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1- SST 1.5T PHOSPHORUS OVERVIEW

The SST 1.5T Phosphorus Coil (~25.85 MHz) may be run to check Multi-Nuclear Spectroscopy system functions, excluding the 1.5T Phosphorus TR Flex Coil and associated MNS Quick Disconnect Adapter Box.

This procedure will attempt to test the receiver (via the AUX1 input), and the MNSpectroscopy TR Switch / preamplifier (housed in the ^{31}P Spectroscopy Module Assembly). This represents the receive circuitry of the MNS system. This procedure will not test the 1.5T Phosphorus TR Flex Coils or associated MNS Quick Disconnect Adapter Box.
This procedure does not attempt to test the transmit portion of the MNSpectroscopy system. As the transmit portion of the system can be evaluated using the RF Power Measurement Kit (use the Set-up and Calibration section RF Out protocol (change the RF pulse on the User CV's Screen to "hard" or square pulse when Troubleshooting).
The test principle is to pulse the RF into a small sample (14.7 M H_3 PO_4 solution / coil), and then determine if the received echo is present or not. If a receive signal is not present, it is advisable to determine if the transmit signal is present. If the Transmit signal is present and meets acceptable parameters the receiver should be swapped (swap with another receiver module) as a next step. See Analysis for more help.

1-1 SST Test Hardware

The Universal SST Kit (46-287357G2) is a collection of all items needed to set up and perform the various SST test modes. The major items required for testing the 1.5T Phosphorus are listed in Tables 1-1 and 1-2.

TABLE 1-1
UNIVERSAL SST KIT 46-320383G2 HARDWARE

ITEM	DESCRIPTION	PART NUMBER	QUANTITY
1	Universal Small Sample 1.5T Phosphorus (~25.85 MHz) 14.7M H_3 PO_4	46-320153G3	1
2	Quick Disconnect Adapter for 1.5T systems	46-282468G3	1

TABLE 1-2
ADDITIONAL HARDWARE

ITEM	DESCRIPTION	PART NUMBER	QUANTITY
1	Grafidy Holder Base Plate	46-271410G1	1

Note

The G1 version of the SST Kit does not contain the additional coil for MNSpectroscopy (49-320153G3, 1.5T Phosphorus).

2- SST 1.5T PHOSPHORUS TEST SET-UP

PROPERTY DAMAGE! TO PREVENT COIL AND ASSOCIATED SWITCH DAMAGE, REMOVE ALL PHANTOMS AND HARDWARE (I.E., HEAD COIL, SURFACE COIL...) FROM THE MAGNET BORE.

1. Click on **[New Pt]**.
2. Move the cradle to the “HOME” position.
3. Remove all phantoms and coils (and associated hardware) from the bore.
4. Remove the head holder from the cradle.
5. Place the Grafidy Holder Base Plate on patient table near head end of cradle.
6. Place the Universal Small Sample “1.5T Phosphorus” (14.7M H_3 PO, 46-320153G3) Coil into the “center position” on the Grafidy Holder Base Plate.
7. Unwrap entire length of cable from around coil.
8. With the “1.5T Phosphorus” Coil column on base plate, turn brass lever to lock in place.

POISON HAZARD! SAMPLE CONTAINS PHOSPHORIC ACID, A SUSPECTED CARCINOGEN. DO NOT INGEST. DISPOSE OF AS A HAZARDOUS WASTE ACCORDING TO STATE AND FEDERAL REGULATIONS.

9. Connect cable from coil to the 1.5T adapter (use Extremity Coil/Linear Head Coil Adapter or 1.5T Service Tool Interface).
10. Insert Quick Disconnect Adapter into the “1.5T Spectroscopy Phosphorus Module” (white box used for Multi-Nuclear Spectroscopy).
11. Verify the MNSpectroscopy Module (white box) is connected properly to the transmit and receive cable-take-up lines (connections vary for depending on carriage cover type…)
12. Landmark at center of base plate/coil.
13. Press MOVE TO SCAN to send the coil to isocenter.

