SERVICE MANUAL

MRI Devices Corporation
3545 SW 47th Avenue
Gainesville, FL 32608

Document TR0208S

Revision 02

GE SIGNA 1.5T T/R Knee and Foot Array Coil

GE Catalog Part Number: 2293674-2

MRIDC Part Number: 800208

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.**
- **DO NOT ATTEMPT TO SERVICE THE EQUIPMENT UNLESS THIS SERVICE MANUAL HAS BEEN CONSULTED AND IS UNDERSTOOD.**
- **FAILURE TO HEED THIS WARNING MAY RESULT IN INJURY TO THE SERVICE PROVIDER, OPERATOR OR PATIENT FROM ELECTRIC SHOCK, MECHANICAL OR OTHER HAZARDS.**

AVERTISSEMENT

- **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.**

ATENÇAO

- **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 TENTE REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTÊNCIA TÉCNICA.**
- **O NÃO CUMPRIMENTO DESTE AVISO PODE POR EM PERIGO A SEGURANÇA DO TÉCNICO, OPERADOR OU PACIENTE DEVIDO A' CHOQUES ELÉTRICOS, MECÂNICOS OU OUTROS.**

AVVERTENZA

- **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.**

警告

- このサービスマニュアルは英語版しかありません。
- GEMS以外でサービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。
- このサービスマニュアルを熟読し、理解せずに装置のサービスを行わないでください。
- この警告に従わない場合、サービスを担当される方、操作員あるいは患者さんが、感電や機械的又はその他の危険により負傷する可能性があります。

注意:

- 本维修手册仅存有英文本。
- 非 GEMS 公司的维修员要求非英文本的维修手册时，客户需自行负责翻译。
- 未详细阅读和完全了解本手册之前，不得进行维修。
- 忽略本注意事项会对维修员，操作员或病人造成触电，机械伤害或其他伤害。

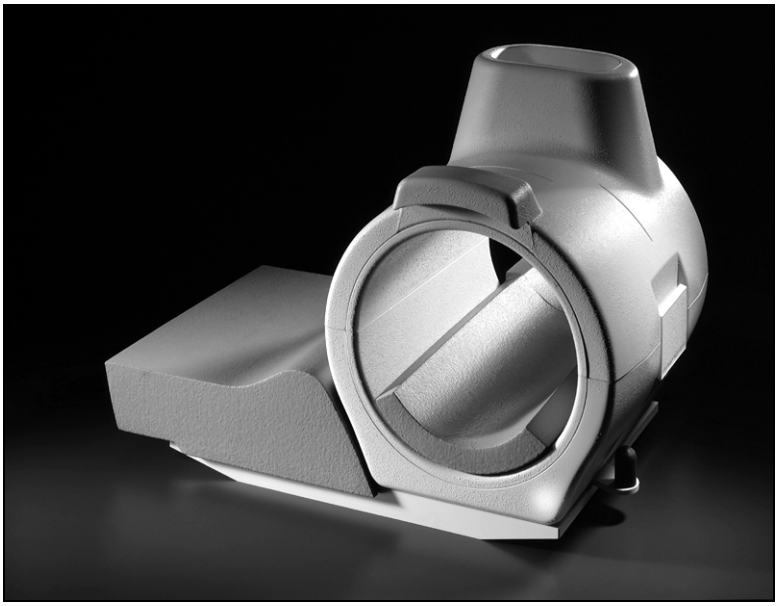
TABLE OF CONTENTS

Section 1 - Introduction 6
1-1 Product Identification and Shipping List 6
1-2 Compatibility 6
1-3 Related Documentation 6
1-4 Environmental Requirements 7
1-5 Theory of Operation 7
Section 2 - Setup and Calibration 9
2-1 Coil Installation 9
2-1-1 Special Install Notes 9
2-1-2 Installing the Coil 9
2-2 Installation Functional Checks 9
2-3 Periodic Quality Assurance Check 9
Section 3 - Functional Checks 10
3-1 Scanner Verification 10
3-2 Coil Imaging Performance Verification 10
3-2-1 Tools Required 10
3-2-2 Explanation of Procedure 10
3-2-3 Signal Scan 10
3-2-4 Noise Scan 12
3-2-5 SNR Image Analysis 14
3-3 External Cable Check 17
3-4 PIN Diodes Check 18
3-5 Mechanical Hardware Check 18
3-6 Troubleshooting Tips 18
Section 4 - Maintenance 20
4-1 Coil Care 20
4-2 Special Care Requirements 20
Section 5 - Replacement 21
5-1 Disassembly of Coil 21
5-2 External Cable Replacement 21
5-3 Mechanical Hardware Adjustment 22
Section 6 - Renewal Parts 23
6-1 Field Replaceable Units 23
6-2 Other Replaceable Accessories 23
Section 7 - Appendix 24
7-1 SNR Data Sheet 24
7-2 Schematic 25
7-3 Coil Configuration 26

SECTION 1 - INTRODUCTION

1-1 Product Identification and Shipping List

This is a service manual for the GE SIGNA 1.5T T/R Knee and Foot Array Coil.



SHIPPING LIST – TABLE 1-2

Description	GE Part #	MRIDC #	Qty
1.5T T/R Knee and Foot Array Coil with cable	2293674-2	101759	1
1.5T T/R Knee and Foot Array Coil Service Manual	2293674-7	TR0208S	1
1.5T T/R Knee and Foot Array Coil Operator Manual	2293674-6	500072	1
Knee Support Pad	2293674-11	101144	1
Alternate Knee Support Pad	2293674-12	101145	1
Foot Support Pad	2293674-9	101141	1
Forefoot Wedge Pad	2293674-10	101142	1
Phantom	2293674-3	101448	1
Phantom Positioner	2293674-5	101450	1

1-2 Compatibility

This coil is compatible with the following hardware configurations:

Signa Horizon and LX Horizon 1.5T
Signa Advantage 1.5T

1-3 Related Documentation

Signa LX Service Methods CD, 2160623-1

1.5T T/R Knee and Foot Array Coil Operator's Manual, 2293674-6

1-4 Environmental Requirements

Storage Requirements

The 1.5T T/R Knee and Foot Array Coil has no special storage requirements.

