

Reveille

Vacuum Tube Linestage

Owners & Assembly Manual

designed by:

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Reveille Vacuum Tube Linestage

The Reveille Vacuum Tube Linestage is our version of a cost-no-object preamplifier. Granted we could have gone further and gold plated many more items and incorporated the use of even more expensive parts, we chose once again to error on the side of sanity and produce a well engineered, top quality product we hope will be affordable for many of you.

The pre-amplification circuit is simple, keeping with our minimalist approach, and consists of a single stage SRPP using the 6SN7 octal base triode tube without feedback. The 6SN7, known for its low distortion, provides a very neutral sound while maintaining the natural harmonic integrity of the music signal. The Reveille linestage incorporates the use of a very high quality input transformer for decoupling the preamp from noise generated by source equipment. This feature reduces the overall noise floor resulting in greater resolution, added dimensionality and a grainless treble. The input transformer also inverts the phase which in conjunction with the SRPP circuit results in a non-inverted output signal. The pre-amplification stage is dual mono.

The Reveille Linestage uses the best quality passive components available such as resistors from Caddock and Holco, and capacitors from Solen, Elna and Hovland MusiCaps. Oxygen free copper hookup wire is used for the interconnections along with the well known Cardas silver rhodium rca connectors for the inputs and outputs. A super high quality 24-position, ladder-type stepped attenuator using 1% metal film resistors controls the gain and input selection is accomplished via silver contact toggle switches. And finally, the circuit board is a solder plated 2 oz. copper double-sided board that is solder masked, silk screened and incorporates the use of a ground plane for emi/emc shielding.

The power supply design is also dual mono except for the single detachable power cord. It features two toroidal power transformers along with a separate on-off switch for each channel. The power supply uses the ultra fast rectifier diodes for reduced noise and a mosfet regulator stage for each channel provides a very stiff voltage source for the preamplifier circuit. Ripple voltage is less than .001%. The filament voltages are also regulated and biased for reliable SRPP operation.

The all aluminum chassis are identical in size and measure 2.25"h x 14"w x 10"d. The chassis front and rear panels are 3/8" aluminum, bottom panels are .09" and the top panel of the preamplifier is 3/8". The side panels are cnc machined out of 1" thick aluminum and styled to match the shape of the front panel. This design makes for a very rigid, solid and heavy chassis. A nice feature of the linestage is its slim and compact styling while still allowing for the tubes to be visible and accessible without having to remove the top cover.

The linestage includes: 4-input capability (CD, Tuner, Aux/Phono, Tape), 1 main output and a tape out for monitoring. The power supply chassis and preamp chassis are connected via a short umbilical with a connector on each end.

Specifications:

Frequency Response:	2 to 80Khz (+0, -2dB)
Harmonic Distortion:	0.025% @ 1 volt output 0.06% @ 12 volts output
Voltage output:	12 volts rms maximum
S/N Ratio:	~90dB (tube dependent)
Voltage:	115/230Vac 50/60Hz

Features, Installation and Operation

Front Panel Features

Source Selection

The Reveille uses toggle switches for source switching. Four sources are available including CD, Tuner, Tape and Aux. The source switches correspond to the identically named inputs on the rear panel. Positioning the toggle in the “up” position selects the source. Caution: with this type of source switching, more than one source can be selected at a time therefore, when changing sources, always de-select the old source before selecting the new source.

The selected source indicates the signal that is used for the Tape Output on the rear panel and also the Main Output when the Tape/Source switch is in the Source position. Normal operation consists of the Tape/Source switch in the Source position. The Tape Input is amplified and sent to the Main Outputs when the Tape/Source switch is in the Tape position.

Note: when changing sources it is always good practice to reduce the volume level to its lowest setting.

Volume and Balance Control

Volume is controlled by the independent left and right channel mono attenuators. Each attenuator has 24 steps set at approximately 2dB per step. Left and right stereo balance can be obtained by adjusting one channel's attenuator for more or less gain than the other channel.

Power Switching

Each channel of the Reveille has its own independent power switch. Power is applied to each channel by positioning the Power toggle switch in the “up” position. The corresponding channel's blue LED should light upon application of power.

Rear Panel Features

Power Connection

An IEC power cord connector is provided for attaching the Reveille provided ac power cord or any other brand chosen by the user.

Umbilical Connection

Operating voltages are transferred between the preamp unit and the power supply unit by way of an umbilical cord. Each unit has an identical 8 pin umbilical connector. Only the Welborne Labs provided umbilical cord should be used with the Reveille Linestage.

Inputs

The inputs are separated by channel. The right channel inputs are on the left side of the rear panel and the left channel inputs are on the right side of the rear panel. The Reveille Linestage should be powered down when mating and demating connections.

Outputs

The outputs are also separated by channel. The right channel outputs are on the left side of the rear panel and the left channel outputs are on the right side of the rear panel. Tape outputs are provided for recording purposes. The signal on the Tape Output will correspond to that chosen by the input selector switch.

Features, Installation and Operation

Installation and Operation

Please read through the following setup instructions before operating the Reveille Linestage.

1. Position the unit in a well ventilated stable area.
2. Connect the umbilical cord between the power supply unit and the preamp unit. The umbilical connections are made by inserting the female connector into the male connector, push the collar forward and rotate clockwise approximately one half turn.
3. Connect the signal cables from the source components into the Reveille's rear panel jacks.
4. Connect the tape and amplifier input cables to the corresponding Reveille outputs.
5. Plug the power cord into the Reveille's IEC connector making sure it is firmly seated prior to plugging it into the ac outlet. Plug the power cord into the ac outlet. The unit is internally wired for ac power corresponding to the country in which it has been sold. If you are not sure if the unit is correctly wired for your country, consult the manufacturer. If the unit is purchased as a kit, consult the assembly manual for the correct wiring.
6. Power up the unit by switching on the two power switches. Observe the LEDs for appropriate operation.
7. Select the appropriate source, turn up the volume, and enjoy the music.

Note: The Reveille Linestage's input circuitry is isolated from its amplification circuit by a transformer. This transformer isolates the preamp circuit from source generated ground noise and other artifacts that can corrupt the audio signal. Because of this isolation transformer, the Reveille's input circuitry is dependent upon a good ground being established by whatever source is selected. If a good ground is not established by the source, and transferred to the Reveille via the interconnect cables, hum may result. For example; if your CD player does not have an "earth ground" or it has been lifted with a cheater plug, this may cause hum to be audible in your system.

If hum is present, check the grounding capacity of your source(s). If your source player was not originally equipped with an ac ground pin on its power cord, it may be necessary for you to establish a good ground. We have provided an external ground strap with this unit. This ground strap can be connected between the chassis of the source player and the ac ground provided at the ac wall outlet, or connecting this ground strap to another source player may also eliminate the hum. Connection is made by securing the ground strap to a component's chassis screw. Some amount of experimentation may be required to establish the right connection to eliminate hum. Properly installed, there should be no audible hum produced by the Reveille Linestage.

Words of Caution

Always keep in mind that you are the manufacturer of this preamplifier. The final appearance of this equipment and its sound quality will largely depend upon the care taken during the assembly of this kit. We recommend that your work surface be padded, clean of debris and kept clean during assembly. This will prevent the chassis from becoming accidentally scratched. Keep finger prints to a minimum (wear white cotton gloves when handling the chassis). This chassis design is very heavy so be careful and don't drop it on your dining room table! Don't create antennas out of the hookup wire by making big loops and arches. Keep all wiring neat, lead lengths short and routed close to the chassis. Believe us when we say "neat wiring sounds mo better".

Always remember the nature of the equipment you are working on. It contains high voltages and can cause serious personal injury. Always make sure that capacitors are completely discharged before handling or soldering the internal components. Never disconnect the power cord, or remove tubes while the unit is powered on.

Tools Required for Assembly

Soldering Iron
Solder
Solder Wick™ or Solder-Removing Device
Pliers
Wire Strippers
Hex Drivers
Screw Drivers
Multimeter
Cotton Gloves

Before Beginning

The next few pages include the schematics and parts lists. Check the components delivered to you against those on the parts list. There are two large bags one marked *preamp* and one marked *power supply*. Do not allow these parts to become mixed together. Always keep them separate and it is recommended, as you assemble the linestage, you treat the preamp and power supply as two separate pieces of equipment. This will prevent the possibility of preamp parts being installed in the power supply and vice versa.

Notify us immediately if there are any missing pieces.

Please read through the manual thoroughly before beginning assembly. This will give you with a rough idea of the entire assembly process and how much detail is provided herein.

Welborne Labs reserves the right to occasionally change or substitute parts of equal or greater quality.

Preamplifier Parts List

R1,R8	10kohm/.75 watt	Caddock 1% Film Resistor (2)
R2,R9	100ohm/.75 watt	Caddock 1% Film Resistor (2)
R3,R10	1kohm/.75 watt	Caddock 1% Film Resistor (2)
R4,R11	1kohm/.75 watt	Caddock 1% Film Resistor (2)
R5,R12	45ohm/.75 watt	Caddock 1% Film Resistor (2)
R6,R13	1Mohm/.75 watt	Caddock 1% Film Resistor (2)
R7,R14	Select/.75 watt	Not used
R17,R18/wire	511ohm/.5 watt	Holco 1% Film Resistor & hookup wire (2)
C1,C7	100uf/35 volts	Elna Cerafine Electrolytic Capacitor (2)
C2,C8	3.0uf/200 volts	Hovland MusiCap PP Film and Foil Capacitor (2)
C3,C9	0.01uf/1600 volts	Hovland MusiCap PP Film and Foil Capacitor (2)
C4,C10	10.0uf/400 volts	Solen Polypropylene Capacitor (2)
C5,C11	Select	Not used
C6,C12	3300uf/35 volts	Panasonic Electrolytic Capacitor (2)
T1,T2	IT2408	Welborne Labs Input Transformer (2)
VR1,VR2	15 kohm	Welborne Labs Stepped Attenuator (2)
V1	6SN7GT	Triode Vacuum Tube (2)
TS1,TS2	miscellaneous	Tube Socket (2)
PCB	miscellaneous	Printed Circuit Board (1)
STD	miscellaneous	Circuit Board Standoffs (9) Screws (18)
SW1-SW4	miscellaneous	Augat DPDT Toggle Switch (4)
KNOB	miscellaneous	Aluminum Knob (2)
RCA	miscellaneous	Cardas Silver Rhodium RCA Connectors (12)
CHUMB	miscellaneous	8 Pin Umbilical Connector Male/Female (1)
WIRE	miscellaneous	Cardas Blue 15.5ga Stranded Pre-Tinned Wire (12)
WIRE	miscellaneous	Black/Yellow/White 18ga. Solid Core Copper Wire
WIRE	miscellaneous	Blue/Black 20ga. Stranded Kimber Wire
CHGND	miscellaneous	Chassis Ground Strap w/Hardware (1)
GSTRAP	miscellaneous	External Ground Strap (1)
SHRINK	miscellaneous	Heat Shrink Tubing
TIES	miscellaneous	Cable Ties
CHASSIS	miscellaneous	Aluminum Chassis w/Hardware (1)
SOLDER	miscellaneous	Silver Solder
CLIPS	miscellaneous	Cable Clips and Ties (4)
BUTT	miscellaneous	Butt Splices (2)
SWGND	miscellaneous	Toggle Switch Ground Wires 20ga. Solid Core

