

Dynaco PAS Preamplifier Selector Switch Replacement Installation & Wiring Manual

Introduction

The Dynaco design engineers when working within strict cost constraints placed their emphasis on the audio performance and made the compromises in the selection of the hardware. Over the first few years of service these choices did not impact performance however over time and exposure to atmospheric contaminants and rigors of daily use, the connections associated with these hardware choices became compromised showing surface deterioration (pitting and oxidation) and loss of connector tensioning. The result is intermittent audio and/or loud hum due to open ground connections.

The original Dynaco selector switch has six positions. Three of these six positions (Tape Head, Special, and Magnetic Phono) are routed to the input phono module. Consequently, these inputs are not available for “line level” signals normally provided by CD players, tape recorders, video sources, tuners and other “high level” sources. Today it is very unusual to have a need for more than one RIAA magnetic phono input. Consequently, in its original configuration, the stock Dynaco selector switch wastes two inputs.

As part of the design to route three of its inputs to the phono pc board, the original Dynaco selector switch incorporates a third section. This third section was included to provide the associated equalization to the phono module when one of the three low level inputs is selected. This third section combined with the inexpensive materials of construction (open switch phonelic materials) causes the switch to be a frequent source of problems with the preamp.

This document describes the procedure to remove and replace the original PAS Selector Switch with a much higher quality switch. It will be wired to convert two of the low level inputs (Tape Head & Special) to line level inputs suitable to accept Tuners, CD players or other line level sources. The result will be elimination of pops, hum and other compromised switch problems along with two additional useful inputs as well as higher long term reliability. The steps defined will require basic soldering skills and tools outlined in the following documents (available from our web page 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

Our replacement selector switch is offered as a stand alone (P/N PAS-SSW) or as a kit (P/N PAS-SSW-K) that includes all of the wiring specified as well as the RIAA correction capacitor for the Dynaco Phono board (PC-6).

Important Information Regarding Internal Wiring

If you will be supplying your own replacement wiring it is critical that you use only 22ga Teflon insulated stranded wire. The Teflon will permit you to apply sufficient thermal energy to the solder connection for proper solder joint formation without worrying about melting the insulation. Thicker wire or solid wire will cause problems - if not now (too much strain on the boards or parts) or later (reliability issues). This is an important tip – follow it. Some of our customers have reported difficulty in finding short sections of Teflon wire – therefore we offer the necessary wire in our Kit version of this project.

In many cases you will be directed to “prepare” a length of wire. The preparation process requires you to take 3 steps: 1) Cut the wire to the length indicated, 2) Strip ¼” of insulation from each end and, 3) “Tin” each end of the wire. Please don’t try to save time by skipping the tinning step.

In some cases we have specified connections be completed in pairs (2 wires). In these cases you will use a pair of wires together to make an electrically related connection (such as signal + and signal -). It is much easier to prepare a master length of pairs at the beginning of your project and then when required, cut the designated length from this master. For this project, I recommend that you prepare two lengths of 7.5 foot red/black and green/black pair.

To prepare a master pair, use the following method:

1. Take the ends of the wires in the group and clamp them in a pair of “vice grip” or other device that can secure the ends of the wires firmly. Now, secure the vice grip.
2. Take the other ends of the wires in the group and stretch them to about 10% greater than the desired length. Cut them at that point and then place them in the jaws of a ¼” variable speed drill. Make sure all wires are of equal length - and while keeping the group taut, begin to slowly twist the assembly. Continue slowly until the turns ratio is about 2 to 3 turns per inch.
3. While keeping the twisted group taut, run your hand along the length of the assembly to stress relieve the elements.
4. Let the assembly sit for about 5 minutes and then release.

During the assembly process when you are directed to use twisted pairs, simply cut the length designated and strip ¼” insulation (unless otherwise directed) and “tin” each conductor.

Overview

You will begin by removing the original selector switch and its associated wires. This will remove most of the wires from the input / output connector (left and right). Next the remaining wires connected to the input / output connector(s) will be removed and will cleaned and prepared for the new wires. Next, the wires connected to the front panel components (Blend Switch and Tape Monitor Switch) will be removed and replaced. The new selector switch will be prepared and installed. Next, new wires will be connected to the input / output terminals. Finally, those wires will be connected to the appropriate terminals on the selector switch, tape monitor switch, and the two printed circuit boards.

