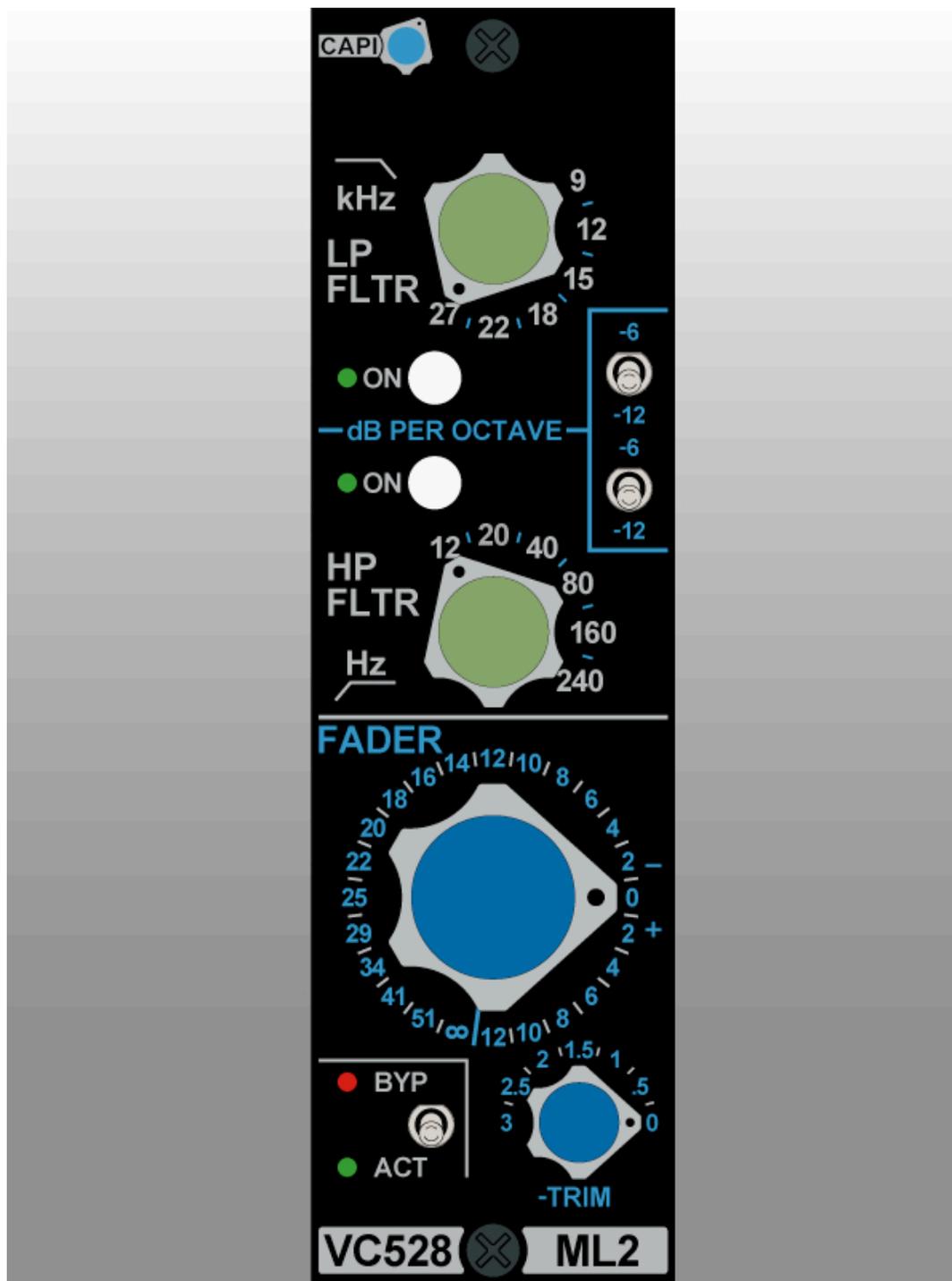


CAPI VC528 ML2 Rev B Assembly Aid



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****Time to begin, starting with the Discrete Followers****

