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1- DESCRIPTION

EPT performs B₀ Dither Calibration and Group Delay Calibration using a single tool with a simple user interface. The output is suitable for remote support access, trending, and automatic checking of results against acceptance limits. In addition, EPT automatically updates the EPI calibration files when authorized by the user. For **TwinSpeed**, EPT is run for each GradMode, **Whole-Body** (WB) and **Zoom** (ZM). Both GradModes can be selected in a single pass, and both require calibration at least once per installation, and during any other routine system tests.

2- TOOLS REQUIRED



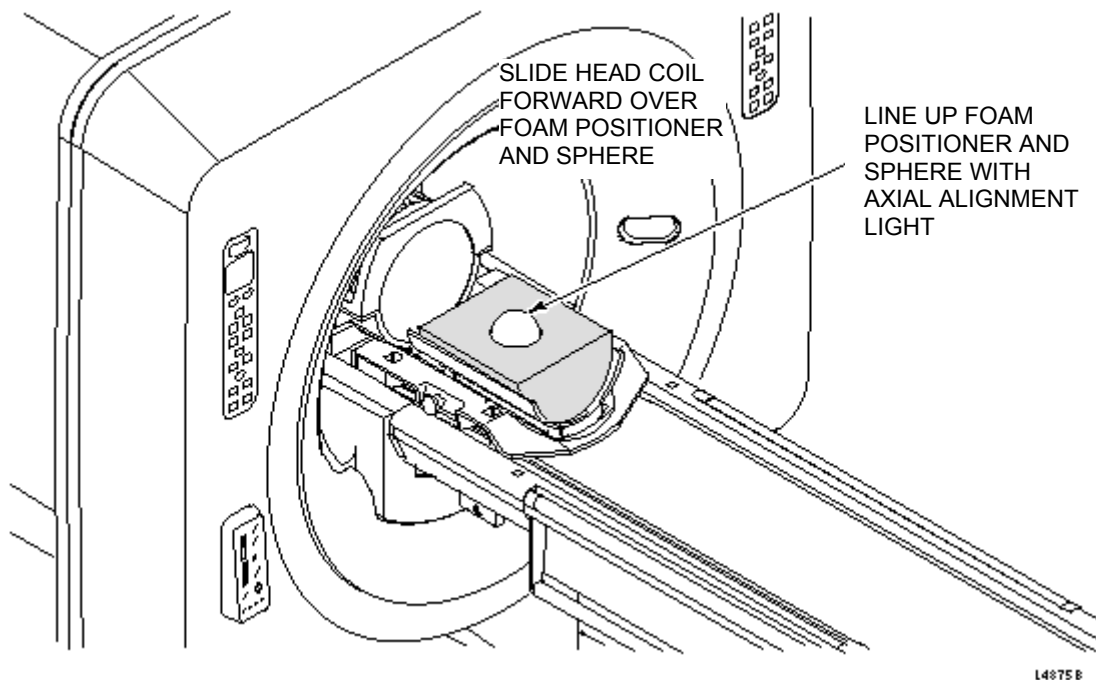
POISON HAZARD! THE PHANTOM CONTAINS NICKEL, A SUSPECT CARCINOGEN. DO NOT INGEST. DISPOSE OF AS A HAZARDOUS WASTE ACCORDING TO STATE AND FEDERAL REGULATIONS.

Item	Description	Part Number	Qty.
1.	100-mm Sphere Phantom	46-317586G1	2
2.	EPI Foam Positioner	2170481	2
3.	Grafidy Baseplate	46-317410G1	1

