

VP28 2-Stage Mic Preamplifier Kit

All Discrete • Vintage Style • 500 Series Format



Required Tools, assembly tips and pointers:

These can be found in the VP2x Assembly Guide. All of the tips and pointers there relate to this build as well. The main difference to point out is that it's not really needed or recommended to solder from the top first. The boards go together just fine with the old method of installing the component, holding in place while flipping the board over, then slightly bending the leads outward to hold it in place. Next solder from the bottom and trim the leads. Leave the top of the PCB as is, except where noted.

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****Time to begin starting with the Main-PCB****

1. Locate the appropriately labeled bag and install all VP-Gainswitch resistors. The locations and values for these R's can be found in the "*VP28 Grayhill Stop-Pins and Gainswitch Schematic.pdf*".
2. Locate the appropriately labeled bag and install all stepped fader R's. Refer to the VP28 BOM for locations and values.
3. Sort and install the remainder of the R's for the PCB.
4. Install the transistor in the Q1 location. Do not overheat by soldering all leads at one time.
5. Install all rectifier diodes.
6. Install all capacitors.
7. Install the DIP8 IC socket. Align the notch with the label in the silkscreen.
8. Install all twelve DOA sockets. I do this from the bottom of the PCB, like shown in the VP2x Assembly Guide. You can install these from the top of the board if it makes you feel better.
9. Install all four C&K PHA pushbutton switches. I keep them centered in the thru holes and make sure they are seated tight to the PCB in the front and the rear of the switch. I solder two of the "corner" pins first to seat all switches. Align them with the silkscreen to keep perpendicular to the edge of the PCB. Then flip over and solder using a similar alternating pattern as shown in the VP2x Assembly Guide.
10. Install the C&K mini-toggle switch. This switch mounts from the bottom of the PCB as shown in the silkscreen. Before soldering, I hold the switch in position on the PCB and trim all five PC pins short and close to the PCB. This step is **imperative** or the pins will interfere with the pushbutton switch on the HPF PCB. I keep the switch tight to the PCB and parallel in both directions. I have never seen the need to pre-assemble everything before soldering this switch. That can be done though if you are unsure of the alignment.
11. Install the stop-pins and silver retaining stickers on both Grayhill switches. The stop-pin locations can be found in the "*VP28 Grayhill Stop-Pins and Gainswitch Schematic.pdf*". Install both of the Grayhill 71 series rotary switches. Make sure they are tight and the bodies are aligned parallel to the PCB.

****Tip:** I highly recommend checking the soldered Grayhill pin arrays with a lighted magnifier of some sort. It is very easy to short these pins together with excessive, sloppy soldering.

12. Install the EA2622 input transformer. I use a small piece of double faced tape as shown in the VP2x Assembly Guide.
13. Install the EA2623-1 output transformers. Position A2 with the leads facing the top edge of the PCB. Trim the leads as required. Use the supplied larger diameter, black piece of heat shrink tubing to gather and tidy the leads. Position T3 with the leads facing the bottom edge of the PCB. Use the supplied smaller diameter, two black pieces of heat shrink tubing to gather and tidy the leads. The fastener method for both T2 and T3 is the same as described in the VP2x Assembly Guide.
14. Install the long 2-pin header in the J2 position. Make sure the plastic shroud is tight to the top of the PCB and the pins appear perpendicular to the PCB in both directions.
15. Install the four pushbutton caps in the positions shown in the BOM.
16. Set this assembly to the side for the time being.



****Prepare to stuff the 553-Sub-HPF PCB****

1. Install the 5-pin 90° degree header.
2. Install the C&K pushbutton switches as described above.
3. Install all film capacitors following the information in the "*Classic VP28 Sub-553-HPF BOM.pdf*".
4. Install the two black pushbutton switch caps on the C&K switches.
5. Install the Keystone brackets and hardware onto the 553-Sub-HPF PCB. This should be done only **finger-tight** at the moment. This will require two of the 4-40 x 1/4" Phillips pan head screws going thru the Keystone brackets, then thru the PCB with #4 split lock-washers and #4 small pattern hex nuts at the rear of the 553-Sub-HPF PCB. You can use the pics in the build thread to help orientate the hardware properly.

