Channel diagnostic
- Run Analog Rx diagnostics

Failure of one of these diagnostics following the replacement of the defective GTX, will typically mean damage to one of the Front Planes. Swap locations of the Front Planes and re-run the tests to see if the failure follows the front plane. In rare occurrences, damage has occurred to the GRX Board.

If these diagnostics pass check image quality in the near field. See:
Figure 7-199 "Check in near Field Image" on page 7-295.

Install and check image quality on all probes that may have been used during the time period that the system began to show the transformer failure issue.

7-9-19-7 Visual Inspection of Board (cont'd)

Troubleshooting Step 2 - Upper and Lower Transmit Bank (cont'd)

Figure 7-199 Check in near Field Image



A dark streak in the near field, indicates either a defective Front Plane or the transducer itself has been damaged. Save image to the clipboard, swap the Front Plane locations, reproduce the saved image and compare. If images are the same, the transducer is bad. If there is one dark streak and it moved, the Front Plane is bad. If two dark streaks appear, both the transducer and the Front Plane are most likely defective.

In very uncommon cases, it has been seen that there was no physical damage apparent and the T/R Channel Test and Analog Rx diagnostics will pass, but there is a dark streak in the near field of the image.

In this case, typically only one half of the transmit waveform is being seen at the transducer. This is caused by one of the blocking diodes on a Front Plane being open.

It is important to use a known, good transducer to troubleshoot this type of failure mode.

Make sure the Front Planes and GTX Boards are marked for their original positions.

Remove GTX1 and GTX2, so only GTX3 is imaging in the system. Install the Front Planes in their original positions and check the near field image. There should be one dark streak. Save this image to the clipboard for reference.

Swap the Front Planes and check the near field image. If there are now two dark streaks, this is the defective GTX Board.

If one dark streak is apparent, rotate the remaining GTX Boards through slot 3 and repeat the test until the case of two dark streaks is seen.

If two dark streaks are seen with multiple GTX Boards, this may indicate a defective GRX Board.

7-9-20 How to Recognize missing Transmit and Receive Channels for Cardrack Troubleshooting on the LOGIQ E9

Use this to troubleshoot missing Transmit and Receive Channels in the Cardrack.

7-9-20-1 Topics in this Section

Image Artifact Troubleshooting, see:

- 7-9-20-2 "How to use this Section" on page 7-297
- 7-9-21 "How to Recognize missing Transmit and Receive Channels for a 9L-D Probe in a LOGIQ E9 GFI Configuration" on page 7-298
- "7-9-21 How to Recognize missing Transmit and Receive Channels for a 9L-D Probe in a LOGIQ E9 GFI Configuration (cont'd)" on page 7-299
- 7-9-22 "How to Recognize missing Transmit and Receive Channels for a C1-5-D Probe in a LOGIQ E9 GFI Configuration" on page 7-304
- 7-9-23 "How to Recognize missing Transmit and Receive Channels for a ML-6-15-D Probe in a LOGIQ E9 GFI Configuration" on page 7-310
- 7-9-24 "How to Recognize missing Transmit and Receive Channels for a 9L-D Probe in a LOGIQ E9 MRX Configuration" on page 7-316
- 7-9-25 "How to Recognize missing Transmit and Receive Channels for a C1-5-D Probe in a LOGIQ E9 MRX Configuration" on page 7-322
- 7-9-26 "How to Recognize missing Transmit and Receive Channels for a ML-6-15-D Probe in a LOGIQ E9 MRX Configuration" on page 7-328.

7-9-20-2 How to use this Section

This Section shows how to identify channels' area of influence associated with certain probes, and transmit and receive boards within the Cardrack. By looking at the missing channels area, you can identify the boards associated with that channel and determine possible origin of a particular artifact.

Colors are used to identify the components and the "region" within the near field are bordered in the same color (as the respective component). Within this "region" is where an artifact will appear.

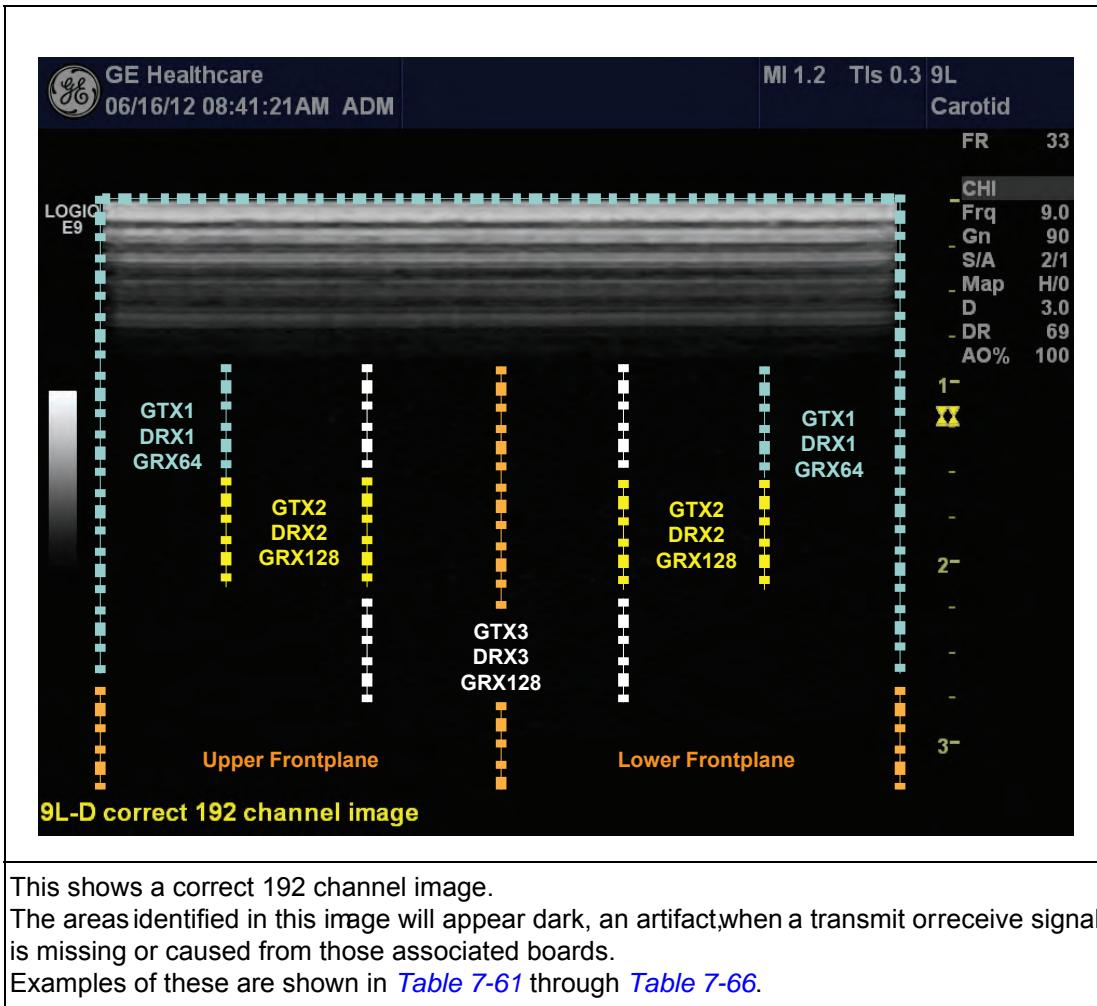
The guide lines in the overlays represent an approximate border between components. When an artifact is seen near the border between two components, both components should be considered.

7-9-21 How to Recognize missing Transmit and Receive Channels for a 9L-D Probe in a LOGIQ E9 GFI Configuration

Table 7-61, "GFI Configuration - 9L-D Probe with a correct 192 channel image," on page 298.

7-9-21-1 9L-D Probe - Missing Transmit and Receive Channels

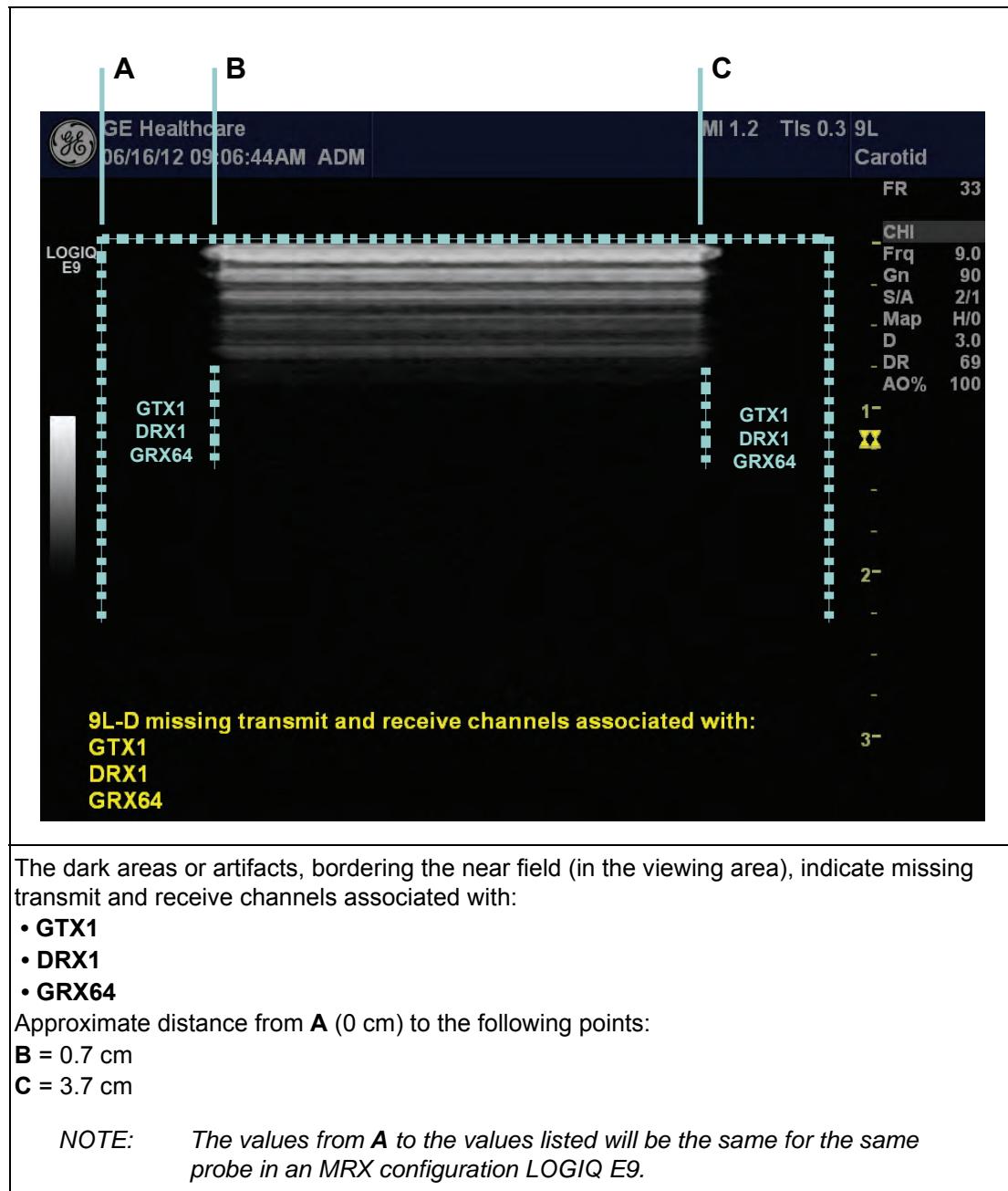
Table 7-61 GFI Configuration - 9L-D Probe with a correct 192 channel image



7-9-21 How to Recognize missing Transmit and Receive Channels for a 9L-D Probe in a LOGIQ E9 GFI Configuration (cont'd)

7-9-21-2 9L-D Probe - Missing Transmit and Receive Channels

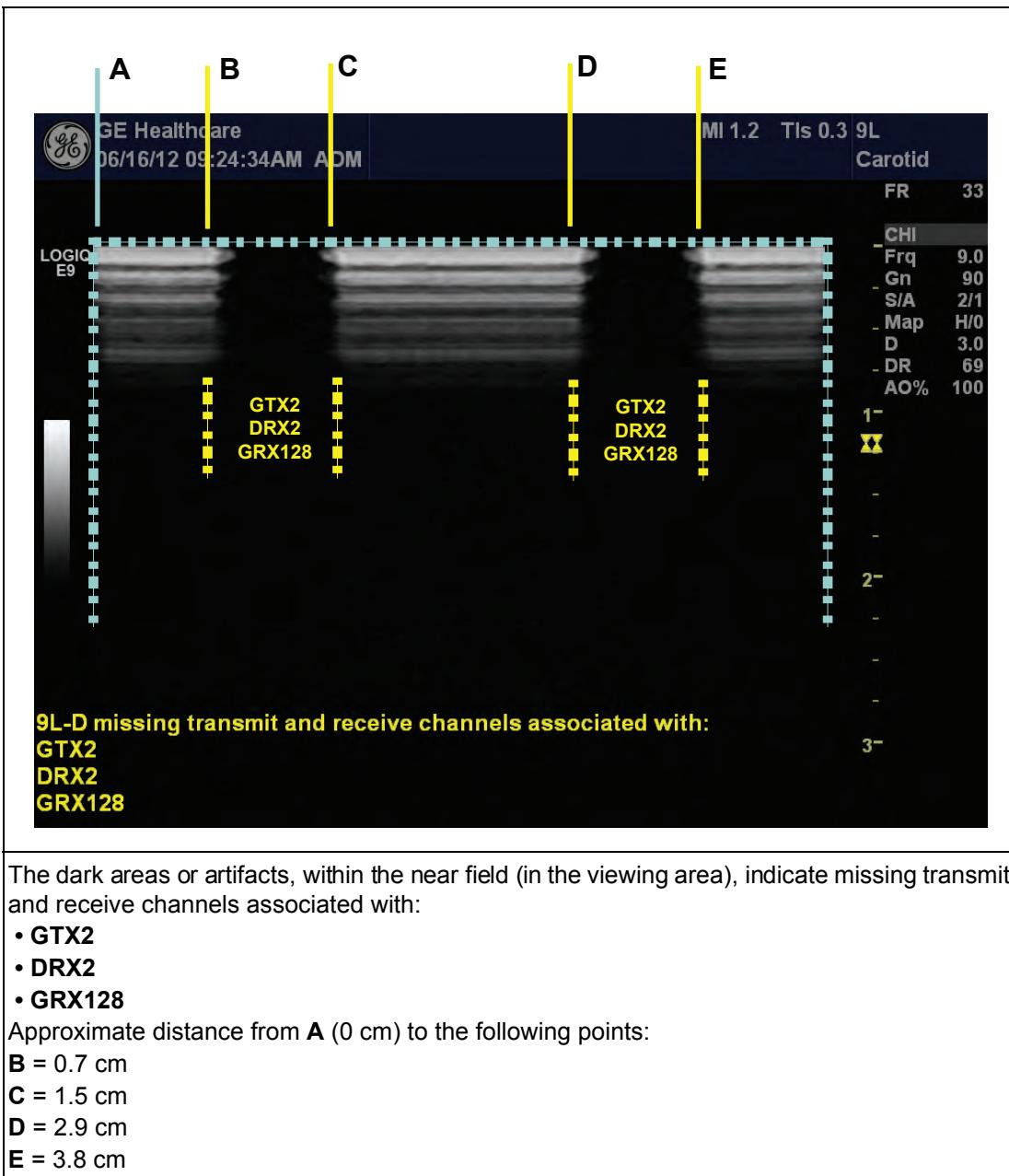
Table 7-62 9L-D Probe - GFI Configuration



7-9-21 How to Recognize missing Transmit and Receive Channels for a 9L-D Probe in a LOGIQ E9 GFI Configuration (cont'd)

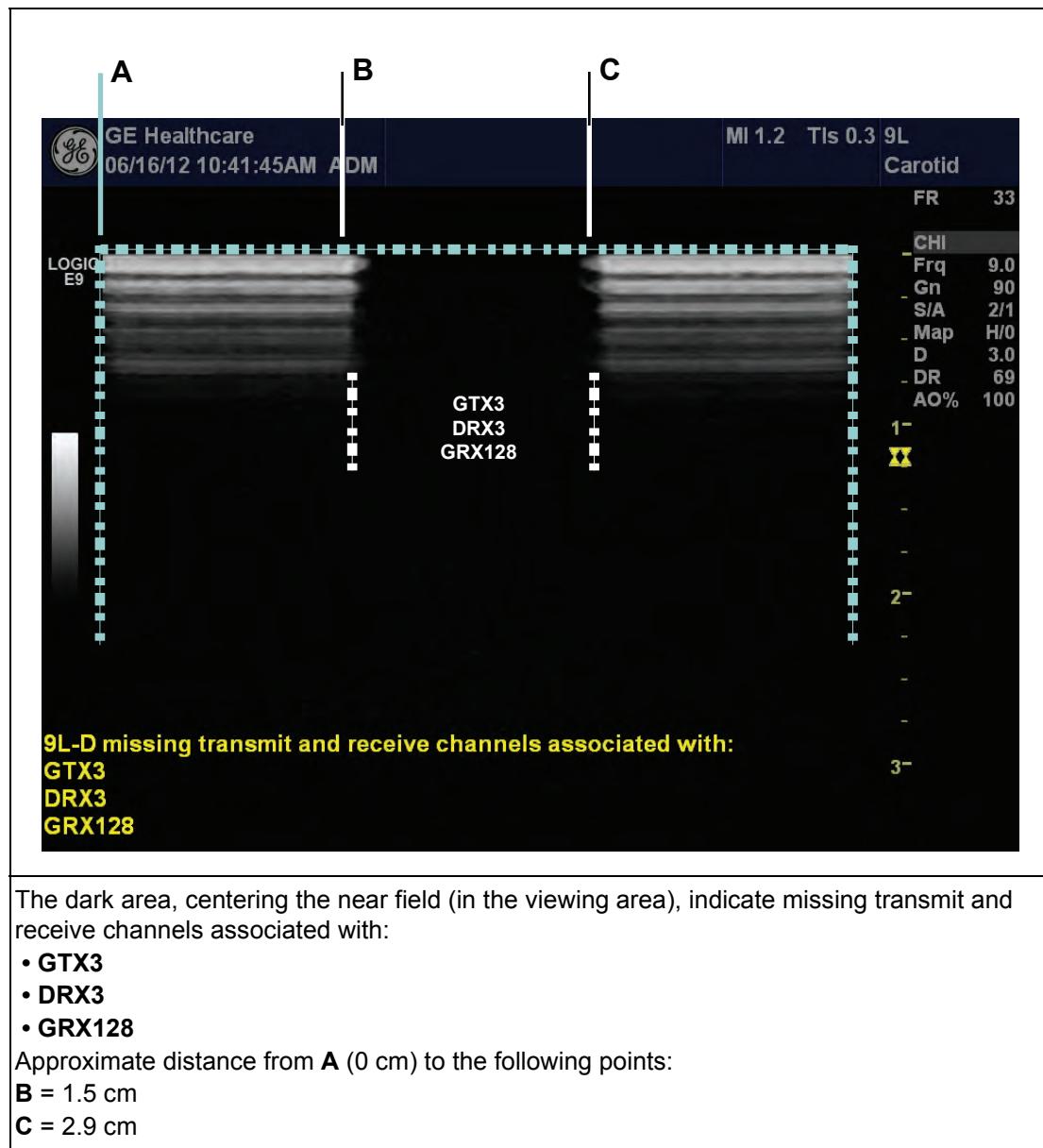
7-9-21-3 9L-D Probe - Missing Transmit and Receive Channels

Table 7-63 GFI Configuration - 9L-D Probe



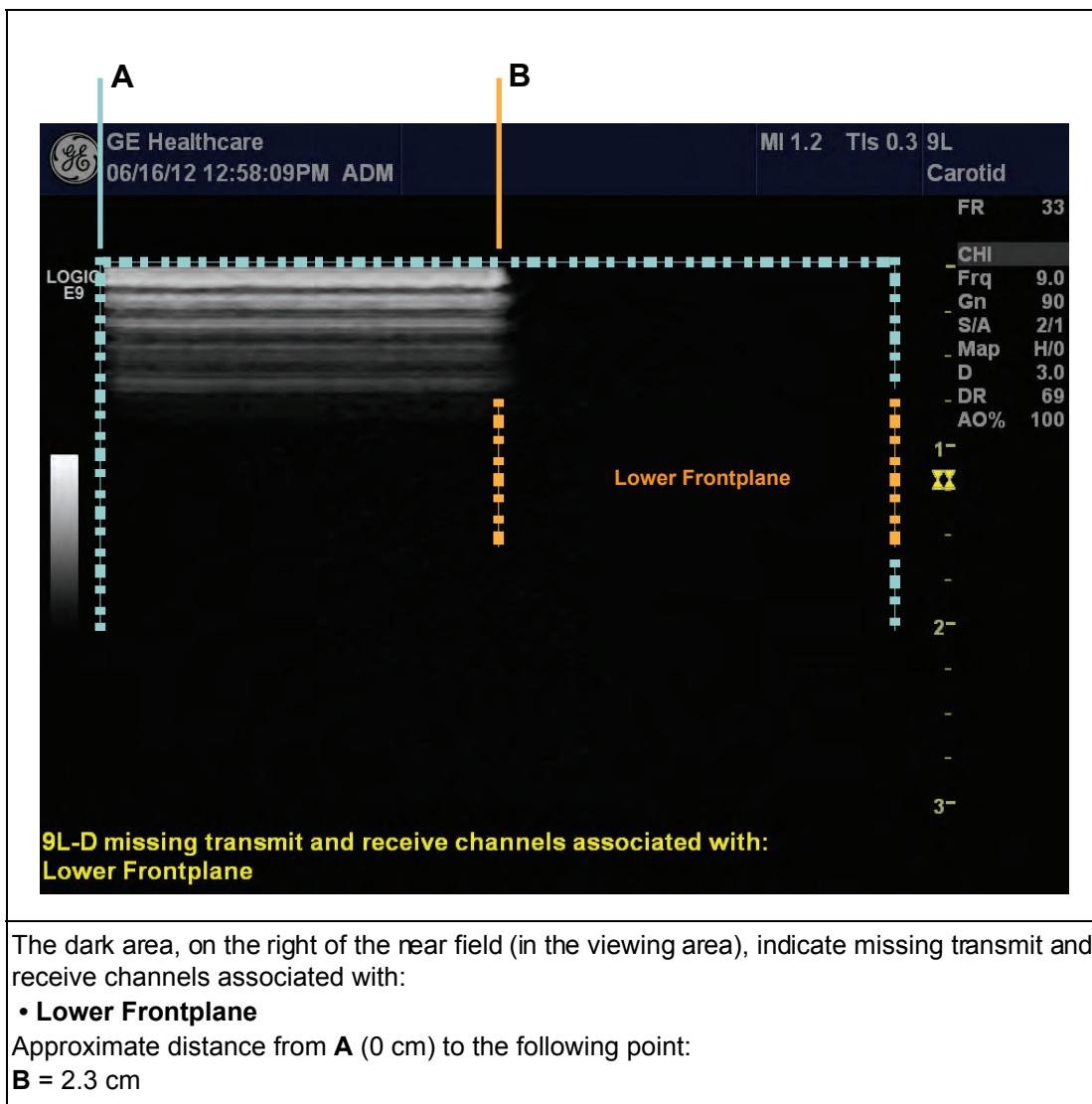
7-9-21 How to Recognize missing Transmit and Receive Channels for a 9L-D Probe in a LOGIQ E9 GFI Configuration (cont'd)

