

DYNACO STEREO 120 C12 With EZTOP REPLACEMENT MANUAL



Note that picture shown also includes really big heat-sinks, sold separately

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Table of Contents

Section 1: About This Manual	3
Who Should Attempt this Project?	3
Tools You'll Need.....	3
Project Overview	4
Important Safety Notes	4
Section 2: Preliminaries	5
Does Your Stereo 120 Work?	5
Opening the Amplifier	5
Check the Power Supply Voltage	5
Removing the PC-15 module and Replacing C10	6
Building the Dynamite Capacitor with the EZTOP PCB	8
Removing the Old C12	9
Installing the New C12 Dynamite Capacitor Configuration.....	9
A few preliminary words about UP, DOWN and Polarity	9
Wiring the C12.....	9
Reinstall the Regulator Assembly.....	10
Check and Test Your Work	16
Reassemble the Amplifier.....	16
Results.....	16
References.....	16

Table of Figures

Figure 1-Location of the four screws that hold the cover to the base.....	6
Figure 2-Dynaco PC-15 Power supply board highlighting C10 location and polarity.....	7
Figure 3-3 30 mm diameter capacitors take the space of one 2.5" diameter capacitor	8
Figure 4-Stock amplifier layout (before C12 replacement).....	11
Figure 5-Stock Amplifier with Dynamite Capacitor Configuration Installed	13
Figure 6-Dynaco PC-15 Power Supply and Updatemydynaco amplifier modules, before changing C12	13
Figure 7-PC-15 Power supply, Updatemydynaco amp modules, after C12 replacement	14
Figure 8-PSUG Power Supply and Updatemydynaco amplifier modules, after C12 replacement	15

Section 1: About This Manual

This manual covers the replacement of the stock C12, a 3300 μF capacitor, with a total of 20,400 μF . This gives any Dynaco Stereo 120 better bass.

This manual includes the EZTOP option. It's a specially designed round circuit board that fits over the top of the 3 capacitors that make up the C12. Compared to wiring up the caps with bus wire, EZTOP just looks better.

This manual covers 4 configurations of power supply and amplifier circuit boards:

Power Supply	Amplifier Modules	Upgrade Kit
Dynaco	Dynaco	C12DD
Updatemydynaco	Dynaco	C12UD
Dynaco	Updatemydynaco	C12DU
Updatemydynaco	Updatemydynaco	C12UU

Some sections of this manual are common to all the configurations. Some sections are specific to your configuration. The headings and introductions clearly label each, making your upgrade easy to complete.

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
3. can get to YouTube to watch a video about the assembly process

Tools You'll Need

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

1. multi-meter capable of reading the 72 Volt (nominal) DC Power supply output
2. flat blade screwdriver for #6 screws, #2 Phillips screwdriver
3. pliers or nut drivers suitable for #6 hardware (5/16" nut driver or hex wrench)
4. needle nose pliers (helpful, but not strictly necessary)
5. pencil type soldering iron of 25 to 50 Watts (no huge honking soldering guns or blowtorches)
6. wire cutters and strippers
7. wooden toothpicks (or some other means of clearing component holes of solder)

Project Overview

The project replaces C12 with a group of 3 capacitors, all connected with the EZTOP Printed Circuit board. There may be some other components that are replaced depending upon your configuration. The major steps are:

1. Checking the existing Dynaco Stereo 120 power supply.
2. Replacing C10 on PC-15, and/or modifying Updatemydyanco amplifier modules
3. Building and installing the new C12 with the EZTOP.
4. 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 C12XX 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.

Check the Power Supply Voltage

First, you'll need to safely check the power supply output voltage.

1. Turn the Stereo 120 power switch off.
2. Keeping hands well clear of the inside of the Stereo 120, plug in the power cord.
3. Turn the Stereo 120 power switch on, and give the amp about 15 seconds to stabilize.
4. Refer to Figure 4. Measure the DC voltage present on the terminals of C12. The nominal voltage is 72 volts.
 - a) You may proceed with the rest of these directions if the actual voltage is between 68 and 76 volts.
 - b) If the voltage is more than 80 Volts, do not go on. Repair the regulator. There are some hints about this on the Updatemydynaco web site. If you're good at building, but not strong on electronic troubleshooting, it might make more sense for you to purchase the PSUG kit.
 - c) If the voltage is less than 68 volts, do not go on. Repair the regulator or determine if its output is being overloaded by the amplifier modules.

