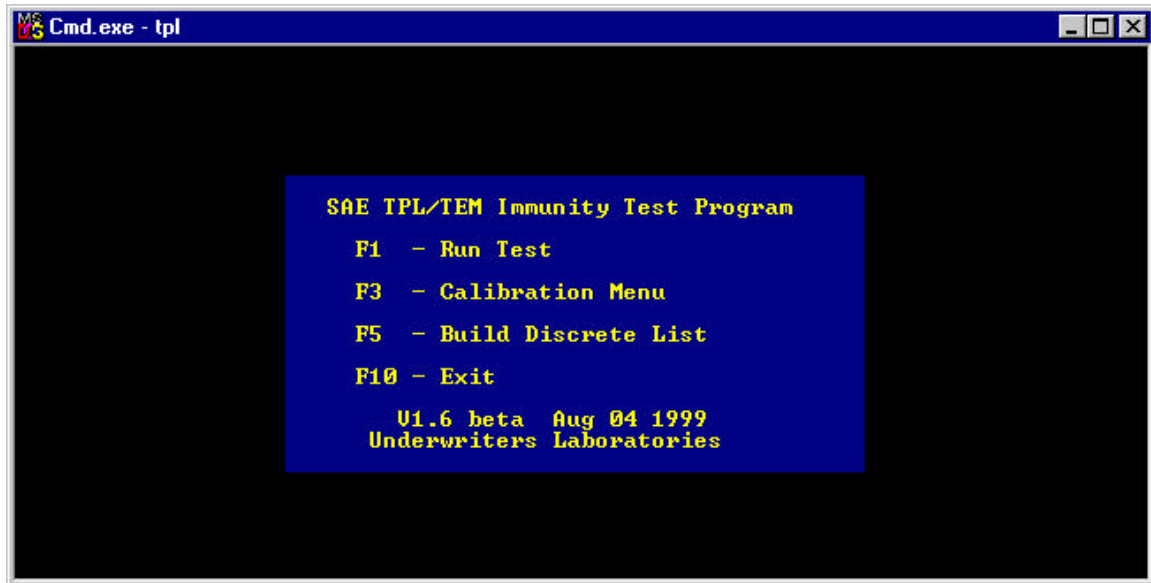


SAE TPL/TEM Immunity Test Program

User Manual

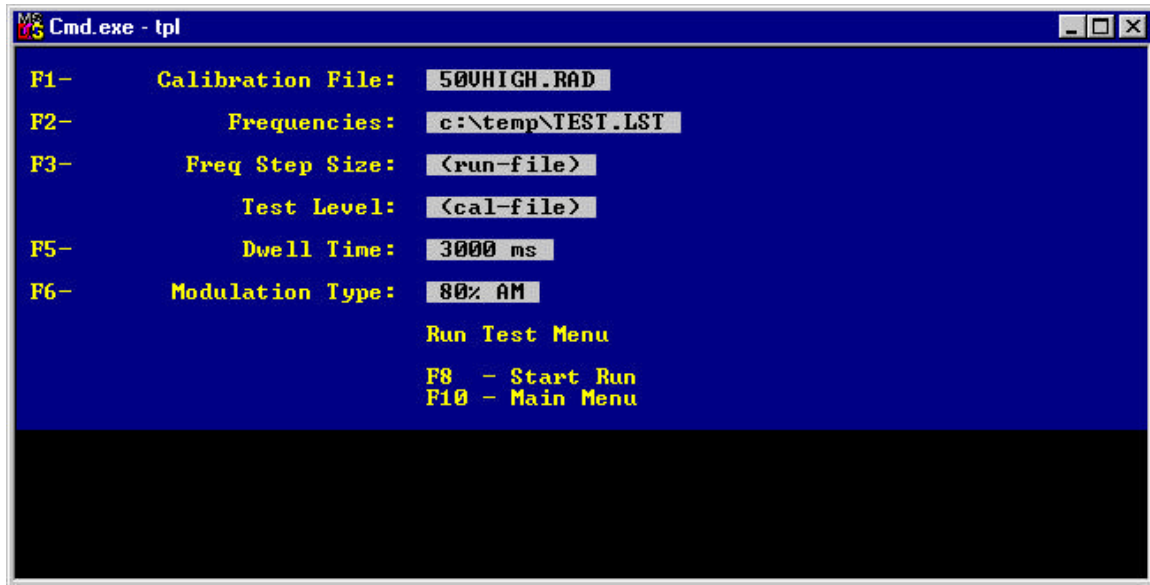
Main Menu



- F1 Goes to Test Run menu. All the parameter for running a test can be entered, and the test performed.
- F3 Goes to Calibration menu. From this menu, the various parameters for calibrating a test setup can be entered and the calibration then performed.
- F4 Goes to Build Frequency List function. Use this to assemble a frequency list for testing the discrete frequencies of an EUT.
- F10 Exits program.

