CLEE QUAD VCA BOM

Resistors — 1/4w 1%

4	200K	
20	100K	
8	51k	
4	30K	
4	28k	
2	6k2	
1	1k5	
8	500R	
4	100R	

Capacitors

3	47ufd	electrolytic
19	100n	Ceramic bypass
1	330n	Ceramic
8	560pfd	
4	100pfd	
8	47pfd	

Semicondoctor

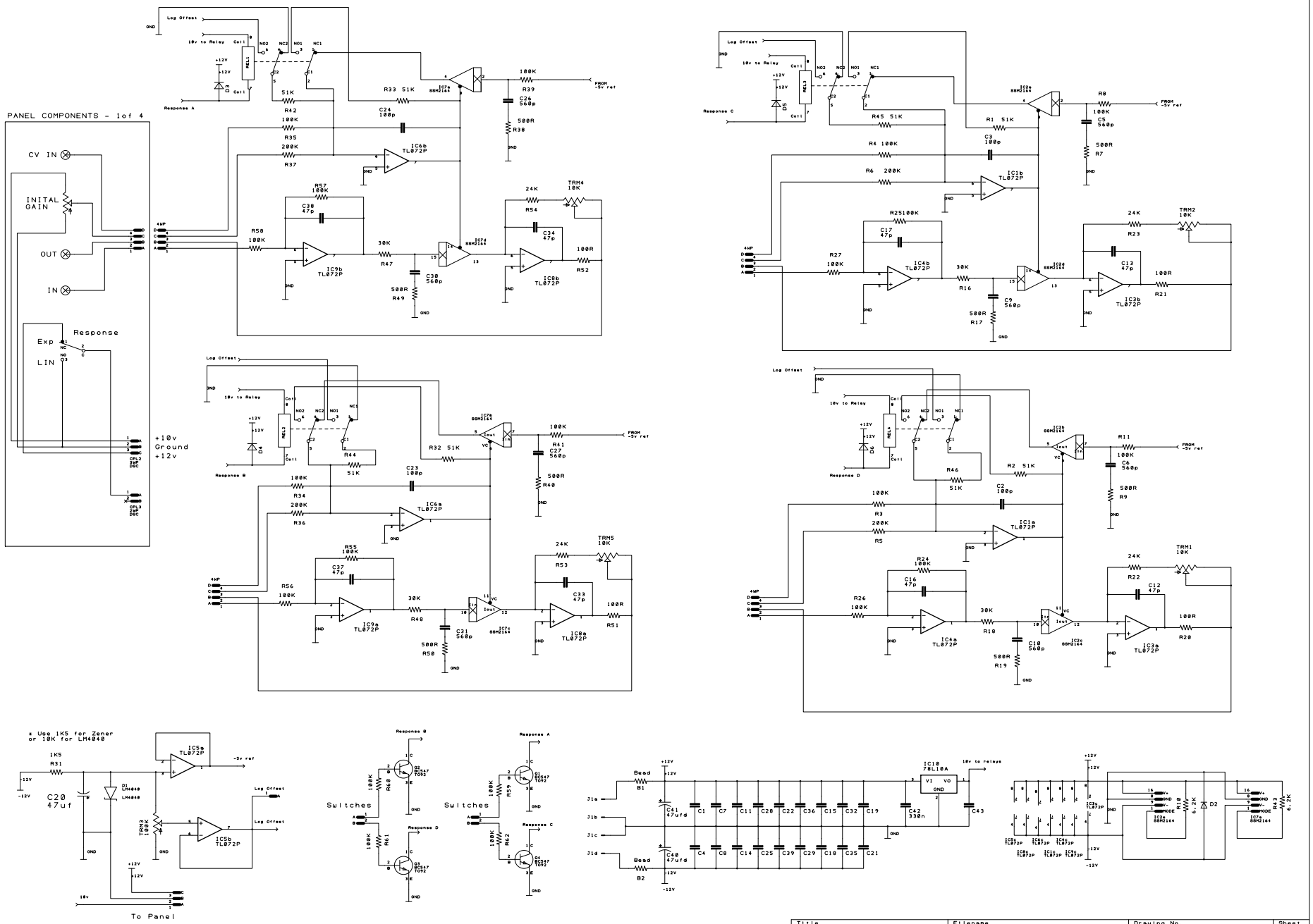
4	BC547	
4	1N4148	or similar Diode
1	1N5817	or similar Schottky Diode
1	5.1v Zener	or LM4040 5volt
2	V2164	Quad VCA
3	TL072	
4	OPA2164	TL072 as an alternative
1	78L10A	10v voltage regulator 100ma