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Power Supply Parts List

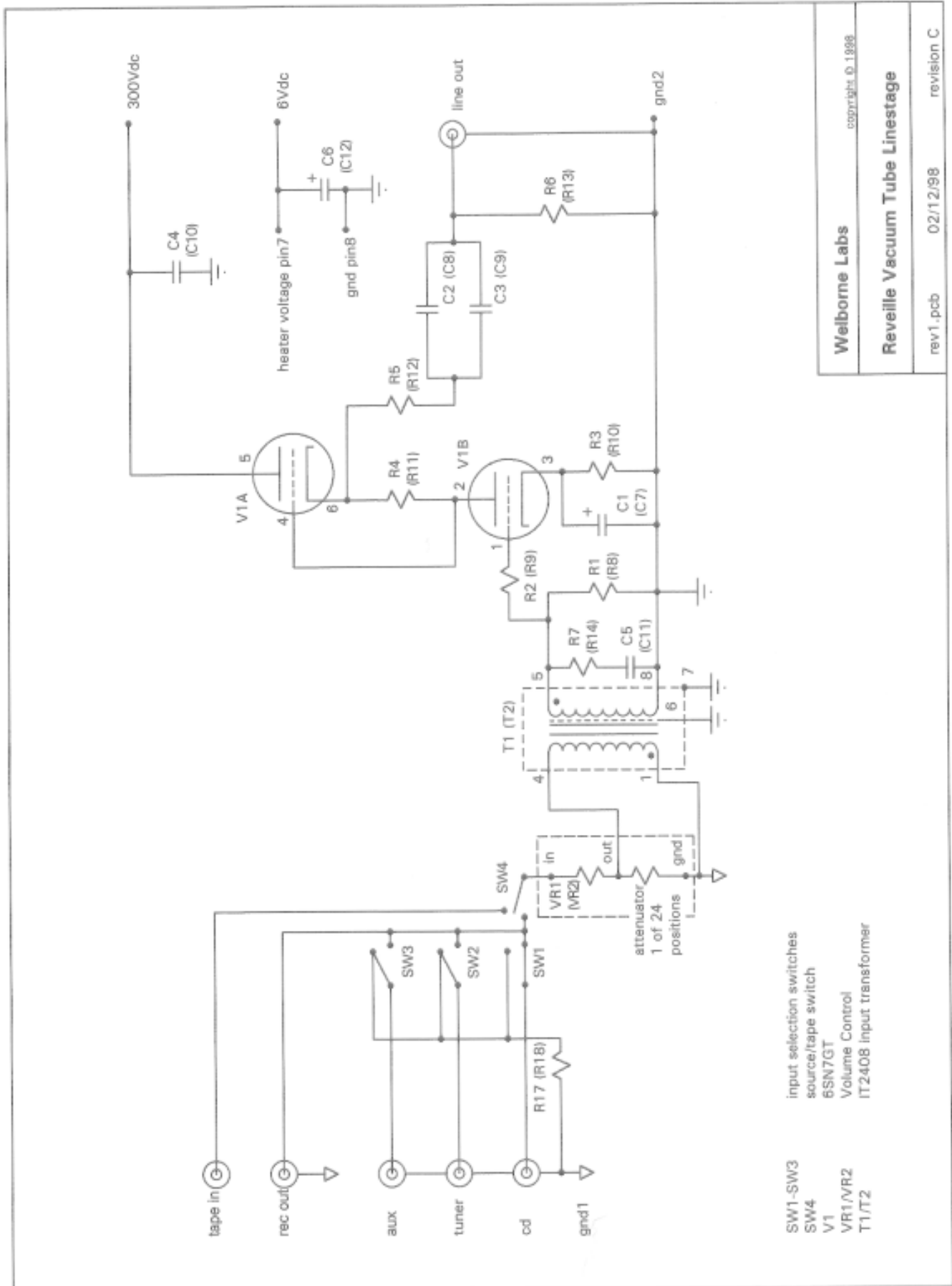
R1,R2	12kohm/2 watt	Matsushita Metal Oxide Resistor (2)
R3,R4	2Mohm/.5 watt	Holco 1% Metal Film Resistor (2)
R5,R6	100ohm/.5 watt	Holco 1% Metal Film Resistor (2)
R7,R8	100kohm/2 watt	Matsushita Metal Oxide Resistor (2)
R9,R10	100kohm/2 watt	Matsushita Metal Oxide Resistor (2)
R11,R12	715ohm/.5 watt	Holco 1% Metal Film Resistor (2)
R13,R14	2.74kohm/.5 watt	Holco 1% Metal Film Resistor (2)
R15,R16	374ohm/.5 watt	Holco 1% Metal Film Resistor (2)
C1,C2	.01uf/1000 volts	Ceramic Capacitor (2)
C3,C4	68uf/450 volts	Panasonic Electrolytic Capacitor (2)
C5,C6	1.0uf/400 volts	Solen Polypropylene Capacitor (2)
C7,C8	47uf/450 volts	Panasonic Electrolytic Capacitor (2)
C9,C10	0.1uf/400 volts	Wima PP Capacitor (2)
C11,C12	100uf/250 volts	Panasonic Electrolytic Capacitor (2)
C13,C14	3300uf/35 volts	Panasonic Electrolytic Capacitor (2)
C15,C16	100uf/35 volts	Elna Cerafine Electrolytic Capacitor (2)
C17,C18	3300uf/35 volts	Panasonic Electrolytic Capacitor (2)
C19,C20	0.1uf/160 volts	Wima PP Capacitor (2)
T1,T2	miscellaneous	Plitron Power Transformer w/Hardware (2)
D1-D4	MUR860	Motorola Ultra Fast Rectifier Diode (4)
D5,D6	1N4007	1A/1000V Diode (2)
D7-D12	1N4002	1A/100V Diode (6)
D13,D14	LED	Blue LED w/Hardware(2)
Z1-Z4	1N5383B	Motorola 150V/5W Zener Diode (4)
Z5,Z6	1N4742A	12V/1W Zener Diode (2)
BR1,BR2	BR602	4A/200V Bridge Rectifier (2)
Q1,Q2	IRFP340	IR High Voltage MOSFET (2)
U1,U2	LT1085CT/LM317T	Linear Technology Voltage Regulator (2)
J1-J6	miscellaneous	Jumper Wires (6)
F1	miscellaneous	1.5A Fuse (1)
FB1	miscellaneous	Fuse Holder (1)
HS1-HS4	miscellaneous	Heatsinks w/Hardware (4)
PCB	miscellaneous	Printed Circuit Board (1)
STD	miscellaneous	Circuit Board Standoffs (6) Screws (12)
SW1,SW2	miscellaneous	Augat SPDT Toggle Switch (2)
IEC	miscellaneous	IEC Connector w/Hardware (1)
CHUMB	miscellaneous	8 Pin Umbilical Connector Male/Female (1)
WIRE	miscellaneous	Black Teflon Coated 18ga. Hookup Wire
WIRE	miscellaneous	Red/Black Twisted Pair 20ga. Stranded Hookup Wire
WIRE	miscellaneous	Black/White/Yellow 18ga. Solid Core Hookup Wire
ICORD	miscellaneous	Detachable Power Cord (1)
SHRINK	miscellaneous	Heat Shrink Tubing
TIES	miscellaneous	Cable Ties
CHASSIS	miscellaneous	Aluminum Chassis w/Hardware (1)
CHGND	miscellaneous	Ground Strap w/Hardware (1)
UMB	miscellaneous	Umbilical Wire 18ga. Solid
CABLE STRAP	miscellaneous	Cable Strap and Ties (2)

Attenuator Resistor List

Step		Row A	Row B
-100dB	R1	15.0K	0.00
-57.0	R2	15.0K	22.0
-50.0	R3	15.0K	45.3
-46.0	R4	15.0K	75.0
-44.0	R5	15.0K	100
-42.0	R6	15.0K	121
-40.0	R7	14.7K	150
-38.0	R8	14.7K	182
-36.0	R9	14.7K	249
-34.0	R10	14.7K	332
-32.0	R11	14.7K	374
-30.0	R12	14.7K	453
-28.0	R13	14.0K	576
-26.0	R14	14.0K	750
-24.0	R15	14.0K	1.0K
-22.0	R16	14.0K	1.21K
-20.0	R17	14.0K	1.50K
-17.0	R18	12.1K	1.91K
-14.0	R19	12.1K	3.16K
-11.0	R20	10.5K	3.92K
-9.00	R21	10.0K	5.11K
-6.00	R22	6.81K	6.81K
-3.00	R23	4.75K	10.5K
-0.00	R24	0.00K	15.0K

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revision C

In the Beginning

Remove the front and rear panels from the chassis and set them to the side so they do not become scratched during the assembly process. The Reveille assembly begins by soldering wires to the rca jacks. Remove the rca jacks from their bag and remove the gold nuts and teflon washers. You will notice on the rear of the plug there is a hole in the back plate (figure 1). Using the solid core 18ga. black hookup wire, cut 14 pieces each 8 inches long. Strip 1/8" of insulation off one end of 12 of the wires. Slip the stripped end of each wire through the hole on the back plate of the rca jack and solder by placing the soldering iron on the side of the rca jack where the wire is visible (figure 2). Use just enough solder to attach the wire to the body of the rca jack. Do not allow solder to creep outside of the cavity between the two plates.

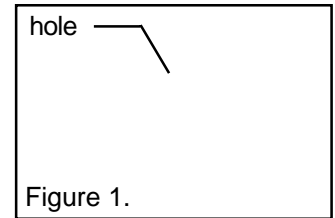


Figure 1.



Figure 2.

Install the rca jacks onto the rear panel. Each rca jack has one red washer and one white. One washer mounts on the inside of the chassis and one washer mounts on the outside of the chassis. At least one of the two washers should be a shoulder washer. The lip of this washer is inserted inside the mounting hole on the chassis panel. The red washers should mount on the outside of the chassis for the right channel and the white washers should mount on the outside of the chassis for the left channel. The rca jacks are secured with the gold nuts. Figure 3 depicts the rca jacks mounted and viewed from the inside of the panel. Please note the orientation of the jacks.

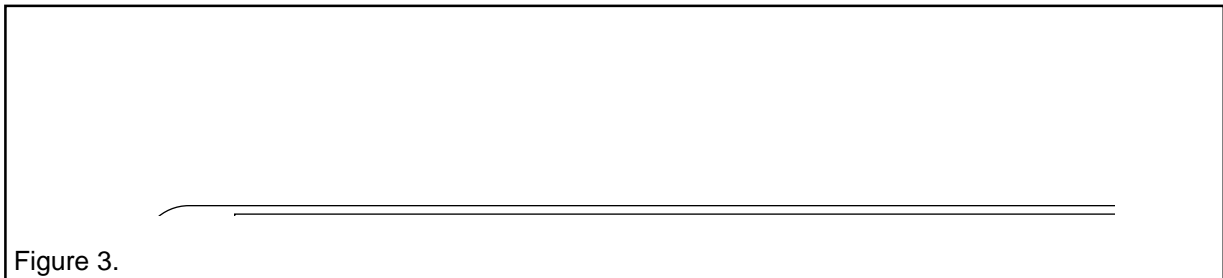
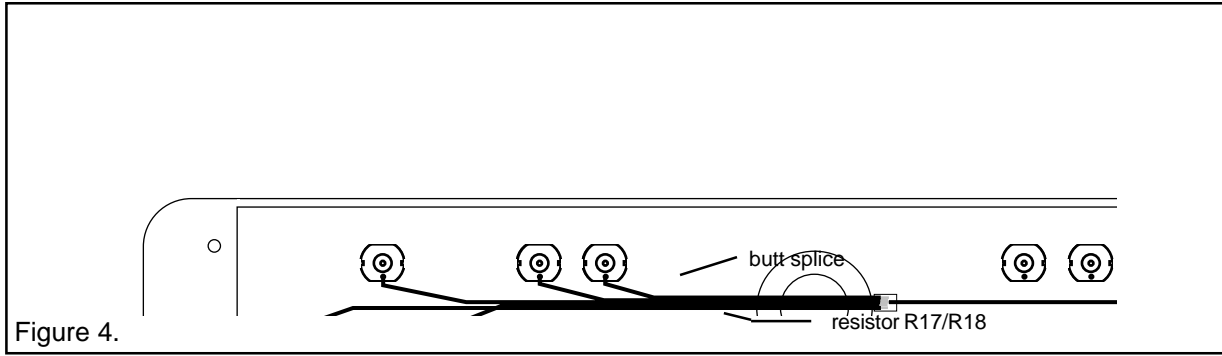
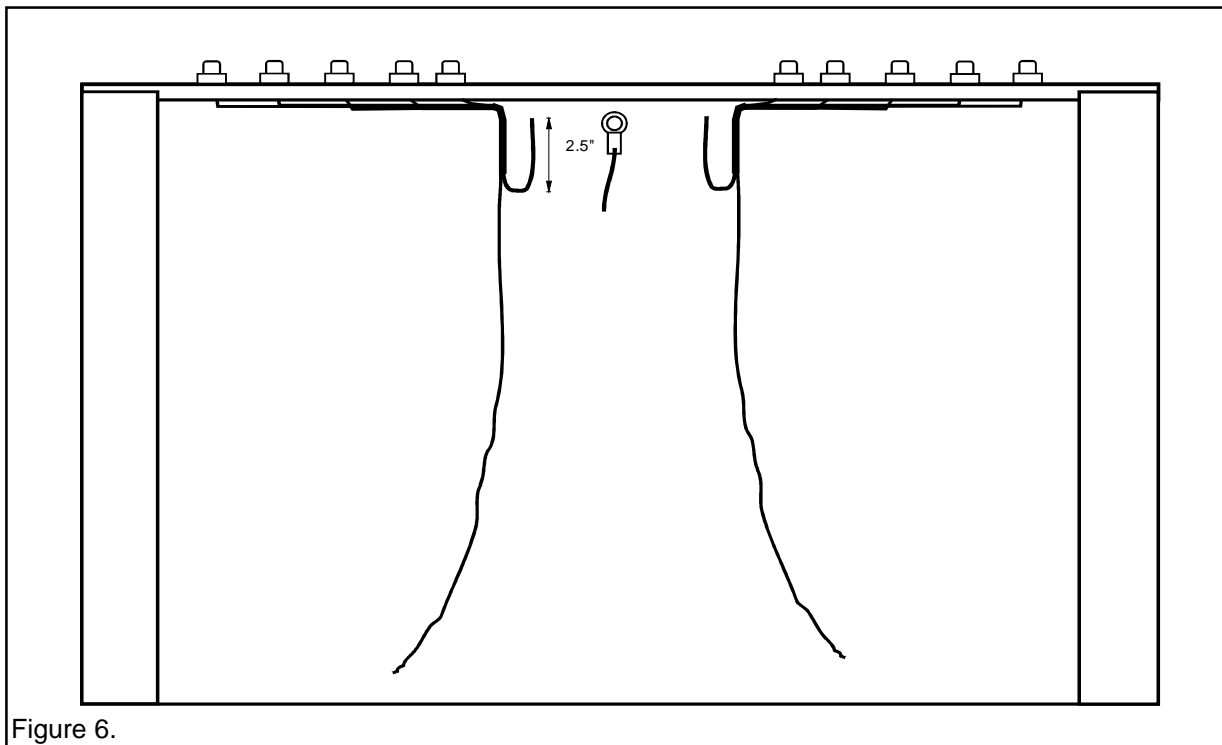
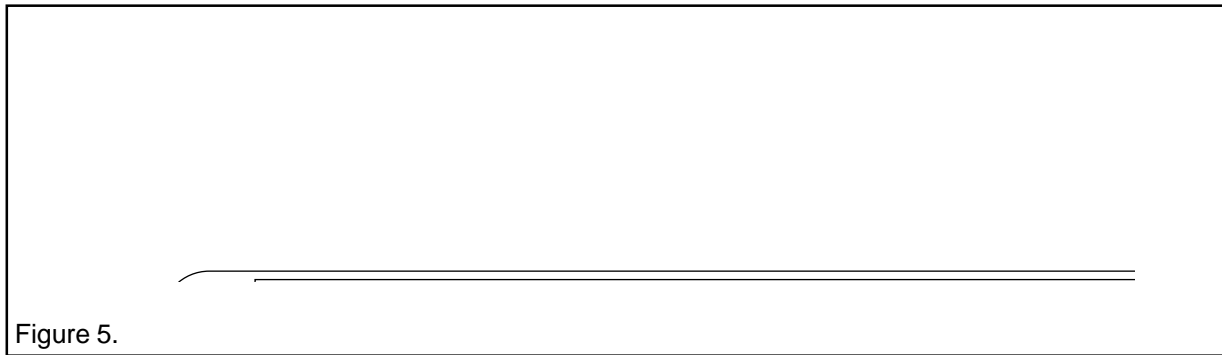


Figure 3.