The following components are specified in the text of this document.

Item	Description	Part Number	Quan	Rating
S1	2 Pole 6 Position Selector Switch	PAS-SSW	1	2 Pole, 6 Position
C1, C2	Capacitor, Poly	CAE-50V820pf	2	820pf
X1	20ga Teflon Insulated Stranded Wire	CAE-TWK-PAS	1 ea.	8’ Red, 8’ Green 16’ Black

A complete kit including all of the above is available from Curcio Audio. Please refer to part number CAE Part Number SSW-PAS-K.

Procedure

A. Removal of the original Dynaco selector Switch

1. Cut all the wires connected to the selector switch that are connected to the input / output (RCA) strip on the rear of the preamp. Note that there are two rows – the top row is dedicated to the left channel inputs / outputs while the bottom row is related to the right channel inputs / outputs.
2. Cut the 12 wires connected to the phono pc board (PC-6). This pc board is immediately under the selector switch. FYI, the terminal numbers are: 1,2,3,4,5 & 6 (for the right channel) and 7,8,9,11,12 & 13 (for the left channel).
3. De-solder the red and green wires from terminals 3 & 6 (see figure 1) of the tape monitor switch.

4. At this point all of the wires connected to the selector switch should be free. Remove the original Dynaco selector switch.

B. Prepare the Phono PC board (PC-6)

The phono module (located immediately below the original selector switch) was originally used to amplify magnetic cartridges, tape heads, and perhaps microphones (via the special input). We will be eliminating all these unnecessary functions and will retain the magnetic phono input. Therefore will no longer need to include a switch to change the equalization on PC-6. To effect this upgrade, you will need to remove and replace two 68pf capacitors on this pc board.

1. Look carefully at the components on the pc-6 phono board and you should see four (two per channel) very flat components that stand perpendicular to the surface of the pc board. These are the equalization capacitors. There should be two large caps and two smaller caps having this same flat panel shape. The two smaller caps are rated at 68pf. These should be removed and replaced with 820pf caps. I suggest using either polystyrene or silver mica types.
2. Cut a 7.5" section of the Red-Black Twisted pair. Strip and tin both wires on each end. Connect the Red wire to terminal 6 of the phono board (PC-6). Connect the remaining Black wire on the same end to terminal 4 of PC-6. Both terminals are labeled from the bottom side of the board and are located near the front outer corner of the pc board.
3. Cut a 4" section of the Green-Black Twisted pair. Strip and tin both wires on each end. Connect the Green wire to terminal 13 of the phono board (PC-6). Connect the remaining Black wire on the same end to terminal 11 of PC-6. Both terminals are labeled from the bottom side of the board and are located near the rear outer edge of the pc board.
4. Cut a 3" section of the Red-Black Twisted pair. Strip and tin both wires on each end. Connect the Red wire to terminal 1 of the phono board (PC-6). Connect the remaining Black wire on the same end to terminal 4 of PC-6. Note that terminal 4 already terminates a black wire from step 2.
5. Cut a 5" section of the Green-Black Twisted pair. Strip and tin both wires on each end. Connect the Green wire to terminal 7 of the phono board (PC-6). Connect the remaining Black wire on the same end to terminal 11 of PC-6. Note that terminal 11 already terminates a black wire from step 3.

C. Prepare the Input / Output Connector Strips

There are two groups of Input / Output Connectors – a group towards the top of the preamp associated with the left channel and a group associated with the right channel near the bottom of the preamp. You will first clean both groups of all wires and solder blobs so that the entire connector appears as it did when it was new – no wire shards and all clean surfaces. This will require time and patience. Use the right tools – temperature controlled soldering station, solder sucker, soldering tools, and high quality serrated needle nose pliers. You should refer to our Tech Note #4 Kit Builders Guide available at our web site (www.curcioaudio.com) for specific instructions and tool recommendations.

To assist you with this section we have prepared two figures that are nearly identical 1a & 1b. Figure 1a describes the connections for the top strip (Left Channel) and Figure 1b describes the connections to the bottom strip (Right Channel).

