

# ***DYNACO STEREO 120 C7 REPLACEMENT MANUAL***



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## **Section 1: About This Manual**

This manual covers the replacement of both the stock C7 output coupling capacitors. The original capacitor was 3300  $\mu\text{F}$ . The replacement for C7 is a triple of three 3300  $\mu\text{F}$  capacitors in parallel, for a total capacitance of 9900  $\mu\text{F}$ . This extends the low frequency response and reduces low frequency distortion. The kit is for use with the original Dynaco Amplifier Modules.

### ***Who Should Attempt this Project?***

You can build this kit and improve your Dynaco Stereo 120 if you can:

1. solder (using normal rosin core solder and a soldering iron).
2. use simple hand tools like screwdrivers, wire cutters, and pliers.
3. make basic voltmeter measurements
4. read and follow directions.

It helps if you:

1. know a bit about electronics, or
2. have a friend who knows a bit about electronics

### ***Tools You'll Need***

You'll need the following tools to update your Stereo 120:

1. flat blade screwdriver for #6 screws, #2 Phillips screw driver
2. pliers or nut drivers suitable for #6 hardware (5/16" nut driver or hex wrench)
3. needle nose pliers
4. pencil type soldering iron of 25 to 50 Watts (no huge honking soldering guns or blowtorches)
5. wire cutters and strippers

### ***Project Overview***

The project replaces C7, the speaker coupling capacitor, for both the left and right channels. We assume that your original amplifier modules were working, with the biggest problem being that the old C7 has lost a significant amount of its capacitance.

Alternatively, you may choose to install this C7 upgrade to improve the bass and reduce the low frequency distortion of your Stereo 120. The major steps are:

1. Removing the old C7's and their mounting clamps.
2. Building the new triple capacitor modules in the original mounting clamps.
3. Re-using the old inductor wire from the original C7
4. Re-installing the new C7's.
5. Testing the completed result and reassembling the amplifier.

## Important Safety Notes

By purchasing this kit, you have agreed to hold Akitika, LLC harmless for any injuries you may receive in its assembly and/or use. To prevent injuries:

- Wear safety glasses when soldering to prevent eye injuries.
- Always unplug the power before working on the amplifier.
- Large capacitors hold lots of energy for a long time. Before you put your hands into the amplifier:
  - Pull the AC plug!
  - Wait 1 full minute for the capacitors to discharge!
- Remove jewelry and rings from your hands and wrists, or anything that might dangle into the amplifier.
- If working in the amplifier, keep one hand in your pocket, especially if you're near the power supply or power supply wires. This can prevent serious shocks.
- Build with a buddy nearby. If you've ignored all the previous advice, they can dial 911 or get you to the hospital.

## Section 2: Preliminaries

### Does Your Stereo 120 Work?

The C7 kits are meant to be installed into a working Stereo 120. If your Stereo 120 is broken, then you should definitely repair it first. Doing otherwise invites bad outcomes unless you are very knowledgeable.

### Opening the Amplifier

1. *Make sure the amplifier is unplugged. If it was recently powered allow the amp to sit for one full minute before proceeding.*
2. Remove the four screws along the outside edge of the bottom that hold the cover in place (see Figure 1).
3. Holding both the top and bottom of the amplifier, flip it over.
4. Lift the perforated metal top off of the amplifier.