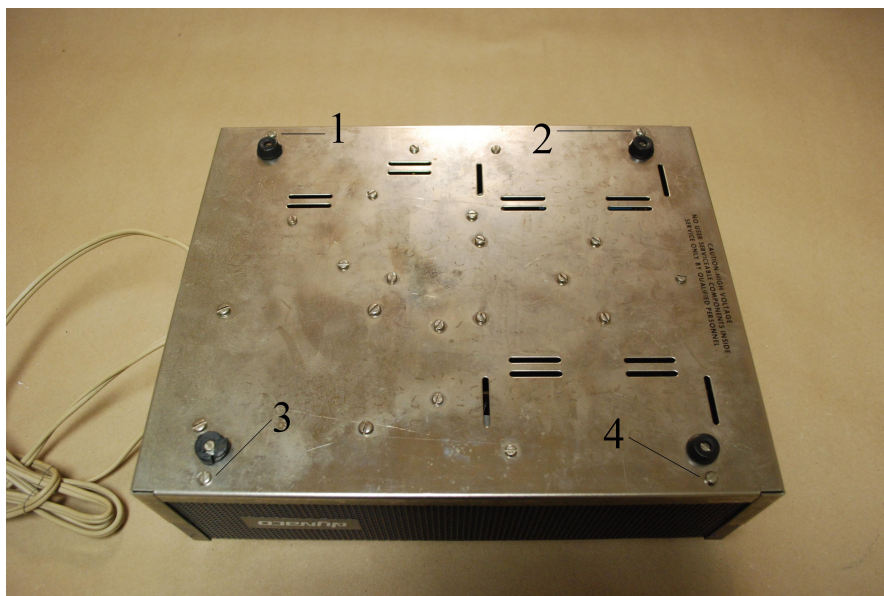


Figure 1-Location of the four screws that hold the cover to the base

If the voltage on C12 was within tolerance, then:

1. Remove the power plug from the wall socket
2. Turn the Stereo 120 power switch off.
3. Allow one full minute for the capacitors to discharge.

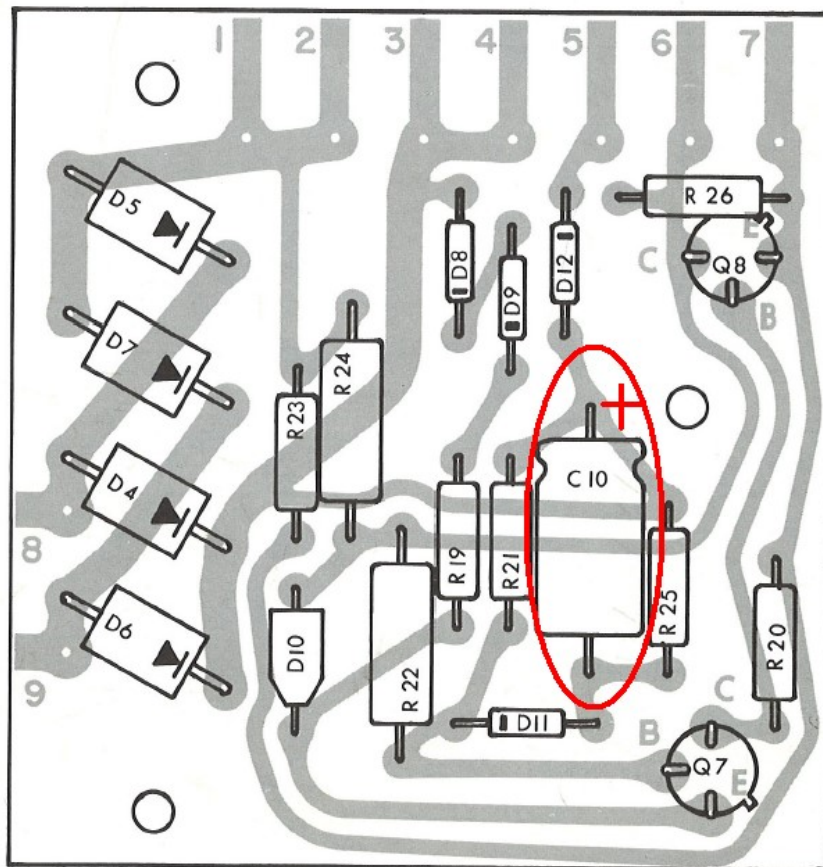
Removing the PC-15 module and Replacing C10

- Perform this step if your Stereo 120 uses the original Dynaco PC-15 power supply regulator.
- Skip to “Building the Dynamite Capacitor with the EZTOP PCB” if your Stereo 120 uses the Updatemydynaco PSUG kit.