Dimensions

Coil Dimension:	460.0 mm x 381.0 mm x 356.4 mm	(18.11 in x 15.00 in x 14.03 in)
Phantom* Dimension:	295.0 mm x 203.0 mm x 305.0 mm	(11.80 in x 8.12 in x 12.20 in)

Weight

Coil Weight:	6.90 Kg	(15.180 lb)
Phantom* Weight:	4.69 Kg	(10.318 lb)

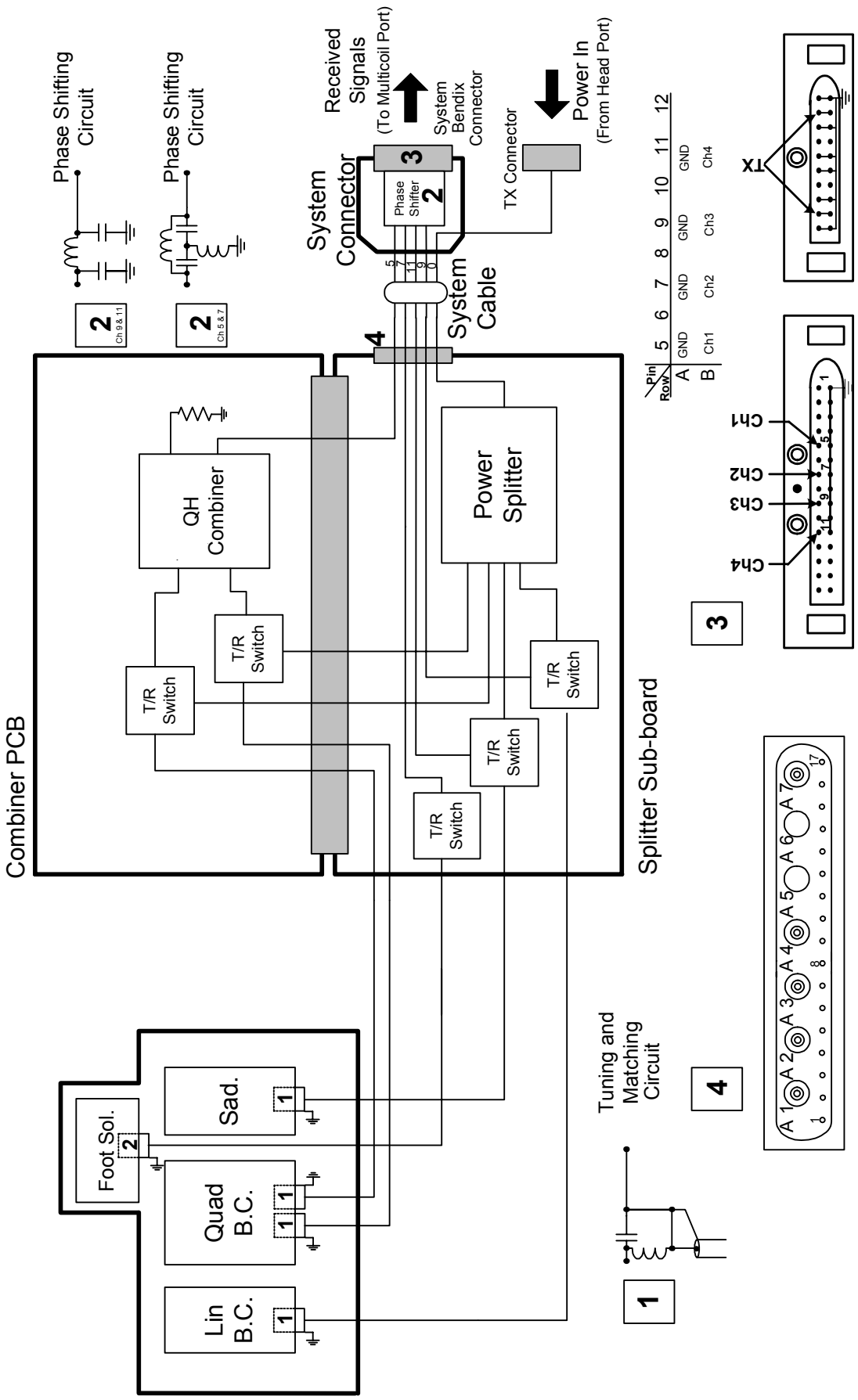
**Phantom Dimension* is the combined measurement of the phantom mounted in the phantom positioner. *Phantom Weight* is the combined weight of the phantom, filled with fluid, and the phantom positioner.

1-5 Theory of Operation

Refer to the Block Diagram on the following page.

The 1.5T T/R Knee and Foot Array Coil consists of 4 elements: 3 elements (Quad-Birdcage, Linear Birdcage and a saddle coil) cover the knee and ankle areas, and a solenoid covers the forefoot and toes area. During transmit RF power is properly phased and split mainly to the Quad-Birdcage, Linear Birdcage and the saddle, with a marginal amount coupled to the solenoid. This forms a very uniform excitation field. The T/R switches consist of series diodes activated during transmit, as well as preamp protection networks. During receive, signals from the coil elements are directed to the multi-coil system connector. Phase shifters in the receive path provide additional element decoupling by proper transformation of pre-amplifier input impedance.

1.5T T/R Knee & Foot Array - Block Diagram



SECTION 2 - SETUP AND CALIBRATION

2-1 Coil Installation

2-1-1 Special Install Notes

None

2-1-2 Installing the Coil

For software versions 8.3 and earlier, the names for this coil are: **TRKneePA, TRFootPA** and **TRKneePA-SHIM**. For software versions 8.5 and later, the names for this coil are: **TRKneePA** and **TRFootPA**.

