PRICE $2.00

BENTON HARBOR MICHIGAN

HEATHKIT®
ASSEMBLY MANUAL

HEATH COMPANY

HEATHKIT® by Daystrom

STEREO AMPLIFIER

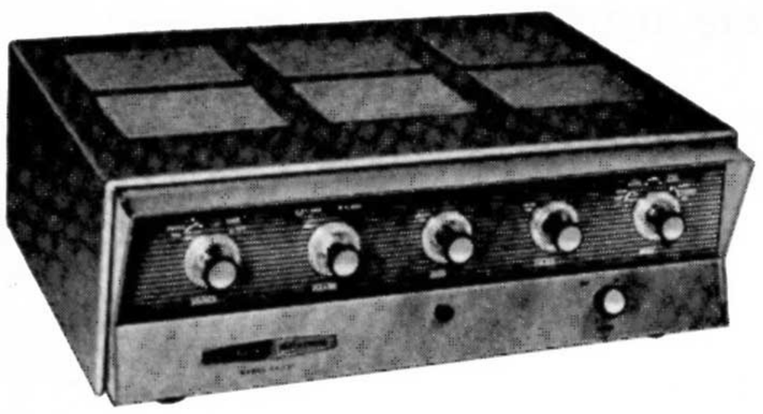
MODEL AA-151

Assembly and Operation of the

HEATHKIT by DAYSTROM

STEREO AMPLIFIER

MODEL AA-151



HEATH COMPANY,
BENTON HARBOR,
MICHIGAN

a subsidiary of DAYSTROM, INCORPORATED

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SPECIFICATIONS

Power Output	
Rated Power (rms):	14 watts per channel, 28 watts monophonic.
Peak Power:	28 watts per channel, 56 watts monophonic.
Circuit:	Features Heath patented Ultra-Linear circuit, U. S. Patent #2, 710, 312.
Power Response:	±1 db from 30 to 15,000 cps at 14 watt level.
Tone Controls	
Bass:	19 db boost at 30 cps. 17 db cut at 30 cps.
Treble:	13 db boost at 15,000 cps. 17 db cut at 15,000 cps.
Maximum Harmonic Distortion (both channels at full output).	
30 cycles:	2%.
1 kc:	.7%.
15 kc:	2%.
Intermodulation Distortion (maximum): (Using 60 cycle and 6 kc signal mixed 4:1.)	2%, both channels at full output.
Input Sensitivity	
MAG. PHONO:	.004 volt for 14 watts output.
TUNER-AUX.:	.2 volt for 14 watts output.
XTAL:	.25 volt for 14 watts output.
Channel Separation:	Better than 35 db.
Hum And Noise	
MAG. PHONO:	55 db or better below 14 watts.
XTAL-TUNER-AUX.:	65 db below 14 watts.
Damping Factor:	10.
Tube Complement:	2 - 6EU7 2 - 6AU6 2 - 6AN8 4 - EL84/6BQ5 1 - GZ34/5AR4

Controls And Switches:.	SOURCE Selector (MAG. PHONO, XTAL PHONO, TUNER, AUX.) VOLUME (dual-concentric with clutch). BASS (dual-tandem). TREBLE (dual-tandem). MODE Selector (AMP LEFT, AMP RIGHT, MONO LEFT SOURCE, MONO RIGHT SOURCE, STEREO, and STEREO REV.) POWER (ON-OFF). SPKR. PHASE (NORM.-REV.) FILAMENT BALANCE (LEFT CHANNEL and RIGHT CHANNEL).
AC Receptacles:.	1 - NORMAL (unswitched), 3 amps maximum. 1 - SWITCHED, 1 amp maximum.
Power Supply:.	Transformer-operated full-wave rectifier.
Power Requirements:.	117 volts AC, 50/60 cps, at 130 watts.
Dimensions	
Overall:.	5-1/4" high x 15" wide x 11" deep.
Clearance required for rear apron connections:.	1-1/4".
Net Weight:.	25 lbs.
Shipping Weight:.	28 lbs.

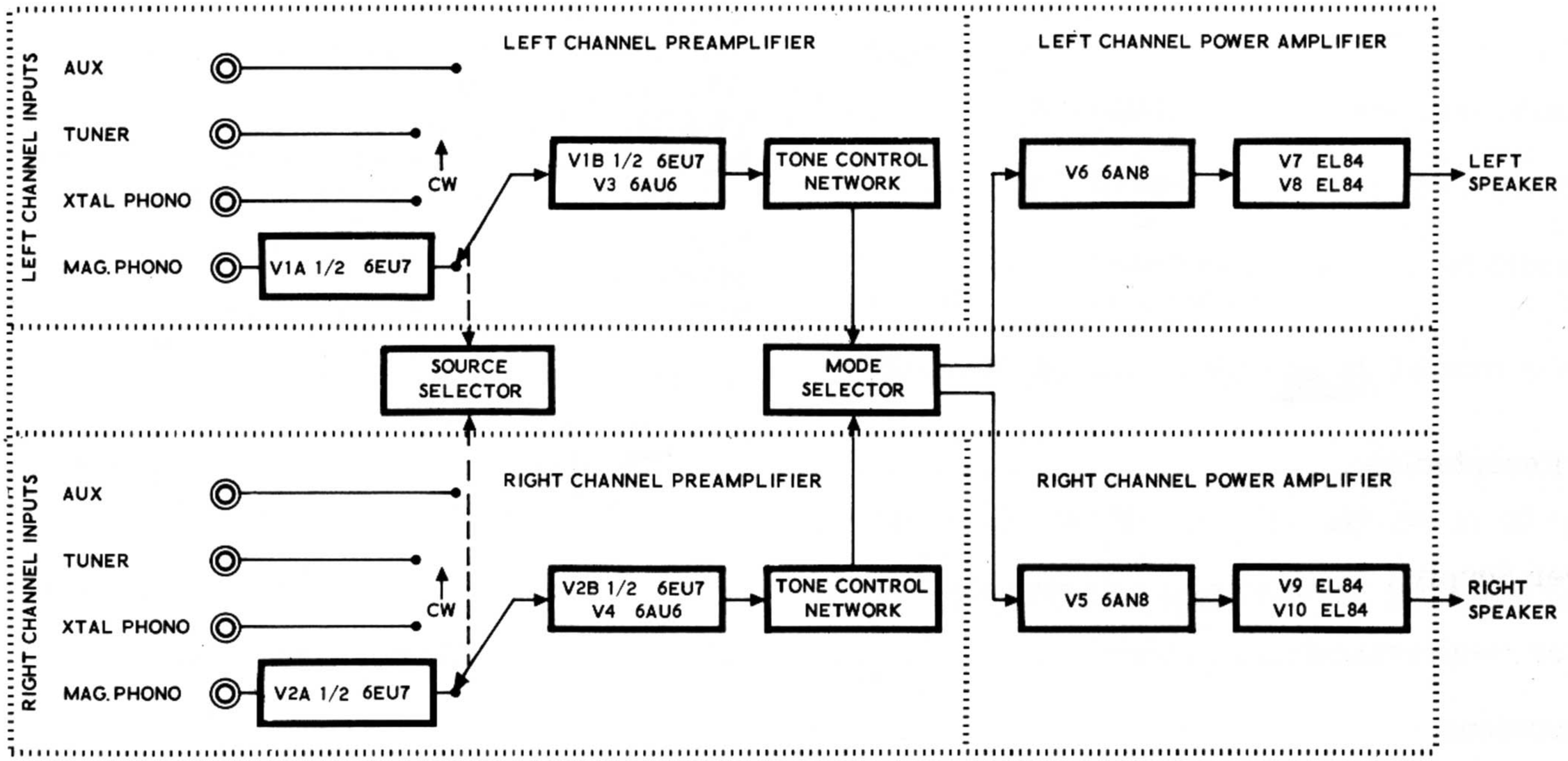
Features patented Heath Ultra-Linear ® circuit
U. S. Patent #2,710,312

INTRODUCTION

Your HEATHKIT Model AA-151 Stereo Amplifier is, effectively, two high fidelity amplifiers, two preamplifiers and a power supply, all contained in a single, attractively styled vinyl-clad cabinet. Quality, versatility, styling, and economy are the keynotes of the AA-151 design.

The use of two independent power amplifiers and preamplifiers as a single unit provides excellent performance versatility, which could not be duplicated using separate amplifiers and preamplifiers occupying the same amount of space as the AA-151. Either eight monophonic or four stereo signal sources can be connected to the input jacks of the AA-151. Each input source can then be selected individually with the SOURCE selector switch. The output level of the power amplifiers may be set separately or simultaneously with the clutched VOLUME control.

CIRCUIT DESCRIPTION



BLOCK DIAGRAM

The Model AA-151 Stereo Amplifier has three basic sections; a common power supply, the left channel preamplifier and amplifier, and the right channel preamplifier and amplifier.

The left and right channel preamplifier and amplifier circuits are identical, therefore, only the left channel and power supply circuits will be discussed. For the purpose of this description, assume that the SOURCE switch is in the MAG. PHONO position and that the MODE selector switch is in the LEFT AMP position. We suggest that you frequently refer to the Schematic and Block Diagrams.

The audio signal presented to the MAG. PHONO input is applied directly to the grid of tube V1A. V1A is a high-gain, low-noise preamplifier stage. The amplified signal is coupled from the plate of V1A through capacitor C5 to the grid of V1B. Resistors R9 and R10, along with capacitors C3, C4 and C6, provide RIAA equalization for magnetic phono cartridges. V1B is also a high-gain preamplifier. The amplified signal from its plate is coupled by capacitor C8 and the VOLUME control to the grid of V3.

V3 further increases the amplitude of the signal. The amplified signal from V3 is fed through capacitor C11 to the packaged electronic tone control network. This network consisting of several resistors and capacitors, encapsulated in an insulating material, operate in conjunction with R20 and R23 to perform the BASS and TREBLE control functions. The output signal of the tone control network is applied through the MODE switch to the grid of V6A.

The signal is again amplified by V6A and is applied to the grid of V6B, the phase inverter V6B does not amplify the signal, but applies the signal in proper phase, to each tube (V7 and V8) in the push-pull amplifier output stage.

The signal from the push-pull output stage is coupled through audio output transformer T1 to the left channel speaker system.

The power supply uses a 5AR4 tube as a full-wave rectifier. The filter network, consisting of capacitors C25, C24, C23, and C22, and resistors R36, R35, and R34, removes the 120 cycle ripple from the B+ voltage.

CONSTRUCTION NOTES

This manual is supplied to assist you in every way to complete your kit with the least possible chance for error. The arrangement shown is the result of extensive experimentation and trial. If followed carefully, the result will be a stable instrument, operating at a high degree of dependability. We suggest that you retain the manual in your files for future reference, both in the use of the instrument and for its maintenance.

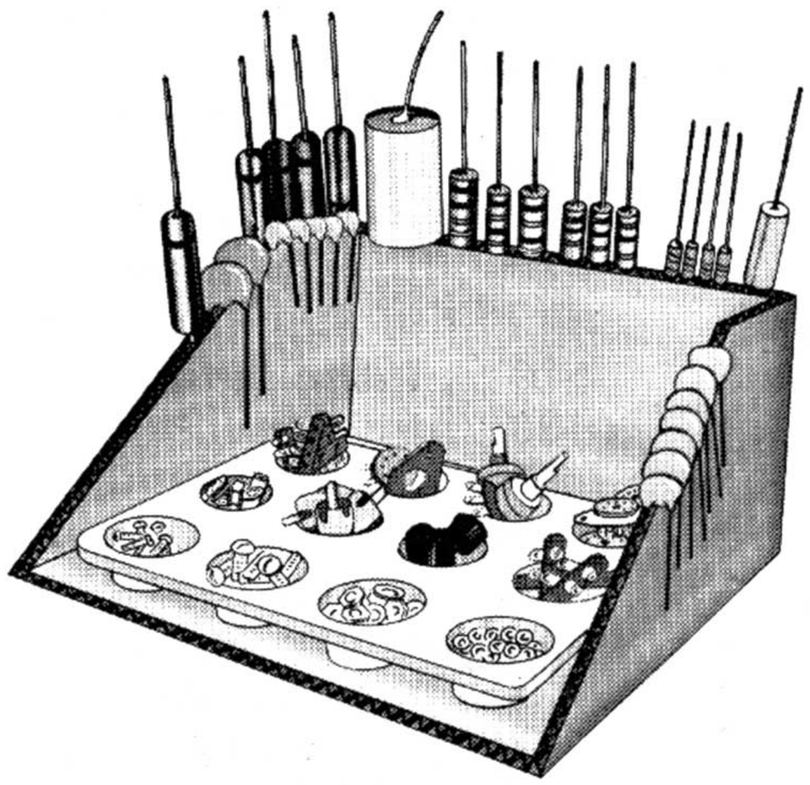
UNPACK THE KIT CAREFULLY AND CHECK EACH PART AGAINST THE PARTS LIST. In so doing, you will become acquainted with the parts. Refer to the charts and other information on the inside covers of the manual to help you identify the components. If some shortage or parts damage is found in checking the Parts List, please read the Replacement section and supply the information called for therein. Include all inspection slips in your letter to us.

Resistors generally have a tolerance rating of 10% unless otherwise stated in the Parts List. Tolerances on capacitors are generally even greater. Limits of +100% and -20% are common for electrolytic capacitors.

We suggest that you do the following before work is started:

1. Lay out all parts so that they are readily available.
2. Provide yourself with good quality tools. Basic tool requirements consist of a screwdriver with a 1/4" blade; a small screwdriver with a 1/8" blade; long-nose pliers; wire cutters, preferably separate diagonal cutters; a pen knife or a tool for stripping insulation from wires; a soldering iron (or gun) and rosin core solder. A set of nut drivers and a nut starter, while not necessary, will aid extensively in construction of the kit.

Most kit builders find it helpful to separate the various parts into convenient categories. Muffin tins or molded egg cartons make convenient trays for small parts. Resistors and capacitors may be placed with their lead ends inserted in the edge of a piece of corrugated cardboard until they are needed. Values can be written on the cardboard next to each component. The illustration shows one method that may be used.



