BOONTON ELECTRONICS

a Wireless Telecom Group Company

4400A/4500A MANUAL ADDENDUM

Applies to **Instruction Manual Model 4500A RF Peak Power Meter /Analyzer, Model 4400A RF Peak Power Meter,** Part Number 98404700A, revised 09/97.

Effective for Control Software Revision **20020511** and later.

1.0 NEW FEATURES

1.1 Peak Sensor Temperature Compensation

When used with a peak sensor that contains a valid temperature compensation table, the model 4400A and 4500A Peak Power Meters can provide temperature compensated power measurements. The default mode for temperature compensation is active. The *Chan n > Calibration>Temp Comp* menu box will be visible with "Sensor Tbl" displayed. To turn off temperature compensation press the menu button and "Off" will be displayed. The "Off" setting is volatile and not preserved through power cycles or major mode changes. If the sensor in use does not have a temperature compensation table the *Temp Comp* menu box will not appear at all.

The *Spcl>Chan n Sensor* report will include the message "Sensor has Temperature Compensation Table" when appropriate. The *Spcl>Servicing>Configuration* report shows TC system status if either channel has a sensor with a valid table. The format of this message
if present is:

TC System Status 1:[err code] #### 2:[err code] ####

The error codes are:

0	No error.	
145	TC # of Temps Err	Table parameter error
146	TC # of Powers Err	Table parameter error
147	TC Interp Err	Table interpolation error
148	TC Expand Err	Table expansion error
149	TC Extend Err	Table extension error
150	TC Chksum Err	Table read checksum error
151	TC Table Length Error	
152	TC Temp Value Err	A temperature value is out of range

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153	TC Temp Non-mono	A temperature array is non-monotonic
154	TC Power Value Err	A power value is out of range
155	TC Power Non-mono	A power array is non-monotonic
156	TC Corr Value Err	A correction value is out of range

Use CH1 or CH2 to specify to which channel the following temperature compensation related GPIB commands apply:

TCON   Turn on temperature compensation if available. If not, ignore.

TCOFF   Turn off temperature compensation. This is a volatile setting if compensation is available.

1.2 Sensor Auto-calibration File Retention

Sensor auto-calibration files are now saved by channel as .AC1 and .AC2 files in non-volatile (flash) memory. This avoids the need to perform auto-cal every time a sensor is removed and replaced by a different one, provided the sensors are known to the channel(s) involved. When a sensor is plugged-in a search is made to find an existing auto-cal file. If one is found, it is installed. If not, the "Needs Auto-cal" message will appear. When auto-cal is performed the existing file is overwritten with the new result. If no previous file exists, one is created. Sensor filenames have the form SEN#####.AC n, where ##### is the serial number and n is the channel number.

The file directory system is expanded to display auto-calibration files in flash memory as well as the previous files on the floppy disk. The *Utility>Disk>Flash Disk* path lists sensor auto-cal files by channel. The *Select File <>* menu contains a sequence number which refers to the position of the file in the list. The selected file is shown in RED and may be deleted by pressing the menu button next to the "Delete" box. Deletion of files must be confirmed or cancelled.

There are no GPIB operations on the file directory.

1.3 Color *.bmp File of Display

The Hardcopy section now includes a color *.bmp file of the current display that can be saved to the floppy disk, sent to the COM1 port or the GPIB. To select this feature set the *Util>Hardcopy>Device* menu to "Plotter". Then select *Util>Hardcopy>Model* ".BMP". Choose the *Plot Label*, *Output Port* and *File Select* number if the output is the floppy disk. *Graph & Text* is not applicable. Note that the "IEEE-488" output selection applies to the listen only (lon) GPIB addressing mode only. For controller directed GPIB output

see below. Press the <u>PLOT</u> key to send the file to the selected output. The .bmp extension is added to the floppy disk file directory to allow viewing the filenames saved on disk. The GPIB commands for controller directed return of the .bmp file contents are:

> Send the sequence PLOTTER PLOT.BMP to select the bit-map mode.
> Send TKPLOT to set the talk mode that returns the file when addressed to talk.

The GPIB commands to send the plot file contents to an output other than the GPIB are:

> Send the sequence PLOTTER PLOT.BMP to select the bit-map mode.
> Send PLOTSER1, PLOTCOM1, PLOTLPT1 or PLOTDISK to select the output.
> {Use PLOT488 only with the front panel <u>PLOT</u> key manually to send in the talk only (ton) mode to a listen only (lon) device}.
> For PLOTDISK send FILENO ## to select a filename.
> Send PLOT to simulate pressing the <u>PLOT</u> key to send the file to the selected output.

