

28 March, 2013

## **FPAS2 Bias and TRIM Adjustment**

The purpose of this document is to present the procedure for adjusting the bias and TRIM components of the FPAS2 system for best detector uniformity.

### **Setup:**

The system must be setup with a known signal shape on the detector. This can be done with the detector separated from the spectrometer viewing a uniform chopped blackbody source, or with the detector on the spectrometer viewing a known spectral shape. Sufficient energy should be present to produce a signal level around 1Volt.

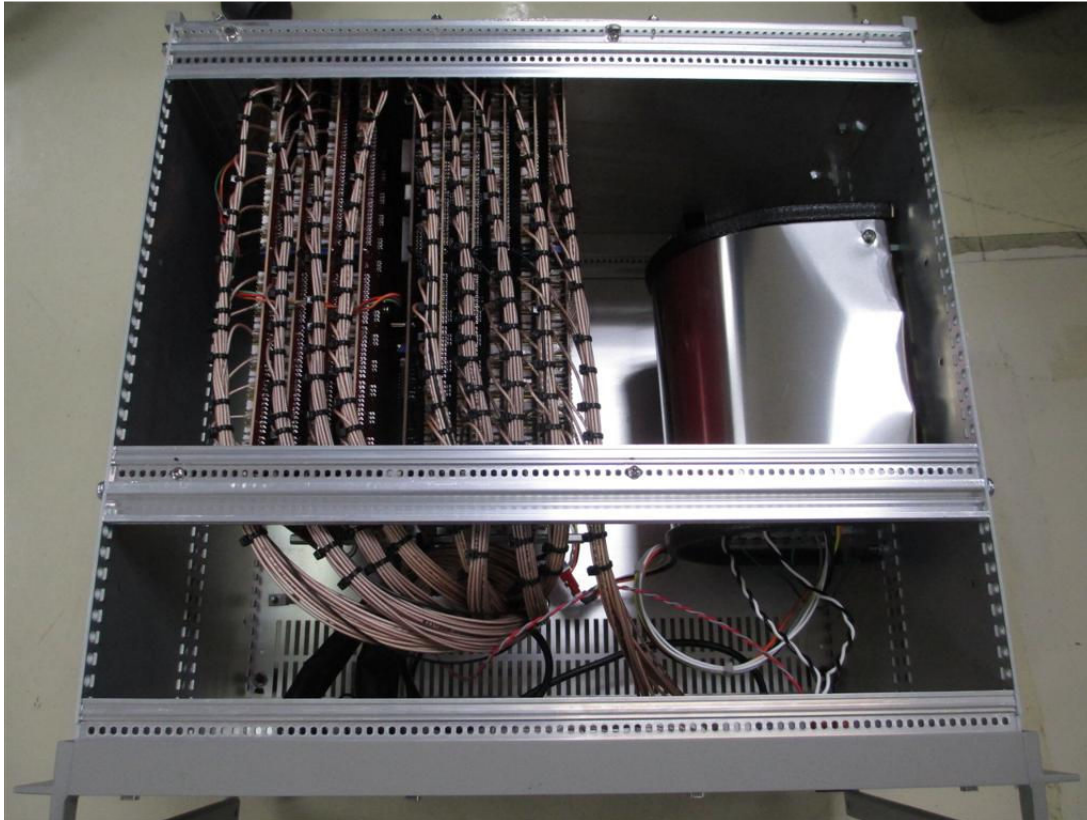
### **Bias Adjustment:**

The FPAS2 system is comprised of 16 channel PC Boards that connect to 16 element sections of the detector array. Each PC Board has one master bias control that is used to set the operating bias of the associated detector section.