MISC

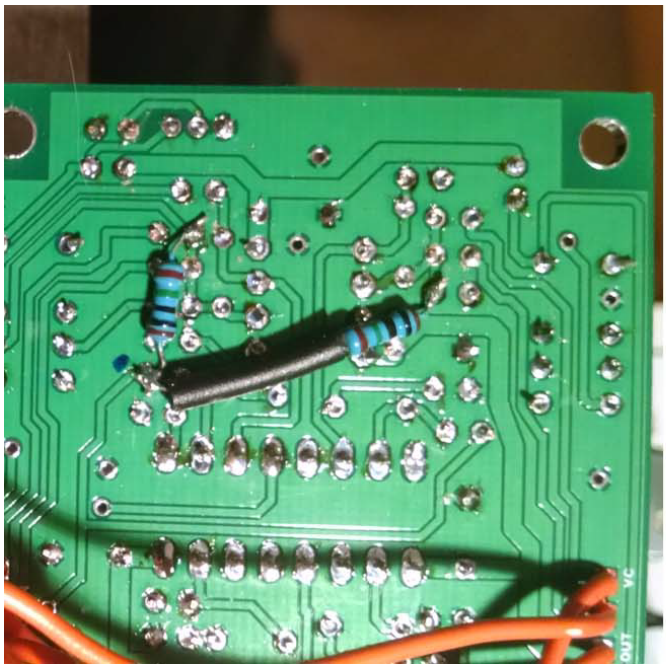
4	Relay	NEC EC2-12NU
2	ferrite bead	
4	50K	Linear Potentiometer
4	SPDT	Toggle Switch

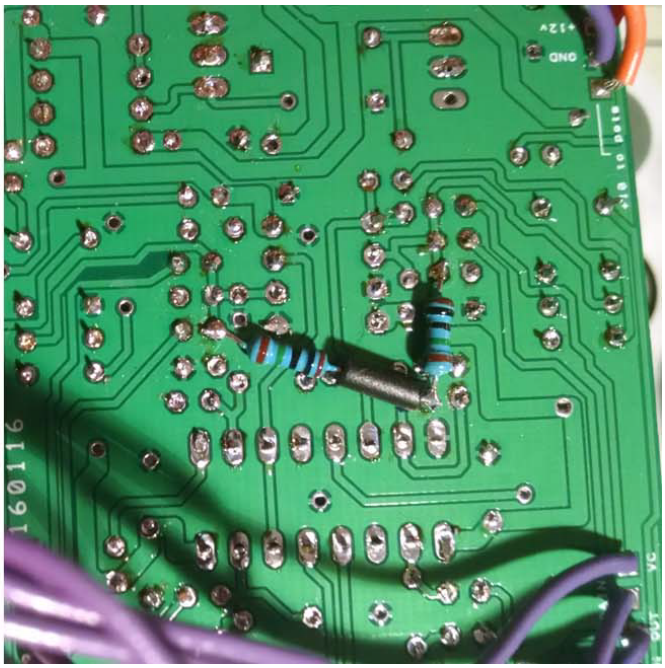
PC MOUNT TRIMMER

1	100K	
4	10K	
1	male header	1pin for test point


PANEL COMPONENTS - 1of 4
CV IN
INITAL GAIN
OUT
IN
Exp
Response
LIN
+10v
Ground
+12v
Log Offset
10v to Relay
Response A
Response B
Response C
Response D
FROM -5v ref
IC6b TL072P
IC9b TL072P
IC8b TL072P
IC6a TL072P
IC9a TL072P
IC8a TL072P
IC1b TL072P
IC4b TL072P
IC3b TL072P
IC1a TL072P
IC4a TL072P
IC3a TL072P
IC10 78L10A
* Use 1K5 for Zener or 10K for LM4040
IC5a TL072P
IC5b TL072P
C20 47uf
To Panel
Switches
Bead
Title
Filename
Drawing No.
Sheet of

Install 10meg resistors as shown





Leakage currents can keep the VCA from closing completely. Installing 10meg resistors between the voltage control summing node and the negative 5v reference can insure the VCA closes completely

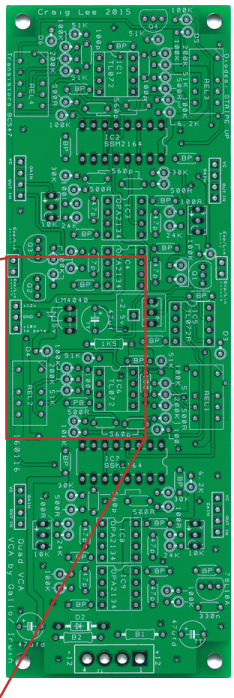
There is a error in the circuit for the reference voltage.
The bias resistor is connected to the positive supply, not negative.

