

SERVICE MANUAL

MRI Devices Corporation
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Document TR0092S

Revision E

GE Signa[®] Ovation[™] 0.35T Open Breast Coil

GE Catalog Part Number: M20052BC

MRIDC Part Number: 800092



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DAMAGE IN TRANSPORTATION

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

Immediately complete a "Damage Loss Claim Form", available via MS Exchange Mail, after the damage is found.

MS Exchange Path:

Outlook/Public Folder/All Public Folders/Medical Systems!/Global Initiatives/Information Management/Forms/Common Forms/DAMAGE LOSS CLAIM FORM.

Send the completed form to the email address listed in the form.

For more information about the Transportation Claim Procedure, access the GE Medical Systems Intranet and enter the following URL address (case sensitive):

<ftp://3.87.40.2/globepro/qualsys/Docs/190016MF.PDF>

Rev. 11/15/2000

Language Policy For Service Documentation (Dir. 2128126)

W A R N I N G

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

WARNUNG

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

AVISO

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

ATENÇÃO

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

AVVERTENZA

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

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SECTION 1 - INTRODUCTION

1-1 Product Identification and Shipping List

This is a service manual for the GE Signa® Ovation™ 0.35T Open Breast Coil.

Figure 1-1-1



SHIPPING LIST – TABLE 1-1-1

Description	GE Part #	MRIDC Part #	Qty
0.35T Open Breast Coil System	2282852	101181	1
OBC Service Manual	2284541	TR0092S	1
OBC Operator Manual	2282842	500044	1
Phantom Holder	2263556	100679	2
Sphere Phantom	46-317586G1	101129	1
Ramp Pad	2261597	100740	1
Sternum Pad	2261589	100433	1

1-2 Compatibility

This coil is compatible with the GE Signa® Ovation™ 0.35T System

1-3 Related Documentation

0.35T Open Breast Coil Operator Manual 2282842
GE MR Service Methods CD, 2283084

1-4 Environmental Requirements

Storage Requirements

The Open Breast Coil has no special storage requirements.

Dimensions

Coil Dimension:	559 mm x 406 mm x 176mm	(22.00 in x 15.98 in x 6.93 in)
Phantom Dimension:	100 mm diameter	(4.38 in diameter)

Weight

Coil Weight:	7.4 kg	(16.31 lb.)
Phantom Weight:	3.4 kg	(1.55 lb.)