1. Fully populate and assemble both discrete follower boards following the BOM provided in the file “1_DF.1-layout.pdf”.

****Moving on to the main PCB****

1. Fully populate the main PCB. This includes the long header J1. Make sure it is perpendicular to the PCB in both directions.
2. Use cutoff resistor leads to fasten the 528-SW PCB to the main PCB from the bottom. Make sure the PCB's are tight together and the front edges are in line. Install the pushbutton switches.
3. Install two of the 1/4" standoffs with 3/16" undercut flathead screws adjacent to the 528-SW PCB. Put a small dab of nail polish at the bottom of the PCB. This will help lock these in so they are a little stronger than the screws thru the L-bracket.

http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_1.jpg

4. For the GND test position (just left of C5), use a cutoff lead from one of the large caps and leave it protrude above the PCB about an 1/8", just enough to get an alligator clip on it.

http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_2.jpg

5. Install stripped and tinned leads for both switches. Using cutoff leads from the output transformers, cut the Elma leads to 1.75" and cut the Grayhill trim switch leads to 2". Tin and solder to the main PCB.

http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_3.jpg

****Grayhill 71's and the 528-FLTR PCB****

1. Inspect the style of 71 series switches you have. If they have adjustable stops with stop pins, **prior to turning the shaft at all**, with the **PC pins pointing straight down**, insert the first stop pin at the 12:00 position and the 2nd stop pin at the 6:00 position. Apply the silver retaining stickers. See the “9_Grayhill stop-pins for ML2.pdf” for more detailed information.
2. Fully assembled the 528-FLTR PCB. As a tip when populating all the caps, I fit them loose one row at a time, hold with a finger, flip over and solder. During the manufacturing, some of the cap leads are not perfectly centered in their bodies so dry fitting them as a group helps. If you get a really tight situation, sometimes turning one or two of them 180° will help.

http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_4.jpg

****Grayhill 56 and the 528-TR PCB****

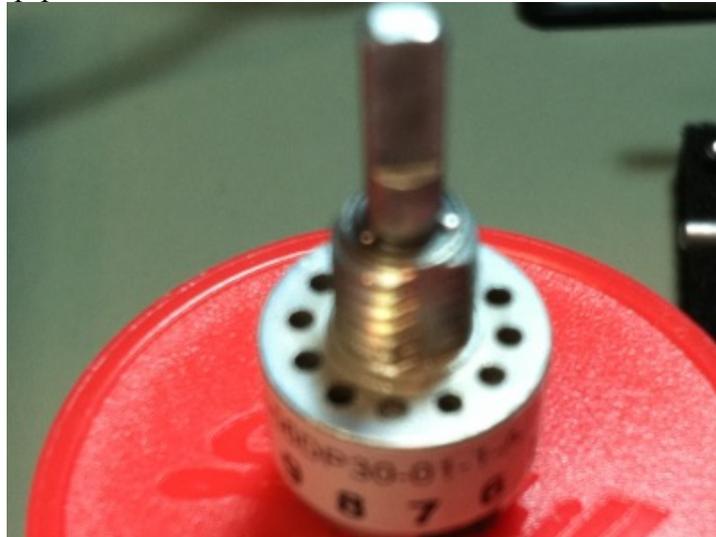
1. When you remove the 56 series Grayhill from the packaging, the flat part of the shaft will be facing between the numbers 6 and 7. This starting location couples the switch wiper to position #1. Double check with your DMM if you want to be sure. Leave it there! Do not turn the shaft! Remove the nut and set to the side. Discard the lock washer as we do not use it.



2. Since this switch has adjustable stops, we need to insert the stop pins. The stop-pin location is **extremely** important. Locate the two small stop-pins. Insert one of the stop-pins between the numbers 1 and 12.