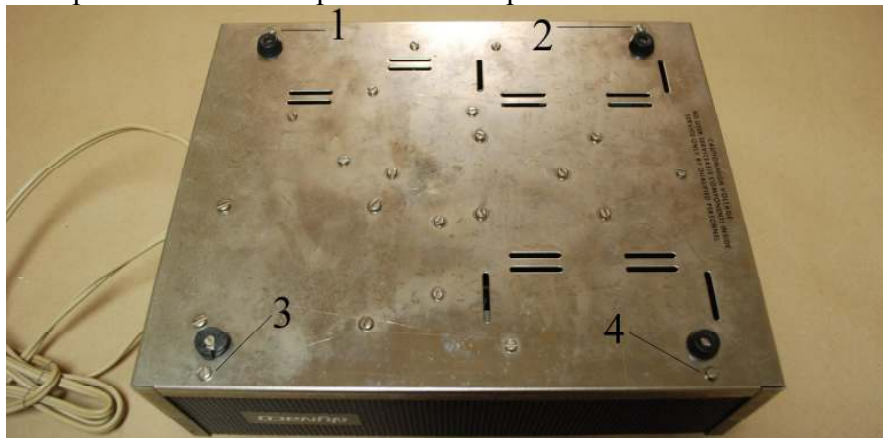


Figure 1-Location of the four screws that hold the cover to the base

## Removing Left and Right Channel C7's

The following procedure applies to both the left and right channel C7's. Refer to Figure 2.

1. Left channel – the left channel capacitor C7 is near the end of the chassis.
  - a. Make and apply a masking tape label with “L+” for the wire that goes from the left channel PC-14 Eyelet 8 to the positive (red) capacitor terminal.
  - b. Desolder the wire from the positive capacitor terminal.
  - c. Make and apply a masking tape label with “L-” for the wire that goes from the left channel PC-14 Eyelet 11 to the negative (black) capacitor terminal.
  - d. Desolder the wire from the negative capacitor terminal.
  - e. Identify the white wire from the coil around C7 that connects to the left channel red speaker binding post. Desolder it from the binding post.
2. Right channel – the right channel capacitor C7 is near the center of the chassis.
  - a. Make and apply a masking tape label with “R+” for the wire that goes from the right channel PC-14 Eyelet 8 to the positive (red) capacitor terminal.
  - b. Desolder the wire from the positive capacitor terminal.
  - c. Make and apply a masking tape label with “R-” for the wire that goes from the right channel PC-14 Eyelet 11 to the negative (black) capacitor terminal.
  - d. Desolder the wire from the negative capacitor terminal.
  - e. Identify the white wire from the coil around C7 that connects to the right channel red speaker binding post. Desolder it from the binding post.
3. Remove the three screws that hold the capacitor clamp to the chassis. Save the screws for re-assembly. The kit provides 6 keps nuts (nuts with attached lockwashers) to make reassembly easier. Don't loosen the capacitor clamp screw yet.
4. Sit the old capacitor in its clamp on a piece of paper, and trace the mounting hole locations on the piece of paper. You'll use this template to guide a bit of creative bending in an upcoming step. Repeat this step for the other old C7.