PARTS LIST

PART No.	PARTS Per Kit	DESCRIPTION
Resistors		
1-9	4	1000 Ω 1/2 watt (brown-black-red)
1-13	4	2700 Ω 1/2 watt (red-violet-red)
1-22	5	22 KΩ 1/2 watt (red-red-orange)
1-23	2	27 KΩ 1/2 watt (red-violet-orange)
1-24	5	33 KΩ 1/2 watt (orange-orange-orange)
1-88	4	36 KΩ 1/2 watt (orange-blue-orange)
1-25	2	47 KΩ 1/2 watt (yellow-violet-orange)
1-26	5	100 KΩ 1/2 watt (brown-black-yellow)
1-27	3	150 KΩ 1/2 watt (brown-green-yellow)
1-29	4	220 KΩ 1/2 watt (red-red-yellow)
1-30	2	270 KΩ 1/2 watt (red-violet-yellow)
1-33	10	470 KΩ 1/2 watt (yellow-violet-yellow)
1-34	2	680 KΩ 1/2 watt (blue-gray-yellow)
1-35	2	1 megohm 1/2 watt (brown-black-green)
1-37	2	2.2 megohm 1/2 watt (red-red-green)
4-2	2	100 KΩ 1/2 watt LOW-NOISE (brown-black-yellow)
1A-2	1	1000 Ω 1 watt (brown-black-red)
1B-2	1	4700 Ω 2 watt (yellow-violet-red)
3G-9	1	100 Ω 7 watt wire-wound
Capacitors		
21-3	2	10 μμf disc ceramic
21-7	6	33 μμf disc ceramic
21-85	2	56 μμf disc ceramic
21-39	2	.0035 μfd disc ceramic
21-42	1	.01 μfd disc ceramic 1.6 kv
21-47	2	.01 μfd disc ceramic
21-82	1	.02 μfd disc ceramic
23-50	2	.022 μfd tubular
23-52	2	.047 μfd tubular
23-61	4	.05 μfd tubular
23-28	8	.1 μfd tubular

PART No.	PARTS Per Kit	DESCRIPTION
Capacitors (cont'd.)		
25-42	1	30-30 μfd at 350 volts twist prong electrolytic
25-55	2	50 μfd at 10 volts miniature electrolytic
25-85	1	50 μfd at 25 volts tubular electrolytic
25-101	1	60-25 μfd at 500-450 volts twist-prong electrolytic
Controls-Switches		
10-61	2	200 Ω tab-mount control
12-34	1	1 megohm dual-concentric control
12-35	2	1 megohm dual-tandem control
60-2	1	DPDT slide switch
63-249	1	AC switch
63-258	1	4-position, single-section rotary switch
63-259	1	6-position, single-section rotary switch
Transformers		
51-29	2	Audio output
54-93	1	Power
Terminal Strips-Sockets		
431-1	6	Dual 1-lug terminal strip
431-2	2	2-lug terminal strip
431-3	3	3-lug terminal strip
431-5	6	4-lug terminal strip
431-13	1	4-lug screw type terminal strip
431-17	1	5-lug screw type terminal strip
431-27	3	3-lug terminal strip
434-15	2	7-pin wafer tube socket
434-16	4	9-pin wafer tube socket
434-20	2	AC socket
434-58	1	Octal tube socket
434-68	4	9-pin molded tube socket
434-76	2	Triple phono socket
434-82	1	Double phono socket
Tubes-Lamp-Fuses		
411-11	2	6AU6 tube
411-68	2	6AN8 tube
411-108	4	EL84 tube

PART No.	PARTS Per Kit	DESCRIPTION
Tubes-Lamps-Fuse (cont'd.)		
411-136	1	GZ34/5AR4
411-143	2	6EU7 tube
412-13	1	Red neon pilot lamp
421-3	1	2-amp slow-blow fuse
Hardware		
250-8	16	#6 x 3/8" sheet metal screw
250-10	4	6-32 x 1/2" truss head machine screw
250-49	20	3-48 x 1/4" screw
250-56	40	6-32 x 1/4" screw
250-89	22	6-32 x 3/8" screw
250-106	2	6-32 x 3/8" self-tapping screw
252-1	20	3-48 nut
252-3	64	6-32 nut
252-4	12	8-32 nut
252-7	6	Control nut
252-32	1	Push-on speednut
254-1	72	#6 lockwasher
254-2	12	#8 lockwasher
254-4	10	Control lockwasher
254-7	20	#3 lockwasher
255-1	2	1/8" spacer
259-11	1	Spade lug
Wire-Knobs		
89-1	1	Line cord
340-1	1	Length bus wire
341-1	1	Length heavy black wire
343-6	1	Length shielded audio cable
344-1	2	Length hookup wire (light and dark color)
346-1	1	Length sleeving
347-9	1	Length 3-conductor shielded cable
462-117	1	Small black knob 3/4" x 5/8"
462-118	1	Clear plastic knob 1-13/16" x 13/32"

PART No.	PARTS Per Kit	DESCRIPTION
Wire-Knobs (cont'd.)		
462-119	1	Small black knob 3/4" x 5/8" for .187 diameter shaft
462-124	4	Black and clear plastic cascaded knob
Sheet Metal		
90-M166	1	Cabinet
200-M296F469-470	1	Chassis
203-M234F467	1	Control panel
203-M235F468-498	1	Front panel
203-M236	1	Subpanel
204-M366	1	Left front panel support bracket
204-M367	1	Right front panel support bracket
205-M296	1	Bottom plate
206-M176F471	1	Center shield
210-14	1	Front bezel
Miscellaneous		
75-20	1	Insulated plate for double phono socket
75-24	1	Line cord strain relief
75-41	2	Insulator for triple phono socket
84-23	2	Packaged Electronic Circuit (P.E.C.) tone control network
206-3	2	Tube shield
206-55	2	Tube base shield
261-17	4	Plastic foot
391-11	1	Nameplate
423-1	1	Fuse holder
481-1	1	Metal capacitor mounting wafer
481-4	1	Fiber capacitor mounting wafer
331-6		Solder
595-421	1	Manual

PROPER SOLDERING TECHNIQUES

Only a small percentage of HEATHKIT equipment purchasers find it necessary to return an instrument for factory service. Of these instruments, by far the largest portion of malfunctions are due to poor or improper soldering.

If terminals are bright and clean and free of wax, frayed insulation and other foreign substances, no difficulty will be experienced in soldering. Correctly soldered connections are essential if the performance engineered into a kit is to be fully realized. If you are a beginner with no experience in soldering, a half hour's practice with some odd lengths of wire may be a worthwhile investment.

For most wiring, a 30 to 100 watt iron or its equivalent in a soldering gun is very satisfactory. A lower wattage iron than this may not heat the connection enough to flow the solder smoothly over the joint. Keep the iron tip clean and bright by wiping it from time to time with a cloth.

CHASSIS WIRING AND SOLDERING

1. Unless otherwise indicated, all wire used is the type with colored insulation (hookup wire); the size of the conductor is the same for all colors of hookup wires furnished with this kit. In preparing a length of hookup wire, 1/4" of insulation should be removed from each end unless directed otherwise in the construction step.

2. To avoid breaking internal connections when stripping insulation from the leads of transformers or similar components, care should be taken not to pull directly on the lead. Instead, hold the lead with pliers while it is being stripped.

3. Leads on resistors, capacitors and similar components are generally much longer than they need to be to make the required connections. In these cases, the leads should be cut to proper length before the part is added to the chassis. In general, the leads should be just long enough to reach their terminating points.

4. Wherever there is a possibility of bare leads shorting to other parts or to the chassis, the leads should be covered with insulating sleeving. Where the use of sleeving is specifically intended, the phrase "use sleeving" is included in the associated construction step. In any case where there is the possibility of an unintentional short circuit, sleeving should be used. Extra sleeving is provided for this purpose.

5. Crimp or bend the lead (or leads) around the terminal to form a good joint without relying on solder for physical strength. If the wire is too large to allow bending or if the step states that the wire is not to be crimped, position the wire so that a good solder connection can still be made.

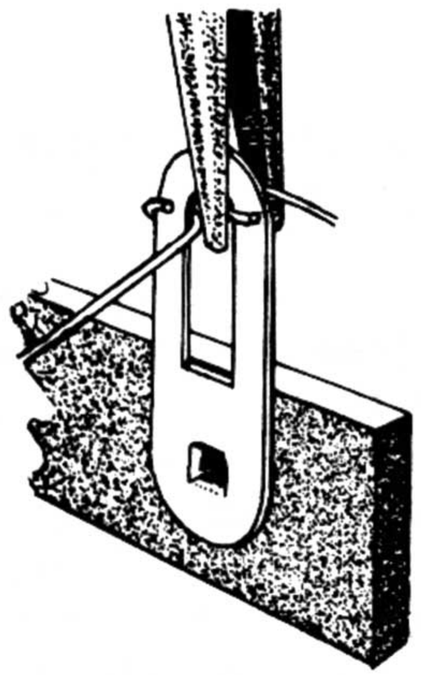
6. Position the work, if possible, so that gravity will help to keep the solder where you want it.

7. Place a flat side of the soldering iron tip against the joint to be soldered until it is heated sufficiently to melt the solder.

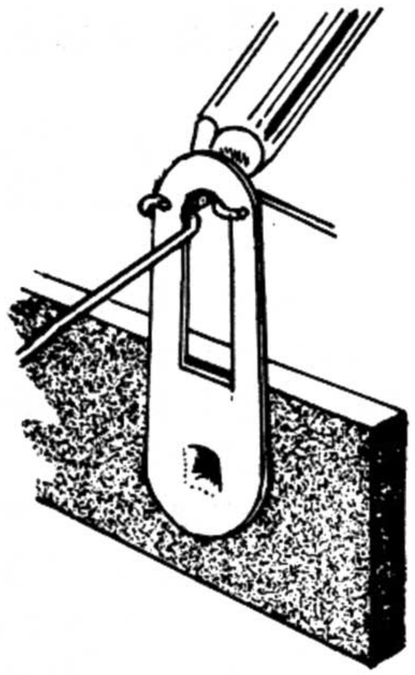
8. Then place the solder against the heated terminal and it will immediately flow over the joint; use only enough solder to thoroughly wet the junction. It is usually not necessary to fill the entire hole in the terminal with solder.

9. Remove the solder and then the iron from the completed junction. Use care not to move the leads until the solder is solidified.

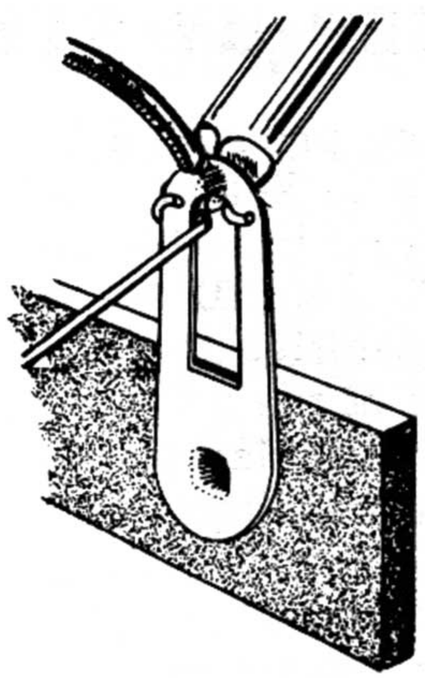
A poor or cold solder joint will usually look crystalline and have a grainy texture, or the solder will stand up in a blob and will not have adhered to the joint. Such joints should be reheated until the solder flows smoothly over the entire junction. In some cases, it may be necessary to add a little more solder to achieve a smooth bright appearance.



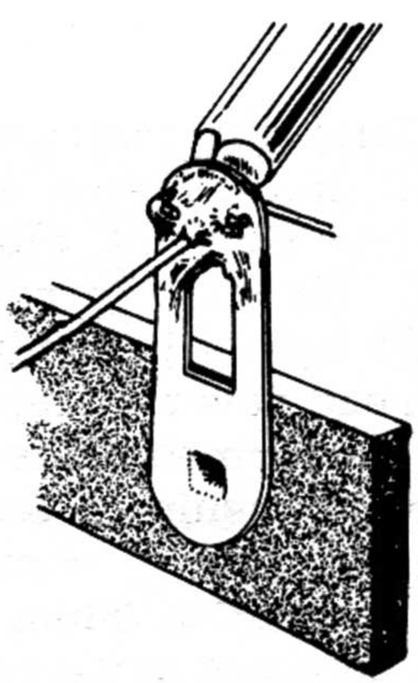
CRIMP WIRES



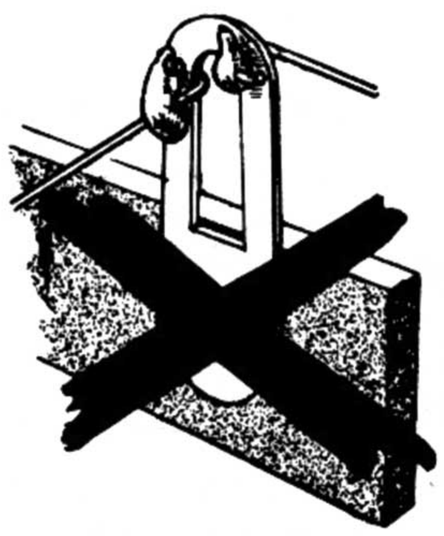
HEAT CONNECTION



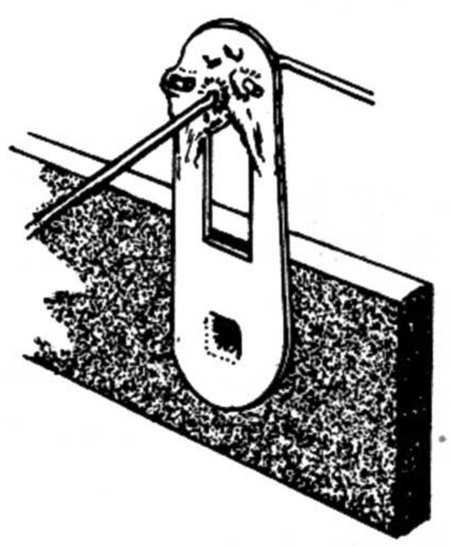
APPLY SOLDER



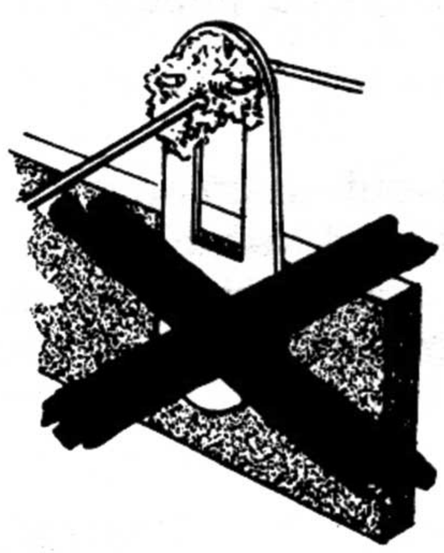
ALLOW SOLDER TO FLOW



COLD SOLDER JOINT
CONNECTION INSUFFICIENTLY HEATED



PROPER SOLDER CONNECTION



COLD SOLDER JOINT
CONNECTION MOVED WHILE COOLING

ROSIN CORE SOLDER HAS BEEN SUPPLIED WITH THIS KIT. THIS TYPE OF SOLDER MUST BE USED FOR ALL SOLDERING IN THIS KIT. ALL GUARANTEES ARE VOIDED AND WE WILL NOT REPAIR OR SERVICE EQUIPMENT IN WHICH ACID CORE SOLDER OR PASTE FLUXES HAVE BEEN USED. IF ADDITIONAL SOLDER IS NEEDED, BE SURE TO PURCHASE ROSIN CORE (60:40 or 50:50 TIN-LEAD CONTENT) RADIO TYPE SOLDER.

STEP-BY-STEP PROCEDURE

The following instructions are presented in a logical step-by-step sequence to enable you to complete your kit with the least possible confusion. Be sure to read each step all the way through before beginning the specified operation. Also read several steps ahead of the actual step being performed. This will familiarize you with the relationship of the subsequent operations. When the step is completed, check it off in the space provided. This is particularly important as it may prevent errors or omissions, especially if your work is interrupted. Some kit builders have also found it helpful to mark each lead in colored pencil on the Pictorial as it is added.

The fold-out diagrams in this manual may be removed and attached to the wall above your working area; but, because they are an integral part of the instructions, they should be returned to the manual after the kit is completed.

In general, the illustrations in this manual correspond to the actual configuration of the kit; however, in some instances the illustrations may be slightly distorted to facilitate clearly showing all of the parts.

The abbreviation "NS" indicates that a connection should not be soldered yet as other wires will be added. When the last wire is installed, the terminal should be soldered and the abbreviation "S" is used to indicate this. Note that a number will appear after each solder instruction. This number indicates the number of leads that are supposed to be connected to the terminal in point before it is soldered. For example, if the instruction reads, "Connect a lead to lug 1 (S-2)," it will be understood that there will be two leads connected to the terminal at the time it is soldered. (In cases where a lead passes through a terminal or lug and then connects to another point, it will count as two leads, one entering and one leaving the terminal.)