Test Run Menu

(from the main menu)



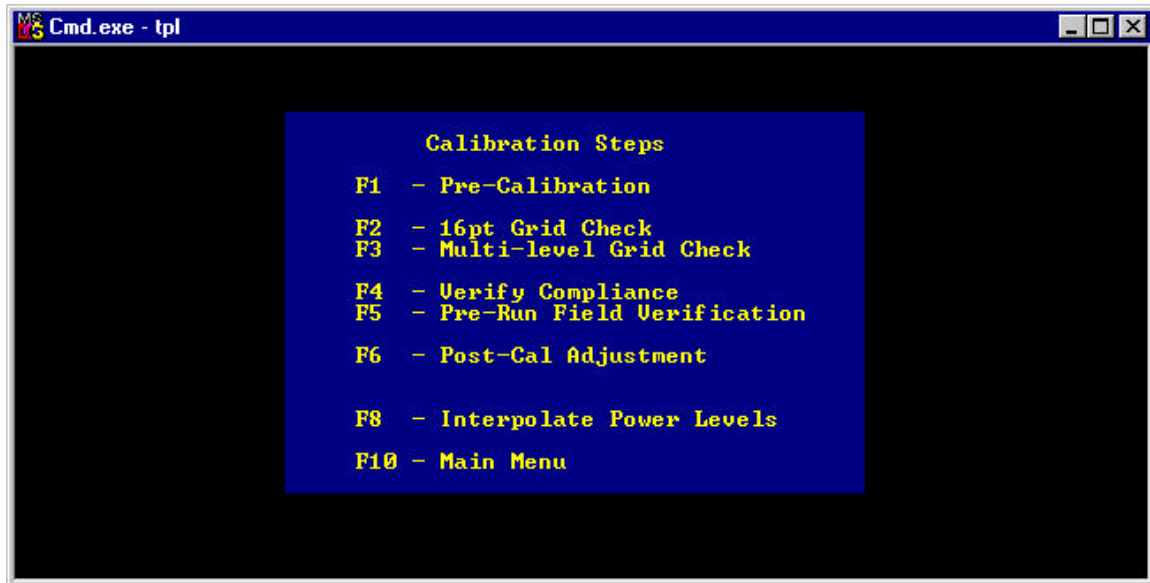
- F1 Selects calibration file. A popup windows will allow you to select the file. This file determines the test level.
- F2 Frequencies. Pressing F2 will allow you to select either a list file, or a frequency range. For SAE tests, you will select a discrete frequency list file to use for the frequencies listed in the test specification.
- F3 Selects step size if a frequency-range was selected with F2.
- F5 Sets the time the test will pause at each frequency. Selecting a dwell time of 0 will cause the program to wait for a keypress before stepping to the next frequency.
- F6 Modulation type. One of three choices can be made. None; 80% AM; Pulse. For the SAE TPL/TEM test, the 80% AM mode is a constant-peak method, where the peak of the power envelope is equal to the CW calibration level, which means the level from the signal generator is reduced by 5.1dB. When running in AM mode, the power is ramped up to the test level in CW mode first (for the purpose of measuring the net power), then changed to 80% AM.
- F8 Starts the test run.
- F10 Exits this menu.

Once the test has started, pressing the "Esc" key will prompt you for one of two reponses. Pressing "Esc" again will halt the test run, while pressing any other key will cause the program to go into manual mode.

In the manual mode, pressing the left/right arrow keys will cause the program to move up/down in frequency. Pressing the up/down keys will cause the output level to go up or down, but never higher than the calibration level. Pressing the "Ins" or "Del" keys will cause the RF output of the signal generator to switch on or off, respectively. The manual mode can be used for determining failure threshold of the EUT.

