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1- INTRODUCTION

1-1 Surface Coil Test

The Surface Coil Test for the USA Instruments Quad CTL Array is a Signal-to-Noise measurement test with improved Tool Gage R&R. The test allows the user to make a definite pass/fail decision on the GE USA Instruments 1.5T Quadrature CTL Array Coil, M1087SP, or the earlier version, E8800P.

The test allows the operator to input comments and customer observations of coil performance prior to test execution. This information assists in data collection and test usage feedback to GE MR Headquarters.

1-2 Compatibility

The Surface Coil Test is compatible with the following hardware configurations:

- Signa® LX Release 8.3 and above, 1.5T System and 1.0T Systems

1-3 Related Documents

- USA Instruments Premier 7000 Phased Array CTL Spine Coil, 780005, found on MR Signa® 8X Service Methods, CD-ROM, 2160623-2, Revision 6 and newer.

2- SETUP, CALIBRATION, AND EXECUTION

2-1 Phantoms Required

- CT Phantom, 2225545-4, USA Instruments #150028
- TL Phantom, 2225545-3, USA Instruments #150027
- Patient Comfort Pad, USA Instruments #150029, recommended

2-2 Setup Procedure

CAUTION

The Quad Head Coil must be completely removed from the cradle before performing any body scans. Failure to do this may result in damage to the Head Coil T/R Network.

1. Remove the Quad Head Coil (if present) from the cradle.

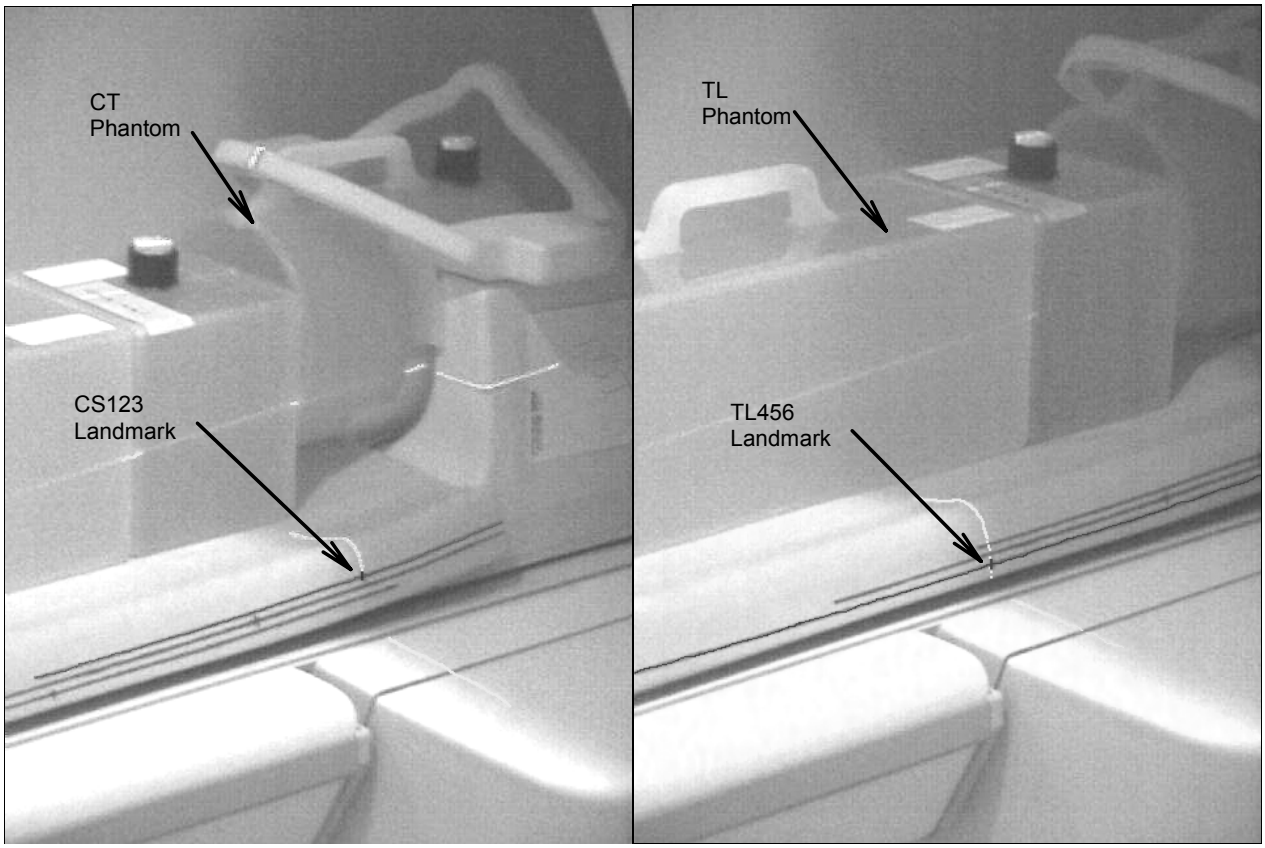
2 Select **[Set Up Scan**], Patient ID: **geservice**, and Weight: **111** lbs to allow a new Landmark to be set.