3- PROCEDURE

3-1 Startup

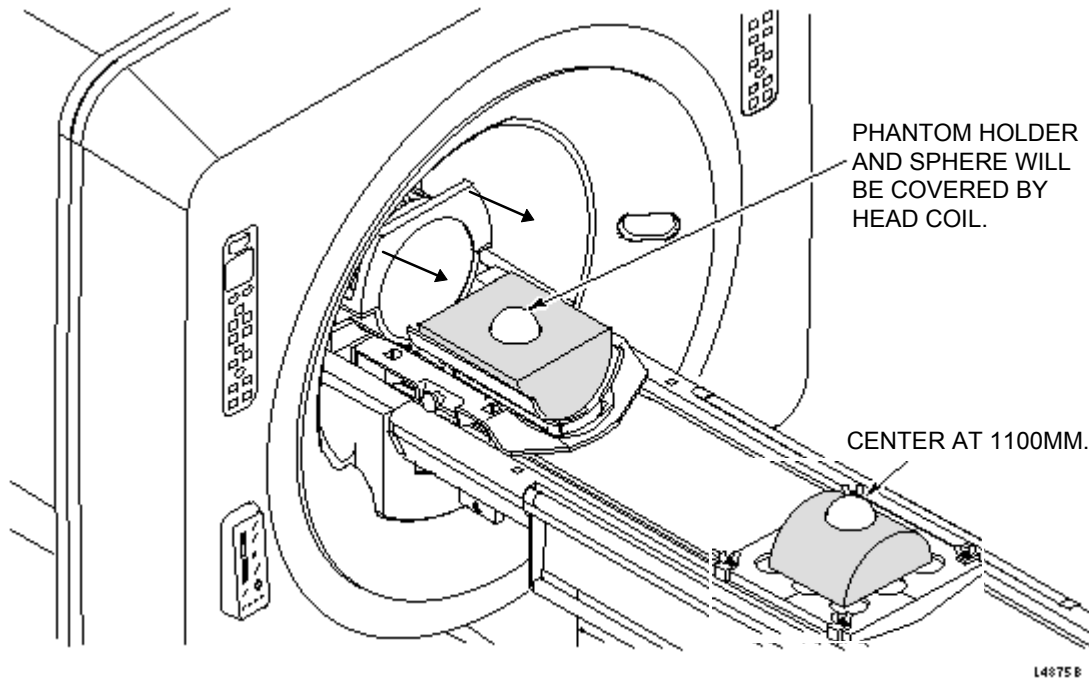
1. **Important!** Any time a change is made to the RF Chain hardware, and once per installation, perform the Bandpass Asymmetry Correction Characterization (BACC) procedure. Refer to *System Cabinet: Troubleshooting: Bandpass Asymmetry Correction Test* before running this calibration.
2. In the New Patient Register window, click on **[New Pt]**, and in the ID field, enter **geservice**
3. Place an EPI foam phantom holder and a 100-mm sphere phantom in the head coil as shown in Illustration 3-1. Landmark on the center of the sphere.



EPI PHANTOM POSITIONING - HEAD COIL
ILLUSTRATION 3-1

3-1 Startup (continued)

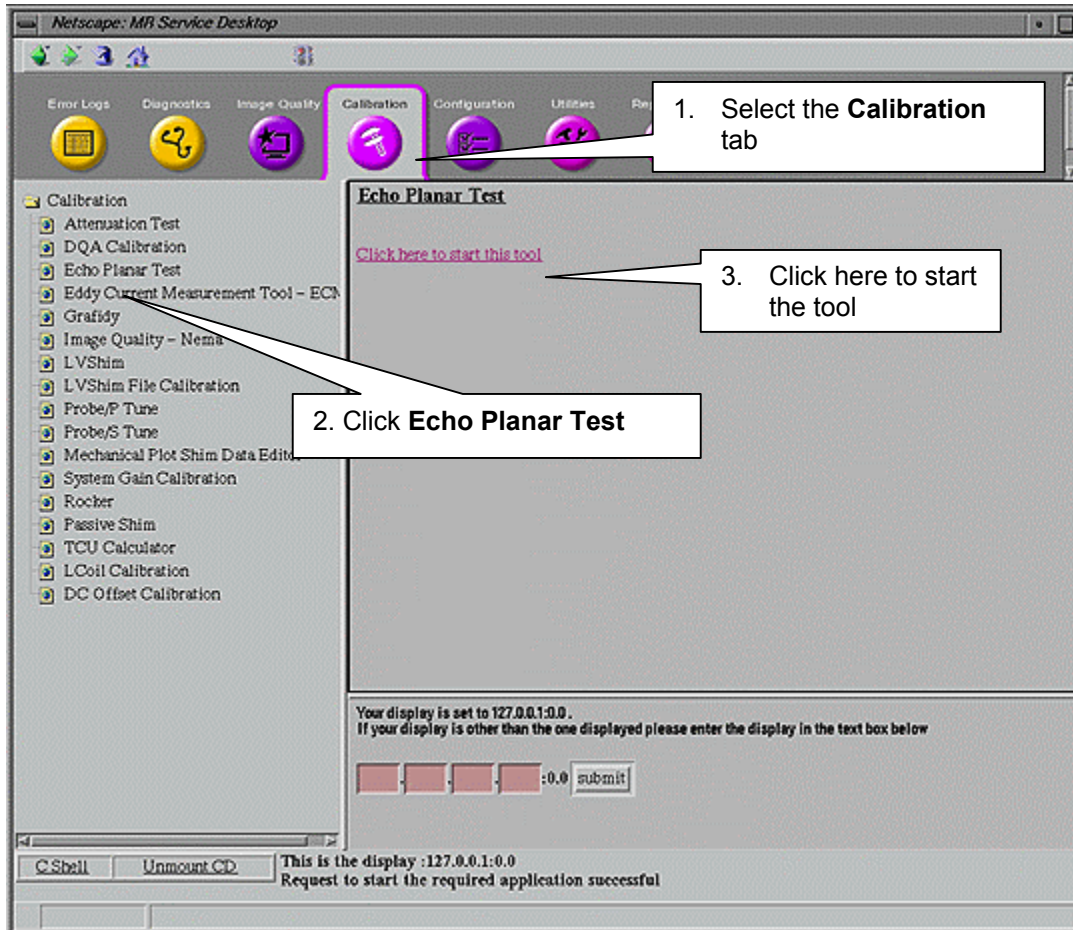
4. Place an EPI foam phantom holder and a 100-mm sphere on the Grafidy base plate, as shown in Illustration 3-2. Move the table into the bore to 1100 mm from landmark. Slide the Grafidy base plate so the center of the 100-mm sphere is at the axial alignment light, and then press the MOVE TO SCAN button.