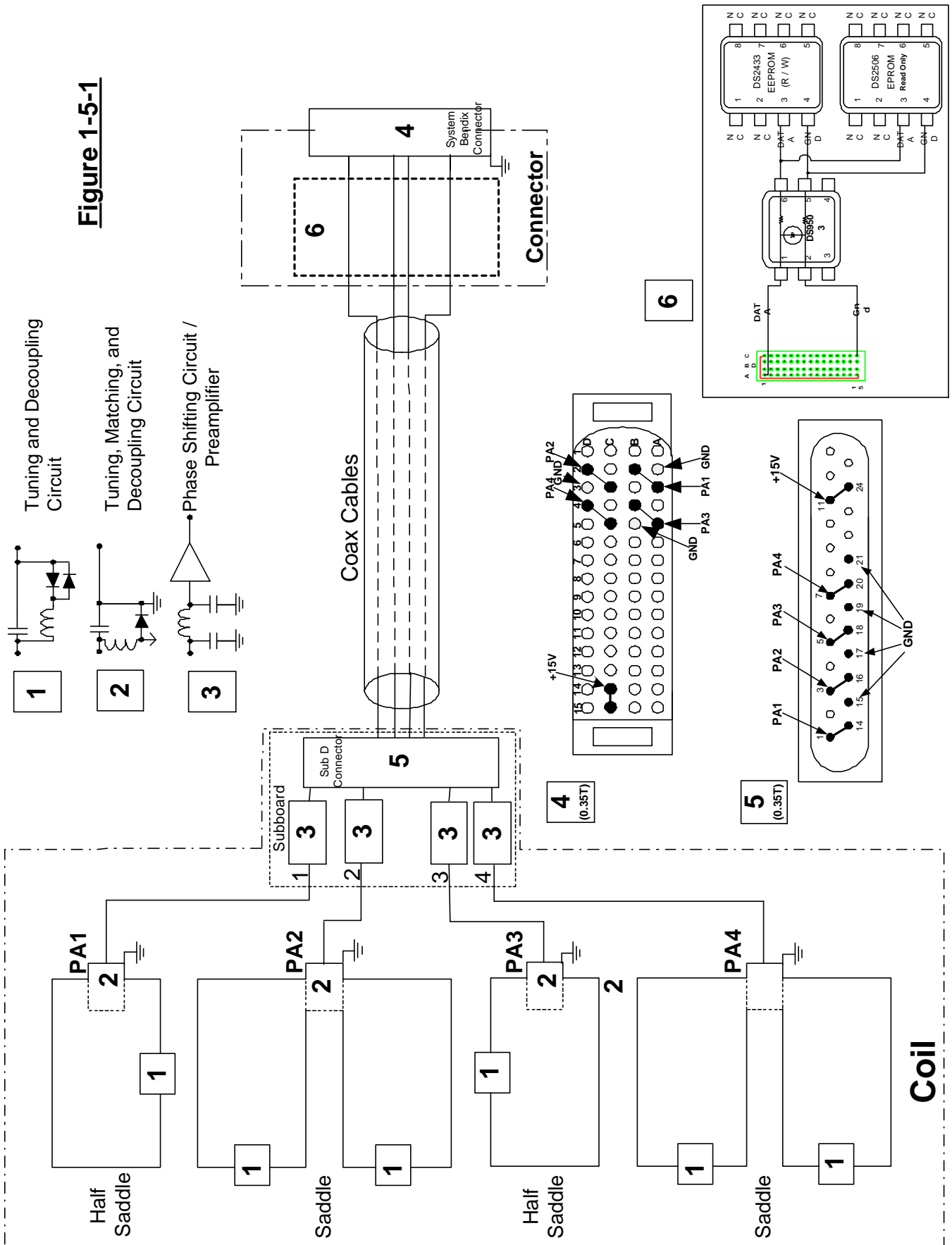
1-5 Theory of Operation

Refer to the Block Diagram, Figure 1-5-1, on the following page.

The Phased Array Open Breast Coil consists of one coil with 4 elements. Two of the elements are saddle coils and two of the elements are half saddle coils. The coil can be used in three modes of operation: Breast-BOTH, Breast-RIGHT and Breast-LEFT. Breast-BOTH uses all 4 elements. Breast-RIGHT uses the right loop and right saddle elements. Breast-LEFT uses the left loop and left saddle elements.

Each element contains items 1, 2, and 3, as labeled on block diagram. Item 1 is a tuning and decoupling circuit, which uses passive decoupling via back to back fast acting diodes which are enabled by the RF pulses. When the diodes short, the network creates a high impedance block to eliminate decoupling artifact and interaction with the excitation field. Item 2 is a tuning, matching, and decoupling circuit which not only tunes and matches the coil to the system resonant frequency, and matches the coil to 50 ohms when loaded, it also provides decoupling when the DC bias on the center conductor of the input cable is positive. Item 3 provides the proper phase shift between the preamplifier and item 2 to create the phased array decoupling required during receive. The coil ID circuit is located in the system connector, item 6.

Figure 1-5-1



SECTION 2 - SETUP AND CALIBRATION

2-1 Coil Installation

2-1-1 Special Install Notes

None

2-1-2 Configuration

The system will automatically recognize the coil using the Coil ID feature. No configuration should be required. For reference, the configuration information, Table 7-3-1, is included in the Appendix. Check the system coil configuration file and verify that it is the same as the coil configuration table in the latest manual.

2-2 Installation Functional Checks

1. From the Scan Desktop, start new scan by selecting [**New Pt**]; set **Patient ID** to “geservice” and **Patient Weight** to “111” pounds. Click [**Patient Position**] to open protocols window.
2. Plug the coil into the patient table and verify the coil indicator light, on the side of the port, turns green. A green light indicates the system hardware identifies the coil.
3. At the console, verify the Coil has been properly identified by the system: correct name in **Coil** field and correct picture on the screen.
4. Perform system level Signal to Noise Check. Refer to Service Methods CD; System Level Procedures; Functional Checks; Signal to Noise Check.
5. Perform Section 3 - Coil Imaging Performance Verification.

2-3 Periodic Quality Assurance Check

On a periodic basis, such as during planned maintenance, perform the quality assurance checks as outlined below to ensure the coils is operating properly.

1. Check external cable for cracks or cuts.
2. Perform Section 3 - Coil Imaging Performance Verification and record data values in Data Sheet.

SECTION 3 - FUNCTIONAL CHECKS

3-1 Scanner Verification

Perform system level Signal to Noise Check. Refer to Service Methods CD; System Level Procedures; Functional Checks; Signal to Noise Check.

3-2 Coil Imaging Performance Verification

3-2-1 Tools Required

TOOLS REQUIRED – TABLE 3-2-1

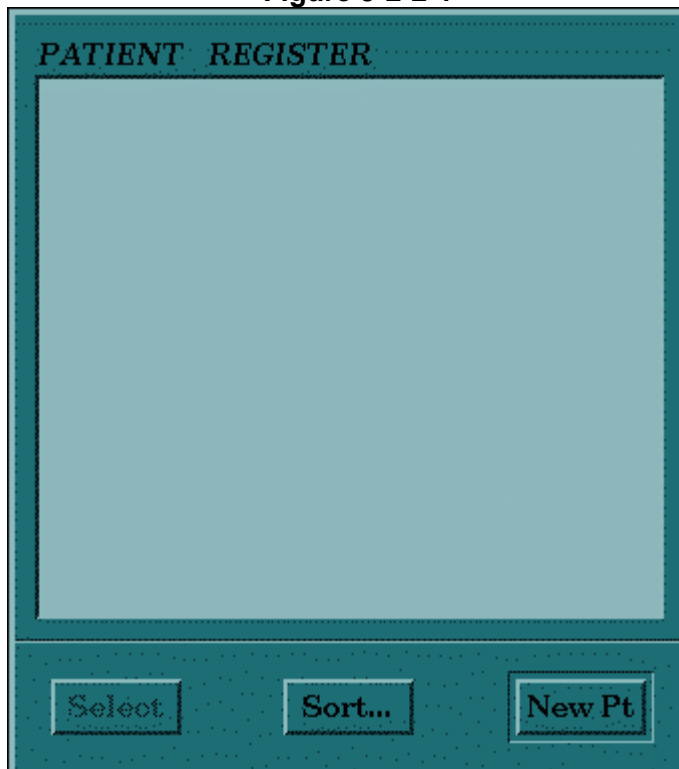
Description	GE Part #	MRIDC Part #	Qty
Phantom Holder	2263556	100679	2
Sphere Phantom*	46-317586G1	101129	2