1.4 External Trigger Input Calibration

A provision to zero and calibrate the external trigger inputs has been added to provide better accuracy for voltage measurements made with the trigger inputs. The following procedure is used to calibrate each external trigger input:

> Set *Time>Timebase* to "5 ms/Div"
> Set *Trig>Trig Mode* to "Auto"
> Select the external trigger input in the *Trig>Trig Source* menu corresponding to the selected measurement channel (CH1 to 1EXT or CH2 to 2EXT).
> Set the *Chan#>Extensions>Display* to "Trig" (Trigger View Mode)
> Set the *Chan#>Vert Scale* to 1.00 V/Div
> Set the *Spcl>Servicing>Cal Mode* "On"

With *Cal Mode* "On" two boxes labeled *Ext Trig Zero* and *Ext Trig Cal* will appear in the *Chan#>Extensions* menu. *Ext Trig Zero* will have a bright "Start" label.

With no input to the selected external trigger input, press the menu button for *Ext Trig Zero* "Start". The input will be zeroed and the *Ext Trig Cal* "Start" label will be bright.

With +3.00 volts applied to the selected external trigger input, press the menu button for *Ext Trig Cal* "Start". The input will be calibrated for 3 divisions of deflection at 1 V/Div.

> Set the *Spcl>Servicing>Cal Mode* "Off"

The results of the calibration are stored in non-volatile memory with file extension .TRV. Absent a file, default data is supplied automatically and simulates the existing software. External trigger level calibration is not available on the GPIB.

1.5 UNDIM Command.

A GPIB command, UNDIM, is added to reset the screen saver without touching the panel or re-loading the color table. This is helpful in remotely controlled applications.

2.0 Changes

2.1 Instrument Setup Save/Recall change.

The instruments setup save and recall system has been modified to save a binary file instead of an ASCII file. The binary file is smaller and more comprehensive and is identical to the internal save/recall format. The new file has the extension .ISU. For customers with existing .INS files the ability to read an .INS file is still present, but new features will not be available using this method. Existing files should be converted by reading the .INS files and saving them as .ISU. The file directory is modified to display .ISU files. The GPIB commands are not affected.

2.2 GPIB command *OPT? change.

An installed hardware options list has been appended to the *OPT? GPIB command format previously used. For example, a single channel instrument with Option 04 hardware installed and a sensor plugged-in returns:

<div align="center">1,1,0,0,4</div>

2.3 Configuration report change.

Installed options are now identified in the Configuration Report. For example:

The *Spcl>Servicing>Configuration Report* for Option 04 installed reports:

<div align="center">Opt 04 – Trigger Delay by Events installed</div>

2.4 Sensor Temperature Reporting change.

Sensor auto-cal temperature and current temperature readings have been moved from the *Utility>Report* to the *Spcl>Ch 1 Sensor>Report* and *Spcl>Ch 2 Sensor>Report*.

3.0 Corrections

1. Remove glitches that occur when in Triggered mode (as opposed to Auto) and certain commands are executed. Also, measurement traces can now be moved and re-scaled when Waiting for Trigger on the slow time bases.

2. Calculate the auto-measure parameter "OFF TIME". This function has always been enabled but there was no calculation method included.

3. Correct an overflow error in the cal table expansion that overwrites the first position of the channel 2 table when channel 1 is expanded. This may cause the channel 2 PDF to not appear.

4. GPIB command TKBMEAS now reports the sign of Pk/Avg ratio correctly.

5. Marker math mode changes now occur immediately even in wait for trigger.

6. When both markers are in trigger view mode the marker math functions MK1-MK2, MK2-MK1, MAX-MIN and MIN-MAX are computed as voltage difference and appear in the middle window with voltage difference units. The PK/AVG mode is not recognized in trigger view mode but is not an error. This correction also appears in the parameters of GPIB commands TKMEAS, TKBMEAS and TKUNITS when appropriate.

7. The trigger pointer is now removed when the direct set of a statistical mode occurs.

8. Restore the legacy GPIB command MKDELTA to set the marker math to power difference in the linear units mode only. This command was deleted by mistake in the "A" series.

9. Update the RUN/STOP message in the recall stored setup function to avoid out of sync messages.

10. Change the linear mode reference lines to track vertical offset in "divisions" rather than watts, which is incorrect.

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