Calibration Menu

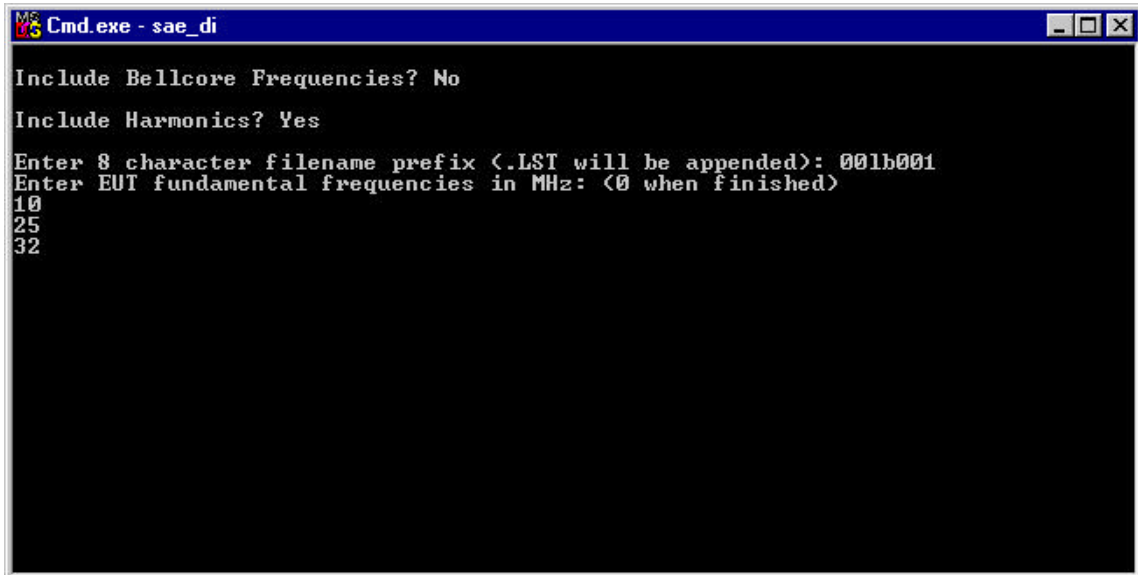
(from the main menu)



- F1 Performs pre-calibration. This function determines preliminary levels needed for further calibration steps.
- F2 Grid Check. This is used for capturing data at each probe position that will be used to determine field uniformity.
- F3 Multi-level grid check. Not currently implemented.
- F4 Verify Compliance. Once the data has been collected for the different probe positions, this function will determine the field uniformity and create an analysis file that will be used by the post-cal adjustment function.
- F5 Pre-Run Field Verification. Used as a check (before running a test) to see that the calibration file is still valid, and as a check to see that the system functions properly.
- F6 Post-Cal Adjustment. The last step of a calibration. The uniformity data collected by the Verify Compliance function will be used to make final adjustments needed to create a calibration file.
- F8 Interpolate Power Levels. Takes a calibration file and performs a linear interpolation of the power levels between the calibration frequencies. This is a function normally used for IEC 1000-4-3 tests and is not used for SAE Tri-plate tests.
- F10 Exits the Calibration Menu.