* The coil package contains only one phantom, another is contained in the system phantom set.

3-2-2 Scan Setup

1. Select [New Pt] to set a new landmark. [Figure 3-2-2-1]

Figure 3-2-2-1



2. Remove any other surface coil (if present) from the cradle. Place the coil near the top of the cradle. Place the two phantoms and the two phantom holders on the coil (See Figure 3-2-2-2). Connect the coil connector to the coil port.

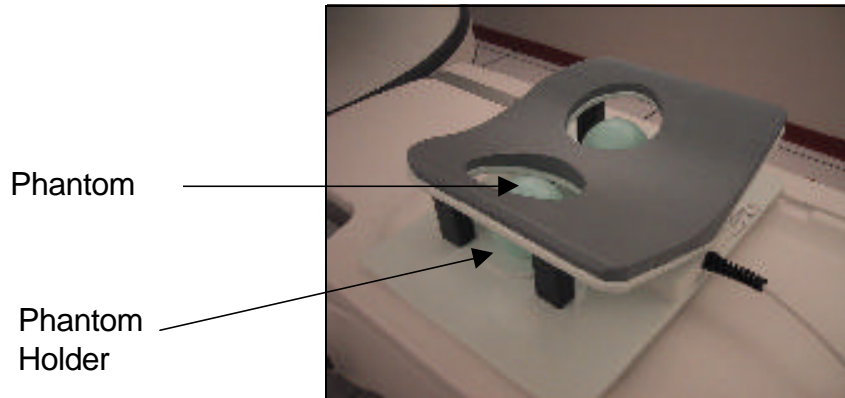
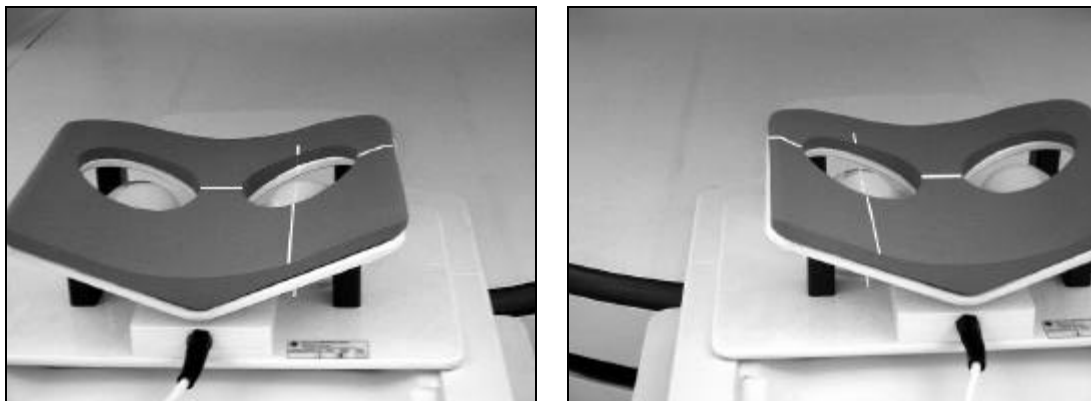


Figure 3-2-2-2: Phantom Setting

3. At the magnet, press the “Alignment Light” button to turn on the light. Move the cradle to align the coil to the alignment lights as shown in Figure 3-2-2-3. Use the lateral handle to set the phantom at the center. Press the “Landmark” button to landmark the alignment.



Breast-RIGHT Landmark

Breast-LEFT Landmark

Figure 3-2-2-3: Coil Landmarks

4. Move the coil to scan position by pushing the “Move to Scan” button, ensuring cable does not get snagged.
5. Enter “geservice” for [Patient ID]. [Figure 3-2-2-4]
6. Enter “QA Scan” for [Patient name]. [Figure 3-2-2-4]

Figure 3-2-2-4

PATIENT INFORMATION

Accession Number

Patient ID

Patient Name

Birth Date Age

Sex Weight Lb Kg

Rad Refer

Operator Status

Exam Description

History

7. Enter "111" lbs for [Weight]. [Figure 3-2-2-4]
8. Select [Patient Position].
9. At the console, verify the Coil has been properly identified by the system: correct picture on the screen and correct name in Coil field. If system does not recognize coil, refer to Section 2 - Setup and Calibration.
10. Enter the following parameters;