The steps directing the installation of resistors include color codes to help identify the parts. Also, if a part is identified by a letter-number designation on the Schematic, its designation will appear in the construction step which directs its installation.

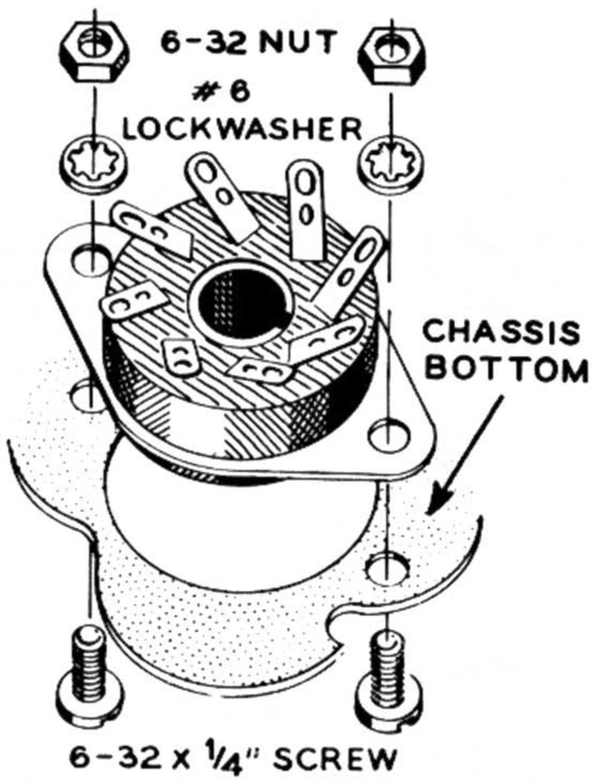
STEP-BY-STEP ASSEMBLY

Refer to Pictorial 1 (fold-out from Page 15) for the following steps.

NOTE: The phrase "#6 hardware" means 6-32 x 1/4" screws, #6 lockwashers, and 6-32 nuts.

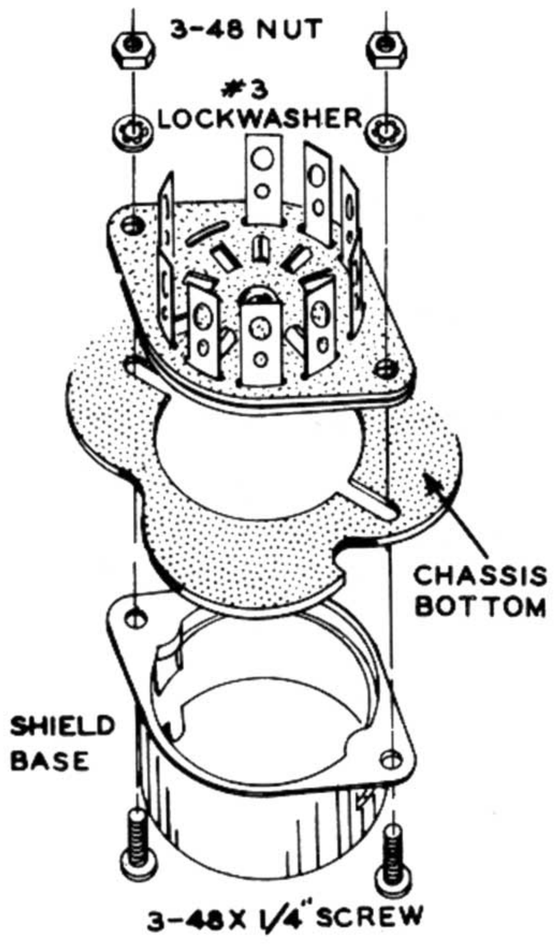
Position the chassis as shown in Pictorial 1.

( ) Referring to Detail 1A, mount the octal tube socket at location V11. Use #6 hardware. Orient the keyway of the tube socket as shown by the arrow in Pictorial 1.



Detail 1A

NOTE: When mounting wafer tube sockets, be sure to mount each socket from the bottom of the chassis. If, by mistake, the sockets are mounted so the lugs pass through the chassis, they will short to the chassis where they pass through the mounting hole.



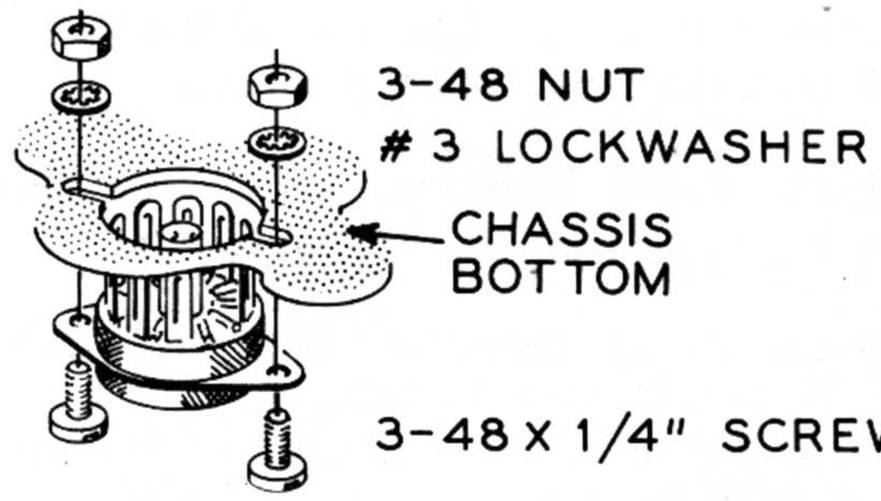
Detail 1B

( ) Referring to Detail 1B, mount 9-pin wafer tube socket and shield bases at locations V1 and V2. Use 3-48 screws, #3 lockwashers, and 3-48 nuts. Orient the blank space of each tube socket as shown by the arrows in Pictorial 1.

( ) Mount 9-pin wafer tube sockets at locations V5 and V6. Use 3-48 screws, #3 lockwashers and 3-48 nuts. Be sure to orient the blank space as shown by the arrow in Pictorial 1.

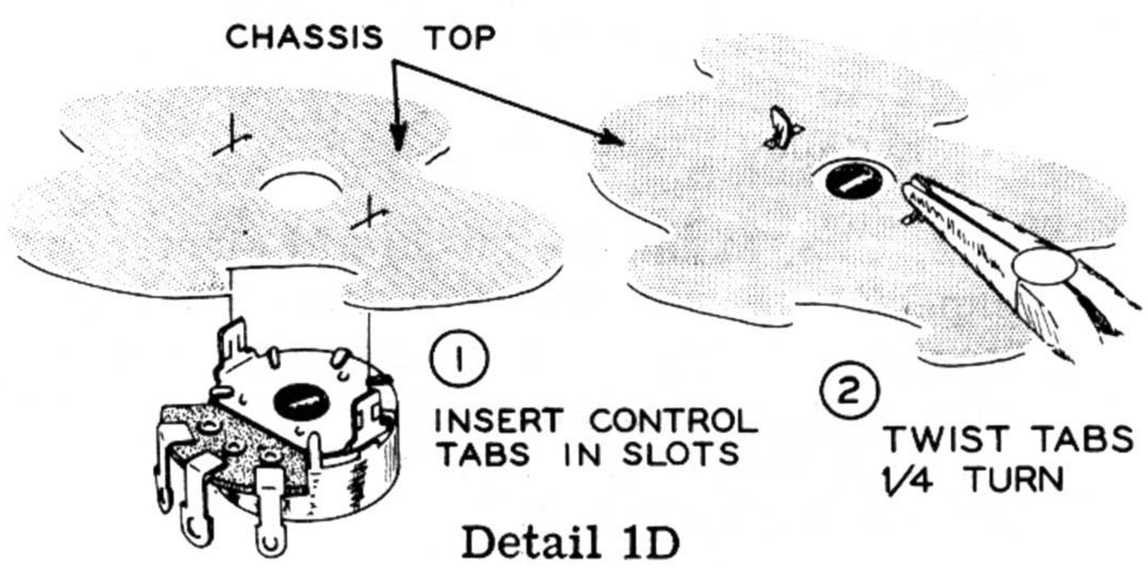
( ) Mount 7-pin wafer tube sockets at locations V3 and V4. Use 3-48 screws, #3 lockwashers, and 3-48 nuts. Orient the blank space of each tube socket as shown by the arrows in Pictorial 1.

( ) Referring to Detail 1C, mount 9-pin molded tube sockets at locations V7, V8, V9, and V10. Use 3-48 screws, #3 lockwashers and 3-48 nuts. Be sure to orient the blank spaces as shown by the arrows in Pictorial 1.



Detail 1C

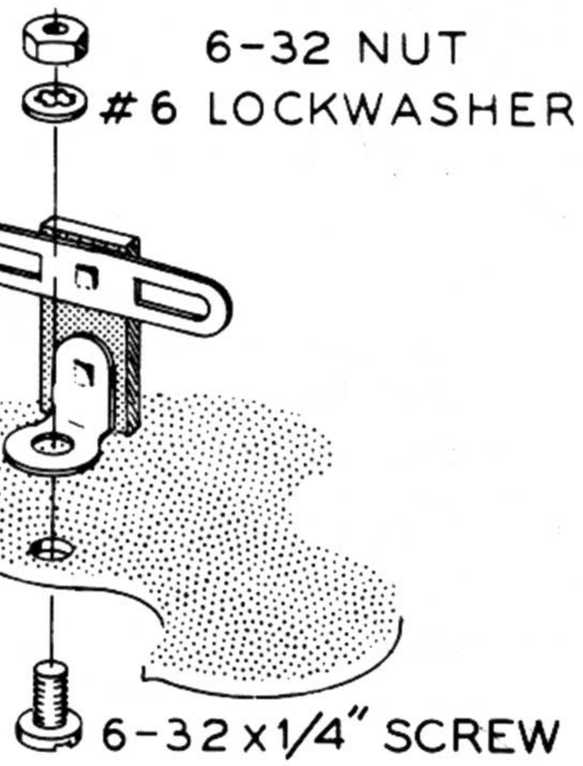
( ) R69. Mount a 200 Ω twist-tab control (#10-61) at location J. Secure the control by twisting each mounting tab 1/4 turn with long-nose pliers. Refer to Detail 1D. Orient the lugs as shown in Pictorial 1.



Detail 1D

( ) R70. Similarly, install a 200 Ω twist-tab control (#10-61) at location K. Orient the lugs as shown in Pictorial 1.

( ) Referring to Detail 1E, mount a dual 1-lug terminal strip at location A. Use #6 hardware.



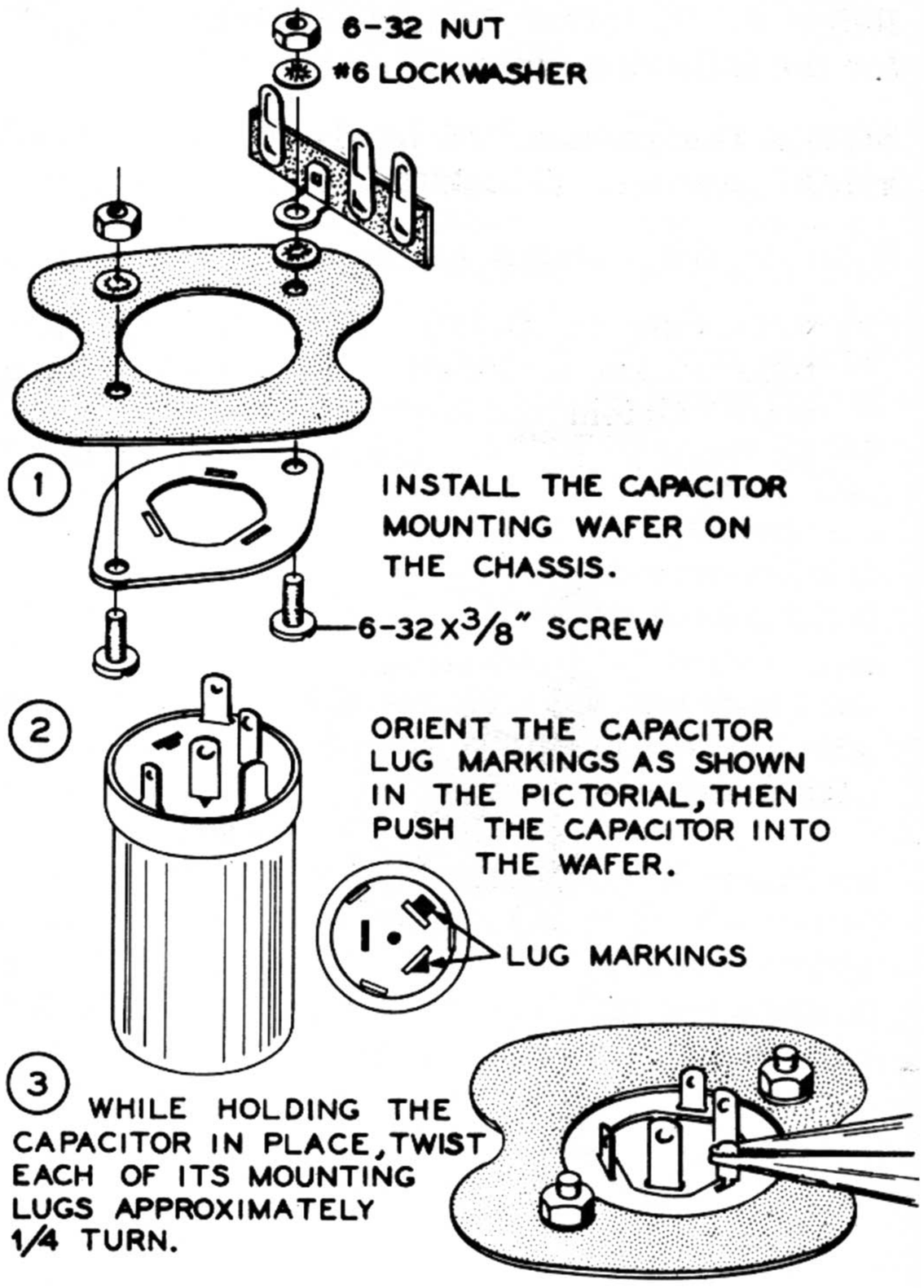
Detail 1E

( ) Similarly mount dual 1-lug terminal strips at locations B, C, S, and T. Use #6 hardware.

( ) Mount a dual 1-lug and a 4-lug terminal strip at M and L. Use a 6-32 x 3/8" screw, #6 lockwashers, and a 6-32 nut.

( ) Mount 4-lug terminal strips at locations G, P, W, and X. Use #6 hardware.

( ) Mount 3-lug terminal strips at locations H, N, and Q. Use #6 hardware. Refer to the Parts Pictorial and Pictorial 1 for identification of the proper terminal strips.



Detail 1F

( ) Referring to Detail 1F, mount the fiber electrolytic capacitor mounting wafer at location E, and mount a 3-lug terminal strip at location F on one of the mounting screws. Use a 6-32 x 3/8" screw, #6 lockwashers and a 6-32 nut for the double mounting. Use #6 hardware for the other mounting hole. Refer to Pictorial 1 for proper orientation of the capacitor lug markings.

( ) C22, C23. Mount the 30-30 μfd electrolytic capacitor at location E. Secure the capacitor by twisting each mounting lug 1/4 turn with long-nose pliers. Refer to Pictorial 1 for proper orientation of the capacitor lug markings.

( ) Mount 2-lug terminal strips at locations R and U. Use #6 hardware.

( ) Similarly, mount the metal electrolytic capacitor mounting wafer at location D. Use #6 hardware.

( ) C24, C23. Mount the 60-25 μfd electrolytic capacitor (#25-101) at location D. Secure the capacitor by twisting each mounting lug 1/4 turn with long-nose pliers. Refer to Pictorial 1 for proper orientation of the capacitor lug markings.