Add the coil using the Configuration File Manager. Refer to: Service Methods CD; System Level Procedures; Software Utilities.

If the coil does not exist in the Coil Config File refer to the Adding New Coils to Config File Manager procedure and use the coil configuration information in Section 7-3 of this manual.

NOTE: Remove the following coil configurations from the site's CoilConfig.cfg file if the customer does not have these coils.

Medical Advances	QUADKNEE
MedRad	KNEEPA, LGEXTPA, SMEXTPA
GE	EXTREM

Also, edit the patient protocols in the site extremity saved protocols and change the default coil to **TRFootPA**. This is especially effective for localizer prescriptions where the body coil might be selected accidentally. Refer to the GE System Operator's Manual.

2-2 Installation Functional Checks

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

2. 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 #	Qty
Phantom	2293674-3	101448	1
Phantom Positioner	2293674-5	101450	1

3-2-2 Explanation of Procedure

The 1.5T T/R Knee and Foot Array Coil can be used in 2 modes of operation and has 3 coil names for software versions 8.3 and earlier: **TRKneePA, TRFootPA** and **TRKneePA-SHIM**. SNR measurements should be made for the **TRFootPA** mode of operation, requiring 4 sets of signal and noise scans. For software versions 8.5 and later, the 1.5T T/R Knee and Foot Array Coil can be used in 2 modes of operation and has 2 coil names: **TRKneePA** and **TRFootPA**. SNR measurements should be made for **TRFootPA** mode requiring 4 sets of signal and noise scans. Refer to the Data Sheet in Appendix 7-1 to understand the data required to calculate the individual element SNR for each mode of operation. All ROI measurements are made on the individual element images, **not** on the composite image.

The image quality check uses two different protocols for signal and noise image acquisition. The signal scan is an **FSE** sequence used to minimize susceptibility and B_0 inhomogeneity effects. The noise scan is a **GRE** sequence that has a Control Variable (do_noise) to eliminate the transmit RF completely during the scan. The signal scan **must** be run prior to the noise scan as the R1, R2, and TG values from the signal scan are used for the noise scan.

3-2-3 Signal Scan

The following procedure is specific to the LX platform but can be easily adapted for 5.x systems.

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. Remove any other surface coils from the cradle. Position the 1.5T T/R Knee and Foot Array Coil on the cradle with the coil cable extending into the magnet [Figure 1]. The coil may be shifted left or right on its baseplate, and is intended for use with the patient entering the magnet feet first [Figure 2]. The coil is landmarked at isocenter [Figure 3].

3. At the magnet, press "**Alignment Light**" button to turn on the light. Move the cradle to align the coil to the alignment lights as shown in figure 3. Press "**Landmark**" button to landmark the alignment.

4. Move the coil to scan position by pushing the "**Move to Scan**" button, ensuring cable does not get snagged.

5. At the console, set the protocols per the Signal section from Table 3-2-4: Signal and Noise Protocols.

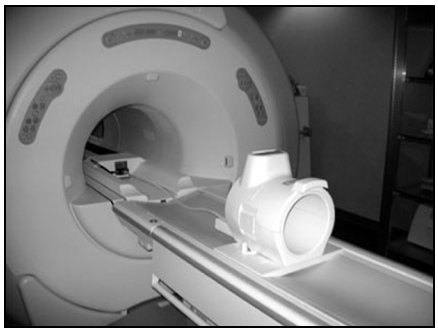
6. Click [**Save Series**] to download the protocols, then click [**Prepare to Scan**].

7. Open [**Display CVs**] menu under [**Research Operations**] (click right mouse button). Set the "**saveinter"** CV to "*1*" (saves the intermediate images so ROI measurements can be performed).

8. Run [**Auto Prescan**]. Record the R1, R2 and TG values on the SNR Data Sheet (found at the end of this manual).

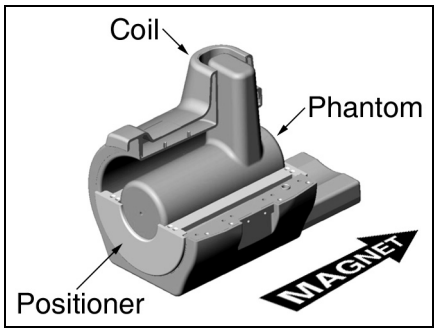
9. Run [**Scan**].

Figure 1



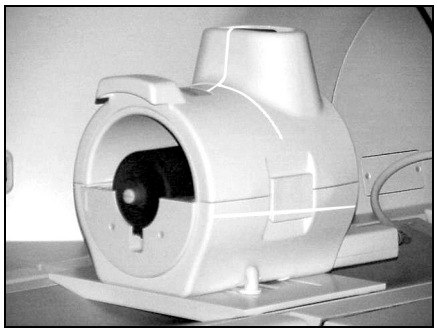
Coil Positioning

Figure 2



Coil Orientation

Figure 3



Coil Landmark at Isocenter

3-2-4 Noise Scan

A signal scan must be run **prior** to the noise scan as the same R1, R2 and TG values must be used for both the signal and noise scans. Do **not** run an Auto Prescan prior to the noise scan as the values will be changed.

1. Copy the signal scan series. Use [**Copy Series**] (highlight signal series and click right mouse button) and [**Paste Series**] in **RX Manager**.

2. Click [**View Edit**] and set the protocols per the Noise section from Table 3-2-4: Signal and Noise Protocols.

3. Click [**Save Series**] and click [**Prepare to Scan**].

4. Open [**Display CVs**] menu under [**Research Operations**]. Set the "**saveinter**", "**rhformat**", and "**do_noise**" CVs to "*1*".

