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DESCRIPTION

The free induction decay (FID) is the MR signal that occurs when the magnetic nuclei return to their lined up state in the magnetic field after being deflected 90 degrees by an RF pulse. The FID signal that you are tuning for is at the Larmor frequency, which is dependent on your specific field strength. In order to maximize, or "tune," the FID signal, you will change the receive and transmit frequencies to find the Larmor frequency.

Note

A FID can be obtained using the body coil or the head coil. This procedure uses the body coil.

1- INITIAL CONDITIONS

- Signa software fully operational
- Magnet mechanically shimmed

2- SET UP

Tools Required

- SPT Sphere, 2135650
- Foam Holder, 2141454

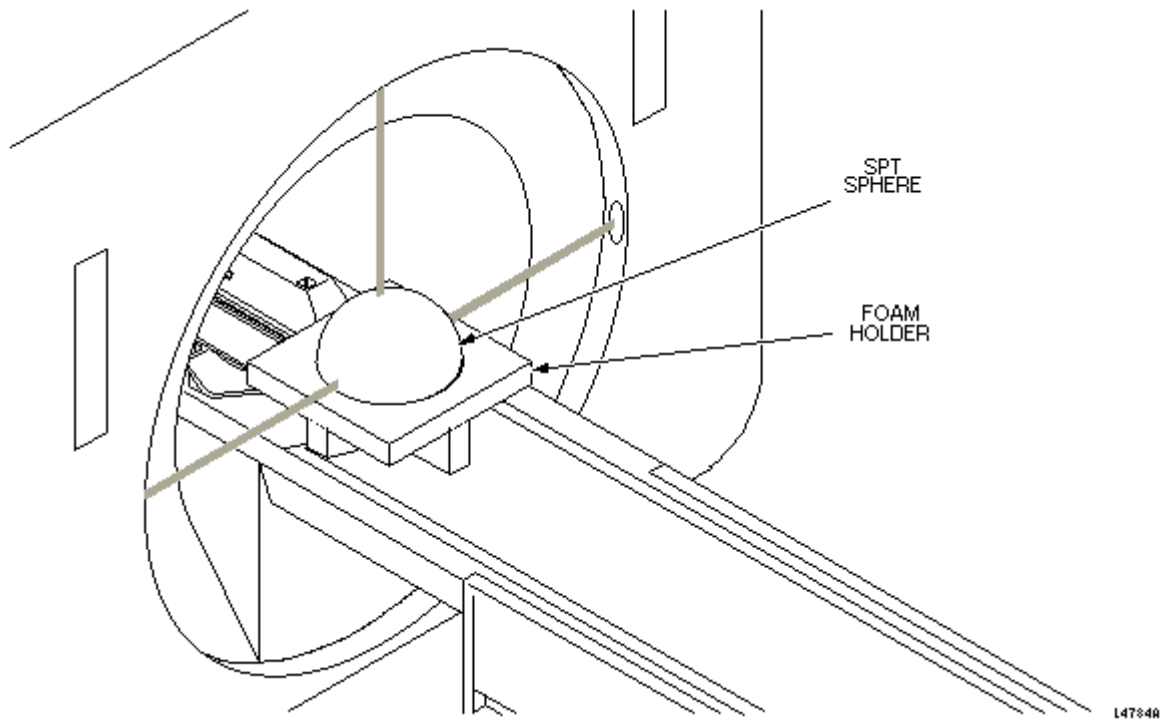
WARNING!

POISON HAZARD! THE PHANTOM CONTAINS NICKEL, A SUSPECT CARCINOGEN. DO NOT INGEST. DISPOSE OF AS A HAZARDOUS WASTE ACCORDING TO STATE AND FEDERAL REGULATIONS.

CAUTION

Equipment damage possibility. Completely remove the quad head coil from the cradle and the bore of the magnet before performing any body scans. Failure to do so may damage to the head coil T/R Network.

1. Remove the quad head coil from the bore of the magnet.
2. Place the foam holder on the patient table and the body sphere into the foam holder. Landmark on the center of the body sphere (see Illustration 2-1).



ALIGNING BODY SPHERE & HOLDER ON PATIENT TABLE
ILLUSTRATION 2-1

3. Use the keypad at the front of the magnet enclosure, to position the body sphere. Then press LANDMARK and MOVE TO SCAN.

The phantom should be positioned about 32 inches behind the front edge of the RF/gradient coil assembly.

4. At the operator work space, prepare the system for a FID Tuning scan using the "Service Protocols" procedure located under **[Software Utilities]** menu on the service methods CD-ROM, or for the alternate proprietary procedure, see below.