****Final Assembly****

1. There is typically no need to temp-assemble and then reassemble this build. Unless you have a problem, this will be the one and only time for the assembly to the L-bracket.
2. Prepare the L-bracket with 4-40 x 3/16" undercut flat head screws and aluminum standoffs.
3. Install the 553-Sub-HPF PCB assembly to the main PCB. Slip a #4 lock-washer onto the remaining 4-40 x 1/4" Phillips pan head screw. Insert this fastener thru the bottom of the main PCB. Insert the 553-Sub-HPF PCB into position gently snugging the screw. **DO NOT** solder the 5-pin 90° header to the main PCB at this time. Final alignment needs to be done first. You can use the pics in the build thread to help orientate the hardware properly.
4. Slip the entire PCB assembly into position in the L-bracket. Align properly then install split lock-washers and 4-40 x 3/16" panhead screws in the four standoffs.
5. Slightly loosen the screw on the top Keystone bracket so you can slip the last remaining #4 outside tooth lock-washer between the Keystone bracket and the VP28 L-bracket. This is most easily done by holding the assembly vertical, with the front of the module facing upwards.
6. Install the 4-40 x 1/8" undercut flat head screw thru the L-bracket and into the Keystone bracket. Fully tighten this screw making sure that the Keystone bracket does not turn or rotate. The long flat edge of the Keystone bracket must be flat and perpendicular to the front of the L-bracket. You can use the pics in the build thread to help with the last two steps.
7. Install the faceplate. **DO NOT** use the lock washers for the Grayhill switches. Just throw them out or save for another project. Finger-snug the nuts on the Grayhills. There will be very little room to adjust but center over the four main pushbutton switch caps as well as possible. Once aligned, you can tighten the nuts. Remember the console tape tip on the end of the socket. The faceplates are anodized but can still be scratched if you use gorilla type force here so be careful. If the tape leaves marks or you have smudges to clean, just use a Q-tip or cloth and water. **DO NOT** use alcohol or any other chemical without testing on the back of the faceplate first. Some chemicals can damage the anodized finish.
8. Use the three finger-tight fasteners on the HPF PCB to adjust and align so the two black pushbutton switch caps are centered in their respective faceplate holes. Once happy with the alignment, fully tighten the three screws. Double check alignment to make sure the HPF assembly did not drastically move when the screws were tightened.



9. Flip the assembly over and solder the 5-pin 90° header at the bottom of the main PCB. Use the strategically placed access slot machined in the L-bracket. After soldering, inspect with a lighted magnifier to make sure there are no solder bridges between these pins. If you are insecure about soldering these pins, solder at least one of them, then take the assembly apart to have full access to solder the rest of them. The experienced DIY'er should have no problems though.
10. Install the four LED's at the bottom side of the PCB thru the access notch in the L-bracket. The colors of the LED's are written in the silkscreen. I bend both leads downward at an approximate 45° degree angle just behind the spurs on the leads. I then trim them and slip into place with a needle nose pliers. Remember to orientate them correctly. The shorter lead goes to the pad that the arrow in the silkscreen points to. If the LED's do not illuminate when the respective pushbutton is depressed, they are in backwards. There are a few pics on the build thread to help with this.
11. Slip the two provided .0625" diameter pieces of clear heat shrink tubing over the long pins of the J2 header. Trim them as required to leave about .1" of pin exposed at the top.
12. Bend the leads of the green LED as required. Remember, the shorter lead goes to the pin that the arrow in the silkscreen points to. I start by bending the shorter lead at a 90° angle just behind the spurs on the leads. Then bend the longer lead about .1" behind that. When installing the LED, I try to position the long pins of the J2 header behind the LED's leads so they put a slightly forward pressure on the LED, holding it tight into its position in the faceplate. There are a few pics on the build thread to help with this LED install.
13. Install the inserts on the aluminum control knobs.
14. Before installing the knobs, I find it easiest to use a pliers and rotate the switch shafts to their 12:00 positions. Install the blue 3/8" pointer on the gain switch. You may need to "cheat" the pointer slightly towards 1:00 as sometimes the right setscrew has a tendency to pull the pointer towards 12:00 when tightening.
15. Insert the 1/8" to 1/4" shaft adapter onto the fader switch shaft. Align the split so it is facing the 6:00 position. I push it on until the top is approximately flush with the top of the shaft. Install the 1/2" clear pointer knob.

****That's it!! Apply power and test this baby out!!****

1. Before installing any opamps, I recommend connecting the module to a bench PSU or 500 series slot-extender to verify that the proper voltages appear at the expected DOA sockets.
2. With no power connected to the module, prep the DOA sockets and install opamps as described on the http://capi-gear.com/catalog/DOA_Install.php page at my site.
3. Before installing the IC opamp, I prep the 8-pin sockets in a similar manor using a cutoff lead from a resistor. This will make the IC install a little easier. If not very careful, it is easy to bend over or smash some or all of the leads. Do not apply downward pressure on the IC until you are sure all 8 pins are aligned correctly towards their sockets. The dot in the top of the IC goes towards the notch in the DIP8 frame or towards the EA2623-1's.

Nothing left to do but enjoy!!

