RTF PROCEDURE CDMS 10 December 1998
TUNING: BOARD # _____ STATUS _____ DATE _____

TUNING:

INTRODUCTION:

This procedure will tune the RTF board by calibrating the trigger offset voltage and threshold.

P-LOW TRIGGER SECTION:

OFFSET CALIBRATION-

EQUIPMENT SETUP-

- Enable all phonon channels (P1, P2, P3, P4).
  `perl: Enable`
- Set up the frequency generator-
  Frequency ➔ 80HZ
  Amplitude ➔ 50mV p-p
- Connect the frequency generator output to the attenuator input. Set the attenuation level.
  Attenuation ➔ -50dB (Vin=158μV/input)
- Connect the attenuator output to (P1, P2, P3, and P4) on the break out box.
- Connect an oscilloscope to (P LO FILTER) of the board.

CALIBRATE-

- A tuned board should have the following output for (P LO FILTER):
  AC Amplitude ➔ 120mV p-p (30mVp-p/input)
  DC Offset ➔ 0V
- If the offset is not 0V, adjust (POT R280 @ U110) to zero the offset.
- Record actual measurements in TABLE 1.

TABLE 1
CALIBRATION MEASUREMENTS

AC Amplitude	
DC Offset (equal to 0?)	
Gain	

SUMMER TEST-

- For each phonon channel (P1), (P2), (P3), or (P4): disable the input, observe the output, and re-enable the input.
  DISABLE➔ `perl: Disable(`string)
  Disables channels “P1”, “P2”, “P3”, “P4”, “Qi”, or “Qo”
  ENABLE➔ `perl: Enable(`string)
  Enables channels “P1”, “P2”, “P3”, “P4”, “Qi”, or “Qo”
  NOTE: If a specific channel is not specified in the string, the command will be issued to all channels.
- For each phonon channel disabled, the output voltage recorded in TABLE 1 should drop by 25%.

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THRESHOLD CALIBRATION-

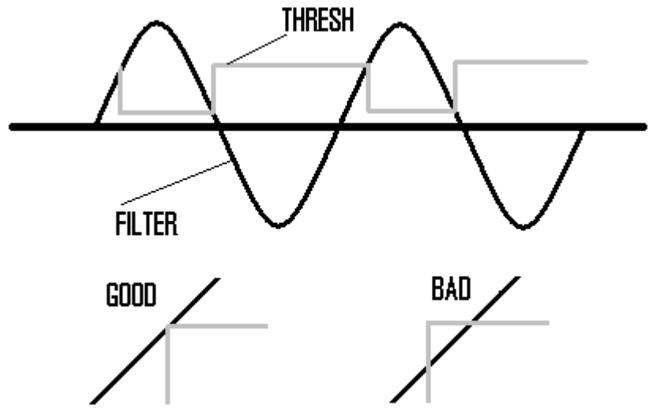
EQUIPMENT SETUP-

- Enable all phonon channels (P1, P2, P3, P4).
  `perl: Enable`
- Set up the frequency generator-
  Frequency ➔ 80HZ
  Amplitude ➔ 50mV p-p
- Connect the frequency generator output to the attenuator input. Set the attenuation level.
  Attenuation ➔ -50dB
- Connect the attenuator output to (P1, P2, P3, and P4) on the break out box.
- Connect oscilloscope channel 1 to (P LO FILTER) of the board.
- Connect oscilloscope channel 2 to (P LO THRESH) of the board.

CALIBRATE-

- Set P-LOW threshold to 5V.
  `perl: PLoThresh(5)`
- Set P-LOW threshold to 240mV.
  `perl: PLoThresh(0.240)`
  The (P LO TRIGGER) led should be off.
- Set P-LOW threshold to the AC Amplitude of TABLE 1.
  `perl: PLoThresh(`voltage`)`
  The (P LO TRIGGER) led should light intermittently.
- If the led does not light intermittently, adjust (POT R309 @ U117).
- To fine tune, adjust (POT R309 @ U117) so the waveforms match FIGURE 1.

FIGURE 1



P-HIGH TRIGGER SECTION:

OFFSET CALIBRATION-

EQUIPMENT SETUP-

- Enable all phonon channels (P1, P2, P3, P4).
  `perl: Enable`
- Set up the frequency generator-
  Frequency ➔ 80HZ
  Amplitude ➔ 100mV p-p
- Connect the attenuator output to (P1, P2, P3, and P4) on the break out box.
- Connect an oscilloscope to (P HI FILTER) of the board.

