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1- DESCRIPTION

This procedure uses EPI scans and the raw data mode of recon to analyze the raw data for white pixel artifacts; these can exhibit themselves as corduroy artifacts in images.

2- OVERVIEW

There are two modes of operation for the EPI White Pixel Test. Mode 1 creates 48 images while iterating on Readout Axis (X, Y, Z), ESP (readout train frequency), and placement of the data acquisition window over the attack "knee" and decay "knee" of the readout trains positive and negative lobes. In addition, Mode 1 generates various report fields and plot files that can be used to analyze white pixels. Mode 1 has been incorporated in the EPT test to be run as a single test.

Mode 2 prompts you to enter an image number that generated the most white pixels from the Mode 1 test, and allows you to use the real time display feature of EPI to loop on that condition for troubleshooting purposes.

3- PREREQUISITES

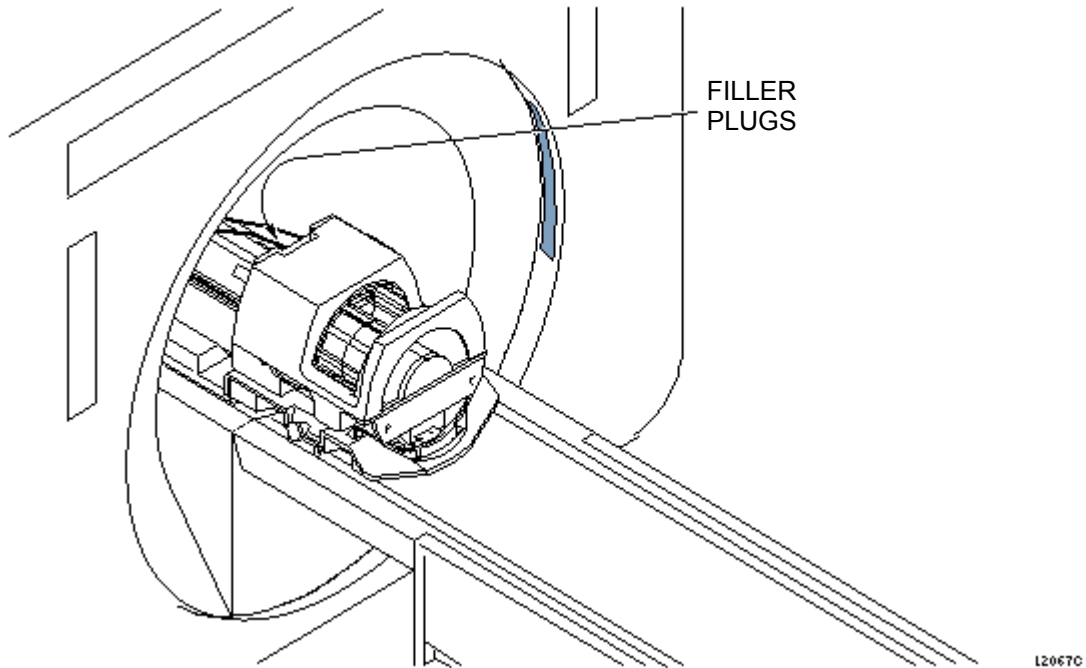
To run this procedure, service protocols need to be loaded, and the service key installed, which requires a system under warranty, or an advanced service contract.

4- RUNNING EPI WHITE PIXEL TEST

Note

Before starting, you must have a valid landmark on the Head Coil.

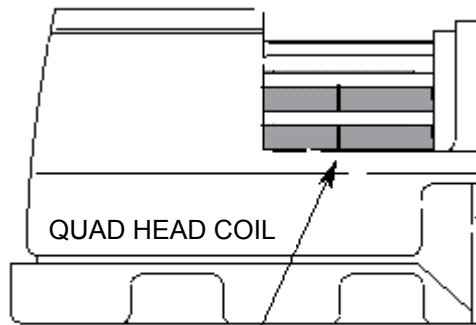
1. Place the DQA-III phantom in the head coil. Position with fill plugs up, and toward rear of magnet (see Illustration 4-1).



DQA-III PHANTOM POSITIONING
ILLUSTRATION 4-1

2. Landmark in sagittal and axial planes (DQA-III coronal plane is not at isocenter). See Illustration 4-2 for positioning the phantom in the quad head coil.

Position DQA-III Phantom in the Head Coil.



Landmark the DQA-III Phantom on the Landmark Line.