Bend the black left channel wires over as shown in figure 4. Cut the ends so they are flush and then strip 1/4" of insulation from each end. Take one of the remaining unused 8" wires and strip 1/2" of insulation from one end. Using one of the uninsulated butt splices, insert the wire, with 1/2" of insulation removed, into the butt splice and all the way through so the wire can be seen at the other end of the splice. Insert the 5 wires (**important note: the main output ground wire is not included in this step**) with 1/4" of insulation removed into the other end of the splice. Locate the bag marked R17/R18/Wire. Take one piece of the hookup wire from the bag, strip 3/4" insulation from one end of the wire, twist it together with one lead of R17 and solder. Trim R17's other lead to a length of 1/2" and insert it into the butt splice as shown in figure 4. Place a piece of cardboard between the splice and the back panel, place your soldering iron on top of the splice, allow it to heat up and then apply an ample amount of solder inside the splice on both ends. Allow the splice to cool before disturbing. Repeat this procedure for the other right channel. Locate the black 3/8" diameter heat shrink tubing and cut two pieces approximately 2" long. Place the heatshrink over the butt splice and apply heat either by holding your soldering iron close to the tubing or using a hair dryer works very well too. Heat the tubing until it is secure over the butt splice.



Re-attach the rear panel to the chassis and bend the ground wires as shown in figures 5 and 6. Locate the bag marked chassis ground strap and secure the strap to the chassis using the provided hardware as shown in figure 6.



The next step involves soldering the signal path hookup wire to the rca jacks. In this step, wire is soldered to all of the rca jacks except for the main output jack. The blue Cardas hookup wire has been cut to the proper length and tinned on each end. You will notice that each wire has one stripped end that is larger in diameter than its other stripped end. The larger diameter end solders to the rca jack. The wire color supplied with the kit is blue, however in figure 7 we have used a different color for each wire as a visual assembly aid. First attach the adhesive backed wire clips as shown in figure 7. Next remove the individually marked wires from their respective bags (**note: don't mix them as they have been pre-cut to the exact length**), route and solder them to their designated rca jacks. After each wire has been soldered, cut a piece of 1/8" diameter black heatshrink tubing approximately 1/2" in length, slide it over the solder joint and rca cup and secure with heat. This technique hides the solder joint and makes for a more attractive appearance. Route the wires as shown in figure 7.

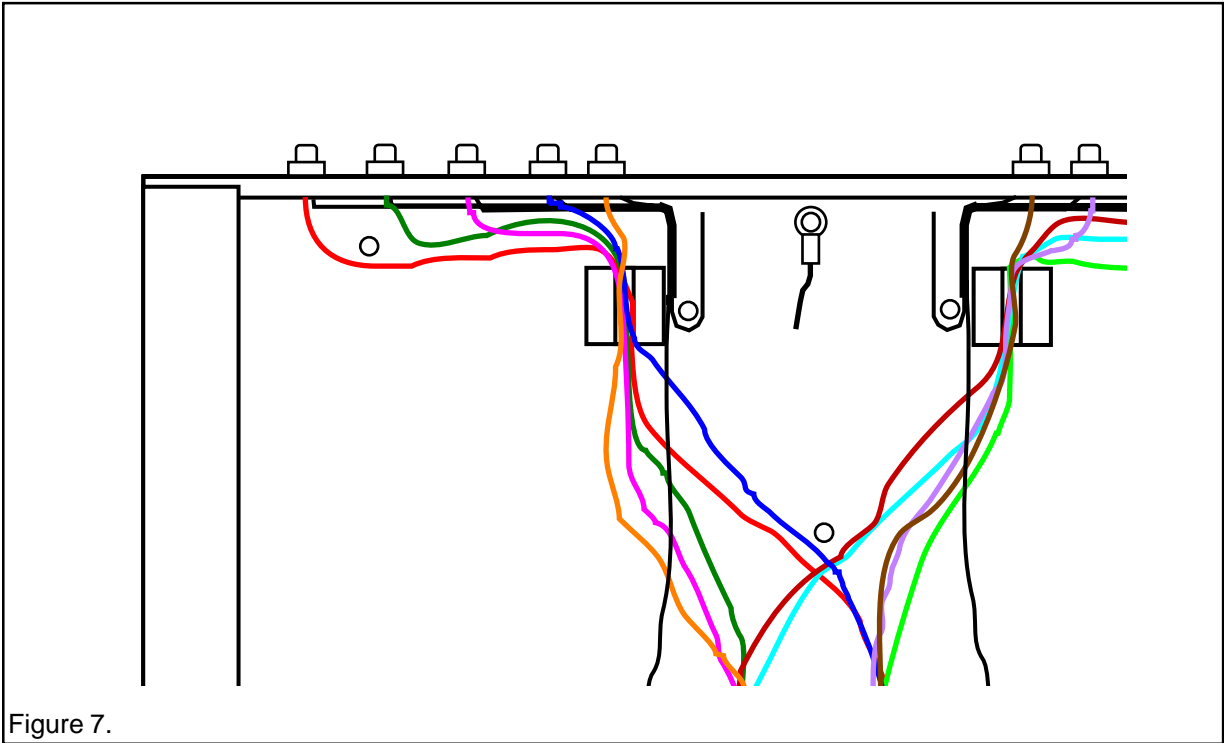


Figure 7.

Stuffing the Circuit Board

The next step involves placing and soldering the components onto the preamp circuit board. Move the chassis off to one side and clear an area to work on the circuit board.

All components mount on the side of the circuit board that has the stuffing guides and text. Begin by removing the individual components from their bags and placing and soldering them to the board one at a time. Start with the smaller components first such as R1, R2, C1, C7, etc. and then place and solder the larger sized components. Mount each component so it is flush with (or lays flat), and makes contact with, the circuit board. Insert the component leads and then flip the board upside down and solder the leads to the circuit board pads.

The resistors (R1, R2, R3, R4, etc.) have no polarity and neither do capacitors C4, C5, C10 and C11. Capacitors C1, C7, C6 and C12 have a positive and negative terminal. The negative terminal is identified by the ban on the side of the capacitors. Place these capacitors on the board such that the positive terminal is inserted into the circuit board hole marked "+". Capacitors C2, C3, C8 and C9 have one red lead and one green lead. These capacitors should be mounted on the circuit board such that the red leads are oriented towards the front of the chassis. When stripping the insulation from these four capacitors, use a pair of needlenose pliers and very gently hold the insulated lead at the base of the capacitor and then strip the end of the lead with wire strippers. This will prevent the lead insulation from being pulled away from the capacitor body.

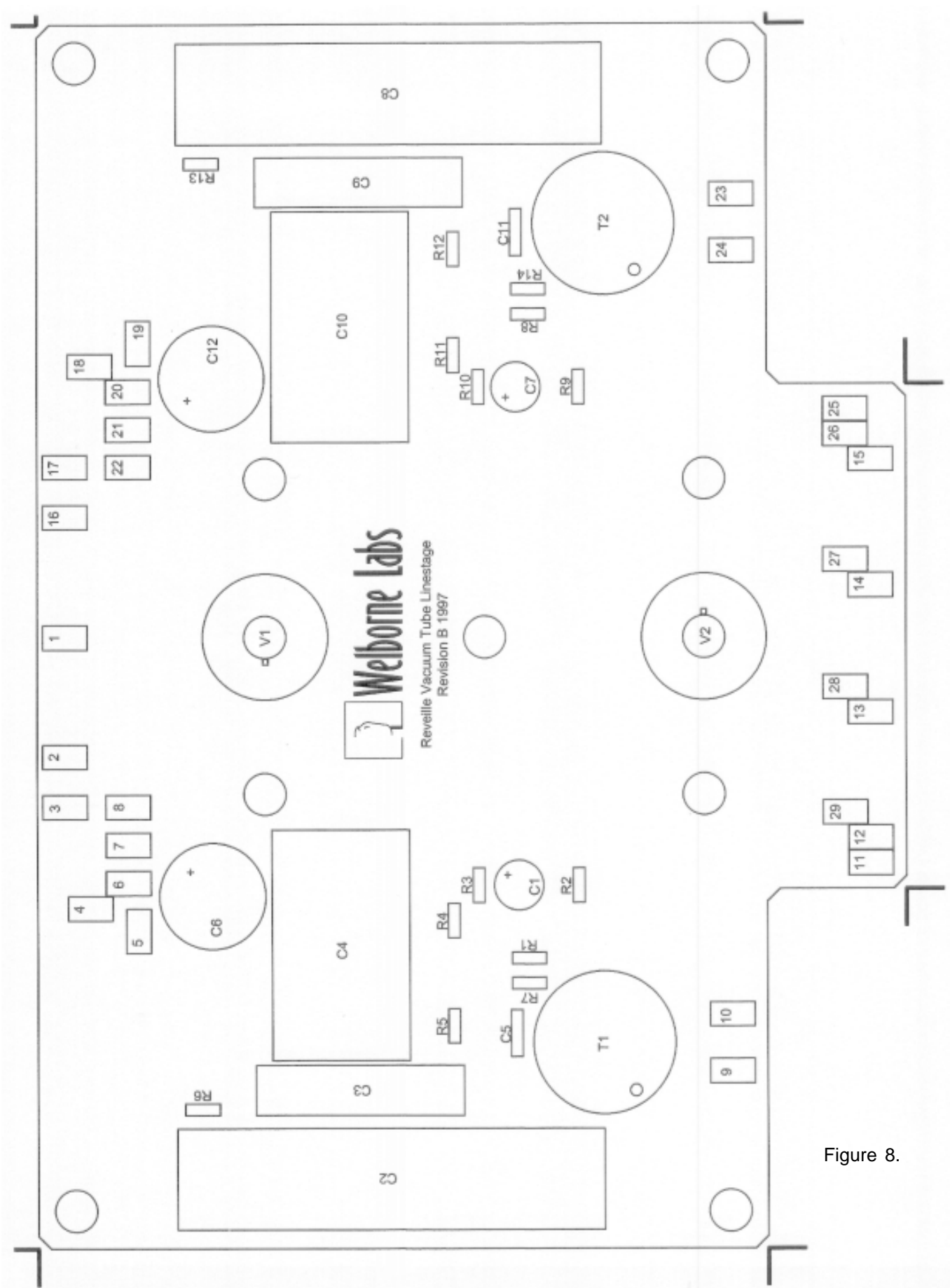


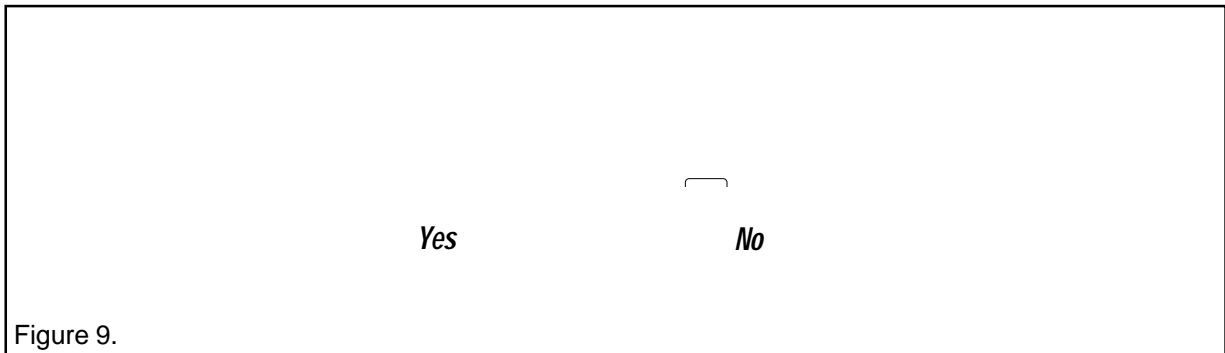
Figure 8.

Note that transformers T1 and T2 must also be oriented properly. The stuffing guide on the circuit board has a dot inside the circle. This dot corresponds to the identically placed dot on the top of the transformer enclosure. Install the transformers such that the dot on the circuit board is aligned with the dot on the transformer.

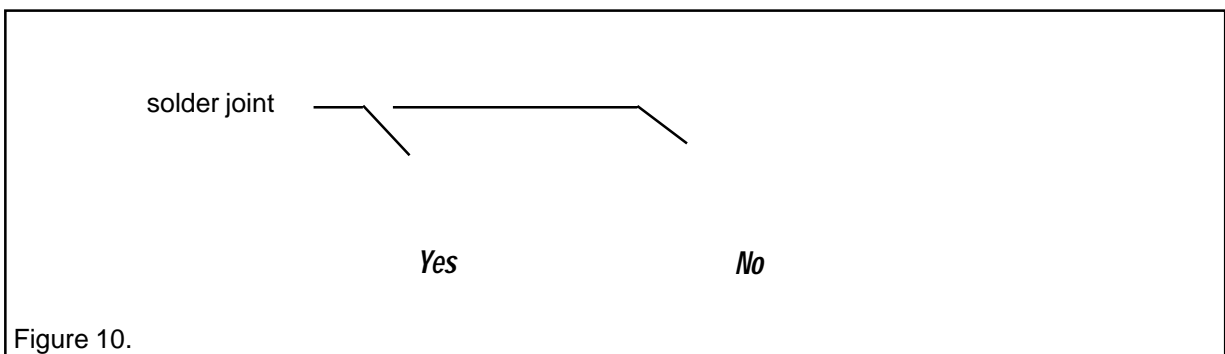
The tube sockets V1 and V2 are keyed for proper installation. Note the tabs on the stuffing guide correspond to the keyed hole in the middle of the socket. Orient the sockets properly and solder to the circuit board.