***Make sure that the 0.1  $\mu$ F capacitors remain attached to the red speaker binding posts!***

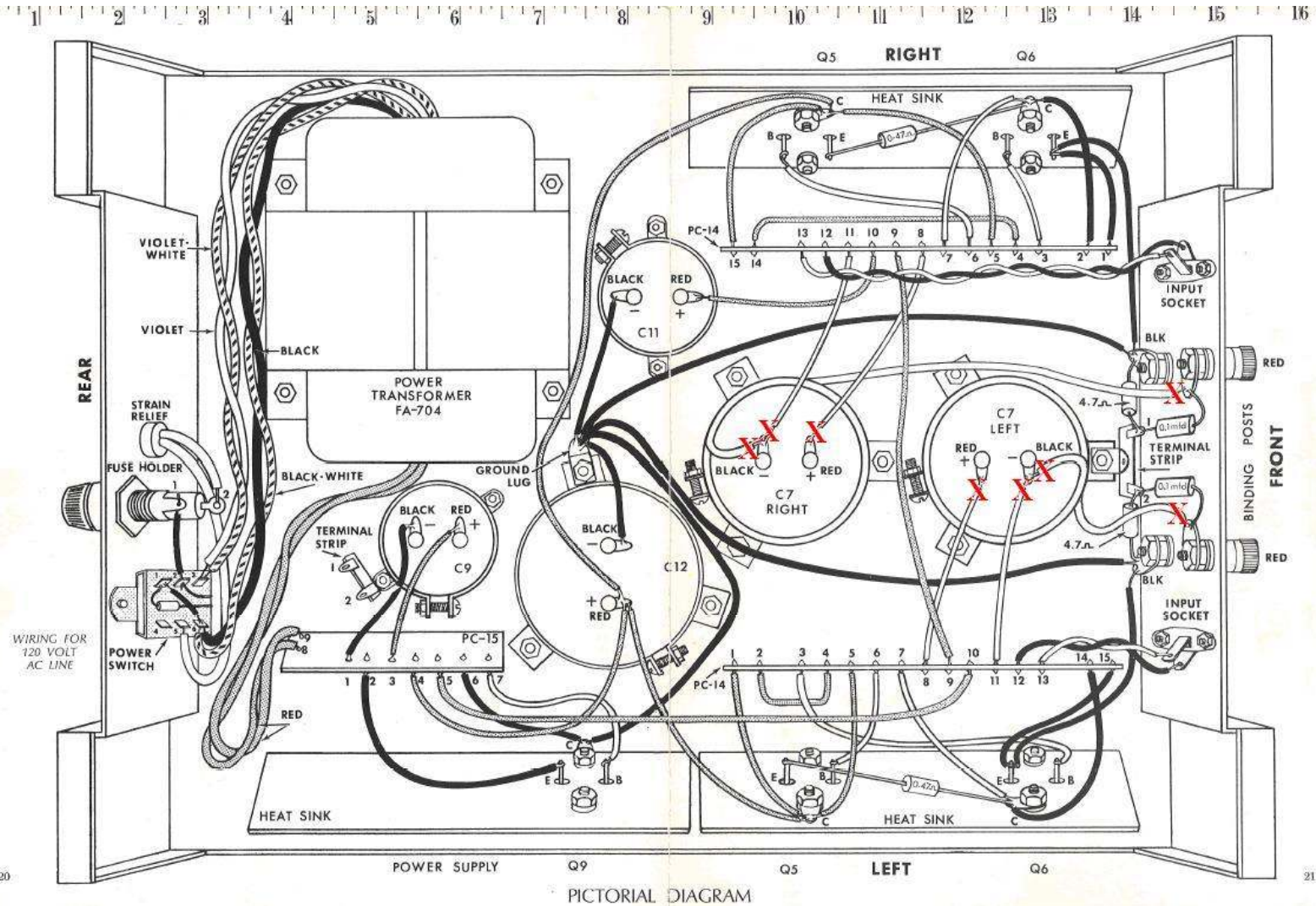


Figure 2-Stock amplifier layout (before C7 replacement), X shows where to desolder

## Building the Dynamite Capacitors

The actions described in this section must be performed twice, once for the left channel, and then again for the right channel.

1. You'll replace C7, a single 2" diameter capacitor with three 25 mm diameter capacitors, as shown in Figure 3.
2. Loosen the capacitor clamp screw and remove the original C7.



**Figure 3-3 25 mm diameter capacitors take the space of one 2" diameter capacitor**

3. Orient the three capacitors with the ***negative*** leads in the center of the grouping.
  - a. The space between two capacitors should be located next to the clamp tightening screw.
  - b. Place the group of three capacitors in the clamp as shown in Figure 3. Referring to Figure 4, squeeze and bend the clamp a little by pushing inward toward the spaces between the capacitors in the triangle capacitor pattern. This makes it easy to use the supplied 6-3/8x5/8" screw in the capacitor clamp. (Note that the capacitors won't be wired at this point of the assembly).
  - c. Tighten the capacitor clamp screw until the holes in the clamp align with the holes recorded on your template. This will make it easy to install the upgraded C7 capacitor assembly in later steps.
4. Remove and straighten the white wire that was wrapped around the old C7. It will be reused (though not all of it) to create the new inductor for the new C7.
5. Strip a bit more than 2" of insulation from the white wire. Clean the bare wire by lightly scraping it with the jaws of the diagonal cutters or by cleaning it with isopropyl alcohol. This step is not strictly necessary, but it may make the wire a bit easier to solder.