Important: If your Stereo 120 used the original Dynaco PC-15 regulator board, then C10 must be replaced. It is not optional. If you change C12 from 3300 μ F to 20,400 μ F and do not change C10, then your regulator will die, causing further damage to the amplifier!

1. To remove the PC15 module, loosen the two 6-32 screws and nuts that hold the heat sink to the chassis. One of the screws may also hold a foot. There will probably be lock-washers under the nuts. Don't lose them, and don't allow them to go wandering loose inside the amplifier.
2. De-solder the red and black wires from C9, at the C9 end (see Figure 4).
3. At the C12 end, clip (or de-solder) the red wire that runs from PC-15 eyelet 4 to the positive terminal of C12.
4. With a little care, you should now have enough leeway to lift the power supply module free of the chassis.
5. Remove and save the three long screws, nuts, stand-offs and lock washers that secure the PC-15 circuit board to the heat sink. Be sure to keep track of the lock washers so they don't end up rattling around inside the amplifier.
6. Carefully lift the bottom end of the PC-15 away from the heat sink to gain access to the component side of the board.

7. C10, nominally 50 μ F, is the only large capacitor on the PC-15. De-solder and remove C10.
8. Clear the holes in which C10 was previously installed using your favorite method, be that solder wick, a sold-a-pult, or a solder sucker. My favorite method is the “toothpick trick”, as it’s inexpensive.
 - a. Insert a toothpick from the component side, while simultaneously heating the pad on the solder side.
 - b. Push the toothpick through the hole to clear it.
9. Install the new C10, a 330 μ F capacitor. Make sure that the polarity is correct. The ridged (positive) end of the cap goes in the hole closer to the center of the board.
10. Solder both leads of C10, and then clip the extra lead length.
11. Re-install the 3 screws, standoffs, nuts and lock washers to once again fasten the PC-15 to the heat sink.
12. Do not re-install the regulator assembly to the chassis. That will be done later.



POWER SUPPLY CIRCUIT BOARD

Figure 2-Dynaco PC-15 Power supply board highlighting C10 location and polarity

Building the Dynamite Capacitor with the EZTOP PCB

1. You'll replace C12, a single 2.5" diameter capacitor with three 30 mm diameter capacitors connected by the EZTOP PCB as shown in Figure 3.



Figure 3-3 30 mm diameter capacitors take the space of one 2.5" diameter capacitor

2. Orient the three capacitors with the ***negative*** leads in the center of the grouping.
3. Hold each cap flat to the PCB as you solder the central lead of each capacitor.
4. Before you go on, double check that the negative ends of the capacitors are positioned in the centrally located holes.
5. Make sure that the PCB sits flat on the top of the three capacitors. If it doesn't, re-heat and re-adjust the centrally located solder joints.
6. Solder the positive terminals on all 3 caps.

Removing the Old C12

1. Either de-solder or cut the remaining red wires on the old C12 near its positive terminal.
2. De-solder or cut the black wire(s) from the old C12 negative terminal near that terminal.
3. Loosen the clamp-band-tightening screw on the C12 clamp. Wiggle and rotate the old C12, then lift it up and out of the amplifier. You may have to loosen the band-tightening screw a bit more, but try and leave the nut on the bolt to make reassembly easier.

Installing the New C12 Dynamite Capacitor Configuration

A few preliminary words about UP, DOWN and Polarity

Most of the pictures show the wires inserted from the top of the EZTOP PCB. That was just a convenient and clear way to show their locations. The wires that connect to the EZTOP PCB can be inserted from either the top or the bottom. Here are a few hints that may help you avoid problems.

1. If you insert the wires from the top, it may be very awkward to solder them on the bottom of the PCB. A good alternative is insert the wire from the top, backing the insulation about 1/8" out of the hole. This gives you room to solder the wire from above without burning the insulation.
2. If you insert the wires from the bottom, twist them before you insert them. That way, you can track that all of the strands came through the hole. The last thing that you want is a pair of hidden strands from positive and negative terminals shorting together by accident.
3. Get the polarities right. Assuming that you are using sensible color coding:
 - a. Red=positive
 - b. Black=negative
 - c. Stay out of trouble by double checking that Red goes to POS and Black goes to NEG

Wiring the C12

Now it's time to install the new capacitor arrangement and reconnect the wires. Review Figure 4 through Figure 8 to determine which is closest to your replacement conditions. Use those Figures to guide the rewiring of the C12 replacement capacitor.

