

***Update my dynaco***  
***Dynaco PAT-4 Preamp***  
***And SCA80***  
***Better Balance Control with Detent***  
***(PAT4BBCD)***

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

This manual gives the information needed to build and install a new balance control into either Dynaco's PAT-4 Preamp or SCA80(Q) integrated amp. The replacement is electrically identical to the original balance control, but adds a mechanical detent at the center of rotation. It's a pretty well drop-in replacement. Thus we call it the "Better Balance Control with a detent<sup>1</sup>".

### ***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 typically need the following tools:

1. Phillips screwdriver (#1 and #2), regular screw-drivers.
2. Pliers or nut drivers suitable for #4 and #6 hardware as well as the control mounting nuts
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. Labeling the wires on the balance control.
2. Removing the old balance control.
3. Installing and testing the new balance control.

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<sup>1</sup>The previous version did not have a detent.

## ***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 63/37 Rosin Core solder. The recommended diameter is 0.031 inches. Kester 24-6337-0027 does a fine job, but please note it's a 1-pound spool, enough to assemble very many kits.

## ***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 the recommended 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 for just that board 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](mailto:dan@akitika.com) or [dan@updatemydynaco.com](mailto:dan@updatemydynaco.com). You'll help yourself and everyone who builds the kit.

## Section 3: Replacing the PAT-4 Balance Control

### 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 5<sup>th</sup> screw in the center of the back-panel cover.
5. Remove the cover and set it aside in a safe place.
6. Set up a bowl to receive the parts that you remove.

### Gaining Access to the Old Balance Control



Figure 1-Mark the fully clockwise positions of the front and back tone control knobs

Here's the procedure:

1. Start with the two bass control knobs. Turn both knobs fully clockwise. Put a piece of masking tape on the front panel. Use a pen to mark the fully clockwise position on the masking tape. Use "B" and "F" to mark the end-stops of the Back and Front knobs, respectively. See Figure 2. Remove the two bass control knobs by loosening their set-screws.
2. Move on to the two treble control knobs. Turn both knobs fully clockwise. Put a piece of masking tape on the front panel. Use a pen to mark the fully clockwise

- position on the masking tape with B and F. Remove the two treble control knobs by loosening their set-screws.
3. Note that the clockwise end stops of your equipment may be rather different than the ones shown here. If, upon reassembly, you'd like to check and recalibrate your unit's tone controls, please refer to Appendix 2.
  4. Remove the 4 remaining front panel knobs by loosening the set-screws in the knobs. Store the knobs in a safe place. There is no need to mark their positions as it will be evident when they are re-installed.
  5. Note the locations of the nuts that hold the cosmetic front panel in place. Remove those nuts and save them into your bowl.
  6. Remove the front panel and store it in a safe place.



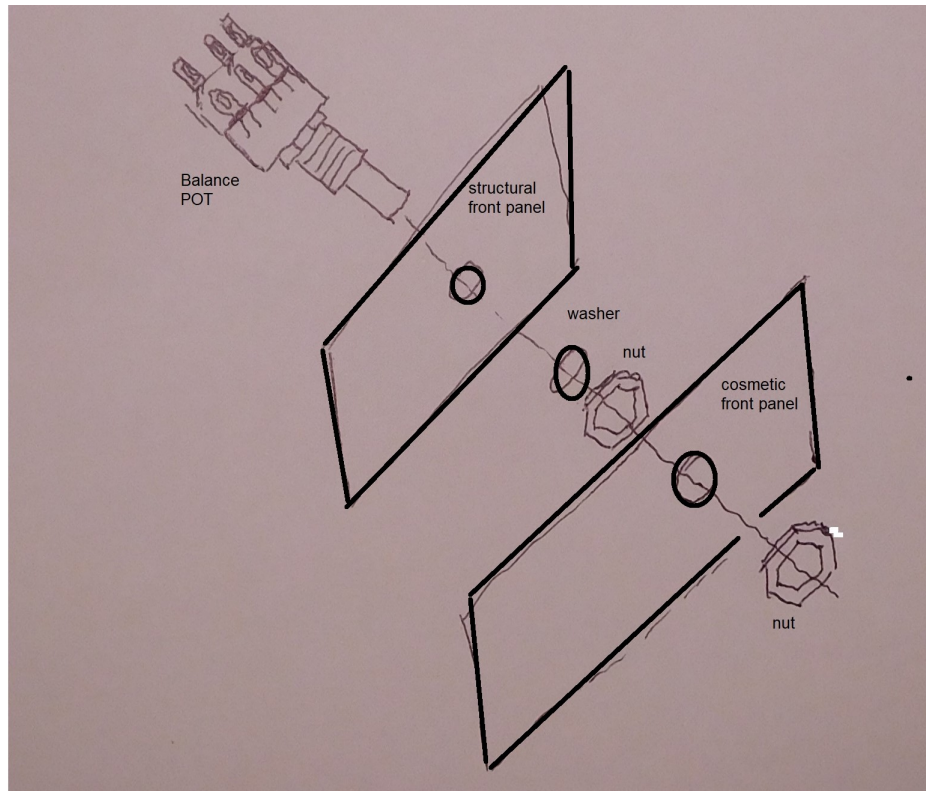
**Figure 2-knobs removed, note markings for clockwise positions of tone controls**



**Figure 3-Viewing the structural front panel with the cosmetic front panel removed**

## ***Replacing the balance control***

Disconnect the existing balance control wires as close to the original balance control as possible. Reconnect the wires to the new balance control as shown in Figure 6. It's as simple as one-by-one removing the wires from the old balance control and attaching them to the new balance control.