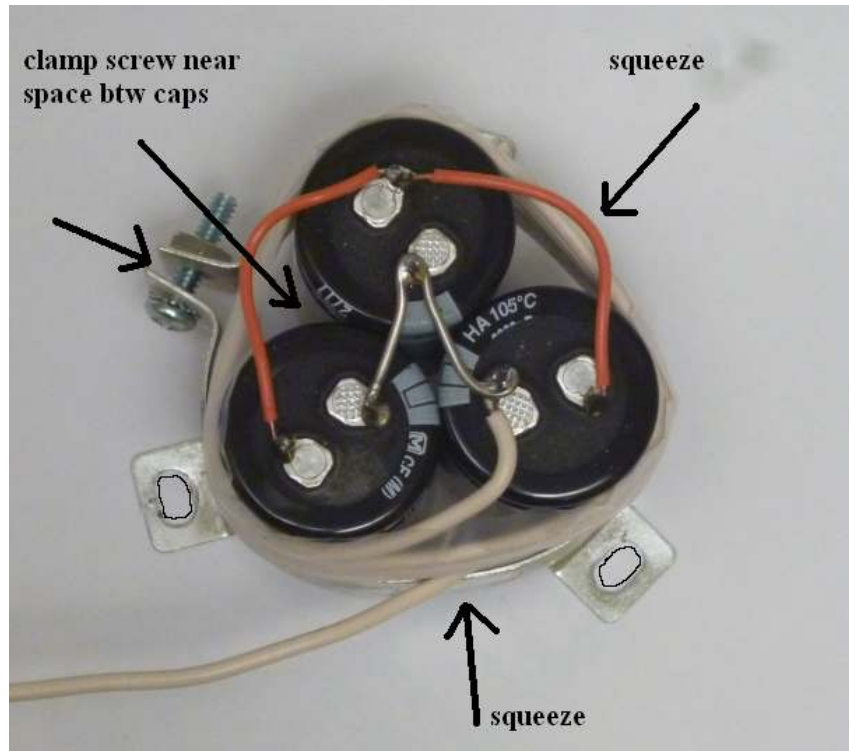


Figure 4-A bit of squeezing as indicated triangularizes the bracket, making it easy to tighten the clamp screw (the wires shown in the picture are added in a later step).

6. Form the bare wire as shown to connect together all three negative terminals as shown in Figure 5. Solder the terminals.



Figure 5-Negative Terminal Configuration



7. Wrap 5 turns of wire around the top of the capacitors, as shown in Figure 6. Wrap the turns tightly, starting the first turn in the ridge near the top of the capacitors. You can add a layer of transparent tape around the turns once they are in place, but it is not necessary. Leave the end of the wire at least 12" long.



**Figure 6-Inductor wound around the new C7**

8. Cut two 2" lengths of the supplied 20 AWG red wire. Remove 3/8" of insulation from the ends. Connect together the positive capacitor terminals as shown in Figure 7.