SNR PROTOCOL SHEET - TABLE 3-2-2-1

Patient/Exam Information			
Patient ID	geservice		
Patient Name	QA Scan		
Patient Weight	111 lbs (50kg)		
Landmark	Nasion		
Table Entry	Center		
Patient Position			
Patient Position	Supine		
Patient Entry	Head first		
Coil	Breast-Right Breast-Left		
Series Description	<i>leave blank</i>		
Imaging Parameters			
Plane	Axial		
Mode	2D		
Pulse Seq	Spin Echo		
Imaging Options	None		
PSD Name	<i>leave blank</i>		
Protocol	<i>leave blank</i>		
Scan Timing			
# of Echoes	1		
TE	25.0		
TR	500		
Bandwidth	10.42		
Additional Parameters			
<i>no entries required in this area</i>			
Acquisition Timing			
Freq	256		
Phase	256		
NEX	1.0		
Phase FOV	1.0		
Freq DIR	L/R		
Auto Center Freq	Peak		
Auto Shim	On		
Contrast	Off		
Scanning Range			
FOV	25		
Slice Thickness	5		
Spacing	0		
	I/S	P/A center	R/L center
start	0	P100	0
End	0		
# Slices	1		

11. Select [Save Series].

3-2-3 Phantom Scan

1. Choose the saved series and select [Prepare to scan]

- Bring the mouse pointer to [Research Operations]. Then click right button on the mouse.
- Select [Display CVs].

Figure 3-2-3-1

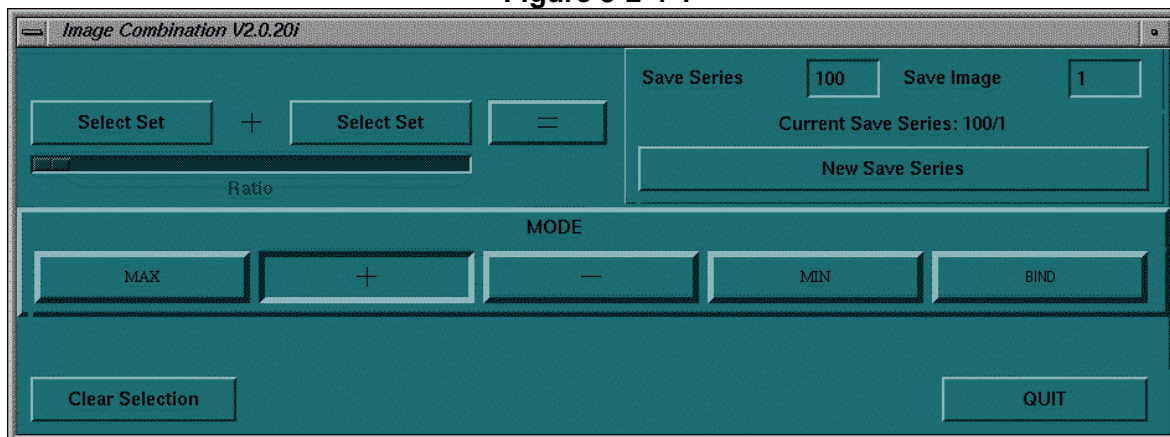


- Enter "saveinter" for CV name, set the current value to 1. Press enter key to save the changes made in the "saveinter" window. Press [Accept] to close window.
- Select [Auto Prescan]
- Select [Scan]
- Wait for scan to finish before proceeding.
- After first scan, select [Scan] again

3-2-4 Create Subtraction Images

- Select [Display Icon] to display the Browser.
- Select the exam named "QA Scan"
- After the phantom scan, select [Add / Sub] from browser.

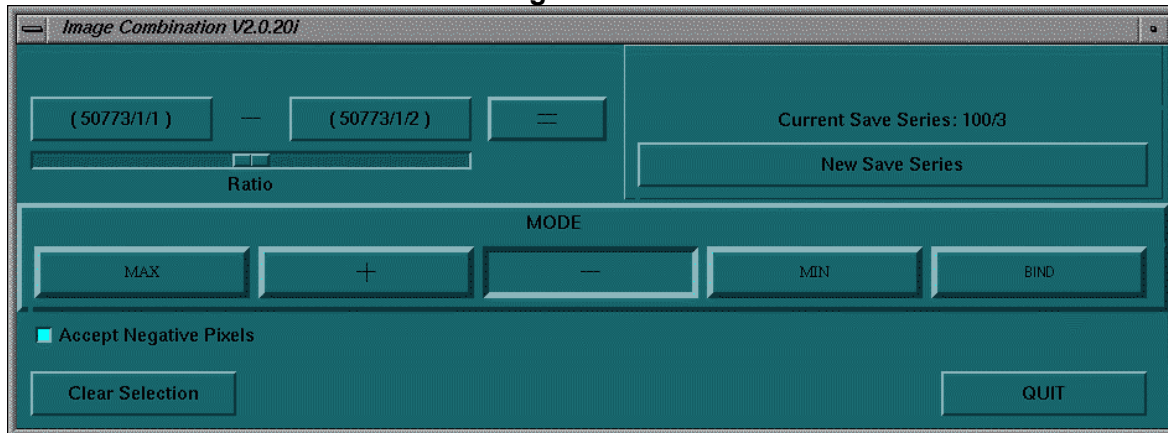
Figure 3-2-4-1



- Select MODE [-] and Check [Accept Negative Pixels].
- Select image#1 from browser and then Select [Select Set](left button on the Image Combination window).
- Select image#4 from browser and then Select [Select Set] (right button on the Image Combination window).
- Select [=].