Table 7-64 GFI Configuration - 9L-D Probe



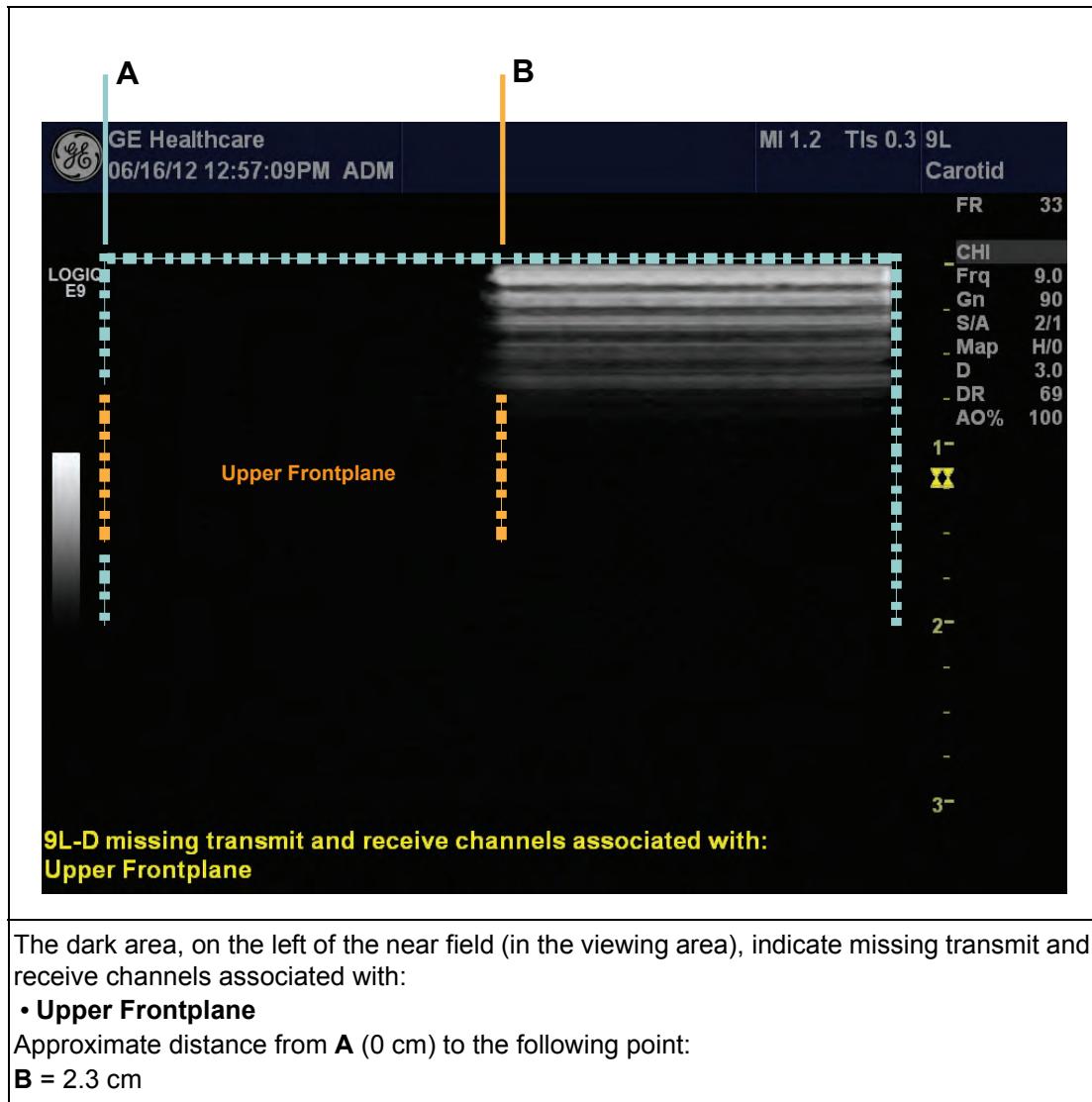
7-9-21 How to Recognize missing Transmit and Receive Channels for a 9L-D Probe in a LOGIQ E9 GFI Configuration (cont'd)

Table 7-65 GFI Configuration - 9L-D Probe



7-9-21 How to Recognize missing Transmit and Receive Channels for a 9L-D Probe in a LOGIQ E9 GFI Configuration (cont'd)

Table 7-66 GFI Configuration - 9L-D Probe

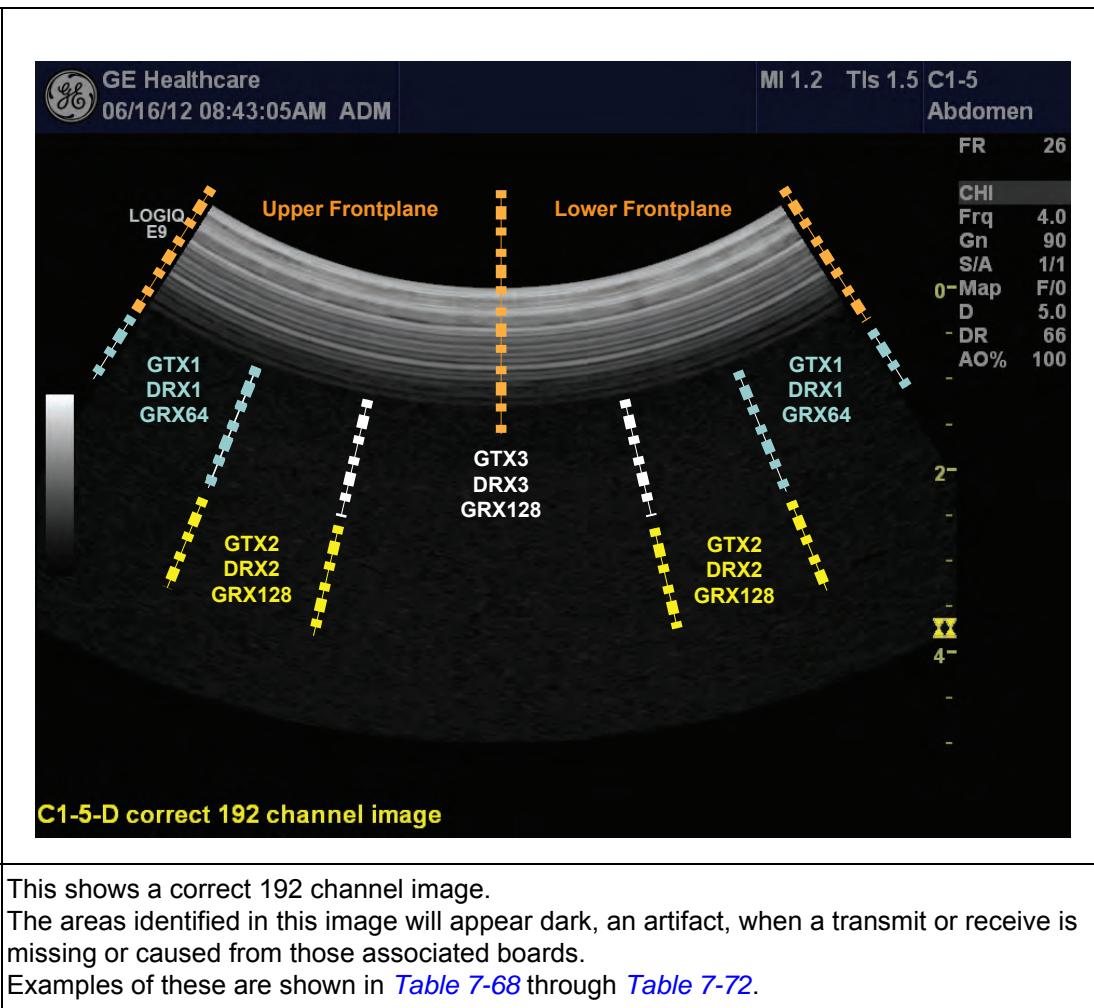


7-9-22 How to Recognize missing Transmit and Receive Channels for a C1-5-D Probe in a LOGIQ E9 GFI Configuration

Table 7-67, "GFI Configuration - C1-5-D Probe with a correct 192 channel image," on page 304.

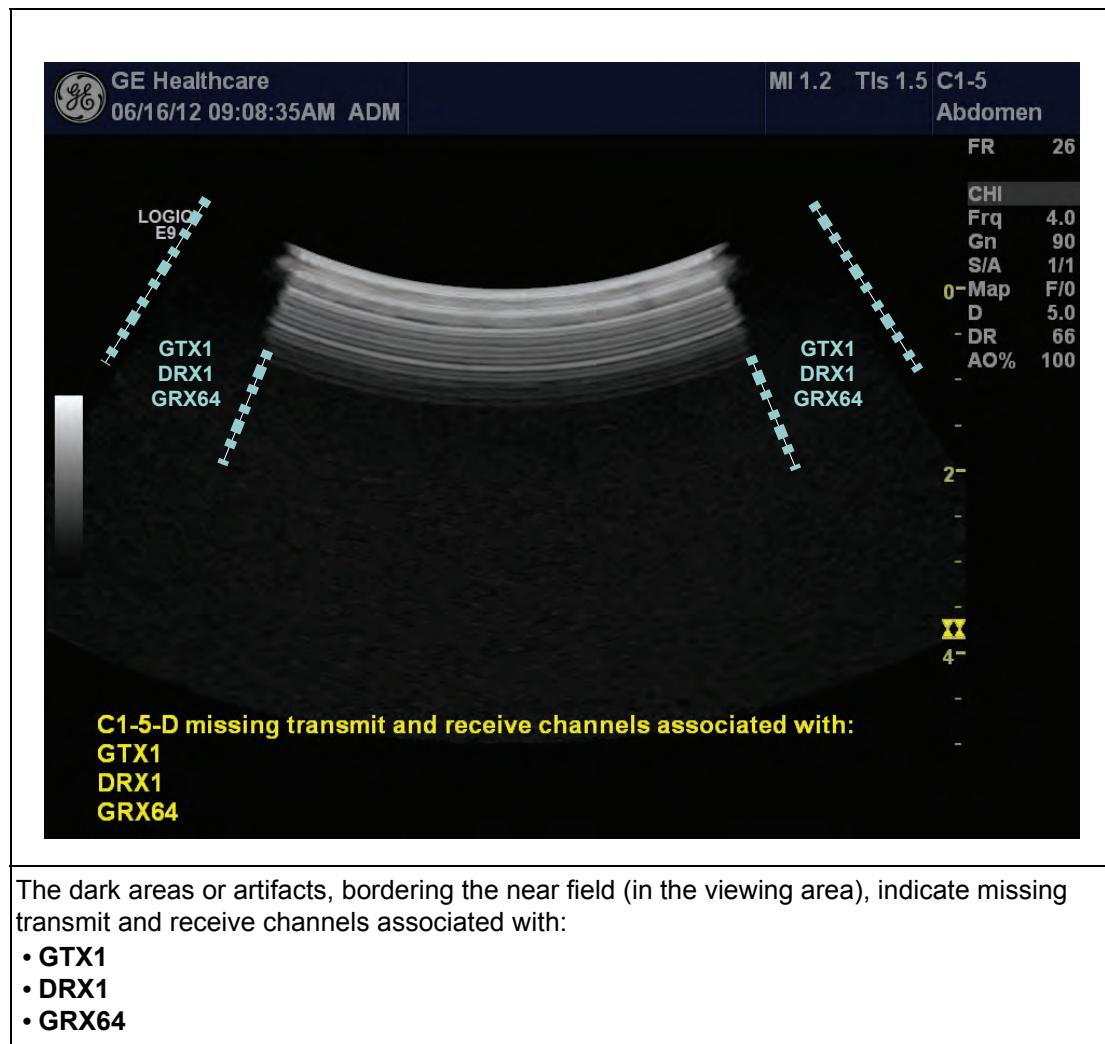
7-9-22-1 C1-5-D Probe - Missing Transmit and Receive Channels

Table 7-67 GFI Configuration - C1-5-D Probe with a correct 192 channel image



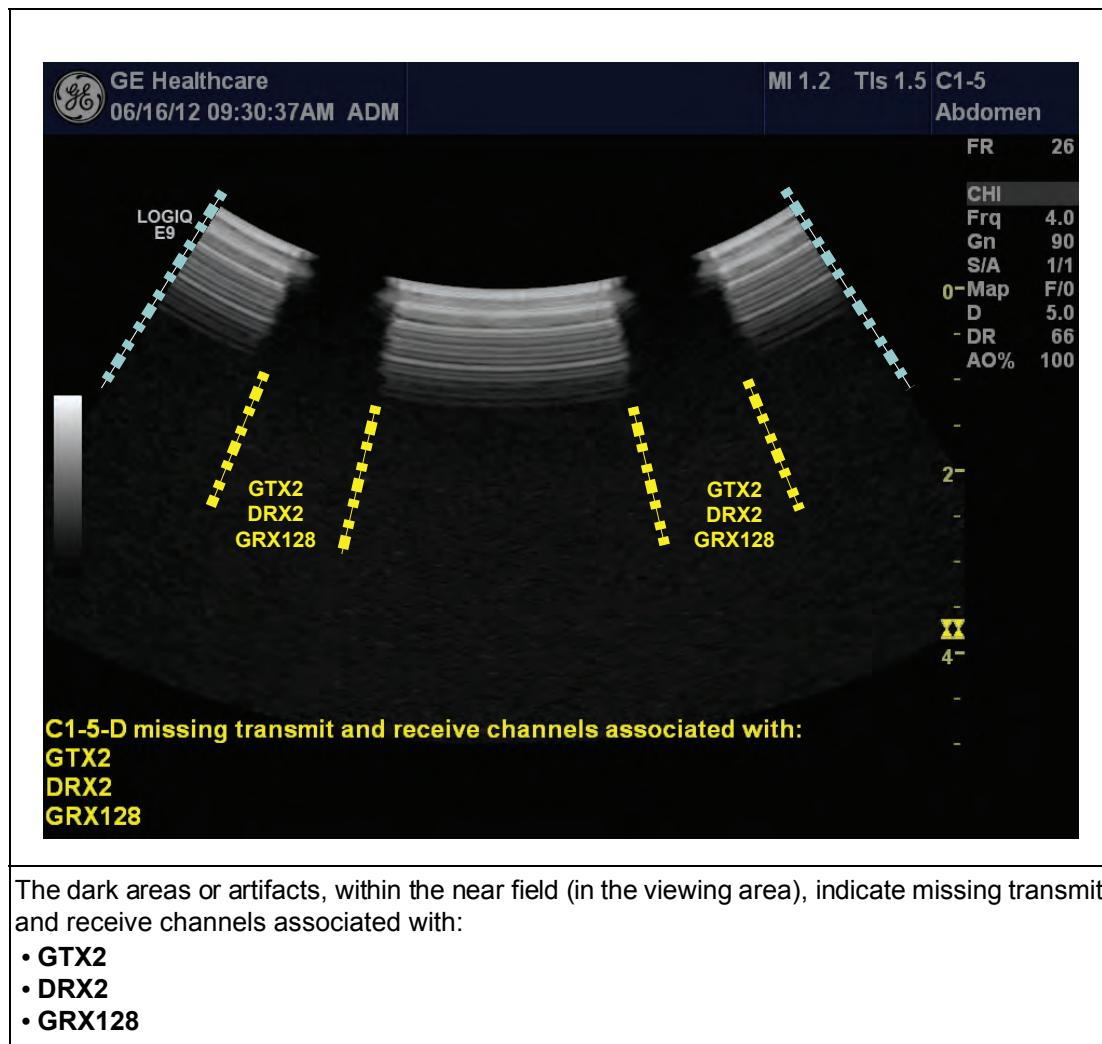
7-9-22-1 C1-5-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-68 C1-5-D Probe - GFI Configuration



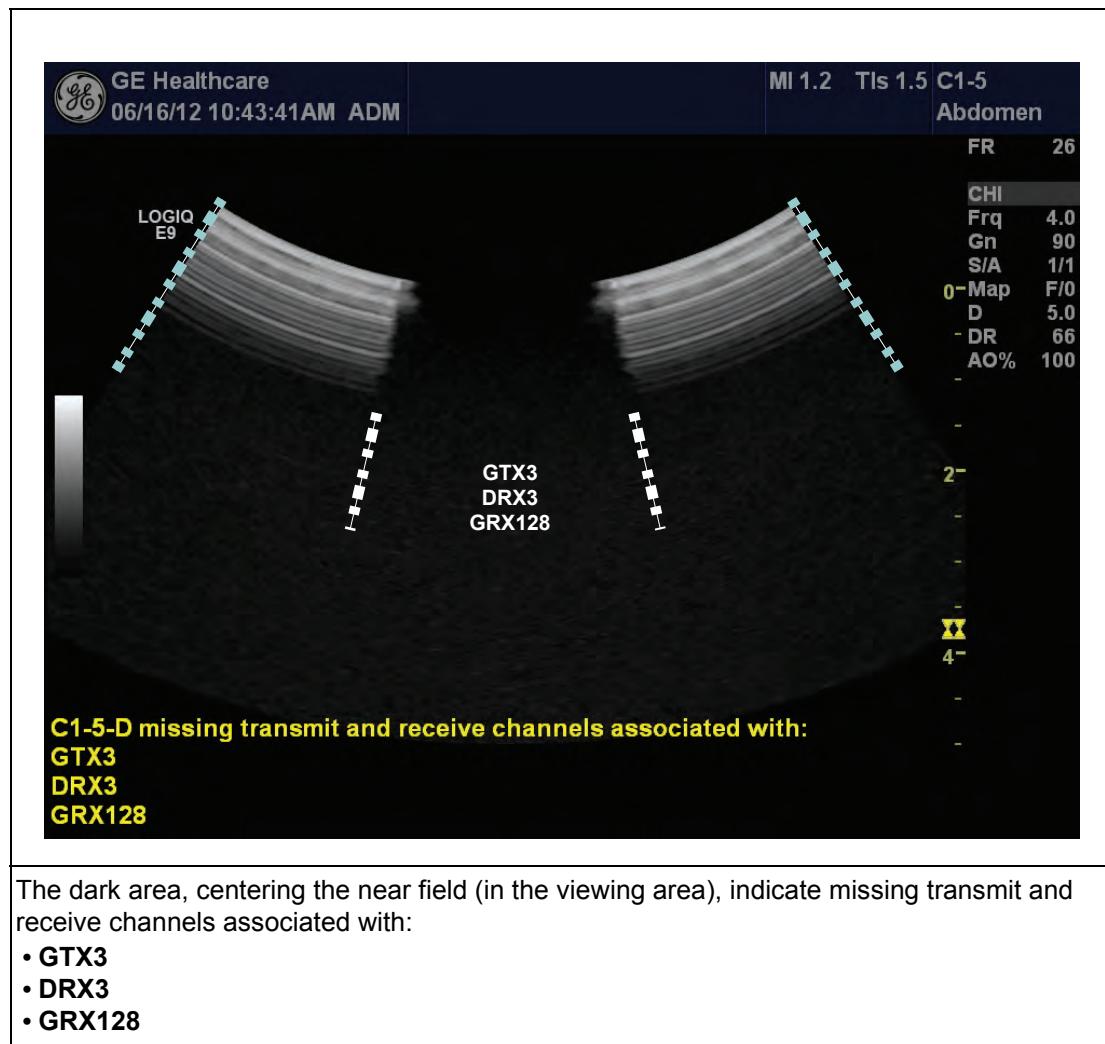
7-9-22-1 C1-5-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-69 GFI Configuration - C1-5-D Probe



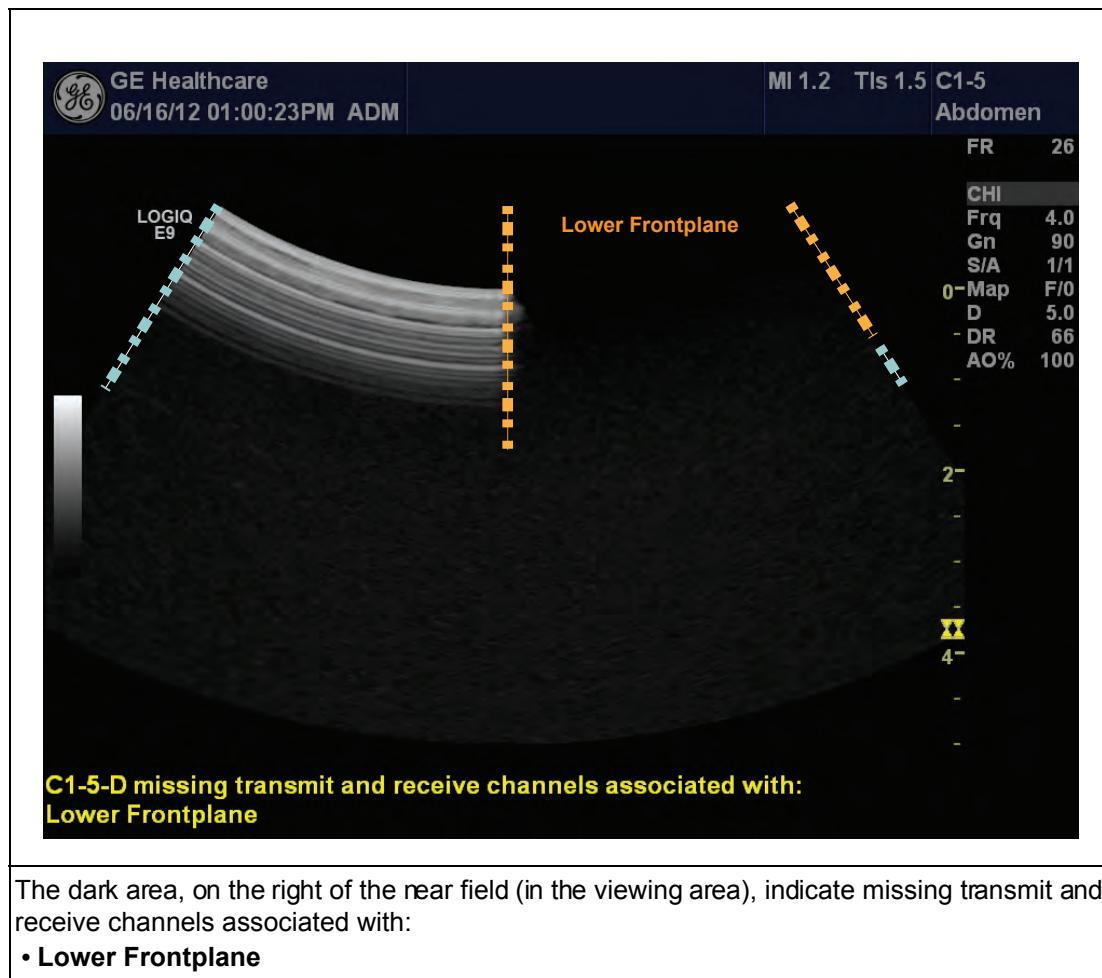
7-9-22-1 C1-5-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-70 GFI Configuration - C1-5-D Probe