This alternate proprietary procedure is available for GE use, and to sites with a valid Advanced Service Package Limited License.

- a. Click on **[New Pt]**, and enter
Id: **geservice**
Name: **fid tuning**
Weight (Lb): **111**
Set Patient Protocols to **Service**.

- b. In the Protocol field, type **o.39.1** (o=Other, 2=series number) to load the protocol.

- c. **[Save Series]**, then **[Prepare to Scan]**.

5. Click on **[Manual Prescan]**, and then click **[Center Freq Coarse (CFL)]**.

Note

When you open the manual prescan window, ignore any values showing in the Gradient Shimming area. Your goal is to locate the optimal center frequency.

6. Highlight **Center Freq (AX)** and enter the frequency value displayed on the magnetometer (after the magnet has been successfully ramped).
7. Adjust the **Analog (R1)**, **Digital (R2)**, and **Transmit Gains (TG)** as follows: $R_1 = 7$, $R_2 = 10$, $TG = 0$.
8. Set the window display as follows: at **Type**, select [**I Channel**]. Click on the **Gain [▲]** (increase) until a signal appears in the plot display.

Note - Definitions of the terms used in setting up window displays

Definitions for the terms when setting up the window displays are as follows:

RG = Right window gain

LG = Left window gain

RT = Right window type = I, Q, M, or P

LT = Left window type = I, Q, M, or P

I = Digitally processed I Channel signal

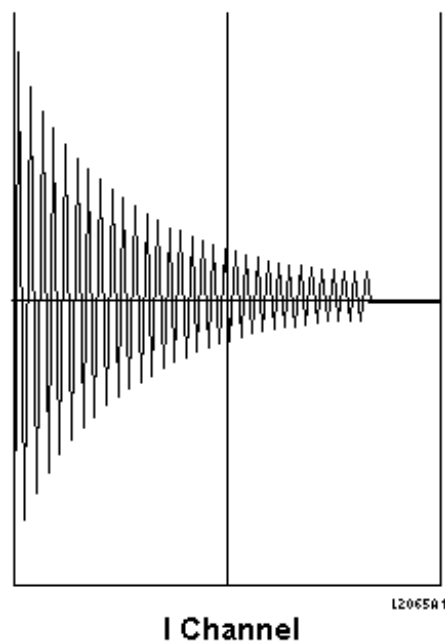
Q = Digitally processed Q Channel signal

M = Magnitude = square root of I squared + Q squared.

P = Power spectrum

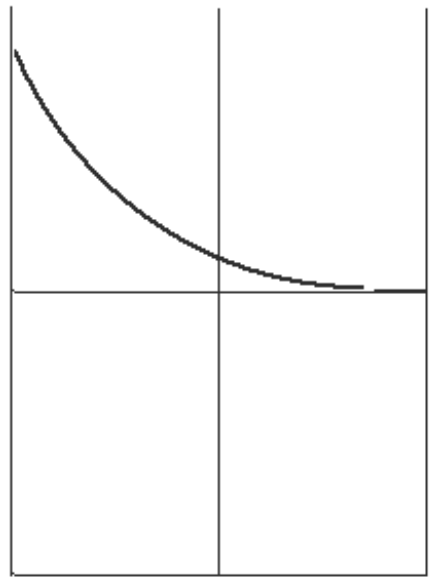
3- LOCATING CENTER FREQUENCY

1. Adjust **Delta Freq (DX)** in steps of 2000 Hz above or below the center frequency until a FID signal appears (see Illustration 3-1).



FID 500 HZ OFF FREQUENCY
ILLUSTRATION 3-1

- Repeat step 1 using smaller frequency units, <2000 Hz until maximum amplitude and the simplest waveform is achieved. See Illustration 3-2 for a typical waveform. The waveform can be above or below the horizontal axis.



I Channel

FID AT CENTER FREQUENCY

ILLUSTRATION 3-2

- Once optimal frequency is reached, select **[Frequency]**, and click on **[Save Frequency]**. Record the new frequency in the System Log.

4- SYSTEM RESTORATION

- At **Type**, select **[P. Spect]**, and at **Gain**, click on **[▼]** until the value is reduce to 1.
- Click on **[Done]** to exit manual prescan.
- Click on **[End Exam]** and **[Confirm]**.

REVISION HISTORY

REV	DATE	AUTHOR	PRIMARY REASONS FOR CHANGE
0	Jun 19, 1998	L. Loehrer	Initial conversion to Word.
1	Nov 12, 1998	M. Keber	Removed obsolete 8.1 information; misc. style guide cleanup.