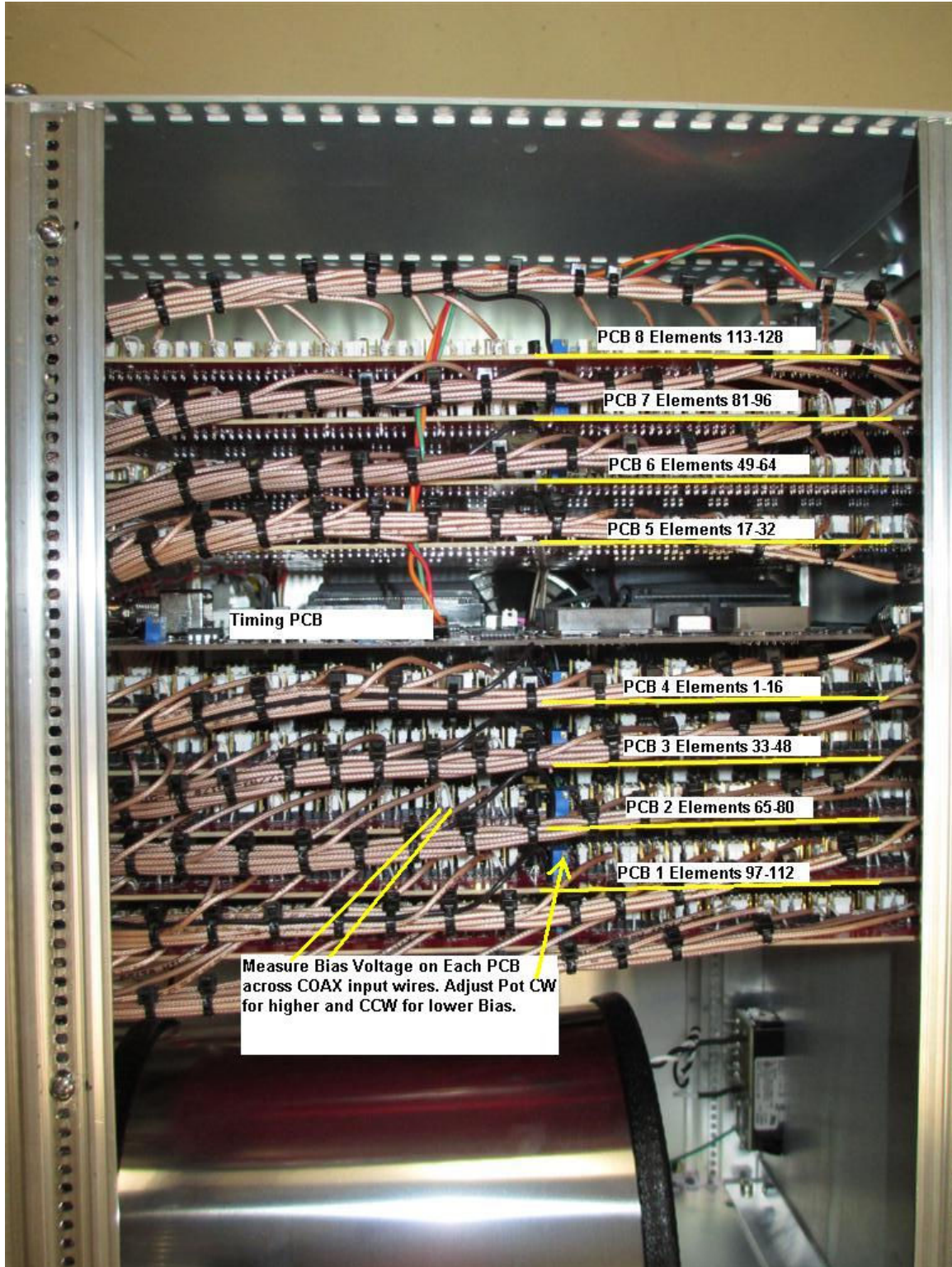
The bias adjustment is a coarse adjustment used to remove the step uniformity from 16 element section to 16 element section of the array.

