

This information is copied from David Morrin's website. The calibration procedure is attributed to Howard Davis.

<https://sites.google.com/a/davidmorrin.com/www/home/trouble/troubleeffects/electro-harmonix-memory-man/eh-7850/eh-7850-calibration>

There are a few related webpages on the site that you should check out:

<https://sites.google.com/a/davidmorrin.com/www/home/trouble/troubleeffects/electro-harmonix-memory-man/eh-7850>

### **DELUXE MEMORY MAN CALIBRATION**

- INPUT: 250Hz Sine 500mV p-p
- LEVEL: CCW
- BLEND: CW
- FEEDBACK: CCW
- DELAY: CW
- CHORUS: CCW
- CH/VIB: CH

### **CHECK BBD CLOCK**

- Connect the scope to pin 2,4,6,10,12, or 15 of the CD4049 and observe the square wave period between 120 and 140 $\mu$ s. (Alternatively, if CD4049 buffer is omitted, check pins 10 & 11 on the 4047.) To adjust, change 240pF between CD4047 pins 1 & 3. (Reduce = shorter, increase = longer.)

### **Clock Noise**

- If the period is too long, you will get "clock noise" and distortion on the long echoes. The longest times will also be too long. If you hear a high pitched "whine" at maximum delay, you must reduce the delay time by speeding up the 4047 clock. Check all resistances, in addition to the cap, at the 4047 pins 1, 2, and 3.

### **DELAY: CCW**

- The period should now be between 8 and 10 $\mu$ s.
- CHECK CH/VIB LFO:
- DELAY: 50%
- With the switch in the chorus position slowly bring up the chorus/vibrato control, watching the square wave. The period should decrease slightly and become modulated at a rate of slightly less than 1Hz. At max. chorus setting the period should swing approx. 10% of its average value.

### **CH/VIB: VIB**

- CHORUS: CCW
- Set the switch to the vibrato position. The modulation rate should go up to approx. 4Hz.

### **COMPANDER AND OVERLOAD LED**

LEVEL: Raise until pin 6 of NE570 is 500mV p-p (unity with input)

- The level at pin 7 should be between .95 and 1.4 V p-p.

LEVEL: Raise until overload light begins to glow, while observing pin 7 of NE570.

- Watching pin 7, increase the level. The overload light should just begin to glow at about 1.4V p-p and should be almost as bright as the pilot light at about 2.3V.
- No distortion should be visible in the signal at this point.

### **FREQ. RESPONSE CHECK #1**

- LEVEL: Observe first MN3005 pin 7, turn down until 1.5V p-p
- INPUT: Change freq. to 900Hz, 2.5kHz and 3.8kHz as per instructions.
- Slowly increase the input frequency. The response at pin 7 of the MN3005 should be flat up to about 900Hz, rise to a max. of about 2V p-p at around 2.5kHz at which point the overload light should glow dimly, drop back to 1.5V p-p at about 3.8kHz and roll off sharply above this.

### **BBD BIAS**

- INPUT: 250Hz
- TRIM 2 (GAIN): 50%
- Connect the scope to pin 7 of the second 4558, which is also the wiper of the first gain trimpot.

### **TRIM 1 (BIAS 1)**

- Set for maximum unclipped signal
- Increasing the level setting as necessary, set the first bias trim for maximum p-p unclipped signal.

### **TRIM 2 (GAIN 1)**

- Set for unity.
- Decrease signal level and set the gain to unity (output level = input level). The output level before clipping should be 3.8V p-p or greater.
- Vary the delay over its full range and if clipping becomes very unsymmetrical at either end, trim the bias a bit for a good compromise over the range. It is normal to see a lot of clock noise at the highest frequencies.

### **TRIM 3 (BALANCE/CANCEL)**

- Adjust for minimum clock signal (maximum clock cancellation).

### **TRIM 4 (BIAS 2)**

- Set for maximum unclipped signal.
- The second MN3005 is aligned in the same way as the first, except that the clock balance trim is carefully set for min. clock frequency at its wiper at maximum delay (min clock frequency) setting. This should be done before fine trimming the bias for symmetrical clipping and again after the bias is finally set, with the input signal to the unit disconnected and the scope gain high.

### **TRIM 5 (GAIN 2)**

- Unity between NE570 pins 14/15 and 7.
- Set the 2nd gain trim last looking at pins 14 and 15 of the NE570 and setting this trim so that the signal is equal in level to that at pin 7 of the 570. If this can't be done, go as far as the trimmer permits and re-adjust the first gain trim to achieve it.

### **FREQ. RESPONSE CHECK #2**

- LEVEL: Set so overload in on dimly.
- Looking at the signal at pins 14 and 15 of the NE570.
- DELAY: CW
- INPUT: 40Hz
- Vary the input frequency from 40Hz upward. The signal should be unclipped and clean over the range. The response should show no peaks, but be flat at about 2.5 KHz and -3db(x.7) at about 3.2kHz, where only a small amount of aliasing ripple of the waveform should be visible.

### **DELAY: CCW**

- The response should now have a peak of about +3db (x1.4) around 2.5KHz and roll off sharply above 3.5 KHz with no trace of noise or aliasing.
- INPUT: 250Hz
- LEVEL: 1.0V p-p at NE570 14/15
- There should now be between .6 and .8V p-p at NE570 pin 10.

### **FEEDBACK CHECK**

- INPUT: Disconnect
- DELAY: CW
- Looking at the unit's output and overload light,

### **FEEDBACK: CW**

- Touch the input to introduce a transient signal.
- Runaway oscillation should occur with the overload light flashing brightly.

### **FEEDBACK: CCW**

- FINAL CHECK:
- BLEND: 50%
- INPUT: 250Hz Sine 500mV p-p
- Reconnect input and observe output as input frequency is varied slowly. It should show a peak and null (comb filter) response.
- Check that the footswitch connects the direct signal to the output when it is thrown and that this signal is always present at the direct output and is controlled with the level control.
- The test and alignment is now complete.