EPI PHANTOM POSITIONING - BODY COIL
ILLUSTRATION 3-2

3-1 Startup (continued)

5. Open the Service Browser if it's not already open. Follow the instructions on Illustration 3-3, below, to start EPT.

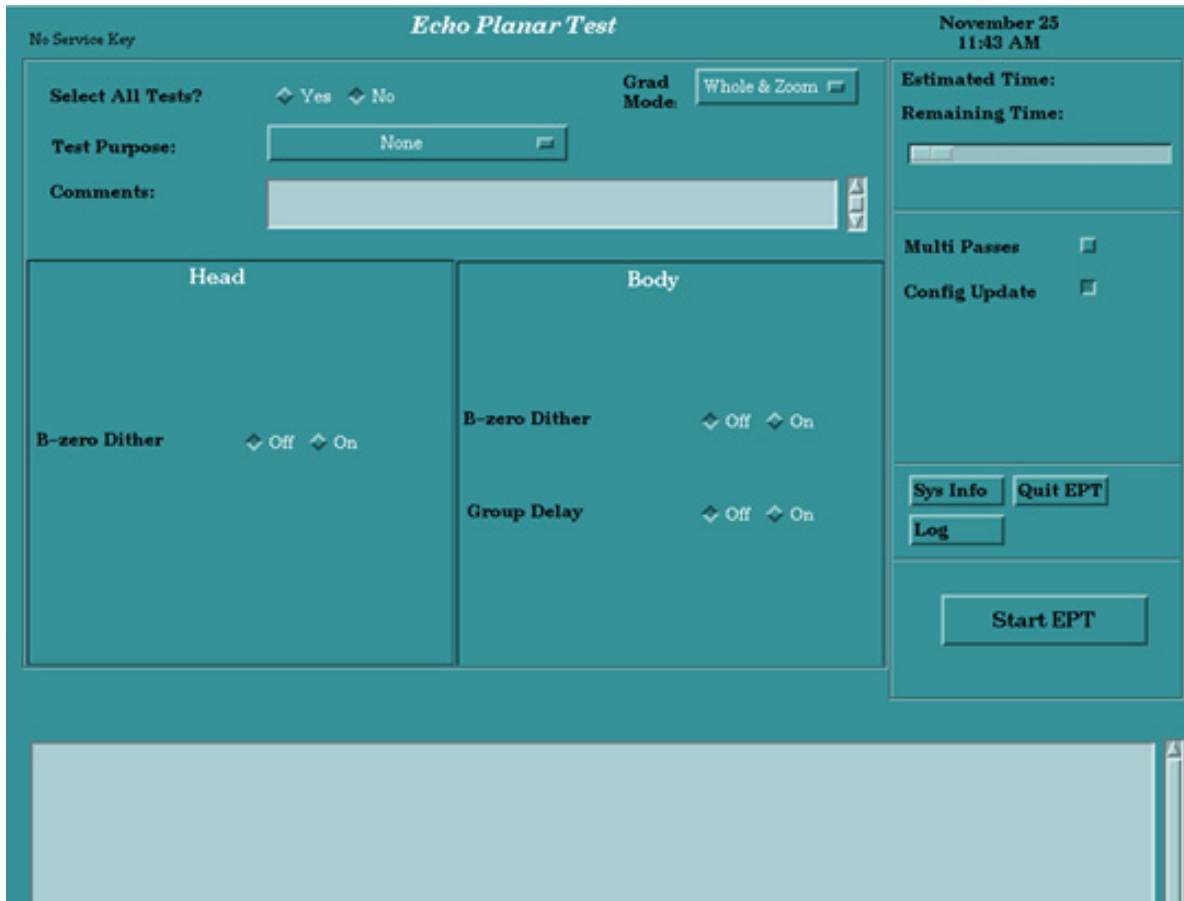


STARTING EPT
ILLUSTRATION 3-3