**Figure 4-Nuts and washers for balance control installation. Nut holding cosmetic front panel is optional and may depend upon your PAT-4**

You may find that you must replace the ground wires owing to the short length(s) of the original wires. We have included 12" of 22 AWG solid black wire for that purpose.

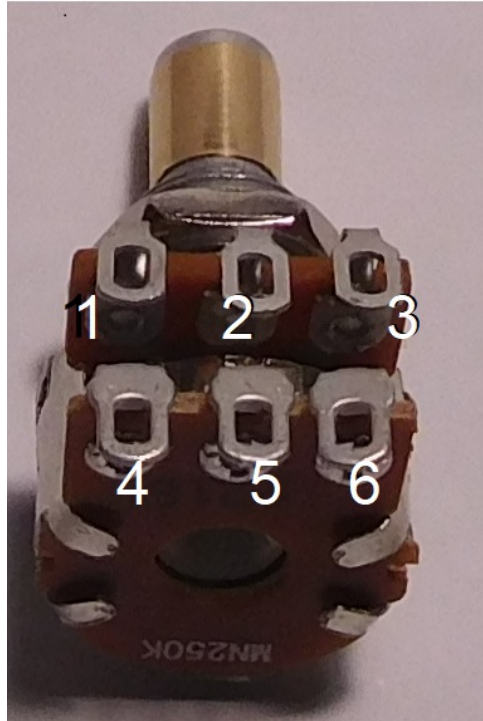


Figure 5-New balance control pin numbering matches the old

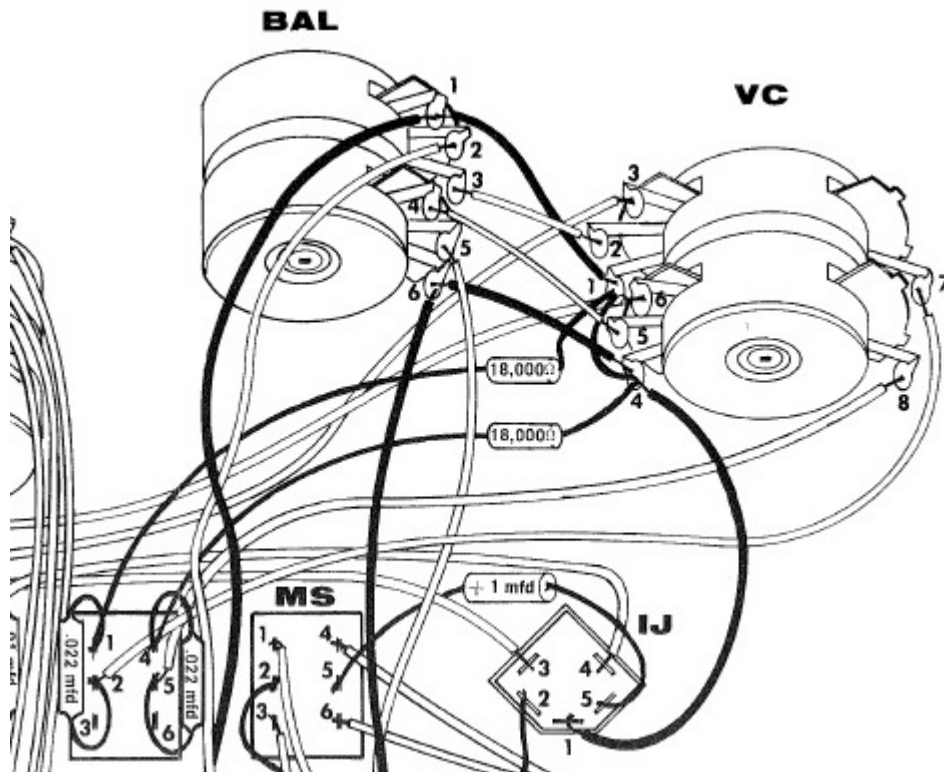


Figure 6-Closeup of original balance control wiring



## **Re-install the front panel**

Reinstall the front panel. Affix it in place using the same nuts that previously held it in place.

Re-install the bass and treble knobs using the B and F marks on the masking tape. Reinstall the rest of the knobs. Replace the cover and install the 4 (perhaps 5) screws that hold the cover in place. Reinstall your upgraded PAT4 into your sound system.

## **Old and New Balance Control Shaft Diameter**

The old balance control had a 6.35 mm (0.25") diameter shaft. The new balance control has a 6.00 mm diameter shaft. For that reason, we include the small gold-colored shaft adapter with the new balance control. It builds out the diameter of the shaft to 6.35 mm (0.25"). Slide the gold colored shaft adapter over the balance control shaft before reattaching the balance knob.

## **Reinstalling the Balance Knob**

Rotate the knob so you can feel when it drops into the detent position. Reinstall the balance knob with the indicator straight up, aligned with the mark on the front panel.