3. Install the second stop-pin between the numbers 7 and 8.



4. Install the silver retaining sticker.
5. Populate the resistors on the TR PCB.
6. Install the 56 series switch soldering it tight to the PCB.
http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_5.jpg

****Final Assembly****

1. Install the white pushbutton caps on the two switches.



2. Affix the three 1/4" standoffs using 3/16" undercut screws to the L-bracket.
http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_6.jpg
3. Solder the three "Fader" leads to the Elma switch's PCB.
"T" goes to "IN"
"W" goes to "OUT"
"G" goes to "GND"
http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_7.jpg
4. Grab the switch and twist the leads a few times, then lay the Elma switch into its position.
5. Maneuver the 528-FLTR PCB into position over the header. **DO NOT** solder the header at this time. Install the 1/4" pan head screws and lock washers but do not fully tighten. They need to be slightly loose for final adjustment purposes.
http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_8.jpg
6. Slip the entire PCB assembly into position in the L-bracket. Snug the three 3/16" pan head screws and lock washers but do not fully tighten.
7. Flip the assembly over and install the two undercut flathead screws that are adjacent to the pushbutton switches. Fully tighten. They should be nice and tight but not with all your might. You don't want to break the nail polish loose.
8. Make sure the main PCB is aligned properly to the back of the L-bracket then fully tighten the three mounting screws.
9. Slide the faceplate into position with no nuts at this time.
10. Hold the FLTR PCB tight to the back of the L-bracket and fully tighten the two mounting screws.
http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_9.jpg
11. Align the faceplate to be parallel with the L-bracket and tighten the two GH 71 nuts. Remember the console tape on the socket trick. There is not a lot of room for adjustment but try to center the pushbutton switch caps in their respective faceplate holes.
12. Install the Elma nut and fully tighten.
13. Solder and trim the header pins from the exposed side of the 528-FLTR PCB.
14. Solder the three trim switch leads to the 528-TR PCB.
http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_10.jpg
15. Hold the switch and twist the leads a few times.
16. Insert, align and install the Grayhill 56 series switch into the faceplate/L-bracket assembly. Fully tighten the nut. Again, console tape on your socket.
http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_11.jpg



17. Put a small piece of console tape over each section of LED holes.

http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_12.jpg

18. Bend the LED leads as required and trim. They should slide very easily into the faceplate. **DO NOT** force them as you can easily break their tips. The console tape will keep them flush to the faceplate and hold them in place while you solder. LED's have a polarity. The shorter lead goes to the pad that the small silkscreen arrow is pointing to. If the LED's do not illuminate when you are done, you have them in backwards.

http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_13.jpg

http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_14.jpg

http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_15.jpg

19. Remove the console tape. If there is any residue, gently clean with water and a tiny dab of liquid dishwashing soap.

20. Install all the knob inserts and knobs.

****Pre-Power Measurements****

1. With your DMM set to read resistance, probe between either of the "+V" DOA sockets and to a "C" DOA socket. The resistance should be greater than 100k Ω . Repeat for the "-V" sockets to "C". Again, the resistance should be greater than 100k Ω .
2. Probe between the A3 "O" socket and "C". The resistance should be greater than 100k Ω . Repeat for A4 expecting the same, greater than 100k Ω reading.

****Final Adjustments****

1. Prep the opamp sockets as detailed here http://capi-gear.com/catalog/DOA_Install.php
2. Install discrete opamps in positions A3 and A4. The module also needs to be flat in front of you on a bench or table and under power. A 500/51x Extension Jig will be the easiest solution.

If you don't have an Extension Jig already, here is a link to the subcategory at the store.

http://capi-gear.com/catalog/index.php?cPath=22_117_185

3. For the CMRR adjustment of RV1, refer to the directions on the Extension Jig. Your output monitoring connections should be made as shown in the following pic.

http://capi-gear.com/catalog/images/ML2-build/ML2_ass_aid_16.jpg

4. With RV1 properly set, it is now time to adjust RV2 for unity gain. Firstly, make sure the CMRR switch is **not** engaged on the 500/51x Extension Jig. Flip the lower toggle to the ACT position. Make sure both filter pushbutton switches are in the out or disengaged positions. Make sure both Fader and Trim switches are set to "0". Apply a 1k sine wave test tone to the input of the module. Adjust the output level to match the input level. You may want to leave the unit running for 15 minutes or so, as the level can tend to drift by a few fractions of a decimal point.

****Congrats, You Are Done!!****

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