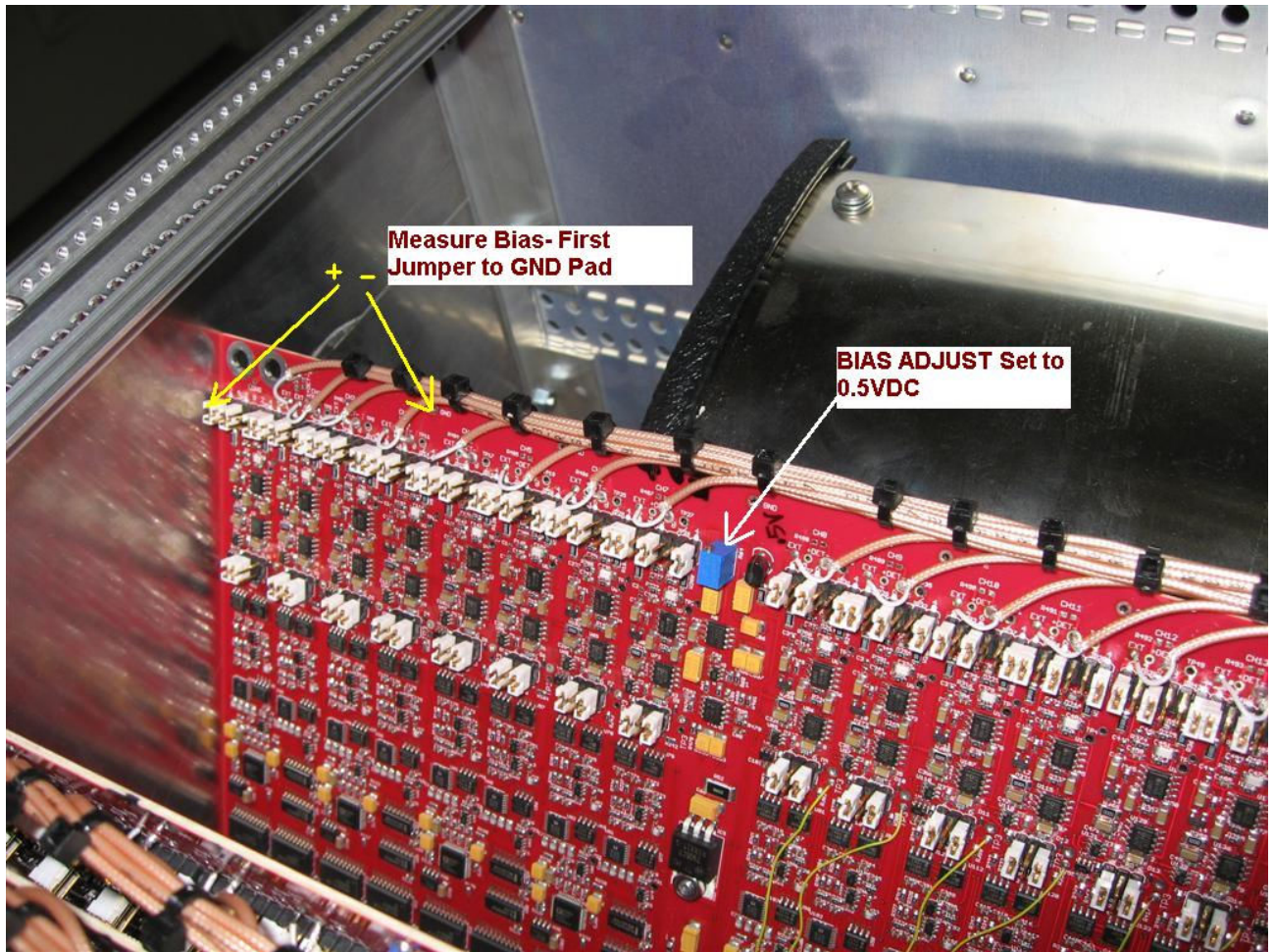
Procedure:

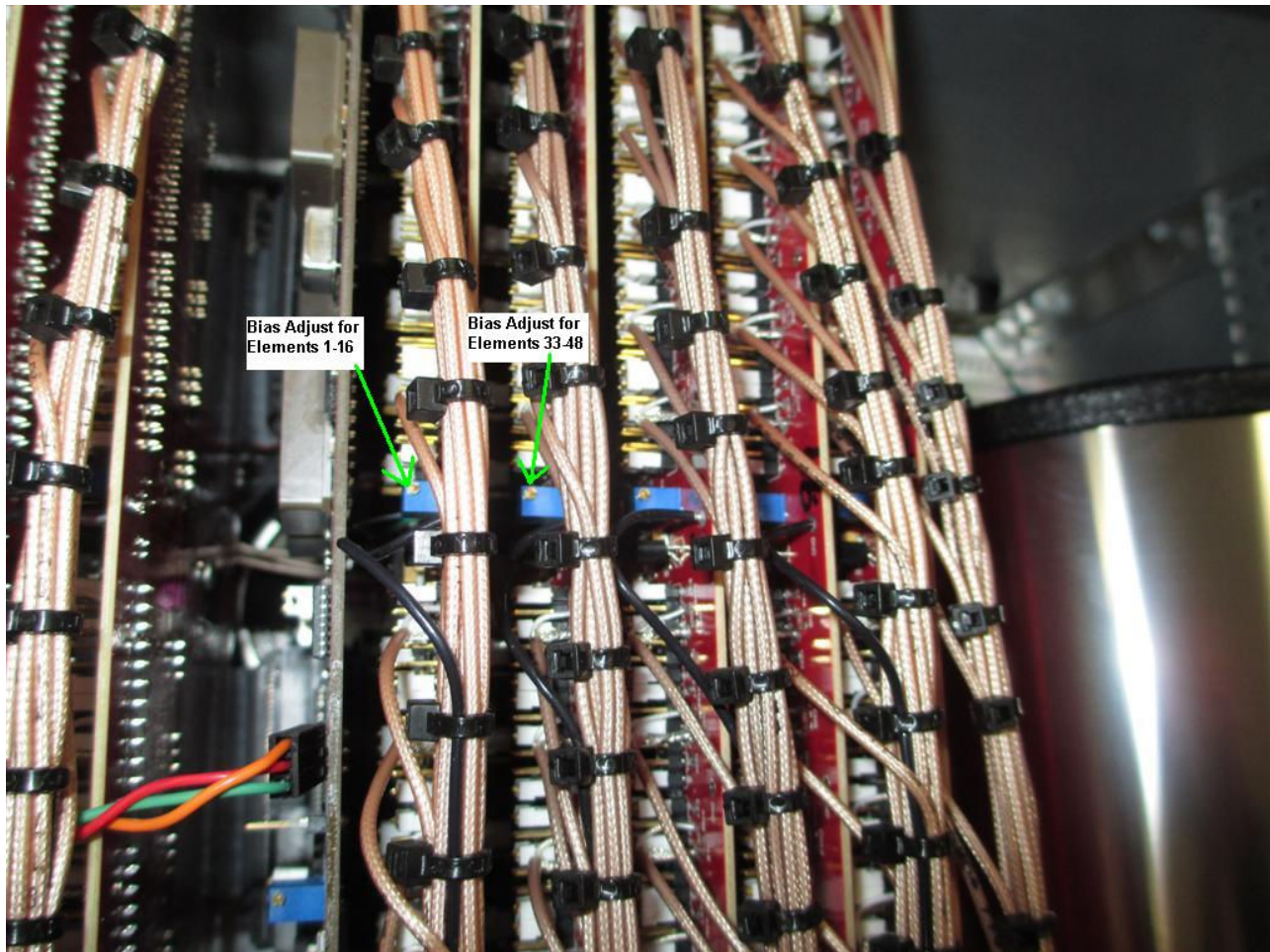
- 1.) Remove the top cover by loosening the two rear cover screws with a 3mm Hex wrench. Then lift the rear edge of the top cover and slide rearwards to remove.



- 2.) Locate the Bias Adjustment potentiometer, it is a small blue 100 turn potentiometer in the top center of each PC Board.
- 3.) The nominal Bias level is 0.5 Volts. The bias voltage on each PC Board is measured with a voltmeter placed across the input coax wires from any channel connected to the PC Board. Alternately, the most rear top jumper can be measured with respect to a Ground pad.







- 4.) Turn the potentiometer with a small flat blade screwdriver Clockwise (CW) to increase the Bias voltage and Counter-Clockwise to reduce.
- 5.) To avoid an over-bias condition, it is suggested that the Bias voltage be lowered on the sections that are higher in response, rather than increasing the Bias voltage on lower responding sections. All Bias voltages should be less than 0.6 Volts.
- 6.) While acquiring scans of the known spectra, adjust the Bias potentiometer on each PC Board for the most uniform response. Typically, the centerline of the sections response is adjusted to the centerline of the other sections.

7.) Measure and record the Bias voltage when adjustment is completed.

### **TRIM Adjustment:**

The FPAS2 system includes a Digital Potentiometer for each detector channel. This potentiometer is referred to as the TRIM. The TRIM is used as a fine adjustment to remove the non-uniformities of the individual detector element responses.

The TRIM adjustment is to be done after the coarse Bias adjustment is completed.

### **Setup:**

The system must be setup with a known signal shape on the detector. This can be done with the detector separated from the spectrometer viewing a uniform chopped blackbody source, or with the detector on the spectrometer viewing a known spectral shape. Sufficient energy should be present to produce a signal level around 1Volt.

- 1.) Acquire a scan of the known spectral shape on the array as outlined above.
  
- 2.)The gains and trims are stored in EPROM in the FPAS system timing electronics. The last set gain or trim for each channel is stored. On startup the gains and TRIMs are automatically restored from the EPROM.
  
- 3.)The gain and trim parameters for each channel are changed using the SETUP button in the top left corner of the LaspecMX HS software.
  
- 4.) Under the TRIM tab select the channel to change then select the value of the TRIM (0-255) , select **Set 1 channel** (to set that channel) or **Set All Channels** (to set all channels, including externals), and click the SET button.
  
- 5.) Select the TRIM channel and decrease the TRIM value from 255 to lower the response until this channel is set as desired.
  
- 6.) When the SET button is clicked, the system will acquire a new scan with the new TRIM value set. Repeat the TRIM setting operation for each channel until the detector uniformity us as desired.