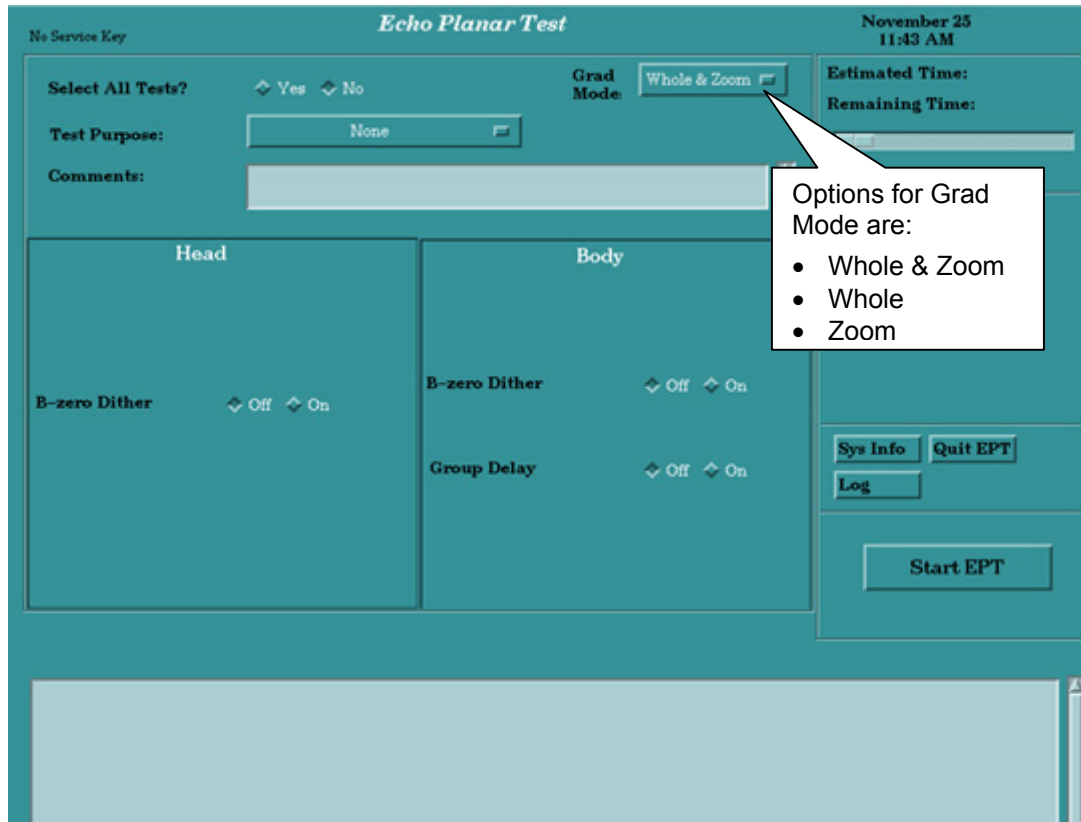
6. The Echo Planar Test Window will appear as shown in Illustration 3-4. For **TwinSpeed**, the **GradMode** selection menu will display with three possible entries:

- Whole & Zoom
- Whole
- Zoom

See Illustration 3-4.