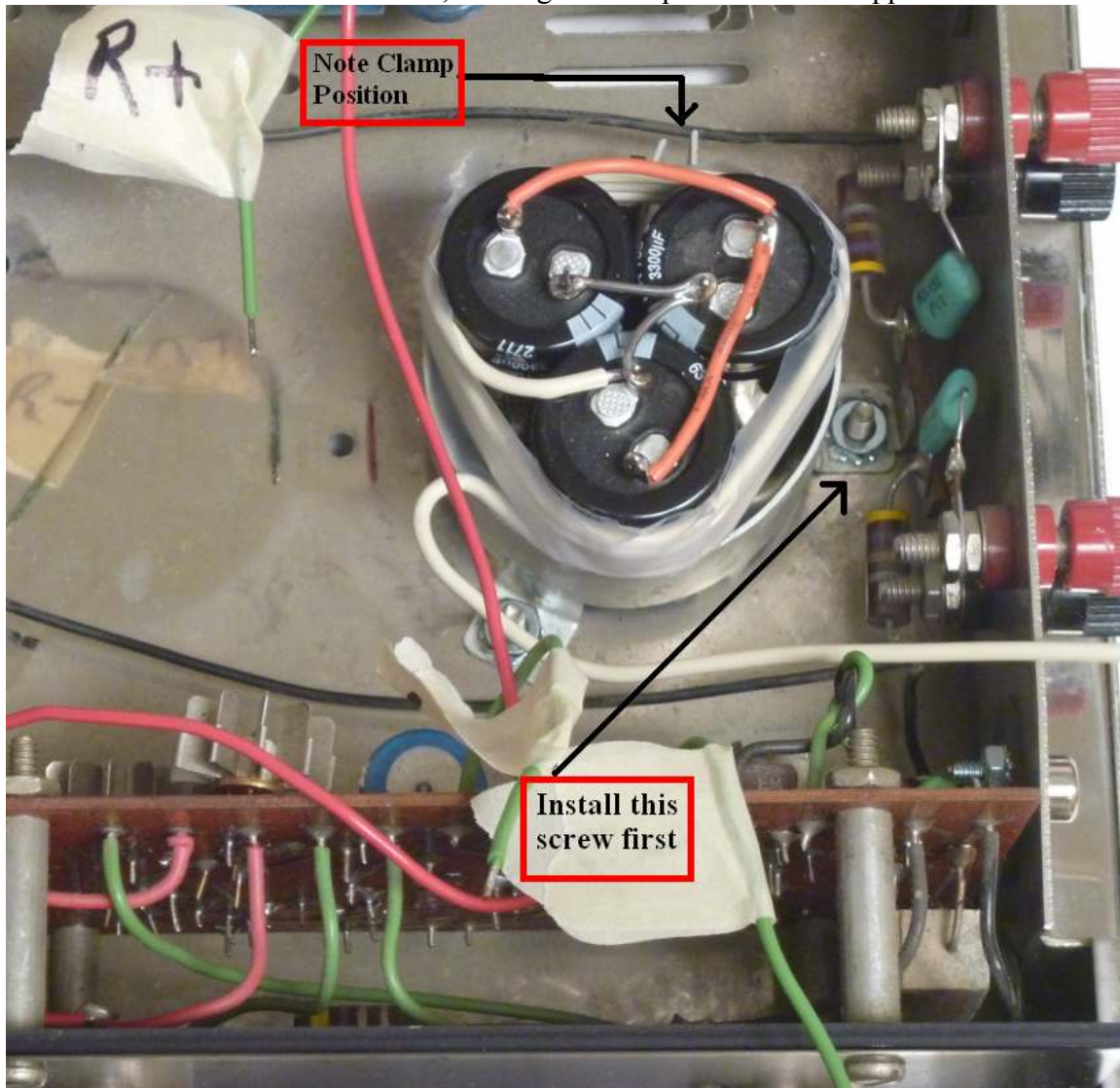
**Figure 7-Adding red wires to connect positive terminals**

## ***New C7 Capacitors Mechanical Installation***

### **Left Channel C7**

The left channel C7 is closest to the end of the chassis. Install the wired capacitor.

1. Note the clamp position.
2. Note the way the end of the coil is dressed toward the red binding post.
3. Install the indicated screw first. Note that the screw does double duty, holding down the terminal strip and the capacitors. Use the supplied PEM nuts and the old 6-32 screws. The PEM nuts have built-in lockwashers<sup>1</sup>.
4. Install the other two screws, holding them in place with the supplied PEM nuts.

