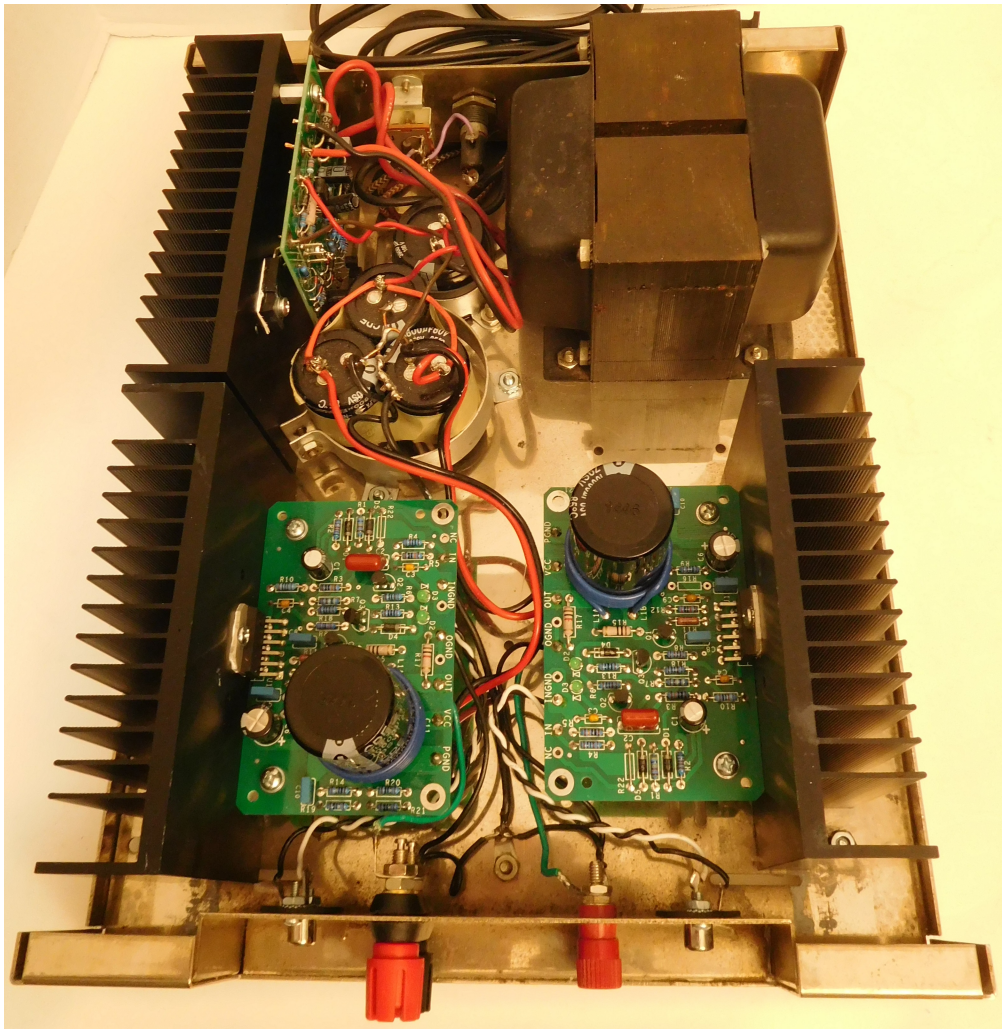
DYNACO STEREO 120
Installing the Really Big Heatsinks for Updated Amplifier Modules



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Section 1: About this Manual

This manual gives you the information you need to replace the original amplifier module heatsinks (or Super Duper Heatsinks) in a Dynaco Stereo 120 Solid State Power Amplifier with Really Big Heat Sinks (RBHSPA). This kit allows your Stereo 120 to deliver more power, particularly at low frequencies, while running cooler.

Who Should Attempt this Project?

This is largely a mechanical project. You can upgrade the heatsinks on you Dynaco Stereo 120 if you can:

1. use simple hand tools like screwdrivers, wire cutters, and pliers.
2. read and follow directions.
3. If you need to increase some wire lengths, you'll need to be able to solder, but in most cases existing wire lengths should be adequate.

Important Note: This kit is only compatible with Updatemydynaco amplifier modules.