- Also create Subtraction Images using, (image#2 – image#5) and (image#3 – image#6).

Figure 3-2-4-2



SETTING CURSOR

- Select [Display Icon] to display the Browser.
- Select the exam named “QA Scan”.
- Select image #1. Select [Mini Viewer]
- Select [Grid] to set cursor.
- Select [Measure] button. Select circular cursor and set 2800mm² (+/-100mm²)
- Set cursor at the center of the phantom.
- Use cursor copy [CTRL]+[C] and paste [CTRL]+[V] to easily set the cursor to each image.

3-2-5 SNR Image Analysis

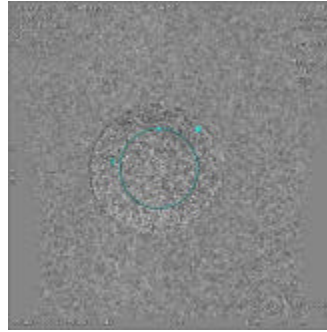
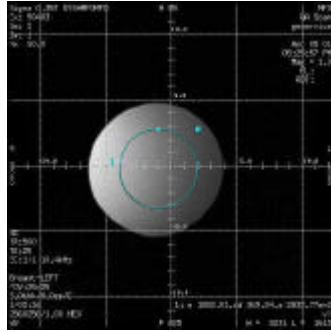
Signal measurement

- Measure the mean value of image#1 and record it on the table on Appendix SNR worksheet
- Open image#4 and measure the mean value with same size ROI.
- Measure the mean of other images #2, #3, #5 and #6.

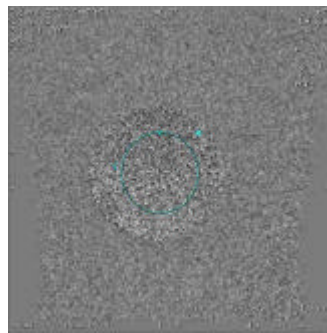
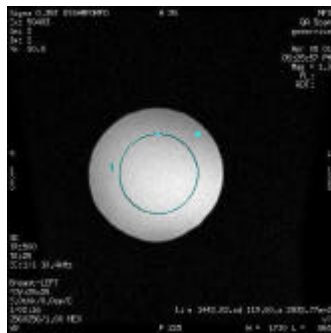
Noise measurement

- Select subtracted image#1 in the series#100s from browser and select [Mini Viewer].
- Record SD value using with same size ROI on SNR Worksheet on Appendix.
- Repeat this procedure for image#2 and #3 in series#100s.

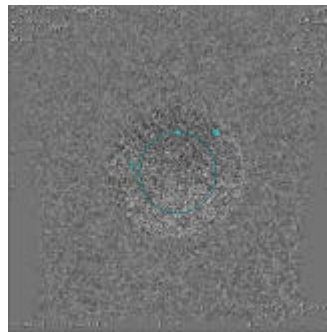
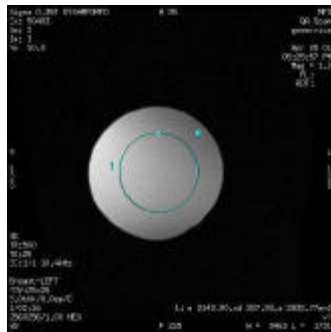
Left Breast Element 1 Images - Figure 3-2-5-4



Left Breast Element 2 Images - Figure 3-2-5-5



Left Breast Composite Images - Figure 3-2-5-6



3-3 External Cable Check

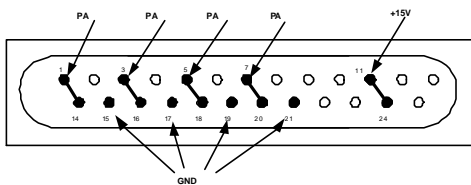
Check the system cable using the following procedure. Remove four screws on the bottom of the coil housing and disconnect the Sub D connector (No. 5 in block diagram, Figure 1-5-1). Using a digital multimeter, measure continuity through the connections detailed in External Cable Expected Readings – Table 3-3-1. Also verify that signal pins are not shorted to GND.