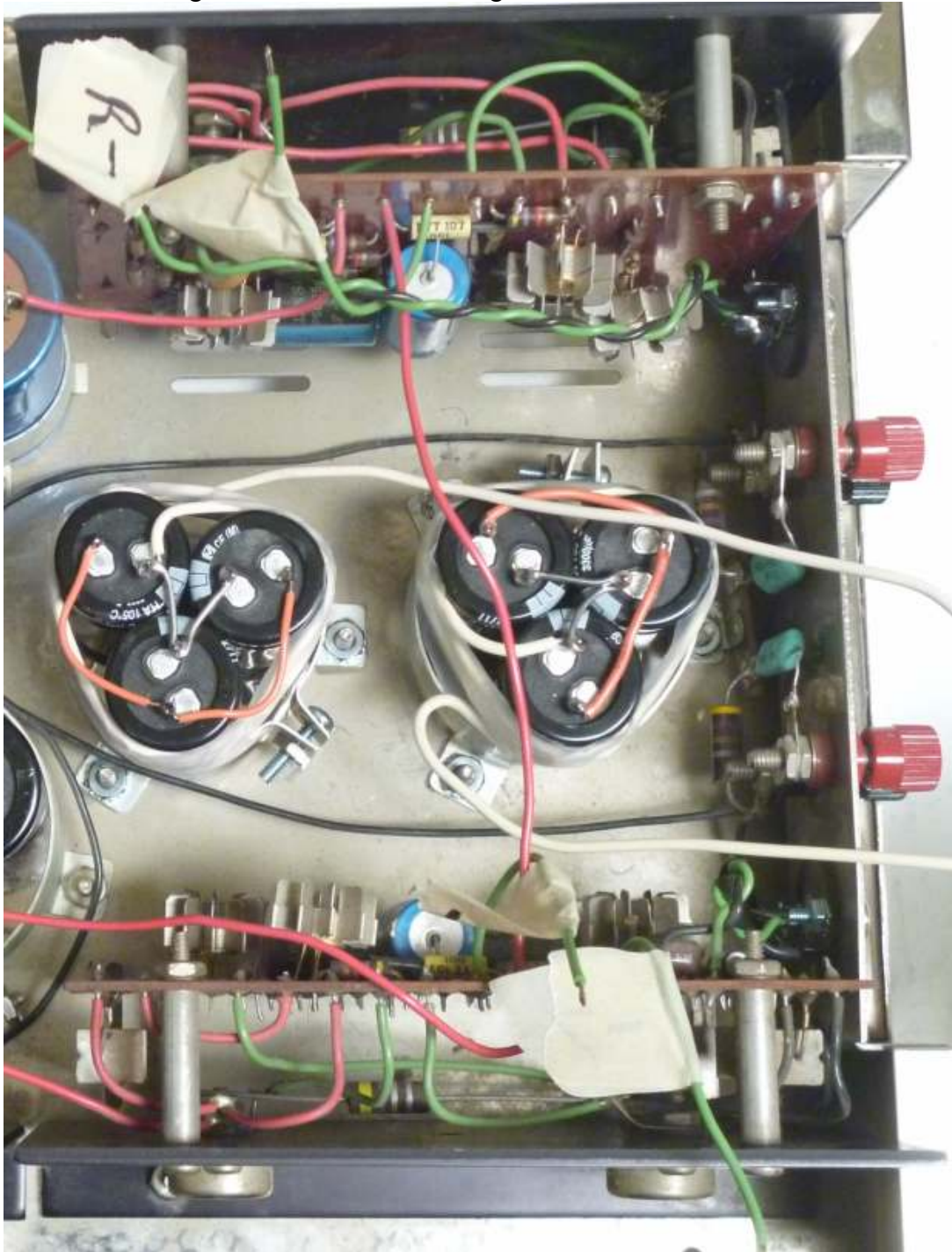


**Figure 8-Installing C7 Left Channel**

<sup>1</sup> The PEM nuts make a difficult assembly a little easier as their lockwashers are captive, and so won't fall off the nut at the worst possible instant during the assembly process.

## Right Channel C7

Install C7 for the right channel as shown in Figure 9



**Figure 9-Installing C7 for the right channel**

Use the old screws and the new PEM nuts to mount the right channel C7 to the chassis.

1. Match the orientation of the clamp screw.
2. Dress the end of the coil toward the Right channel Red speaker binding post.

## ***New C7 Capacitors Final Wiring***

Refer to Figure 10 to see what the completed wiring looks like. Note that the amp shown has standard power supply and amplifier modules, but the stock C12 has been replaced by the C12DD kit<sup>2</sup>.