(note: R7, R14, C5 and C11 are not used).

As mentioned before, mount the components flat on the surface of the circuit board. Refer to figure 9 as a guide.



OK, while we're on the topic of proper assembly techniques...what do your solder joints look like? Refer to figure 10 for proper solder-etiquette.



Locate the stranded 20ga. blue hookup wire and cut 10 pieces approximately 2.5 inches in length. Strip 1/4 inch of insulation from one end of each wire. These wires are to be soldered into the pads located at the front edge of the circuit board. These pads are numbered. The wires should be inserted from the top of the board and soldered on the bottom side. Solder one blue wire to each of the following numbered pads:

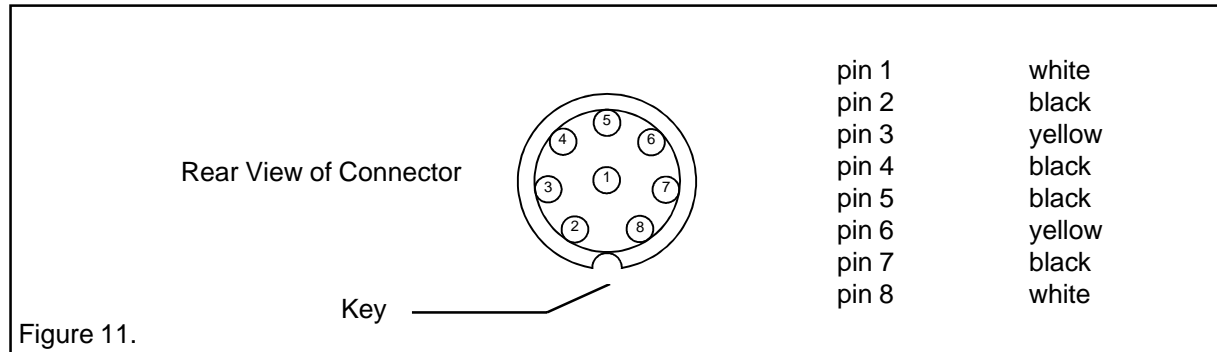
10 12 13 14 15 23 26 27 28 29

Locate the stranded 20ga. black hookup wire and cut 2 pieces approximately 3 inches in length. Strip 1/4 inch of insulation from one end of each wire. These wires should be inserted from the top of the board and soldered on the bottom side. Solder one black wire to each of the following numbered pads:

9 24

Set the circuit board to one side and return to the chassis.

Locate the chassis mount umbilical connector *CHUMB* and some of the yellow, black and white 18ga. solid core copper hookup wire. Cut 4 black, 2 white and 2 yellow pieces of this wire approximately 3.5 inches in length. Strip 1/4 inch of insulation from one end of each wire and solder them to the connector pins as indicated in figure 11 below. Solder the center wire first and then the remaining wires. There is very little space between the connector pins so you must use a minimum amount of solder here and make sure that no solder burrs are left on the solder joint as these could result in a short circuit between adjacent pins.



Install the connector on the rear panel and secure with the nut. The connector key should be on the bottom.

Locate the selector switches *SW1-SW4*. Install them on the front panel (**don't forget to wear the gloves when handling the chassis**) by slowly screwing them into the threaded holes. Try installing the switches first without the jam nuts. Thread the switches as far as they will go. Do not over-tighten and strip the threads. The goal is to have the switch tight enough that it won't become loose and rotate but you also want the switch oriented such that the body of the switch is vertical. If you are unable to position all of the switches vertically and secured tightly, remove the switches and install one jam nut onto the threaded bushing of the switch. Then install the switches back into the panel. By adjusting the jam nuts you will eventually be able to position the switches vertically and secured tightly. Make sure all of the switch toggles protrude out in front of the panel approximately the same distance. *This procedure will be a very iterative process but patience will pay off. If you run out of patience, you can cheat by applying a very very small amount of super glue to the threads at the base of the switch. Caution: too much glue and you may not be able to remove the switch should you need to.* Install the front panel onto the chassis.

Assemble Attenuator

Each mono attenuator has a front and a rear PC board. Each switch position of these attenuators uses a pair of resistors: an Input resistor (*RA*) and a Ground resistor (*RB*), as shown in figure 13A. You must install all of the Input resistors first. This is because they are installed underneath (inside) the outer circle of Ground resistors (see figure 13B). The inner circle of pads (the ones with the numbers next to them), is for the Input resistors. The outer circle of pads is for the Ground resistors. Also note that there are 3 locations which are to have buss wires installed, not actual resistors.

Trim each resistor to proper length before installing it. The overall resistor length should be: 1.0", = 25.4 mm.

A lead length measuring tool can be cut from a piece of cardboard, using an x-acto knife, as shown in figure 13C. To use this tool, lay the resistor body into the rectangular cutout, holding the tool and the resistor with the thumb and index finger of one hand. Then, trim the leads flush to the edges of the tool. The cardboard tool will last for hundreds of resistors if you keep the cutters from pressing too hard against it.

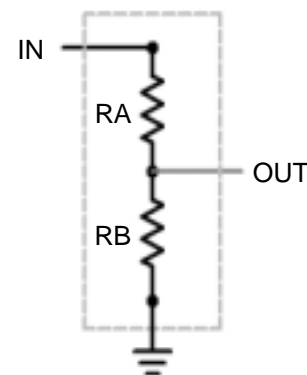


Figure 13A.

Assemble Attenuator

Select resistor R1A and trim its leads to proper length.

Install it into the pads which have the "1" right next to them. Slip one lead all the way into a pad hole, then "pull it back" as the other lead is inserted into the corresponding pad hole on the other wafer. Due to the insertion angle, you will have to bend the first lead inserted for each Input resistor, and then straighten it out after pulling the other lead into place. (Use needle nose pliers with smooth, non serrated jaws for straightening resistor leads.) Also, it is a good idea to orient all the resistors in the same direction. Do this so that you can read all of the resistor values left to right or right to left.

Center the resistor between the wafers. (You may want to make another cardboard tool for holding the resistors centered while soldering them.)

Solder only the rear wafer connection at this time. This is because you will want to carefully check to ensure all of these "inner circle" Input resistors are the correct ones before you cover them up with the resistors on the "outer circle" (Ground resistors). If you have to remove one, it is a lot easier to do if only one lead was soldered.

Continue as above for R2A and the rest of the Input resistors. (You may find it easier to install 5 or 6 in sequence, solder their rear wafer connections, then do the next 5 or 6, etc.) The last Input resistor (R24A) is 0.0 ohm - so install buss wire or a clipped lead for it. After installing R24A, also install the buss wire next to the pad labeled Gnd, and the buss wire used for R1B.

When all the Input resistors are installed, check their values against the parts list. You may also want to check the installed resistor values with an ohm meter. Then, look them over and straighten any leads, if necessary.

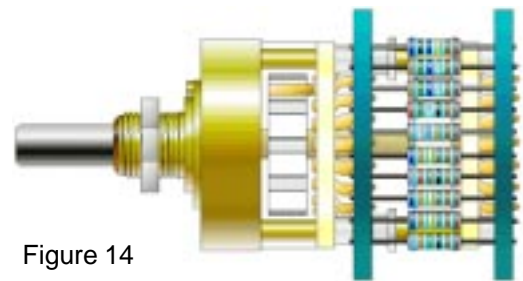
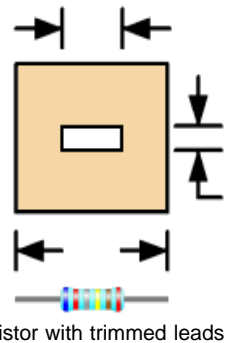
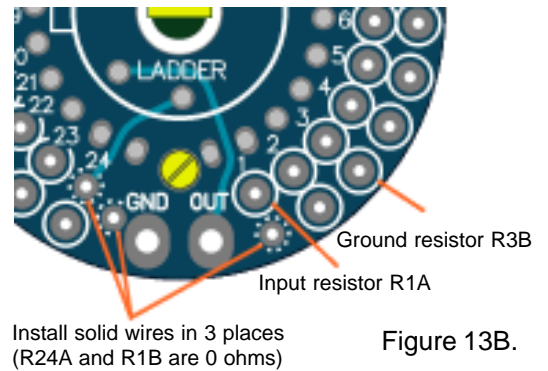
Install Ground resistors R1B through R24B. R1B is 0.0 ohms (a buss wire) and is located next to R1A but on the outer circle of pads (see figure 13B). (Again, you may find it easier to install 5 or 6 in sequence, solder their rear wafer connections, then do the next 5 or 6, etc.) Then, check their values against the parts list and/or with an ohm meter, and straighten any leads, if needed.

Solder all resistor connections on the front wafer. The following order is recommended:

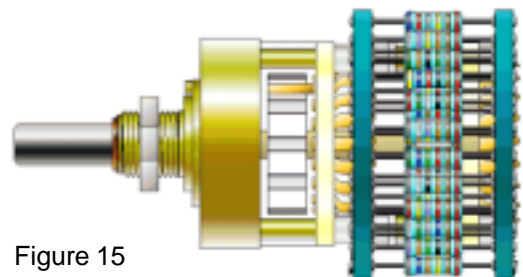
Soldering the resistors in groups on alternate sides of the switch helps to ensure that the resistors do not warp the switch pc boards as they cool from soldering.

It is not essential to clean off excess solder flux from the PC board pads, but it does look better. If you choose to do it, use Q-tips and solder flux remover. (99% isopropyl rubbing alcohol is great for removing excess flux. Fingernail polish remover can also be used for this.)

Do not let ANY solvents run or drip onto the switch contacts or their clear plastic covers.



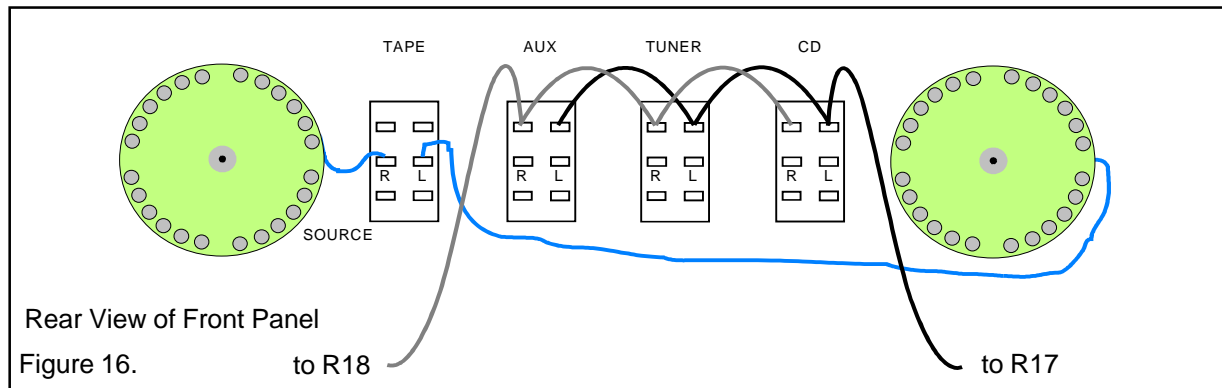
Attenuator with row A resistors installed



Attenuator with row B resistors installed

Route each wire connected to the *IN* lug of the rotary switch to the Source/Tape toggle switch and solder their ends to the middle lugs on this switch. See figure 16.

Locate the bag marked *SWGND*. Cut four wires approximately 1" in length, strip 1/8" of insulation from each end and solder to the *AUX*, *TUNER* and *CD* switch lugs as shown in figure 16. Solder the black ground wires previously connected to R17 and R18 to the switch terminals as shown below.



Install Preamp Circuit Board

Attach the standoffs to the bottom chassis plate using the supplied hardware. Loosely tighten the screws. Next install the preamp circuit board inside the chassis and secure with the provided screws. Once the board is installed, all of the standoff screws can be tightened.

Measure and cut to the proper length the wires originating from the circuit board pads 9 and 10 and solder them as follows: the wire originating from pad 9 will solder to the center hole in the left channel attenuator circuit board. The wire originating from pad 10 will be soldered to the solder lug on the left channel attenuator designated as *OUT*.

Measure and cut to the proper length the wires originating from the circuit board pads 23 and 24 and solder them as follows: the wire originating from pad 24 will solder to the center hole in the right channel attenuator circuit board. The wire originating from pad 23 will be soldered to the solder lug on the right channel attenuator designated as *OUT*.

Next solder the wires from the circuit board to the selector switches. First cut 8 pieces of the black 1/8" diameter heatshrink tubing to a length of 1/2 inch. Slip one tube over each of the wires originating from the following circuit board pads: 12 13 14 15 26 27 28 29

Allow the tubing to rest on the circuit board at the base of each wire. Start with the wire originating from circuit board pad #12. Bend the wire at a right angle towards the CD selector switch. Cut the wire to proper length, strip the end and solder it to the bottom lug of the selector switch as shown in figure 17.

Take the wire originating from circuit board pad #29, bend it at a right angle towards the CD selector switch. Cut the wire to proper length, strip the end and solder it to the bottom lug of the selector switch as shown in figure 17.

Take the wire originating from circuit board pad #13, bend it at a right angle towards the Tuner selector switch. Cut the wire to proper length, strip the end and solder it to the bottom lug of the selector switch as shown in figure 17.

Take the wire originating from circuit board pad #28, bend it at a right angle towards the Tuner selector switch. Cut the wire to proper length, strip the end and solder it to the bottom lug of the selector switch as shown in figure 17.

Take the wire originating from circuit board pad #14, bend it at a right angle towards the AUX selector switch. Cut the wire to proper length, strip the end and solder it to the bottom lug of the selector switch as shown in figure 17.