5. Run [**Manual Prescan**], do **not** make any changes, and click [**Done**].

6. Run [**Scan**].

SIGNAL AND NOISE PROTOCOLS – TABLE 3-2-4-1

Protocol	Signal	Noise
Patient/Exam Information		
Patient ID	geservice	geservice
Patient Name	TR foot PA test	TR foot PA
Patient Weight	111 lbs. (50 kg)	111 lbs. (50 kg)
Patient Position		
Patient Position	Supine	Supine
Patient Entry	Feet First	Feet First
Coil	TRfootPA	TRfootPA
Series Description	Signal	Noise
Imaging Parameters		
Plane	Sagittal	Sagittal
Mode	2D	2D
Pulse Seq	FSE	GRE
Imaging Options	Fast	None
PSD Name	*leave blank*	*leave blank*
Protocol	*leave blank*	*leave blank*
Scan Timing		
# of Echoes	1	1
TE	17	minfull
TR	500	34
Echo Train Length/Flip Angle	4	1
Bandwidth	N/A	15.63
Additional Parameters		
no entries required in this area		
Acquisition Timing		
Freq	256	256
Phase	256	256
NEX	1	1
Phase FOV	1	1
Freq DIR	S/I	S/I
Auto Center Freq	Peak	Peak
Autoshim	On	On
Phase Correct	On	N/A
Contrast	Off	Off
# of Reps B4 Pause	0	N/A
Scanning Range		
FOV	30	30
Slice Thickness	3.0	3.0
Spacing	1.5	1.5
Start R/L	0	0
End R/L	0	0
Slices	1	1
P/A Center	A80	A80
I/S Center	0	0
Table Delta	0.00	0.00

CV PARAMETERS – TABLE 3-2-4-2

Protocol	Signal	Noise
saveinter	1	1
rhformat	0	1
do_noise	N/A	1

3-2-5 SNR Image Analysis

SNR Measurement

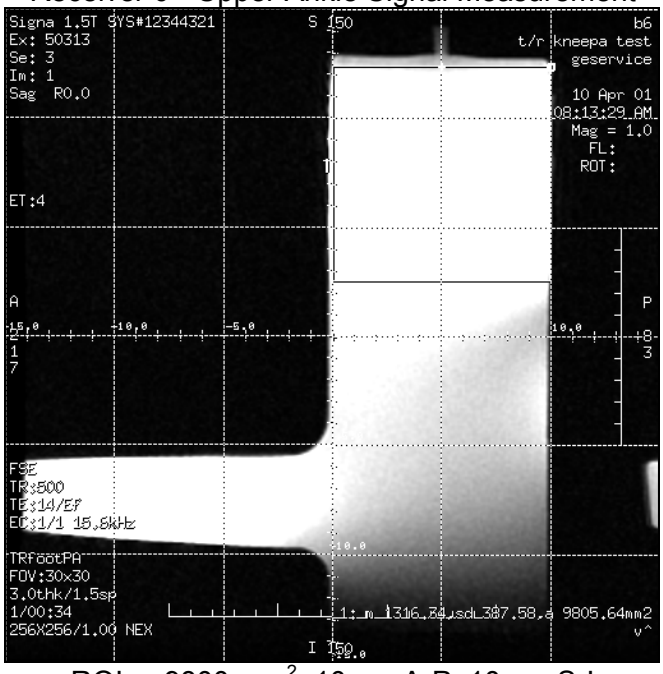
For the signal measurement, choose a rectangular ROI covering the appropriate section of the phantom for the receiver channel being scanned. ROI areas are unique for the anatomy scanned (foot, ankle, or knee), but for each anatomy the same ROI should be measured for each receiver channel utilized. The ROIs are shown in Figures 3-2-5-1 through 3-2-5-4, and the Noise Measurement is shown in Figure 3-2-5-5.

The SNR shall be calculated using the signal to noise ratios of the individual receiver channels. Individual receiver SNR is defined as the mean of data within the signal ROI divided by the standard deviation of data within the noise ROI:

$$SNR_i = \frac{\text{mean of signal within ROI}}{\text{standard deviation of noise within ROI}}$$

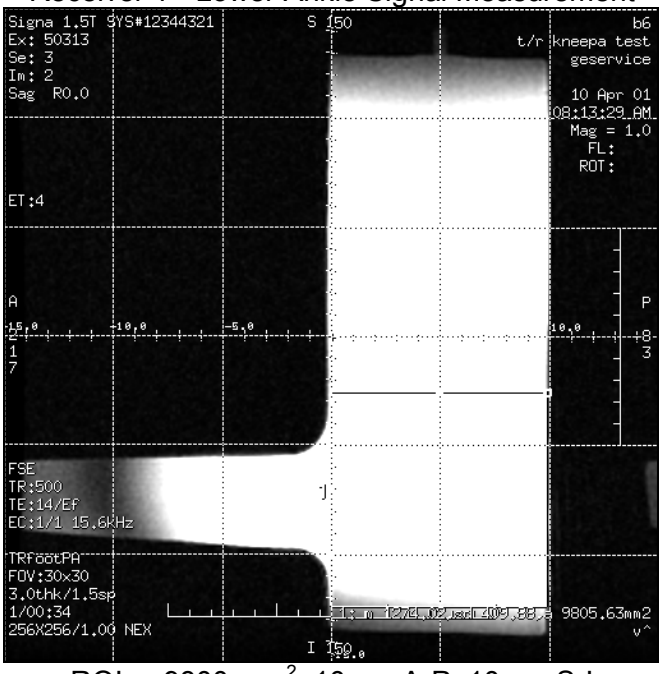
SNRi is the individual receiver SNR.