### **Left Channel C7**

Reconnect the following wires:

1. From the left channel PC-14, eyelet 8, to left channel C7's red wires. If you made masking tape labels, this one will be marked "L+".
2. From the left channel PC-14, eyelet 11, to left channel C7's negative terminal. If you made masking tape labels, this one will be marked "L-".
3. From the end of the coil to the left channel red speaker binding post.

### **Right Channel C7**

Reconnect the following wires:

4. From the right channel PC-14, eyelet 8, to right channel C7's red wires. If you made masking tape labels, this one will be marked "R+".
5. From the right channel PC-14, eyelet 11, to right channel C7's negative terminal. If you made masking tape labels, this one will be marked "R-".
6. From the end of the coil to the right channel red speaker binding post.

***Make sure that the 0.1  $\mu$ F capacitors remain attached to the red speaker binding posts!***

## ***Test and Final Assembly***

With every securely in place, shake the amplifier out to make sure that there are no loose lock-washers rolling around inside. Make sure that the amplifier is completely disconnected from inputs, speakers, and power. Make sure that the power switch is in the OFF position.

Plug the power cord into the AC mains. Standing to the side of the amplifier, turn on the power switch. There should be the usual soft "bong" from the power transformer at startup, but otherwise there should be no drama.

***Please be careful as potentially lethal voltages are now present inside the amplifier.***

1. Measure the voltage across C12's terminals to assure that it's within normal limits (72 $\pm$ 6 Volts).
2. Measure the voltage from each C7 positive terminal to ground (chassis). It should be approximately half of the C12 voltage, plus or minus 3 or 4 volts.
3. You may be alarmed if you measure the voltages across the speaker binding post with no speaker connected. Without a speaker in place the large capacitors charge very slowly. It will take about 5 minutes for the voltage to get below 2 volts. This is normal. With a speaker connected, the voltage across the speaker should drop to under 100 mV in under 10 seconds.
4. Unplug the power cord
5. Wait 3 full minutes to allow the large caps to discharge.

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<sup>2</sup> See the C12 upgrade manual for details. Note that a capacitor on the power supply board must be replaced when C12 is upgraded from 3300  $\mu$ F to 20,400  $\mu$ F.

6. Reinstall the perforated metal top, and fasten it in place using the same 4 screws that originally held it in place.

You are ready to listen to music with better bass.

### ***A Compatibility Note***

If you install the C7 Kit with a PSUG power supply, you will need to change the value of R22, nominally 165K, to 100K Ohms. This assures that the PSUG will start under all conditions with the large C7 capacitors.

### ***References***

Be sure to visit [www.updatemydynaco.com](http://www.updatemydynaco.com) to see the latest ways to make your Dynaco Solid State equipment better than new, or to download the latest version of this manual.