EXTERNAL CABLE EXPECTED READINGS – TABLE 3-3-1

Signal	Coil Sub D Connector (No.5) (27W2) Pin	System Bendix Connector (No.4) (Bendix60) Pin
Channel 1 & T/R 1	1, 14	A3, B2
Channel 1 & T/R 2	3, 16	C3, D2
Channel 1 & T/R 3	5, 18	A5, B4
Channel 1 & T/R 4	7, 20	C5, D4
+ 15 V	11, 24	C1, C2
GND	2,4,6,8,15,17,19,21	A2,A4,B1,B3,B5,C4,D3,D5

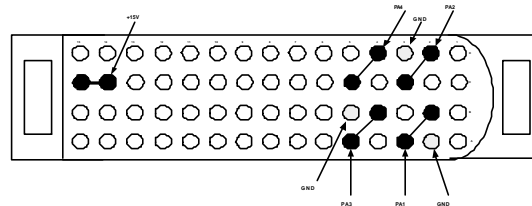
If all readings are < 3 ohms, proceed to **Diode Check**.

Figure 3-3-1



Coil Connector SubD

Figure 3-3-2



System Connector Bendix

3-4 PIN Diodes Check

Measure the following pins in Sub D connector (27W2, No.5 in block diagram) with a multimeter.

PIN DIODE EXPECTED READINGS – TABLE 3-4-1

Positive lead	Negative lead	Reading
Pin 1 (PA1)	GND (Pin 15)	One diode drop
GND (Pin 15)	Pin 1 (PA1)	Open
Pin 3 (PA2)	GND (Pin 17)	One diode drop
GND (Pin 17)	Pin 3 (PA2)	Open
Pin 5 (PA3)	GND (Pin 19)	One diode drop
GND (Pin 19)	Pin 5 (PA3)	Open
Pin 7 (PA4)	GND (Pin 21)	One diode drop

If one or more readings indicate a short, reconnect coil system cable and replace coil. If all of the above readings are correct, redo *Scanner and coil verification testing procedures* from above. If problem still exist, replace breast coil.

3-5 Mechanical Hardware Check

Not Applicable

3-6 Troubleshooting Tips

If poor image quality or dead channels are present, use the following setup information and compare the resulting images to isolate any defective part(s).

COIL ELEMENT INFORMATION – TABLE 3-6-1

Breast-BOTH									
element name	right loop	right saddle	left loop	left saddle	not used	not used	not used	not used	not used
channel number	1	2	3	4	5	6	7	8	n/a
selected channel	See Below				no	no	no	no	n/a
mc bias driver #	1	1	2	2	3	3	4	4	n/a
active bias driver	yes	yes	yes	yes	no	no	no	no	n/a

selected channel	Yes	Yes	Yes	Yes
------------------	-----	-----	-----	-----

Breast-BOTH Image Composite ?

selected channel	Yes	No	No	No
------------------	-----	----	----	----

Breast-BOTH Image Receiver 1 ?

selected channel	No	Yes	No	No
------------------	----	-----	----	----

Breast-BOTH Image Receiver 2 ?

selected channel	No	No	Yes	No
------------------	----	----	-----	----

Breast-BOTH Image Receiver 3 ?

selected channel	No	No	No	Yes
------------------	----	----	----	-----

Breast-BOTH Image Receiver 4 ?



Breast-LEFT – TABLE 3-6-2

Breast-LEFT									
element name	right loop	right saddle	left loop	left saddle	not used	not used	not used	not used	not used
channel number	1	2	3	4	5	6	7	8	n/a
selected channel	no	no	yes	yes	no	no	no	no	n/a
mc bias driver #	1	1	2	2	3	3	4	4	n/a
active bias driver	no	no	yes	yes	no	no	no	no	n/a

Breast-RIGHT – TABLE 3-6-3

Breast-RIGHT									
element name	right loop	right saddle	left loop	left saddle	not used	not used	not used	not used	not used
channel number	1	2	3	4	5	6	7	8	n/a
selected channel	yes	yes	no	no	no	no	no	no	n/a
mc bias driver #	1	1	2	2	3	3	4	4	n/a
active bias driver	yes	yes	no	no	no	no	no	no	n/a

The Breast-LEFT and Breast-RIGHT tables are presented here to provide complete channel information for comparative troubleshooting.

SECTION 4 - MAINTENANCE

4-1 Coil Care



Detach coil connector from scanner before attempting to clean. Do not reattach after cleaning until coil has dried completely. Having the coil attached to the system during cleaning or when it is wet may result in electrical shock.



Do not spray or pour cleaning solution directly on coil. Do not submerge coil in solution. The coil contains sensitive electronics components that could be damaged by the solution.

The Open Breast Array coil, Sternum pad and Ramp pad may be cleaned by wiping with a cloth dampened with a solution of 30% isopropyl alcohol and 70% tap water or a 10% Bleach solution.

4-2 Special Care Requirements

None

SECTION 5 - REPLACEMENT

Simple removals that are clearly obvious are not described here.

Unless otherwise noted, the steps for re-assembly are simply the reverse order of the steps described for disassembly.

5-1 Disassembly of Coil

Not Applicable

5-2 External Cable Replacement

Remove four screws on bottom of coil housing and disconnect Sub D connector (No. 5 in block diagram). Remove cable. After replacement, verify that signal pins are not shorted to GND.