Cut the leads of the power transformer (#54-93) to the following lengths (measured from the exit of the transformer).

	COLOR	LENGTH
( )	Green	3-1/2"
( )	Green	3-1/4"
( )	Blue	3"
( )	Blue	2-1/2"
( )	Red-yellow	2"
( )	Long black	3"
( )	Black	Do not cut these leads as they are of proper length.
( )	Red	
( )	Red	
( )	Yellow	
( )	Yellow	

( ) Strip 1/4" of insulation from the end of each lead and "tin." (Tin means to melt a small amount of solder on the exposed wire ends.)

Cut the leads of either output transformer (#51-29) as follows:

	COLOR	LENGTH
( )	Brown	3-1/2"
( )	Orange	3"
( )	Yellow	3"
( )	Black	2"
( )	Red	3"
( )	Blue	2-1/2"
( )	Green	2-1/2"
( )	Blue-yellow	2-1/2"
( )	Green-yellow	2"

( ) Strip 1/4" of insulation from the end of each lead and tin.

Cut the leads of the remaining output transformer (#51-29) as follows:

	COLOR	LENGTH
( )	Yellow	3-1/2"
( )	Orange	3"
( )	Brown	2-3/4"
( )	Black	1-3/4"
( )	Green-yellow	3-3/4"
( )	Blue-yellow	3-1/2"
( )	Blue	3"
( )	Green	2-1/2"
( )	Red	Do not cut

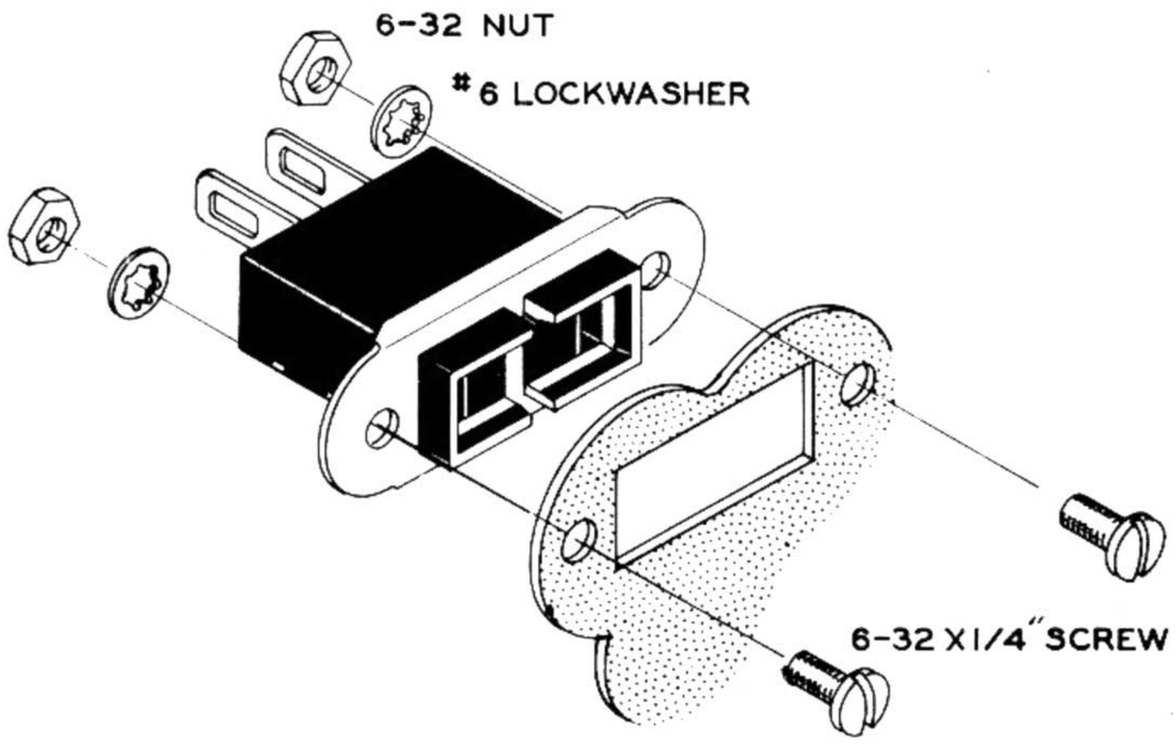
( ) Strip 1/4" of insulation from the end of each lead and tin.

( ) Mark this transformer as T1 so that it can be identified in the following steps.

( ) T1. Mount output transformer T1 as shown in Pictorial 1. The black, brown, orange, and yellow leads should be toward the rear apron of the chassis. Secure the transformer with #8 lockwashers and 8-32 nuts.

( ) T2. Similarly, mount the other output transformer at T2. Again place the transformer with its black, brown, orange, and yellow leads toward the rear apron of the chassis. Use #8 lockwashers and 8-32 nuts to secure the transformer.

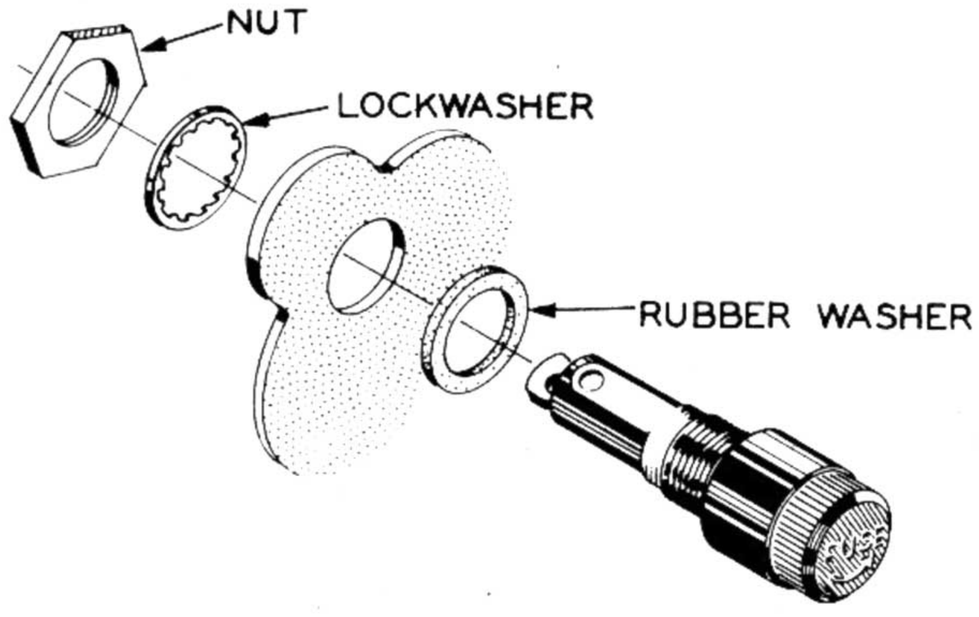
( ) T3. Mount the power transformer on the chassis at T3 as shown. Use #8 lockwashers and 8-32 nuts to secure the transformer.



Detail 1G

( ) Referring to Detail 1G, mount an AC socket at location BA. Use #6 hardware. Bend the two lugs of the socket at 90 degree angles as shown in Pictorial 1.

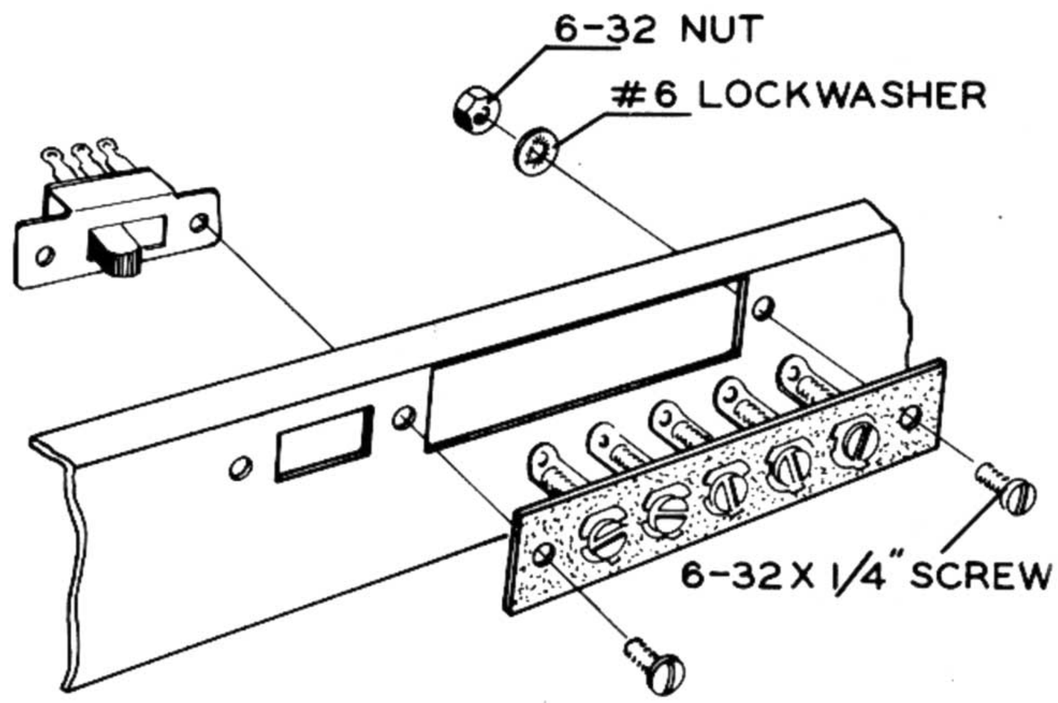
( ) Similarly, mount the remaining AC socket at location BB. Bend the two lugs at 90 degree angles as shown in Pictorial 1.



Detail 1H

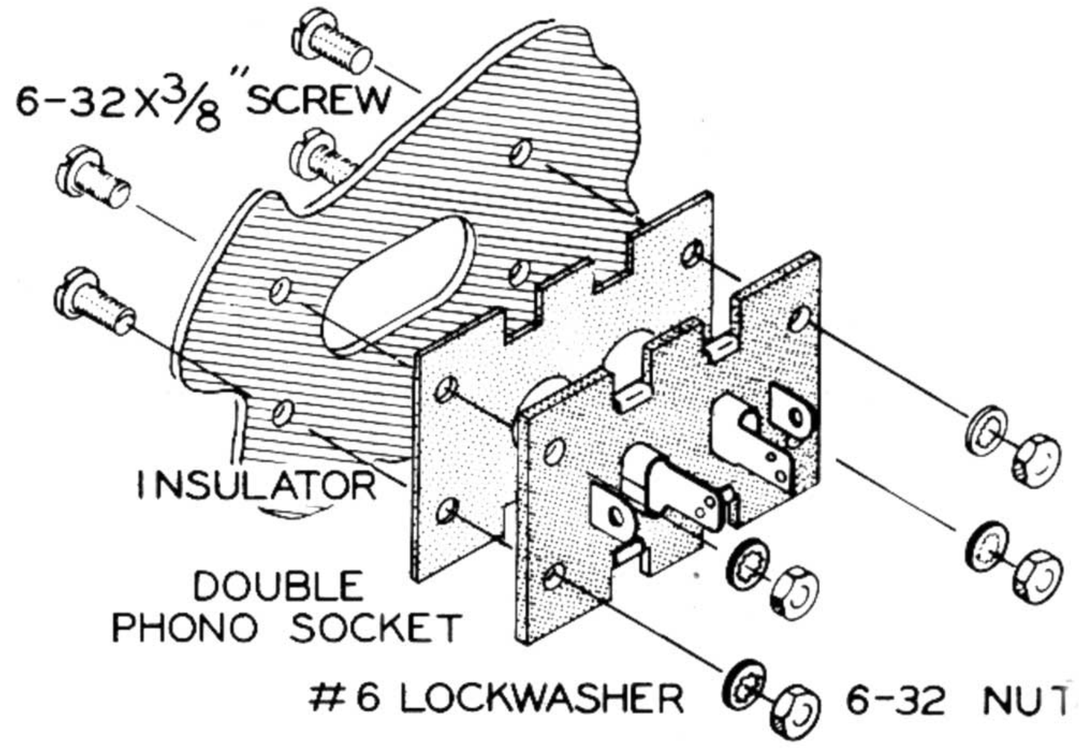
( ) Referring to Detail 1H, mount the fuse holder at location BC. Use the hardware supplied with the fuse holder. Bend lug 1 away from the fuse holder body and orient the fuse holder as shown in Pictorial 1.

( ) Referring to Detail 1J, mount the 5-lug screw type terminal strip at location BD. Use #6 hardware to secure one end of this terminal strip. At the other end a 6-32 x 1/4" screw should be placed through the terminal strip, the rear apron of the chassis, and then into slide switch BE.



Detail 1J

( ) Similarly, mount the 4-lug screw type terminal at location BF. Again #6 hardware should be used to secure one end of the terminal strip. A 6-32 x 1/4" screw should be placed through the other end of the terminal strip, through the rear apron, and then into slide switch BE.

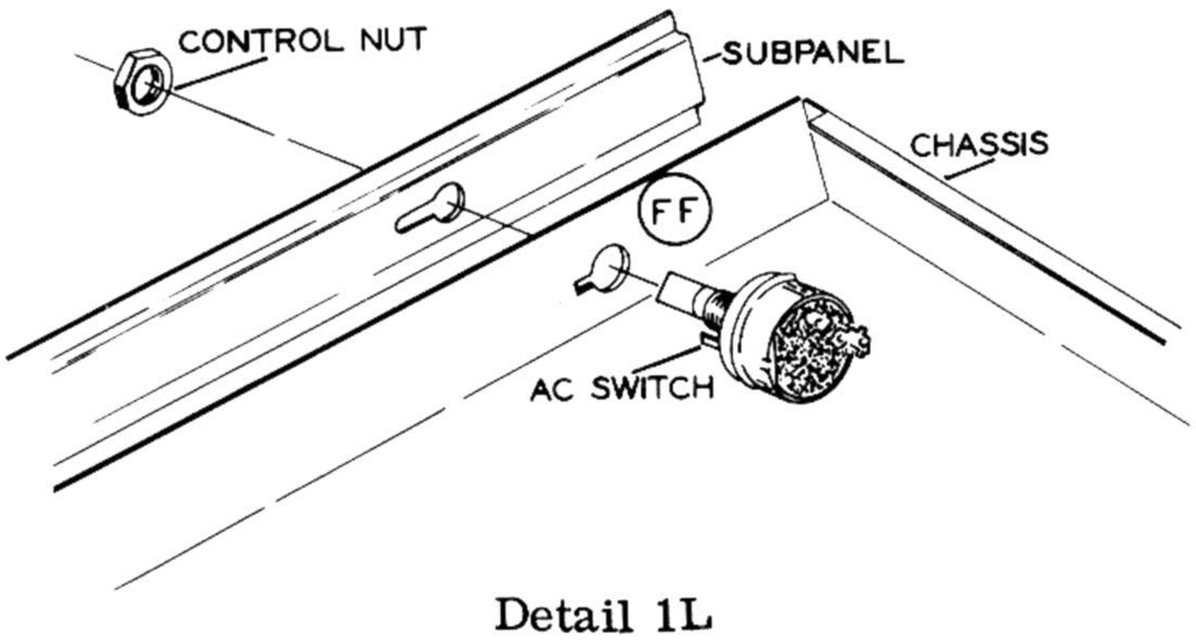


Detail 1K

( ) Referring to Detail 1K, mount a double phono socket and insulator at location BG. Use 6-32 x 3/8" screws, #6 lockwashers, and 6-32 nuts.

( ) Install a #6 sheet metal screw in each side of the chassis, near the front edge, as shown in Pictorial 1.