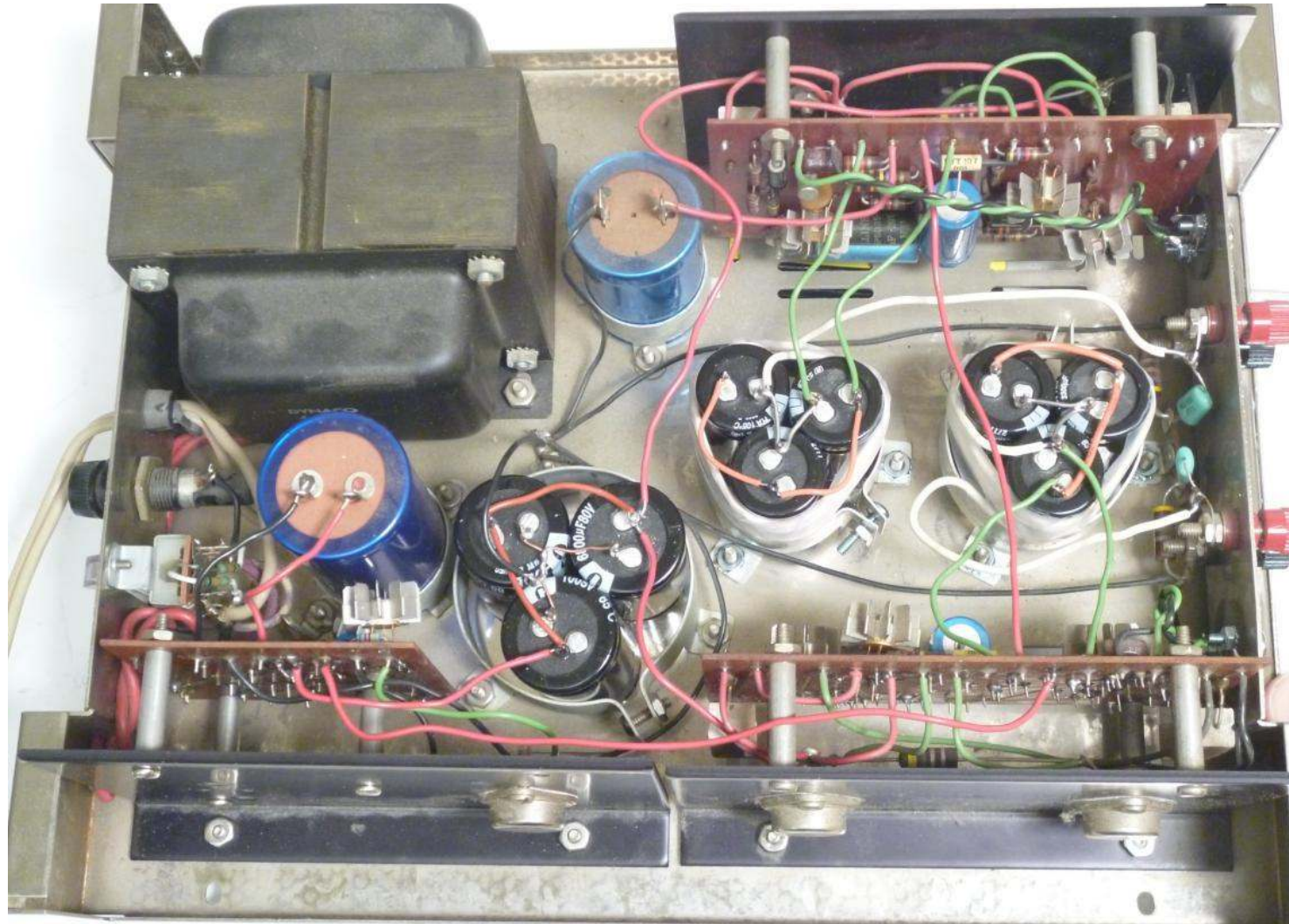


Figure 10-Completed wiring

## ***Better Sound Because You Build It!*** ***GT-101 Stereo Power Amplifier Kit***



*The GT-101 features the parts quality found in high-end equipment, yet costs just \$299+\$26 shipping in kit form  
You can buy it assembled for \$449+\$26 shipping (lower 48 states).*

### ***About the GT-101 Stereo Power Amplifier Kit***

Have you ever built a Heathkit, Eico, or Dynaco kit? Did you build your own computer from components? Was it for the fun? Was it for the feeling of accomplishment? A project to share with the kids or grandkids? Was it to get high-end performance at low cost? If you answered “yes” to any of those questions, the GT-101 kit might be just what you want.

Akitika’s GT-101 is a complete stereo power amplifier kit that delivers more than 50 Watts per channel of clean, low noise power into 8 Ohm loads. Nearly double that into 4 Ohms! More measurements can be found at [www.akitika.com](http://www.akitika.com). The kit supplies everything but the solder. Add a few hours of rewarding assembly time and the result is Better Sound, because you build it.

The kit includes a toroidal power transformer, film and COG capacitors, metal film resistors, heavy-duty extruded aluminum heat sinks, isolated input jacks, double-sided PC boards, and a fully regulated power supply, all elegantly fitted into a black custom chassis. It may well be *the sweetest sound you'll ever build!*

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