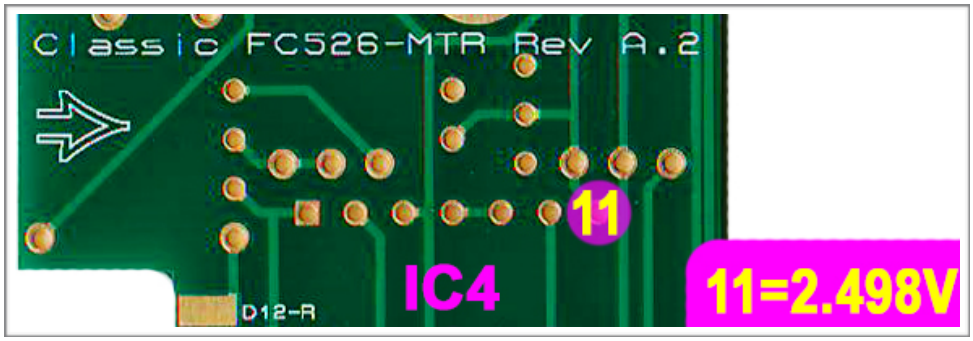
CAPI FC526 Limiter Calibration Guide Rev_1

Pre Calibration Information

1. Before proceeding forward with any of the calibration steps below, make sure you have between -9.98V DC and -10.02V DC at TP9. See the Test Points Guide for more info.

2. Before proceeding forward with the meter calibration steps below, make sure you have between +2.498V DC and +2.502V DC at the “top” of the the meter resistor string for the LM339 comparators, which is MTR point #11 in the pic. See the Test Points Guide for more info.



Q_Bias of VVR

1. Without being connected to a power source, prep the opamp sockets as shown here http://capi-gear.com/catalog/DOA_Install.php

2. Install three good, known to be working opamps into their positions.

3. Turn both input and output pots fully CW to their highest positions.

4. Turn both attack and release pots fully CW to their fastest positions.

5. Set the ratio switch to 20:1.

6. Flip the Gain Reduction toggle down to off.

7. Flip the Sidechain filter up to off.

8. Flip the Bypass toggle up to BYP.

9. Power up the module and hope no silicon smoke escapes. Many of the meter LED’s will be illuminated but don’t worry about that at this time.

10. Apply a 1kHz sine wave @ -30dBu to the module and monitor the output level. Since we are currently in hard bypass, what goes in should be coming out.

11. Flip the Bypass toggle to ACT.

12. The output level should be in the near proximity of +14.15dBu.

13. While watching the output level, adjust the RV2 Q_BIAS trimmer by turning **CW** until the output level does not change. It will most likely not change at all but just to be sure. This adjustment is taking the VVR FET safely out of its conductive range.

14. The FC526's output level will be between +14.05dBu and +14.25dBu. If not, there is something wrong with the audio path in your build. See the Test Points Guide for more info.

15. Adjust the output of your signal generator down until the output of the FC526 is exactly +14dBu.

16. Slowly adjust the RV2 Q_BIAS trimmer **CCW** until your output level reaches +13.5dBu.

17. Enable gain reduction by flipping the GR toggle up. The output level should not change.

THD Nullification

1. If you do not have a way of monitoring THD+N, do not adjust RV7 and skip ahead to the Gain Reduction Meter Calibration section. I am not a DAW guy but assume there are free plug-ins for this function.

2. The goal for the next two procedures is to get 7dB of gain reduction happening.

3. Start by flipping the GR toggle to off.

4. Apply a 1kHz sine wave @ +7dBu to the input.

5. Turn the input pot up to approximately 12:00.

6. Adjust the output pot so that your device monitoring the output level reads +7dBu.

7. Engage the GR toggle. Take note of the output level.

8. Disengage Gain Reduction.

9. Adjust the input pot up or down by the level amount noted in step #7 above. For example, my reading in step #7 was +0.4dBu so I will adjust my input pot up so that the level at the output is +7.4dBu. Then adjust the output pot to yield a +7dBu output level.

10. Engage the GR toggle to verify that you have 7dB of gain reduction. If not, adjust the input an output pots as needed.

11. Set your set test rig to monitor THD+N.

12. With Gain Reduction engaged, adjust the RV7 trimmer until you reach the lowest amount of THD. This should be in the neighborhood of 0.35% or so. There will be a point where the THD% will start to increase again. Feel free to experiment with a preset higher % of THD. I have never done this but it could prove to be interesting!

Tip: A software audio spectrum analyzer program can also be used to adjust the THD Null. If using something like this, while injecting a 1kHz sine wave, you will be looking at the 2nd harmonic (2kHz). Adjust the RV7 trimmer for the lowest level at 2kHz.

Gain Reduction Meter Calibration

1. Following the above steps, readjust the module to produce 7dB of gain reduction.

2. Once that has been verified, turn the GR toggle off.

3. At this point, your input pot should be right around 12:15 and your output pot should be at 10:00.

4. Set your DMM to read DCV. Hook your black probe onto the GND lug. Hold your red probe on pad TP10.

5. Adjust RV1 Z_ADJ thru the front panel access hole so that you have a +2.487V reading on your DMM. This is typically in a CW direction. This is a number that will not change since we are using a 2.5V precision reference for the comparator string.

6. With the red probe removed, only the green LED should be lit and glow fully illuminated.

7. Engage the GR toggle.

8. With 7dB of gain reduction, the target DCV at TP10 is +2.245V. The RV8 MTR_TRACKING trimmer will need to be adjusted to reach this goal. This can be a little tricky since it works opposite of how you might think. For example, if your initial reading is more than +2.245V, you will need to increase this voltage by turning RV8 in a CW direction. If your initial reading is less than +2.245V, you will need to decrease RV8 by turning in a CCW direction. Without the red probe touching TP10, make sure that the -7dB LED is glowing fully. If not, a very slight adjustment may need to be made to compensate. The comparators are fairly sensitive. Although +2.245V has been consistent for me, there could be a a few mV difference on your build due to resistor tolerances.

9. Flip the GR toggle off and readjust RV1 Z_ADJ thru the front panel to yield a +2.487V reading at TP10.

10. Engage GR and recheck for the +2.245V target at TP10. By now you should see the pattern so rinse and repeat until you are satisfied. The final step should always be the adjustment of RV1 thru the front panel access.

11. If you are feeling adventurous, you can spend the time to check all of the meter LED's. With GR engaged, adjust the input pot to illuminate the specific LED you are checking. Then disengaged GR to see what the actual level difference is. I have found than each and every LED is accurate to within 0.3dB at the worst with a typical range of +/- 0.1dB.

FYI, when switching the ratio switch to ABI, the green meter LED will not illuminate. This is normal since the FET is being taking out of its conductive range. On a properly calibrated vintage FET limiter, the VU meter will increase by the amount of loss the FET is biased to.

Due to heat, periodic adjustments may need to be made to zero out the meter's green LED. This is normal but should be pretty consistent once the module has been up and running for 45 minutes or more. The LM339 voltage comparators and fairly sensitive so a few mV of drift can be enough to turn the LED on or off.

And that is all folks! Enjoy!!