Updatemydynaco

Dynaco PAT-4 Preamp Chassis Signal Caps Replacement (PAT4CSC)

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Section 1: About This Manual

This manual gives the information needed to replace the chassis signal caps in Dynaco's PAT-4 Preamp. It covers replacement of:

- C9, tape output cap, both channels
- C10 input caps, both channels
- C11 low filter caps, both channels
- C12 loudness control caps, both channels
- C28, power switch, anti-click capacitor

Note that the phono ground capacitors, which are either part of PEC 555005 or supplied externally with the PAT4PPR or PAT4LP kits, are covered in those cases, and thus not a part of this kit.

This kit replaces electrolytic caps with film caps, a rather more linear type of capacitor that is completely unaffected by the polarity of the applied DC voltage. We have also taken the opportunity to supply better tolerance and/or more robust caps.

Who Should Attempt this Project?

You can build this kit 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. 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 few helpful videos about the assembly process (none are posted as of this version of the manual).

Tools you'll need

You'll need the following tools:

1. Phillips screwdriver (#1 and #2), regular screwdrivers.
2. Pliers or nut drivers suitable for #4 and #6 hardware
3. needle nose pliers (helpful, but not strictly necessary)
4. pencil type soldering iron of 25 to 50 Watts (no huge honking soldering guns or blowtorches)
5. wire cutters and strippers

Helpful Tools

These tools aren't strictly necessary, but make building the kit easier.

1. magnifying glass, if you're over 42!

Project Overview

The project consists of the following steps:

1. Replacing the power switch capacitor.

2. Removing and labeling some wires from the PCBs. This enables you to "roll-out" the PCB's, giving access to the front panel.
3. Replacing the capacitors on the front panel.
4. Replacing the capacitors on the back panel.
5. Reassembling the PAT-4 and returning it to service.

Important Safety Notes

By purchasing, using, or assembling 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 clipping wires 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 2 full minutes for the capacitors to discharge!
- Remove jewelry and rings from your hands and wrists, or anything that might dangle into the amplifier.
- If working on the equipment with the power on, 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.
- Read and understand the safety manuals of all the tools you use.

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 60/40 tin/lead Rosin Core solder. The recommended diameter is 0.031 inches. Among many such sources of solder, I have used both Kester and Radio Shack solder.

Warranty

With the exception of fuses, Akitika LLC will replace for free any parts of a correctly assembled product that fails within one year of the date of purchase when the equipment has been used in home stereo applications. It is the responsibility of the kit builder to install the replacement part(s). This warranty applies to the original purchaser only. It does not apply to units that have been physically or electrically abused, modified without prior factory authorization, or assembled with other than 60/40 Rosin Core solder. Akitika LLC's liability shall in no event exceed the cost paid to Akitika LLC for the kit.

Section 2: Kit Building Hints

Yes, I know you want to ignore this section and jump right into building the kit. However, please ***take a minute and read the advice.*** I've condensed it into bullets so that even you guys who are in a hurry can benefit.

- Stop any time you're feeling confused, tired, or anxious. Taking breaks at those strategic times will keep the build enjoyable and greatly enhance your chances of first-time success.
- A soup bowl is your friend. Before you build, carefully empty the parts into a broad, flat, light colored soup bowl. That makes it easy to find the parts and keeps them from getting lost.
- Is something in this manual confusing? Does something look wrong? Send your questions by email to dan@akitika.com or dan@updatemydynaco.com. You'll help yourself and everyone who builds the kit.

Section 3: Replacing the Capacitors

Removing the Cover

1. Disconnect your PAT-4 from your system.
2. ***Pull your PAT-4's power cord out of the AC wall socket.***
3. Pull any power cords that are plugged into your PAT-4's convenience outlets.
4. Remove the 4 screws (two on each side) that hold the cover in place. Note that some PAT-4's have a 5th screw in the center of the back-panel cover.
5. Remove the cover and set it aside in a safe place.

When to Do this kit?

The directions in this manual assume that you are doing this kit independent of all other upgrade operations. The real issue is getting access to the front panel. Given that:

- If you're re-doing a PAT-4, installing for example:
  - P4LSRC, PAT-4 Line Stage Replacement Components, or
  - PAT4LP, the PAT-4 phono upgrade
  - Install this kit while the boards are out of the PAT-4
  - Skip ahead to "Replacing the Front Panel Capacitors".
- If this is the only upgrade you're making, then these are the instructions you'll want to follow, and move on to "Gaining Access to the Front Panel".