5-3 Mechanical Hardware Replacement

Not Applicable

SECTION 6 - RENEWAL PARTS

6-1 Field Replaceable Units

FIELD REPLACEABLE UNITS LIST – TABLE 6-1-1

MRIDC No.	Description	GE Part No.
101181	0.35T Open Breast Coil System	2282852
101197	System Cable, Open Breast Coil 0.35T	2284540
100679	Phantom Holder	2263556
101129	Sphere Phantom	46-317586G1

6-2 Other Replaceable Accessories

OTHER REPLACEABLE ACCESSORIES LIST – TABLE 6-2-1

MRIDC No.	Description	GE Accessory Part No.
100740	Ramp Pad	2261597
100433	Sternum Pad	2261589

SECTION 7 - APPENDIX

7-1 SNR Data Sheet

Use tables 7-1-1 and 7-1-2 to record the Signal to Noise Ratio (SNR) data obtained from the Functional Checks in Section 3.

Breast-RIGHT SNR DATA SHEET – TABLE 7-1-1

Date Tested	Receiver ch.#	Coil Element #	Image #	Signal Mean 1	Signal Mean 2	Noise SD from Subtraction image	SNR	Spec.
	1	1	1&4					
	2	2	2&5					
	composite	composite	3&6					
		R1=		R2=				
		TG=		Freq=				

Breast-LEFT SNR DATA SHEET – TABLE 7-1-2

Date Tested	Receiver ch.#	Coil Element #	Image #	Signal Mean 1	Signal Mean 2	Noise SD from Subtraction image	SNR	Spec.
	1	3	1&4					
	2	4	2&5					
	composite	composite	3&6					
		R1=		R2=				
		TG=		Freq=				

7-2 Schematic

Refer to Block Diagram, Figure 1-5-1, under Section 1-5 Theory of Operation

7-3 Coil Configuration

Breast-BOTH COIL CONFIGURATION – TABLE 7-3-1

coilCode	BREAST								
coilName	Breast-BOTH								
element name	left loop	left saddle	right loop	right saddle	not used	not used	not used	not used	not used
channel number	1	2	3	4	5	6	7	8	n/a
selected channel	yes	yes	yes	yes	no	no	no	no	n/a
mc bias driver #	1	1	2	2	3	3	4	4	n/a
active bias driver	yes	yes	yes	yes	no	no	no	no	n/a
mcPortEnable	3	bit mask driver 1 = 1, 2 = 2, 3 = 4, 4 = 8							
mcErrorEnable	3	must be same as mcPortEnable							
mcChannelSel	15	see truth table							
mcReconEnable	0	bit mask to cut out receivers: rcvr 0 = 1, 1 = 2, 2 = 4, 3 = 8							
startRec	0	value 0 through 3 must be <= endRec							
endRec	3	value 0 through 3 must be >= startRec							
numRec	4	(endRec - startRec) + 1							
startFastRec	4	always 4							
endFastRec	4	always 4							
numFastRec	0	always 0 except single channel coils with fast receiver present							
ATTN_Q	0	Q channel attenuation. Range 0.0 to 15.5 dB in 0.5 dB steps.							
ATTN_I	0	I channel attenuation. Range 0.0 to 15.5 dB in 0.5 dB steps.							
quadRotation	0	selects quadrature shifter for single channel quadrature coils: 1=+90, 0=-90							
coilType	3	1 = head T/R, 2 = body T/R, 3 = receive only							
extremity	no	must be "yes" or "no", only meaningful if coilType = 1							
cableLoss	1	linear attenuation factor representing loss between RF amp and T/R coil							
coilLoss	1.165	transmit energy lost in coil (joules per standard pulse)							
reconScale	0.87	Gain factor for T/R coils. Rcv only coils multiply this times head coil value.							
multiCoil	yes	must be "yes" or "no"							
linearQuad	1	0 = linear, 1 = quadrature. Applies to transmit coils only.							
xmitAtten	0	equivalent to attenuation added between sys & RF cabs in TG units							
fastTGstartTA	90	subtract this value from 200 to get TG at which fast TG starts							
fastTGstartRG	12	default R1 setting for fast TG							
autoslimRcvr	-1	for T/R phased arrays, tells autoslim which rcvr (0-15) to use, otherwise -1							
headDefaultFreqDir	0	1 means default frequency direction is same as head coil, 0 is not							
quadRcvCoil	0	0 = linear, 1 = quadrature. Only applies to single channel receive & TR coils.							
cfoption	0	Special Sequence Coefficient							