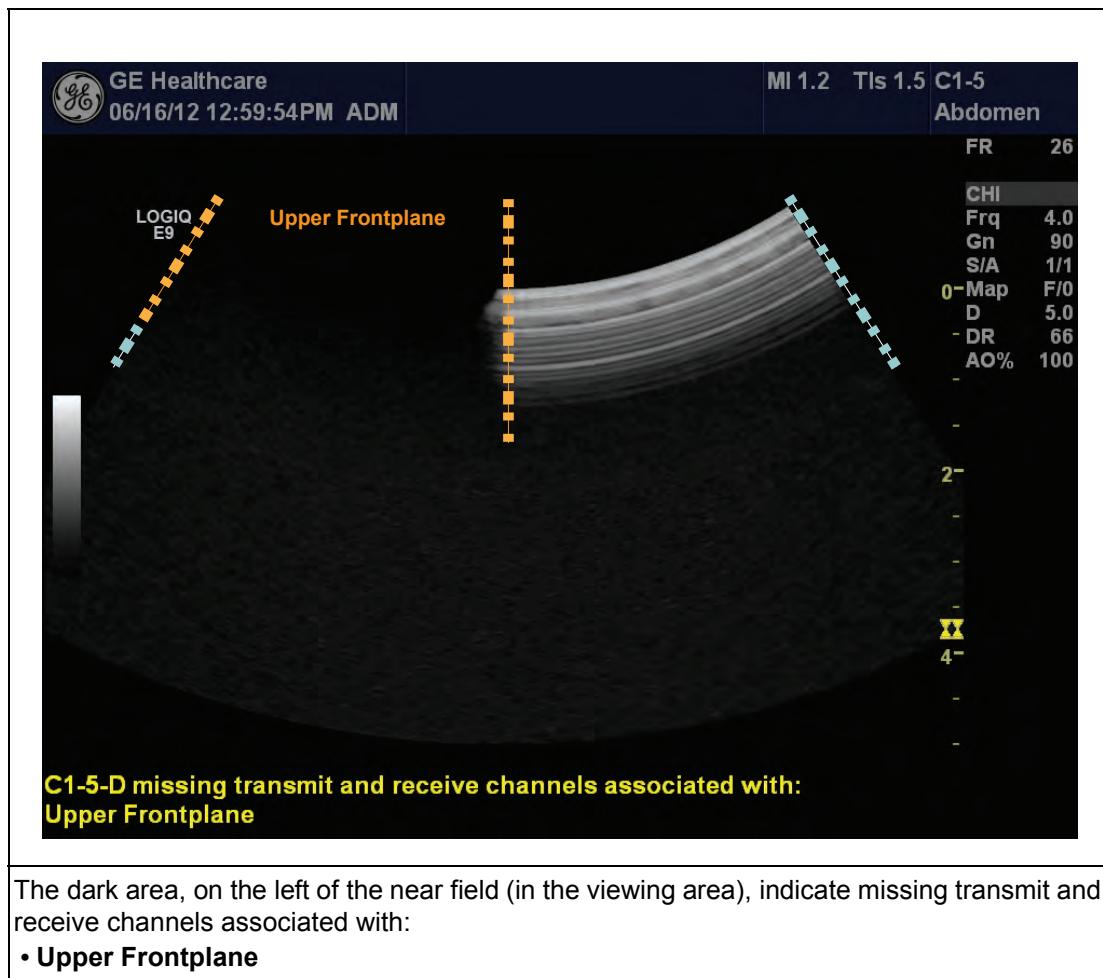
7-9-22-1 C1-5-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-71 GFI Configuration - C1-5-D Probe



7-9-22-1 C1-5-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-72 GFI Configuration - C1-5-D Probe

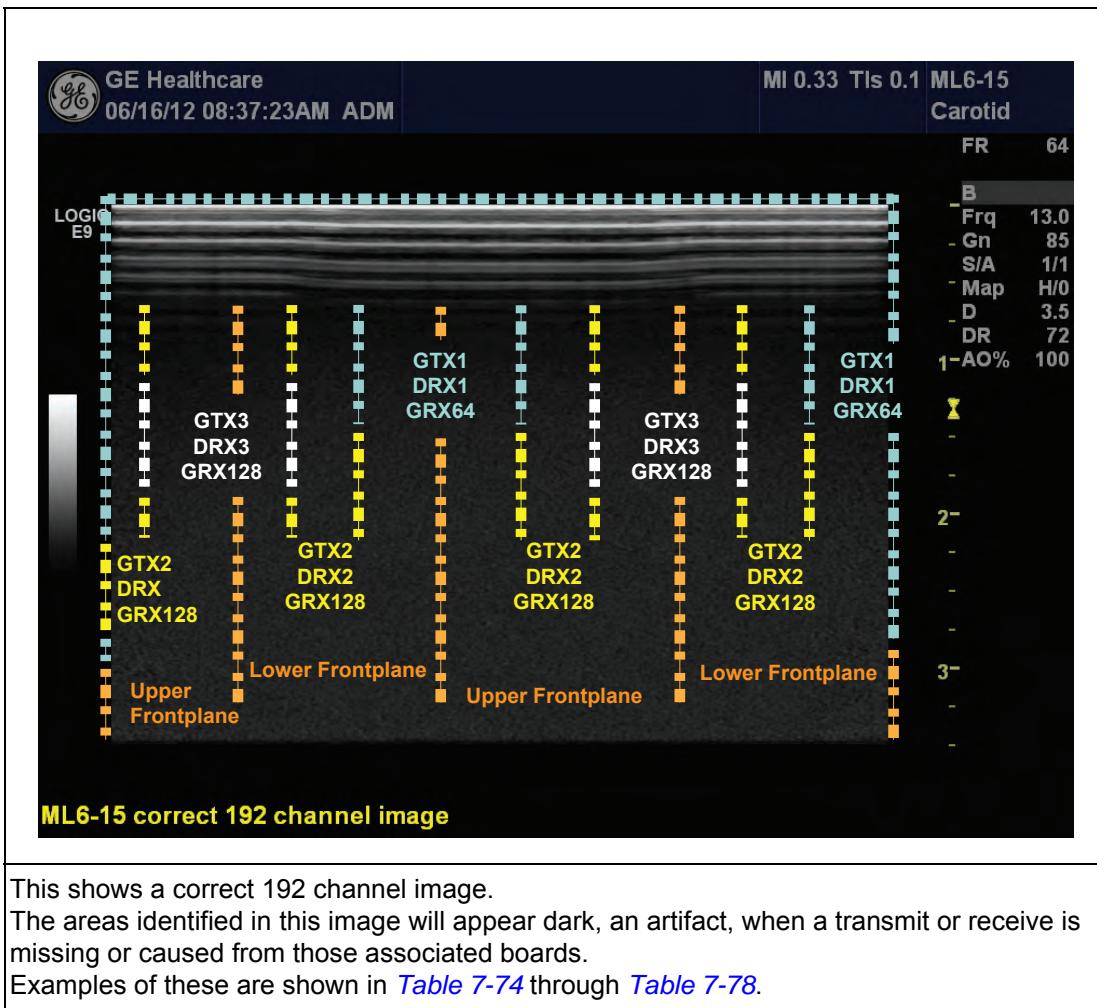


7-9-23 How to Recognize missing Transmit and Receive Channels for a ML-6-15-D Probe in a LOGIQ E9 GFI Configuration

Table 7-73, "GFI Configuration - ML-6-15-D Probe with a correct 192 channel image," on page 310.

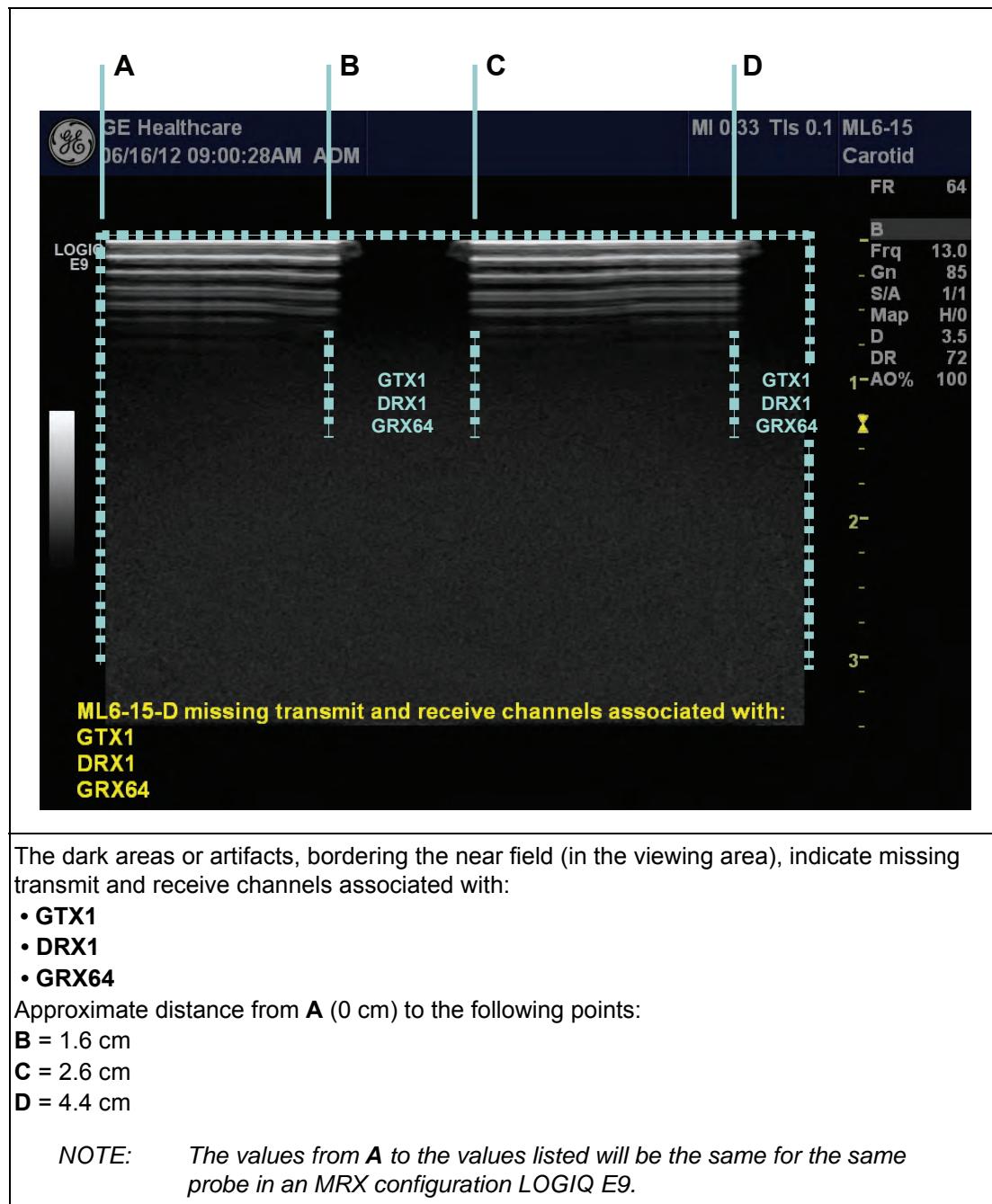
7-9-23-1 ML-6-15-D Probe - Missing Transmit and Receive Channels

Table 7-73 GFI Configuration - ML-6-15-D Probe with a correct 192 channel image



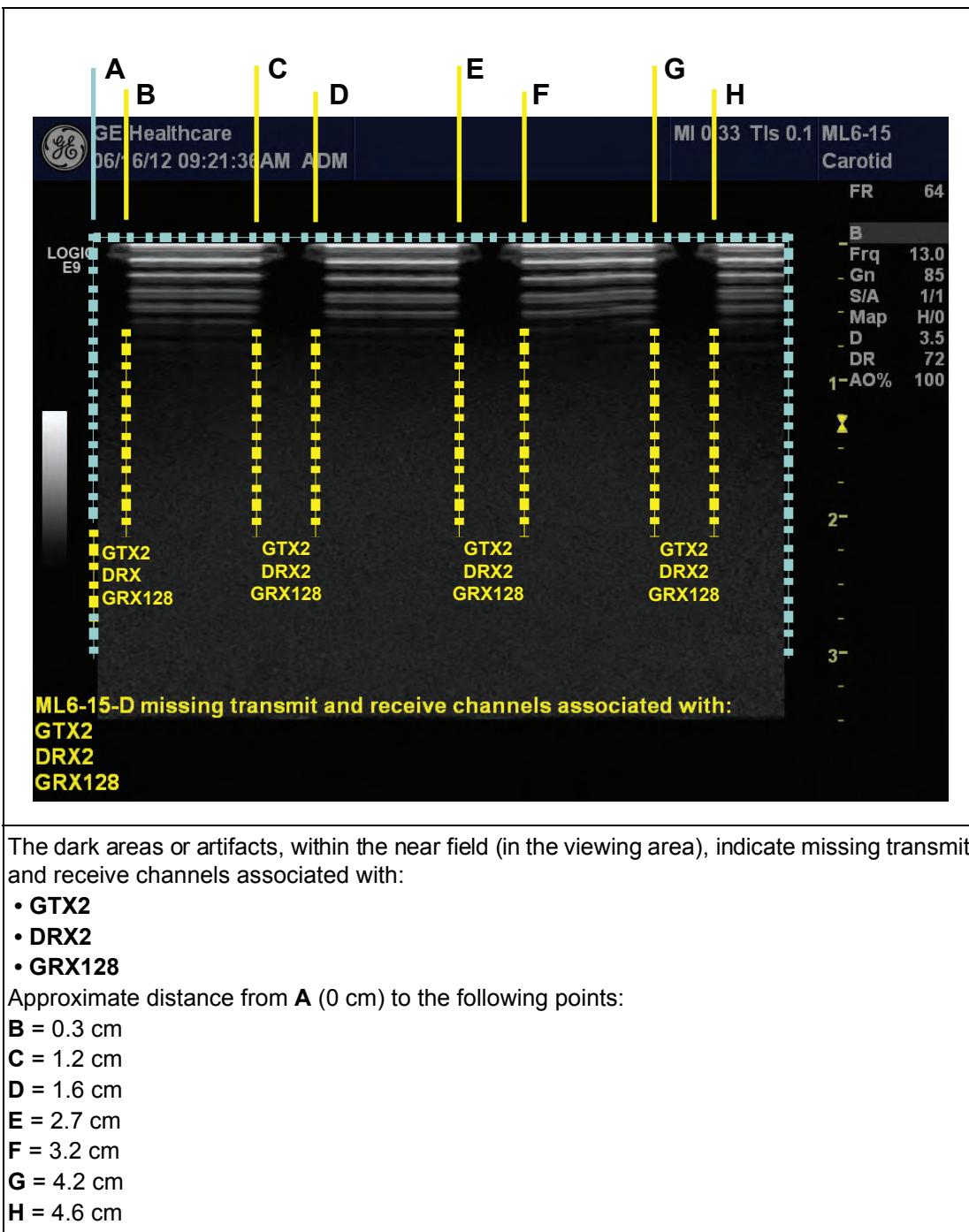
7-9-23-1 ML-6-15-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-74 ML-6-15-D Probe - GFI Configuration



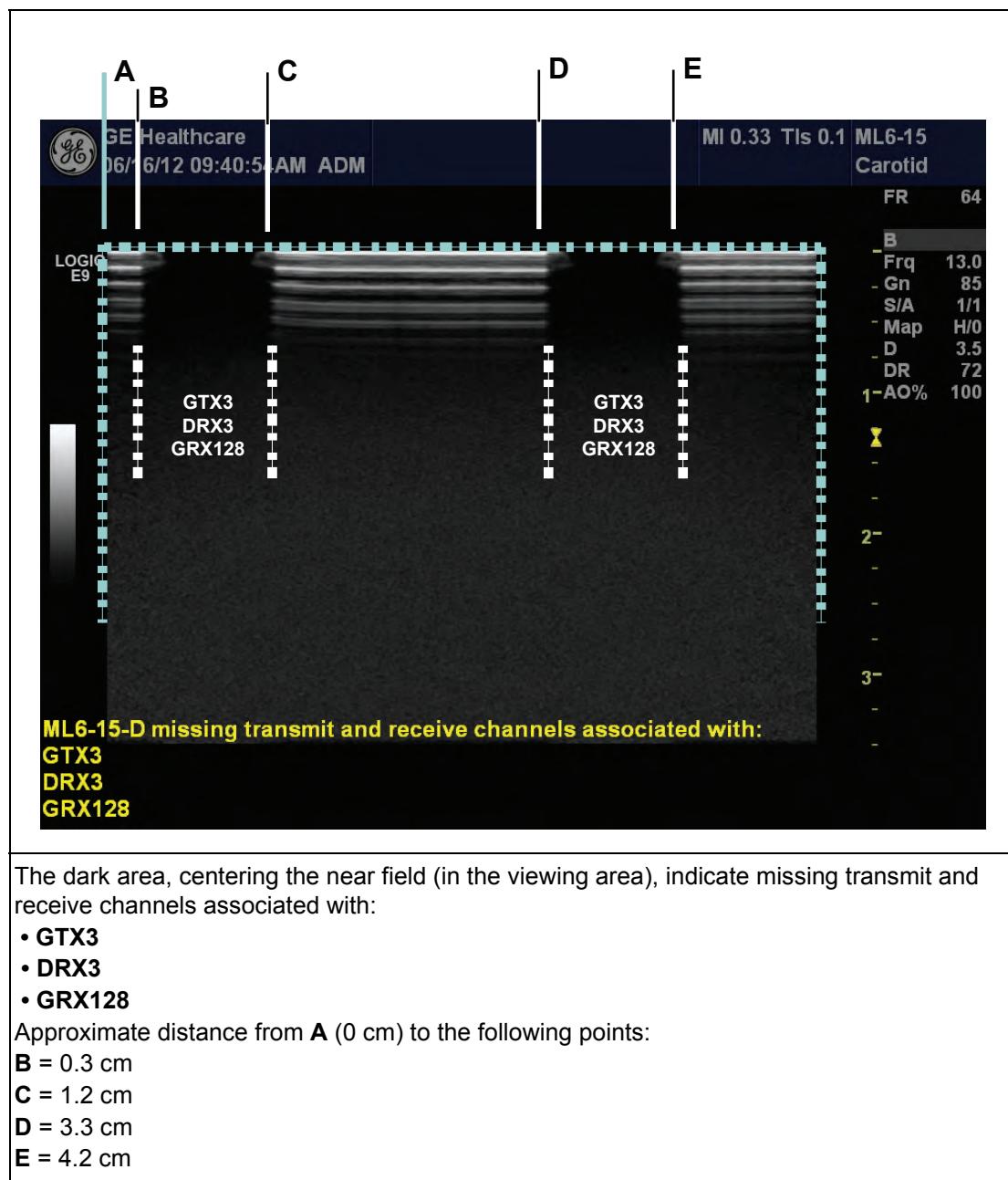
7-9-23-1 ML-6-15-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-75 GFI Configuration - ML-6-15-D Probe



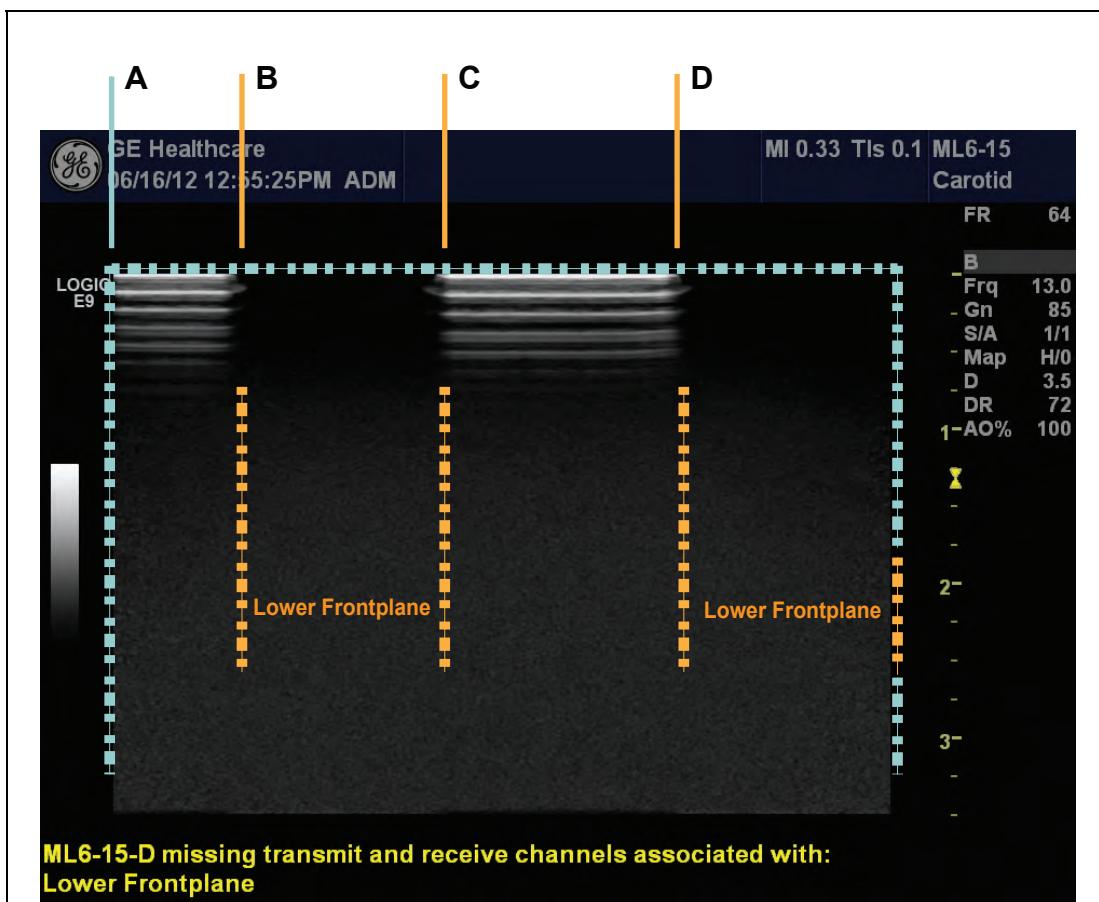
7-9-23-1 ML-6-15-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-76 GFI Configuration - ML-6-15-D Probe