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 videos about the assembly process (not yet available)

Tools You'll Need

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

1. Ruler, drill, and 9/64" drill bit, and reamer or rat-tail file (optional).
2. flat blade screwdriver for #6 screws
3. Phillips screwdriver (#2)
4. pliers or nut drivers suitable for #6 hardware (5/16" nut driver or hex wrench)
5. needle nose pliers (helpful, but not strictly necessary)
6. optional, probably not needed for this project:
    a. pencil type soldering iron of 25 to 50 Watts (no huge honking soldering guns or blowtorches)
    b. wire cutters and strippers

Project Overview

The project consists of the following steps:

- Remove the stock heat sinks and updated amplifier module combination from the amp
- Mark and drill the chassis with additional 9/64" holes, and perhaps enlarge a small area of a slot with a reamer or rat-tail file.
- Move the amplifier modules to the new heatsinks.
- Re-install the new heatsink amplifier module combination.

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 or using power tools 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.

About Components

We reserve the right to make design/or component changes at any time without prior notification.

Recommended Solder

The kit must be assembled with 63/37[1] Rosin Core solder. The recommended diameter is 0.031 inches. Among many such sources of solder, I have used

- Kester 24-6337-8800 50 Activated Rosin Core Wire Solder Roll, 245 No-Clean, 63/37 Alloy, 0.031" Diameter. This is a 1 pound roll of solder. No-clean means that it leaves the minimum possible residue on the PCB.

Section 2: Removing the Amp Modules and Heatsinks

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 the amplifier.

[1] 60/40 solder is acceptable to use, but 63/37 is preferable.

