



# Dynaco PAS Preamplifier Volume Control Replacement

## Introduction

At the time the Dynaco PAS preamplifier was designed, high quality close tracking dual potentiometers were not available (at less than stratospheric prices) and therefore it was common practice, even with the highest priced preamps to accept simple ganged controls and accept mis-tracking as inevitable. To circumvent the lack of quality pots, some manufacturers elected to specify multi position switches to address tone control, volume control and on occasion balance control. Since the Dynaco PAS preamp was certainly targeting a cost effective market, the Dynaco engineers did not have this luxury. Instead they specified a standard “off the shelf” dual potentiometer from a variety of suppliers. The result, even when the preamp was new, was volume that varied from channel to channel across the full rotation of the control. This was most evident at the most common, lower half of the control. Users learned to compensate with judicious use of the balance control. Over time the situation became worse as the cheap materials used to fabricate these controls became worn resulting in signal loss and rotational noise.

Nearly all of the samples we encounter suffer from these ills and require a new volume control. Therefore you should consider the replacement of the original volume control as a “must have” modification.

Today there are many options available to replace the original volume control including high quality carbon, plastic film as well as switched attenuator controls. From a subjective measurement and longevity perspective, any one of these choices will provide a reliable high performance replacement that will resolve all of the original problems. It should be noted that some forum posts have reported sound quality gains with the higher priced solutions however our listening panels have not found this to be the case with no type to be superior to any other. On the other hand we have found significant audible improvements with simply replacing the original volume control that we believe are due to improvements in contact resistance and higher quality resistive film. Additionally we have found that moving to a resistance value of 100K compared to the original value of 250K provides subtle audible improvements as well. We believe this is due to more stable films at this value and the higher tolerance of capacitive loading.

Consequently we have elected to offer high quality carbon based potentiometer that delivers all of the performance and reliability targets without unnecessary cost. Our control is a direct drop in including the original LOUDNESS taps.

This document describes the procedure to remove the original PAS Volume Control and replacement with the CAE Volume Control (P/N PAS-VC). The steps defined will require basic soldering skills and tools outlined in the following documents (available from our web page [www.curcioaudio.com](http://www.curcioaudio.com)):

- a. Soldering Tutorial (CAE Tech Note # 2)
- b. Recommended Tools & Test Instruments (CAE Tech Note # 3)

Please take the time to familiarize yourself with all of these documents in particular Tech Note # 2.

**Note 1: During the removal of the original Dynaco Volume Control you will be required to de-solder and label all of the original wires. You must be very careful not to melt any of the original insulation (PVC) – this will require some skill and most importantly good tools including a high quality soldering station (temp controlled), de-solder sucker, and soldering aids. To dramatically improve your chance of success (not to mention going from a chore to fun) I strongly recommend obtaining the correct tools.**

## Procedure

You will begin by removing the PAS faceplate and knobs. Next all of the wires connected to the original PAS volume control will be de-soldered and labeled. The original volume control will then be physically removed and replaced with the CAE replacement Volume Control (P/N PAS-VC). You will be given an opportunity to retain or bypass the original LOUDNESS switch with instructions provided for both options including the re-connecting of all of the original wires and components.

Refer to figure 1 and proceed with the following steps:

1. Disconnect your PAS preamplifier from the AC mains and allow the internal voltages possibly stored in the electrolytic capacitor to discharge over a 20 minute period.
2. Remove the four screws holding the top cover and remove the top cover and bottom plate.
3. Remove all eight knobs from the front of your preamp. Some models use retaining screws located in the barrel of the knob while some versions you will simply pull the knob to remove.
4. Once the knobs are removed you will remove the faceplate. The faceplate is held in place with a series of retaining nuts sharing the same position as the stock switches and controls. You should remove all of the nuts and place aside for use later.
5. You may want to take the time to clean your faceplate and knobs at this point since it is possible to submerge all of these items in a mild solution of "Top Job". Let it soak for 20 minutes and using a soft toothbrush you can clean the ridges of the knobs, Be sure you rinse completely and dry before reinstalling.
6. Referring to Figure 2, de-solder all the wires connected to each of the 8 terminals on the original Volume Control. This includes two 0.1uF capacitors. Label each wire (and capacitor lead) with the number of the pot lug designator as shown in the diagram.
7. You can now remove the original volume control by loosening the retaining nut on the front panel.
8. Install the CAE replacement Volume Control as shown in Figure 1 (or Figure 2).

Since many users never use the LOUDNESS function, we recommend bypassing this feature as a switch contact will be eliminated in your signal path. Alternatively if you will be retaining your LOUDNESS function follow the appropriate steps as illustrated in Figure 2.