ECHO PLANAR TEST WINDOW, NON TWINSPEED
ILLUSTRATION 3-4



ECHO PLANAR TEST WINDOW, TWIN SPEED SYSTEMS
ILLUSTRATION 3-5

Note

When the window opens, the Select All Tests option will always default to **No**.

7. Set the Select All Tests? option to **Yes**.

Note

When running EPT with a GradMode selection of **Whole & Zoom**, and the Select All Tests option set to **Yes**, two files (EPT.ZOOM and EPT.WHOLE) are created in /usr/g/bin/ept when the scan is complete. However, the results in the status field of the EPT test window will only display the **last** coil mode run, not both. Therefore, it is possible to experience a failure in the first mode run that is not reported.

The workaround is to select one mode at a time when you run EPT tests. Run either Zoom or Whole and view the results, then run the other mode and view the results.

8. Before starting EPT, you can make two additional settings by selecting the buttons on the right side of the screen:
 - a. To perform more than one pass of the tests, press the **Multi Passes** button and enter an integer in the text box that appears to the right of the button.
 - b. To have one or more of the selected tests automatically update the config files with new calibration data, if the new data is within specs, select **Config Update** before starting EPT.
9. Select the reason for running the test in the Test Purpose pull down menu.



The test you are about to initiate will move the cradle. Please take appropriate precautions to ensure that no person will be in its path.

10. Select **[Start EPT]**. Running all the tests takes about one hour and will thoroughly test the EPI performance of your system. This is the recommended mode for baseline, PM, and initial problem finding. The single test mode is meant to be used while troubleshooting.

If possible, run the full set of tests at the end of your troubleshooting to verify system performance. While EPT is running, each test will be displayed in the message window indicating the amount of time the test requires to run.
11. For **TwinSpeed**, the tests should be run with the **GradMode** set to **Whole & Zoom**, so that both gradients are checked and calibrated. During troubleshooting, a single gradient can be checked by selecting the **GradMode** as either **Whole** or **Zoom**.
12. EPT will create many images. If there is not enough space, a window will popup to inform you that there is not enough space available.

13. When the tests are complete, one of four messages will appear:

Your tests completed successfully

or

A minor system problem has been detected. This problem is NOT expected to affect image quality

or

A serious system problem has been detected. This problem IS expected to impact image quality, however, this does not affect the system's ability to scan

or

EPT was unable to determine PASS/FAIL status of the tests

14. Select **[Quit EPT]** and confirm.

3-2 Test Termination Procedure

1. If **[Quit EPT]** is selected, a confirmation window appears.
2. If the EPT process is not shut down in an orderly manner, the service protocol directions may need to be reset. This can be done by opening a C-shell and typing the following:

```
cd /usr/g/bin/ept <Enter>
```

```
resetept <Enter>
```

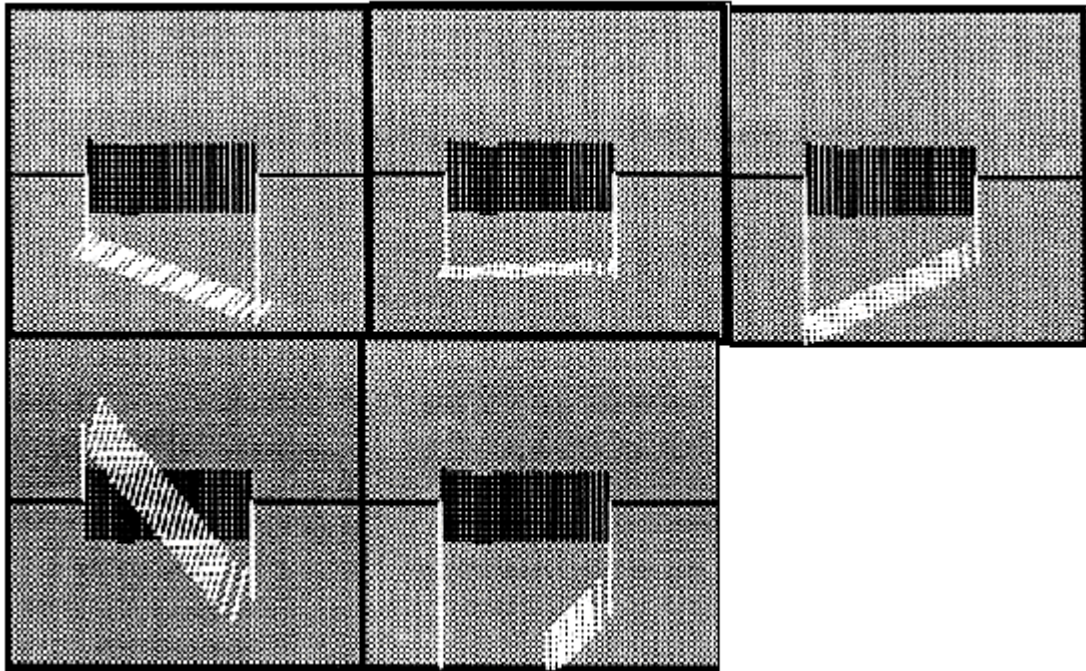
3. Return the TNS hardware switch to the clinical setting (usually **Enabled**).
4. Review status maps for B₀ Dither and Group Delay.