FIGURE 3-2-5-1
Receiver 0 - Upper Ankle Signal Measurement



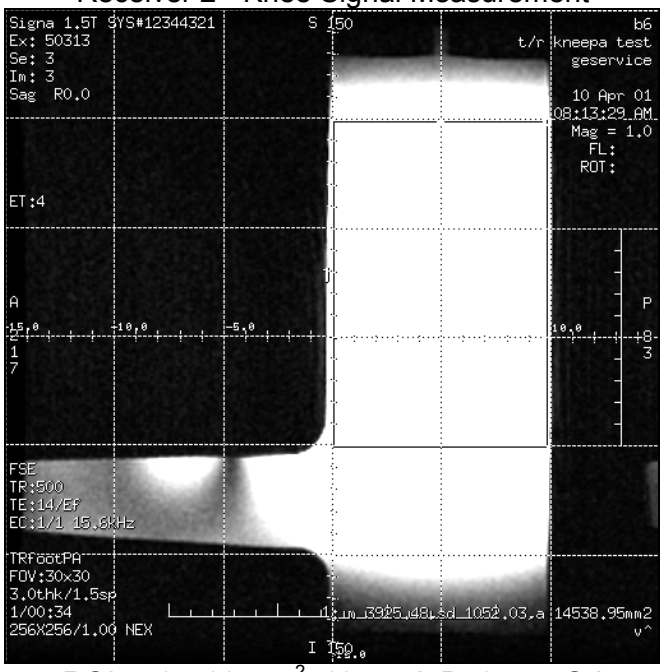
ROI ≈ 9800 mm^2 10 cm A-P 10 cm S-I

FIGURE 3-2-5-2
Receiver 1 - Lower Ankle Signal Measurement



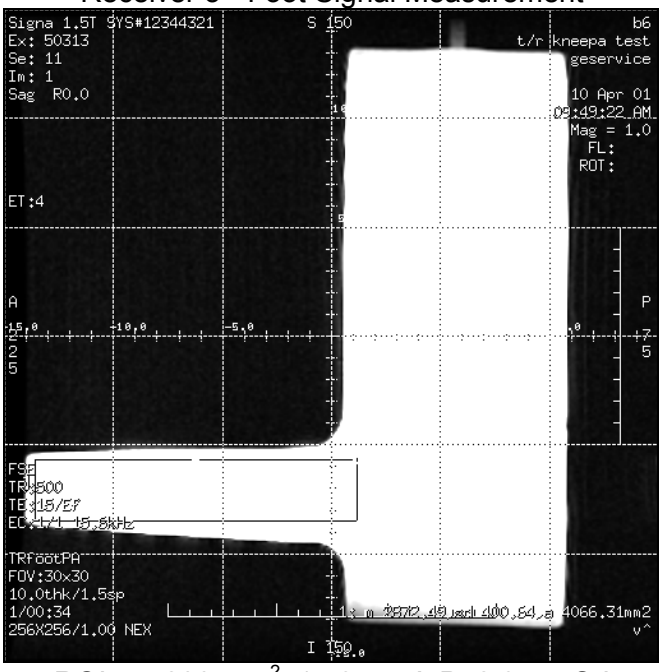
ROI ≈ 9800 mm^2 10 cm A-P 10 cm S-I

FIGURE 3-2-5-3
Receiver 2 - Knee Signal Measurement



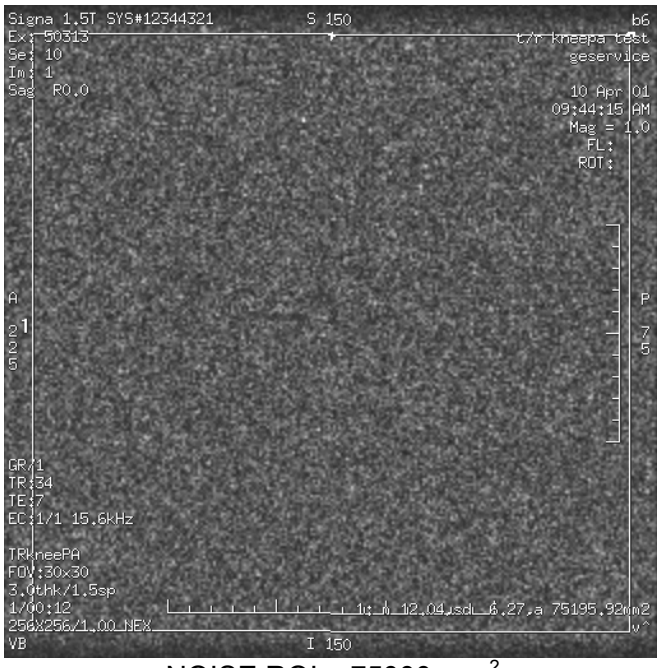
ROI ≈ 14700 mm^2 10 cm A-P 15 cm S-I

FIGURE 3-2-5-4
Receiver 3 - Foot Signal Measurement



ROI ≈ 4200 mm^2 14.8 cm A-P 2.8 cm S-I

FIGURE 3-2-5-5
Noise Measurement



NOISE ROI ≈ 75000 mm^2

Note: The SNR calculation uses the **MEAN** of the signal image and **STANDARD DEVIATION** of the noise image. SNR is measured for each **element**, not on the composite image.

Individual Element Performance

Regions of interest in both signal and noise images can be measured directly in the image browser. Click the user interface button Measure, select the circular or rectangular shape, and adjust its size and orientation when the shape is displayed in the selected image. Mean, standard deviation, and area of the ROI will appear in the lower right corner of the image. Examples of typical Receiver Images are shown in Figures 3-2-5-6 through 3-2-5-10 below. These images look very similar for the foot/ankle and knee configurations.