Gaining Access to the Front Panel

If you have already upgraded your PAT4 selector switch, you will not need to remove as many wires from the PCBs. You likely only need to remove the power lines on eyelets 3, 4, 11, and 12 on both boards. If you have not upgraded your selector switch, remove and **label** the following wires from both PCBs (do *not* clip the leads, you will need to reinsert the wires later):

- Eyelets 1-8
- Eyelets 11 & 12

- Any other wires that may be too short in your particular unit, preventing the PCBs from moving freely over the front panel.

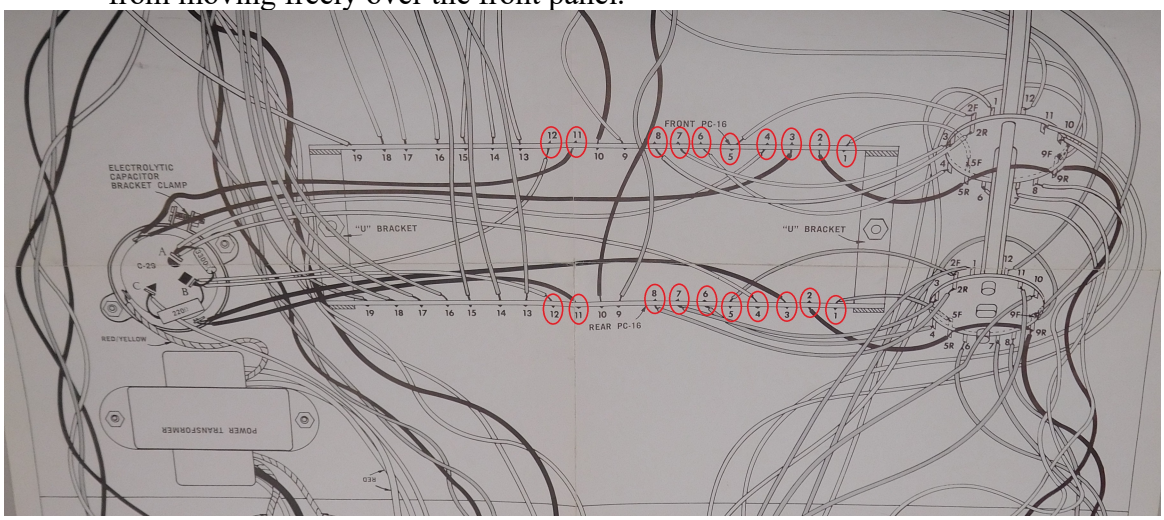

Figure 1-Remove these wires to gain front panel access

Once you have pulled the wires from the PCBs, unscrew the "U" bracket from the chassis floor and "roll" the two boards over the front panel, as shown in Figure 3.

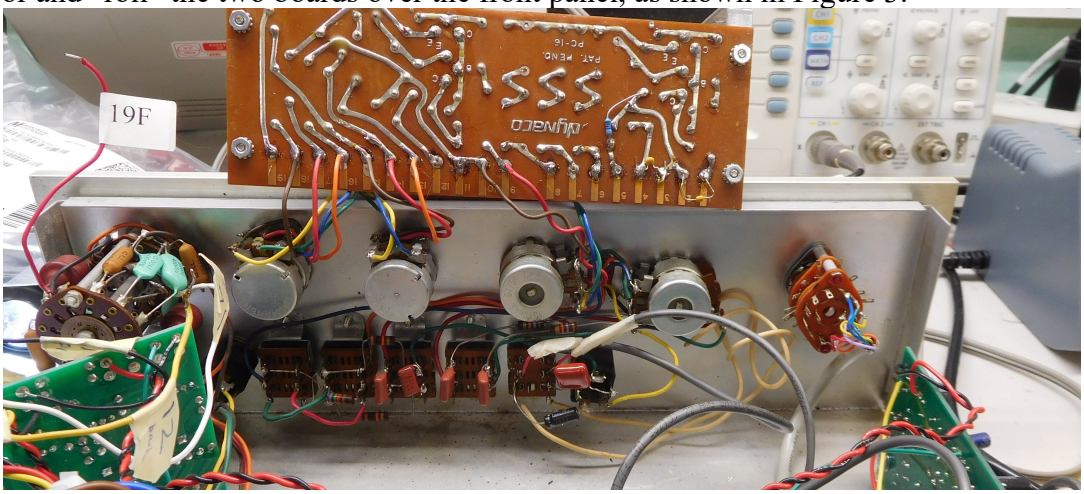

Figure 2-Gaining access to the capacitors on front panel (all but one are replaced here)

Replacing the Front Panel Capacitors

Now that the front panel is accessible, replacing the capacitors is a fairly easy task. We suggest that you remove and replace one capacitor at a time.

