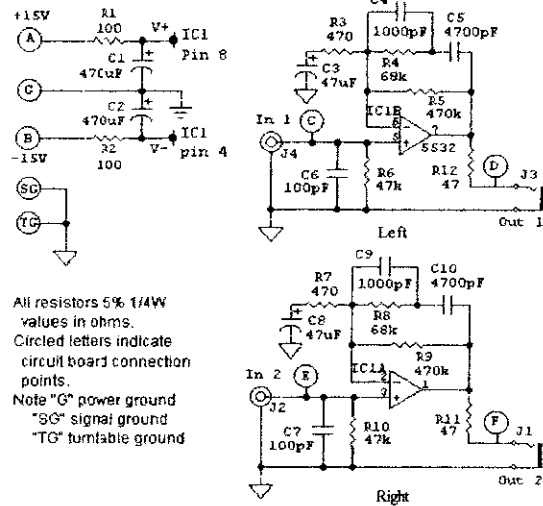
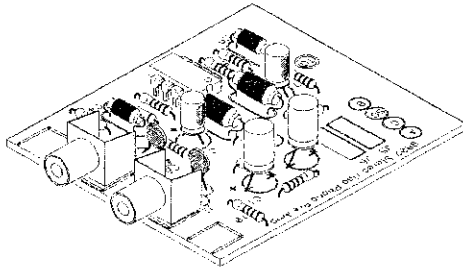


PAiA riaa Phono Pre

Model 9802k

Assembly and Using Instructions



All resistors 5% 1/4W values in ohms.
Circled letters indicate circuit board connection points.
Note "G" power ground
"SG" signal ground
"TG" turntable ground

This riaa Pre-Amp is the perfect solution to getting a signal off of your old turntable and into your mixing board. Whether you want to grab a couple of loops from a 70's LP record or just archive your record collection you need an riaa compensated pre-amp to do it. When grooves are cut in the vinyl of a record pre-emphasis is used to even out the size of the high and low frequency grooves. To restore the recovered signals frequency response, de-emphasis is required and this is the function of the PAiA riaa pre-amp.

As shown in the schematic above, the circuit is built around an NE5532 high performance dual operational amplifier set up in a non-inverting configuration. Let's look at one channel and see how it works. R5 and R3 initially give the pre-amp about 60db of gain. However R3 and C3 roll off low frequencies and form a rumble filter. The network of R4/C4 and R5/C5 actually form the riaa equalization response. Power is isolated by R1/R2 and filtered by C1/C2. +/-9 to +/-18VDC is acceptable for powering the PAiA riaa pre-amp.

riaa Phono Pre Kit Parts List

Qty	Description	Designation
<i>Semiconductors</i>		
1	5532 Dual OpAmp	IC1
<i>Capacitors</i>		
2	1000pF Polystyrene	C9,C4
2	4700pF Polystyrene	C10,C5
2	100pF Ceramic Disk	C6,C7
2	470uF 25V Electrolytic	C1,C2
2	47uF 15V Electrolytic	C8,C3
<i>Resistors 5% 1/4W values in ohms</i>		
2	100 (brown-black-brown)	R2,R1
2	470 (yellow-violet-brown)	R7,R3
2	68k (blue-grey-orange)	R8,R4
2	470k (yellow-violet-yellow)	R9,R5
2	47k (yellow-violet-orange)	R10,R6
2	47 (yellow-violet-black)	R11,R12
<i>Miscellaneous</i>		
2	PC Mount Phono Jacks	J2,J4
2	Panel Mount 1/4" Phone Jacks	J1,J3
1	9802pc Circuit Board	
3	24" lengths #22 Stranded Wire	

THE CIRCUIT BOARD

The Phono Pre is built on a single-sided circuit board. Before beginning assembly, clean oxidation from the copper side of the board using scouring cleanser and water. The copper should be bright and shiny before beginning assembly.

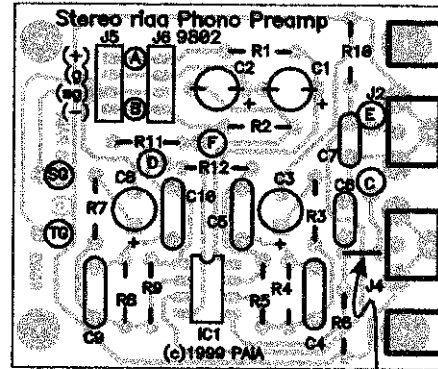
SOLDERING

Select a soldering iron with a small tip and a power rating not more than 35 watts. Soldering guns are completely unacceptable for assembling solid state equipment because the large magnetic field they generate can damage components.

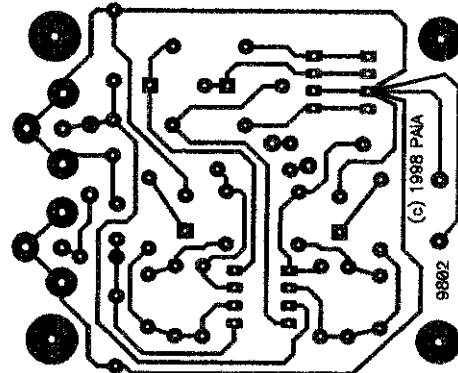
Use only rosin core solder (acid core solder is for plumbing, not electronics work). A proper solder joint has just enough solder to cover the soldering pad and about 1/16 inch of lead passing through it. There are two improper connections to beware of: Using too little solder will sometimes result in a connection which appears to be soldered when actually there is a layer of flux insulating the component lead from the solder bead. This situation can be cured by reheating the joint and applying more solder. If too much solder is used on a joint there is the danger that a conducting bridge of excess solder will flow between adjacent circuit board conductors forming a short circuit. Accidental bridges can be cleaned off by holding the board upside down and flowing the excess solder off onto a clean, hot soldering iron.