FIGURE 3-2-5-6: Receiver 0

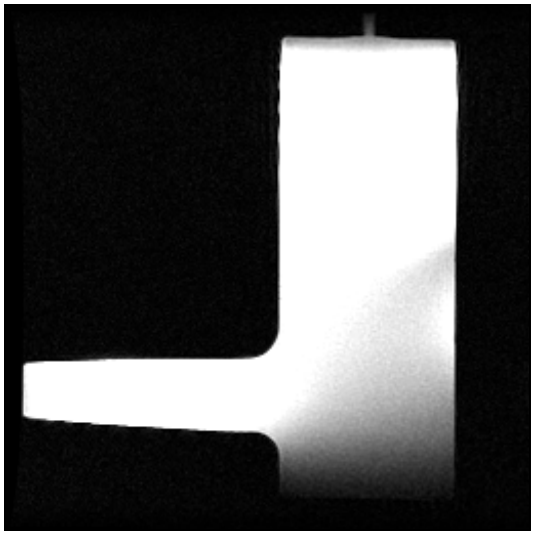


FIGURE 3-2-5-7: Receiver 1

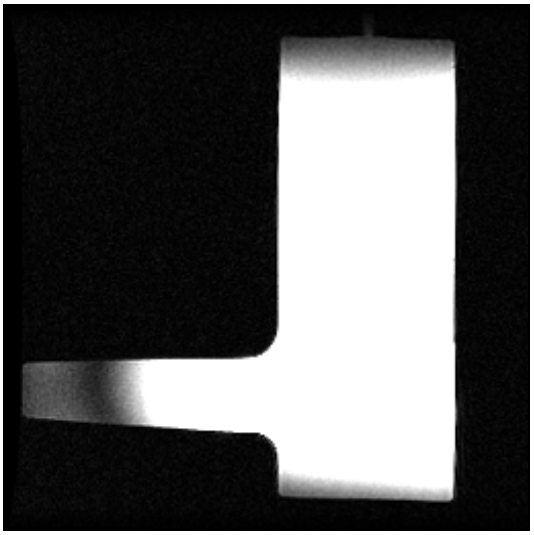


FIGURE 3-2-5-8: Receiver 2

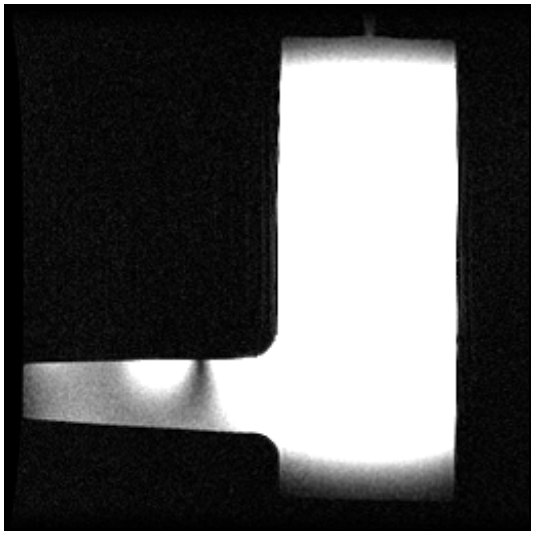


FIGURE 3-2-5-9: Receiver 3

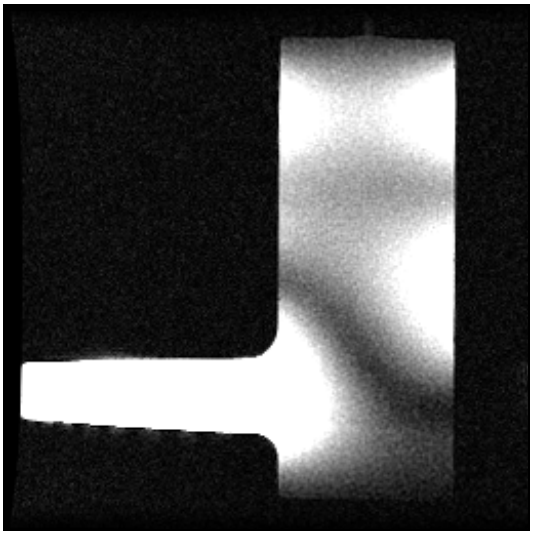
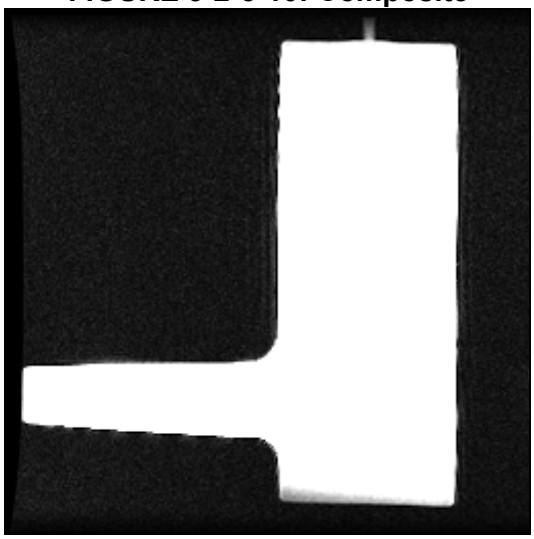


FIGURE 3-2-5-10: Composite



SNR Specification

The SNR measurements must be greater than or equal to the following specifications:

SNR SPECIFICATIONS – TABLE 3-2-5

Channel	SNR
CH0	242
CH1	164
CH2	289
CH3	205

3-3 External Cable Check

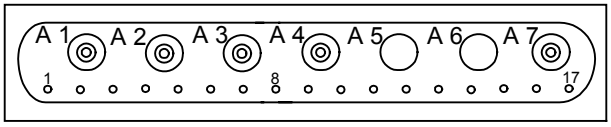
Check the system cable using the following procedure. Referring to Section 5-2, External Cable Replacement, disconnect the SubD coil cable connector (pinout below). Using a digital multimeter, determine continuity between the designated pins for each signal in Table 3-3. Also verify that the signal pins are not shorted to GND.