Take the wire originating from circuit board pad #27, bend it at a right angle towards the AUX selector switch. Cut the wire to proper length, strip the end and solder it to the bottom lug of the selector switch as shown in figure 17.

Take the wire originating from circuit board pad #15, bend it at a right angle towards the Tape/Source selector switch. Cut the wire to proper length, strip the end and solder it to the **top** lug of the selector switch as shown in figure 17.

Take the wire originating from circuit board pad #26, bend it at a right angle towards the Tape/Source selector switch. Cut the wire to proper length, strip the end and solder it to the **top** lug of the selector switch as shown in figure 17.

Slide each of the black heatshrink tubes up over the right angle bend and push it over the wire/solder lug connection so the solder joint is covered. Apply heat to the tubing until it is secure over the solder joint. Follow this procedure for each of the selector switch wires.

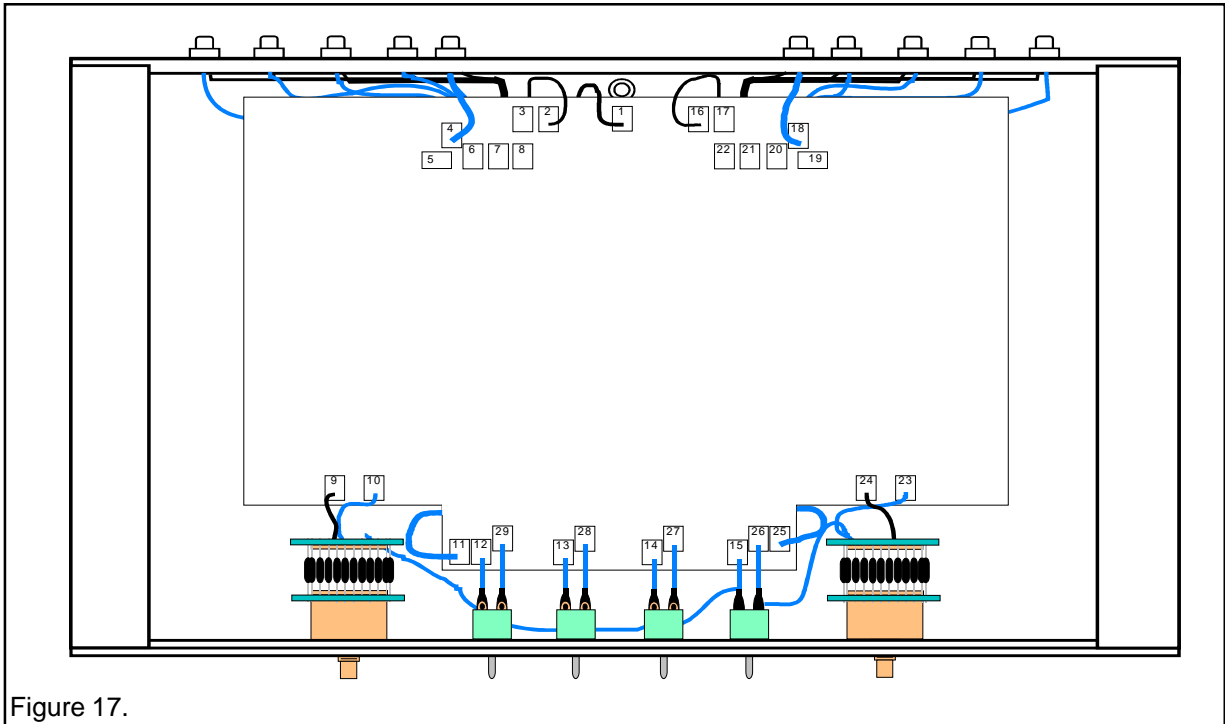


Figure 17.

Next locate the left and right channel Tape Out wires. Solder the left channel Tape Out wire to the circuit board pad labeled #11. For this connection solder is applied to the pad on the top side of the circuit board. Use caution and make certain the soldering iron does not touch adjacent wires or components. Solder the right channel Tape Out wire to the circuit board pad labeled #25. Refer to figure 17.

Solder the ground strap wire located at the rear of the chassis to the circuit board pad labeled #1.

Solder the left channel ground bus wire to circuit board pad #2 and the right channel ground bus wire to pad #16.

The next procedure is to solder the input wires to the toggle switches. Each switch, CD, Tuner, Aux and Source/Tape, will have left and right channel wire(s) soldered to its terminals. Viewing the chassis from the front and looking down on the switches, the left channel switch terminals will be on your left and the right channel switch terminals to your right.

Begin with the CD input wires. Locate the left and right channel wires. Solder them to the middle terminals of the switch as shown in figure 17B. Continue and solder the Tuner, Aux and Tape In wires to the remaining switches.

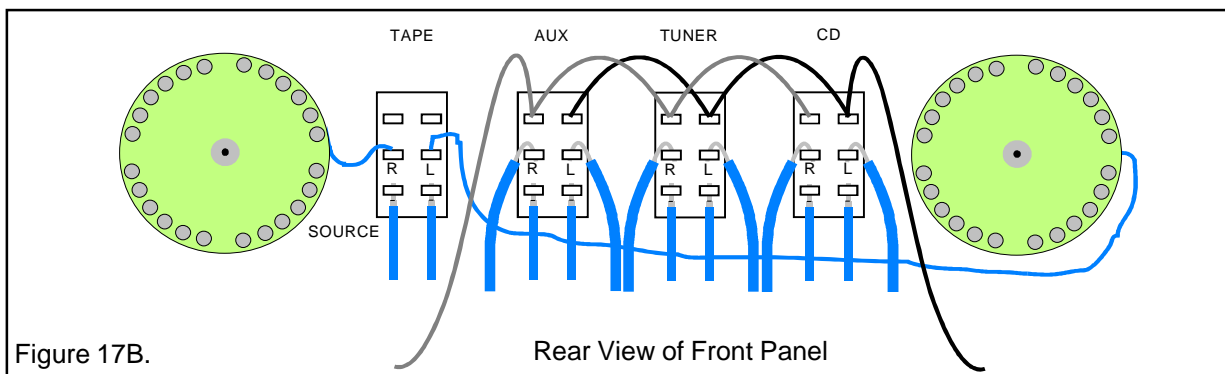
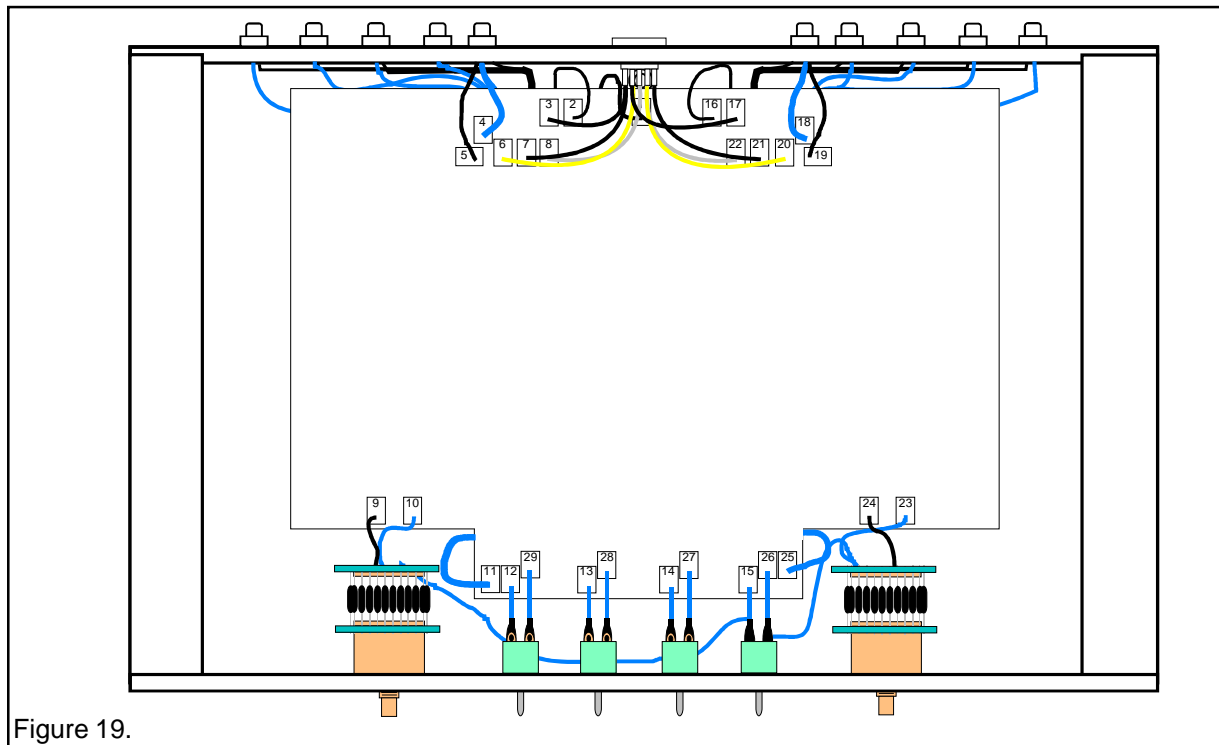
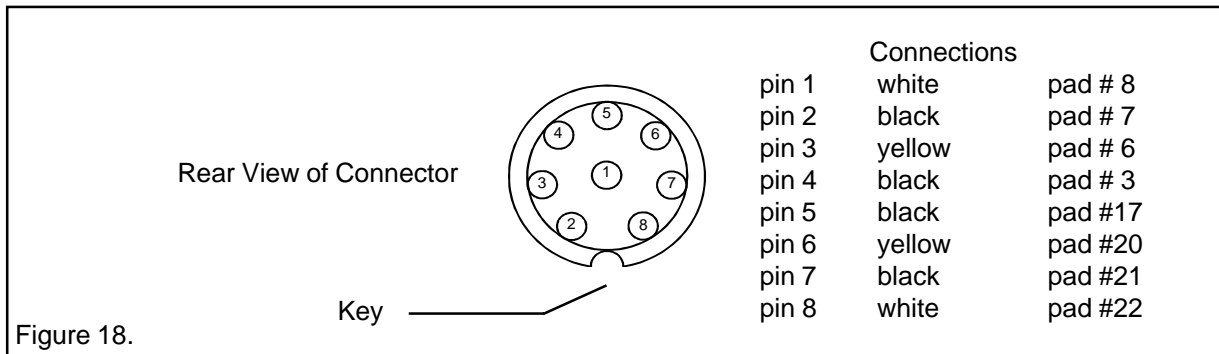


Figure 17B.

Solder the blue Main Output wires between the rca jacks and the circuit board pads.. Solder the left channel Main Output wire to circuit board pad #4. Solder the right channel Main Output wire to circuit board pad #18. Refer to figure 17. Solder the main output ground wires from the rca jacks to the printed circuit board. Solder the left channel main output ground wire to pad #5. Solder the right channel main output ground wire to the circuit board pad #19.

For this procedure you will solder the wires between the umbilical connector and the printed circuit board pads. Refer to figures 18 and 19 for the correct connections. Keep the leads short between the connector and the circuit board. Bend the leads at right angles using gentle bends instead of sharp ones.



The final task involves the installation of the knobs. First, make sure the attenuator shaft is rotated fully counter-clockwise. Loosen the nut on the attenuator switch and carefully rotate it so the flattened section of the shaft is pointing towards 1 o'clock. Tighten the nut securely and then slip the knob onto the shaft. The set screw inside the knob should be tightened down onto the flat section of the shaft. Be careful not to scratch the faceplate with your tools. If the knob is not perfectly centered inside the faceplate hole, remove the knob, loosen the attenuator nut and reposition the switch. Repeat this procedure until the knob rotates freely within the countersunk faceplate hole.

Power Supply Assembly

Remove the front panel from the power supply chassis and set it aside.

Install the IEC connector and fuse to the rear panel using the supplied hardware.

Mount the two toroid power transformers, as shown in figure 20, using the supplied hardware.

Position the two cable straps as shown in the diagram.

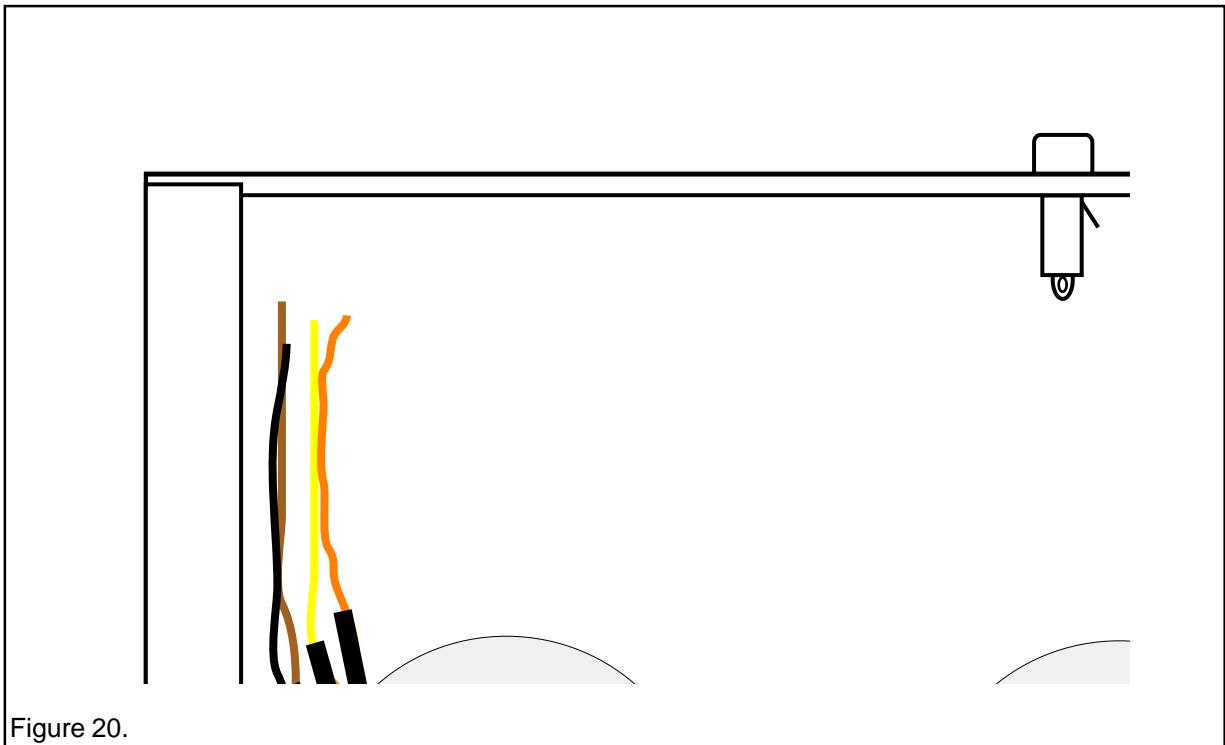


Figure 20.