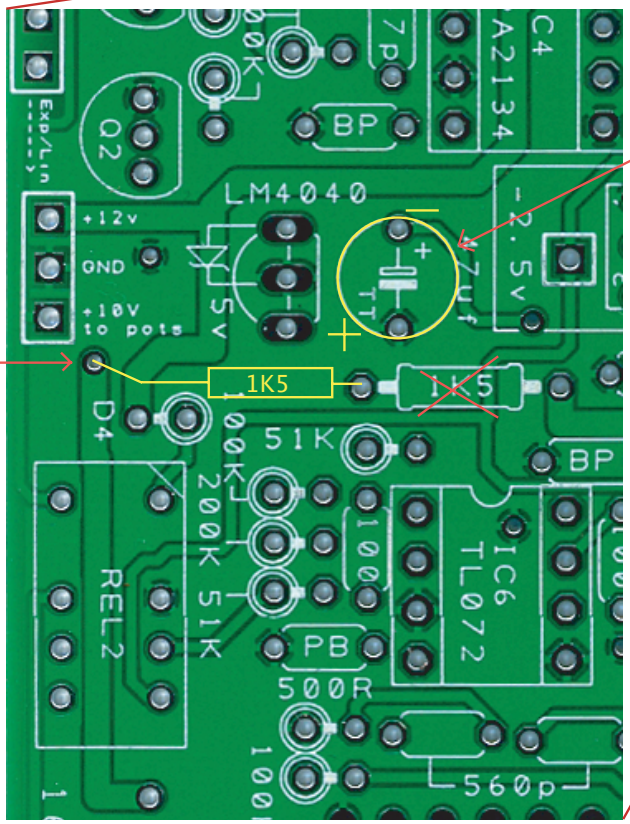
The fix is the following:

1) Install the electrolytic capacitor reverse with regards to the positive side

2) Install the 1K5 resistor so that one end is connected to the via for the negative supply.