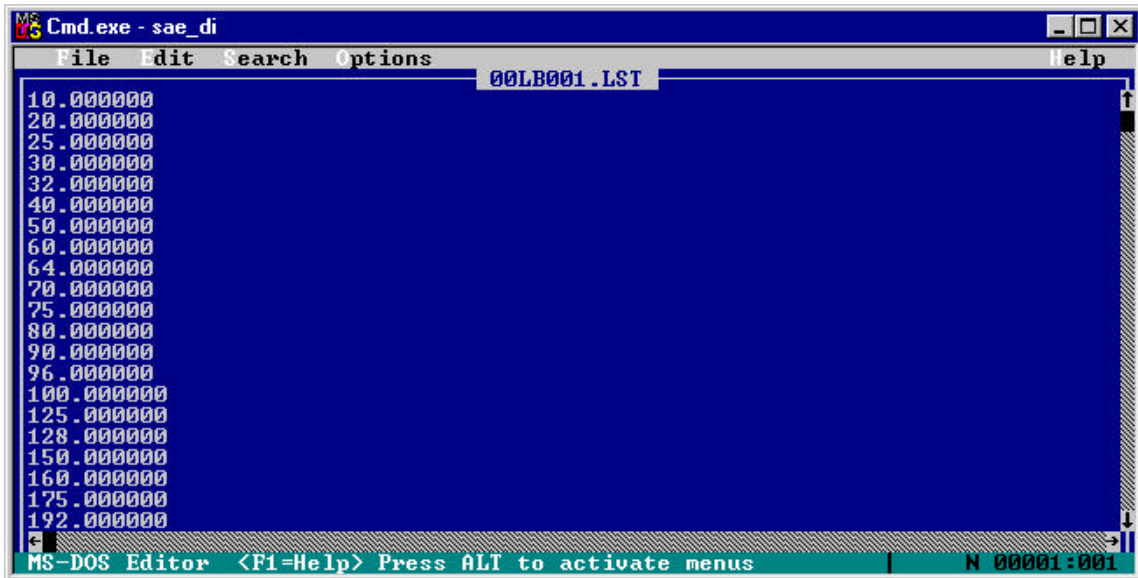
Build Frequency List

(from the main menu)



```
MS-DOS Command Prompt: Cmd.exe - sae_di
Include Bellcore Frequencies? No
Include Harmonics? Yes
Enter 8 character filename prefix (<.LST will be appended>): 001b001
Enter EUT fundamental frequencies in MHz: (<0 when finished>)
10
25
32
```

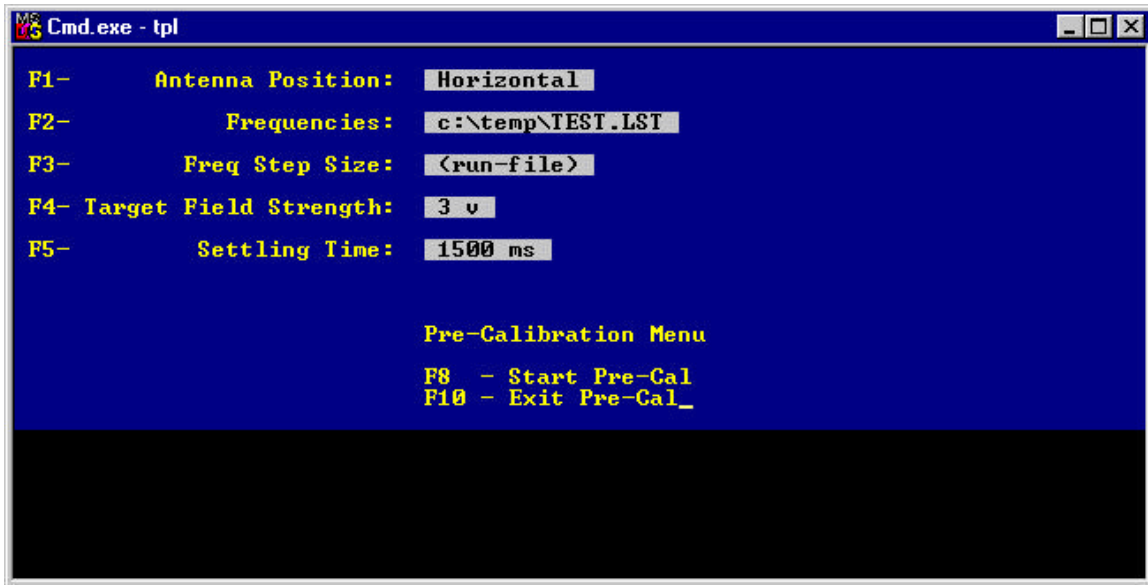
This function allows the construction of a discrete frequency list for testing EUT sensitive frequencies for those tests that require discrete frequencies to be tested. (See test specification or data sheets). Answer the questions appropriately. If you answer "Y" for "Include Bellcore Frequencies?" then the frequencies specified in the Bellcore 1089 standard will be added to the list. "Include Harmonics" will take the frequencies you enter and calculate the harmonics (up to the 10th) to be included in the final list. You must enter an 8 character filename prefix (Dos filename restrictions apply). Now you can enter the frequencies, pressing return between each one. When finished, enter a 0 (zero) as a frequency. If the dos "Edit" program is on the computer, it will run and load the file created to allow any changes to be made, as shown below.



```
MS-DOS Editor: Cmd.exe - sae_di
File Edit Search Options Help
001b001.LST
10.000000
20.000000
25.000000
30.000000
32.000000
40.000000
50.000000
60.000000
64.000000
70.000000
75.000000
80.000000
90.000000
96.000000
100.000000
125.000000
128.000000
150.000000
160.000000
175.000000
192.000000
MS-DOS Editor <F1=Help> Press ALT to activate menus | N 00001:001
```