1. Fit the new dynamite capacitor configuration into the clamp. Rotate the cap so that the amplifier red wires will reach the Positive Wire Harness.
2. When you're sure that the disconnected red wires will reach a capacitor terminal, snug up the capacitor clamp band. Do not over-tighten it¹.
3. Reconnect (crimp and solder) the disconnected red wires to the positive wire harness using the appropriate figure as your guide.
4. Reconnect (crimp and solder) the disconnected black wires to the ground harness, using the appropriate figure as your guide.

¹ It may help to loosen one or more of the screws that hold the capacitor clamp to the chassis.

5. Inspect your work carefully. Make sure that there is no possible way for wires connected to the positive and negative terminals of the new C12 configuration to come into contact.

If your Stereo 120 uses the Updatemydynaco PSUG power supply regulator, then skip to “Check and Test Your Work”.

Reinstall the Regulator Assembly

This section only applies to Stereo 120's that use the original PC-15 power supply regulator board.

1. Re-use the previously installed 6-32 hardware (nut, bolt, and lockwasher) to connect the regulator assembly to the chassis.
2. Remember that one of the mounting screws typically holds a mounting foot.

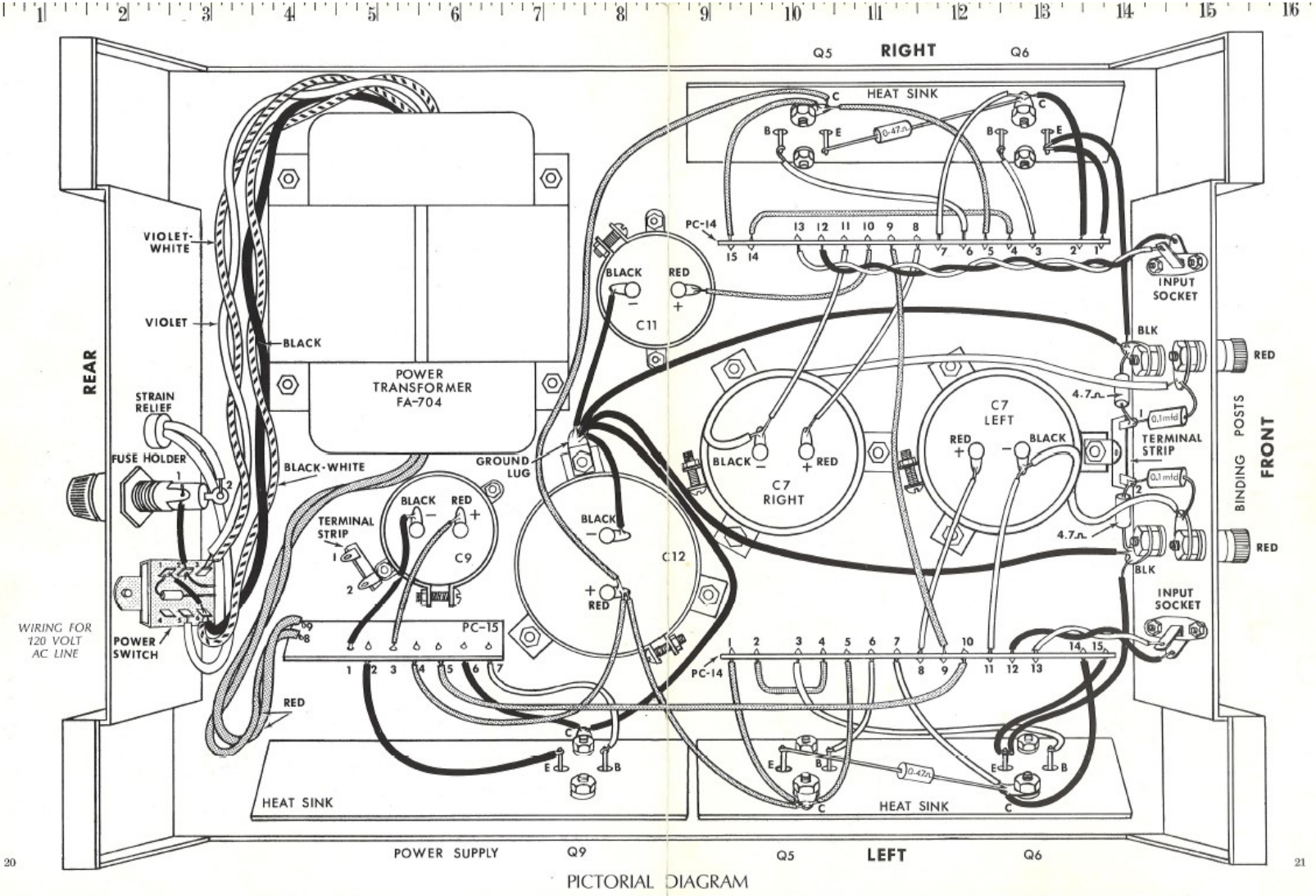
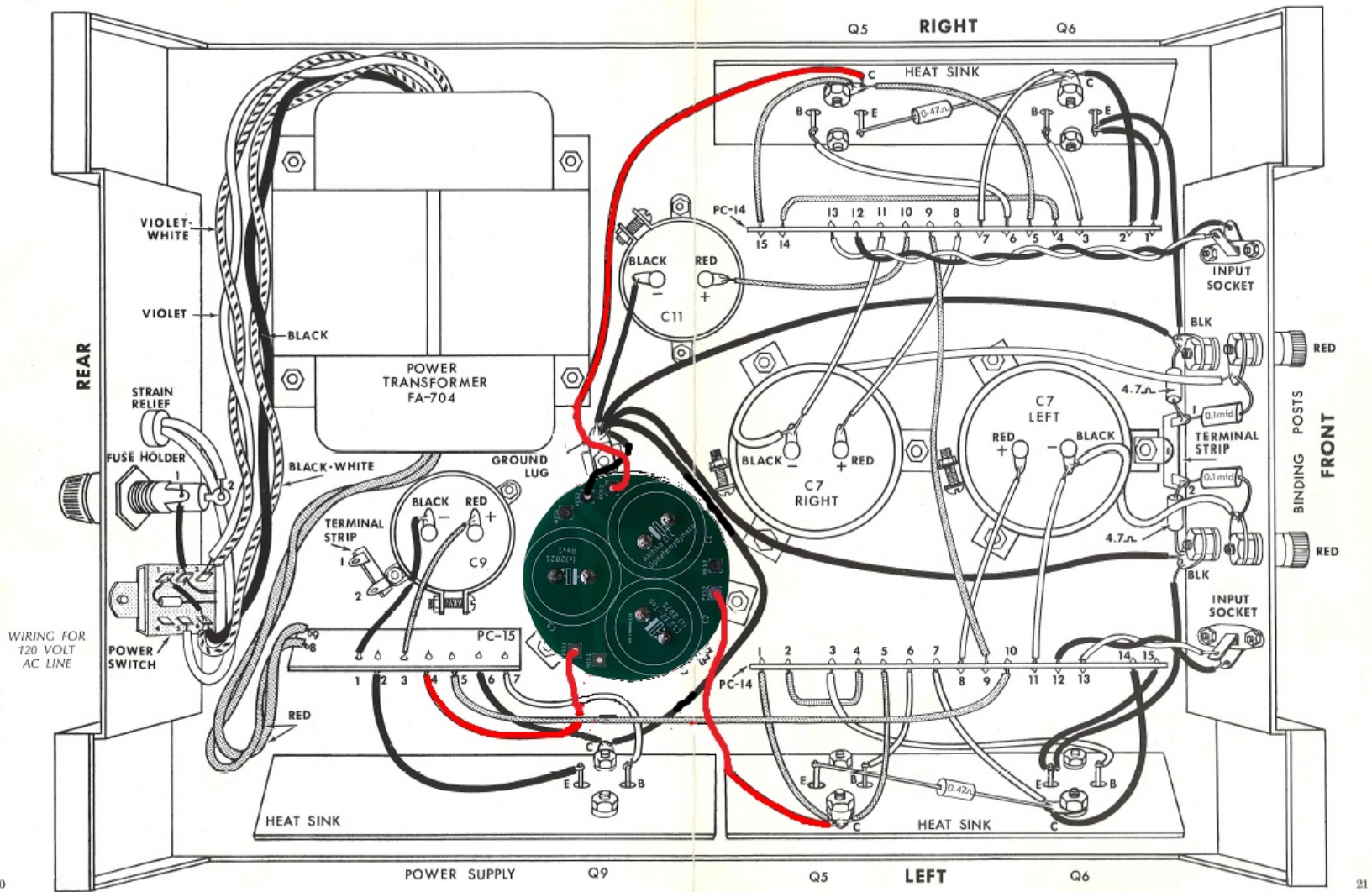


Figure 4-Stock amplifier layout (before C12 replacement)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16