( ) Locate the subpanel and, referring to Detail 1L, mount the AC switch (#63-249) and the subpanel at location FF. Use a control nut. Do not tighten yet.



Detail 1L

( ) Secure the other end of the subpanel to the chassis with a 6-32 x 3/8" screw, #6 lockwasher, and a 6-32 nut. Now tighten the control nut on FF.

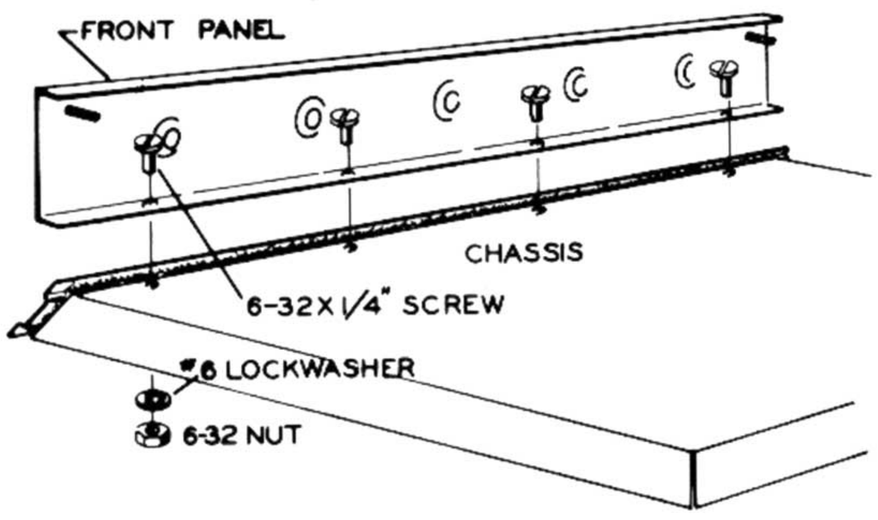
NOTE: In cases where a lead passes through a terminal or lug and then connects to another point, it will count as two leads, one entering and one leaving the terminal.

( ) Locate the heavy bus wire, straighten it to remove the kinks, and pass one end through lug 4 of terminal strip P (NS), through the center hole in dual 1-lug terminal strip S (NS), and through the center hole in dual 1-lug terminal strip T (S-1). Now solder the connection at terminal strip S (S-2). Cut off excess lengths at terminal strip P.

Refer to Pictorial 2 (on Page 17) for the following steps.

( ) Turn the chassis over and mount a 3-lug terminal strip at location Y. Use #6 hardware.

( ) Referring to Detail 2A, mount the front panel to the main chassis. Secure the front panel with #6 hardware.

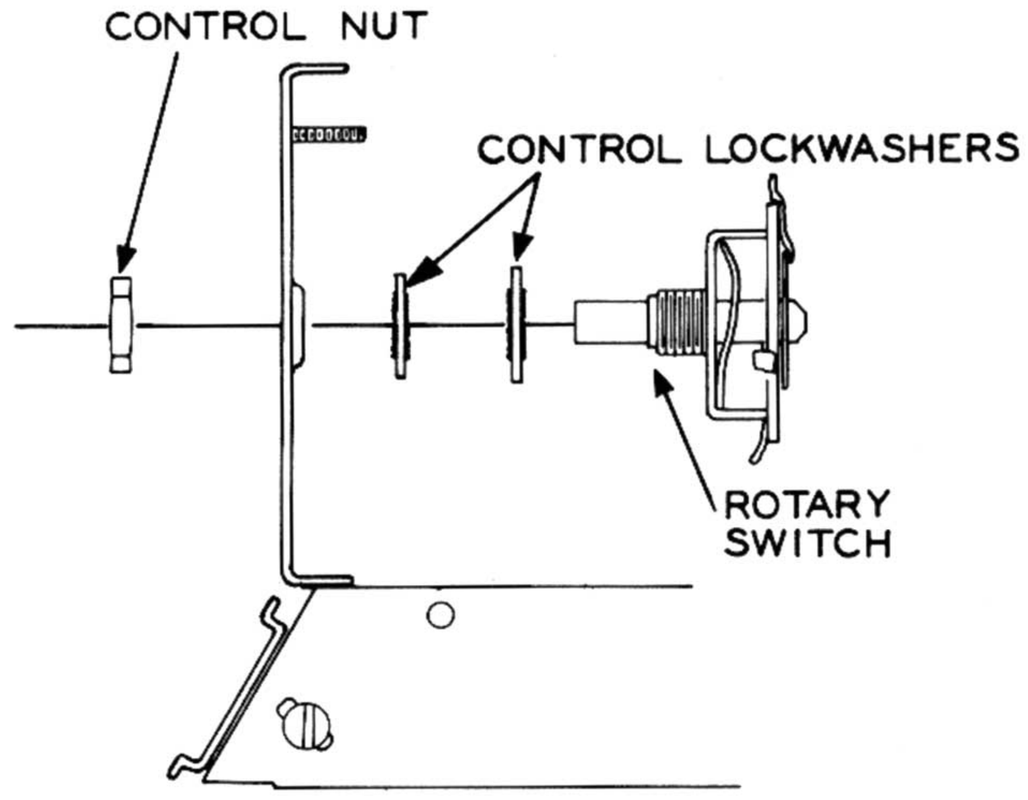


Detail 2A

( ) Referring to Detail 2B, mount the MODE selector switch (#63-259) at location FA. Use two control lockwashers and a control nut. Turn the switch shaft fully clockwise and position the lugs as shown in Pictorial 2. Use a knob for proper indexing.

( ) R23, R59. Mount a dual-tandem control (#12-35) at location FB. Use two control lockwashers, and a control nut. Orient the lugs as shown in Pictorial 2.

( ) R20, R55. Similarly, mount another dual-tandem control (#12-35) at location FC. Orient the lugs as shown in Pictorial 2. Use two control lockwashers, and a control nut.

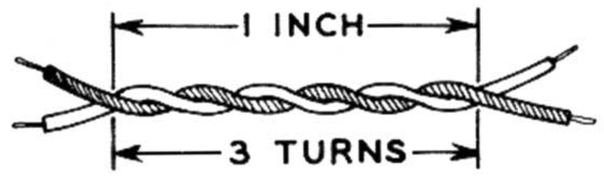


Detail 2B

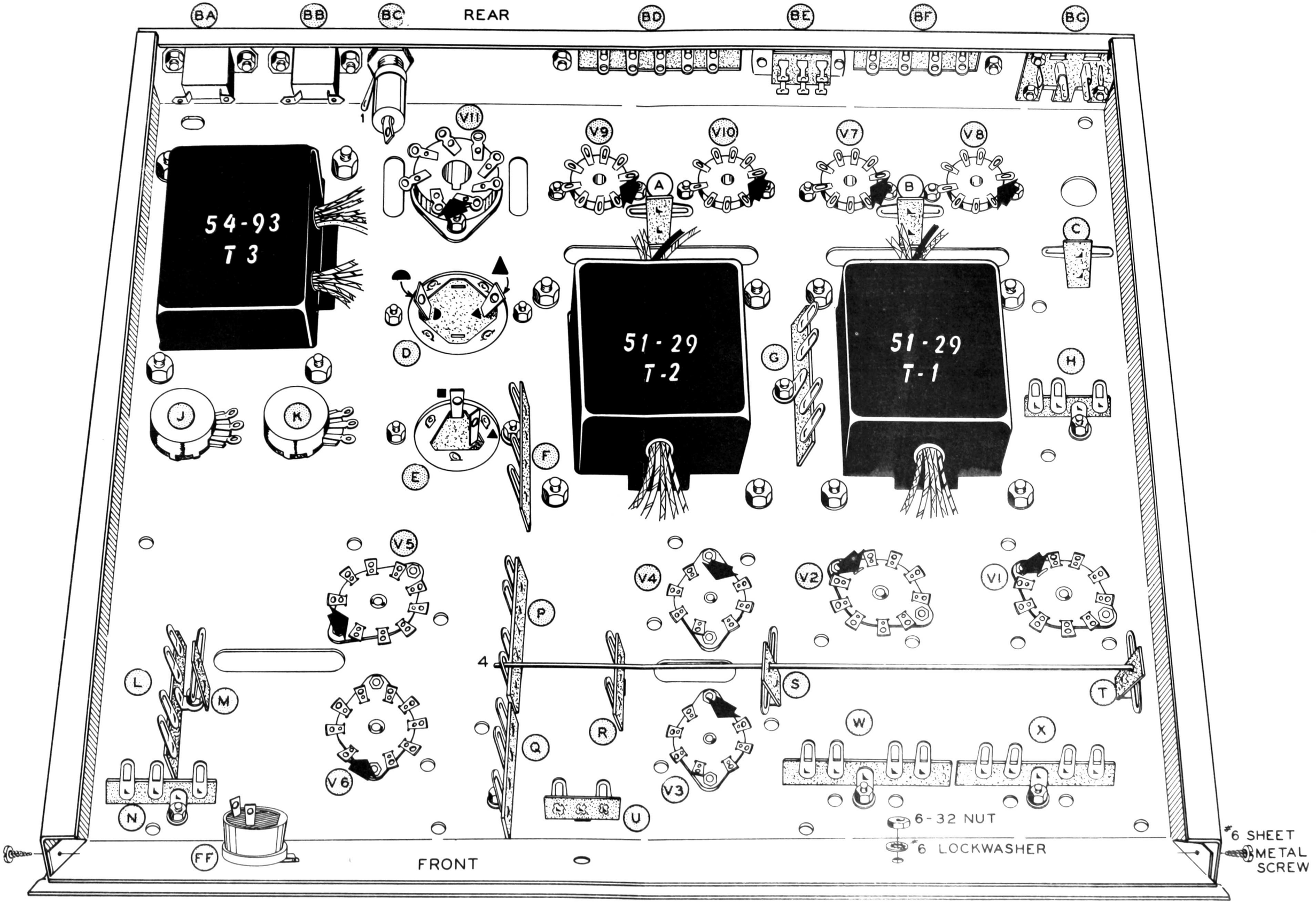
( ) R15,R51. Temporarily mount a dual-concentric control (#12-34) at location FD. Orient the control lugs as shown in Pictorial 2. Use two control lockwashers and a control nut.

( ) Mount the Input Selector switch (#63-258) at location FE. Use two control lockwashers and a control nut. The flat of the shaft should be oriented so that it is exactly opposite the MAG. PHONO position printed on the front panel, when turned fully counterclockwise. Use a knob for proper indexing.

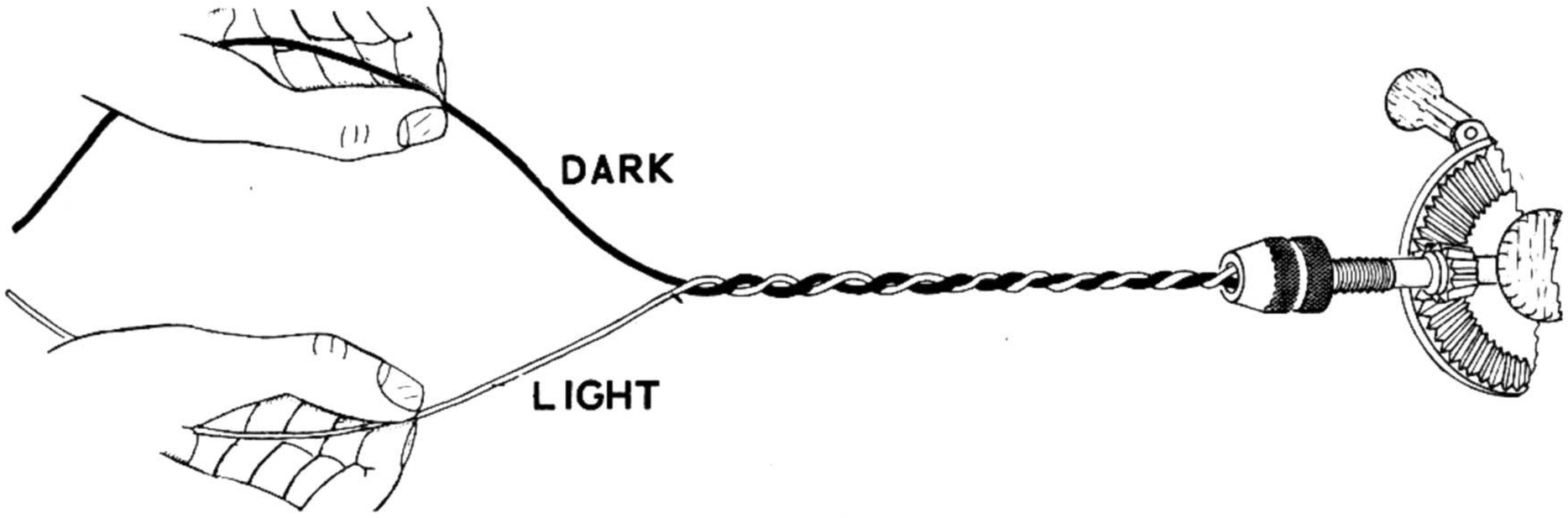
NOTE: The purpose of using twisted pairs of hookup wire is to provide shielding for signal carrying leads and cancellation of hum in the filament and AC leads. Best results will be obtained in the following steps if the wires are twisted approximately three complete turns per inch. See Detail 2C. The wires may be twisted by hand or with a drill as shown in Detail 2D on Page 16. If a drill is used be careful not to twist the wires too tightly.



Detail 2C


BA
BB
BC
REAR
BD
BE
BF
BG
1
V11
V9
V10
V7
V8
A
B
C
54-93
T 3
51-29
T-2
51-29
T-1
D
G
H
J
K
F
E
V5
V4
V2
V1
P
4
L
M
S
T
R
Q
W
X
V6
V3
N
U
FF
6-32 NUT
#6 LOCKWASHER
#6 SHEET
METAL
SCREW
FRONT

Pictorial 1



Detail 2D

( ) Take 20 feet of the light hookup wire and 20 feet of the dark hookup wire. Referring to Details 2C and 2D twist these two wires together.

NOTE: When making a connection with hookup wire, 1/4" of insulation should be removed, unless directed otherwise in the step.

( ) At one end of a 4-1/2" twisted pair, connect the light wire to lug 7 (NS) and the dark wire to double-lug 1 (NS) of switch FA.

( ) At the other end of this twisted pair, connect the light colored wire to lug 2 of control FB (NS). The dark wire serves as a shield and is not connected at this end.

( ) At one end of another 4-1/2" twisted pair, connect the light wire to lug 6 (NS), and the dark wire to lug 1 (NS) of FA.

( ) At the other end of this twisted pair, connect the light wire to lug 5 of control FB (NS). The dark wire is not used at this end.

( ) At one end of a 7" twisted pair, connect the light wire to lug 3 (S-1) and the dark wire to lug 1 (NS) of switch FA. Place the free end of this twisted pair through hole HB near V5 in the chassis. This end will be connected later.

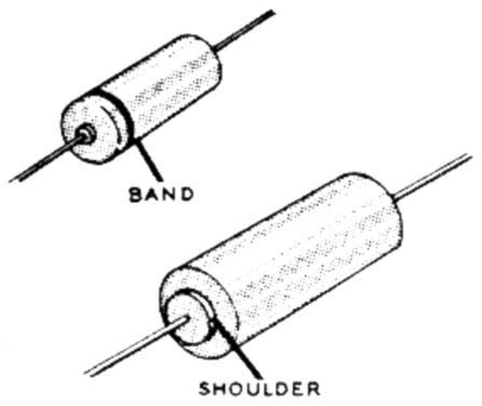
( ) At one end of a 6-1/4" twisted pair connect the light wire to lug 5 (S-1) and the dark wire to lug 1 (S-4) of switch FA. Place the free end of this twisted pair through hole HA in the chassis. It will be connected later.