Mount the circuit board components by passing their leads through the holes provided for them on the silk-screen legended side of the board and solder on the copper side. Clip off any excess component lead flush with the solder joint. Use care when mounting all components. Never force a component into place.

Check off each component as it is mounted. Resistors and disk and polystyrene capacitors are not polarized and may be mounted with either lead in either of the holes in the circuit board. The electrolytic capacitors and IC are polarized and must be oriented as shown in the illustrations.



Components are mounted on the board in the locations shown. Phantom traces show connections between parts. Note Jumper

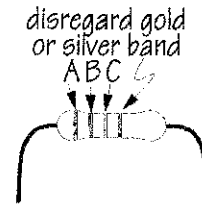


This foil pattern art will be useful if you need to check for solder bridges.

These parts are non-polarized. Either lead can go in either circuit board hole:

Resistors:

Designation	Value	Color code A-B-C
() R3 () R7	470	yellow-violet-brown
() R1 () R2	100	brown-black-brown
() R4 () R8	68K	blue-grey-orange
() R6 () R10	47k	yellow-violet-orange
() R5 () R9	470k	yellow-violet-yellow
() R11 () R12	47	yellow-violet-black

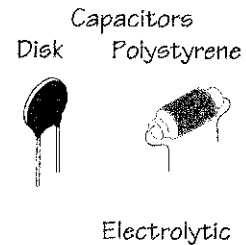


Jumper:

() Use one of the excess leads clipped above to form and install the single jumper marked on the board with a bold line as shown on the facing page.

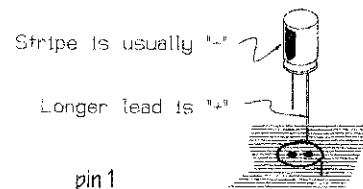
Capacitors:

Designation	Value/Type	Markings
() C6 () C7	100pF Disk	101 -or- 100
() C4 () C9	1000pF Poly	102 -or- 1000J
() C5 () C10	4700pF Poly	472 -or- 4700J



Electrolytic capacitors are polarized- observe orientation in the drawings. Voltages specified are minimums, higher values may be supplied.

() C3 () C8	47uF 15V
() C1 () C2	470uF 25V

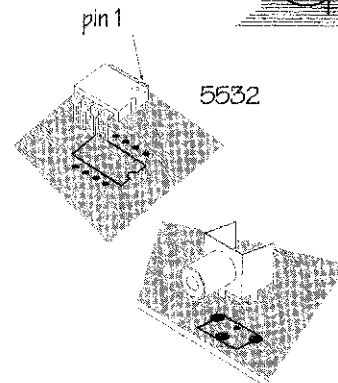


Integrated Circuit:

() IC1 5532 Dual Low Noise Op Amp

Miscellaneous:

() J2 PC Mount Phono Jack
() J4 PC Mount Phono Jack



Use appropriate lengths of the #22 insulated stranded wire supplied to connect the circuit board to the output phone jacks and power supply as shown.

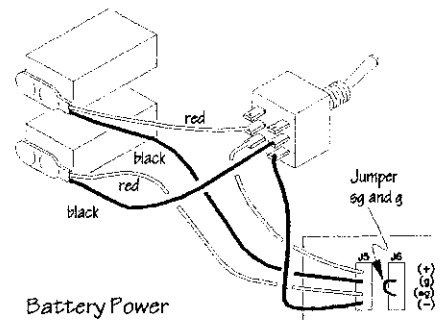
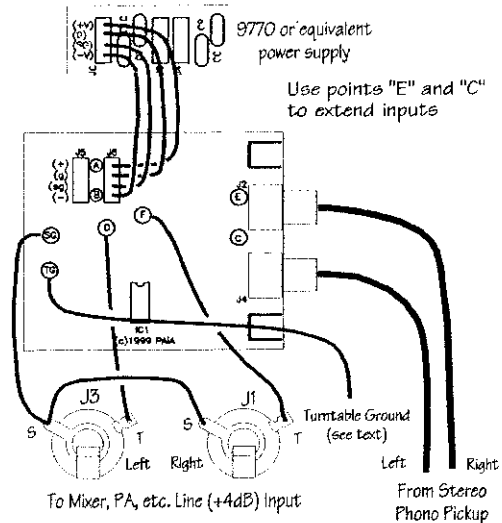
ABOUT POWER SUPPLIES: The phono pre will function on supplies from +/-9V to +/-18V. The recommended PAiA supply is the 9770R-12 but if you are back fitting into a console you probably can tap power from the existing supply. If the supply that you are using does not have separate power and signal grounds these connections on the phono-pre board can both connect to the single power supply ground but separate wires should be used for each.

The Phono Pre can be run from a pair of 9V batteries but not for very long. Perhaps 8 hours from alkaline cells. Rechargeable batteries are the only economical choice. Connect batteries as shown. If you add a switch, it should be a Double Pole type that switches both the "+" and "-" battery leads. The ground lead need not be switched.

Using the PAiA phono pre-amp is simple. Your turntable will have two shielded wires terminated in RCA plugs and a third single wire that is the chassis ground. Connect the left and right signal outputs to the phono pre input RCA Jacks and then connect the outputs to your mixing board or DAT machine. The phono pre puts out a nominal +4dB line level signal so no additional gain will be needed.

The connection between the turntable chassis ground and the phono pre-amp ground is very important. Connect this wire to the "TG" pad on the 9802 circuit board.

The frequency response curve of the 9802 Stereo Phone-Pre conforms to the riaa standard as shown.



riaa Phono Pre response curve