4- EPT CALIBRATION PLOT EXAMPLES

Note

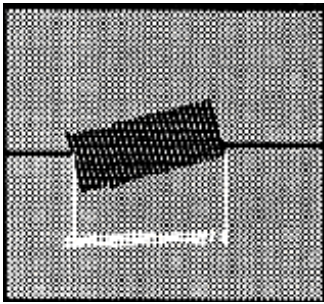
It's a good idea to photograph and label the EPT calibration graph mode plots for future comparison. Future calibration plots may not look identical to these, but they can be a good indicator of historical system tuning and performance.

Illustration 4-1 contains typical EPT calibration plots. One of the most important characteristics is that the top and bottom borders of the plot appear virtually parallel. Width is not as important as the absence of bowtie or conical plots (see Illustration 4-2).

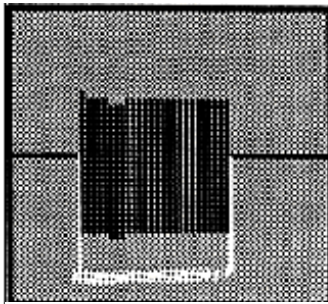


TYPICAL EPT CALIBRATION PLOTS
ILLUSTRATION 4-1

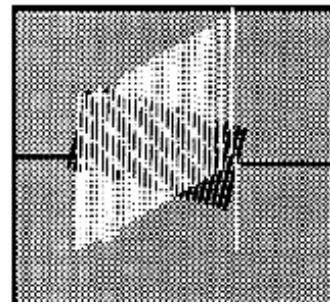
4-1 EPT Calibration Plot Examples (continued)



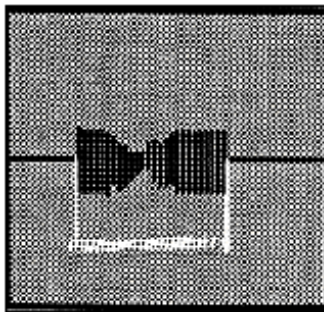
Shim is off. Check shim and or autoshim.



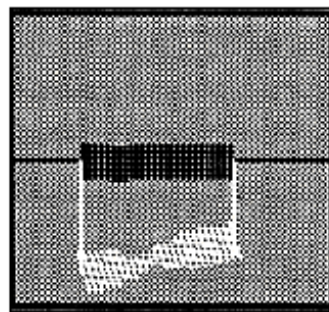
Group delay wrong. Check psd_grd_wait or warp b0.



Excessive Dither. Verify that GRAMS are tuned and Grafidy B0 is in spec.



Bow-tie in center. Verify that GRAMS are tuned and Grafidy B0 is in spec.



Bow-tie in corner. Verify that GRAMS are tuned and Grafidy B0 is in spec.

EXAMPLE OF (BAD B₀) PLOTS WITH TROUBLESHOOTING TIPS
ILLUSTRATION 4-2

REVISION HISTORY

REV	DATE	AUTHOR	PRIMARY REASONS FOR CHANGE
0	August, 2002	Hawthorne	Initial Release of Class A document
1	Nov. 25, 2002	C. MacDonald	Removed mention of B ₀ Image, and edited illustration (3-4) containing it. Minor changes to Illus. 4-2. Renumbered sections to account for removal of proprietary sections.