We will begin with the bottom row – Right Channel and so now refer to Figure 1b. Prepare three sections of un-insulated 20ga solid wire and make the connections to the ground lugs as shown in Figure 1b. Note –

do not connect the MAG PHONO ground to the other grounds. Using the Red / Black twisted pair prepared above, install the 8 sections of twisted pairs (NOTE - You will not include the twisted pair connected to the MAG PHONO input - these wires have already been prepared under the Phono PC module section and will be connected later.) to the lengths indicated as shown in Figure 1b. The Black conductor of each TP should connect to the ground lugs (the same lug shared by the bare ground wires) while the Red lead should connect to the center (hot or signal) terminal. The other ends of the 8 twisted pairs will be connected later – for now just dress them out of the way.

Next, repeat the installation of the three un-insulated solid ground wires and the 8 Green / Black Twisted pairs as shown in Figure 1a.

D. Preparation of the Front Panel (refer to Figure 2)

Before you install the new selector switch it will be necessary for you to cut the positioning lug located on the front of the switch near the mounting nut. Install the replacement selector switch and orient so that terminal #1 is at the 12 o'clock position. Tighten well but be careful not to strip the threads. Temporarily install the knob on the shaft of the selector switch. Be sure you are able to select all six positions – if not remove the switch and reorient the “stop” washer so that all six positions are available.

It may be convenient to rotate the front panel outward from the preamp. This can be reasonably accomplished by removing the two rear mounting screws that secure the front panel while retaining the two mounting screws nearest the front of the preamplifier. In this way the front panel can be rotated around the two front screws.

1. Connect a red wire (use Teflon insulated 22 ga silver plated copper) from the “A” terminal of the selector switch to the “4” terminal of the Tape Monitor switch as shown in figure 2.
2. Connect a green wire (use Teflon insulated 22 ga. silver plated copper) from the “B” terminal of the selector switch to the “1” terminal of the Tape Monitor switch as shown in figure 2.

E. I/O Strip & Selector Switch Wiring (Final)

1. Refer to Figure 1b. Locate the 11.5” Red-Black TP connected to the PREAMP OUT terminals. Connect the RED wire to line module PC-5, terminal # 14. Connect the Black wire to PC-5, terminal # 8. PC-5 is the pc board located immediately behind the Bass & Treble Controls.
2. Refer to Figure 1a. Locate the 11.5” Green-Black TP connected to the PREAMP OUT terminals. Connect the GREEN wire to PC-5, terminal # 7. Connect the Black wire to PC-5, terminal # 8 (same connection as the Black wire from the previous step).
3. At this time you will connect the remaining wires from the bottom (Right) I/O strip and therefore you should refer to Figure 1b. Most connect to the connector switch but not all. Except for the MAG PHONO twisted pair, you will be connecting only the Red (signal) wire at the end opposite the I/O strip. Therefore in the following steps, you should first untwist about $\frac{3}{4}$ ” of the twisted pair at the end opposite of the I/O strip. Next, strip $\frac{1}{4}$ ” of the insulation from the Red wire and solder tin. Take the remaining Black Wire (do not strip any insulation from it) and wrap it spirally around the Red in a coil like manner. The Black wire will not be connected at this end.
4. Locate the 10.5” Red-Black twisted pair connected to the TAPE OUT terminals. Route along the rear of the chassis towards the TAPE HEAD terminals and then make a right angle turn towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Red wire to terminal “A” of the selector switch (refer to Figure 2).

