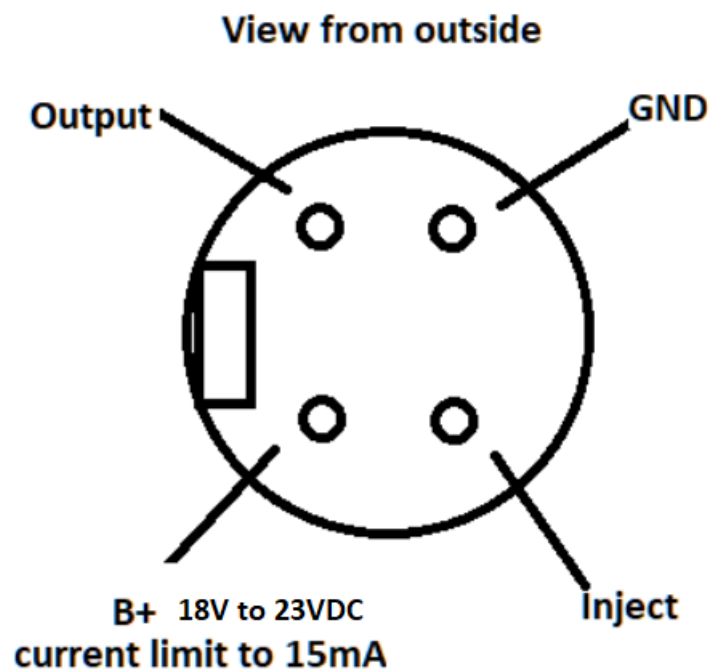


Refurbishing a GenRad P42-1560 preamp

To open them, you need to press out the little pin that's near where the cord plugs in. I used a small drill bit, just pushed it out using that and the side of a screwdriver handle and then pulled it out the rest of the way on the other side with toothed needle nose pliers. You need something to pull with at the other end of the tube, something that won't booger up the threads or break the thin plastic separating ring at the end. I an old destroyed 1/2" capsule. You can use a good one, too, but of course be careful.

Get the pin out and pull the innards from the other end. You might have to rotate the shell a little since the circuitry is really packed in there. If there is a dent in the body (several of mine are dented) you might need to find a good rotated angle to pull it out.

To solder cable to the pins, you'll need something to strain-relieve the cable with and a way to connect the cable shield to the metal shell (turns out to be very important for avoiding AC hum. There are 4 pins and a shield connection, you can skip the "inject/insert" pin if you don't plan to use it. Shield connection is the preamp body. I used the cables from long Type A USB cables. This view is looking into the pins from the outside:

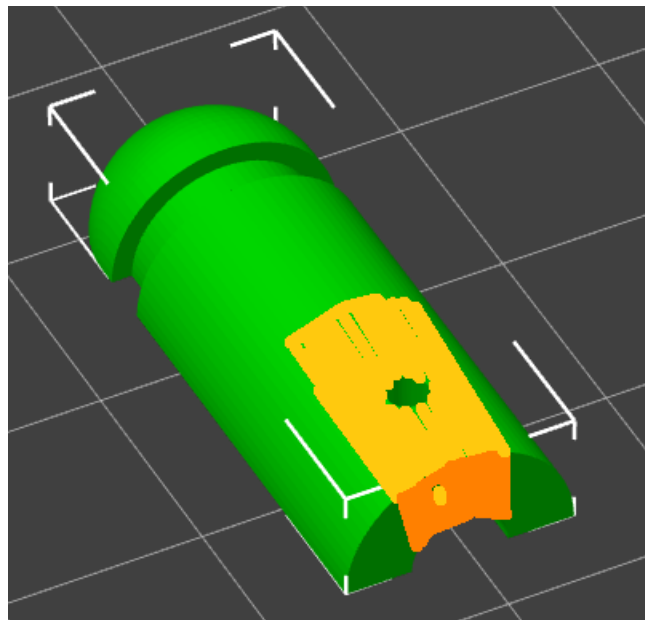
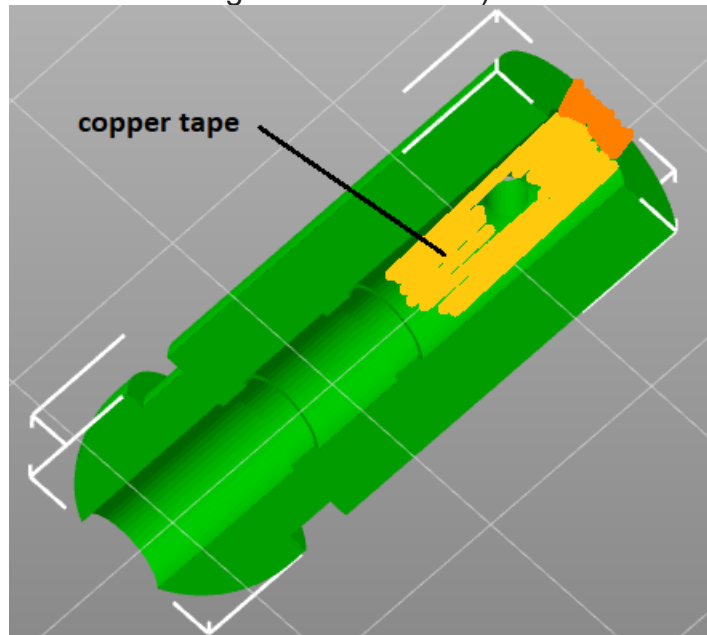