Breast-RIGHT COIL CONFIGURATION – TABLE 7-3-2

coilCode	BREAST								
coilName	Breast-RIGHT								
element name	right loop	right saddle	not used	not used	not used	not used	not used	not used	not used
channel number	1	2	3	4	5	6	7	8	n/a
selected channel	yes	yes	no	no	no	no	no	no	n/a
mc bias driver #	1	1	2	2	3	3	4	4	n/a
active bias driver	yes	yes	no	no	no	no	no	no	n/a
mcPortEnable	1	bit mask driver 1 = 1, 2 = 2, 3 = 4, 4 = 8							
mcErrorEnable	1	must be same as mcPortEnable							
mcChannelSel	3	see truth table							
mcReconEnable	0	bit mask to cut out receivers: rcvr 0 = 1, 1 = 2, 2 = 4, 3 = 8							
startRec	0	value 0 through 3 must be <= endRec							
endRec	1	value 0 through 3 must be >= startRec							
numRec	2	(endRec - startRec) + 1							
startFastRec	4	always 4							
endFastRec	4	always 4							
numFastRec	0	always 0 except single channel coils with fast receiver present							
ATTN_Q	0	Q channel attenuation. Range 0.0 to 15.5 dB in 0.5 dB steps.							
ATTN_I	0	I channel attenuation. Range 0.0 to 15.5 dB in 0.5 dB steps.							
quadRotation	0	selects quadrature shifter for single channel quadrature coils: 1=+90, 0=-90							
coilType	3	1 = head T/R, 2 = body T/R, 3 = receive only							
extremity	no	must be "yes" or "no", only meaningful if coilType = 1							
cableLoss	1	linear attenuation factor representing loss between RF amp and T/R coil							
coilLoss	1.165	transmit energy lost in coil (joules per standard pulse)							
reconScale	0.87	Gain factor for T/R coils. Rcv only coils multiply this times head coil value.							
multiCoil	yes	must be "yes" or "no"							
linearQuad	1	0 = linear, 1 = quadrature. Applies to transmit coils only.							
xmitAtten	0	equivalent to attenuation added between sys & RF cabs in TG units							
fastTGstartTA	90	subtract this value from 200 to get TG at which fast TG starts							
fastTGstartRG	12	default R1 setting for fast TG							
autoshimRcvr	-1	for T/R phased arrays, tells autoshim which rcvr (0-15) to use, otherwise -1							
headDefaultFreqDir	0	1 means default frequency direction is same as head coil, 0 is not							
quadRcvCoil	0	0 = linear, 1 = quadrature. Only applies to single channel receive & TR coils.							
cfoption	0	Special Sequence Coefficient							

Breast-LEFT COIL CONFIGURATION – TABLE 7-3-3

coilCode	BREAST									
coilName	Breast-LEFT									
element name	not used	not used	left loop	left saddle	not used	not used	not used	not used	not used	not used
channel number	1	2	3	4	5	6	7	8	n/a	
selected channel	no	no	yes	yes	no	no	no	no	n/a	
mc bias driver #	1	1	2	2	3	3	4	4	n/a	
active bias driver	no	no	yes	yes	no	no	no	no	n/a	
mcPortEnable	2	bit mask driver 1 = 1, 2 = 2, 3 = 4, 4 = 8								
mcErrorEnable	2	must be same as mcPortEnable								
mcChannelSel	15	see truth table								
mcReconEnable	0	bit mask to cut out receivers: rcvr 0 = 1, 1 = 2, 2 = 4, 3 = 8								
startRec	2	value 0 through 3 must be <= endRec								
endRec	3	value 0 through 3 must be >= startRec								
numRec	2	(endRec - startRec) + 1								
startFastRec	4	always 4								
endFastRec	4	always 4								
numFastRec	0	always 0 except single channel coils with fast receiver present								
ATTN_Q	0	Q channel attenuation. Range 0.0 to 15.5 dB in 0.5 dB steps.								
ATTN_I	0	I channel attenuation. Range 0.0 to 15.5 dB in 0.5 dB steps.								
quadRotation	0	selects quadrature shifter for single channel quadrature coils: 1=+90, 0=-90								
coilType	3	1 = head T/R, 2 = body T/R, 3 = receive only								
extremity	no	must be "yes" or "no", only meaningful if coilType = 1								
cableLoss	1	linear attenuation factor representing loss between RF amp and T/R coil								
coilLoss	1.165	transmit energy lost in coil (joules per standard pulse)								
reconScale	0.87	Gain factor for T/R coils. Rcv only coils multiply this times head coil value.								
multiCoil	yes	must be "yes" or "no"								
linearQuad	1	0 = linear, 1 = quadrature. Applies to transmit coils only.								
xmitAtten	0	equivalent to attenuation added between sys & RF cabs in TG units								
fastTGstartTA	90	subtract this value from 200 to get TG at which fast TG starts								
fastTGstartRG	12	default R1 setting for fast TG								
autoshimRcvr	-1	for T/R phased arrays, tells autoshim which rcvr (0-15) to use, otherwise -1								
headDefaultFreqDir	0	1 means default frequency direction is same as head coil, 0 is not								
quadRcvCoil	0	0 = linear, 1 = quadrature. Only applies to single channel receive & TR coils.								
cfoption	0	Special Sequence Coefficient								

REVISION HISTORY

Rev	Date	Author	Primary Reason for Change	DCN
A	1/8/2000	T. Holzworth	First Issue	
B	4/25/2000	L. Hyler	Revise Document Format	
C	7/5/2001	L. Hyler	Revise according to YMS Comments	
D	7/16/2001	L. Hyler	Further YMS Revision	
E	12/07/01	L. Hyler	Add cfoption	