Front Panel switch marking	Figure 3 switch marking	Value	Done?(✓)
LO FILTER	RS (rumble switch)	0.01 uF (10 nF), marked 103J	□ (both caps)
LOUDNESS	LS (loudness switch)	0.022 uF (22 nF), marked 223J	□ (both caps)

For the 0.01uF and 0.022uF caps, no insulation is necessary, but be careful not to cross a capacitor lead with another contact.

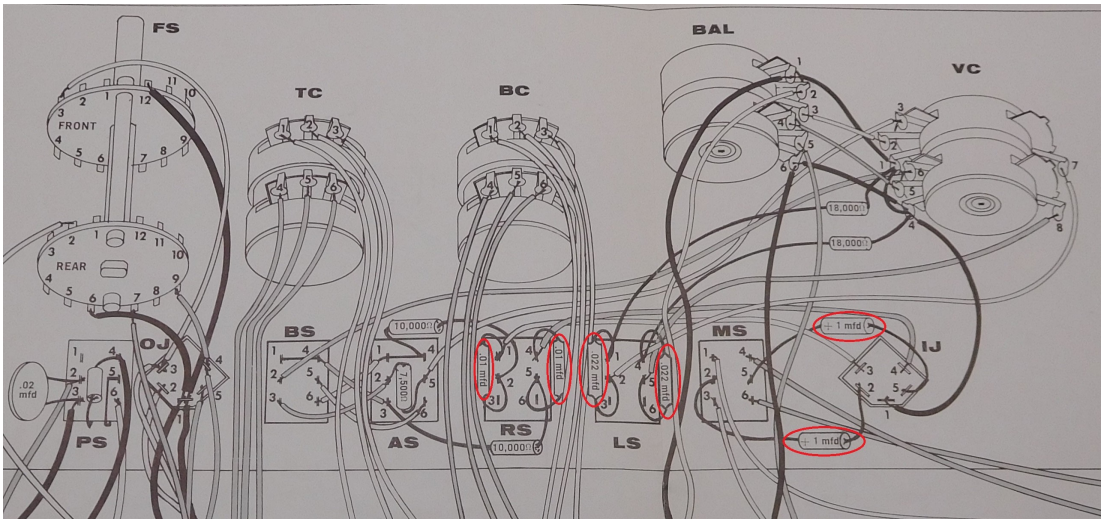

Figure 3-Front panel illustration displaying capacitor locations

Insulate both leads of the 1 µF capacitors used on the front panel to prevent short circuits. Use the insulation from the provided 22 AWG stranded wire, stripping off about 5/8" of insulation for each of the four leads and slip them over the lead as shown in Figure 5.

Once safely insulated, replace the "1 mfd" electrolytic capacitors (see the right side of Figure 3) with these new 1 µF film capacitors. Film capacitors are not polarized, and may be installed with either orientation.

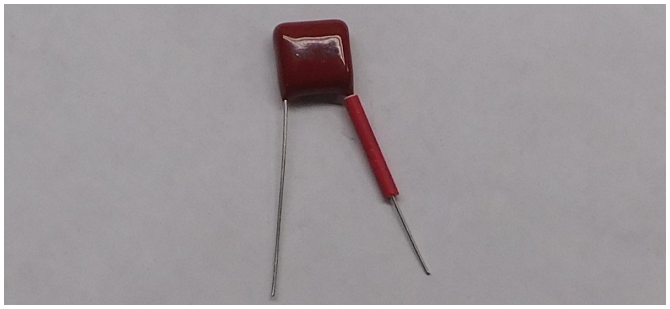

Figure 4-1 µF capacitor with insulation on one lead. You will insulate both leads.