Pre-Calibration Menu

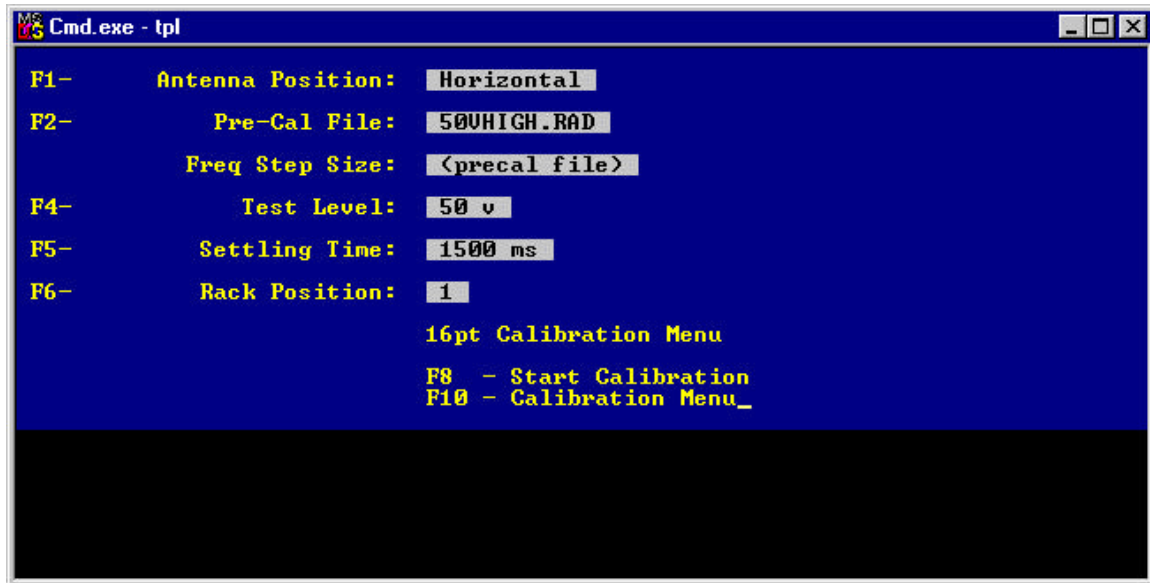
(from Calibration Menu)



- F1 Select antenna polarity (not used for SAE TPL/TEM, leave as Horizontal).
- F2 Frequencies. (See Run Test menu for explanation).
- F3 Frequency Step Size. (Also see Run Test Menu).
- F4 Target Field Strength. Select the v/m level desired. For pre-calibration purposes, select a number less than 100 v/m.
- F5 Settling Time. Select the time required by the instrumentation for settling before making a measurement.
- F8 Starts pre-cal.
- F10 Exits to calibration menu.

16pt Calibration Menu

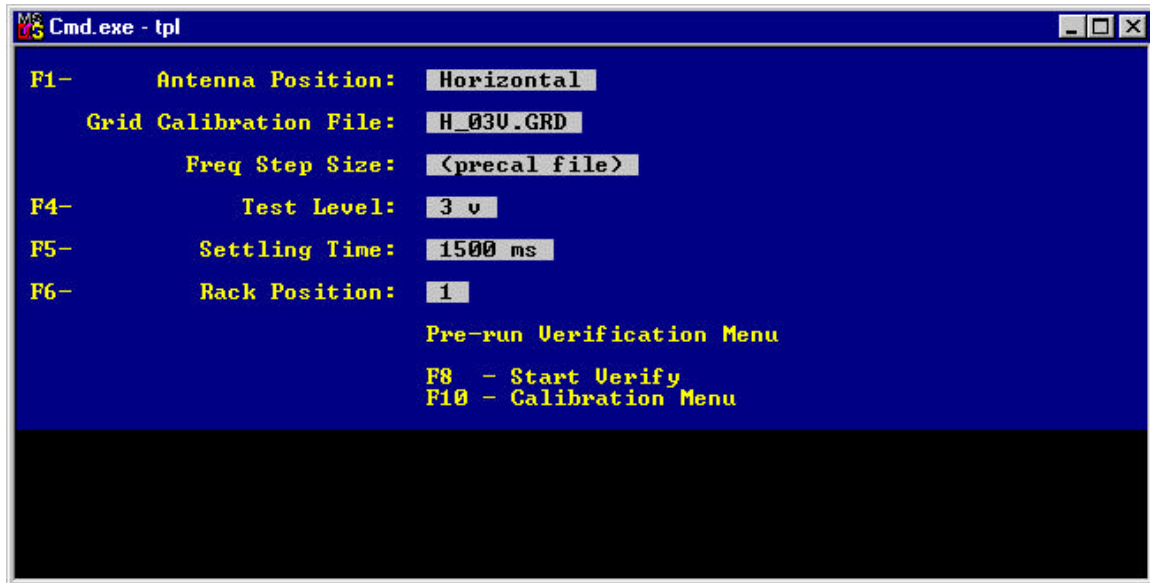
(From Calibration Menu)