3. Make sure you have valid Gradshim values, or set up a scan of the body TLT phantom, run Auto Prescan with Autoshim on, and save the shim values.

4. Position the CTL Array onto the cradle. In the scan room, position the USA coil on the patient table, taking care to center the coil in the x (patient left - right) direction and position it parallel to the table. Adjust the longitudinal coil position so that the coil cable lies flat on the table and cradle as far back as possible and then goes the shortest distance to the MultiCoil interface on the "doghouse."

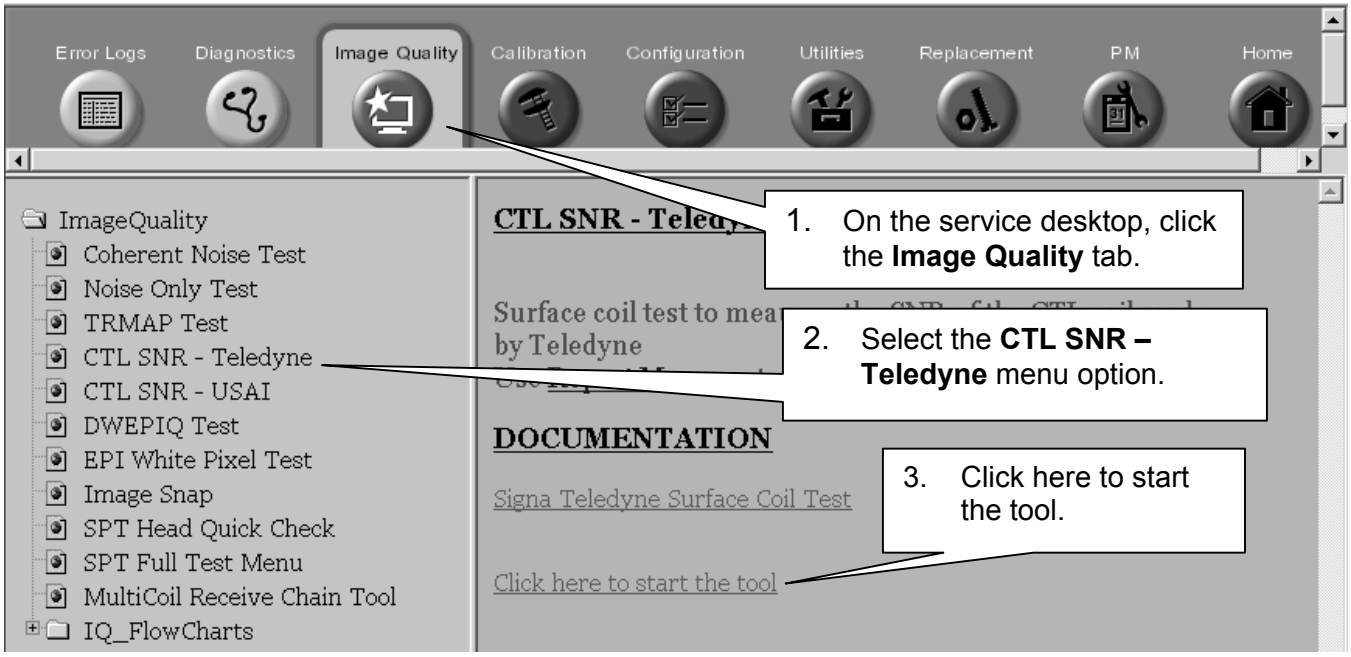
5. Position the CT Phantom, 2225545-4, and TL Phantom, 2225545-3, onto the CTL Array. See Illustration 2-1. Ensure the fill plug is positioned away from the magnet as shown. If the fill plug is incorrect, the test analysis will read 3 phantoms instead of 1 phantom.