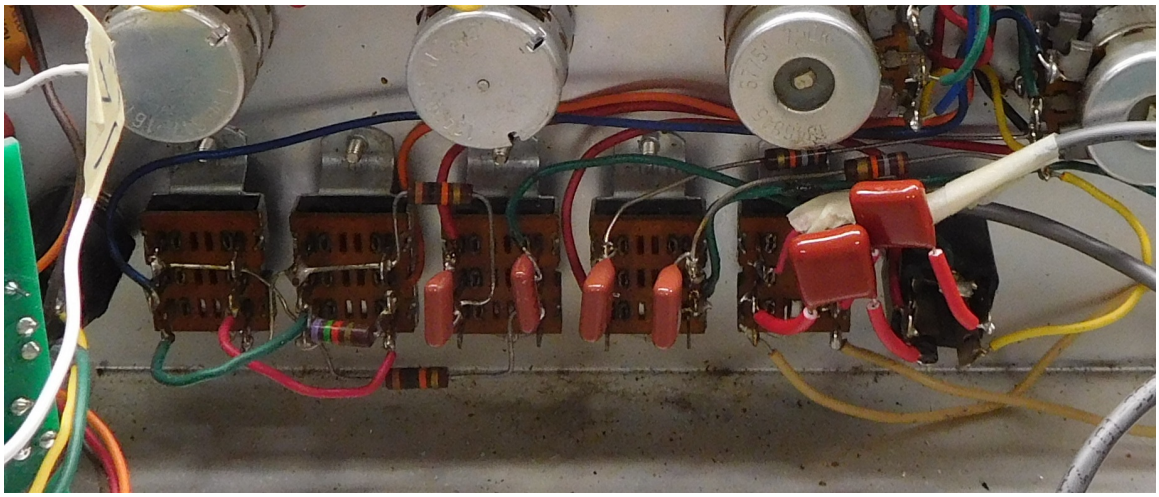

Figure 5-All front panel capacitors replaced

Replacing the Back-Panel Capacitors

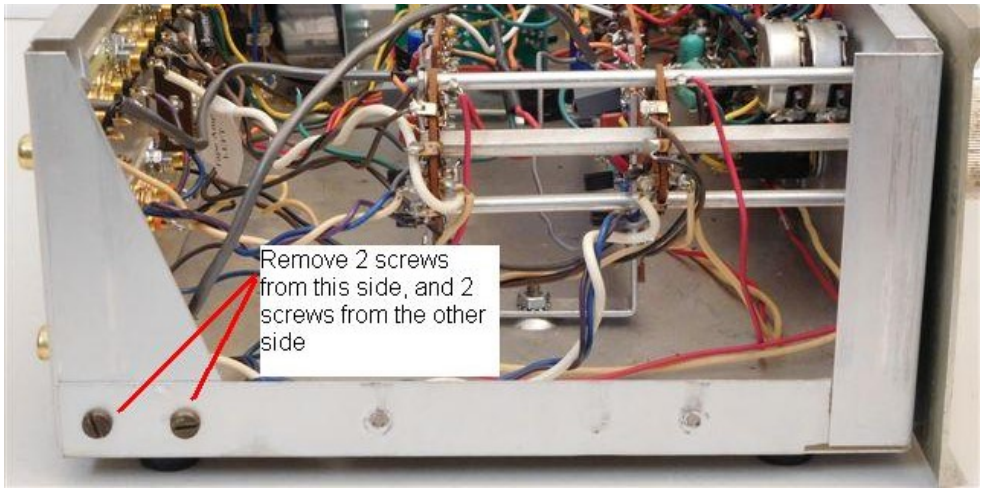

Figure 6-Remove screws to loosen back panel

To make it easier to replace the capacitors in the back panel, we suggest that you remove the four screws holding the back panel to the chassis-bottom to free up wiggle room. These capacitors connect the selector switch output to the TAPE OUT RCA jacks. Note that if you have installed the PAT4SEL upgrade, this has already been done, and you may skip this step.

Once the back panel is loosened, remove the two 1 mfd polarized electrolytic capacitors as shown in Figure 7, and replace them with two 1 µF capacitors provided in this kit. No insulation is necessary.