CALIBRATE-

- A tuned board should have the following output for (P HI FILTER):
  AC Amplitude ➔ 50mV p-p
  DC Offset ➔ 0V
- Record actual measurements in TABLE 2.

TABLE 2
CALIBRATION MEASUREMENTS

AC Amplitude	
DC Offset (equal to 0?)	
Gain	

SUMMER TEST-

- For each phonon channel (P1), (P2), (P3), or (P4): disable the input, observe the output, and re-enable the input.
  DISABLE➔ `perl: Disable(`string)
  Disables channels “P1”, “P2”, “P3”, “P4”, “Qi”, or “Qo”
  ENABLE➔ `perl: Enable(`string)
  Enables channels “P1”, “P2”, “P3”, “P4”, “Qi”, or “Qo”
  NOTE: If a specific channel is not specified in the string, the command will be issued to all channels.
- For each phonon channel disabled, the output voltage recorded in TABLE 2 should drop by 25%.

THRESHOLD CALIBRATION-

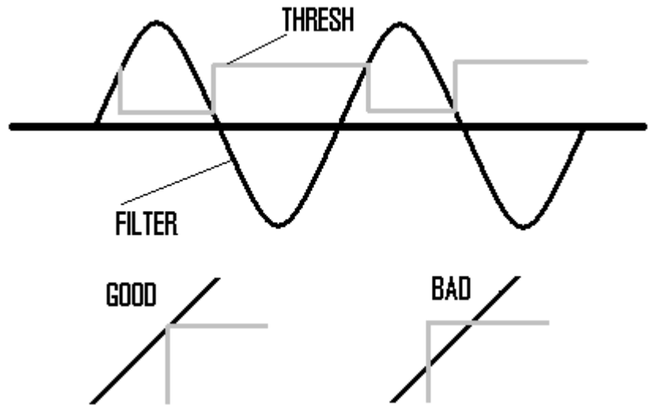
EQUIPMENT SETUP-

- Enable all phonon channels (P1, P2, P3, P4).
  `perl: Enable`
- Set up the frequency generator-
  Frequency ➔ 80HZ
  Amplitude ➔ 100mV p-p
- Connect the attenuator output to (P1, P2, P3, and P4) on the break out box.
- Connect oscilloscope channel 1 to (P HI FILTER) of the board.
- Connect oscilloscope channel 2 to (P HI THRESH) of the board.

CALIBRATE-

- Set P-HIGH threshold to 5V.
  `perl: PHiThresh(5)`
- Set P-HIGH threshold to the AC Amplitude of TABLE 2.
  `perl: PHiThresh(`voltage`)`
  The (P HI TRIGGER) led should light intermittently.
- If the led does not light intermittently, adjust (POT R331 @ U126).
- To fine tune, adjust (POT R331 @ U126) so the waveforms match FIGURE 2.

FIGURE 2



Q-LOW TRIGGER SECTION:

OFFSET CALIBRATION-

EQUIPMENT SETUP-

- Enable all Q channels (Qi, Qo).
  `perl: Enable`
- Set up the frequency generator-
  Frequency ➔ 2kHZ
  Amplitude ➔ 50mV p-p
- Connect the frequency generator output to the attenuator input. Set the attenuation level.
  Attenuation ➔ -30dB
- Connect the attenuator output to (Qi, Qo) on the break out box.
- Connect an oscilloscope to (Q LO FILTER) of the board.

CALIBRATE-

- A tuned board should have the following output for (Q LO FILTER):
  AC Amplitude ➔ 40mV p-p
  DC Offset ➔ 0V
- If the offset is not 0V, adjust (POT R221) to zero the offset.
- Record actual measurements in TABLE 3.

TABLE 3
CALIBRATION MEASUREMENTS

AC Amplitude	
DC Offset (equal to 0?)	
Gain	

SUMMER TEST-

- For each Q channel (Qi), (Qo): disable the input, observe the output, and re-enable the input.
  DISABLE➔ `perl: Disable(`string)
  Disables channels “P1”, “P2”, “P3”, “P4”, “Qi”, or “Qo”
  ENABLE➔ `perl: Enable(`string)
  Enables channels “P1”, “P2”, “P3”, “P4”, “Qi”, or “Qo”
  NOTE: If a specific channel is not specified in the string, the command will be issued to all channels.
- For each Q channel disabled, the output voltage recorded in TABLE 3 should drop by 50%.