You'll also need some copper tape or the like to get the cable shield contacted to the shell, otherwise you'll get all kinds of AC hum pickup (Connect shield to ground at the other end of the cable). Will aluminum tape or foil work? I don't know whether the contact will be good enough.

Two identical 3D printed parts clamp the cable and hold it to the preamp body. Ideally they should be made with rubbery plastic like TPU, but probably regular PLA will work. The 3D printed part gets the copper tape. It goes in the groove in the 3D piece and around to the other side so it gets pulled against the body by a screw that will hold it into the body (there's a

hole already, just get a self-tapping M3 or M2 type, maybe a normal threaded type can work in there too). Tack-solder the inner leads of the cable directly to the gold pins at the end of the preamp. Wrap the shield braid back so it contacts the copper tape in the groove when the 3D parts get clamped around the cable. Use a small narrow nylon tie wrap in the groove to hold it together.

Then squeeze the two clamp halves onto the cable, and push it into the preamp body until the hole lines up with the hole in the clamp piece. You might need pliers to hold the clamp pieces together while pushing into the body. Then drive in the screw. Lastly, put the pin into the body (and into the plastic base holding the circuit board) so the whole assembly is solid.



File:
cable clamp.stl (print two pieces for each preamp)

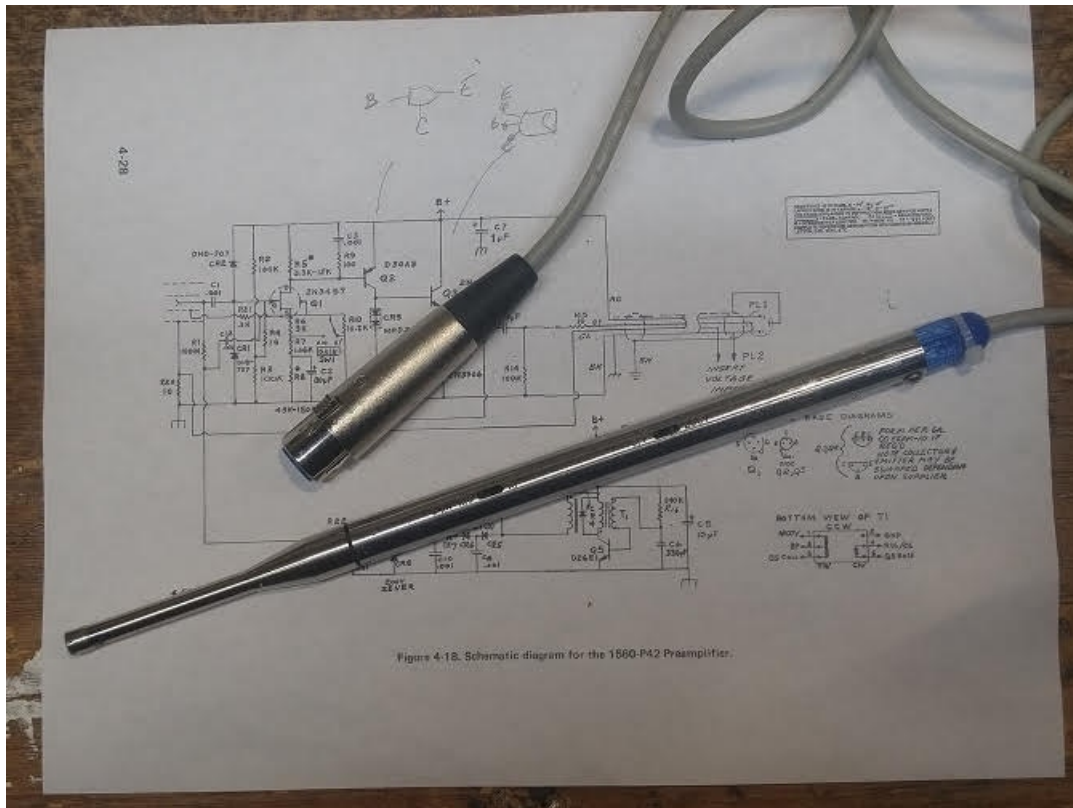


Figure 4-18. Schematic diagram for the 1560-P42 Preamp.

Power with clean +18V to +23Vdc. Two healthy 9V batteries in series works well. If you put a resistor 390 ohms or more in series with the preamp's output line, you won't need to worry about current limiting on the power source. Put the resistor on the far end near your XLR (or other) connector.