DO NOT INSTALL A RESISTOR IN THE SPOT INDICATED BY
THE SILK SCREEN LAYER

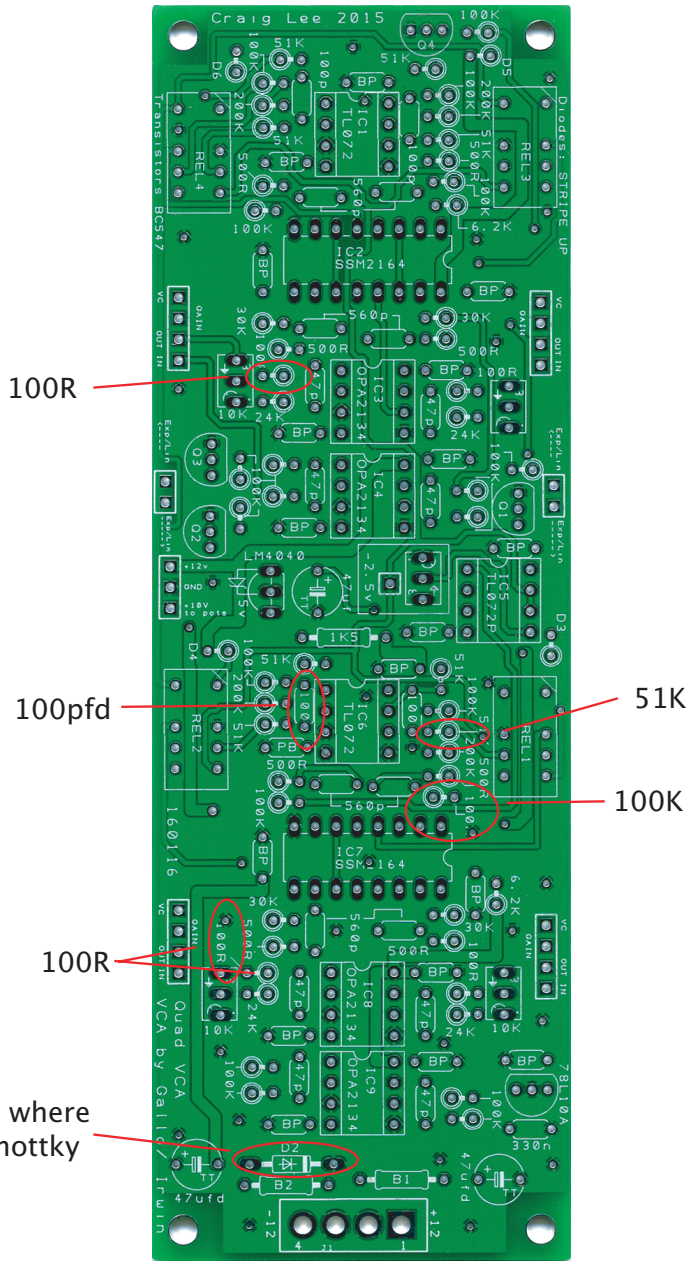


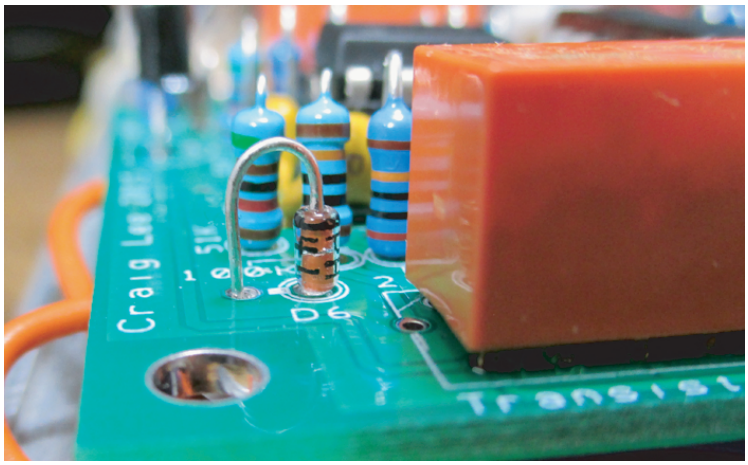


Install 1K5 resistor here with one end soldered in via

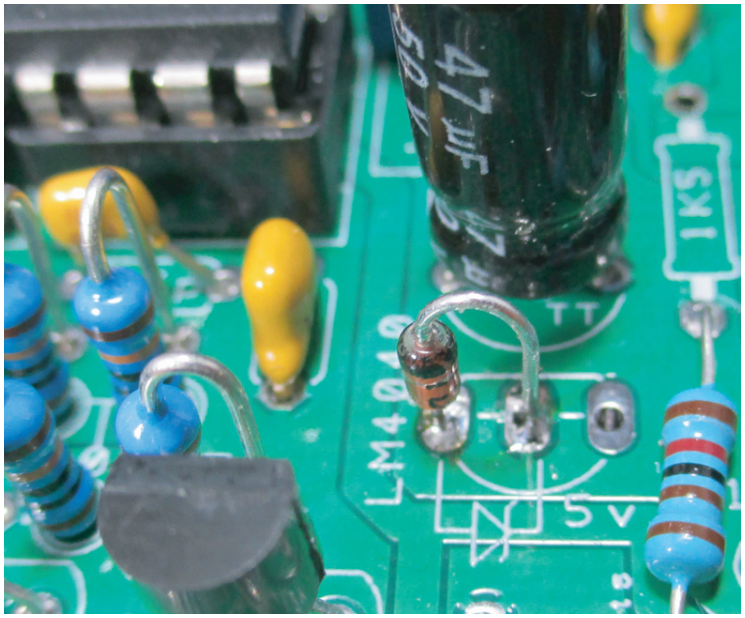
Install this electrolytic with + and – reversed

Craig Lee - Quad VCA for 4U
The board is very dense and a few of the component values are obscured by vias. Here are the correct values