WIRING FOR
120 VOLT
AC LINE

20

PICTORIAL DIAGRAM

21

Figure 5-Stock Amplifier with Dynamite Capacitor Configuration Installed

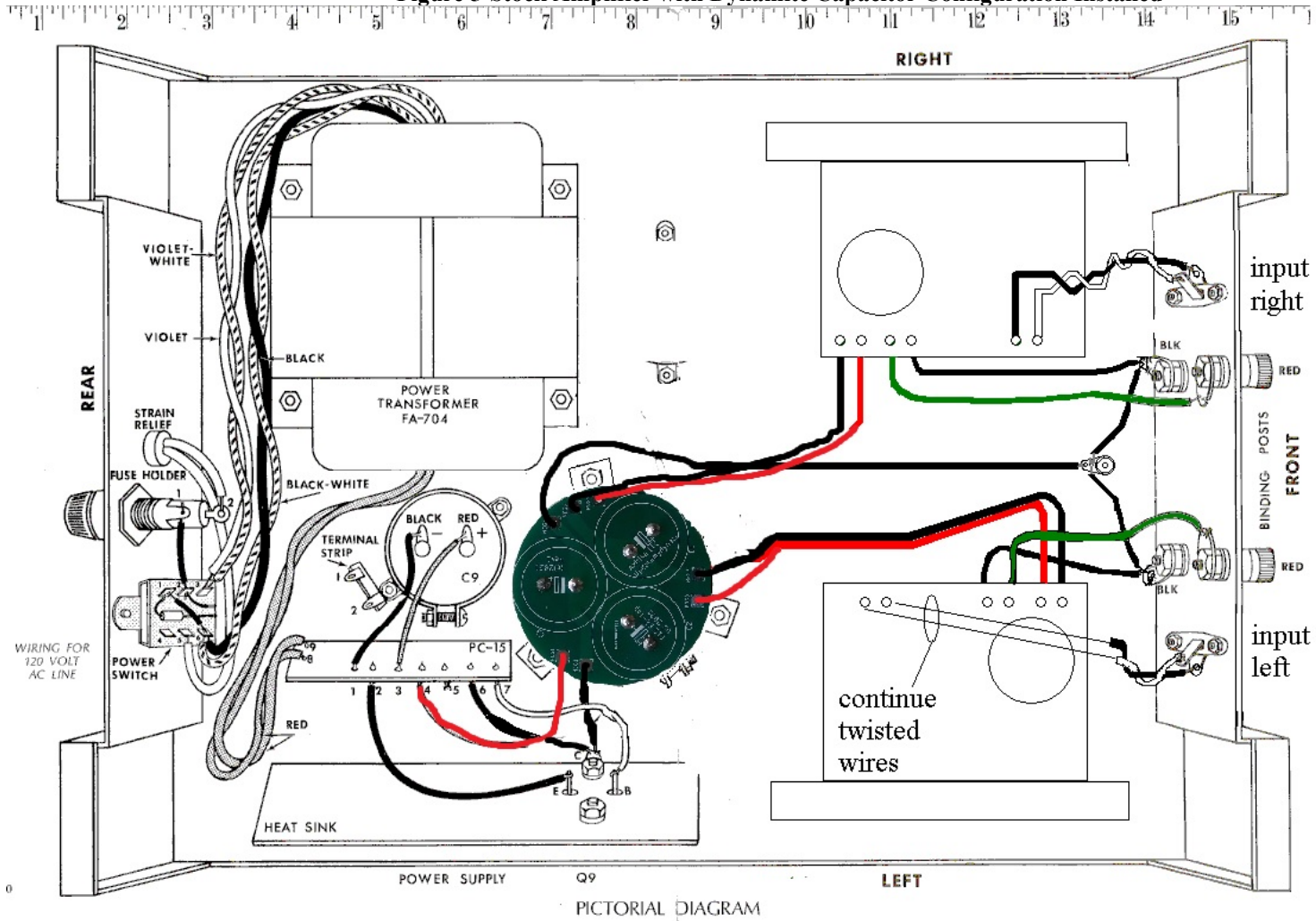


Figure 6-Dynaco PC-15 Power Supply and Updated dynaco amplifier modules, before changing C12