Locate the chassis mount umbilical connector *CHUMB* and some of the yellow, black and white 18ga. solid core copper hookup wire. Cut 4 black, 2 white and 2 yellow pieces of this wire approximately 4.5 inches in length. Strip 1/4 inch of insulation from one end of each wire and solder them to the connector pins as indicated in figure 11 below. Solder the center wire first and then the remaining wires. There is very little space between the connector pins so you must use a minimum amount of solder here and make sure that no solder burrs are left on the solder joint as these could result in a short circuit between adjacent pins.

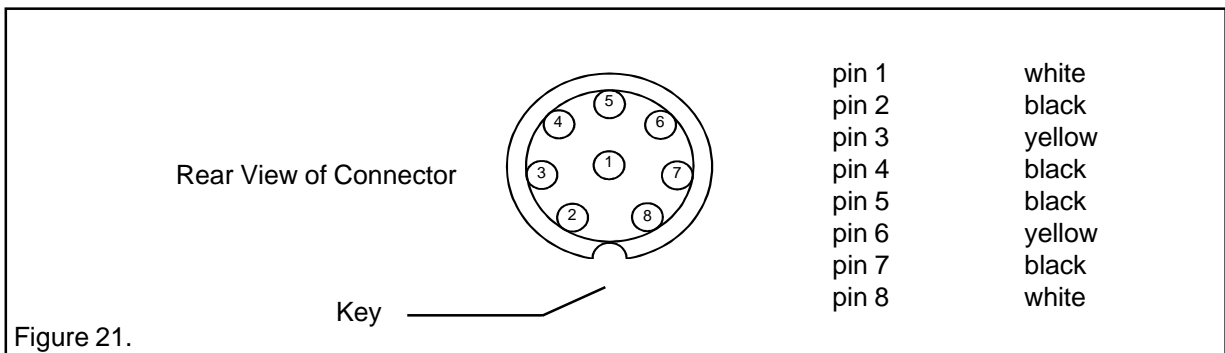


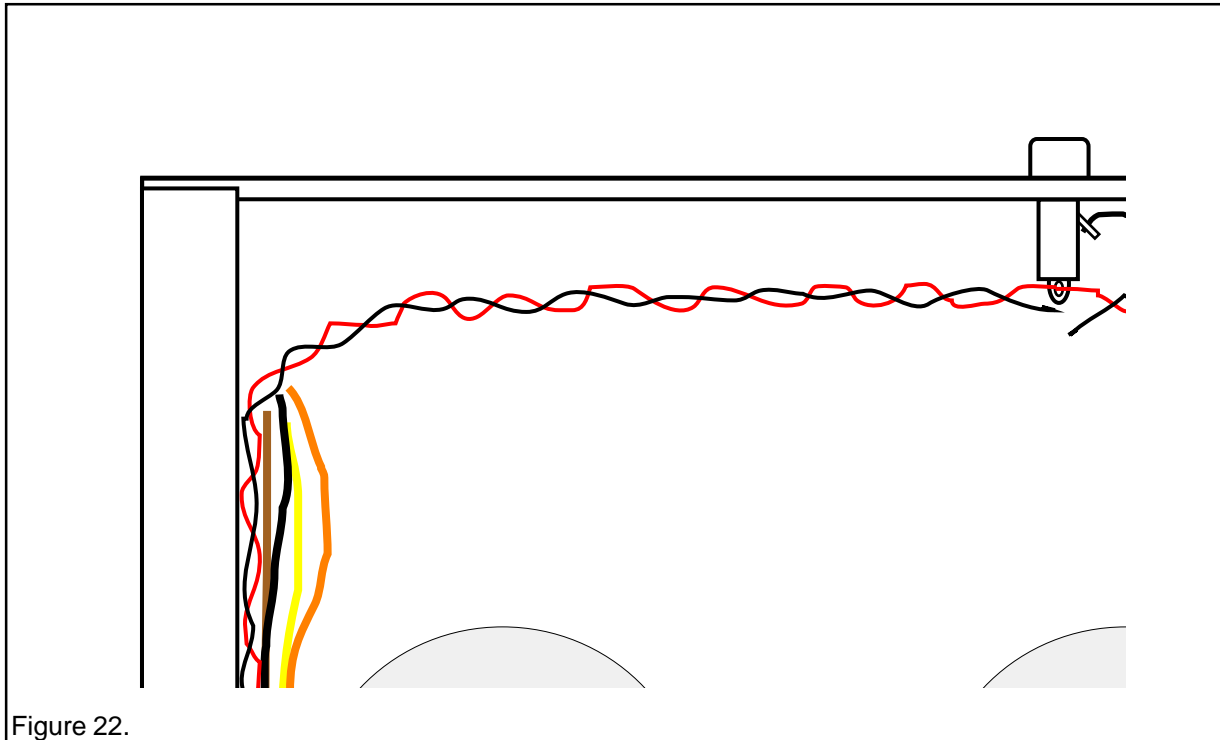
Figure 21.

Install the connector on the rear panel and secure the connector nut finger tight. The connector key should be on the bottom.

Locate the red and black twisted pair wire and cut it in half. Solder the red lead of each half to the solder lug of the fuse holder and route the two twisted pairs through the cable straps as shown in figure 22.

Solder one end of the chassis ground strap *CHGND* to the center solder lug of the *IEC* connector (ac receptacle). Attach the other end of the ground strap to the chassis using the supplied hardware (refer to figure 22).

Cut to length a short piece of the 18ga. stranded black hookup wire and solder it between the side lug of the fuse holder and the left solder lug of the *IEC* connector (refer to figure 22). You can use heatshrink tubing to cover these solder joints.



Power Supply Circuit Board Assembly

The next step involves placing and soldering the components onto the power supply circuit board. Move the power supply chassis off to one side and clear an area to work on the circuit board.

All components mount on the side of the circuit board that has the stuffing guides and text. Begin by removing the individual components from their bags and placing and soldering them to the board one at a time. Start with the smaller components first such as the jumper wires (J1 thru J6), R1, R2, D1, D2, Z1, etc. and then place and solder the larger sized components. Mount each component so it is flush with (or lays flat), and makes contact with, the circuit board. Insert the component leads and then flip the board upside down and solder the leads to the circuit board pads. Refer to the stuffing guide on the circuit board and figure 25.

The resistors R1 thru R16 have no polarity and neither do capacitors C5, C6, C9, C10, C19, and C20. The remaining capacitors have a polarity as well as all of the diodes, bridge rectifiers, mosfets and voltage regulators. For the capacitors, the "+" sign on the circuit board stuffing guide indicates the positive terminal. For the diodes and zener diodes, the line on one side of their stuffing diagram corresponds to the band on the diode body. In the case of D1-D4, Q1 and Q2, and U1 and U2, this line corresponds to the metal tab on the back of the device.

Attach Q1, Q2, U1 and U2 to their respective heatsinks before soldering to the circuit board.

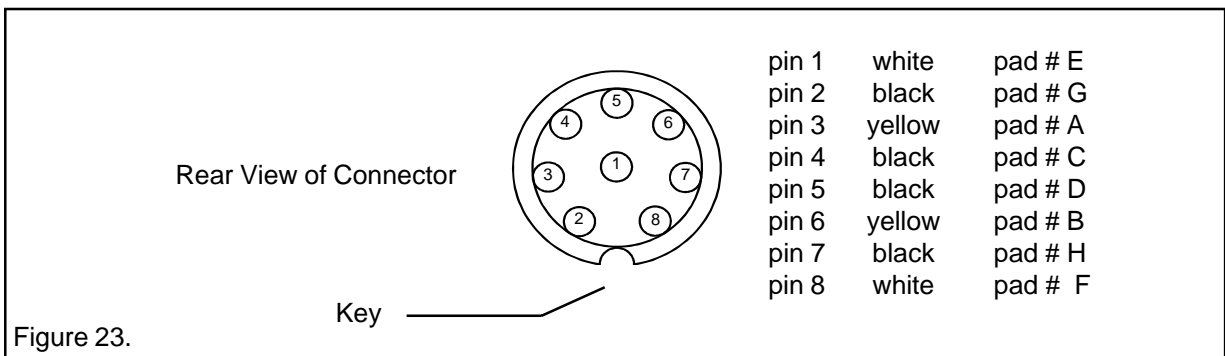
Cut short pieces of the 18ga. black solid core hookup wire for the jumper wires J1 thru J6.

Locate the LED cables and solder one to each of the two pads marked "led" on the circuit board. The white lead solders to the "+" pad and the black lead to the "-" pad.

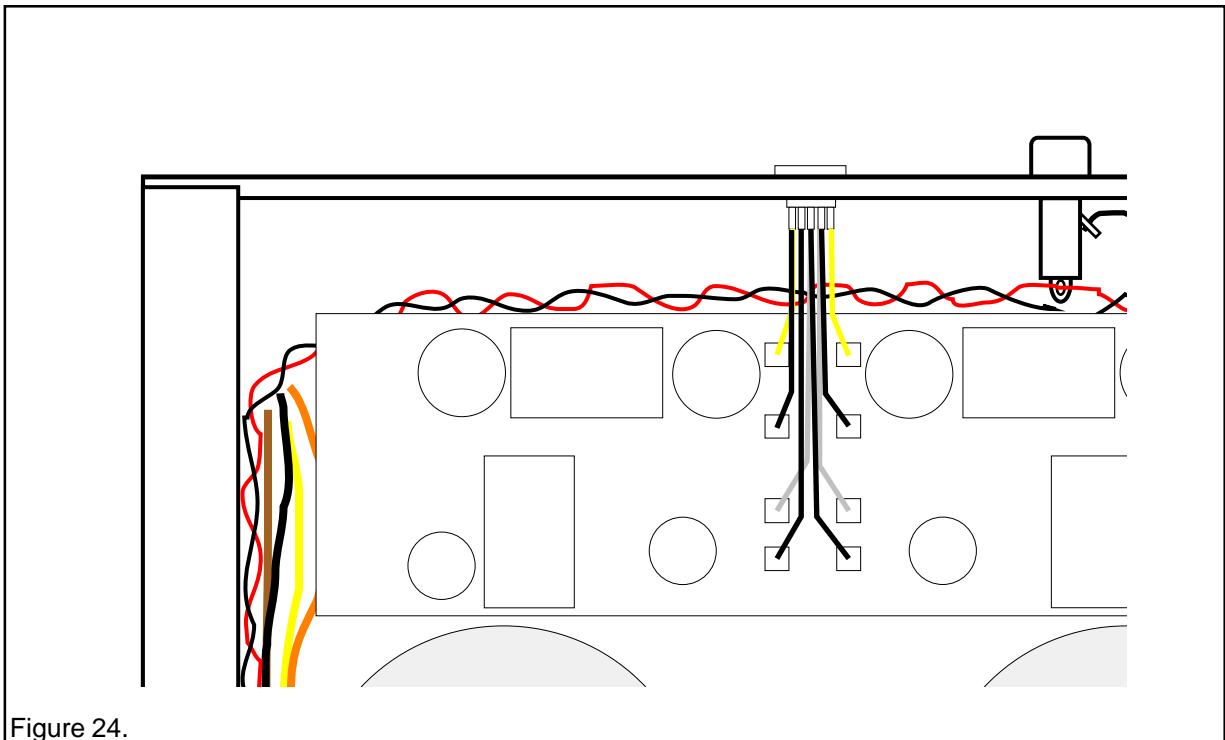
Install the plastic circuit board standoffs inside the chassis using the supplied hardware.

Next place the circuit board inside the chassis into its approximate position. Temporarily hold the circuit board in place with one or two standoff screws.

Bend and cut to the exact length the umbilical connector wires previously soldered to the connector. Measure each wire's length to its respective pad, cut to length and strip 1/4" of insulation from the end. Refer to figures 23 and 24 for the correct connections. Bend the wires at right angles with gentle bends.



Carefully remove the circuit board and the umbilical connector from the chassis so as not to disturb the umbilical connector wires. Insert the umbilical connector wires into the circuit board pads and solder.



Cut a piece of the black 18ga. solid core hookup wire approximately 4.0" in length and strip 1/4 inch of insulation from each end. Locate the pad marked "L" on the circuit board. To the left of pad "L" are two small unused pads. One of these pads connects to pad "L" and the other pad connects to pad "N" by way of the copper traces on the bottom of the board. Solder the 4.0" short black wire to the pad connected to pad "L".

Cut a piece of the black 18ga. stranded hookup wire approximately 4" in length and strip 1/4 inch of insulation from each end. Locate the three unmarked pads immediately to the right of pad "L" and solder one end of this wire to one of these pads. Cut a second piece of the black 18ga. stranded hookup wire approximately 12" in length, strip both ends. Locate the three unmarked pads immediately to the left of pad "K" and solder one end of this wire to one of these pads.

Once again, temporarily install the circuit board inside the chassis and secure with one or two of the standoff screws.