5. Locate the 11" Red-Black twisted pair connected to the TAPE INPUT terminals. Route along the rear of the chassis towards the TAPE HEAD terminals and then make a right angle turn towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Red wire to terminal "6" of the Tape Monitor (not Selector) switch (refer to Figure 2).
6. Locate the 11" Red-Black twisted pair connected to the SPARE terminals. Route along the rear of the chassis towards the TAPE HEAD terminals and then make a right angle turn towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Red wire to terminal # 6 of the selector switch (refer to Figure 2).
7. Locate the 8" Red-Black twisted pair connected to the FM-MPX terminals. Route along the rear of the chassis towards the TAPE HEAD terminals and then make a right angle turn towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Red wire to terminal # 5 of the selector switch (refer to Figure 2).
8. Locate the 9" Red-Black twisted pair connected to the FM-AM terminals. Route along the rear of the chassis towards the TAPE HEAD terminals and then make a right angle turn towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Red wire to terminal # 4 of the selector switch (refer to Figure 2).
9. Locate the 8" Red-Black twisted pair connected to the SPECIAL terminals. Route along the rear of the chassis towards the TAPE HEAD terminals and then make a right angle turn towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Red wire to terminal # 1 of the selector switch (refer to Figure 2). Note, you may be tempted to follow sequence and connect this to the selector switch terminal # 3, however this is incorrect – the correct connection is terminal #1.
10. Locate the 8" Red-Black twisted pair connected to the TAPE-HEAD terminals. Route along the side of the chassis towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Red wire to terminal # 2 of the selector switch (refer to Figure 2).
11. Locate the Red-Black twisted pair connected to the phono module (PC-6) terminals # 1 & # 4. Prepare the end of this pair as described in step 3 above. Connect the Red wire to terminal # 3 of the selector switch (refer to Figure 2).
12. Before we make the final right channel connection to the Phono board input, group the collective of Red-Black twisted pairs from the TAPE OUTPUT through the TAPE HEAD I/O terminals and softly wire tie them so that the group runs along the rear of the chassis along the I/O strip and then makes a right turn towards the front of the chassis at the TAPE HEAD Input.
13. Locate the Red-Black twisted pair connected to the phono module (PC-6) terminals # 6 & # 4. Do not prepare the end of this pair as described in step 3 above but rather strip ¼" of insulation from both the Red & Black Leads. Connect the Red lead to the MAG PHONO input center (signal) connector. Connect the Black lead to the MAG PHONO input ground connector. Be certain that this ground lead does not come in contact with the chassis of the preamplifier – a ground loop will be set up resulting in hum. Also, you should not group this twisted pair with the other Red-Black group of twisted pairs but allow it to rout freely to the MAG PHONO input terminals.

It is now time to wire the left channel inputs. The sequence will be the same as in steps 4 through 11 above. However, you should now refer to Figure 1a.

14. Locate the 10" Green-Black twisted pair connected to the TAPE OUT terminals. Route along the rear of the chassis towards the TAPE HEAD terminals and then make a right angle turn towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Green wire to terminal "B" of the selector switch (refer to Figure 2).

15. Locate the 10" Green-Black twisted pair connected to the TAPE INPUT terminals. Route along the rear of the chassis towards the TAPE HEAD terminals and then make a right angle turn towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Green wire to terminal "3" of the Tape Monitor (not Selector) switch (refer to Figure 2).
16. Locate the 9.5" Green-Black twisted pair connected to the SPARE terminals. Route along the rear of the chassis towards the TAPE HEAD terminals and then make a right angle turn towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Green wire to terminal # 12 of the selector switch (refer to Figure 2).
17. Locate the 8" Green-Black twisted pair connected to the FM-MPX terminals. Route along the rear of the chassis towards the TAPE HEAD terminals and then make a right angle turn towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Green wire to terminal # 11 of the selector switch (refer to Figure 2).
18. Locate the 8" Green-Black twisted pair connected to the FM-AM terminals. Route along the rear of the chassis towards the TAPE HEAD terminals and then make a right angle turn towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Green wire to terminal # 10 of the selector switch (refer to Figure 2).
19. Locate the 7.5" Green-Black twisted pair connected to the SPECIAL terminals. Route along the rear of the chassis towards the TAPE HEAD terminals and then make a right angle turn towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Green wire to terminal # 7 of the selector switch (refer to Figure 2). Note, you may be tempted to follow sequence and connect this to the selector switch terminal # 9, however this is incorrect – the correct connection is terminal # 7.
20. Locate the 7.5" Green-Black twisted pair connected to the TAPE-HEAD terminals. Route along the side of the chassis towards the front of the chassis. Prepare the end of this pair as described in step 3 above. Connect the Green wire to terminal # 8 of the selector switch (refer to Figure 2).
21. Locate the Green-Black twisted pair connected to the phono module (PC-6) terminals # 7 & # 11. Prepare the end of this pair as described in step 3 above. Connect the Green wire to terminal # 9 of the selector switch (refer to Figure 2).
22. Before we make the final left channel connection to the Phono board input, group the collective of Green-Black twisted pairs from the TAPE OUTPUT through the TAPE HEAD I/O terminals and softly wire tie them so that the group runs along the rear of the chassis along the I/O strip and then makes a right turn towards the front of the chassis at the TAPE HEAD Input. These wires should run above the Red-Black group previously installed.
23. Locate the Green-Black twisted pair connected to the phono module (PC-6) terminals # 13 & # 11. Do not prepare the end of this pair as described in step 3 above but rather strip ¼" of insulation from both the Red & Black Leads. Connect the Green lead to the MAG PHONO input center (signal) connector. Connect the Black lead to the MAG PHONO input ground connector. Be certain that this ground lead does not come in contact with the chassis of the preamplifier – a ground loop will be set up resulting in hum. Also, you should not group this twisted pair with the other Green-Black group of twisted pairs but allow it to rout freely to the MAG PHONO input terminals.