7-9-23-1 ML-6-15-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-77 GFI Configuration - ML-6-15-D Probe



The dark area, on the right of the near field (in the viewing area), indicate missing transmit and receive channels associated with:

- Lower Frontplane

Approximate distance from **A** (0 cm) to the following points:

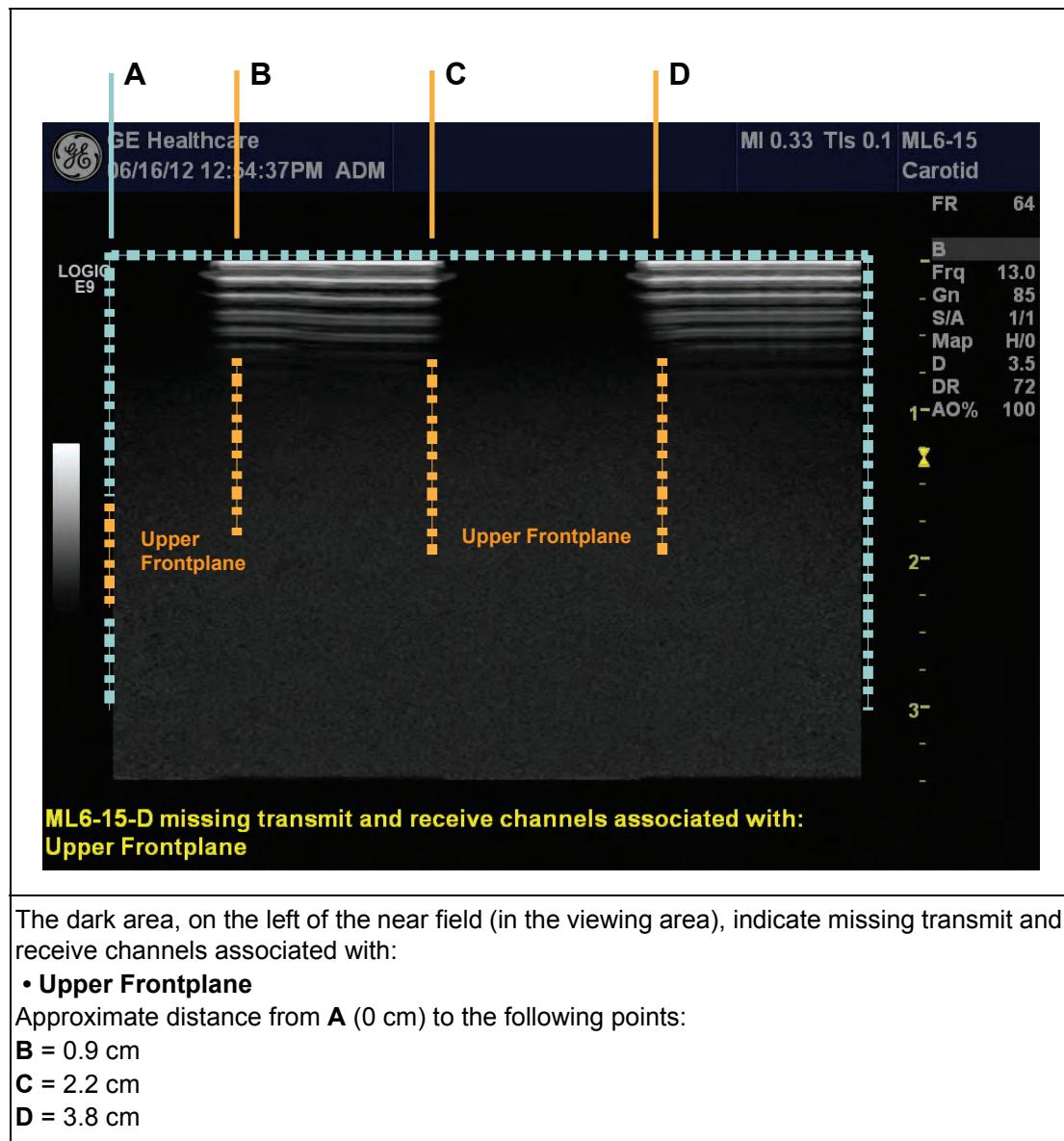
$$B = 0.9 \text{ cm}$$

$$C = 2.2 \text{ cm}$$

D = 3.8 cm

7-9-23-1 ML-6-15-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-78 GFI Configuration - ML-6-15-D Probe

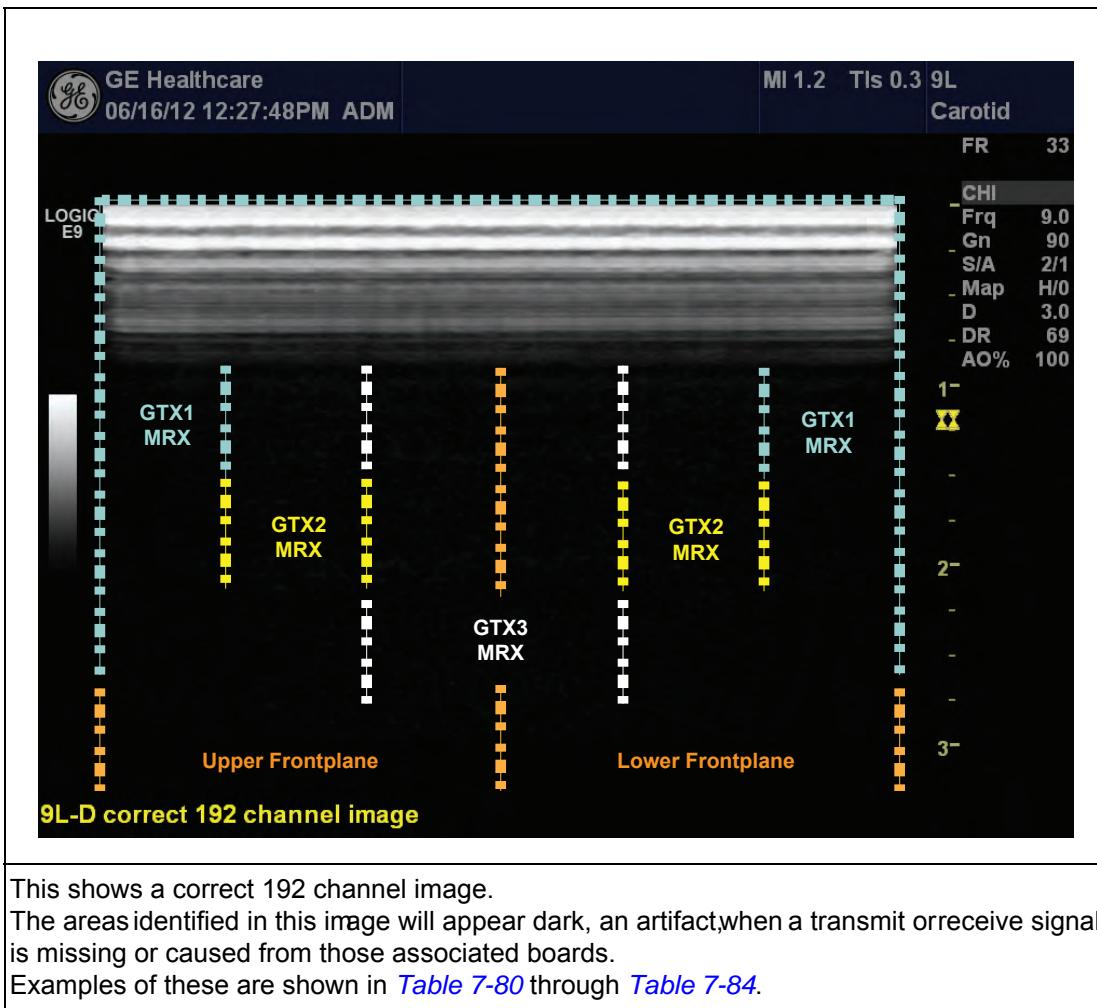


7-9-24 How to Recognize missing Transmit and Receive Channels for a 9L-D Probe in a LOGIQ E9 MRX Configuration

Table 7-79, "MRX Configuration - 9L-D Probe with a correct 192 channel image," on page 316

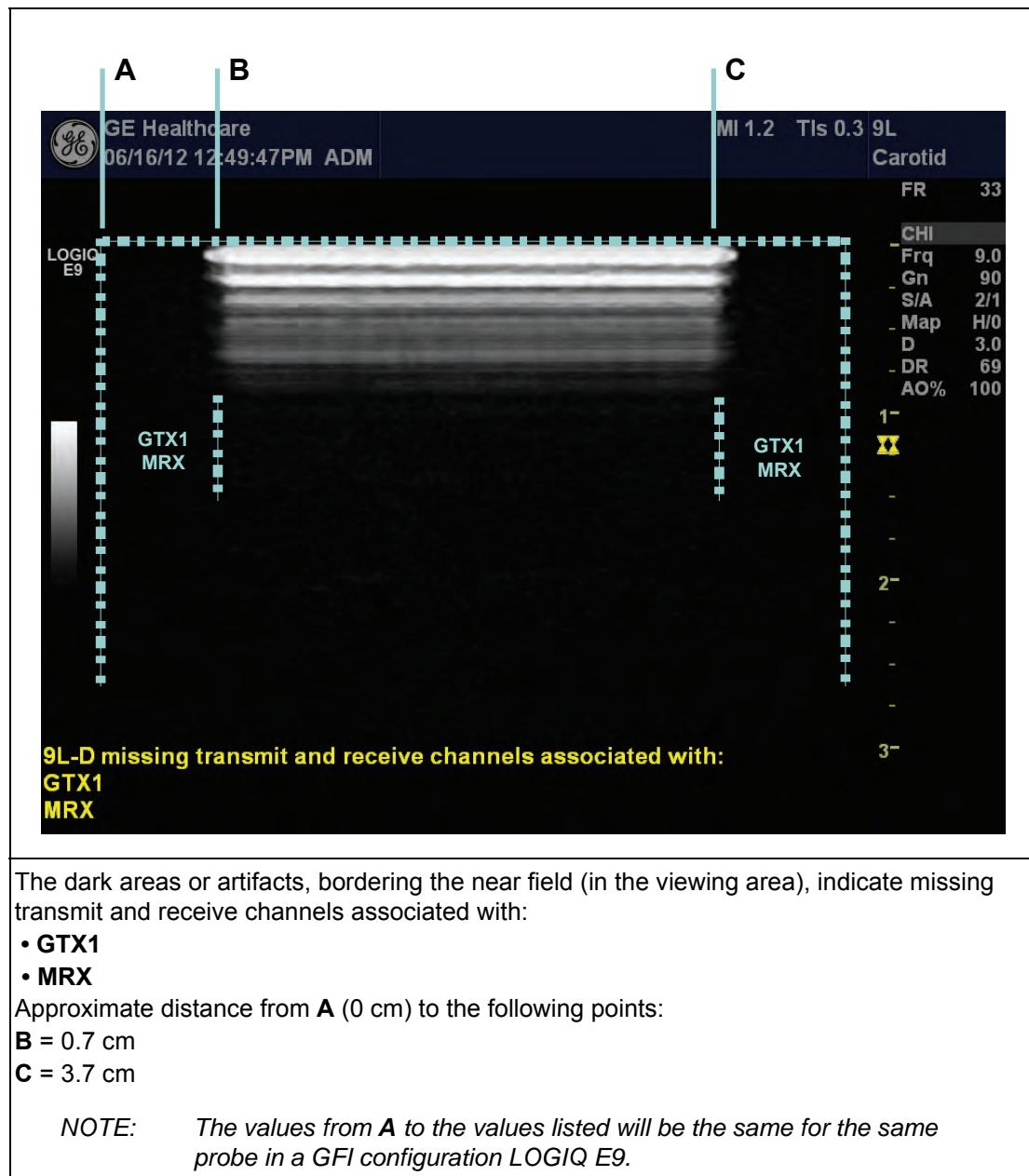
7-9-24-1 9L-D Probe - Missing Transmit and Receive Channels

Table 7-79 MRX Configuration - 9L-D Probe with a correct 192 channel image



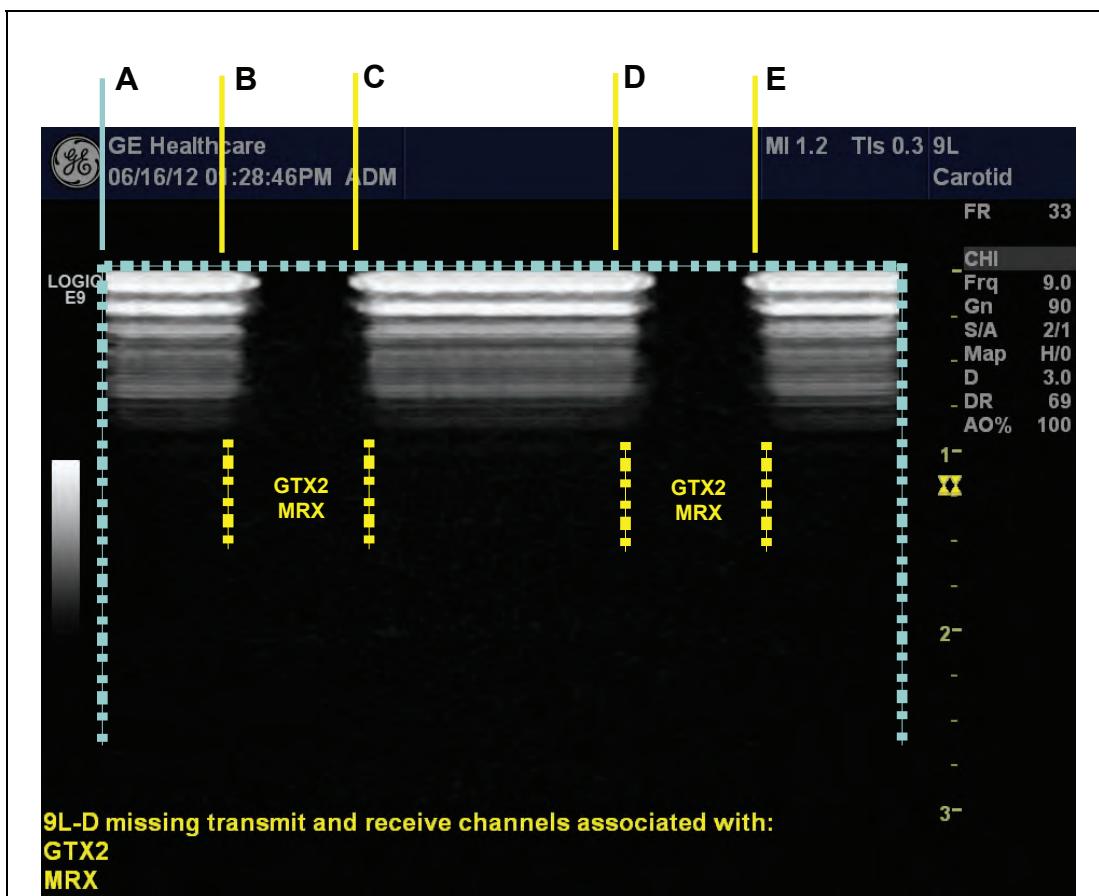
7-9-24-2 9L-D Probe - Missing Transmit and Receive Channels

Table 7-80 9L-D Probe - MRX Configuration



7-9-24-2 9L-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-81 MRX Configuration - 9L-D Probe



The dark areas or artifacts, within the near field (in the viewing area), indicate missing transmit and receive channels associated with:

- **GTX2**
- **MRX**

Approximate distance from **A** (0 cm) to the following points:

B = 0.7 cm

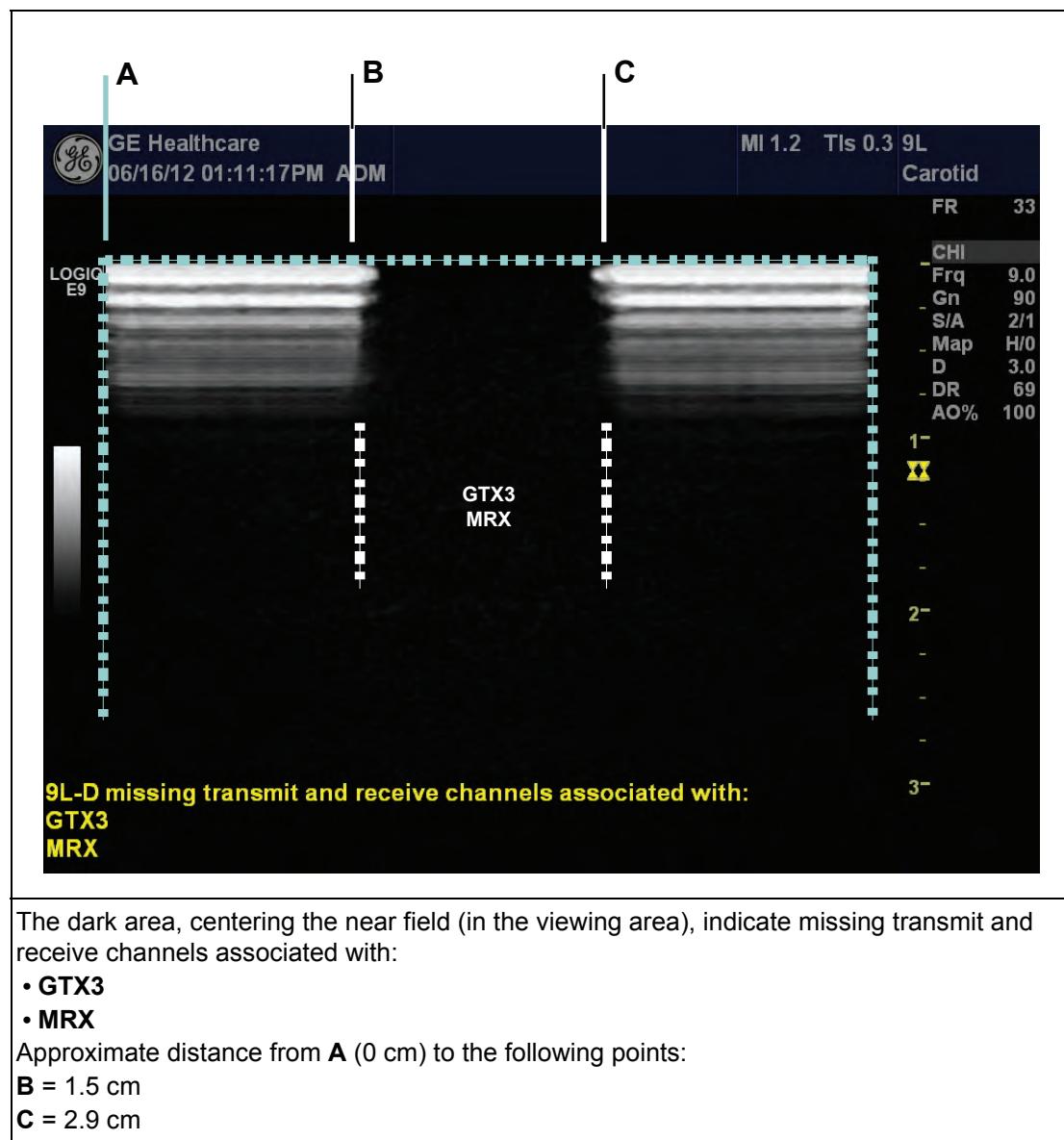
C = 1.5 cm

D = 2.9 cm

E = 3.8 cm

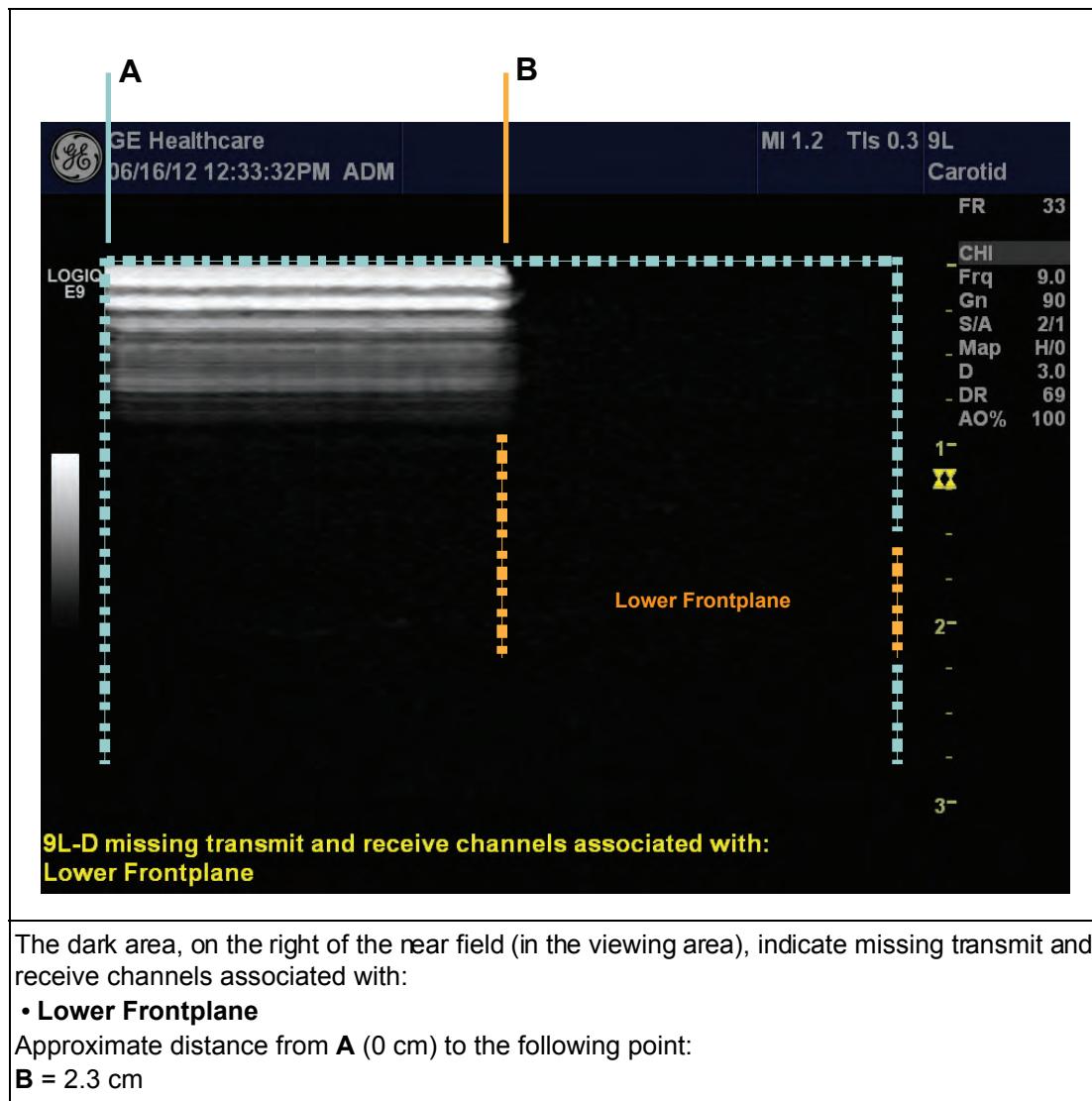
7-9-24-2 9L-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-82 MRX Configuration - 9L-D Probe