Possible repair:

There are (at least) two versions of the preamp, differing mostly in the input JFET they use. I've supplied manuals for both, with schematics.

I had two of the preamps show up dead, probably from an accidental short on the output line when a non-current-limited supply had been used at some time! The problem in each was a shorted transistor Q3. A generic medium voltage device like 2N3904 or BC547 will work as a sub for Q3. If Q2 or Q4 are bad, you can use a 2N3906 or BC557 will work. BE CAREFUL TO CONNECT WITH THE PROPER PINOUT FOR THE DEVICE YOU ARE USING! IT MIGHT NOT BE THE SAME AS THE DEVICE ORIGINALLY IN THE PREAMP. CHECK THE SCHEMATIC AND BOARD LAYOUT INFO IN THE PREAMP MANUAL DOCUMENTS.

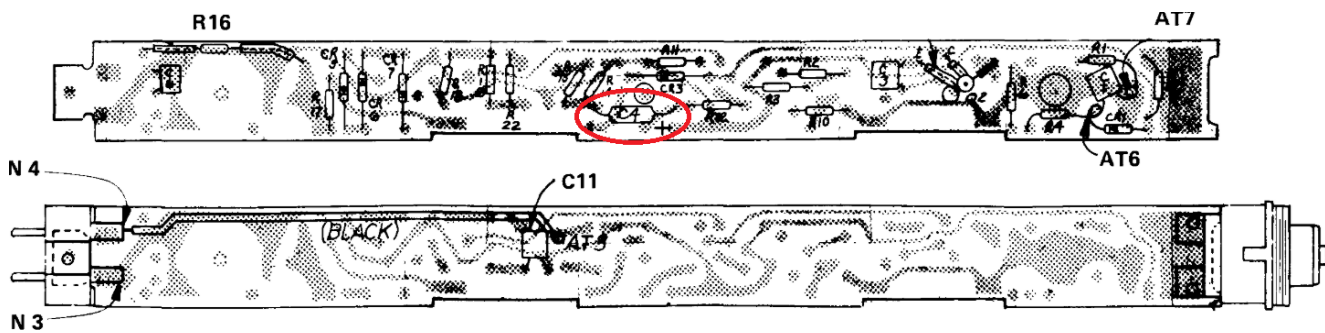
When the preamp is working correctly, you should see a DC voltage of around 6 to 11 VDC at R12 or R13.

Replacing bad or suspect capacitors:

The 1560-P42 used miniature "wet tantalum" capacitors. Some of the ones manufactured then turned out to be not so reliable over time.

C4 is the capacitor that causes most problems – sometimes it goes open, develops a lot of series resistance, or just loses capacitance so you get no low frequencies or low gain. You can replace it with a general electrolytic type (aluminum or tantalum), but don't use ceramic. It may be difficult finding a capacitor small enough to patch onto the board, I used low profile surface mount type 33uF tantalum capacitors, patched in using short bus wire or resistor leads.

The value can be any capacitance 10uF or larger, rated at least 25V. You'll have to get creative connecting and mounting it. Keep it toward the center of the board so the shell doesn't hit.