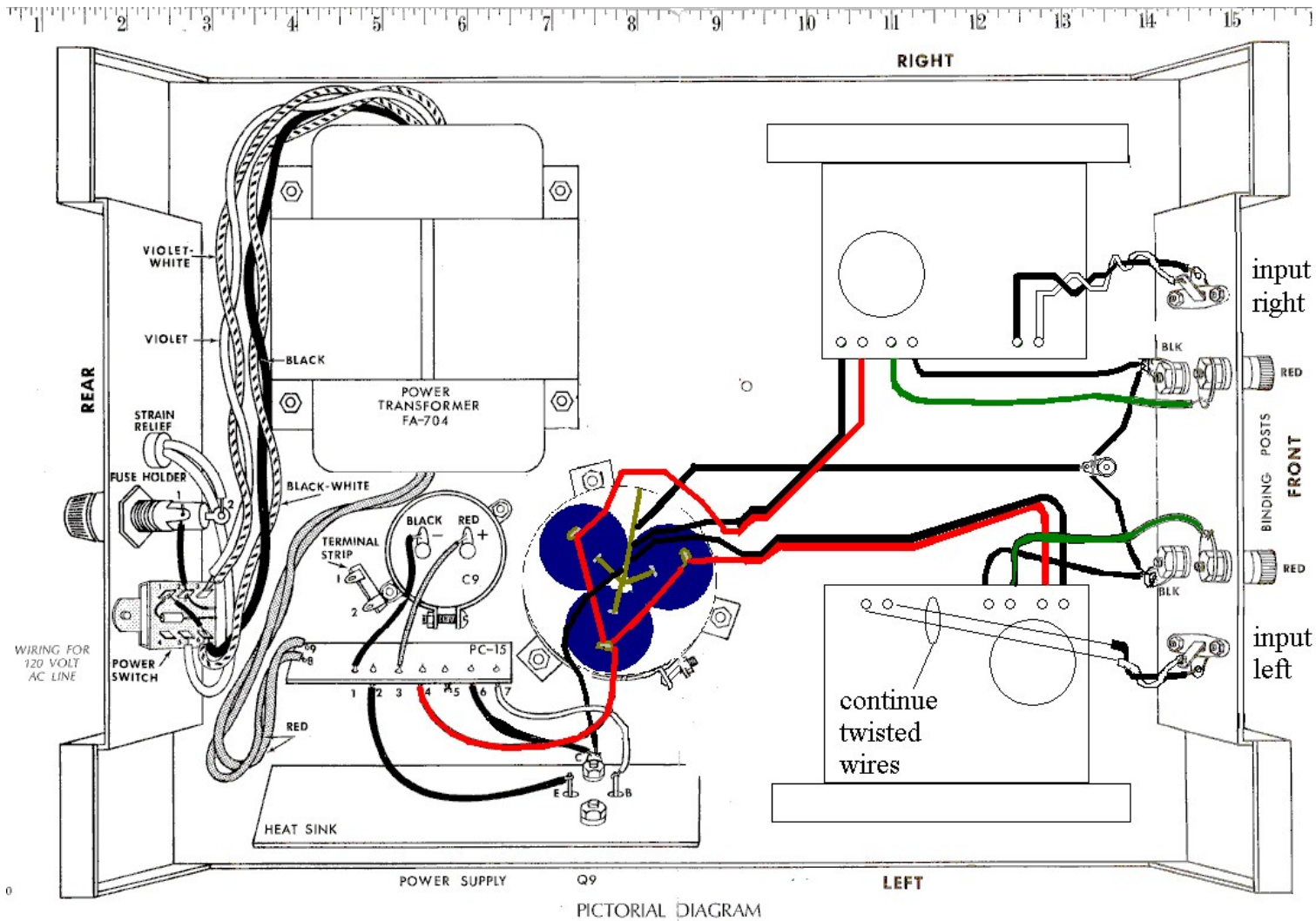
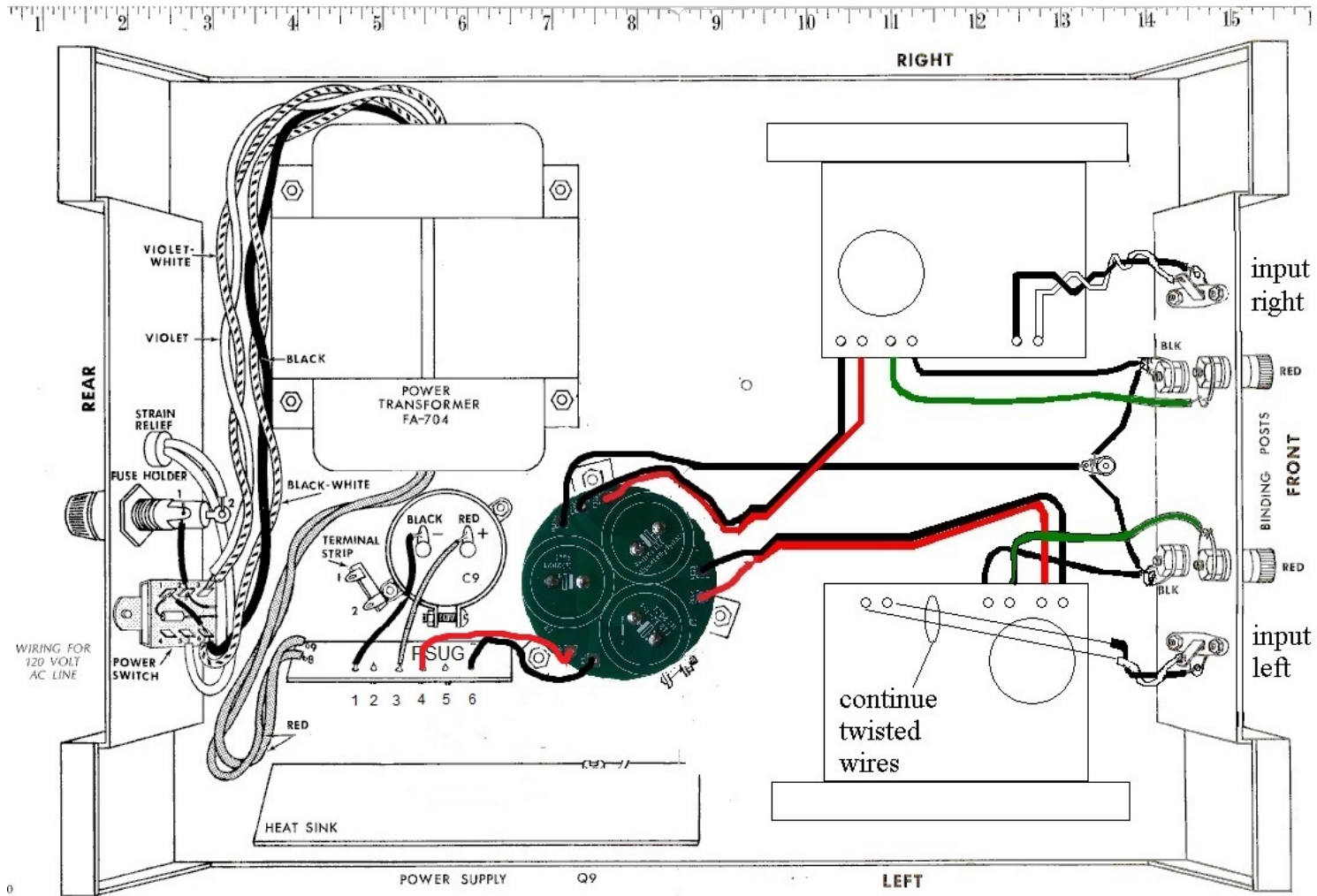