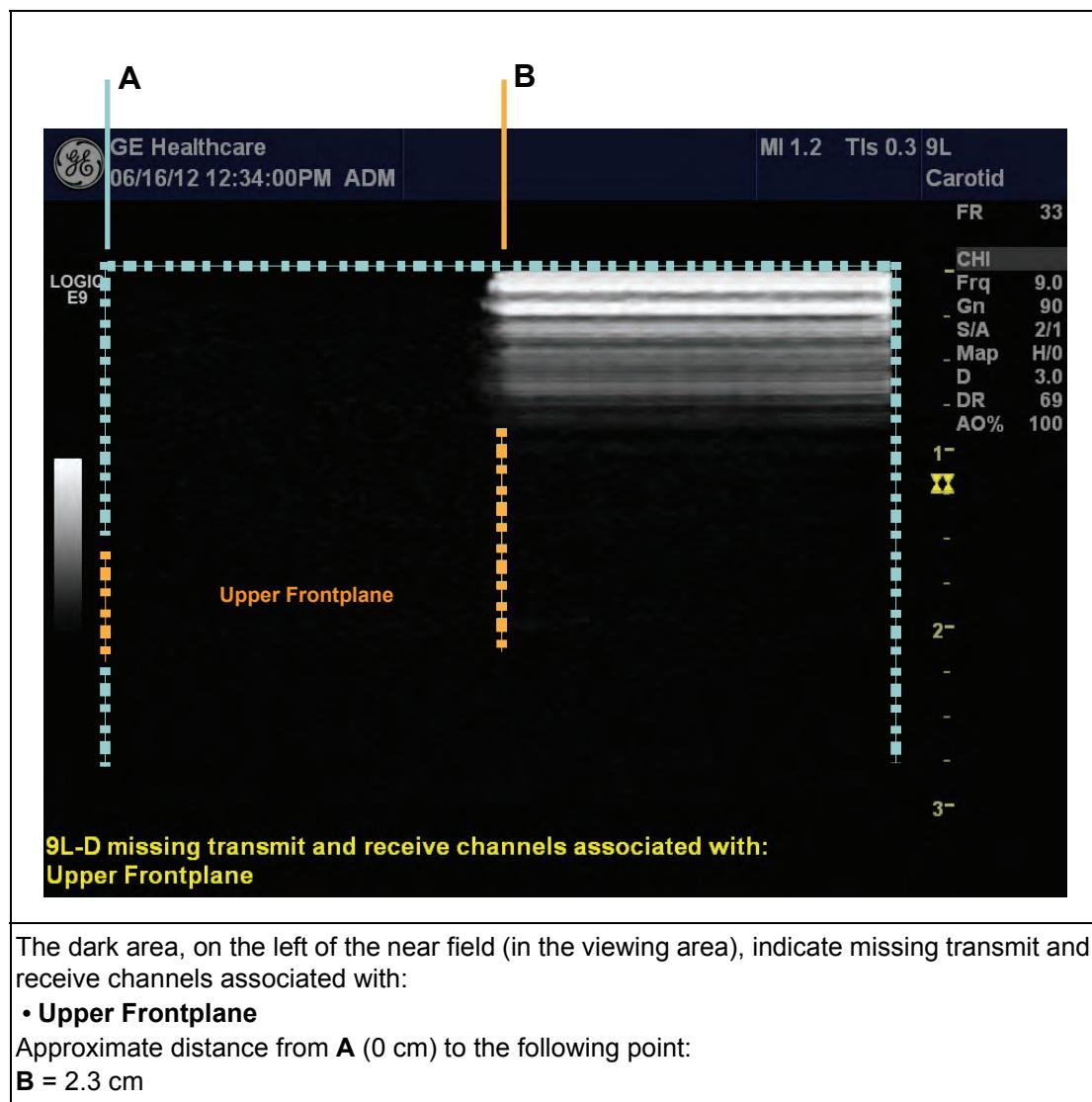
7-9-24-2 9L-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-83 MRX Configuration - 9L-D Probe



7-9-24-2 9L-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-84 MRX Configuration - 9L-D Probe

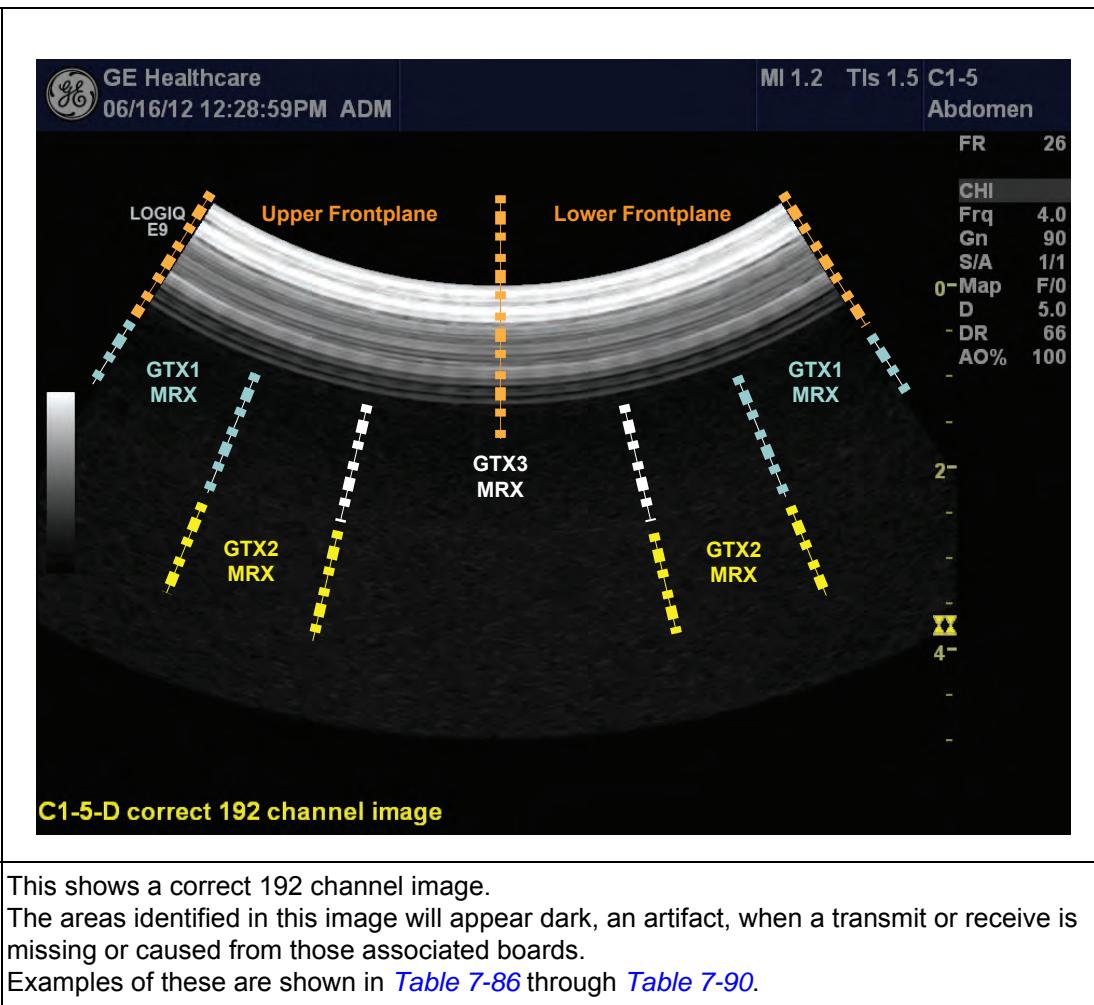


7-9-25 How to Recognize missing Transmit and Receive Channels for a C1-5-D Probe in a LOGIQ E9 MRX Configuration

Table 7-85, "MRX Configuration - C1-5-D Probe with a correct 192 channel image," on page 322

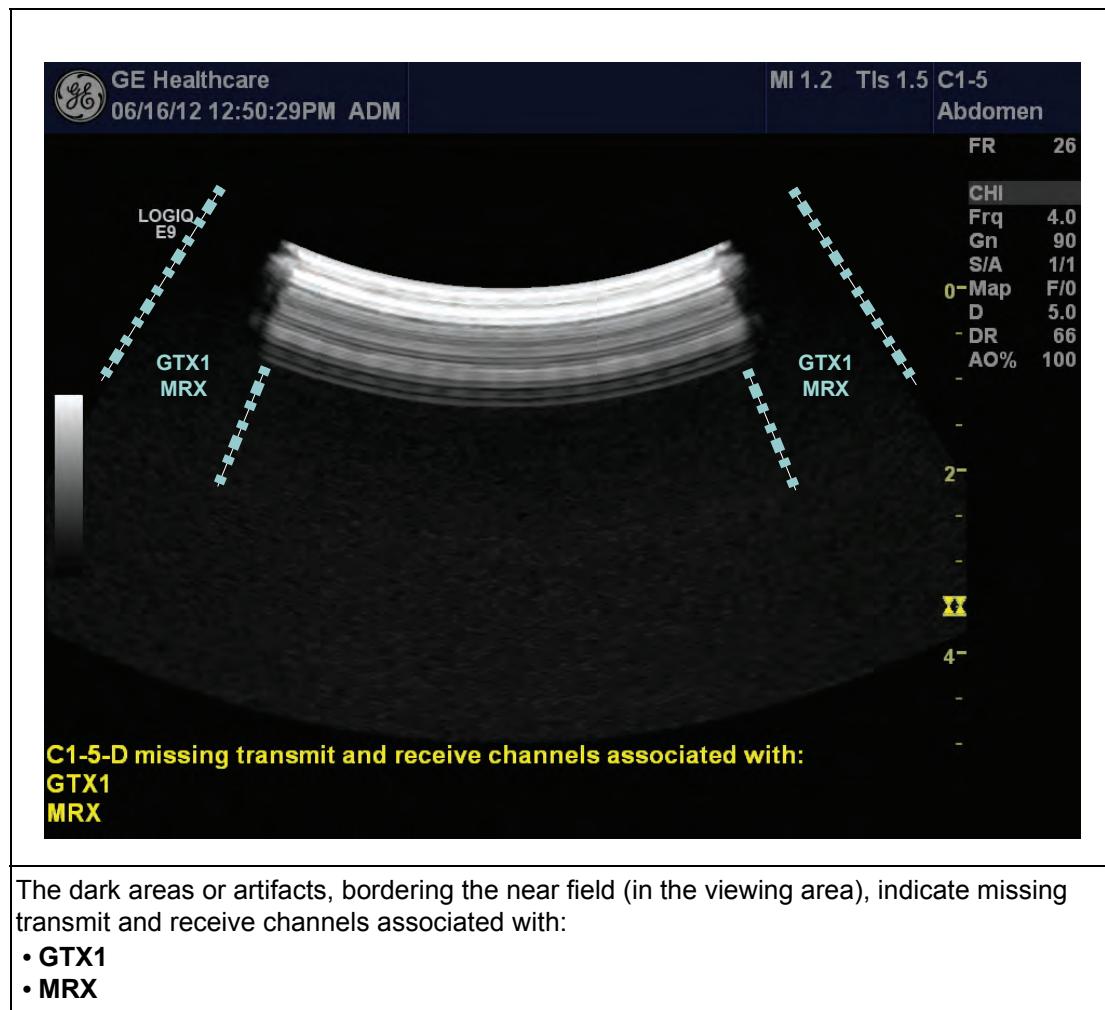
7-9-25-1 C1-5-D Probe - Missing Transmit and Receive Channels

Table 7-85 MRX Configuration - C1-5-D Probe with a correct 192 channel image



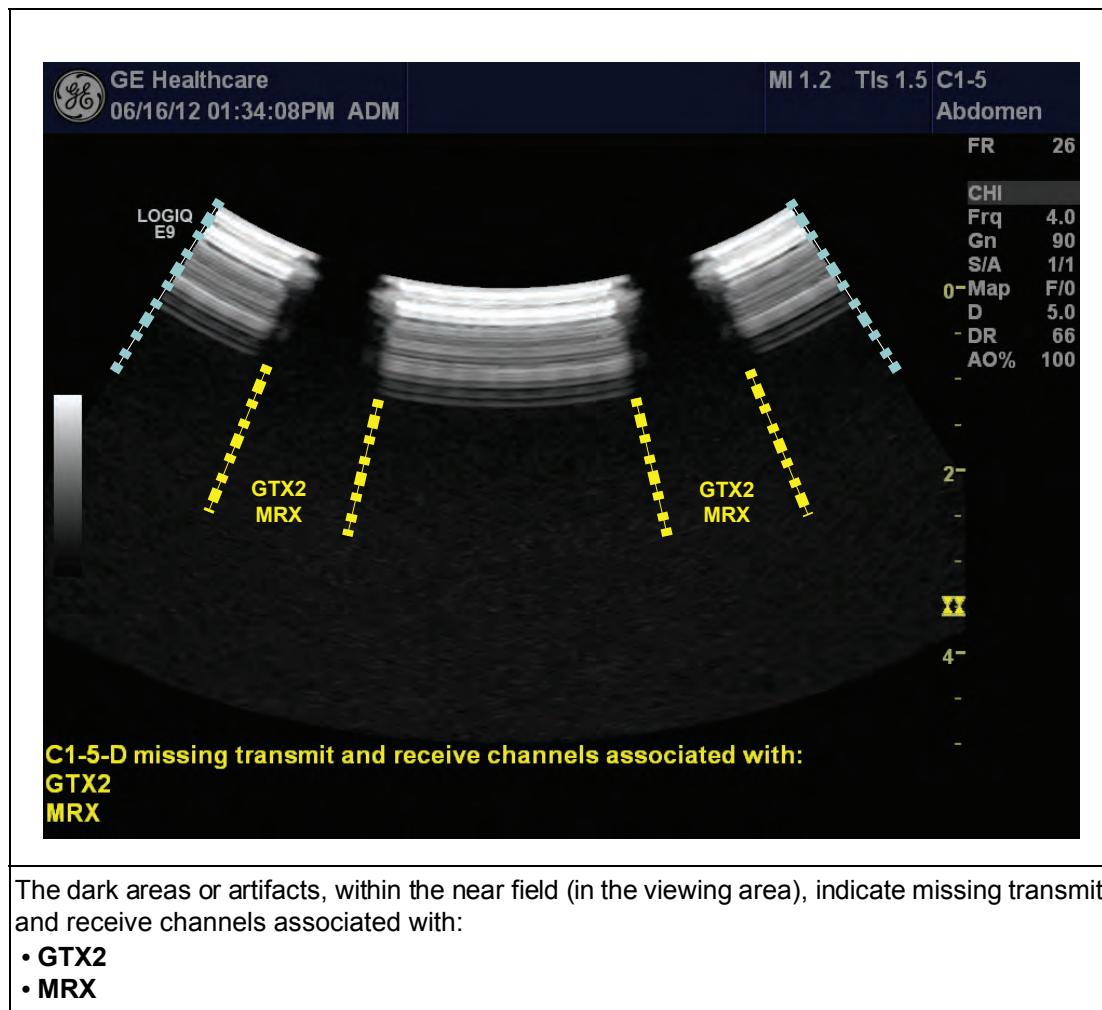
7-9-25-1 C1-5-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-86 C1-5-D Probe - MRX Configuration



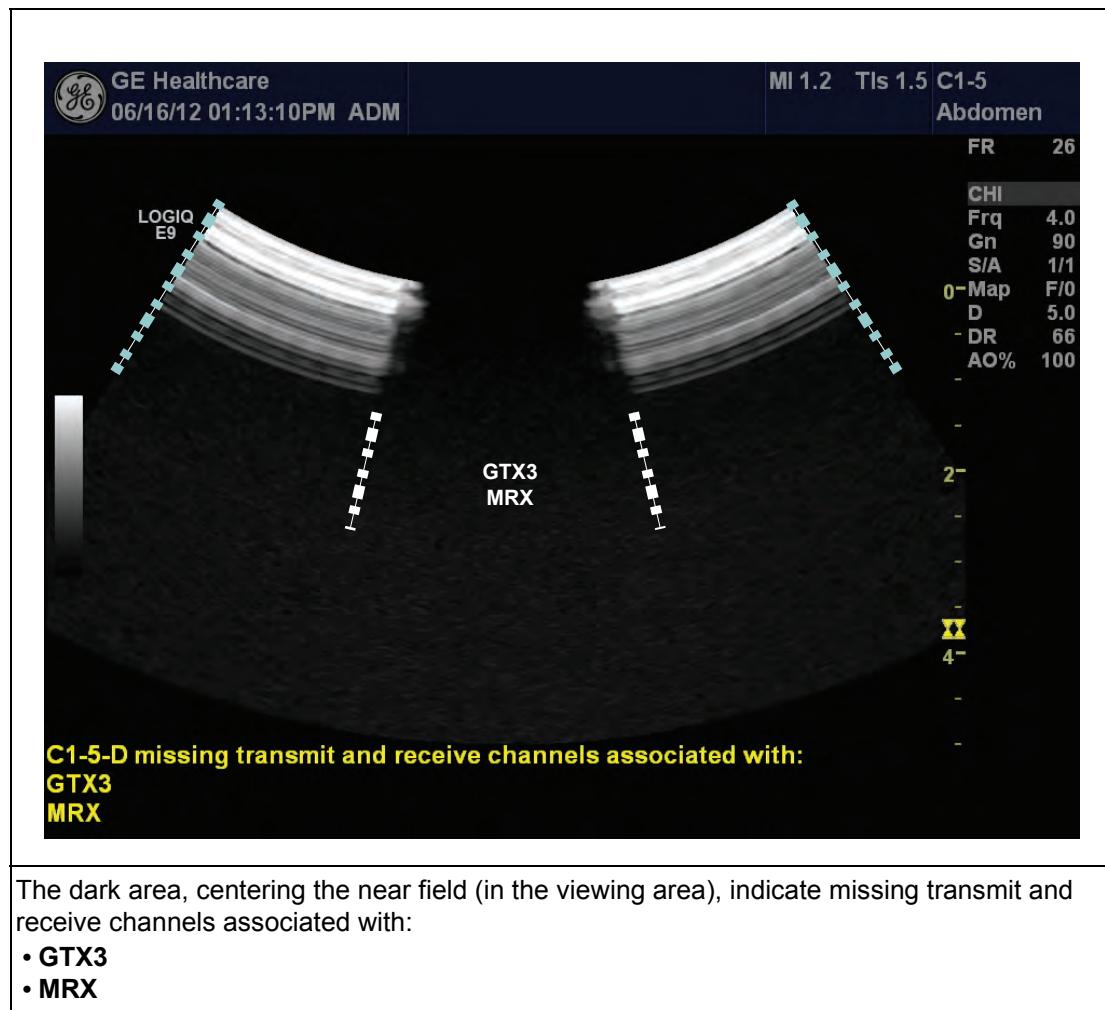
7-9-25-1 C1-5-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-87 MRX Configuration - C1-5-D Probe



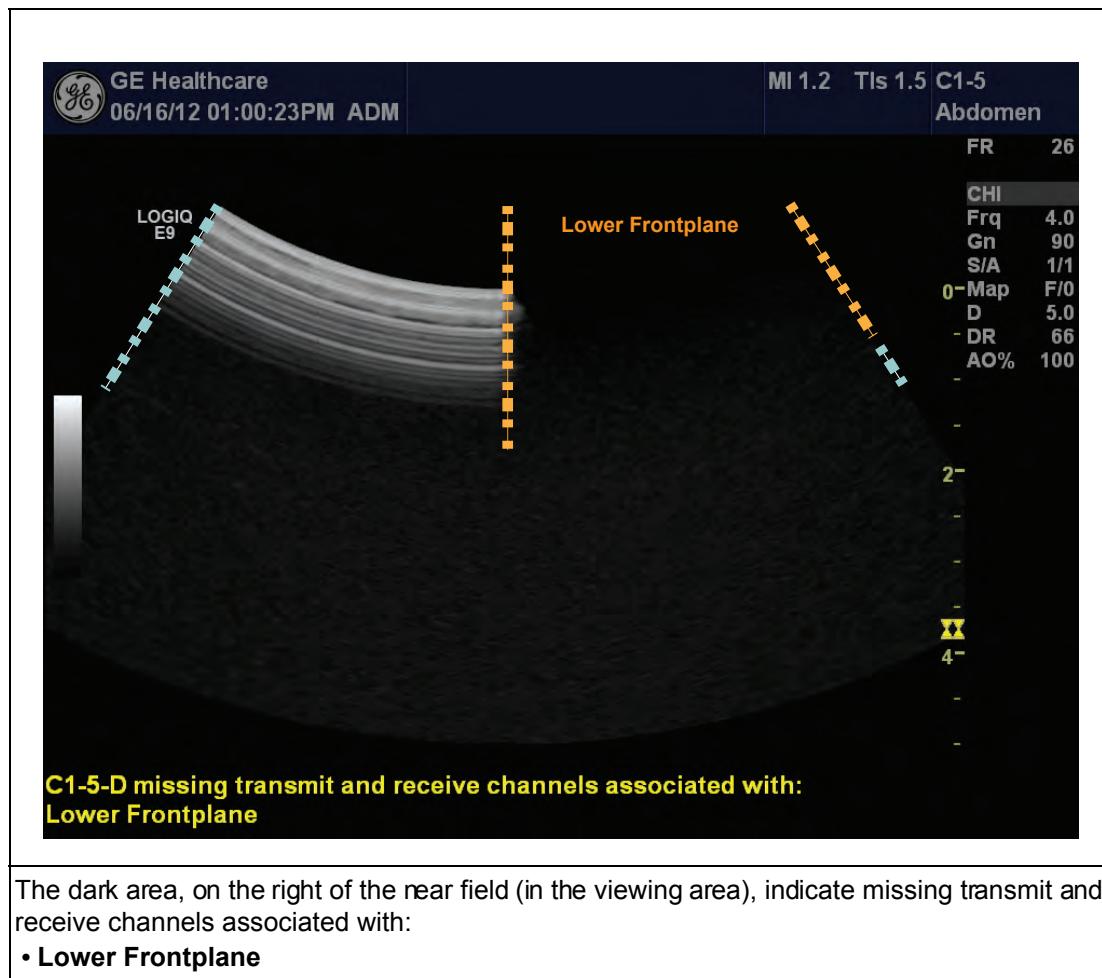
7-9-25-1 C1-5-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-88 MRX Configuration - C1-5-D Probe