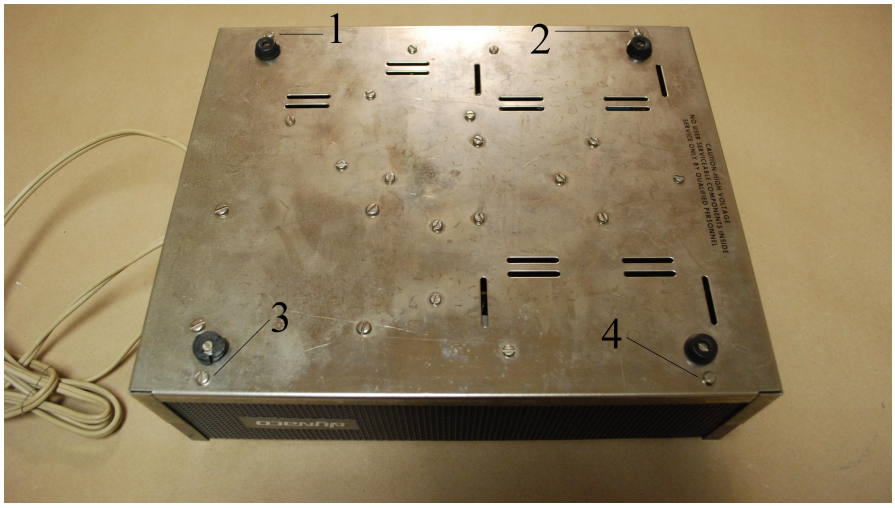

Figure 1-Location of the four screws that hold the cover to the base

Remove the Amplifier Modules and Heatsinks

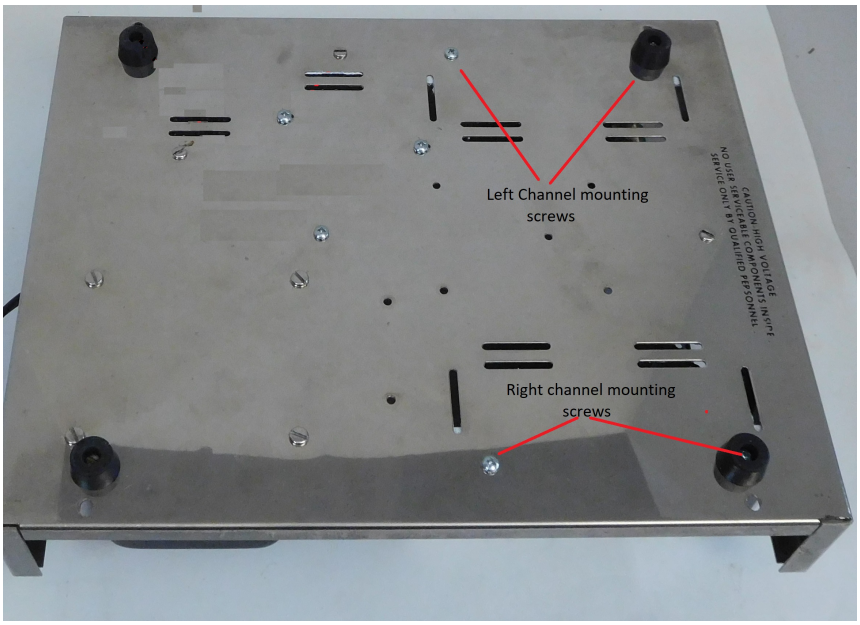

Figure 2-Remove the screws that hold amplifier module heatsinks to the chassis

1. Remove the two screws that hold the left channel Amplifier Module/Heat-sink combination to the chassis.
2. Remove the two screws that hold the right channel Amplifier Module/Heat-sink combination to the chassis.

Separate the Amplifier Modules from the Heatsinks

1. Remove the hardware that holds the amplifier mounting brackets to the existing heatsinks.
2. It is unlikely that you'll need to disconnect any wires. Just make sure that the amplifier modules won't be in harms way as you drill the new holes in the next section.