Figure 7-PC-15 Power supply, Updatemydynaco amp modules, after C12 replacement



PICTORIAL DIAGRAM

Figure 8-PSUG Power Supply and Updatemydynaco amplifier modules, after C12 replacement

Check and Test Your Work

You're about to check and test your work. Please *recall that there are potentially lethal voltages in the amplifier. Please continue to work safely.*

1. Make sure that the AC cord is still disconnected from power.
2. Verify that the wires connected to the positive and negative terminals of C12 cannot, under any foreseeable circumstance, come into contact!
3. Place the rocker power switch in the Stereo 120 in the ON position.
4. Plug the amplifier power cord into a power outlet.
5. There may be the usual "bong" as the amp powers up, but there should be nothing else notable.
6. After 30 seconds or so, check the DC voltage on the new C12, it should be the same voltage you observed before replacing C12.

Reassemble the Amplifier

Remove the power cord and wait one full minute before proceeding. Reinstall the amplifier cover using the four screws that hold it in place.

Results

Once you've placed the amplifier back in service, you may notice the following:

1. It takes a little longer for the power supply to reach full voltage (a few seconds).
2. Upon turning power off, the amplifier will continue to produce sound longer than it previously would.
3. More extreme low bass power will be available.

References

Be sure to visit www.updatemydynaco.com to see if the latest information, or to download the latest version of this manual.

There's a Youtube video showing parts of the process described in this manual:

<https://www.youtube.com/watch?v=eiDIju3C5Hg>