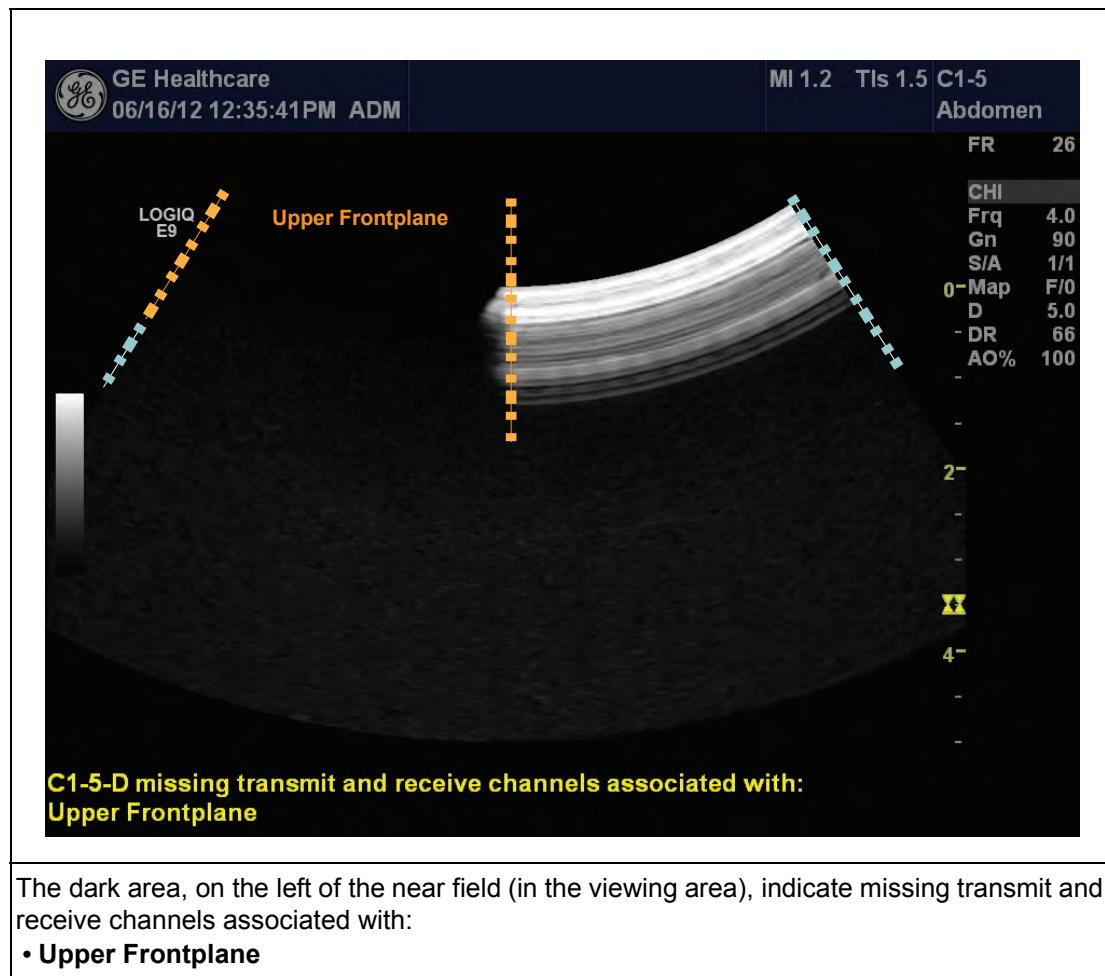
7-9-25-1 C1-5-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-89 MRX Configuration - C1-5-D Probe



7-9-25-1 C1-5-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-90 MRX Configuration - C1-5-D Probe

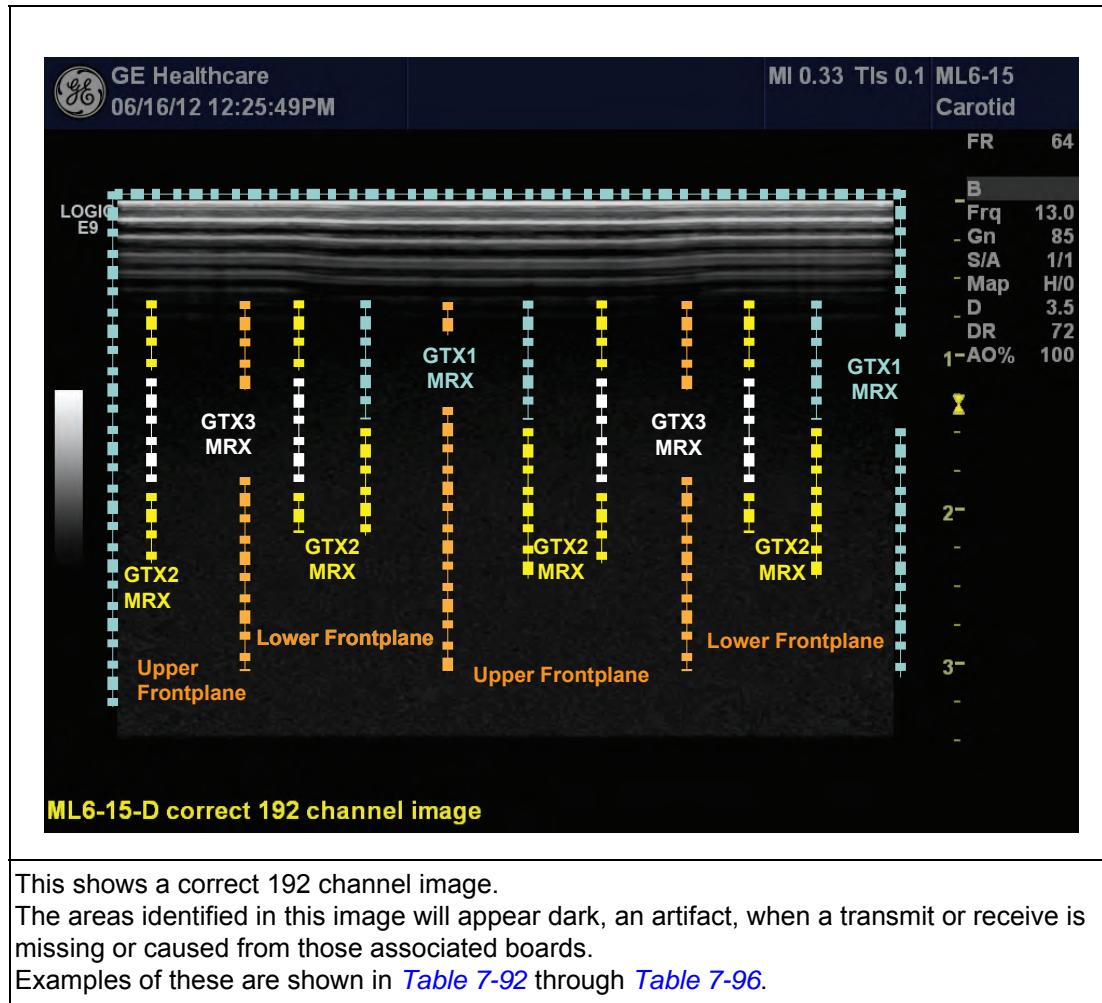


7-9-26 How to Recognize missing Transmit and Receive Channels for a ML-6-15-D Probe in a LOGIQ E9 MRX Configuration

Table 7-91, "MRX Configuration - ML-6-15-D Probe with a correct 192 channel image," on page 328

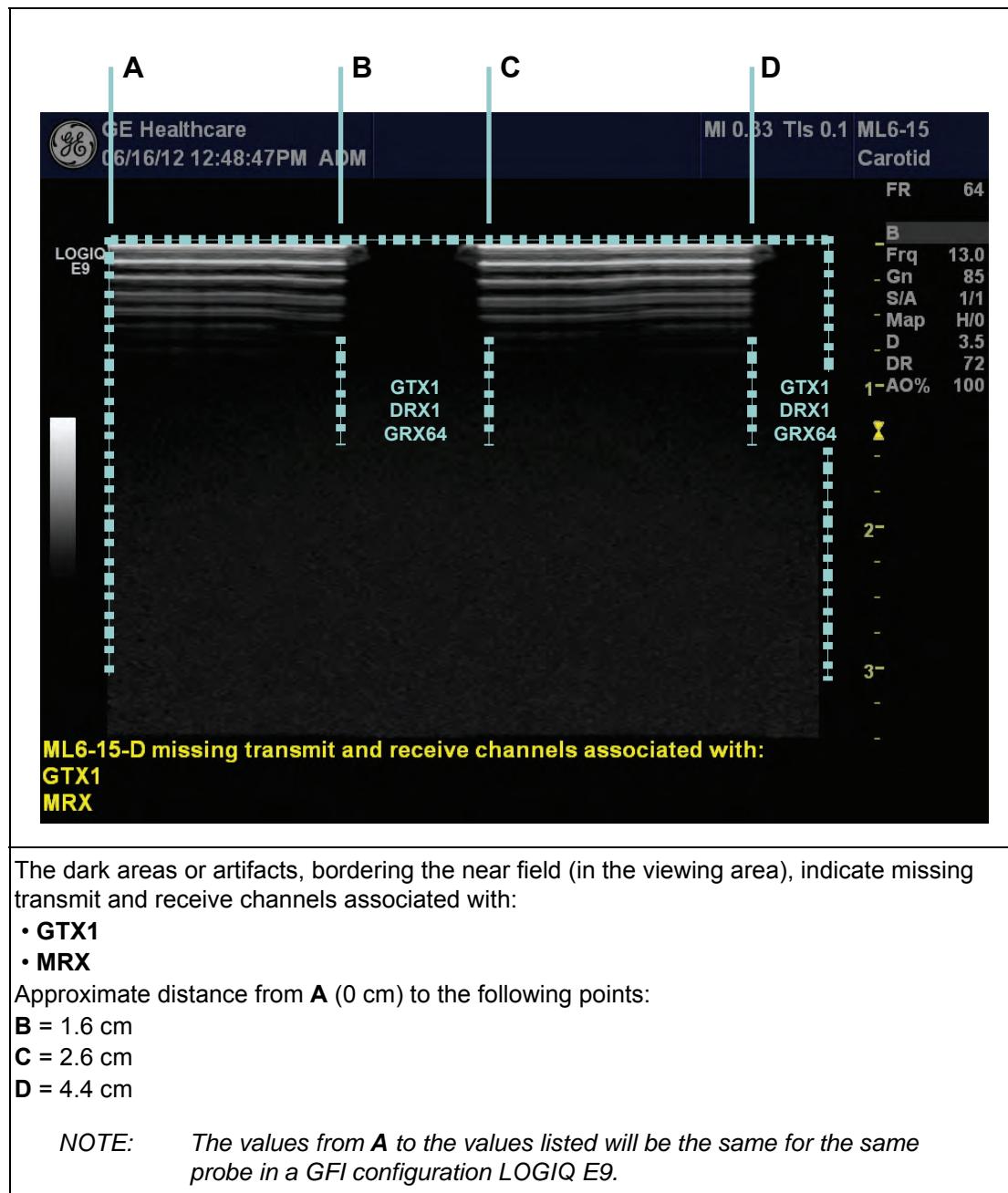
7-9-26-1 ML-6-15-D Probe - Missing Transmit and Receive Channels

Table 7-91 MRX Configuration - ML-6-15-D Probe with a correct 192 channel image



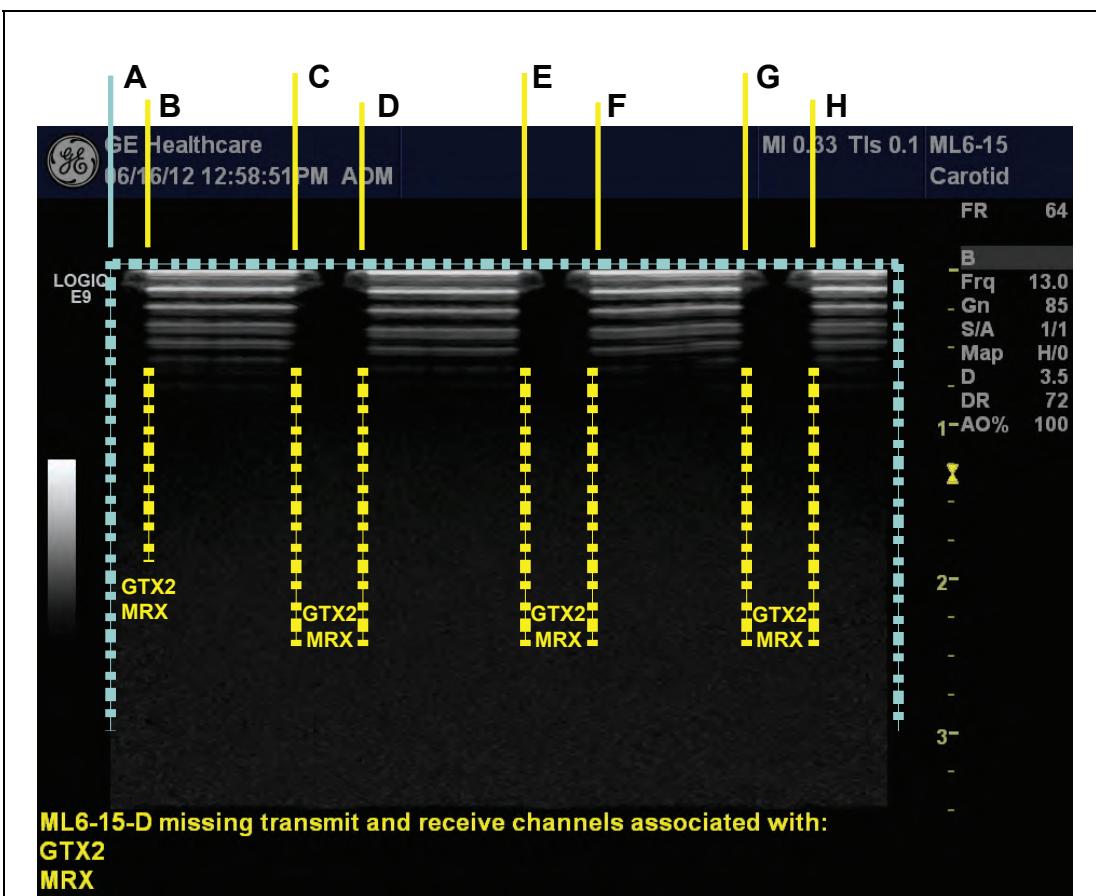
7-9-26-1 ML-6-15-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-92 ML-6-15-D Probe - MRX Configuration



7-9-26-1 ML-6-15-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-93 MRX Configuration - ML-6-15-D Probe



The dark areas or artifacts, within the near field (in the viewing area), indicate missing transmit and receive channels associated with:

- **GTX2**
- **MRX**

Approximate distance from **A** (0 cm) to the following points:

B = 0.3 cm

C = 1.2 cm

D = 1.6 cm

E = 2.7 cm

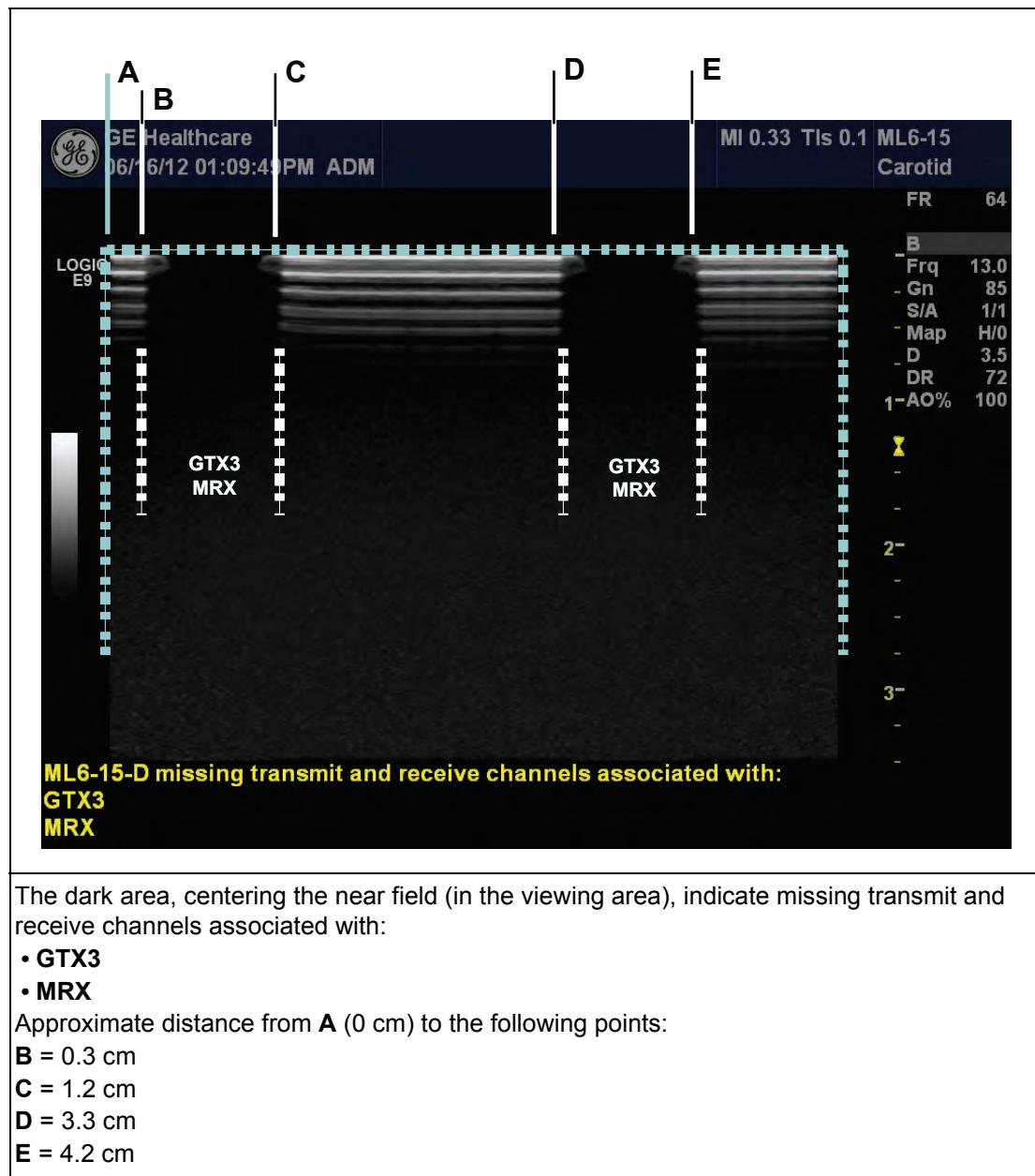
F = 3.2 cm

G = 4.2 cm

H = 4.6 cm

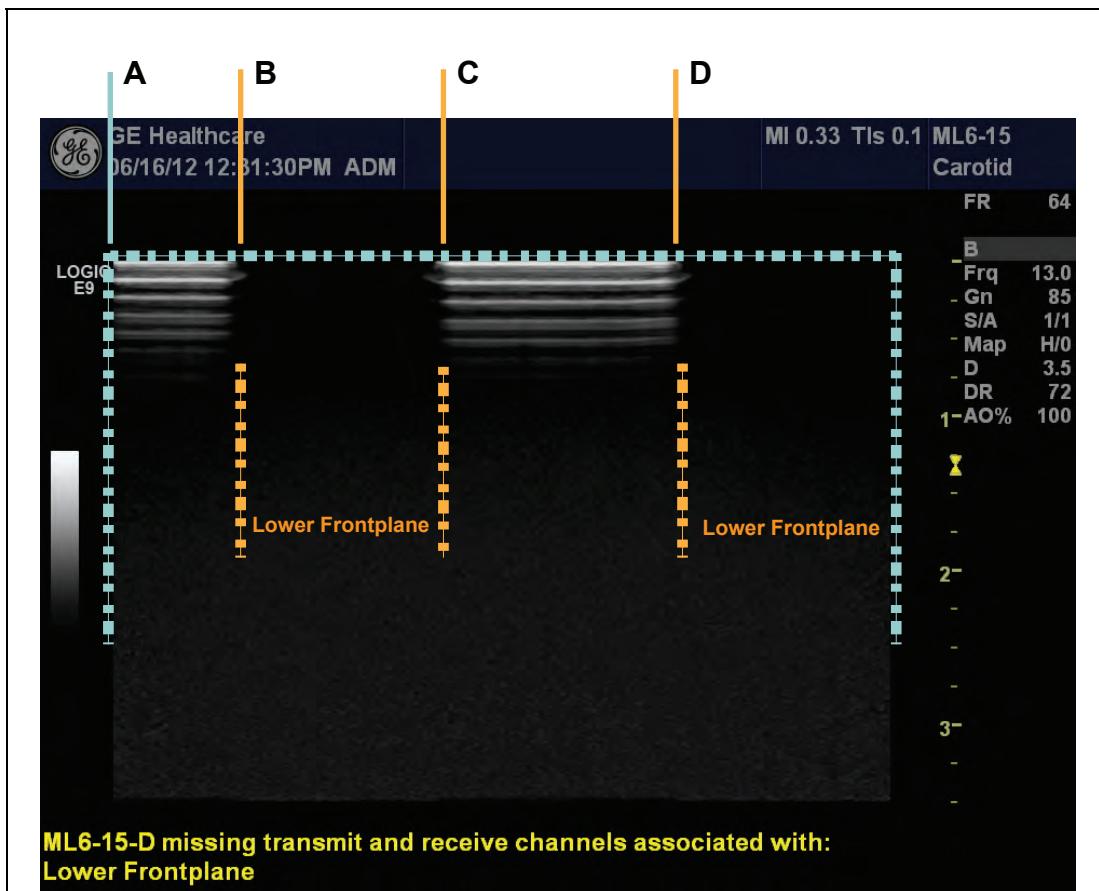
7-9-26-1 ML-6-15-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-94 MRX Configuration - ML-6-15-D Probe



7-9-26-1 ML-6-15-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-95 MRX Configuration - ML-6-15-D Probe



The dark area, on the right of the near field (in the viewing area), indicate missing transmit and receive channels associated with:

- **Lower Frontplane**

Approximate distance from **A** (0 cm) to the following points:

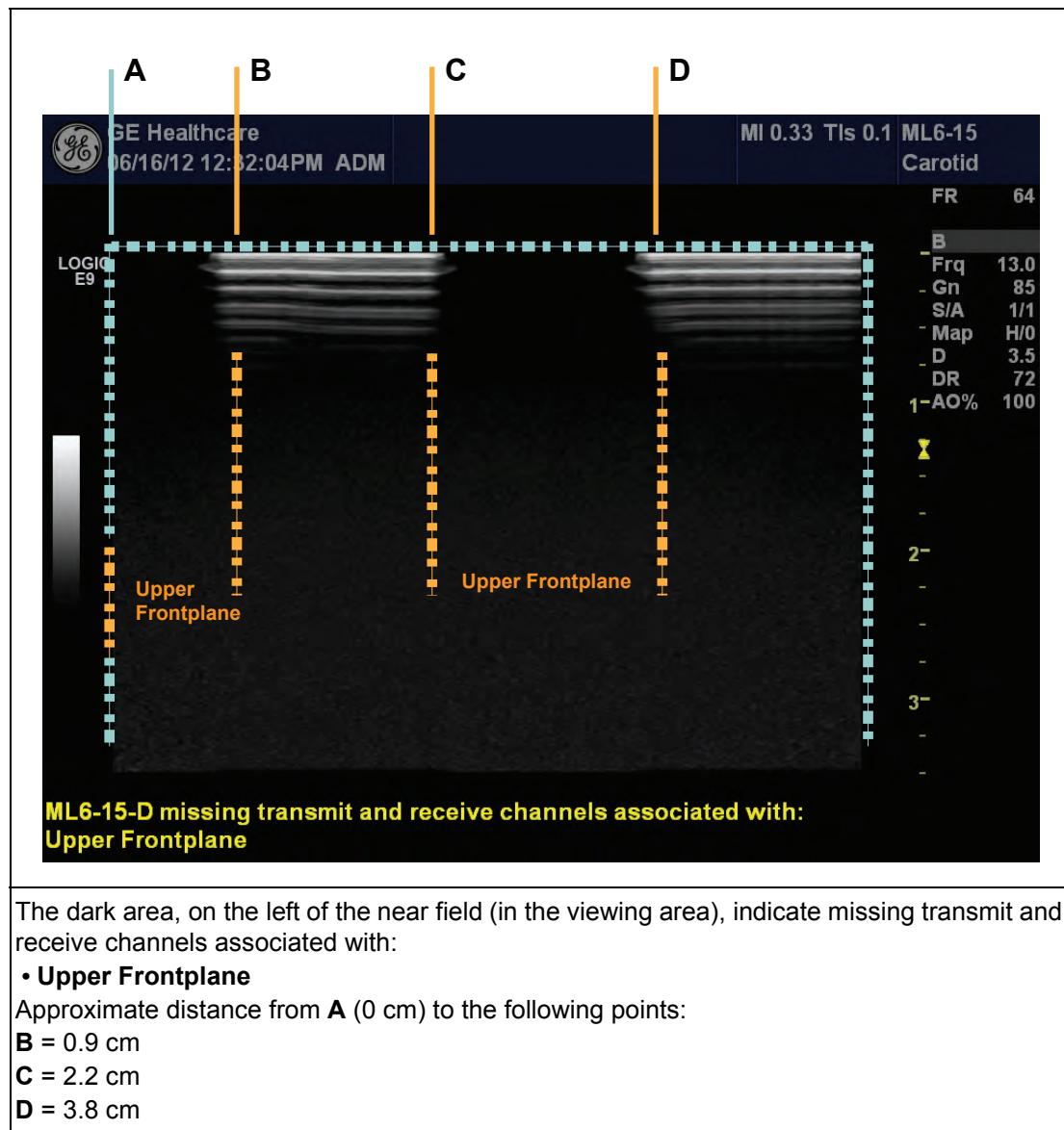
$$\mathbf{B} = 0.9 \text{ cm}$$

$$\mathbf{C} = 2.2 \text{ cm}$$

$$\mathbf{D} = 3.8 \text{ cm}$$

7-9-26-1 ML-6-15-D Probe - Missing Transmit and Receive Channels (cont'd)

Table 7-96 MRX Configuration - ML-6-15-D Probe



7-9-27 LOGIQ E9 GTX HV (High Voltage) Failure on MRX Systems

Use this to troubleshoot GTX Boards P/N 5201044-3, Rev. C or earlier on LOGIQ E9 - 5205000-5, -6 console models.

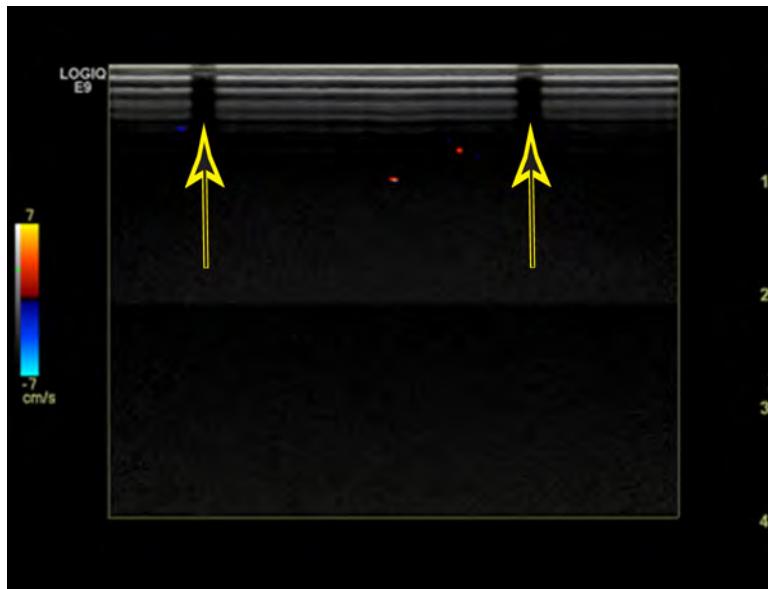
On MRX systems, some signals (JTAG) in the new Backplane are not terminated correctly, leaving voltages floating. Depending on tolerances on the GTX Boards, these floating signals may induce incorrect logic levels causing High Voltage errors; some GTX Boards may be more sensitive to this issue than others. This problem may be observed running Diagnostics or while scanning and it is very intermittent.

An artifact may be seen on the 2D image, intermittently and/or an error message will appear reporting a High Voltage error, and the system needs to be rebooted to continue normal operation.

How to identify:

- 1.) Image artifact: System appears to have dead channels.

Figure 7-200 Image Artifact Dead Channels



7-9-27 LOGIQ E9 GTX HV (High Voltage) Failure on MRX Systems (cont'd)

NOTE: Use "FatalHW" as a search string to find error in the error log. This will help to identify the error explained in step 2 and narrow down to the board that is causing it.

GTX "numbers" use 1, 2, 3 and 4 as nomenclature in VPD, but 0 (zero), 1, 2 and 3 are used as nomenclature in diagnostics. In this manual, 1, 2, 3 and 4 nomenclature is used to identify board, based on location in the Card Rack. See: Figure 7-201 "Card Rack - GTX Board Location (MRX Configuration)" on page 7-336.

2.) Error log: The logfile.txt will display an entry like the following:

```
HouseKeeping: GFI Hardware Exception: SubType 31: -GFE Ch0 empty-GFE Ch1
empty-GTX3 HVFAULT. Severity : FatalHW
Thursday,Aug 11 15:58:41,2011; ; Info ; DFEManager(2980); HandleRunFlag:
setting RunBlock flag to false!
.
.
.
Thursday,Aug 11 15:58:41,2011; ; Debug ; acqGfi(2952); WatchDog:WatchDog :
GTX_PS_CR = 0x0038
Thursday,Aug 11 15:58:41,2011; ; Debug ; acqGfi(2952); WatchDog:WatchDog :
GTX3 @0x0412 TEMP_MONITOR = 0x0000
Thursday,Aug 11 15:58:41,2011; ; Debug ; acqGfi(2952); WatchDog:WatchDog :
GTX3 @0x0413 GTX_ErrorStatus = 0x0000
Thursday,Aug 11 15:58:41,2011; ; Debug ; acqGfi(2952); WatchDog:WatchDog :
GTX3 @0x0421 Status_Bus_REGA = 0x0000
Thursday,Aug 11 15:58:41,2011; ; Debug ; acqGfi(2952); WatchDog:WatchDog :
GTX3 @0x0422 Status_Bus_REGB = 0x0000
Thursday,Aug 11 15:58:41,2011; ; Debug ; acqGfi(2952); Watchdog
still alive, errors=0x0138 [(THOR) -- (TS_OK) (TS_LEVEL_OK) GTX3 -
0x0000 - This specific issue is identified by status registers of all zero value.
```

As the log indicates, the GTX3 was generating the error.

How to Fix:

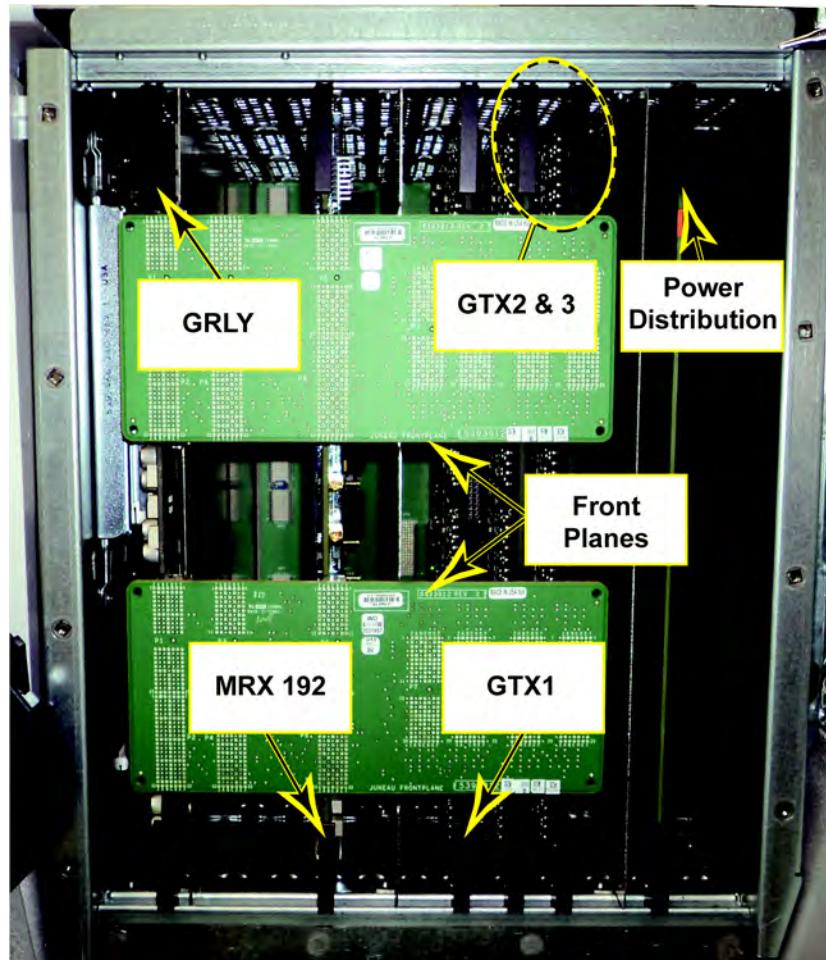
The board needs to be replaced with the Rev. D or later, to prevent this error from reoccurring. The Rev. D Boards have been terminated correctly to prevent floating voltages.

NOTE: Label the GTX Boards prior to removal to reflect which slot each board was removed from, if replacing one or two boards. Install the boards back in the original locations.

Label the Front Planes prior to removal to reflect which is the upper and which is the lower. Install the Front Planes back in the original locations.

Service Stock of the GTX Boards have been purged and populated with Rev. D or later.

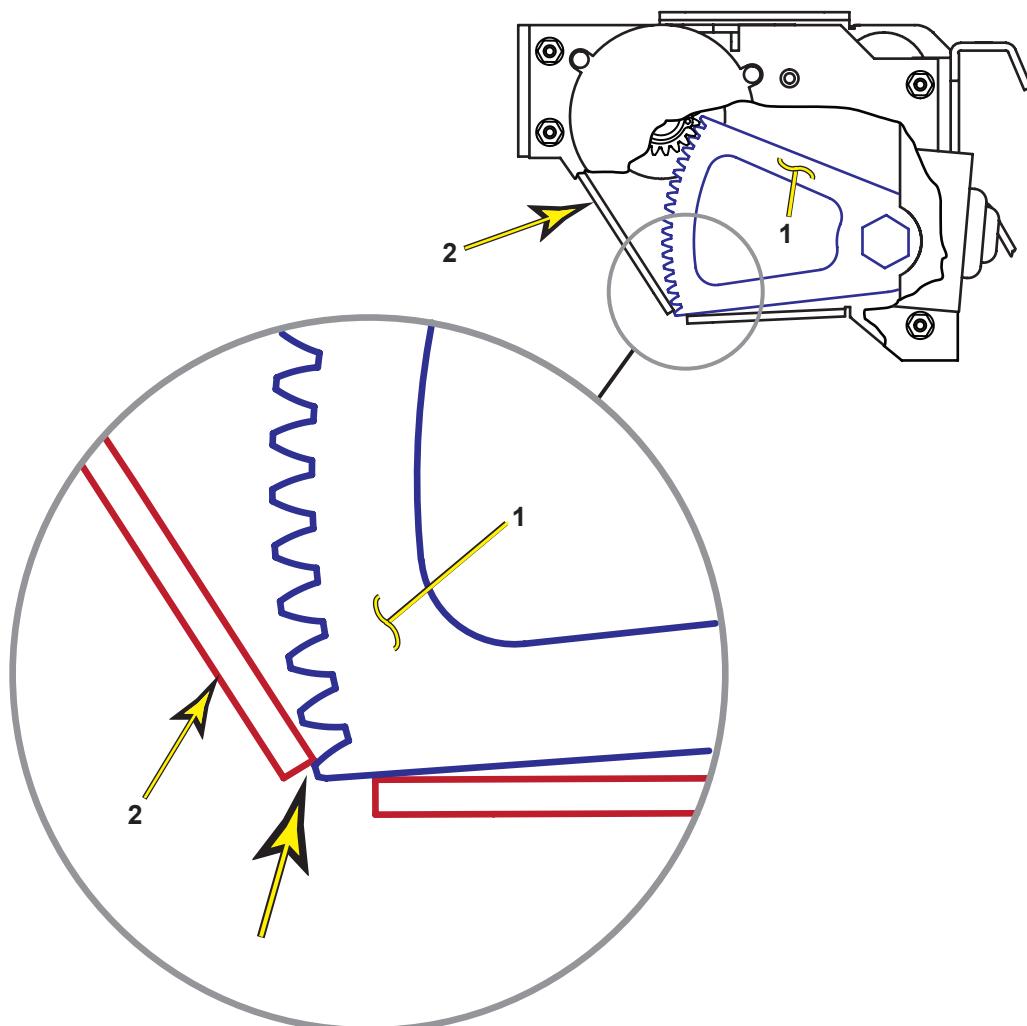
NOTE: GFI console models do not have this problem because those signals are terminated correctly in the Backplanes for GFI console models.

7-9-27 LOGIQ E9 GTX HV (High Voltage) Failure on MRX Systems (cont'd)**Figure 7-201 Card Rack - GTX Board Location (MRX Configuration)**

7-9-28 LOGIQ E9 Z-Axis Stuck Down

Use this procedure in the event the Z-Axis Gear (gear that drives the Z-Axis motion) may be driven beyond the limitations, causing the Z-Axis Gear to jam below the lower, front flange of the Z-Mech Support. See: *Figure 7-202 "Z-Axis Gear (1) jammed below the lower, front flange (2) of the Z-Mech Support (illustration showing behind the Drive Gear Assembly)"* on page 7-337. The lower, front flange protects exposure to the Drive Gear and Z-Axis Gear.

Figure 7-202 Z-Axis Gear (1) jammed below the lower, front flange (2) of the Z-Mech Support (illustration showing behind the Drive Gear Assembly)



7-9-28 LOGIQ E9 Z-Axis Stuck Down (cont'd)**Table 7-97 Freeing the Z-Axis**

Steps	Corresponding Graphic
1. Apply the Brakes and Direction Locks. Remove the Right Side Cover. See: Section 8-5-6-1 "Top Cover removal" on page 8-64.	
2. Locate the Drive Gear Assembly on the right hand side of the system.	

Table 7-97 Freeing the Z-Axis

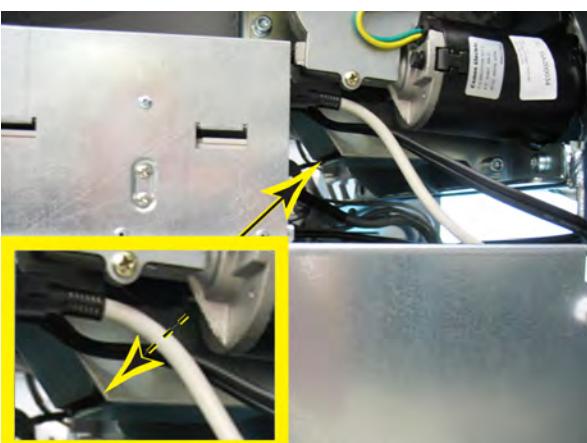
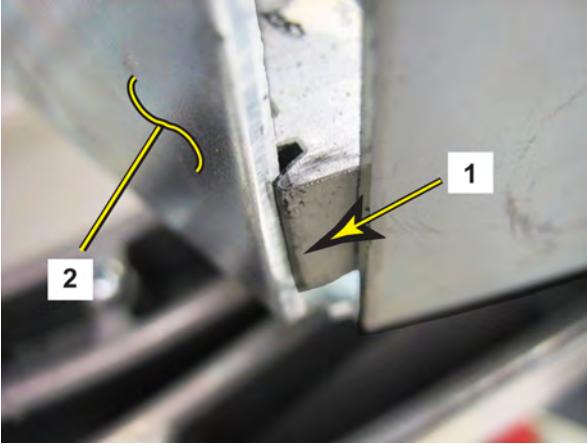
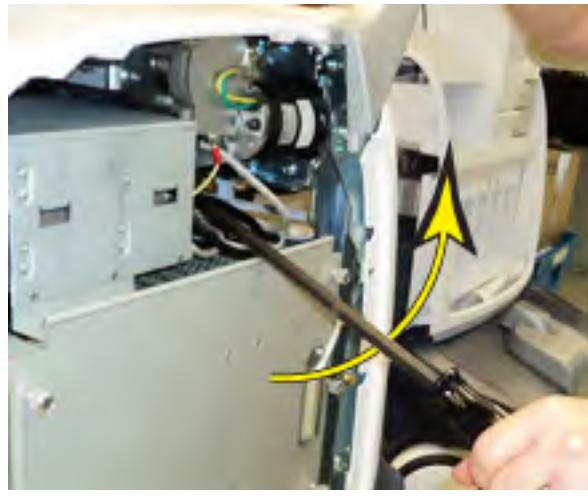
Steps	Corresponding Graphic
3. Locate the area where the Z-Axis Gear is jammed.	<p>area where the Z-Axis Gear is jammed</p>  <p>Z-Axis Gear (1) jammed below the lower, front flange (2) of the Z-Mech Support (picture from below Drive Gear Assembly)</p> 
4. Position the blade of a pry bar into the gap, behind the Drive Gear Assembly, where the Z-Axis Gear has jammed. DO NOT position the pry bar on the Drive Gear. <i>NOTE: Make sure ALL cables or ANY components that can be damaged are clear before proceeding to Step 5, as the pry bar should not pinch any cables or break any components or parts (plastic).</i>	

Table 7-97 Freeing the Z-Axis

Steps	Corresponding Graphic
<p>5. Pull back on the pry bar, and push up on the underside of the Lower Operator Panel until the Z-Axis Gear pops out of the stuck position. The Top Console will only rise slightly when the Drive Gear becomes free.</p> <p><i>NOTE: Apply only enough force to free the jammed gear, but some force is required to free the Z-Axis Gear.</i></p> <p>Use the Z-Mechanism manual release handle to raise the Top Console to ensure the jammed Z-Axis Gear is free.</p>	
<p>6. Perform the Functional Checks as described in the Drive Gear Assembly replacement section. See: Table 8-203 "Drive Gear Assembly replacement Functional Checks" on page 8-332.</p>	

7-9-29 Audio DOES NOT Play after Upgrade from R2 to R5

Table 7-98 Restoring Audio

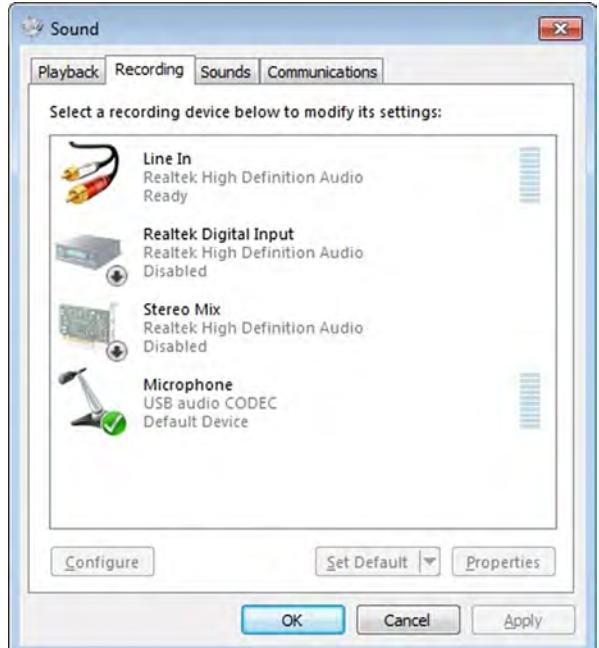
Steps	Corresponding Graphic
1. Insert Service Key.	
2. Exit to Windows using service password.	
3. Open Start -> Control Panel -> Sound .	
4. Click on the Recording Tab. Left Click in the box: Select a recording device and Confirm that "Show Disabled Devices" is checked. Select Line In and than Set Default. The green check mark is displayed for Line in Audio. Select Microphone. Click on the dropdown menu to the right of Set Default and select Default Communication Device.	