EXTERNAL CABLE EXPECTED READINGS – TABLE 3-3

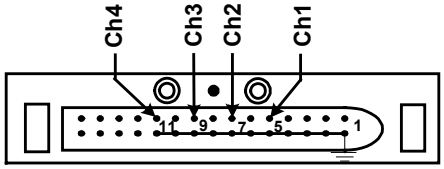
Receive Signals	Coil Connector	Bendix Receive Connector
Channel 1	Pin A4	Pin 5
Channel 2	Pin A3	Pin 7
Channel 3	Pin A2	Pin 9
Channel 4	Pin A1	Pin 11
Transmit Signal		**Transmit System Connector**
Tx	Pin A7	Pins A2, B2, A9, B9

If one or more readings are > 3 ohms, replace the coil cable. If all readings are < 3 ohms, proceed to the **Diode Check.**

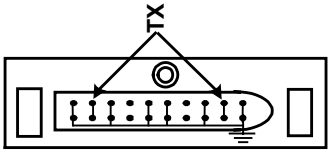
SubD Coil Connector



Bendix System Connector



Transmit System Connector



3-4 PIN Diodes Check

With the cable reconnected to the coil, use a multimeter to measure the Bendix System Connector pins (pinout above) as detailed in Table 3-4.

PIN DIODE EXPECTED READINGS – TABLE 3-4

Positive Lead	Negative Lead	Reading
Pin 5	GND	One Diode Drop
GND	Pin 5	Open
Pin 7	GND	Two Diode Drops
GND	Pin 7	Open
Pin 9	GND	One Diode Drop
GND	Pin 9	Open
Pin 11	GND	One Diode Drop
GND	Pin 11	Open

If one or more of the readings indicates a short, replace the coil. If all of the above readings are correct, redo *3-2 Coil Imaging Performance Verification*. If the problem still exist, replace the 1.5T T/R Knee and Foot Array Coil.

3-5 Mechanical Hardware Check

Not Applicable

3-6 Troubleshooting Tips

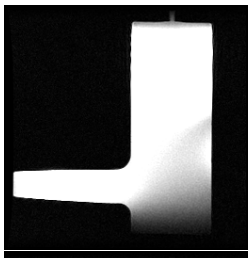
If poor image quality or dead channels are present, use the following setup information and compare the resulting images to isolate any defective part(s).

TROUBLESHOOTING - TABLE 3-6

Element Name	Linear Birdcage	Saddle Coil	Quad Birdcage	Foot Solenoid	not used	not used	not used	not used	not used
channel number	0	1	2	3	4	5	6	7	8
selected channel	See Below				no	no	no	no	no
mc bias driver #	0	1	2	3	4	5	6	7	8
active bias driver	yes	yes	yes	yes	no	no	no	no	no

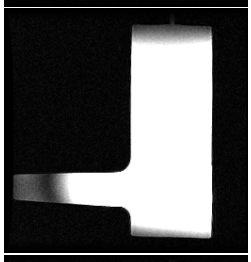
selected channel	yes	no	no	no

Receiver 0 ►



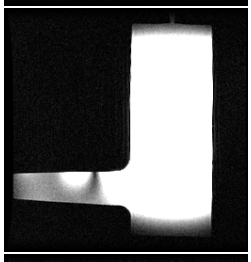
selected channel	no	yes	no	no

Receiver 1 ►



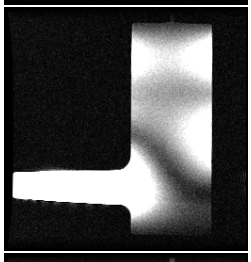
selected channel	no	no	yes	no

Receiver 2 ►



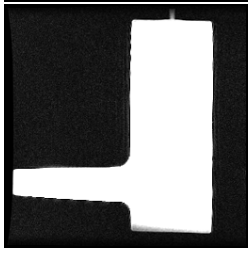
selected channel	no	no	no	yes

Receiver 3 ►



selected channel	yes	yes	yes	yes

Composite ►



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 1.5T T/R Knee and Foot Array Coil and pads 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

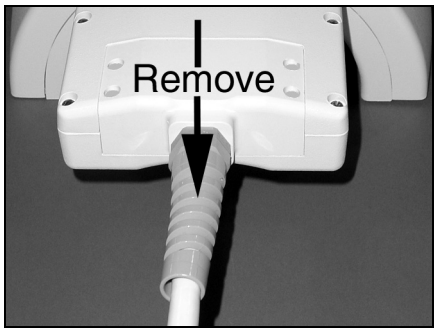
5-2 External Cable Replacement

- Remove four screws (see Figure 1) from the bottom of the coil housing.
- Referring to Figure 2, remove the external cable (Sub D connector - No. 4 in block diagram) by gently pulling the strain relief in the direction of the arrow.
- After replacing the cable, verify that the signal pins are not shorted to GND.

Figure 1

Remove Four Screws

Figure 2



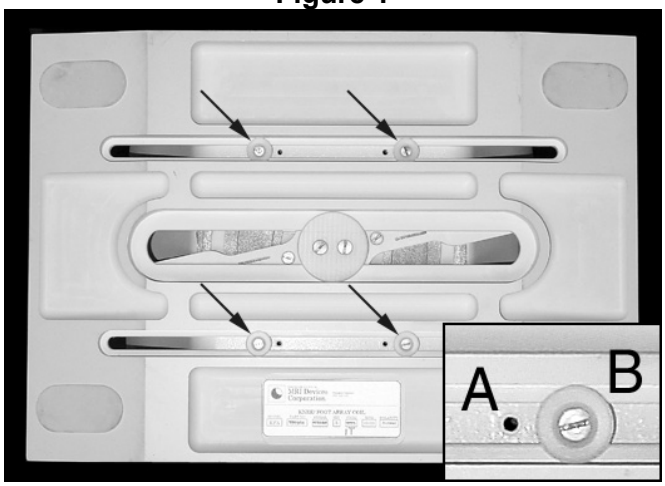
Remove Cable

Figure 3

Coil Connector

5-3 Mechanical Hardware Adjustment

Figure 1



55cm Bore Slider Adjustment

The 1.5T T/R Knee and Foot Array may be adjusted to fit either the standard 60 cm bore or the 55 cm bore, as seen in Figure 1. The arrows detail the location of 4 sliders upon which the coil moves for right or left positioning. Each plastic slider is attached with a screw [inset-B]. Next to each slider is an empty threaded hole [inset-A].