In the next series of steps you will measure and cut to length several wires, including the power transformer wires. It is very important that you not cut these wires too short or else you will have to go back and splice a wire to them so they will fit. These wires will not be soldered to the board at this time, just measured, cut and then 1/4" of insulation stripped from their ends.

Start with the left transformer and locate the two red leads originating from the transformer. One red lead will go the pad "I" and the other red lead will go to pad "M". Stretch the leads to their respective pads, allow approximately 1/2 to 1 inch of extra wire and then cut the wires.

Locate the yellow transformer lead. This lead will connect to pad "K". Measure and cut to length.

Locate the two blue transformer leads. One blue lead will connect to pad "O" and the other blue lead to pad "Q". Measure and cut to length.

Locate the single gray wire. This wire will not be used so cut it to a length of approximately 1" from the transformer body and cover the wire end using a piece of the 1/8 inch diameter heatshrink tubing.

The next step requires the selection of a primary ac voltage. This power supply operates on either 120 volts ac or 240 volts ac. Select the voltage appropriate for your country or location and then follow those directions.

120 volts ac:

Locate the left transformer's black and brown wires. These two wires will connect to the unmarked pads immediately to the left of pad "K". Measure and cut to length.

Locate the left transformer's white and orange wires. These two wires will connect to the unmarked pads immediately to the left of pad "O". Measure and cut to length.

240 volts ac:

Locate the left transformer's white and brown wires. These two wires will connect to the two unmarked pads immediately to the left of pad "M". Measure and cut to length.

Locate the left transformer's black wire. This wire will connect to one of the unmarked pads immediately to the left of pad "K". Measure and cut to length.

Locate the left transformer's orange wire. This wire will connect to one of the unmarked pads immediately to the left of pad "O". Measure and cut to length.

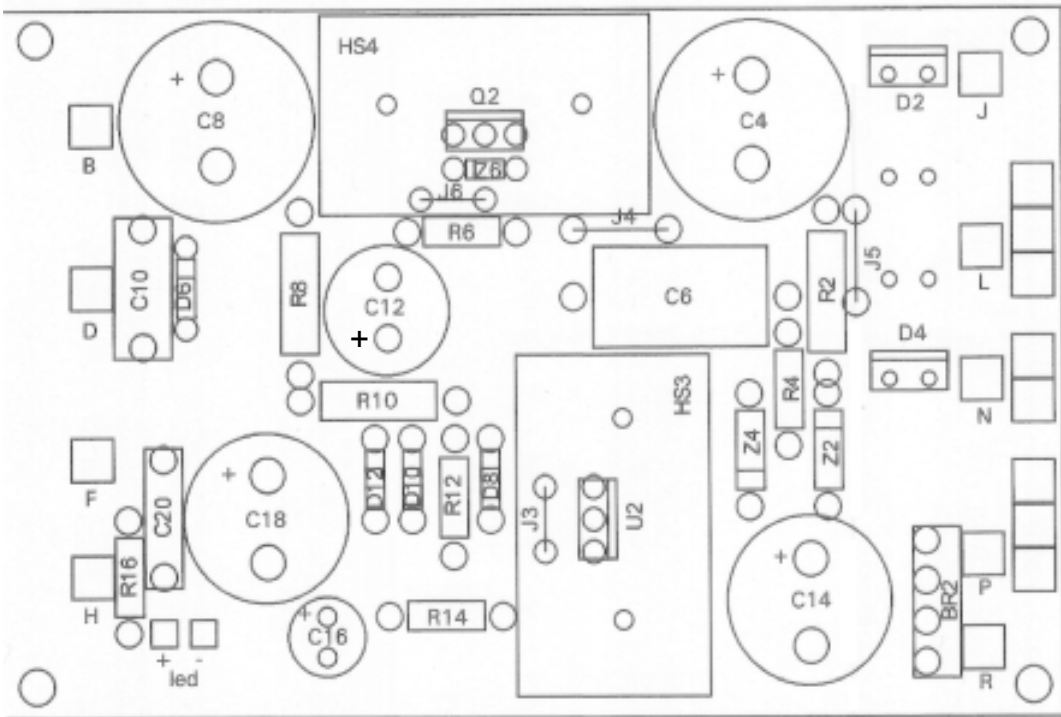
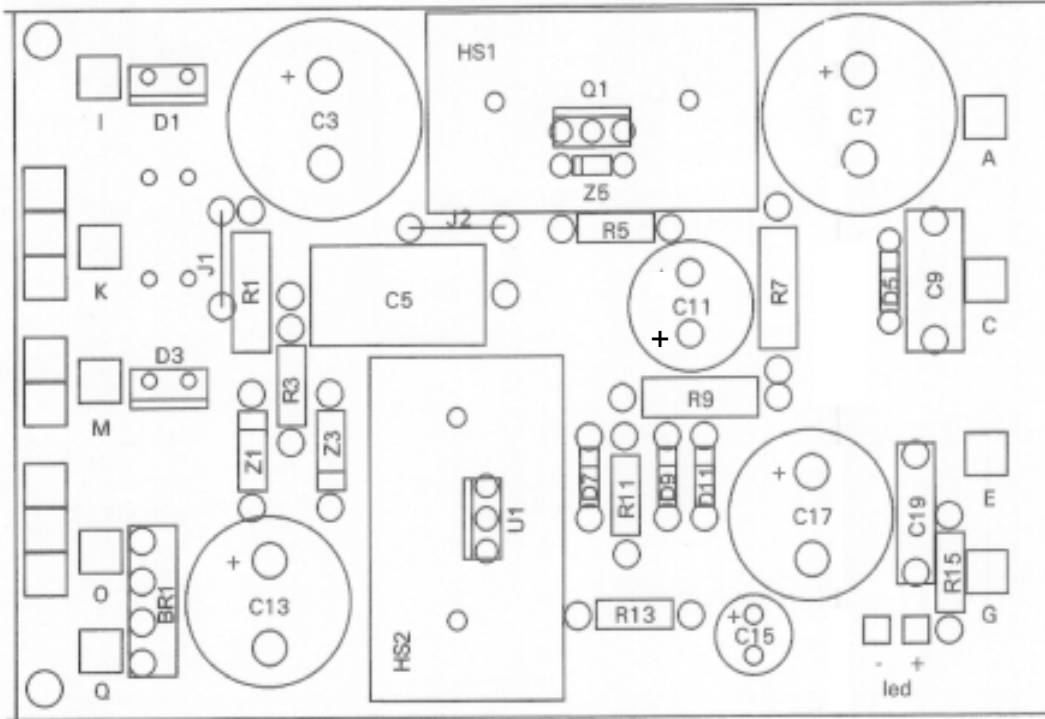


Figure 25.

Repeat the previous steps for the right transformer as follows:

Locate the two red leads originating from the right transformer. One red lead will go to the pad "J" and the other red lead will go to pad "N". Stretch the leads to their respective pads, allow approximately 1/2 to 1 inch of extra wire and then cut the wires.

Locate the yellow transformer lead. This lead will connect to pad "L". Measure and cut to length.

Locate the two blue transformer leads. One blue lead will connect to pad "P" and the other blue lead to pad "R". Measure and cut to length.

Locate the single gray wire. This wire will not be used so cut it to a length of approximately 1" from the transformer body and cover the wire end using a piece of the 1/8 inch diameter heatshrink tubing.

Once again choose the ac voltage appropriate for your country or location and then follow those directions below.

120 volts ac:

Locate the right transformer's black and brown wires. These two wires will connect to the unmarked pads immediately to the right of pad "L". Measure and cut to length.

Locate the right transformer's white and orange wires. These two wires will connect to the unmarked pads immediately to the right of pad "P". Measure and cut to length.

240 volts ac:

Locate the right transformer's white and brown wires. These two wires will connect to the two unmarked pads immediately to the right of pad "N". Measure and cut to length.

Locate the right transformer's black wire. This wire will connect to one of the unmarked pads immediately to the right of pad "L". Measure and cut to length.

Locate the right transformer's orange wire. This wire will connect to one of the unmarked pads immediately to the right of pad "P". Measure and cut to length.

Continuing on:

Locate the red/black twisted pair wire on the left. The black wire of this pair must be cut and one end soldered to one of the three unmarked pads immediately to the left of the pad marked "O". Position the twisted pair adjacent to this pad, cut only the black wire and remove the half that is routed to the fuse holder. Remove this rear half by untwisting the black wire from the pair and leave the front half in the twisted pair.

Repeat this procedure for the red/black twisted pair wire on the right side of the chassis. The black wire of this pair will connect to one of the unmarked pads immediately to the right of the pad "P".

Remove the circuit board from the chassis and begin soldering the wires, you have just cut, to their respective pads. Perform this procedure by inserting one wire at a time into its pad, folding the board back and over towards the front of the chassis and soldering the wire. Repeat this process until all of the wires are soldered to the board.

Carefully install the circuit board back into the chassis and secure with all of the standoff screws. Center the umbilical connector in its hole and tighten the locking nut.

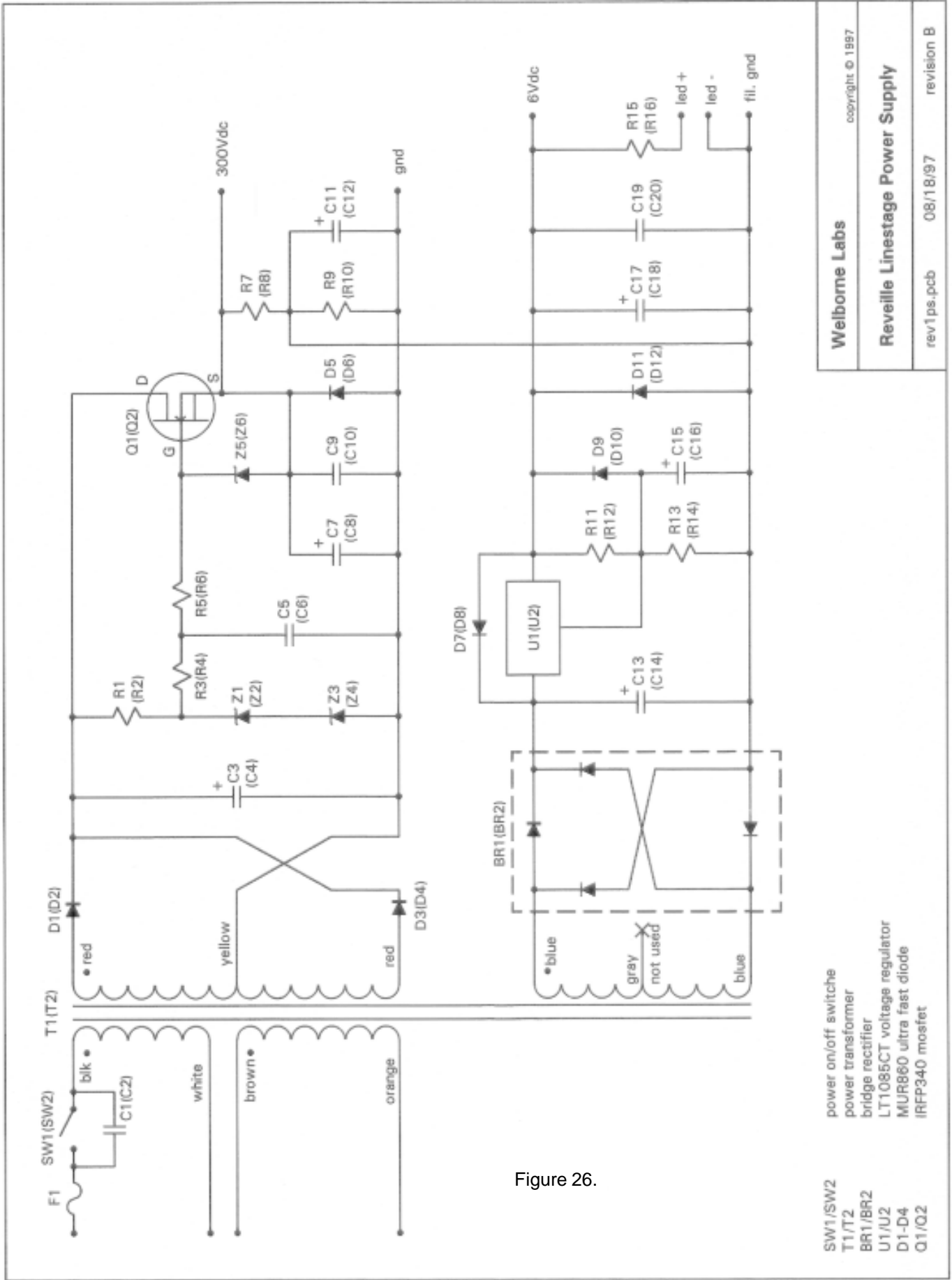


Figure 26.

- SW1/SW2 power on/off switch
- T1/T2 power transformer
- BR1/BR2 bridge rectifier
- U1/U2 LT1085CT voltage regulator
- D1-D4 MUR860 ultra fast diode
- Q1/Q2 IRFP340 mosfet

Welborne Labs	copyright © 1997
Reveille Linestage Power Supply	
rev1ps.pcb	08/18/97
	revision B

Solder the one short black wire originating from the small pad located to the left of pad “L” to the center lug on the IEC connector. Solder the short black wire originating from the pad located to the right of pad “L” to the right IEC connector solder lug. Solder the long black wire originating from the pad located to the left of pad “K” also to the right solder lug of the IEC connector.

Locate the front panel of the power supply chassis and install the two power toggle switches (SW1-SW2) using the same procedure as was used when you installed the four switches to the preamp front panel.

Install the front panel onto the chassis using the supplied hardware. **Be careful not to scratch the front panel.**

Cut to proper length and solder the left channel red/black twisted pair wires to the left power toggle switch. Solder the red wire to the bottom switch terminal and the black wire to the center switch terminal. The top terminal is not used. Repeat this procedure for the right channel. Locate capacitors C1 and C2. Solder C1 to the left channel power switch and solder its leads to the same terminals as the twisted pair wire is soldered to. Repeat this step for C2 and the right channel.