NOTE: Either light or dark hookup wire may be used for point-to-point wiring in the following steps.

( ) Connect a 3" length of hookup wire between lugs 2 (S-1) and 7 (S-2) of switch FA.

( ) Connect a 1-1/2" length of hookup wire between lugs 4 (S-1) and 6 (S-2) of switch FA.

( ) Connect one end of a 3-1/2" hookup wire to lug 1 of terminal strip Y (NS). Place the free end of this wire through hole HA in the chassis. It will be connected later.

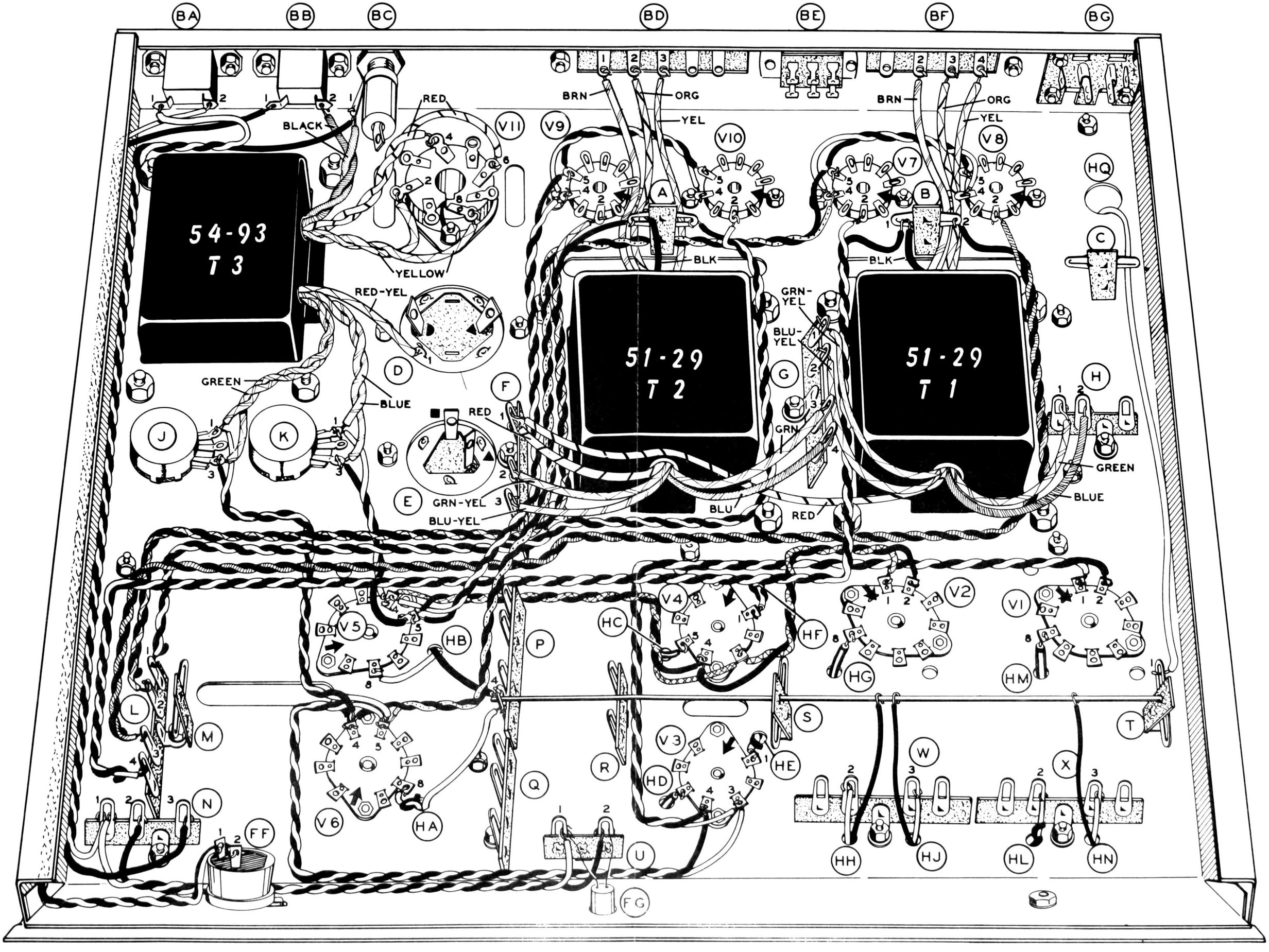


NOTE: When installing the tubular capacitors, be sure that the end marked with a band or shoulder is placed as shown in Pictorial 2.

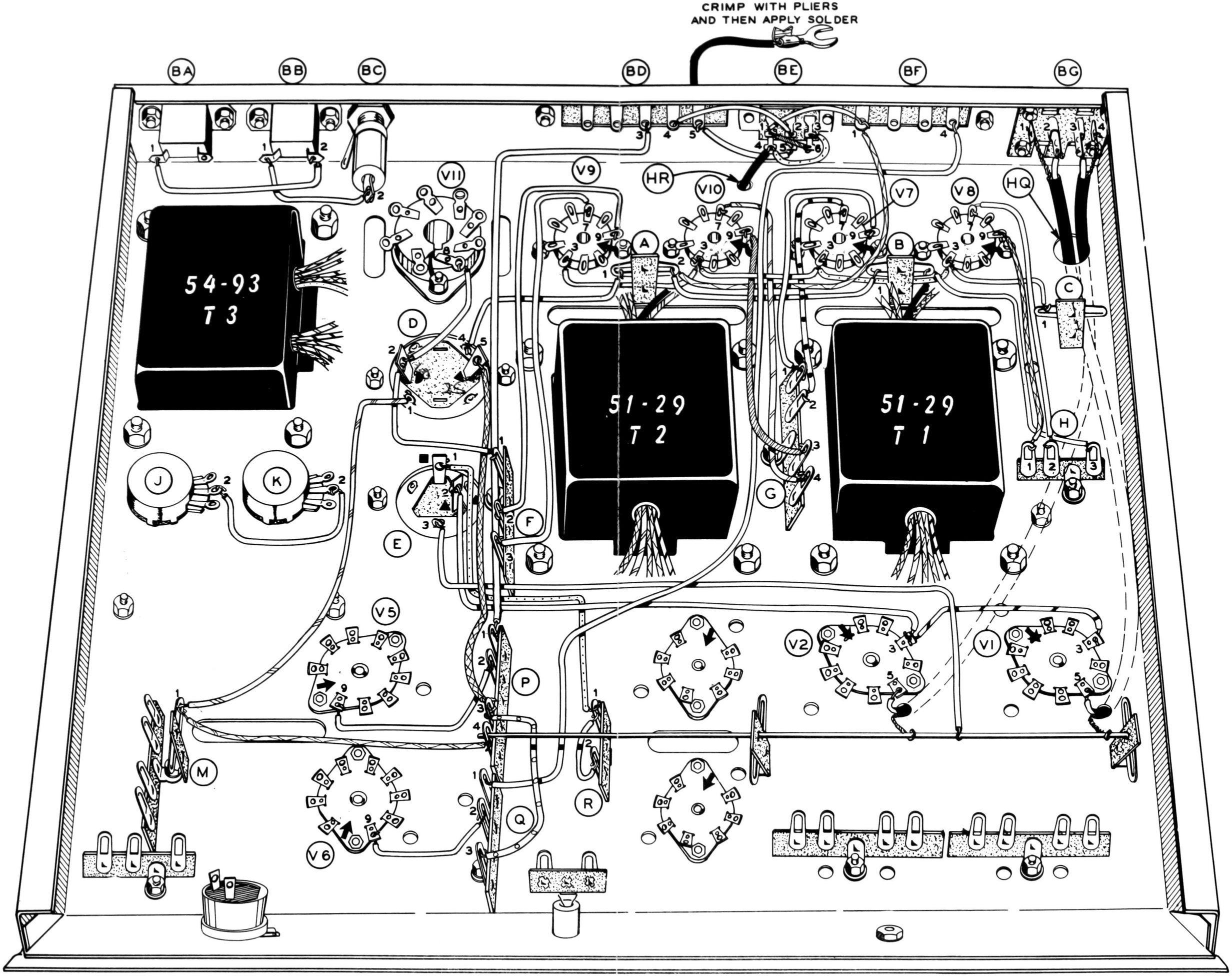
( ) C34. Cut the lead from the unmarked end of a .047 μfd tubular capacitor to 3/4". Connect this lead to lug 2 of terminal strip Y (NS). Place the free lead of this capacitor through hole HC in the chassis. It will be connected later. Use sleeving on the lead passing through the chassis hole.

( ) C9. Cut the lead from the unmarked end of a .047 μfd tubular capacitor to 1/2". Connect this lead to lug 3 of terminal strip Y (NS). Cut the marked lead to 1-1/4" and place this lead through hole HD in the chassis. It will be connected later. Use sleeving on the lead passing through the hole near the tube socket.

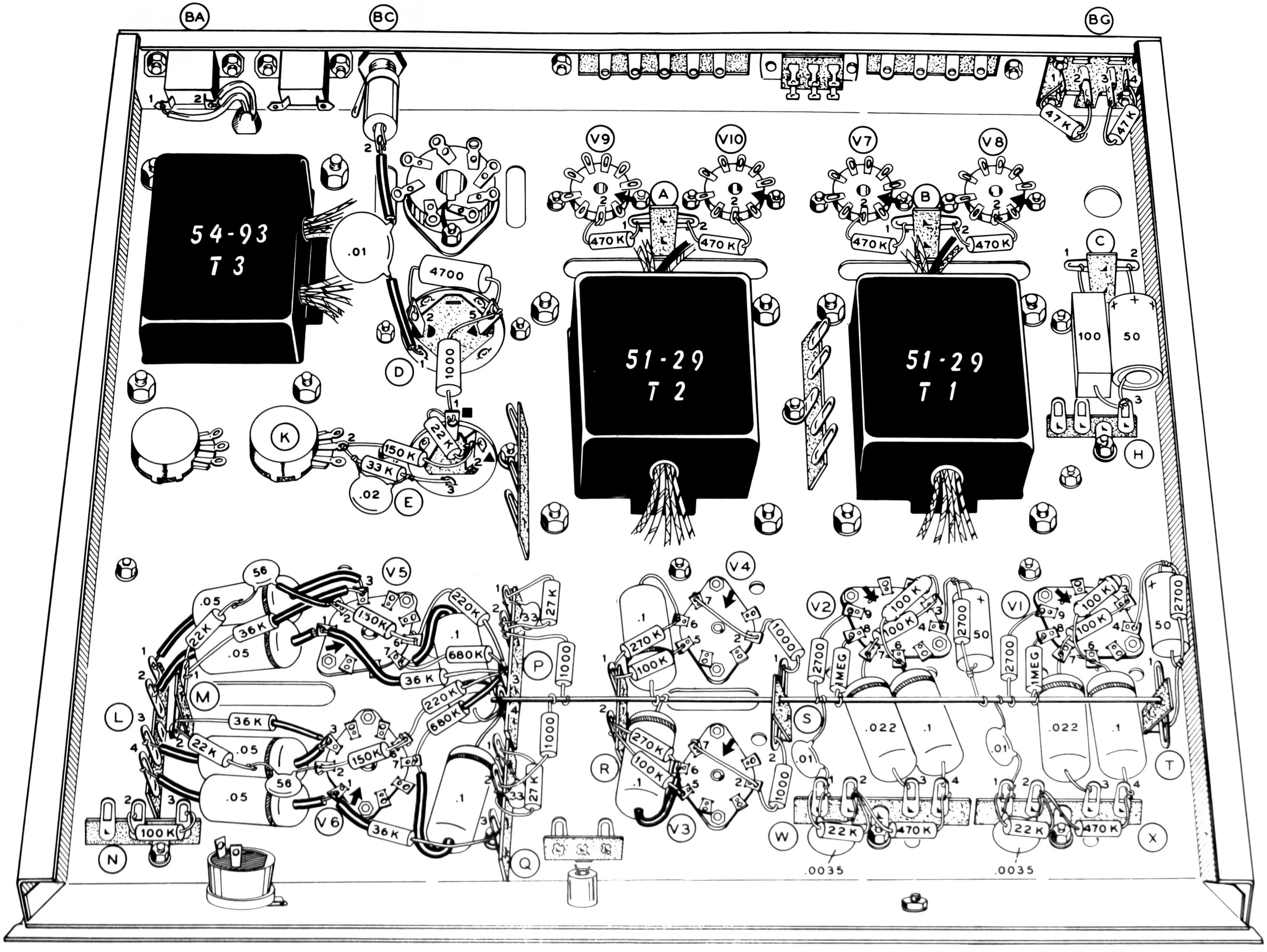
( ) Referring to Detail 2E, cut the leads of both P.E.C. networks (#84-23). Detail 2E is full size and can be used as a template. Place sleeving over each lead and connect one prepared P.E.C as follows:


BA
BB
BC
BD
BE
BF
BG
54-93
T 3
51-29
T 2
51-29
T 1
BLACK
RED
YELLOW
BRN
ORG
YEL
BLK
RED-YEL
GRN-
YEL
BLU-
YEL
GREEN
BLUE
GRN
BLU
RED
GRN-YEL
BLU-YEL
V1
V2
V3
V4
V5
V6
V7
V8
V9
V10
V11
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
S
T
U
W
X
HA
HB
HC
HD
HE
HF
HG
HH
HJ
HL
HM
HN
HQ
FF
FG

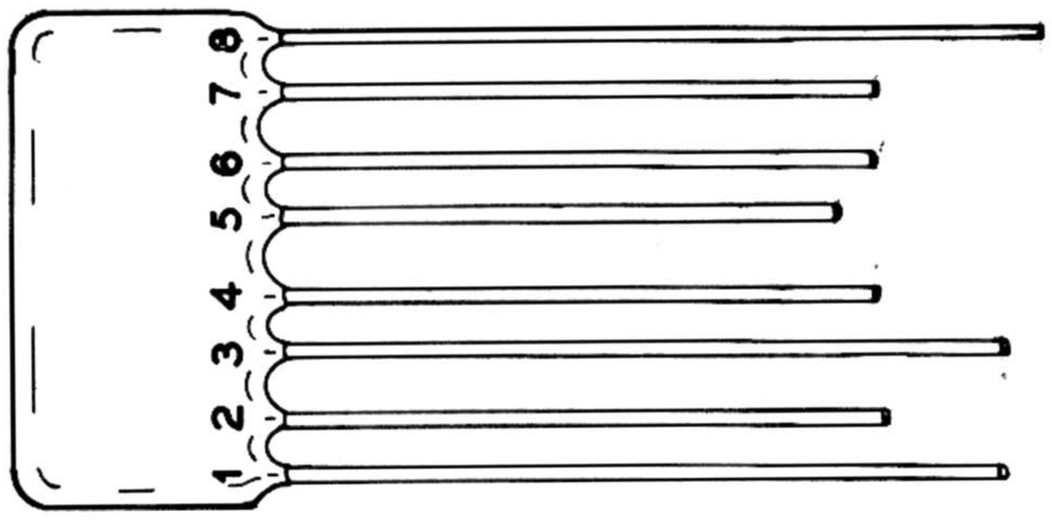
Pictorial 5


CRIMP WITH PLIERS
AND THEN APPLY SOLDER
BA
BB
BC
BD
BE
BF
BG
54-93
T 3
51-29
T 2
51-29
T 1
V11
V9
HR
V10
V7
V8
HQ
A
B
C
D
E
F
G
H
J
K
V5
V2
V1
P
M
Q
R
V6

Pictorial 6


BA
BC
BG
54-93
T 3
.01
4700
.001
D
K
22 K
150 K
33 K
.02
E
V9
V10
A
470 K
470 K
51-29
T 2
V7
V8
B
470 K
470 K
51-29
T 1
47 K
47 K
C
100
50
H
56
.05
22 K
36 K
.05
V5
150 K
220 K
.1
680 K
36 K
220 K
680 K
L
M
36 K
22 K
.05
150 K
56
.05
V6
36 K
100 K
N
P
1000
1000
33
27 K
33
27 K
Q
V4
.1
270 K
100 K
1000
R
270 K
100 K
.1
1000
V3
V2
100 K
100 K
2700
MEG
2700
50
S
.022
.1
.01
W
22 K
470 K
.0035
V1
100 K
100 K
2700
MEG
2700
50
.022
.1
.01
T
22 K
470 K
.0035
X

Pictorial 7



FULL SIZE

Detail 2E

LEAD NO.	CONNECT TO
( ) 1	lug 3 of terminal strip Y (S-2)
( ) 2	lug 3 of control FC (S-1)
( ) 3	lug 3 of control FB (S-1)
( ) 4	lug 2 of control FC (S-1)
( ) 5	lug 1 of control FC (S-1)
( ) 6	lug 2 of control FB (S-2)
( ) 7	lug 1 of control FB (S-1)
( ) 8	lug 1 of terminal strip Y (NS)

( ) At one end of a 6-1/2" twisted pair, connect the light wire to lug 3 of control FD (S-1). Connect the dark wire through lug 1 (NS) to lug 4 (NS) of control FD. Place the free end of this twisted pair through hole HN in the chassis. It will be connected later.