This completes the installation of your new selector switch. You should be able to enjoy a more reliable and probably better sounding and performing preamplifier as a result of your efforts.

Figure 1A – Left Channel Input Output Connector Wiring Diagram

Left Channel (Top Row) I/O Connection Diagram

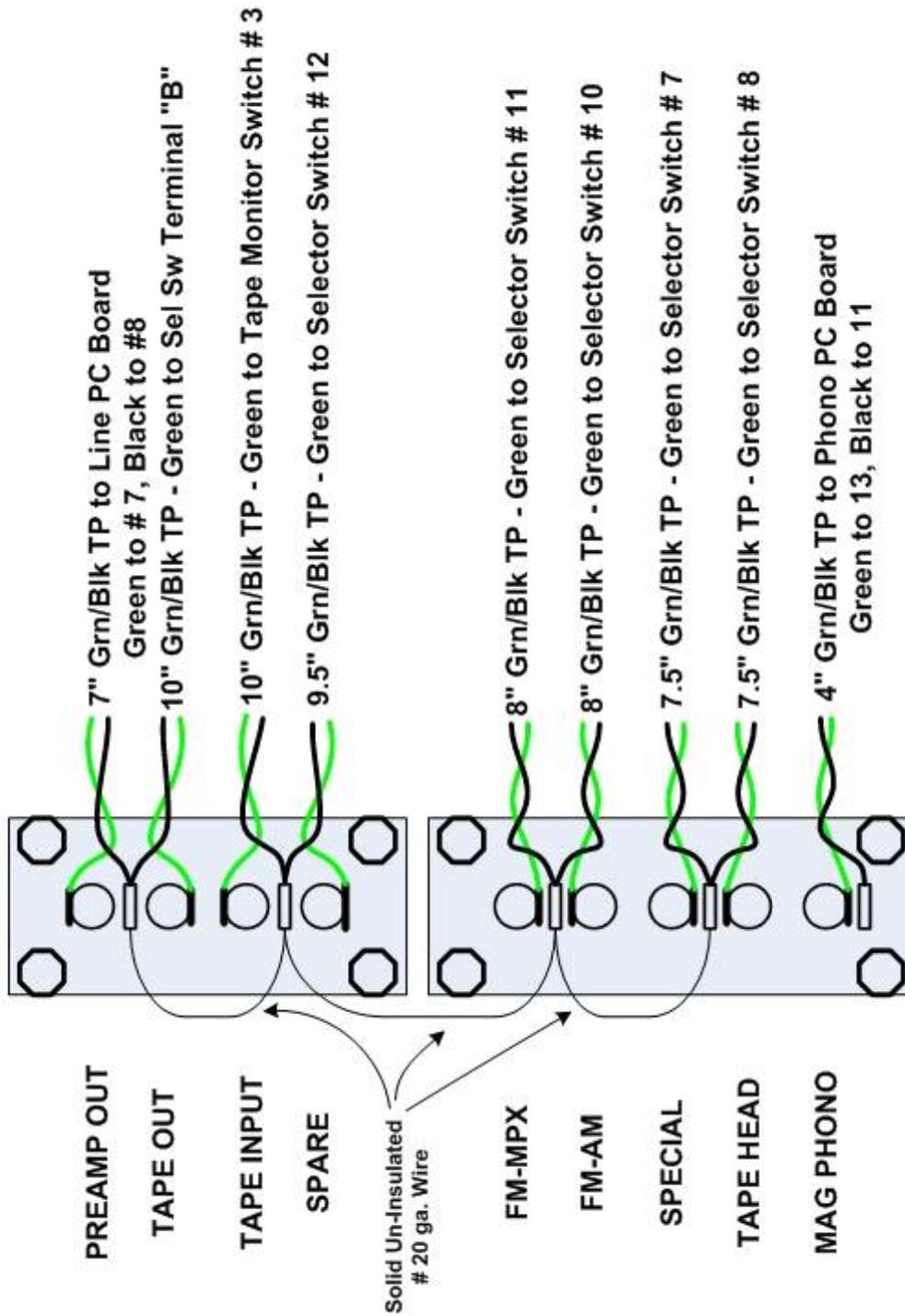


Figure 1B – Left Channel Input Output Connector Wiring Diagram

Right Channel (Bottom Row) I/O Connection Diagram