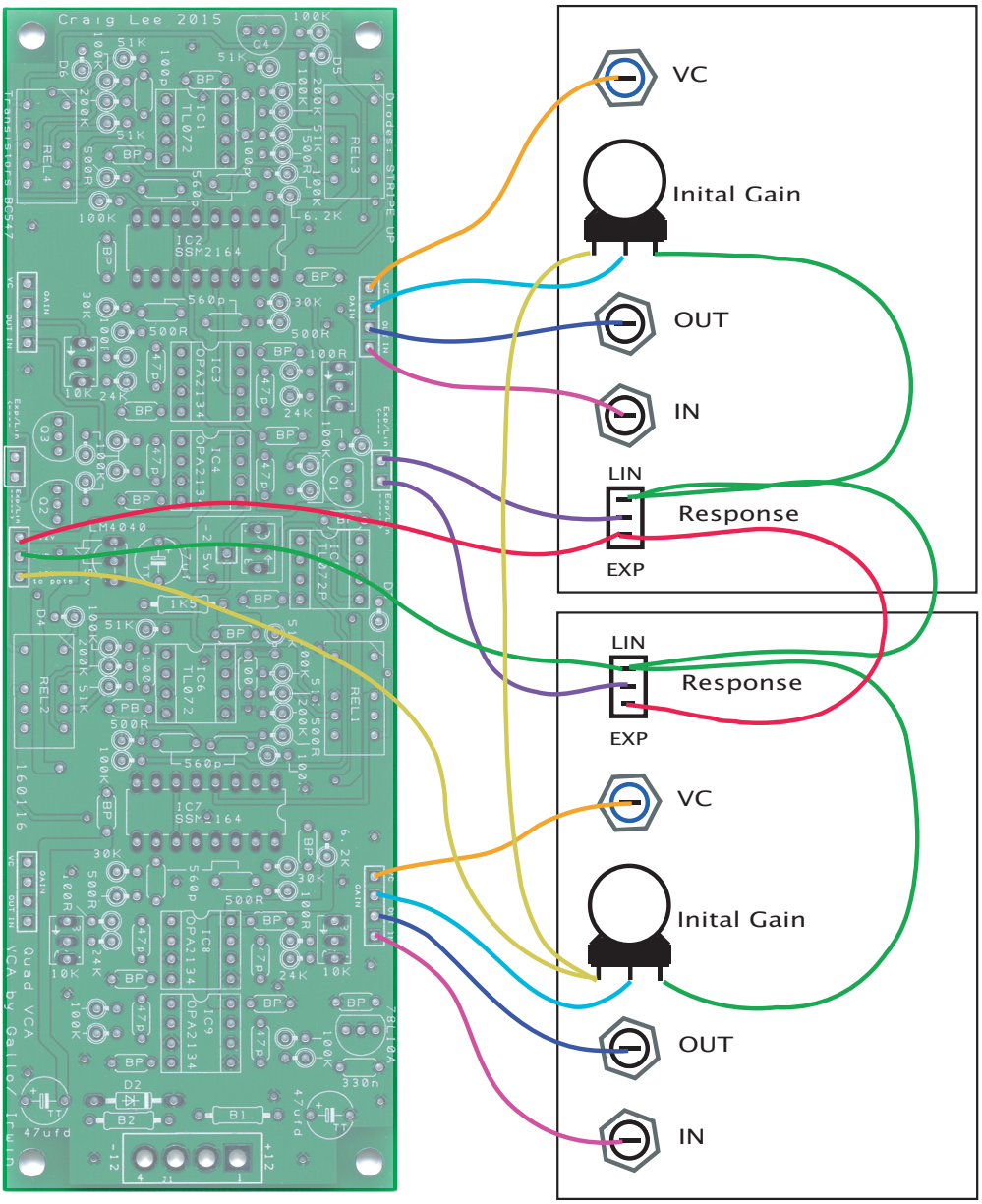


Install all diodes stripe (Cathode) up with the body over the circle on the silk screen layer



Using a 5.1v Zener Diode in place of the LM4040. Drawings for both are shown on the Silk layer

Craig Lee - Quad VCA for 4U
Connection diagram - components viewed from back
Connections for 2 VCAs shown - duplicate for other 2



Trimming the CLee 4U Quad VCA

There are 5 trimmers on the circuit board. One trims the offset for the Exponential mode, which will set the maximum attenuation with no CV applied. There is 1 trimmer that adjusts all 4 VCAs. The other 4 adjust for unity gain at 5V CV in linear mode. There's one trimmer for each VCA.

ADJUSTING THE -2.5v OFFSET:

The trimmer and test point are near the center of the board. While monitoring the test point, adjust the trimmer for -2.50v.

The VCA attenuates at 33mv/db so the maximum attenuation in Exponential mode will be a little over 75db. You can adjust for more or less maximum attenuation, but this will also affect the gain through the VCA at 5v when it's set to Exponential mode.

TRIMMING THE VCA UNITY GAIN:

Make sure the VCA is in LINEAR MODE and the INITIAL GAIN pot is fully CCW (off).

Suppply 5.0v to the VCA IN and VCA CV IN

Monitor the VCA OUT and adjust the trimmer so the output is 5.0v

Repeat for all 4 VCAs