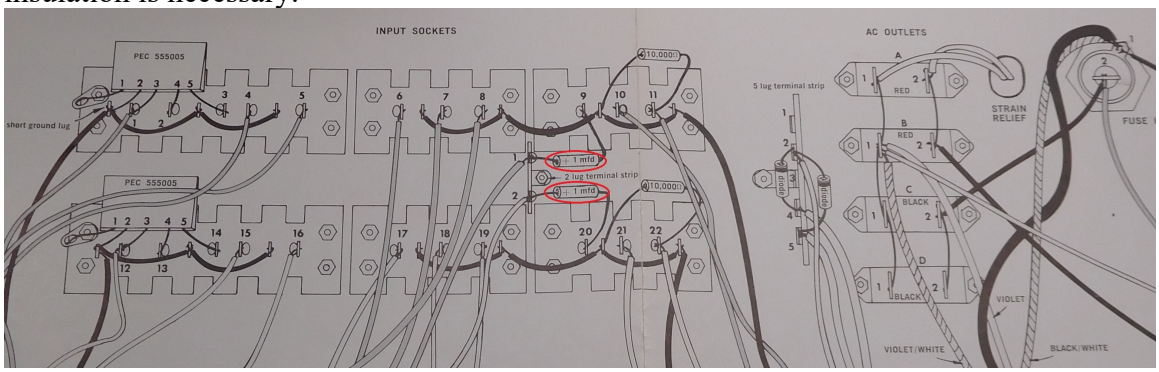

Figure 7-Back panel illustration displaying the two capacitors

Replacing the Power Switch Capacitor

Make sure that the power cord is not plugged in!

Locate the 20nF disc shaped capacitor on the power switch on the front panel, near the transformer as shown in Figure 8. Note that the unit in the photo has an upgraded power supply and may not match your particular preamp, but the location of the power switch capacitor remains the same. Once you've found the capacitor:

- Clip off the leads as close to the tab as possible, or
- De-solder, or
- You may be able to heat up the contacts and wiggle the capacitor out if the leads aren't hooked too well onto the tabs.

Once the old cap is out, replace it with the provided 20nF disc cap (marked 203M) by heating the solder in the tabs and pushing the new capacitor through. Ensure that a strong solder bond is formed with the capacitor and clip the excess leads off. Bend the capacitor forward to leave room for the lid to close. Note that the new cap is rate at 1KV, twice the rating of the original capacitor.

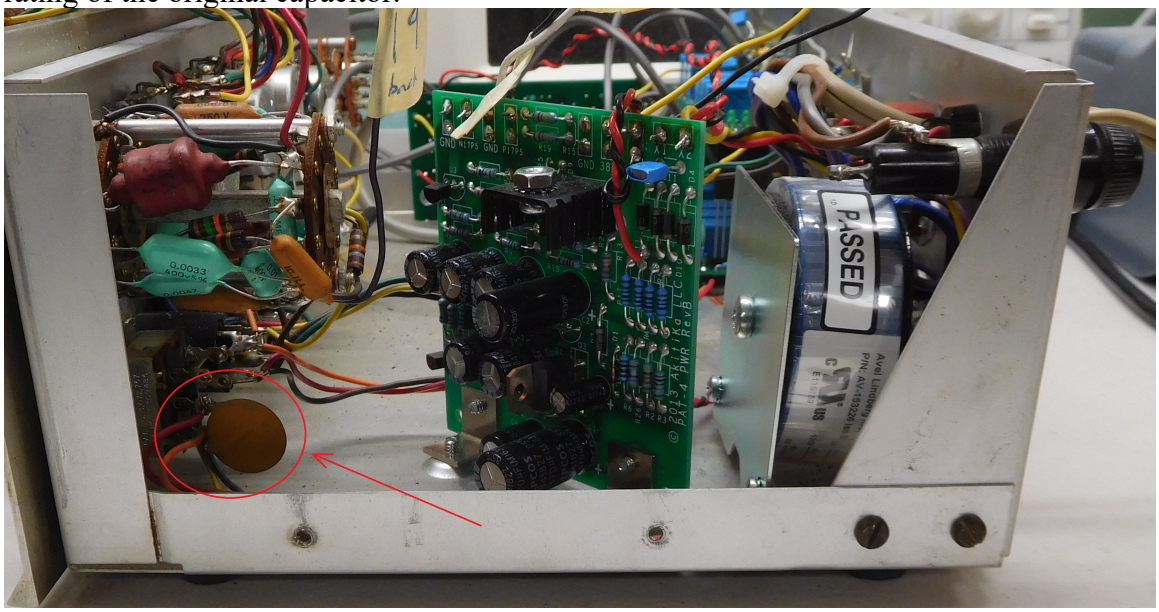

Figure 8-20 nF capacitor on power switch

Putting it back together

Now that all the capacitors have been replaced, all that is left is putting the unit back together!

1. Reinstall the back panel using the four screws, 2 on each side
2. Roll the PCBs back into the chassis. Be careful not to stress the connecting wires.
3. Inspect the connecting wires to make sure that none were broken during the gymnastics of removal and return.
4. Screw the “U” brackets back into place, and re-solder the wires, matching the labels and the numbers on the PCB’s labeled eyelets.