LANDMARKING DQA-III PHANTOM
ILLUSTRATION 4-2

3. At the keypad on the front magnet enclosure, press LANDMARK, then:
 - a. For **Body** EPI White Pixel, remove the head coil and the DQA III phantom.
 - b. For **Head** EPI White Pixel, remove the DQA III phantom from the head coil.
4. Press MOVE TO SCAN.

5. To run Mode 1, select **[Cal/Checks]** in the Service desktop and highlight **Echo Planar Testing**, select **[Start]**. Then, run the EPI White Pixel test using the single test selection (refer to the *System Level Procedures: Setup and Calibration: Echo Planar Test(EPT)*). Select **[Start EPT]**.
6. Use the Report Manager Tool under **[Utilities]** to open the latest EPT file (refer to *System Level Procedures: Software Utilities: Report Manager Tool*). Determine the image with the highest amount of white pixels (if any) by using Group 6 of the report. The image with the highest numbers has the most white pixels. If white pixels are detected, you must troubleshoot for the source of the problem using Mode 2.
7. Alternately, a file called sn_report.body or sn_report.head (depending on which coil is being scanned) is created showing a header file and the white pixel information (if any). If there are no white pixels detected, only the header information will appear in the file. These output files are stored on the system in (**/usr/g/bin**).
8. To run Mode 2, select **[EPI White Pixel Test]** from the SDM under **[TroubleShoot]** or open a UNIX window and type the following:

```
cd ^/usr/g/bin <Enter>
epiwp <Enter>
```

Note

The symbol “^” is used to denote a space in the command line.

9. Type in the type of coil (1=Head) (2=Body) when prompted.
10. Select the Mode 2 option.
11. When prompted for the image number, enter the image number (1-48) determined from Mode 1.
12. Disable the TNF by removing the input and output cables from it and joining the two cables together with a cable bullet.
13. The following prompt will appear:

```
Hit Scan to start scan in RTD mode. (Select [Scan] on the Scan desktop)
Use [Pause] and [Start Scan] hardkeys to start and stop scan
while troubleshooting. (Return to the service desktop)
Hit [Stop Scan] hardkey if you want to finish before the scan
completes.
```

```
Carriage return here to exit Mode 2...
```

Mode 2 runs continuously for approximately 4 minutes for troubleshooting purposes (provided the pause key has not pressed). To repeat the looping process, return to the Scan Desktop and hit the Scan button again, then use the hardkeys to run as previously instructed.

Table 4-1 indicates how the logical to physical gradients are played out in mode 1 operation. It also indicates which images from mode 1 are using what scan plane. This is useful information to know when using this tool in mode1 or in mode 2. Typically the frequency encode axis is the one that generates the spike noise because that is the axis that has the high amplitude, high duty cycle EPI readout train. This is not ALWAYS the case though as we have seen the phase encode axis cause problems in defective gradient filter boxes.

During troubleshooting you can disable particular gradient axes to isolate which axis is causing the spike noise excitations. Please refer to the EPI White Pixel Troubleshooting Guide, (epitsc11.doc).

TABLE 4-1
 EPI WHITE PIXEL IMAGES

Head and Body for Base, HighSpeed, EchoSpeed, & Cardiac Systems					
Image Displayed	Img Plane	Logical Freq Axis	Logical Phase Axis	Logical Slice Axis	Time Order of Acquisition
1,4,7,10,13,16,19,22,25,28,31,34,37,40,43,46	Ax	Phys X	Phys Y	Phys Z	1
2,5,8,11,14,17,20,23,26,29,32,35,38,41,44,47	Sag	Phys Y	Phys Z	Phys X	3
3,6,9,12,15,18,21,24,27,30,33,36,39,42,45,48	Cor	Phys Z	Phys X	Phys Y	2

5- RESTORATION

1. Enable the TNF by removing the cable bullet and restoring the input and output cables to the TNF module.

REVISION HISTORY

REV	DATE	AUTHOR	PRIMARY REASONS FOR CHANGE
0	10/16/97	K. L-P	Initial release
1	2/17/98	K. L-P	Changes per clinical feedback
2	6/10/98	FFF	Changes based on Cardiac bay validation
3	9/3/98	MCK	Removed Release 8.2 references.
4	5/20/99	SMA	Updated Procedure References for New GUI
5	2/17/00	REK	Changed start-up for 8.3 software
6	10/2/00	JAW	Added Section 5 - Restoration
7	01/17/01	K. L-P	Removed RF disable step and added table per Steve Huff
8	3/14/01	M. Jones	In Sec. 4-, clarified step 3, added new step 4, renumbered subsequent steps, then swapped steps 9 and 10.