3- ^{31}P SST SCAN PRESCRIPTION

1. Set up Phosphorus (^{31}P) SST Test scan protocol as follows:

TABLE 3-1
SCAN PROTOCOL: ^{31}P SST TEST

[New Series]

PATIENT INFORMATION

Patient Id	geservice
Patient Name	31p sst
Weight (Lb)	300 ¬ *IMPORTANT*

PATIENT POSITION

Patient Position	**[Supine]**
Patient Entry	**[Head First]**

Coil **[Coil Type] [Surface] [31P_FLEX] [Accept]**

IMAGING PARAMETERS

Plane	**[Axial]**
Mode	**[2D]**
Pulse Seq	**[Fid CSI (MRS)]** **[Accept]**
Imaging Options	**[Extended Dynamic Range]** **[Accept]**
PSD Name	none (default)

SCAN TIMING

# of Echoes	1 (default)
TR	**[1500]**

USER CVs SCREEN

CV0	spectral width	**2500**
CV1	number of points	**1024**
CV2	nucleus	**31**
CV3	scan mode	**1.00**
CV4	total # of scans	**32.00**
CV5	rl resolution - csi scans	**1.00**
CV6	ap resolution - csi scans	**1.00**
CV7	si resolution - csi scans	**1.00**
CV14	rfpulse (soft)	**1.00**
CV16	CSI grid (acq*)*	**2.00**

[Accept]

ACQUISITION TIMING

NEX	**[1.00]**
Freq DIR	**[R/L]**
Auto CF	**[Water]**
Autoshim	**[OFF]**

SCANNING RANGE

FOV	**[20]**
Slice Thickness	**[20]**
Spacing	**[1.5]**
Start	**0**
End	**0**
# Slices	1 (default)
L/R Center	0 (default)
P/A Center	0 (default)
Table Delta	0.00 (default)

(lower portion of monitor)

[Save Series]

[Prepare To Scan]

[Spectro Prescan]

Entry Point	**[single1]**
Nucleus	**[31]**
R1	**[9]**
R2	**[28]**
TG	**[50]**
AX	[Default] (~25.85 MHz)
Top Screen	**[Magnitude] [Hz]**
Bottom Screen	**[Q Chan Raw] [Pts]**

[Start] (we saw 3 x10e8 Magnitude signal)

[Stop]

[Done]

4- HELP

The following is a list of suggestions for troubleshooting if a receive signal echo is not present.

Note
SST is not used to measure SNR.

1. If a receive signal is present the 1.5T Phosphorus TR Flex Coil and associated MNS Quick Disconnect Adapter Box are potentially good.
2. If a receive signal is not present then troubleshoot:

- Verify +15 VDC (receive bias) is present at the input to the MNS TR Module on the receive side lemo cable.
- Determine if the Transmit signal out to the MNS Q. D. Adapter Box is good. Measure the RF Out of the MNS RF Amplifier at TG=200 using the MNS Set-up and Cal protocol, however, set the "rfpulse" in the User CV's page to hard (from sinc to square). Next, measure the MNS signal at the rear pedestal cable-take-up bracket (there will be approximately –1.0 dB to –1.7 dB of cable loss). Next, procure a Q.D. Box with 2 BNC connections. The Quad Normal is acceptable (this adds in some other load circuitry not normally used located in the MNS TR Module). Connect test equipment to the transmit side of the Q.D. Box and measure. RF value should be very close to the value measured at the rear pedestal. The RF pulse should be square.
- If transmit circuitry (see overview section) is good then swap receivers.

5- SYSTEM RESTORATION

1. When completed click on **[End Exam]**.
2. Verify scan desktop icon is displaying the "Idle" message.
3. Remove all test equipment.
4. Successfully complete one body scan.
5. Successfully complete one head scan.

REVISION HISTORY

REV	DATE	AUTHOR	PRIMARY REASONS FOR CHANGE
0	March 20, 2000	Resa Lambert	Initial Release.