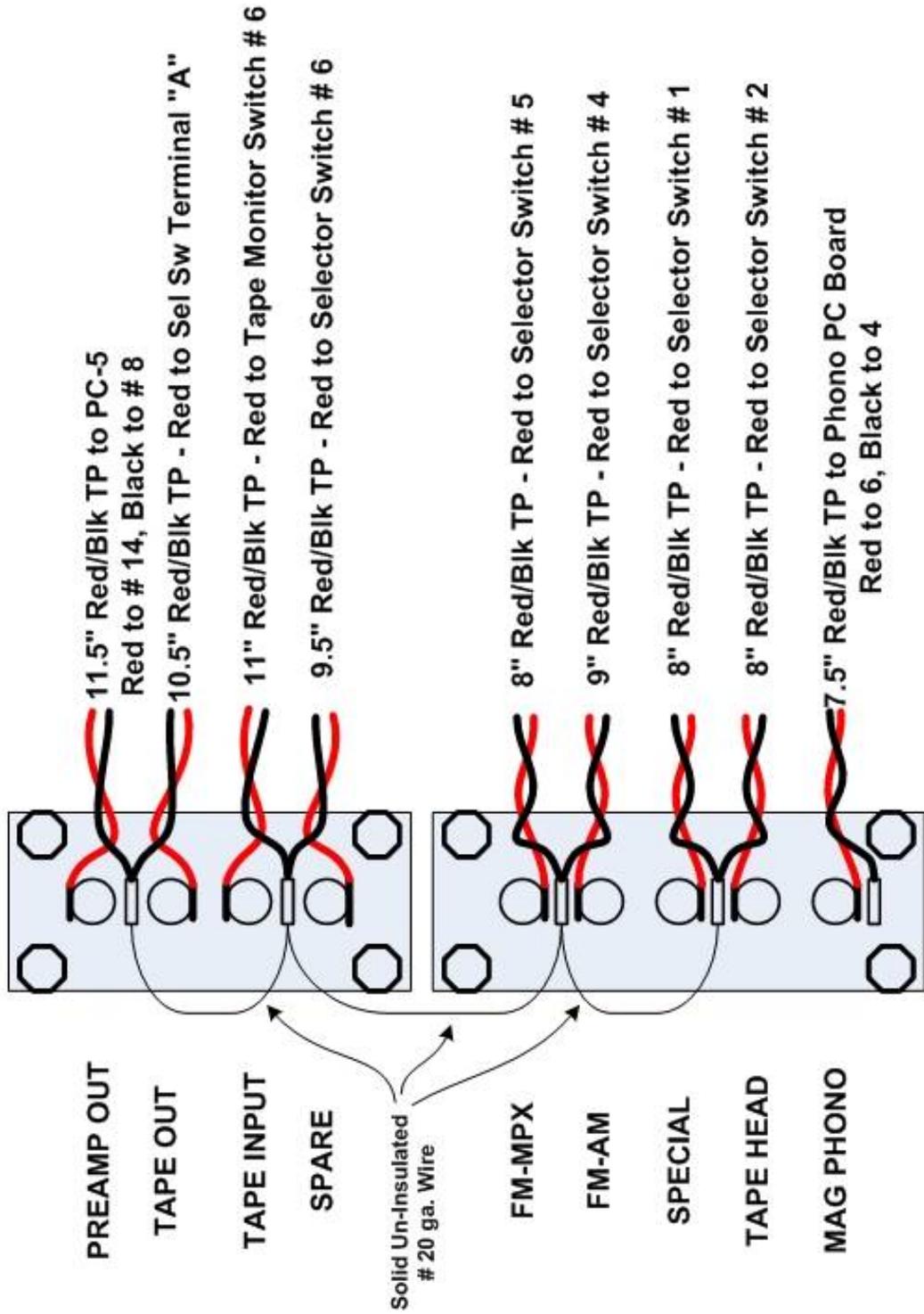


Figure 2 – PAS Preamp Front Panel Selector Switch Installation

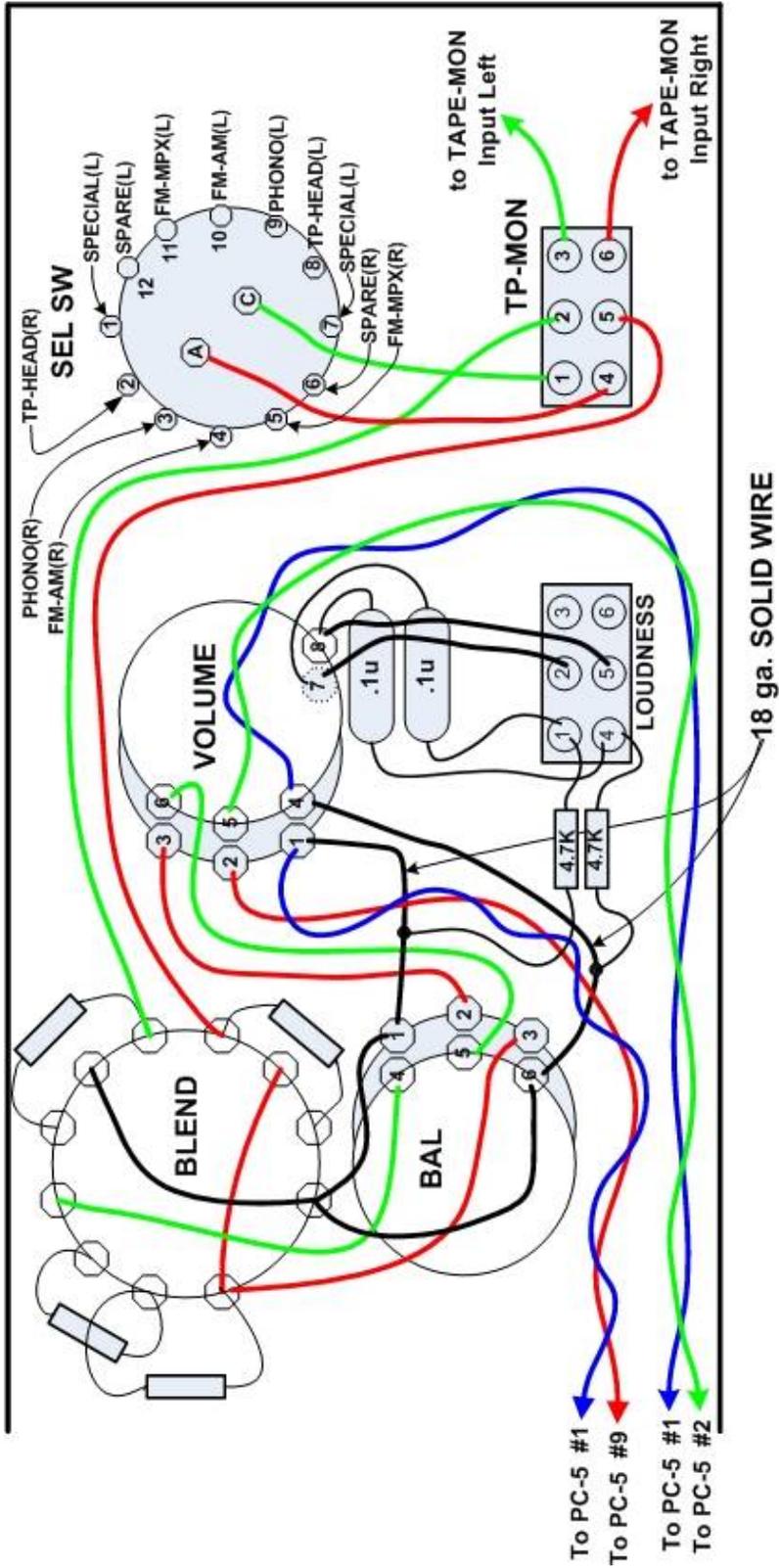


Figure 3 – Top View PAS PC-6 Phono Board & PC-5 Line Amplifier Board