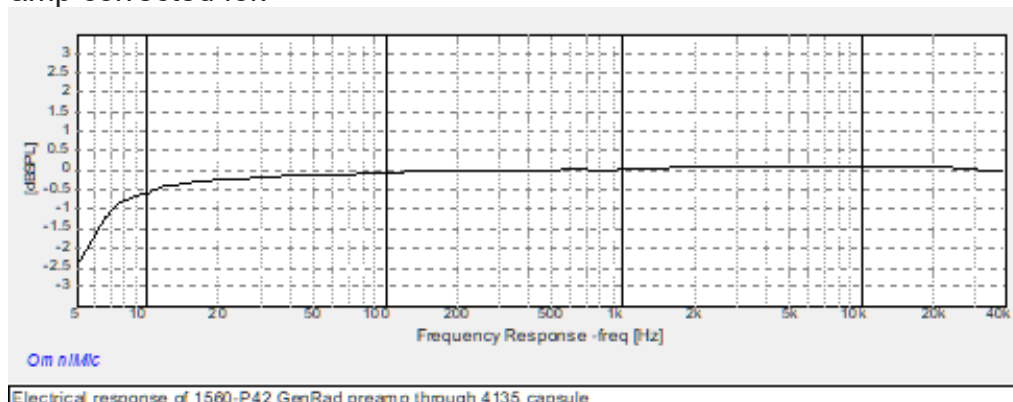


(not sure if this picture is direct or looking xray through board, but you should be able to find C4 near the switch indent. The red stripe is its positive terminal).

C5 is the same type, but hasn't caused problems that I've seen so far. But it's probably a good idea to replace it anyway. C5 can (and probably should) be a ceramic type.

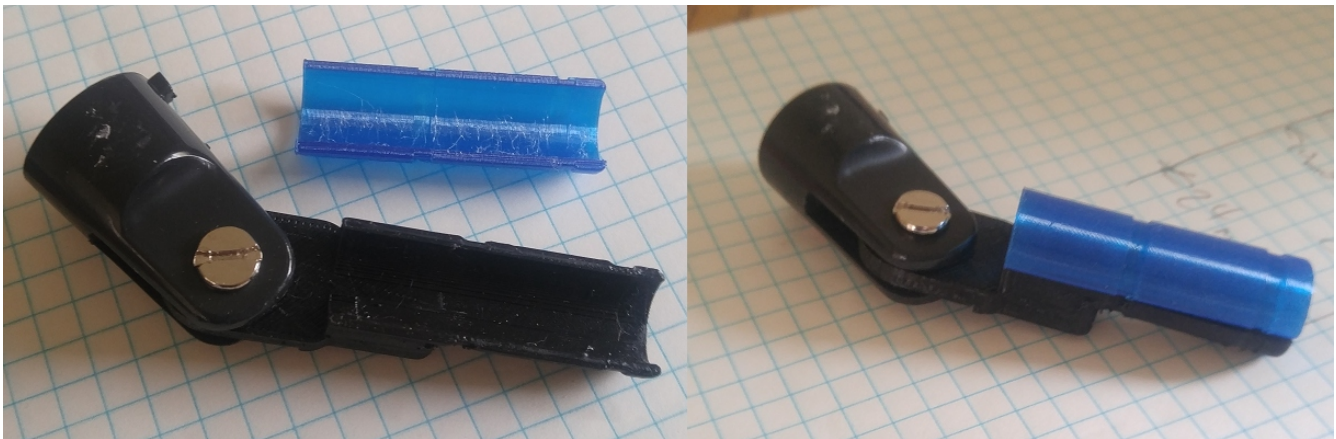
I've also seen C2 go open, but that only matters if you use the preamp in the 10x gain position (which might have better noise but less SPL handling and less flat response). It's pretty hard to find a substitute for. I've used two 47uF 15V tantalums in parallel, but mostly I just leave it as it is and use only the 1X gain position.

Here's the response of 1560-P4 fed through a 4135 capsule (200V off), preamp loaded by ~30kohms, feeding signal through the Inject wire (from a power amp). Response of source and power amp corrected for.



Using it with a Mic Stand:

Most mic clips don't work well with a ½ inch preamp body, and they diffract sound waves causing response ripples at high frequency. Here is a design, again using 3D printing and nylon tie-wraps and the threaded part of a common typical microphone clip. It clamps outside onto the clamp pieces described above. It's not a clip but makes a swiveling mount to thread onto a microphone boom arm, and can reduce diffraction to almost none if swiveled so the mic is in line with the boom arm (unlike as shown below!).



The black printed part is done with PLA, the blue was done with TPU for grip (though PLA would probably work for that also).

Files:

Mount - TPUpart.stl

Mount -PLApart.stl