( ) At one end of a 4-1/2" twisted pair, connect the light wire to lug 2 (S-1) and the dark wire to lug 1 (NS) of control FD. Place the free end of this twisted pair through hole HE in the chassis. It will be connected later.

( ) Connect a 3" length of hookup wire from lug 1 of control FD (S-4) to lug 9 of switch FE (NS).

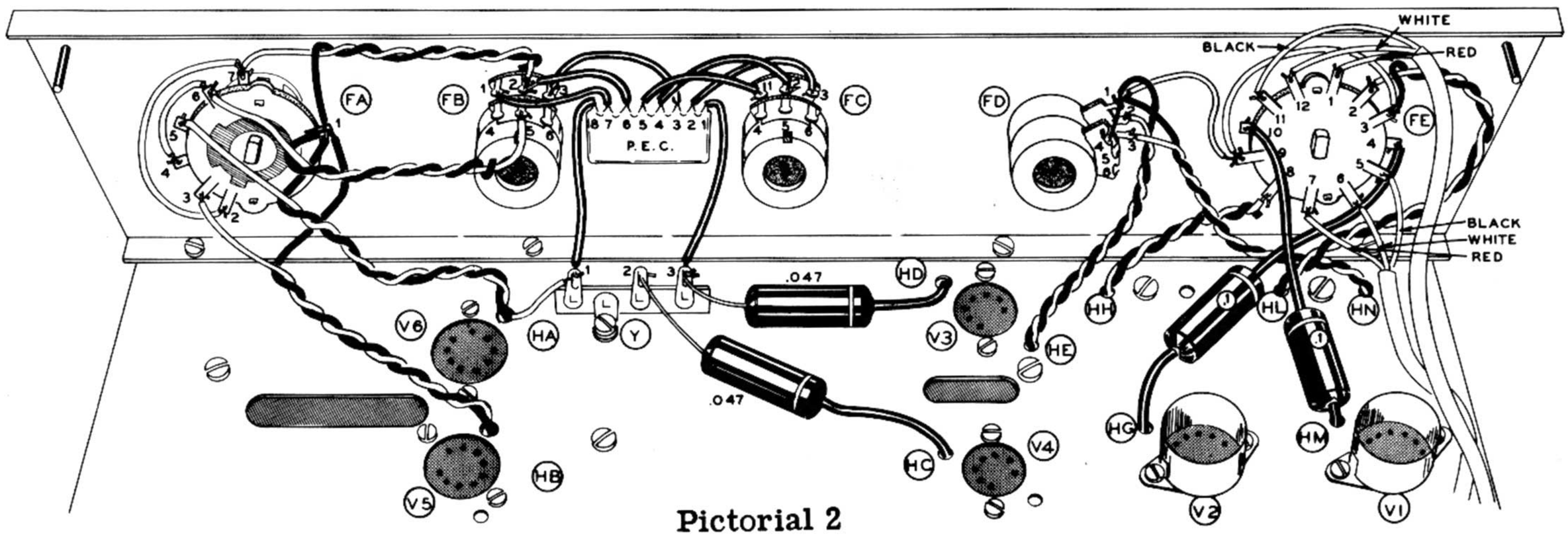
( ) Connect a 3" hookup wire between lugs 9 (NS) and 3 (NS) of switch FE.

( ) At one end of a 4" twisted pair, connect the light wire to double-lug 8 of switch FE (S-1). The dark wire is not connected at this end. Place the free end of this twisted pair through hole HH in the chassis. It will be connected later.

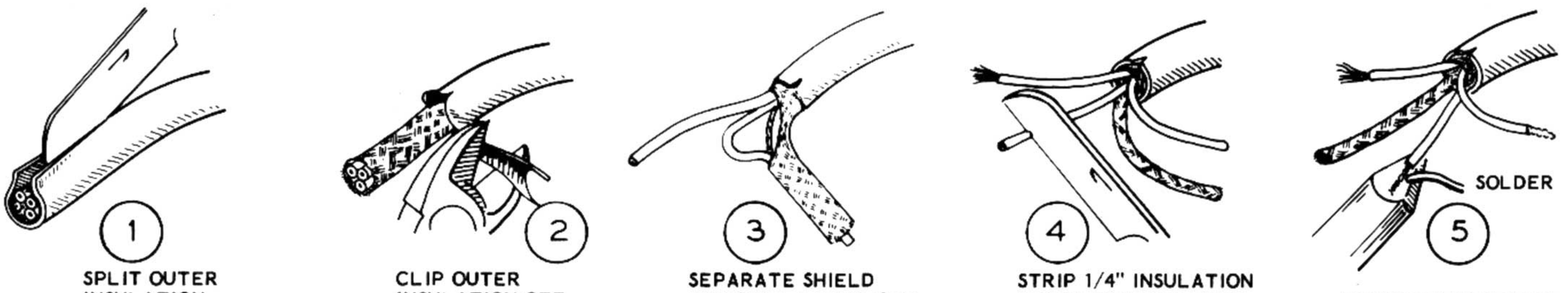
( ) At one end of a 5" twisted pair, connect the light wire to double-lug 2 of switch FE (S-1). Connect the dark wire to lug 3 of switch FE (NS). Place the free end of this twisted pair through hole HL in the chassis. It will be connected later.

( ) C31. Connect the lead from the marked end of a .1 μfd tubular capacitor to lug 4 of switch FE (S-1). Place the free lead of this capacitor through hole HG in the chassis. It will be connected later. Use sleeving on both leads.

( ) C6. Connect the lead from the marked end of another .1 μfd tubular capacitor to lug 10 of switch FE (S-1). Cut the other lead to 3/4" and place it through hole HM in the chassis. It will be connected later. Use sleeving on both leads.



Pictorial 2



Detail 2F

( ) Referring to Detail 2F, prepare a 13" length of 3-conductor cable.

( ) At the end of the cable with no shield pigtail, connect the red wire to double-lug 1 of switch FE (NS).

( ) Connect the white wire to double-lug 12 of switch FE (NS).

( ) Connect the black lead to double-lug 11 of switch FE (NS).

( ) Again referring to Detail 2F, prepare an 11" length of 3-conductor cable.

( ) At the end of this cable having no shield pigtail, connect the black lead to double-lug 5 of switch FE (NS).

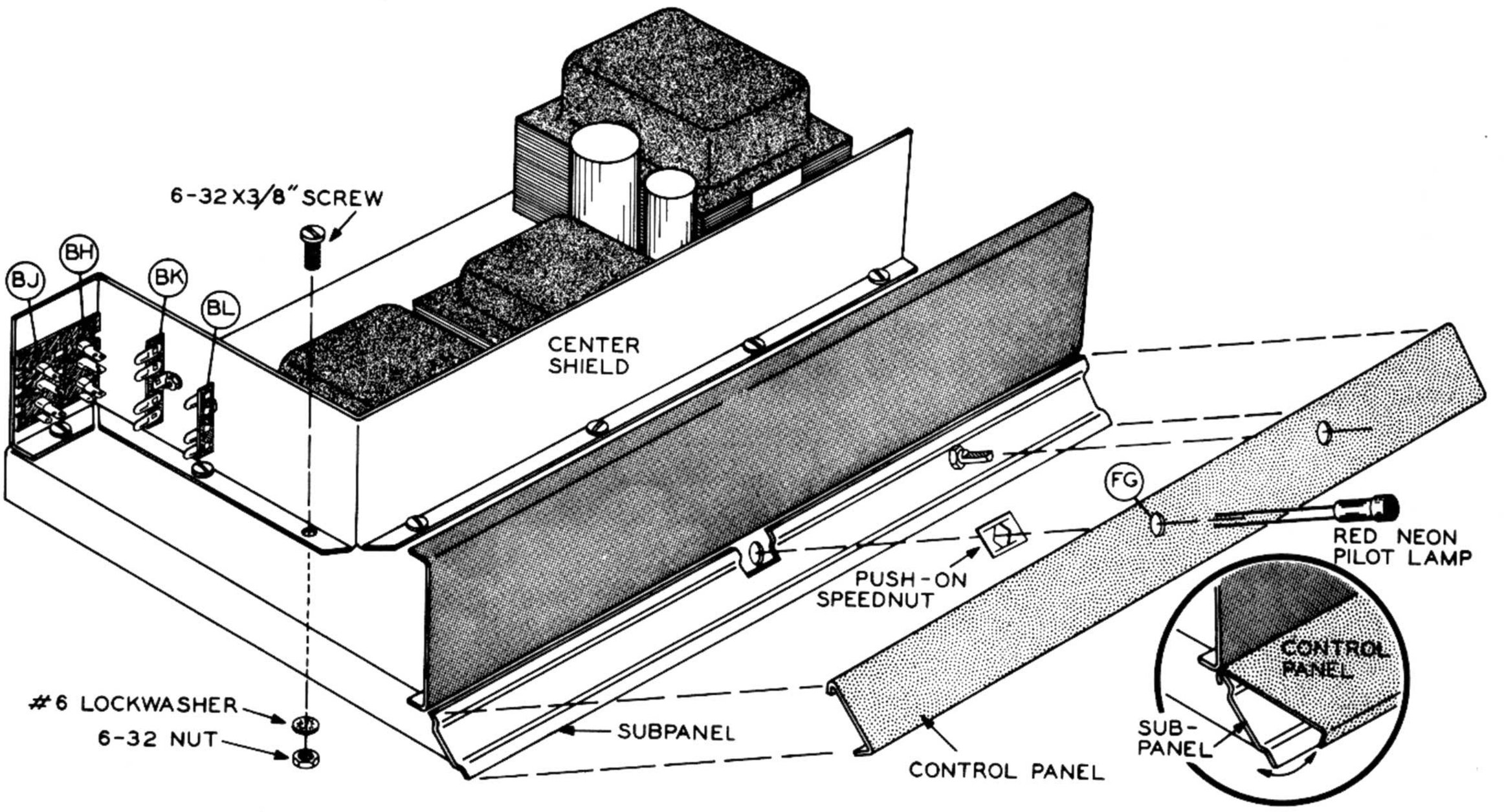
( ) Connect the white lead to double-lug 6 of switch FE (NS).

( ) Connect the red lead to double-lug 7 of switch FE (NS).

Refer to Pictorial 3 for the following steps.

( ) Locate the remaining prepared P.E.C. network (#84-23). Place sleeving on each lead and position the network between controls FB and FC next to the previously installed P.E.C. network. Connect the leads as follows:

	LEAD NO.	CONNECT TO
( )	1	lug 2 of terminal strip Y (S-2)
( )	2	lug 6 of control FC (S-1)
( )	3	lug 6 of control FB (S-1)
( )	4	lug 5 of control FC (S-1)
( )	5	lug 4 of control FC (S-1)
( )	6	lug 5 of control FB (S-2)
( )	7	lug 4 of control FB (S-1)
( )	8	lug 1 of terminal strip Y (S-3)



Pictorial 4

Refer to Pictorial 4 for the following steps.

( ) Locate the center shield and mount a triple phono socket with an insulator at location BH on the center shield. Use 6-32 x 3/8" screws, #6 lockwashers and 6-32 nuts. Refer to Detail 4A for proper orientation of the phono socket.

( ) Similarly mount a triple phono socket and insulator at location BJ. Use 6-32 x 3/8" screws, #6 lockwashers and 6-32 nuts.

( ) Mount a 4-lug terminal strip at location BK on the center shield. Use #6 hardware.

( ) Mount a 3-lug terminal strip at location BL on the center shield. Use #6 hardware.

( ) Mount the center shield to the top of the main chassis. Use 6-32 x 3/8" screws, #6 lockwashers, and 6-32 nuts.

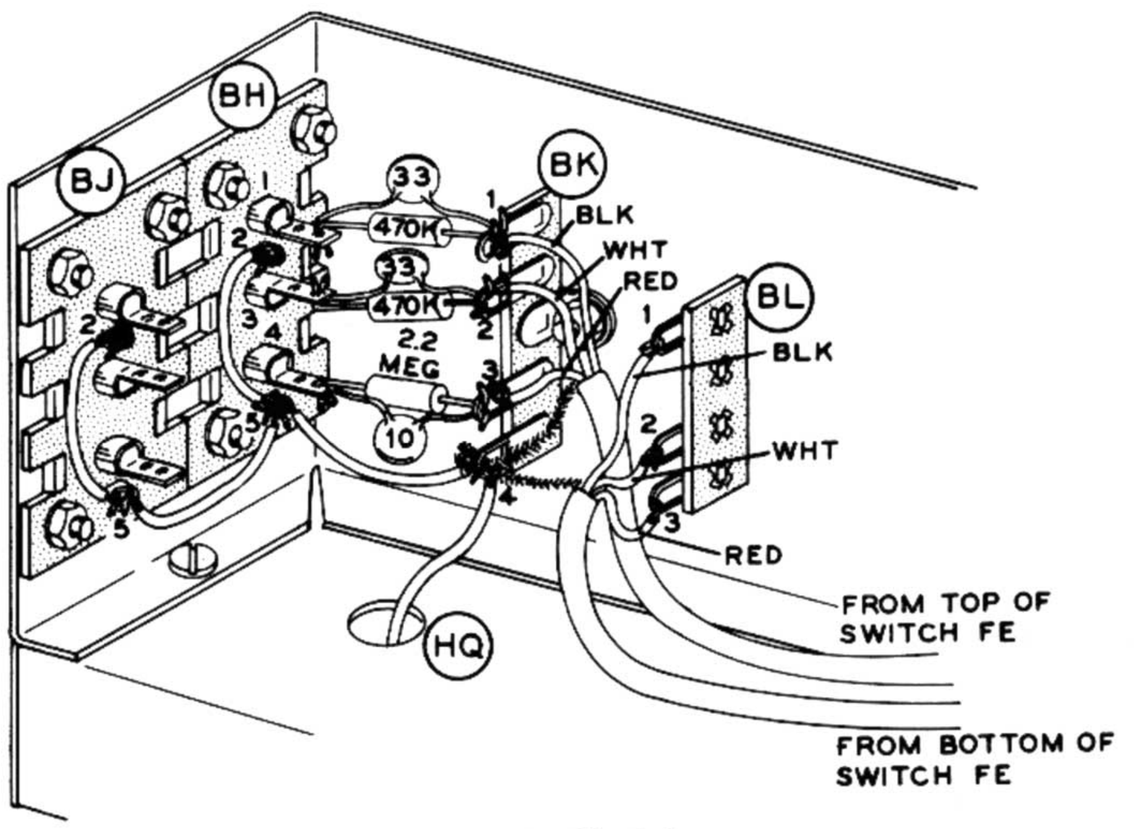
Refer to Detail 4A for the following steps.