THRESHOLD CALIBRATION-

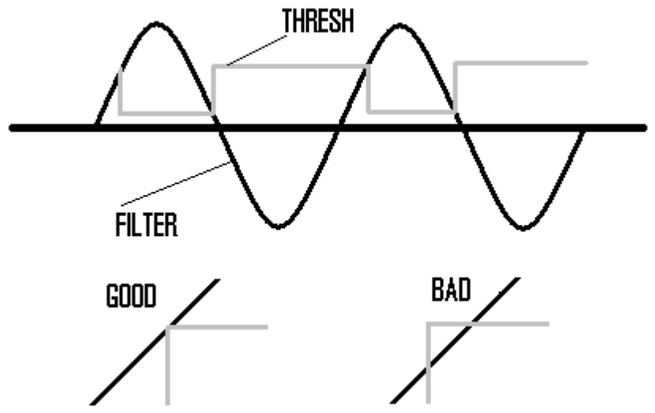
EQUIPMENT SETUP-

- Enable all Q channels (Qi, Qo).
  `perl: Enable`
- Set up the frequency generator-
  Frequency ➔ 2kHZ
  Amplitude ➔ 50mV p-p
- Connect the frequency generator output to the attenuator input. Set the attenuation level.
  Attenuation ➔ -30dB
- Connect the attenuator output to (Qi, Qo) on the break out box.
- Connect oscilloscope channel 1 to (Q LO FILTER) of the board.
- Connect oscilloscope channel 2 to (Q LO THRESH) of the board.

CALIBRATE-

- Set Q-LOW threshold to 5V.
  `perl: QLoThresh(5)`
- Set Q-LOW threshold to 240mV.
  `perl: QLoThresh(0.240)`
  The (Q LO TRIGGER) led should be off.
- Set Q-LOW threshold to the AC Amplitude of TABLE 3.
  `perl: QLoThresh(`voltage`)`
  The (Q LO TRIGGER) led should light intermittently.
- If the led does not light intermittently, adjust (POT R243).
- To fine tune, adjust (POT R243) so the waveforms match FIGURE 3.

FIGURE 3



Q-HIGH TRIGGER SECTION:

OFFSET CALIBRATION-

EQUIPMENT SETUP-

- Enable all Q channels (Qi,Qo).
  `perl: Enable`
- Set up the frequency generator-
  Frequency ➔ 2kHZ
  Amplitude ➔ 50mV p-p
- Connect the attenuator output to (Qi, Qo) on the break out box.
- Connect an oscilloscope to (Q HI FILTER) of the board.

CALIBRATE-

- A tuned board should have the following output for (Q HI FILTER):
  AC Amplitude ➔ 50mV p-p
  DC Offset ➔ 0V
- Record actual measurements in TABLE 4.

TABLE 4
CALIBRATION MEASUREMENTS

AC Amplitude	
DC Offset (equal to 0?)	
Gain	

SUMMER TEST-

- For each Q channel (Qi), (Qo): disable the input, observe the output, and re-enable the input.
  DISABLE➔ `perl: Disable(`string)
  Disables channels “P1”, “P2”, “P3”, “P4”, “Qi”, or “Qo”
  ENABLE➔ `perl: Enable(`string)
  Enables channels “P1”, “P2”, “P3”, “P4”, “Qi”, or “Qo”
  NOTE: If a specific channel is not specified in the string, the command will be issued to all channels.
- For each Q channel disabled, the output voltage recorded in TABLE 4 should drop by 50%.

THRESHOLD CALIBRATION-

EQUIPMENT SETUP-

- Enable all Q channels (Qi, Qo).
  `perl: Enable`
- Set up the frequency generator-
  Frequency ➔ 2kHZ
  Amplitude ➔ 50mV p-p
- Connect the attenuator output to (P1, P2, P3, and P4) on the break out box.
- Connect oscilloscope channel 1 to (Q HI FILTER) of the board.
- Connect oscilloscope channel 2 to (Q HI THRESH) of the board.

CALIBRATE-

- Set Q-HIGH threshold to 5V.
  `perl: QHiThresh(5)`
- Set Q-HIGH threshold to the AC Amplitude of TABLE 4.
  `perl: QHiThresh(`voltage`)`
  The (Q HI TRIGGER) led should light intermittently.
- If the led does not light intermittently, adjust (POT R265).
- To fine tune, adjust (POT R265) so the waveforms match FIGURE 4.

FIGURE 4