Table 7-98 Restoring Audio

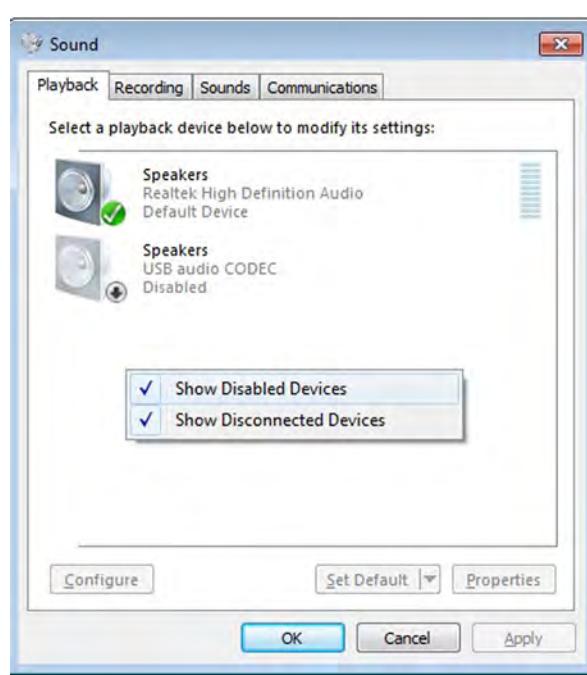
Steps	Corresponding Graphic
5. Confirm that the green telephone icon is shown next to Microphone as shown.	
6. Click on the Playback Tab. Left Click anywhere in the Select Playback Device box and Confirm that "Show Disabled Devices" is checked.	

Table 7-98 Restoring Audio

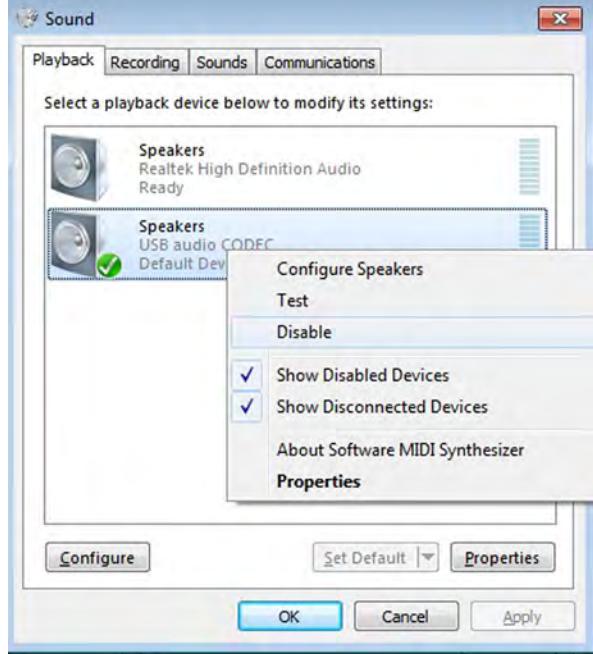
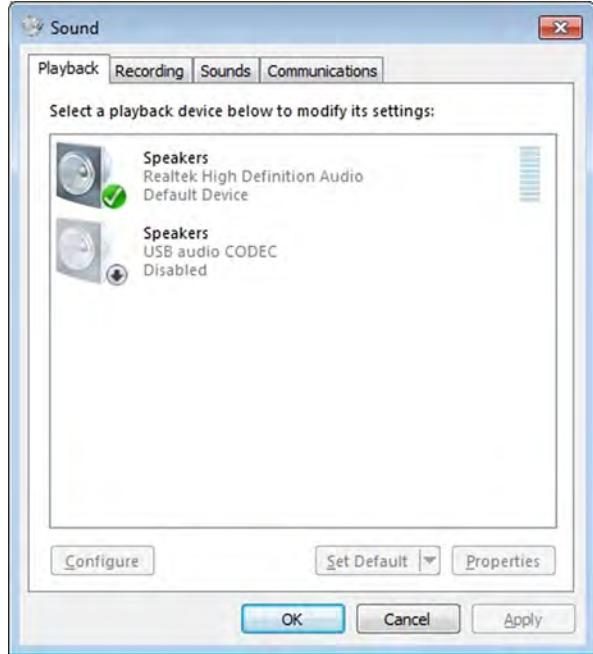
Steps	Corresponding Graphic
7. Left click USB Audio CODEC -> Select Disable.	
8. Confirm that Speaker USB Audio CODEC is disabled and greyed out as shown. Close the Sound window.	

Table 7-98 Restoring Audio

Steps	Corresponding Graphic
<p>9. Go to Start -> Control Panel -> Realtek HD Audio Manager.</p> <p>Make sure that Subwoofer and Front Left and Right speakers are selected.</p> <p>Close the window and shutdown.</p>	
<p>10. Boot up to Application and launch the service desktop.</p> <p>Under Service Diagnostics -> Backend Test -> IO Board test, Run IO Board Audio test.</p> <p>IO Board Audio test should Pass.</p>	

7-9-30 LOGIQ E9 Replacing New Fan Tray - Fails "GFI Fan Test"

LOGIQ E9 console models 5205000, 5205000-2, 5205000-3, 5205000-4 running Application Software R2.x.x or earlier. The introduction of the new Fan Tray (P/N 5394406) fails system level diagnostic "GFI Fan Test."

The "GFI Fan Test" diagnostic checks for basic fan movement at two set points. The diagnostic checks fan rotation by applying two different control voltage Duty Cycles to the fan tray. The current test implementation sets restrictive limits on the rotation RPM. These rotation limits need to be widened (become less restrictive) which will allow for fan and supplier variation.

This Section will instruct how review the test results data and assess if the fan is bad. This diagnostic failure does not affect normal operation, it will only occur when running diagnostics.

GFI Fan Test Results Detail

Figure 7-203 Upper Limit on New Fan Rack Assembly will be 2500

Name	Overall Result	Duty Cycle	Measured RPM	Min RPM	Max RPM	Result
FAN1		0 percent	<=82	0	100	passed
FAN2		0 percent	<=82	0	100	passed
FAN3		0 percent	<=82	0	100	passed
FAN4		0 percent	<=82	0	100	passed
FAN1		22 percent	2008	100	2200	passed
FAN2		22 percent	1820	100	2200	passed
FAN3		22 percent	2029	100	2200	passed
FAN4		22 percent	1978	100	2200	passed
FAN1		100 percent	2720	2000	4000	passed
FAN2		100 percent	2767	2000	4000	passed
FAN3		100 percent	2750	2000	4000	passed
FAN4		100 percent	2849	2000	4000	passed
Fan Test	passed					

NOTE: DO NOT replace any part unless the measured RPM falls outside of the new limit.

7-9-31 LOGIQ E9 VPD Editor "Not Opening"

If a LOGIQ E9 console model running Application Software R3.1.0 and the VPD Editor does not open, or takes too long to open, the VPD Editor, stand alone times out too quickly before it is able to establish communication with the Card Rack.

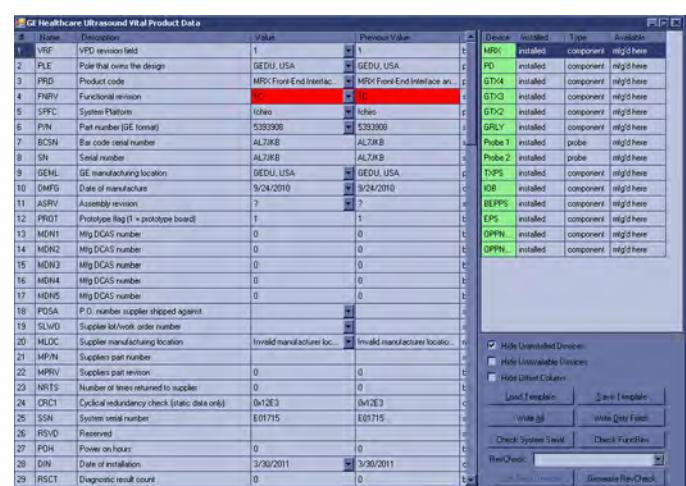
If the system application is running, the VPD Editor will open immediately since the communication to the Card Rack is already established by the system application.

This information is intended to inform the Field about a work around in case this issue is observed.

Table 7-99 Activating VPD Editor

Activating VPD Editor:	Corresponding Graphic
<p>Insert a Service Key:</p> <ul style="list-style-type: none"> • Exit application and go to Windows desktop. • Double-click on the "Vpdedit" (VPD Editor) icon, on the desktop and wait. <p>If the VPD Editor does not open within the next 30 seconds:</p> <p>Double-click on the "Go Ichiro" icon to launch the system application and keep access to Windows.</p> <p><i>NOTE: If the application does not start, power-cycle the system (full power-cycle, not re-start) and start procedure over.</i></p> 	 

Table 7-99 Activating VPD Editor

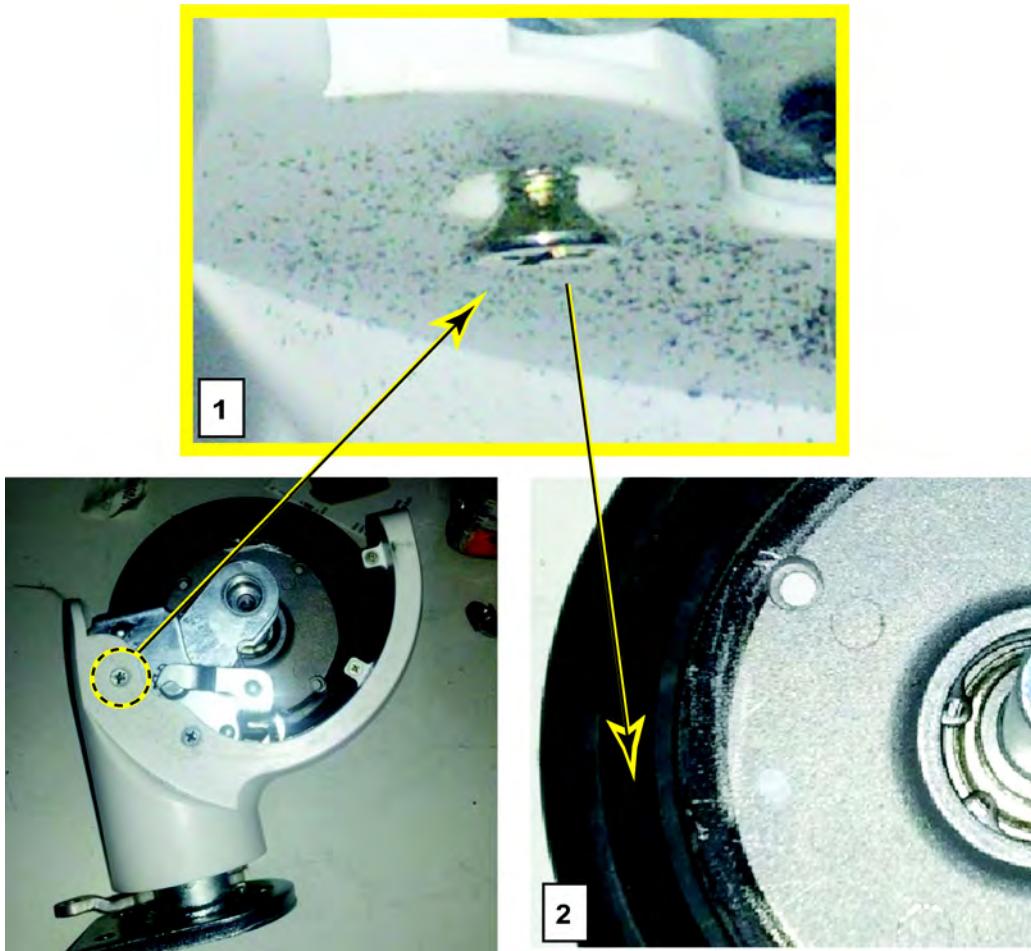
Activating VPD Editor:	Corresponding Graphic																																																																																																																																																																																																																																																
<p>Once the application opens, navigate to the task bar and look for the desktop short cut for show Desk Top.</p>																																																																																																																																																																																																																																																	
<p>The desktop will display.</p> <p>Now double-click on the "Vpdedit" icon to launch the VPD Editor Application.</p>																																																																																																																																																																																																																																																	
<p>Now the VPD Editor opens quickly since the communication to the Card Rack is already established through the system applications.</p> <p><i>NOTE: Make sure the Device column lists the boards installed in the Card Rack. This confirms that the VPD Editor is able to read each board. If the Card Rack boards are not detected as installed, you need to close VPD Editor and re-open.</i></p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Description</th> <th>Value</th> <th>Previous Value</th> <th>Device</th> <th>Installed</th> <th>Type</th> <th>Available</th> </tr> </thead> <tbody> <tr> <td>VRF</td> <td>VPD revision field</td> <td>1</td> <td>1</td> <td>MRX</td> <td>installed</td> <td>component</td> <td>rigid here</td> </tr> <tr> <td>PLC</td> <td>Pole that owns the design</td> <td>GEDU, USA</td> <td>GEDU, USA</td> <td>PD</td> <td>installed</td> <td>component</td> <td>rigid here</td> </tr> <tr> <td>PRD</td> <td>Product code</td> <td>MRX Front End Interface</td> <td>MRX Front End Interface rev.</td> <td>GTx4</td> <td>installed</td> <td>component</td> <td>rigid here</td> </tr> <tr> <td>PNV</td> <td>Functional revision</td> <td>100</td> <td>100</td> <td>GTx2</td> <td>installed</td> <td>component</td> <td>rigid here</td> </tr> <tr> <td>SPPC</td> <td>System Platform</td> <td>Ultrix</td> <td>Ultrix</td> <td>GRx1</td> <td>installed</td> <td>component</td> <td>rigid here</td> </tr> <tr> <td>PIN</td> <td>Part number (GE format)</td> <td>5383908</td> <td>5383908</td> <td>Probe 1</td> <td>installed</td> <td>probe</td> <td>rigid here</td> </tr> <tr> <td>BSN</td> <td>Bar code serial number</td> <td>AL72KB</td> <td>AL72KB</td> <td>Probe 2</td> <td>installed</td> <td>probe</td> <td>rigid here</td> </tr> <tr> <td>SN</td> <td>Serial number</td> <td>AL72KB</td> <td>AL72KB</td> <td>TxPS</td> <td>installed</td> <td>component</td> <td>rigid here</td> </tr> <tr> <td>GMEL</td> <td>GE manufacturing location</td> <td>GEDU, USA</td> <td>GEDU, USA</td> <td>IDB</td> <td>installed</td> <td>component</td> <td>rigid here</td> </tr> <tr> <td>DMFG</td> <td>Date of manufacture</td> <td>9/24/2010</td> <td>9/24/2010</td> <td>BEPSS</td> <td>installed</td> <td>component</td> <td>rigid here</td> </tr> <tr> <td>ASRV</td> <td>Assembly revision</td> <td>?</td> <td>?</td> <td>EPS</td> <td>installed</td> <td>component</td> <td>rigid here</td> </tr> <tr> <td>PROT</td> <td>Prototype flag (1 = prototype board)</td> <td>1</td> <td>1</td> <td>OPPH</td> <td>installed</td> <td>component</td> <td>rigid here</td> </tr> <tr> <td>MDN1</td> <td>Mfg DGS number</td> <td>0</td> <td>0</td> <td>OPPH</td> <td>installed</td> <td>component</td> <td>rigid here</td> </tr> <tr> <td>MDN2</td> <td>Mfg DGS number</td> <td>0</td> <td>0</td> <td>OPPH</td> <td>installed</td> <td>component</td> <td>rigid here</td> </tr> <tr> <td>MDN3</td> <td>Mfg DGS number</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>MDN4</td> <td>Mfg DGS number</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>MDN5</td> <td>Mfg DGS number</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>POSA</td> <td>P.D. number supplier shipped against</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SLWD</td> <td>Supplier lot/work order number</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>HLDC</td> <td>Supplier manufacturing location</td> <td>Invalid manufacturer loc.</td> <td>Invalid manufacturer loc.</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>MPIN</td> <td>Suppliers part number</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>MPRV</td> <td>Suppliers part revision</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>NRTS</td> <td>Number of times returned to supplier</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CRC1</td> <td>Cyclical redundancy check (static data only)</td> <td>0x12E3</td> <td>0x12E3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SSN</td> <td>System serial number</td> <td>E01715</td> <td>E01715</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>RSVD</td> <td>Reserved</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>POH</td> <td>Power on hours</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>DIN</td> <td>Date of installation</td> <td>3/30/2011</td> <td>3/30/2011</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>RSC1</td> <td>Diagnostic result count</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Name	Description	Value	Previous Value	Device	Installed	Type	Available	VRF	VPD revision field	1	1	MRX	installed	component	rigid here	PLC	Pole that owns the design	GEDU, USA	GEDU, USA	PD	installed	component	rigid here	PRD	Product code	MRX Front End Interface	MRX Front End Interface rev.	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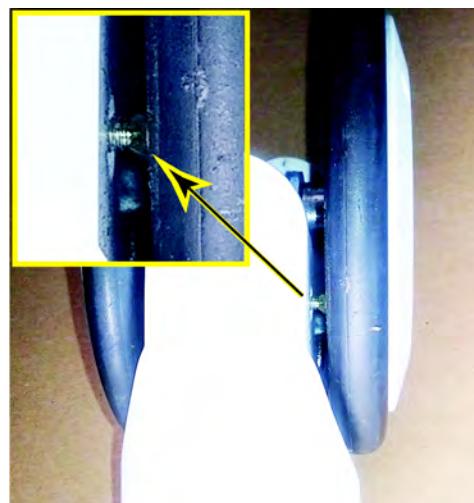
7-9-32 Sticking Brakes

Sticking brakes may be caused by screws backing out of the caster body and contacting the rubber on the caster wheel. This can be found on either the front or the rear brakes. Observe the rubber on the wheel, if you notice worn surfaces in the inside of the rubber or notice debris, replace the caster.

Caster body screw (1) wearing inside of the caster wheel (2). Images are for reference only, the casters CANNOT be serviced. See: *Figure 7-205 "How to identify if screws are backing out of Caster Body" on page 7-349.*

Figure 7-204 Worn Surface from screws



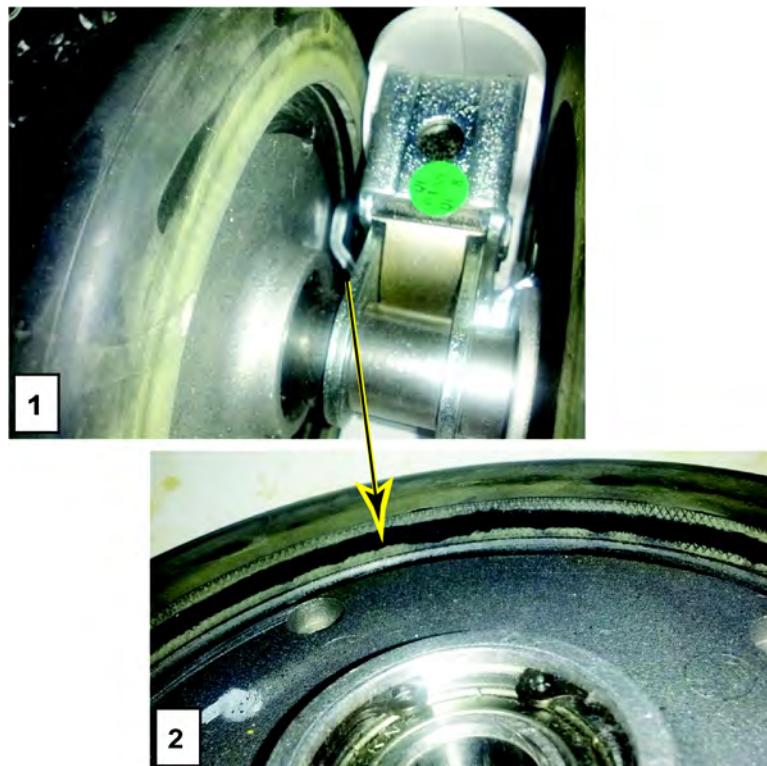
7-9-32 Sticking Brakes (cont'd)**Figure 7-205 How to identify if screws are backing out of Caster Body**

7-9-33 Brake Functionality (not effectively stopping the LOGIQ E9)

Over time the Brake Arm may have worn a groove into the rubber of the caster wheel. The deeper this groove becomes, the less effective the brakes will be. Observe the rubber on the wheel, if you notice worn surfaces in the inside of the rubber or notice debris, replace the caster.

Brake Arm (1) wearing inside, inner diameter of the caster wheel (2). Images are for reference only, the casters CANNOT be serviced.

Figure 7-206 Worn Surface from Brake Arm



Section 7-10 Test of Printers

7-10-1 Windows Print Test Page

This tests that the printer is correctly installed and hooked up at the Windows level.

- 1.) Open the Printers folder, either from **Start -> Settings -> Printers** or from **Utilities -> System -> Printers**.
- 2.) Right click on a printer and select Preferences.
- 3.) Select Print Test Page (this will send a print to the printer bypassing all of the Scanner software).
- 4.) Observe the page. **If the page prints out**, the problem you are looking for is probably a configuration issue in windows or configuration issue in **Utilities -> Connectivity**. **If the page does not print out**, there probably is a cabling issue, or a printer configuration issue in windows.

NOTE: *For the Sony small format printers you will see the test page clipped. This is normal.*

7-10-2 Set-up and Test a Printer Service

- 1.) Select **Utility -> Connectivity**.

If you get a pop-up asking you to log on, select ADM. If the customer has not changed the user it has no password.

- 2.) Select the Service tab.

- 3.) In the comb box "Select Service to Add" select "Standard Print" and click on Add.

- 4.) In the right pane Properties "Combo Box" Select the printer you wish to test. Set any other parameters you desire.

- 5.) In the left pane "Properties" Enter a name that describes the printer and configuration you just selected in the right pane.

- 6.) Select the Button tab.

- 7.) Select one of the "Physical Print Buttons" that you want to configure.

- 8.) In the right pane click on the service name you just created in the Services Tab.

- 9.) Click on the ">>" button. This will place this service in the PrintFlow View for the printer button you selected.

- 10.) Click on Save.

You have now **configured a printer service** and attached it to a print button.

Now you can test the printer by pressing the print button you just configured. If you configured it for 1 row and 1 column each time you press the print button you will get a print sent to the printer. If you configured some other combination of rows or columns you will have to push the printer button multiple times before a print is sent to the printer.

If the image does not print, check the configuration to verify that you have it set up correctly.

7-10-3 View the Windows Printer Queues

- 1.) Go to **Utility -> System -> Peripherals**, and click on Properties.

K	P
Keyboard Mechanical Checks 45	Packing Materials Recycling Information 12
L	Peripherals Checks 33 Connection 32 External Peripherals 32 Internal Peripherals 32
Labels Locations 20	
LCD (Monitor) Adjustments 2	
Lighting 2	
List of Abbreviations 3	
Loading and Archiving Presets 13	Physical Dimensions 16 Inspection 13
Loading Presets from an MO Disk 13	
Lock	Power Stability Requirements 4 Power Transients 4 Voltage Drip-out 4
the Top Console 10	
LOGIQ E9 Models and Hardware/Software Compatibility	Power Supply - Test Procedure 47
5	Power Transients 4
LOTO 22	Power-up Procedures Voltage Settings 17
M	Pre-Installation 1 Requirements DICOM 11
Manpower Requirements 6	Preparing Unit for Installation 13
Mechanical	Probe Disconnect Probe 21
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