Install the LEDs into the front panel. Push the LED as far as it will go into the panel. A small object such as a small scredriver blade may be used to push on the back of the LED to force it all of the way into the hole.

Connect the LED cable to each LED. The LED has two leads one of which is longer than the other. The white wire of the LED cable attaches to this lead and the black wire attaches to the shorter LED lead. The LED leads may be trimmed shorter so that the LED cable connector mounts flush against the back wall of the front chassis panel.

Now is a good time to go back and inspect your work. Use some of the cable ties to bundle the transformer leads and stow them off to the side of the transformer and power supply circuit card.

Install fuse in the fuse holder. This completes the assembly of the power supply.

Assemble umbilical cord

The final assembly procedure involves building the umbilical cord. Locate the two female umbilical cable connectors and the black 18ga. solid core hookup wire.

Cut 8 pieces of the hookup wire each approximately 8 inches in length. Strip 1/4 inch of insulation from one end of each wire. Solder one wire to each of the connector pins starting with the center pin and then the outside perimeter pins. Use just enough solder to make the connection. Lightly pre-tinning the end of the wire first sometimes helps. Make certain there are no solder burrs that can come in contact with an adjacent connector pin.

Once all of the wires are soldered, slip the locking nut over the wires and onto the plug. Slip the strain relief bushing over the wires and into the plug, it should snap into place. Next slide the rubber boot over the wires and onto the plug.

Before soldering the other plug to the wires, first slide the other plug’s rubber boot, strain relief bushing and locking nut onto the cord. You can also slide one or two pieces of 1 inch long heat shrink tubing onto the cable but do not heat it at this time. Bend the cable into a “U” shape such that the plugs will be even with each other and approximately 5 inches apart. Note the plugs are keyed. Bend the wires such that the wire folds underneath the key of the top plug. Refer to figure 27.

Cut the ends of the wires flush with each other and strip 1/4 inch of insulation from each end. Solder the ends of the wires to the connector pins. Each wire should be soldered to the same pin number on both plugs, i.e. pin # 1 of the top connector should be connected to pin #1 of the lower connector, pin # 2 to pin # 2, etc. Once all of the wires are connected, install the locking nut, strain relief bushing and rubber boot and then apply heat to the heatshrink tubing.

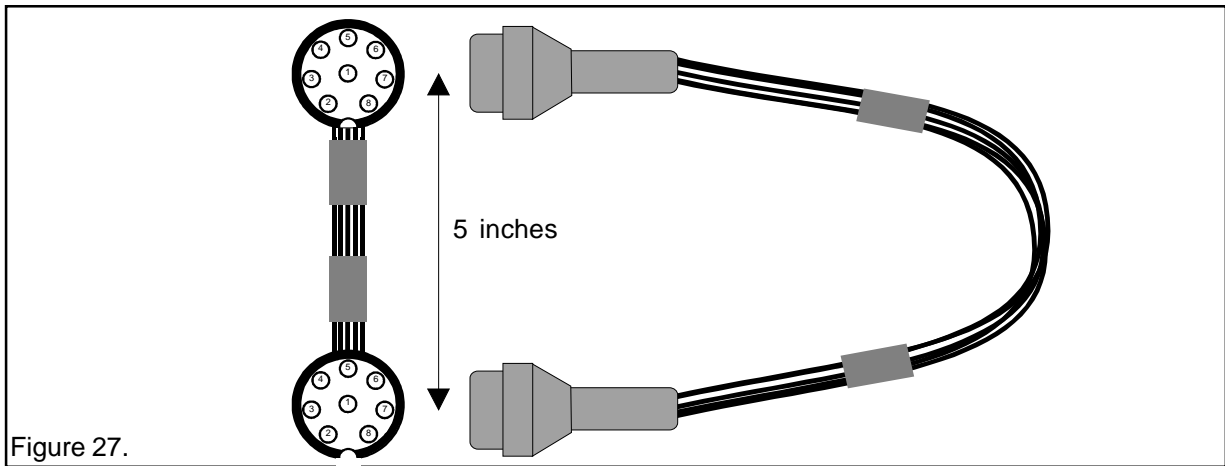


Figure 27.

Power Up and Test Procedure

The power supply will be tested first without being connected to the preamp.

If you own or have access to a variable ac transformer, use it to slowly increase the ac voltage during power-up. Power on one channel at a time and monitor the B+ high voltage, using a dc voltmeter, as you increase the ac voltage or turn on the power switch. To measure the B+ high voltage connect the red or positive test probe of your voltmeter to the banded side of diode D5. Connect the negative or black probe of your voltmeter to the negative, or opposite, lead of diode D5. Set the voltmeter for a "DC Volts" reading and for a voltage range of 400 volts or more. Upon full power you should measure approximately 300 volts. This value may vary by as much as plus or minus 10 volts depending upon the ac line voltage in your area.

If the B+ does not show signs of increasing after 4 or 5 seconds, immediately turn off the power.

If the B+ voltage checks OK, next measure the voltage across diode D11. Connect the positive test probe of your voltmeter to the banded side of D11 and the black or negative test probe to the opposite side of D11. Set the voltage range on the meter to the 10 volt scale. You should measure approximately 6.0 volts. Once again this value may vary by as much as plus or minus 0.2 volts.

Check to see if the LEDs are lit. They should be blue in color.

If all the above voltages measure OK, turn off this channel and power up and test the second channel. For the high voltage B+ measure across D6 and for the low voltage measure across D12.

If these voltages measure OK, turn this channel off and let the unit sit for approximately 2 minutes to allow the capacitors to discharge. You can install the top cover while you are waiting.

Set the preamp chassis on top of the power supply chassis and connect the umbilical cord between the two units. To install the umbilical connectors, push the male connector onto the female as far as it will go, then push the connector forward again while rotating the locking nut in the clockwise direction. The nut should lock after 1 turns. If you assembled all of the connectors properly you should be able to mate the connectors without having to twist the umbilical cable.

Install the 6SN7 tubes into the preamplifier. Power on one channel at a time and perform the following measurements:

Set the meter for a range of 400 volts or more. Place the multimeter's red "+" test probe on the left lead of capacitor C10 and the black "-" test probe on the right lead of C10. You should measure approximately 300 volts dc.

Remove the red test probe from C10 but leave the black test probe on the right lead of C10. Set the meter for a range of 10 volts or more and then place the red test probe on pin 3 of the V1 tube socket (refer to figure 28). You should obtain a reading of approximately 4.0 volts dc.

Carefully place the red test probe on pin 8 of the V1 tube socket and the black test probe on pin 7 of the V1 tube socket. Set the meter for a range of 10 volts or more. You should obtain a reading of approximately 6.0 volts dc.

Set the meter for a range of 400 volts or more. Place the multimeter's red "+" test probe on right lead of capacitor C4 and the black "-" test probe on the left lead of C4. You should measure approximately 300 volts dc.

Remove the red test probe from C4 but leave the black test probe on the left lead of C4. Set the meter for a range of 10 volts or more and then place the red test probe on pin 3 of the V2 tube socket (refer to figure 28). You should obtain a reading of approximately 4.0 volts dc.

Carefully place the red test probe on pin 7 of the V2 tube socket and the black test probe on pin 8 of the V2 tube socket. Set the meter for a range of 10 volts or more. You should obtain a reading of approximately 6.0 volts dc.

If the above voltages measure good turn the unit off and install the top cover. You can now connect the Reveille linestage to your system and listen to music.

Troubleshooting

Problem:

- | | |
|---------------|---|
| Low or no B+ | Check the polarity of all electrolytic capacitors. |
| No Sound | Are the tubes glowing? Are your speakers properly connected? |
| Excessive Hum | Possible ground loop in circuit or chassis may not be grounded. Check all ground wiring. Check filament voltages and wiring. Check all tubes. If you are still experiencing some amount of hum we have including an external ground strap which can be connected between the ac ground of your house wiring and a chassis screw on one of your source units, CD, Tuner, etc. Or possibly connecting the ground strap between a CD player and D/A converter via external chassis screws will remove the hum. This situation may exist because the Reveille input circuitry is not connected to earth ground because of the input transformer. Therefore the input portion of the Reveille is dependent upon the source equipment to supply this ground through the interconnect ground wire. Some source equipment do not have an earth ground connection and this may result in the hum. Some experimentation with the external ground strap will eventually fix the hum. |
| Popping Noise | Possible cold or weak solder joint or loose connections. Check all solder connections. |

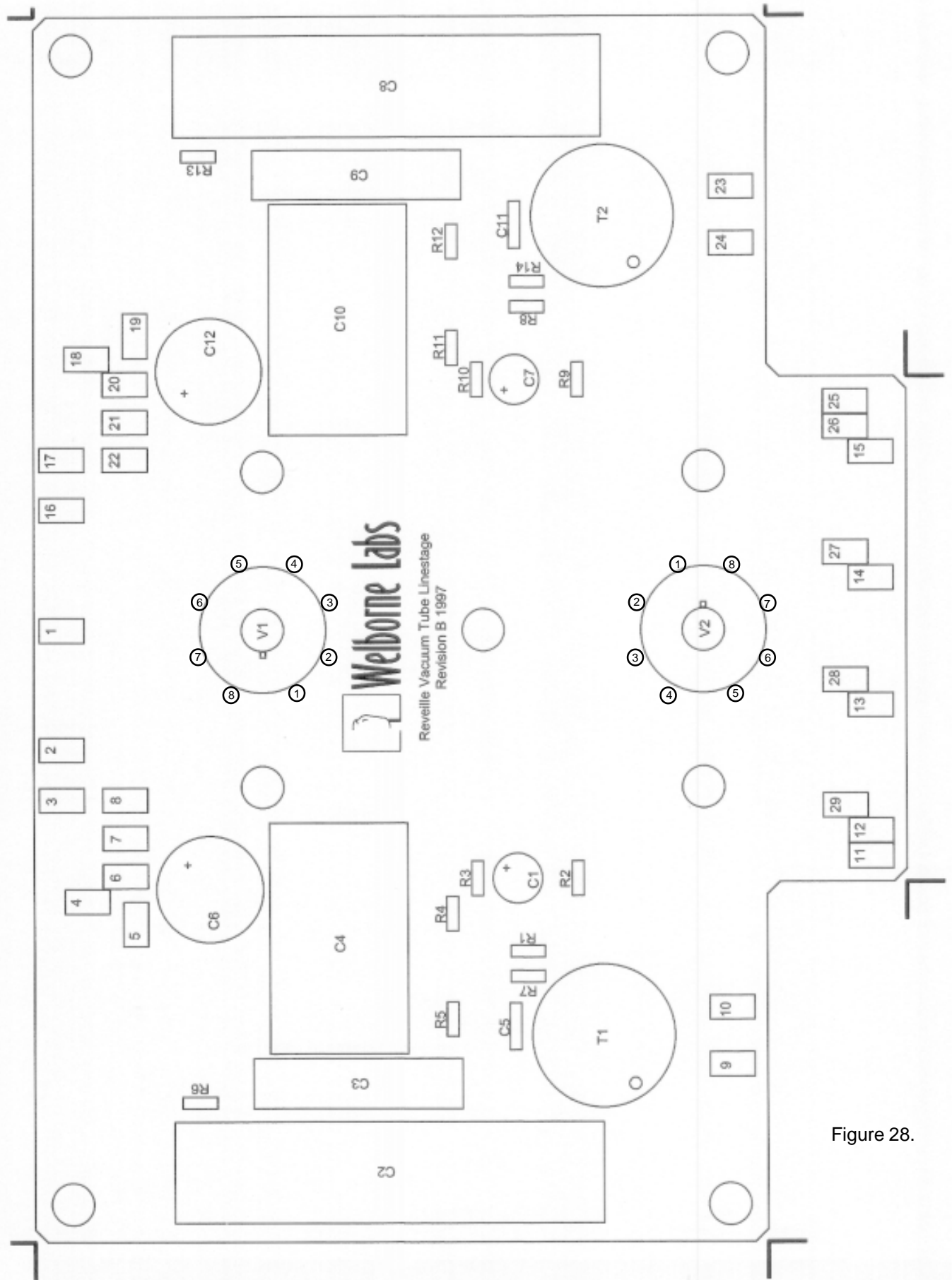


Figure 28.

If you have difficulty building or troubleshooting your equipment, give us a call. We will be glad to help you get your equipment running. We have a very high success rate at troubleshooting equipment problems over the telephone however phone calls can be expensive and they will be on your nickel, not ours. A letter or e-mail might be more appropriate, but in either case it will help if you have taken the time to write down as many symptoms as possible and also take and record some voltage measurements at key nodes in the circuit. If all else fails, you can send your linestage to us, however this should be your last resort.

We have built and tested this linestage many times over and it works and therefore we have to assume that if your linestage does not work, it is most likely something you did wrong during assembly. Please be prepared to pay a flat rate fee of \$35 per hour for repairs. Assuming you did a good job of assembling the unit but overlooked a step or installed a component incorrectly, our repair time should be minimal and your charges will most likely be under \$100.00.

Whatever the case may be, don't give up, please give us a call. We really want you to complete this project.

Final Notes

Allow the linestage to warmup for several minutes prior to using it. This will guarantee the preamp is operating under optimum conditions.

The Reveille Linestage is designed to require a minimum amount of maintenance. There are no adjustments to make, you just plug in the tubes, turn on the power and enjoy. A light application of a window cleaner, such as Windex, 409, etc., can be used to remove dust, dirt and fingerprints from the chassis. I recommend you occasionally clean the rca connectors with a good quality cleaner/conditioner.

No doubt many of you will look at this linestage with an eye on making component changes or circuit modifications. If you purchased this linestage pre-assembled, this will void the warranty. If you have built the kit version, then go for it!

Have fun with your experimentation and listening. I hope you receive many years of enjoyment from your purchase.

Peace and Happiness,



Ron Welborne