6. Landmark onto the appropriate phantom and location for the configuration desired. See Illustration 2-1.



CS123 AND TL456 ARRAY PHANTOM POSITIONING
ILLUSTRATION 2-1

7. To start the Teledyne tool, see Illustration 2-2 below.



STARTING THE TELEDYNE TOOL
ILLUSTRATION 2-2

8. A c-shell will begin running with the typical script shown in Illustration 2-3:

```
Updating config files for protocols...Please wait.
setupProtocols succeeded.

Please choose one of the following:
    (1) Test the top three coils (CS123)
    (2) Test the bottom three coils (LS456)
Selection: 2

Would you like to see instructions on how to run the tool (y/n) [n]? n

================================================================================
|                                                                              |
| It is recommended that you run the tool a minimum of 6 times.                |
| The first run takes approximately 8 minutes.                                 |
| Each subsequent run takes approximately 2.5 minutes.                         |
================================================================================

Enter number of times to run the tool [6]: 2

Estimated test duration: 10.5 minutes

Is the customer:
    (1) Very satisfied
    (2) Satisfied
    (3) Not satisfied
with this coil? 2

Enter two lines of comments or press Enter twice to continue
This is a baseline test of the manufacturing CTLBOT Array
This is only for representation purposes
coil = LS456

Host name: lx-bay13a

Fri Feb 19 12:02:16 1999
 -> Command to svat: RESET_SCAN
Fri Feb 19 12:02:16 1999
 -> Command to svat: DISABLE_IO
```

CTL SNR SAMPLE SCRIPT
ILLUSTRATION 2-3

9. The tool will ask you if you want to run the top 3 coils or the bottom 3 coils. In most cases, you would want to run the tool twice, once for each coil position. Respond according to the landmark you established during the phantom setup above.

10. Next, you'll be asked how many times you want to run the tool. In general, a good number is 6. The first time through takes approximately 8 minutes and each subsequent pass takes approximately 2.5 minutes.

11. The next question concerns the customer's opinion of the coil (Very satisfied, Satisfied or Not satisfied).

12. You will be given the opportunity to enter two lines of comments or press <Enter> twice to continue.

13. The test will now run to completion without any further input. A long series of commands will scroll by while the test is running. There is no need to scrutinize them all. The current pass number is occasionally printed to the screen, which may help you determine how much time is left.

14. When the test is complete, it will print a table to the screen with the noise, signal, SNR, shading and cross talk values for each of the three coil elements tested, and give you the name of the output file where the same information is stored. Record the filename because you will need it later.

15. Re-landmark for the other set of coils. You may get an error message on the screen that says that the landmark is invalid. Just press OK; this will not impact the test.

3- VIEWING RESULTS

1. 1.5T Results: To view the data file, use **[Report Manager]**. The files written for **USA I SNR** have the .CTL suffix. This is the same suffix as the older CTL SNR file names.

2. 1.0T Results: The measured SNR data is viewed using the **[Report Manager]** as noted in step 1. However, the specifications for the 1.0T CTL Coil are different from the 1.5T CTL Coil. To determine Pass/Fail criteria, compare the measures SNR values with the specifications given below.

	Marginal	Severe
Element 1	74.1	73.0
Element 2	31.1	29.9
Element 3	49.7	48.5
Element 4	51.7	50.5
Element 5	47.3	46.2
Element 6	54.5	53.3

REVISION HISTORY

REV	DATE	AUTHOR	PRIMARY REASONS FOR CHANGE
A	Nov. 5, 1999	S. Davis	Preliminary Release
0	Feb. 17, 2000	R. Kaufman	Changed startup method for 8.3
1	Mar. 2, 2000	J. Wolak	Added step to position fill plug away from magnet
2	Oct. 19, 2000	M. Jones	Deleted 8.2.5-related content.
3	Oct. 16, 2002	C. MacDonald	Updated Section 2-2 with new interface procedure.
4	Jul. 30, 2004	E. Garcia	Added Section 3 - Viewing Results