- F1 Antenna Position. Leave as Horizontal for TPL/TEM software.
- F2 Pre-Cal File. Select a file, either a precal (.PRC) file, or a .RAD (calibration file). The frequencies, signal generator levels, and power levels from this file will be used to set the output level for this function. If a power meter is connected and on, it will be used to match the power level that was generated during the pre-calibration.
- F4 Select the level that will eventually be used during the post-calibration step.
- F5 Settling Time. Select the time required for the instruments to settle before making a measurement.
- F6 Rack Position. Set this to the probe position in the TPL. Note: only positions 1-5 are used for TPL.
- F8 Start Calibration.
- F10 Exits to the Calibration Menu.

Pre-Run Verification Menu

(from Calibration Menu)

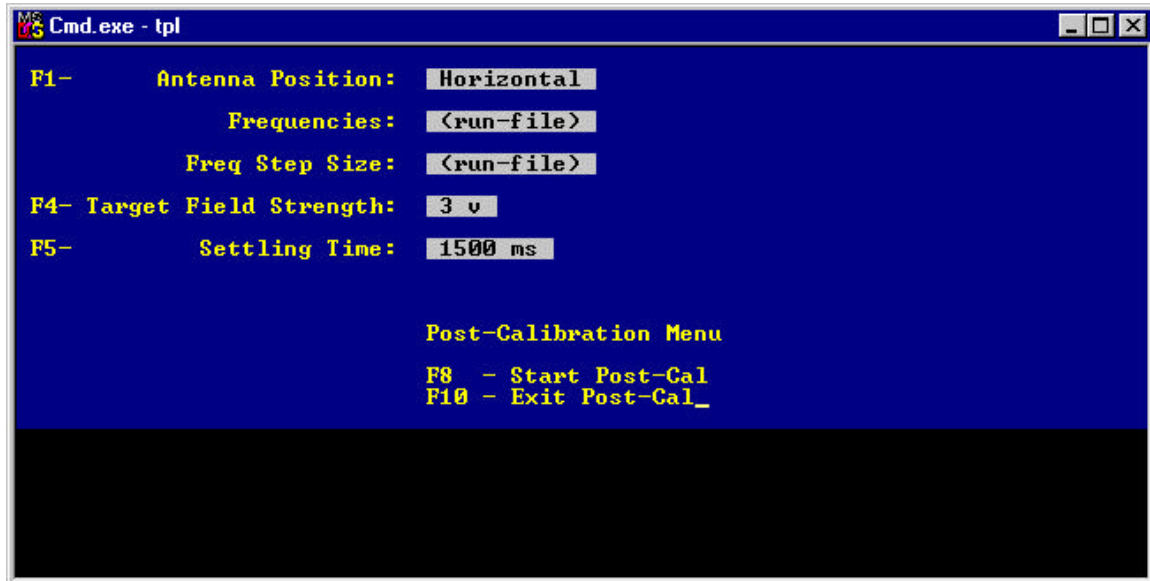


This step is used to verify the test setup. The same levels that were recorded during the TPL calibration will be repeated, and the level from the probe will be compared to the level that was recorded during the calibration. The difference, in dB, will be displayed on the screen and a file output created.

- F1 Select antenna polarity (Leave as Horizontal for TPL/TEM software).
- F4 Select the v/m level that was used during the Grid Check function.
- F5 Settling time. Time needed for the instrumentation to settle before making a measurement.
- F6 Rack Position. Select the probe position being checked.

Post-Calibration Menu

(from the Calibration Menu)



The Post-Calibration step takes the files created by the Verify Compliance step, and adjusts the output level of the signal generator until the required test level is reached. For the TPL/TEM software, the files from the Verify Compliance step must be taken through an additional step (Excel spreadsheet) to adjust the numbers as required for the various test levels needed.

F1 Antenna Position. Leave at "Horizontal" for the TPL/TEM software.
F4 Target Field Strength. Select the level used for the Grid-Check step.
F5 Settling Time. Time required by the instrumentation to stabilize before making a measurement.

F8 Starts the Post-Cal.
F10 Returns to the Calibration Menu.