Drill the Mounting Holes for the Amplifier Heat Sinks

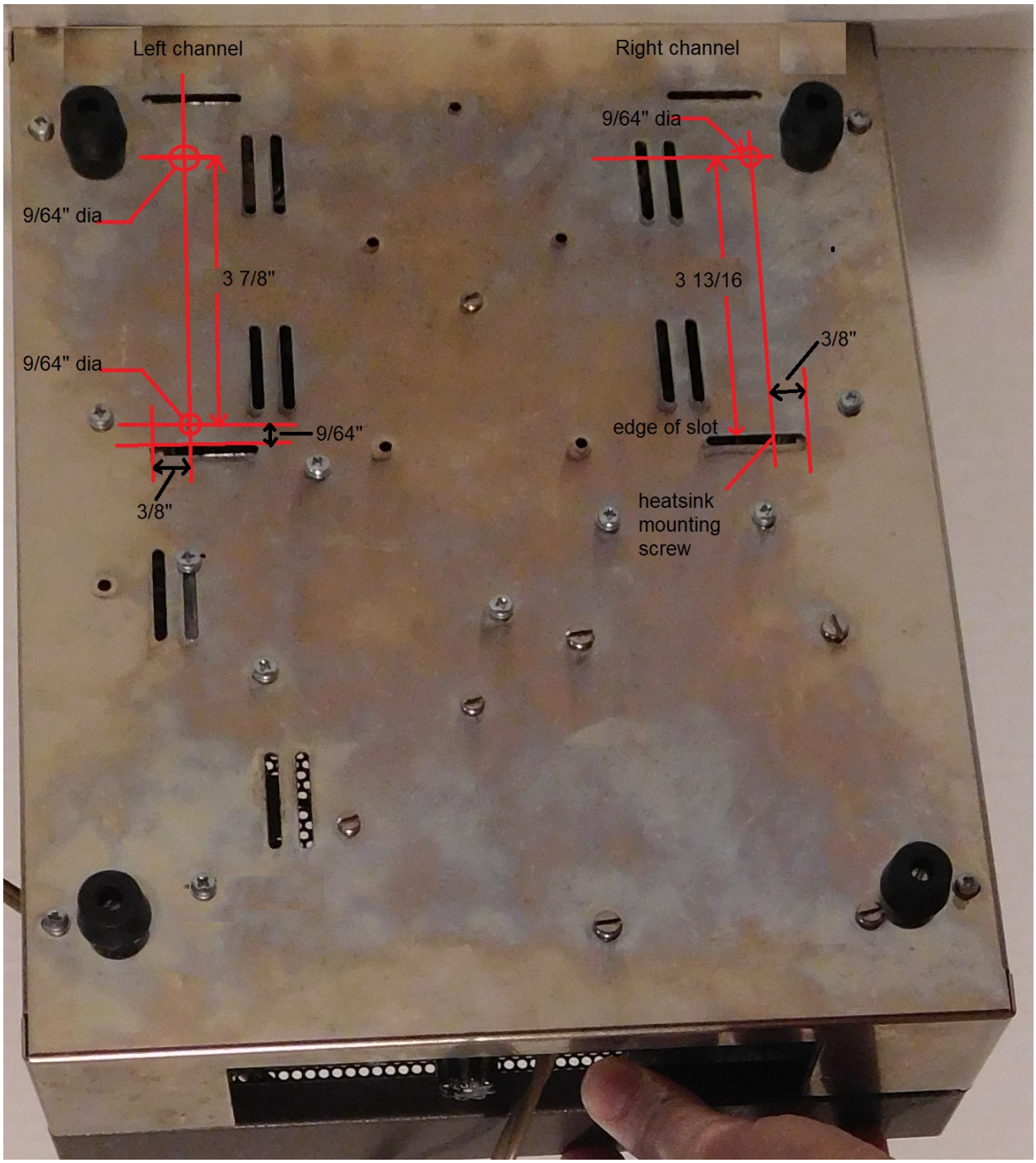

Figure 3-Drilling two holes to mount the heatsinks

Orient the amplifier to match Figure 3. Note that some amps will have the “no user service parts” message written across the top of the chassis. Mark the locations of the new holes as shown. The most important dimension is the one between the heat sink mounting holes, 3.875”, or 3 7/8”, but this is marked off differently for the right and left channels. Please carefully read the upcoming sections on the right and left channel hole locations.

Right Channel Hole Locations

For the right channel, the measurement shown is 3 7/8"-1/16"=3 13/16". This is because the measurement is to the inside edge of the slot and the slot is 1/8" wide.

A word about the slot: The slot is a bit too narrow to accept the screw. With a bit of persistence, you can screw the screw through an unmodified slot. It's probably preferable however to open it up a bit with a reamer or rat-tail file. ***We don't recommend putting a power hand-drill into the slot as it's very difficult to control where the bit goes, and you may injure the chassis or yourself.***

Left Channel Hole Locations

For the left channel, that measurement is 3 7/8", as it is specified as the distance between the drilled holes. Follow the other dimensions closely also so that the lid will fit when you're done, and so the hardware for mounting the feet sits in the clear spots between the heatsink fins.

For All the Holes

Here are some useful hints:

1. For each hole, measure twice[2] and drill once!
2. I like to use something pointy, like an awl, to exactly mark the hole positions. Locate the point of the awl exactly, then push straight down. Use the depression that the awl makes in the metal to guide the drill when you make the hole.
3. Start with a small diameter drill, perhaps 1/16". This makes it easier to keep the hole from wandering.
4. You'll want to avoid broadcasting metal shavings through the amp. I do that by making a catch basin at the marked drilling sites, but on the inside of the chassis, with duct tape or packing tape. The sticky stuff tends to capture the metal shavings. When the hole is done, remove the packing tape and the captured metal shavings by just removing the tape.

Mount the amplifier modules to the Really Big Heat Sink Pair

1. Smear a thin film of thermal compound onto the mounting surface of the LM3886. If the old thermal compound seems dry or crusty, you might want to remove it first using isopropyl alcohol and paper towels. ***Be careful, isopropyl alcohol and paper towels are quite flammable.***
2. Insert the following screws loosely until you see that everything fits, then tighten the screws:
    a. Use the screw from the previous mounting arrangement to fasten the LM3886 to the heatsink.
    b. Use the screws from the previous mounting arrangement to fasten the amplifier brackets to the really big heat sink.
        i. If you are replacing Super Duper heatsinks, everything is set to move these screws to the new arrangement.

[2] Norm Abram, this "This Old House".

ii. If you are replacing the original Dynaco heatsinks, you'll need to drill a 9/64" clearance hole in each bracket. You'll then use the supplied 6-32x3/8" sems screws to fasten the brackets to the new heatsink.

Install the Heatsinks into the Amplifier and re-install the feet

Use the supplied 6-32x3/8" sems screws to hold the amplifier modules into the chassis. For the ultimate in heat-sinking, you may want to apply thermal compound to the surface of the heat-sink that mounts to the chassis. Be forewarned…this can get a bit messy!

Inspect for clearance

Inspect your work, making sure that no wires have gotten pinched in the process of installing the new heatsinks. Make sure that there are no miscellaneous bits of hardware or wire floating around the amplifier.

Testing the Result

If you power up the amp, you should see 72 Volts of DC across C12 after the slow start time has expired. ***Please be careful to stay clear of the high voltages inside the amplifier.***

Turn off the amp and pull the plug before going on. Wait 2 full minutes before continuing.

Reassemble the amplifier

Return the mounting foot to its original hole. Note that the mounting foot is now separate from the RBHS mounting. The mounting nut fits between the fins of the heatsink if you put your added hole in the correct place. Replace the cover and install the 4 screws that hold the cover in place.