Bypassing the LOUDNESS Function (Reference Figures 1 & 2):

9. Refer to Figure 2. De-solder the two 4.7K resistors connected to terminals 1 & 4 of the LOUDNESS switch. De-solder the remaining ends of these two resistors. Keep these resistors as they will be re-used.
10. Cut the two remaining wires connected to the LOUDNESS switch and discard.
11. Cut the two remaining 0.1uF capacitor leads connected to the LOUDNESS switch and discard.
12. See Figure 1. Locate one of the two 4.7K resistors previously de-soldered from the LOUDNESS switch. Connect one end to terminal 1 of the new volume control. Connect the remaining end of the resistor to terminal 7 of the new volume control.
13. See Figure 1. Locate the remaining 4.7K resistor previously de-soldered from the LOUDNESS switch. Connect one end to terminal 4 of the new volume control. Connect the remaining end of the resistor to terminal 8 of the new volume control.
14. Re-connect the six remaining wires to the replacement volume control as illustrated in figure 1.

Retaining the Original LOUDNESS Function (Refer to Figure 2)

15. Re-connect all of the original wires and component leads previously de-soldered from the volume control to the replacement volume control.

Reassembling your Preamp

16. Reinstall your front panel using the original nuts
17. Re-install all of the original knobs at the correct locations. Be sure to position each knob so that they rotate symmetrically across the full rotation (with top dead center at the center of the rotation).

You have now completed the modification. Replace the bottom plate and top cover and secure with the four screws.

Figure 1  
 PAS Volume Control Wiring Diagram Without LOUDNESS Switch

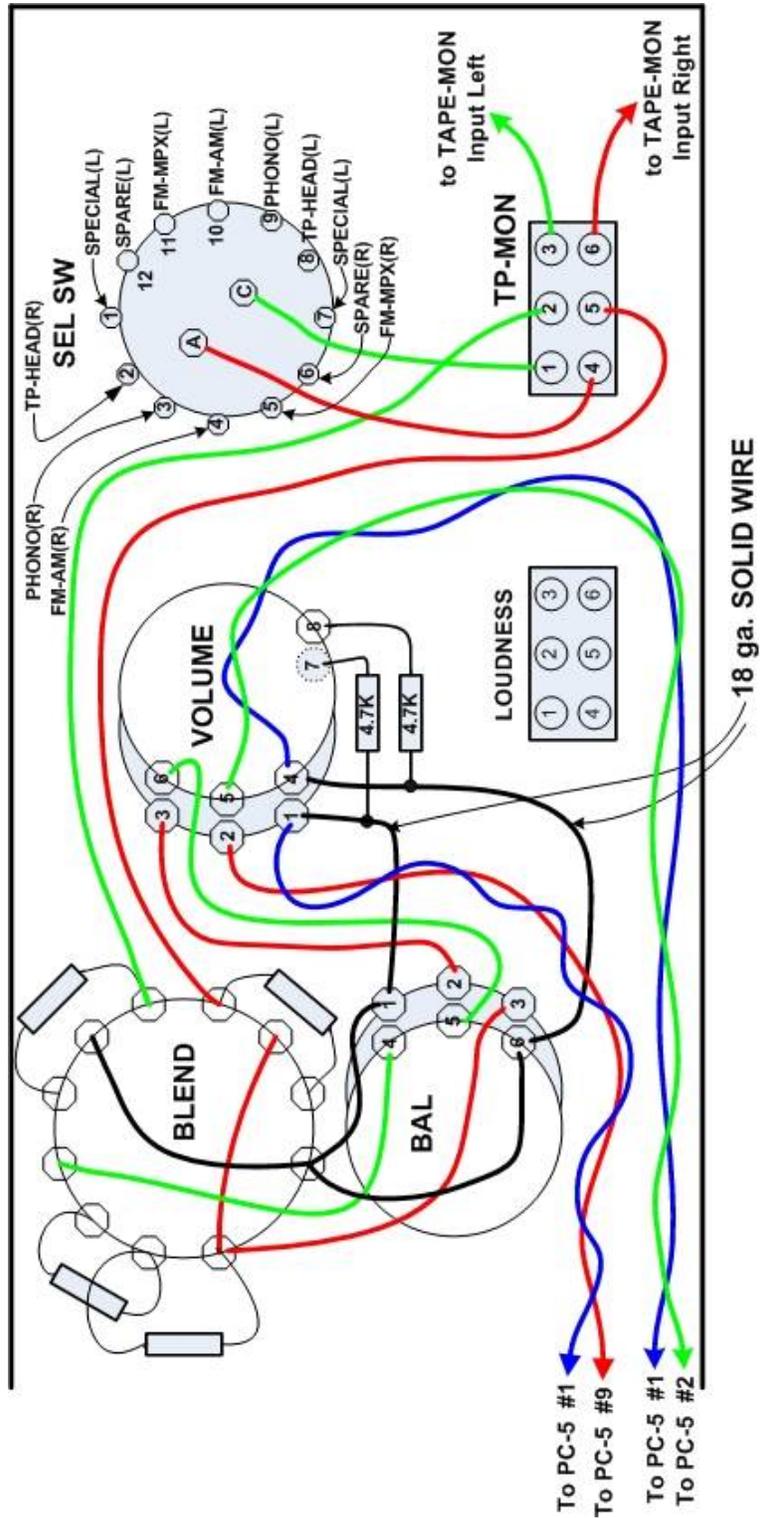


Figure 2  
 PAS Volume Control Wiring Diagram Including LOUDNESS Switch