1.5T coils are shipped in the 60 cm configuration. To change the positioning to 55 cm, as seen in Figure 1, use a flat blade screwdriver to remove the 4 slider screws, then move the sliders to the outboard position. This change will limit left-right movement of the coil for smaller bores.

SECTION 6 - RENEWAL PARTS

6-1 Field Replaceable Units

FIELD REPLACEABLE UNITS LIST – TABLE 6-1

Description	GE Part #	MRIDC #	Qty
1.5T T/R Knee and Foot Array Coil with cable	2293674-2	101759	1
1.5T T/R Knee and Foot Array Coil Cable	2293674-8	101276	1
Phantom	2293674-3	101448	1
Phantom Positioner	2293674-5	101450	1

6-2 Other Replaceable Accessories

OTHER REPLACEABLE ACCESSORIES LIST – TABLE 6-2

Description	GE Part #	MRIDC #	Qty
Knee Support Pad	2293674-11	101144	1
Alternate Knee Support Pad	2293674-12	101145	1
Forefoot Wedge Pad	2293674-10	101142	1
Foot Support Pad	2293674-9	101141	1

SECTION 7 - APPENDIX

7-1 SNR Data Sheet

Use the table provided below to record the calculated signal to noise ratio (SNR) data obtained from the Functional Checks section.

Date	Comments							
Mode	R1	R2	TG	Element	Signal Mean	Noise Std Dev	SNR	Spec Limit
TRFootPA				0				242
				1				164
				2				289
				3				205

Date	Comments							
Mode	R1	R2	TG	Element	Signal Mean	Noise Std Dev	SNR	Spec Limit
TRFootPA				0				242
				1				164
				2				289
				3				205

Date	Comments							
Mode	R1	R2	TG	Element	Signal Mean	Noise Std Dev	SNR	Spec Limit
TRFootPA				0				242
				1				164
				2				289
				3				205

Date	Comments							
Mode	R1	R2	TG	Element	Signal Mean	Noise Std Dev	SNR	Spec Limit
TRFootPA				0				242
				1				164
				2				289
				3				205

7-2 Schematic

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

7-3 Coil Configuration

Software Prior to ASP2 Release

Parameter	Knee Only	Ankle and Foot	Autoshim/Scout
Coil Name	TRKneePA	TRFootPA	TRKneePA-SHIM
Correction Name	Type space bar, then Return		
Coil Type	1	1	1
Extremity Coil	no	no	no
Cable Loss	Same as Signa Head Coil Cable Loss (typically 1.3)		
Coil Loss	Same as Signa Head Coil Loss (typically 0.032)		
Recon Scale Factor (RSF)	Same as Signa Head Coil RSF (typicaly 1.1)		
Linear vs Quadrature	1	1	1
Multiple Receiver Coil?	yes	yes	yes
Number of Receivers	4	4	1
Starting Receiver ID	0	0	2
Ending Receiver ID	3	3	2
Multi-Coil Port Enable Mask	6	6	6
Multi-Coil Part Error Enable Mask	6	6	6
Additional Transmit Attenuation	20	20	20
Number of Fast Receivers	0	0	0
Start Fast Receiver ID	4	4	4
End Fast Receiver ID	4	4	4
Fast TG Start TA	85	85	85
Fast TG Start RG (R1)	11 (8.X systems)	11 (8.X systems)	11 (8.X systems)
	5 (5.X systems)	5 (5.X systems)	5 (5.X systems)
Multi-Coil Recon Enable	8	0	0
Head Default Freq Dir	0	0	0

Software ASP2 Release and Later

Parameter	Knee Only	Ankle and Foot
Coil Name	TRKneePA	TRFootPA
Correction Name	Type space bar, then Return.	
Coil Type	1	1
Extremity Coil	no	no
Cable Loss	Same as Signa Head Coil Cable Loss (typically 1.3)	
Coil Loss	Same as Signa Head Coil Loss (typically 0.032)	
Recon Scale Factor (RSF)	Same as Signa Head Coil RSF (typically 1.1)	
Linear vs Quadrature	1	1
Multiple Receiver Coil?	yes	yes
Number of Receivers	4	4
Starting Receiver ID	0	0
Ending Receiver ID	3	3
Multi-Coil Port Enable Mask	6	6
Multi-Coil Part Error Enable Mask	6	6
Additional Transmit Attenuation	20	20
Number of Fast Receivers	0	0
Start Fast Receiver ID	4	4
End Fast Receiver ID	4	4
Fast TG Start TA	85	85
Fast TG Start RG (R1)	11	11
Multi-Coil Recon Enable	8	0
Head Default Freq Dir	1	1
Phased Array T/R Coil for Autoshim	2	2
SCIC ++ Parameters for Axial Plane	0	0
SCIC ++ Parameters for Sagittal Plane	0	0
SCIC ++ Parameters for Coronal Plane	0	0
Multi-Coil Separation Direction	0	0
MC Switch Select	0	0

REVISION HISTORY

Rev	Date	Author	Primary Reason for Change
A	08-10-01	L. Hyler	Initial Release / Converted from TR0089SRB
B	08-24-01	L. Hyler	Added Signal and Noise Protocols
C	08-28-01	L. Hyler	Change Text in 5-3 Mechanical Hardware Adjustment
D	08-31-01	L. Hyler	Revised Signal and Noise Protocols & Coil Config
E	08-31-01	L. Hyler	Change Coil Config Heading & Add Advantage Compatibility
01	08-29-01	L. Hyler	Release to Phase 5
02	05-02-02	L. Hyler	Implement Changes per Joe Balint E-mail of 04-12-02
			Add Table 3-2-4-2 CV PARAMETERS
			Replace 7-3 Coil Configuration with ASP2 Specific Information