( ) Connect a 2" length of hookup wire between lugs 2 (S-1) and 5 (NS) of phono socket BH.

( ) Connect a 1-1/2" length of hookup wire from lug 5 of phono socket BH (NS) to lug 5 of phono socket BJ (NS).

( ) Connect another 1-1/2" length of hookup wire from lug 5 of phono socket BH (S-3) to lug 4 of terminal strip BK (NS).

( ) Connect one end of an 8" length of hookup wire to lug 4 of terminal strip BK (NS). Place the free end of this wire through hole HQ in the chassis. It will be connected later.



Detail 4A

( ) Connect a 2" length of hookup wire between lugs 2 (S-1) and 5 (S-2) of phono socket BJ.

( ) Dress the length of 3-conductor cable coming from the top of switch FE as shown in Detail 4A and Pictorial 2. Connect the black lead of this cable to lug 1 of terminal strip BK (NS).

( ) Connect the white lead to lug 2 of terminal strip BK (NS).

( ) Connect the red lead to lug 3 of terminal strip BK (NS).

( ) Connect the shield pigtail of this cable to lug 4 of terminal strip BK (NS).

( ) Dress the remaining 3-conductor cable as shown in Detail 4A and Pictorial 2.

( ) Connect the black lead of this cable to lug 1 of terminal strip BL (NS).

( ) Connect the white lead to lug 2 of terminal strip BL (NS).

( ) Connect the red lead to lug 3 of terminal strip BL (NS).

( ) Connect the shield pigtail to lug 4 of terminal strip BK (S-4).

( ) R6. Connect a 2.2 megohm (red-red-green) 1/2 watt resistor from lug 4 of phono socket BH (NS) to lug 3 of terminal strip BK (NS).

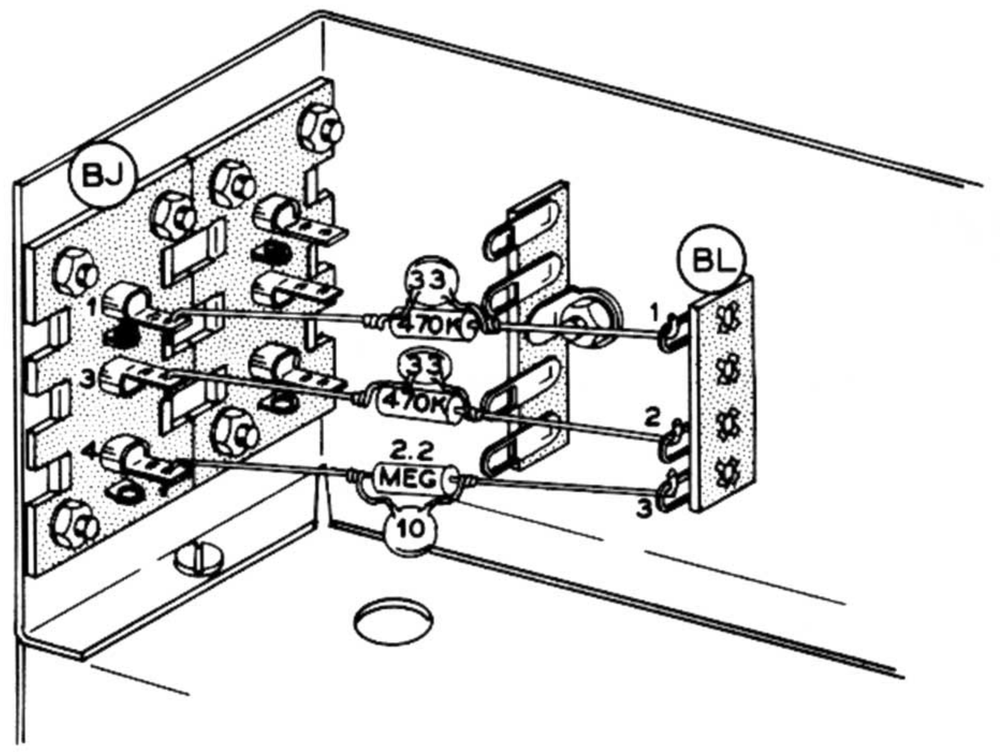
( ) C1. Connect a 10 $\mu\mu$f disc ceramic capacitor from lug 4 of phono socket BH (S-2) to lug 3 of terminal strip BK (S-3).

( ) R4. Connect a 470 KΩ (yellow-violet-yellow) 1/2 watt resistor from lug 3 of phono socket BH (NS) to lug 2 of terminal strip BK (NS).

( ) C9. Connect a 33 $\mu\mu$f disc ceramic capacitor from lug 3 of phono socket BH (S-2) to lug 2 of terminal strip BK (S-3).

( ) R2. Connect a 470 KΩ (yellow-violet-yellow) 1/2 watt resistor from lug 1 of phono socket BH (NS) to lug 1 of terminal strip BK (NS).

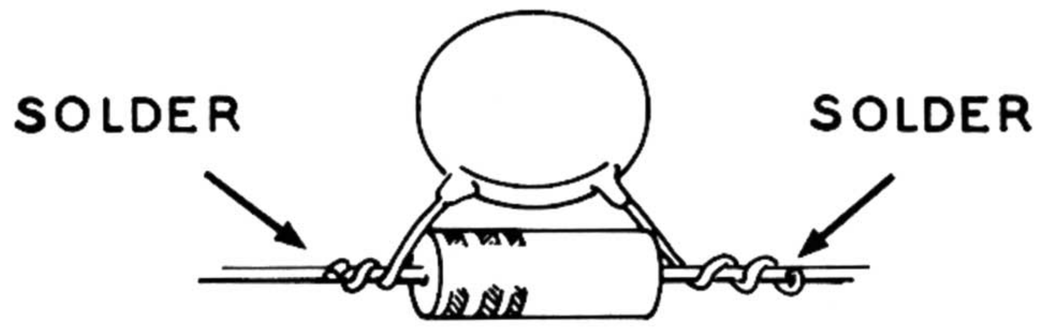
( ) C7. Connect a 33 $\mu\mu$f disc ceramic capacitor from lug 1 of phono socket BH (S-2) to lug 1 of terminal strip BK (S-3).



Detail 4B

Refer to Detail 4B for the following steps.

( ) R39, C27. Referring to Detail 4C, prepare a 2.2 megohm (red-red-green) 1/2 watt resistor and 10 $\mu\mu$f disc ceramic capacitor combination.



Detail 4C

( ) Connect this resistor-capacitor combination from lug 4 of phono socket BJ (S-1) to lug 3 of terminal strip BL (S-2).

( ) R41, C34. Prepare another 470 KΩ (yellow-violet-yellow) 1/2 watt resistor and 33 $\mu\mu$f disc ceramic capacitor combination.

( ) Connect this combination from lug 3 of phono socket BJ (S-1) to lug 2 of terminal strip BL (S-2).

( ) R43, C32. Prepare a 470 KΩ (yellow-violet-yellow) 1/2 watt resistor and 33 $\mu\mu$f disc ceramic capacitor combination.

( ) Connect this resistor-capacitor combination from lug 1 of phono socket BJ (S-1) to lug 1 of terminal strip BL (S-2).

( ) Locate the control panel trim strip and mount the red neon pilot lamp at FG. Use the push-on speednut. See Pictorial 4.

( ) Install the control panel trim strip on the subpanel by placing the panel over the control shaft, then hooking the top lip of the trim strip over the subpanel and forcing the bottom into position. See Pictorial 4.

( ) Be sure that all twisted pairs are dressed as shown in Pictorials 2 and 3.

This completes the wiring on top of the AA-151 chassis.

Refer to Pictorial 5 (fold-out from Page 16) for the following steps.

( ) Connect the free end of the hookup wire coming through hole HQ in the chassis to lug 1 of terminal strip T (S-1).

( ) Connect the light wire of the twisted pair coming through hole HB in the chassis to lug 8 of tube socket V5 (S-1). Connect the dark wire to lug 4 of terminal strip P (NS).

( ) Connect the light wire of the twisted pair coming through hole HA in the chassis to lug 8 of tube socket V6 (S-1). The dark wire is not used at this end.

( ) Connect the free end of the wire extending through hole HA to lug 4 of terminal strip P (NS).

( ) Connect the free end of the capacitor lead coming through hole HC in the chassis to lug 5 of tube socket V4 (NS). Be sure that the sleeving is on the lead.

( ) Connect the free end of the capacitor lead extending through hole HD in the chassis to lug 5 of tube socket V3 (NS). Be sure that the sleeving is on the lead.

( ) Connect the light wire from the twisted pair extending through hole HF in the chassis to lug 1 of tube socket V4 (S-1). The dark wire is not used at this end.

( ) Connect the light wire of the twisted pair extending through hole HE in the chassis to lug 1 of tube socket V3 (S-1). The dark wire is not used at this end.

( ) Connect the free end of the capacitor lead extending through hole HG in the chassis to lug 8 of tube socket V2 (NS). Be sure that the sleeving is on the lead.

( ) Connect the free end of the capacitor lead extending through hole HM in the chassis to lug 8 of tube socket V1 (NS). Use sleeving.

( ) Connect the dark wire of the twisted pair extending through hole HH in the chassis to the bus wire (S-1). Cut the light wire to length and connect it to lug 2 of terminal strip W (NS).

( ) Connect the dark wire of the twisted pair extending through hole HJ in the chassis to the bus wire (S-1). Cut the light wire to length and connect it to lug 3 of terminal strip W (NS).

( ) Cut the light wire of the twisted pair coming through hole HL in the chassis to length and connect it to lug 2 of terminal strip X (NS). The dark wire is not used.

( ) Connect the dark wire of the twisted pair extending through hole HN in the chassis to the bus wire (S-1). Cut the light wire to length and connect it to lug 3 of terminal strip X (NS).

( ) Twist the two green power transformer T3 leads together and connect the longest lead to lug 3 of control J (NS). Connect the other green lead to lug 1 of control J (NS).

( ) Twist the two blue power transformer leads together and connect the longest lead to lug 3 of control K (NS). Connect the other blue lead to lug 1 of control K (NS).

( ) Connect the red-yellow power transformer lead to lug 1 of electrolytic capacitor D (NS).

( ) Twist the two yellow power transformer leads together and connect the longest lead to lug 8 of tube socket V11 (NS). Connect the other yellow lead to lug 2 of tube socket V11 (S-1).

( ) Twist the two red power transformer leads together and connect the longest lead to lug 6 of tube socket V11 (S-1). Connect the other red lead to lug 4 of V11 (S-1).

( ) Connect the shorter black power transformer lead to lug 1 of fuse holder BC (NS). Connect the other black transformer lead to lug 2 of AC socket BB (NS).

NOTE: In the following steps route the twisted wires as shown in Pictorial 5.

( ) At one end of a 3-1/2" twisted pair, connect the light wire to lug 4 (NS) and the dark wire to lug 5 (NS) of tube socket V9.

( ) At the other end of this twisted pair, connect the light wire to lug 4 (S-1) and the dark wire to lug 5 (S-1) of tube socket V10. Route this wire as shown.

( ) At one end of a 7-1/2" twisted pair, connect the light wire to lug 4 (S-2) and the dark wire to lug 5 (S-2) of tube socket V9.

( ) At the other end of this twisted pair, connect the light wire to lug 4 (NS) and the dark wire to lug 5 (NS) of tube socket V5.

( ) At one end of a 3-1/2" twisted pair, connect the light wire to lug 4 (NS) and the dark wire to lug 5 (NS) of tube socket V7.

( ) At the other end of this twisted pair, connect the light wire to lug 4 (S-1) and the dark wire to lug 5 (S-1) of tube socket V8.

( ) At one end of a 12" twisted pair, connect the light wire to lug 4 (S-2) and the dark wire to lug 5 (S-2) of tube socket V7.

( ) At the other end of this twisted pair, connect the light wire to lug 5 (NS) and the dark wire to lug 4 (NS) of tube socket V6.

( ) At one end of a 9-1/2" twisted pair, connect the light wire to lug 1 (S-1) and the dark wire to lug 2 (S-1) of tube socket V1.

( ) At the other end of this twisted pair, connect the light wire to lug 3 (NS) and the dark wire to lug 4 (NS) of tube socket V3.

( ) At one end of a 5" twisted pair, connect the light wire to lug 1 (S-1) and the dark wire to lug 2 (S-1) of tube socket V2.

( ) At the other end of this twisted pair, connect the light wire to lug 3 (NS) and the dark wire to lug 4 (NS) of tube socket V4.

( ) At one end of a 7-1/2" twisted pair, connect the light wire to lug 3 (S-2) and the dark wire to lug 4 (S-2) of tube socket V4.

( ) At the other end of this twisted pair connect the light wire to lug 4 (NS) and the dark wire to lug 5 (NS) of tube socket V5.

( ) At one end of a 3" twisted pair connect the light wire to lug 4 (S-3) and the dark wire to lug 5 (S-3) of tube socket V5.

( ) At the other end of this twisted pair, connect the light wire to lug 1 (S-2) and the dark wire to lug 3 (S-2) of control K.

( ) At one end of a 9" twisted pair, connect the light wire to lug 3 (S-2) and the dark wire to lug 4 (S-2) of tube socket V3.

( ) At the other end of this twisted pair, connect the light wire to lug 5 (NS) and the dark wire to lug 4 (NS) of tube socket V6.

( ) At one end of a 5-1/2" twisted pair, connect the light wire to lug 5 (S-3) and the dark wire to lug 4 (S-3) of tube socket V6.

( ) At the other end of this twisted pair, connect the light wire to lug 1 (S-2) and the dark wire to lug 3 (S-2) of control J.

( ) At one end of an 8" twisted pair, connect the light wire to lug 1 (NS) and the dark wire to lug 2 (NS) of terminal strip U.

( ) At the other end of this twisted pair, connect the light wire to lug 1 (NS) and the dark wire to lug 2 (NS) of terminal strip N.

( ) Connect either of the pilot lamp leads to lug 1 (S-2) and the other pilot lamp lead to lug 2 (S-2) of terminal strip U. Use sleeving on each lead.

( ) At one end of a 14" twisted pair, cut the light wire to length and connect it to lug 1 (S-2) and the dark wire to lug 3 (NS) of terminal strip N.

( ) At the other end of this twisted pair, connect the light wire to lug 1 of AC socket BA (NS). Connect the dark wire to lug 1 of fuse holder BC (S-2).

( ) At one end of a 14-1/2" twisted pair, connect the light wire to lug 1 (S-1) and the dark wire to lug 2 (S-1) of switch FF.

( ) At the other end of this twisted pair, connect the light wire to lug 2 (NS) of AC socket BA and the dark wire to lug 1 (NS) of AC socket BB.

( ) Connect the brown lead from output transformer T2 to lug 1 of screw-type terminal strip BD (S-1).

( ) Connect the orange lead from output transformer T2 to lug 2 of terminal strip BD (S-1).

( ) Connect the yellow lead from output transformer T2 to lug 3 of terminal strip BD (NS).

( ) Connect the black lead from output transformer T2 to lug 1 of terminal strip A (NS).

( ) Connect the brown lead from output transformer T1 to lug 2 of screw-type terminal strip BF (S-1).

( ) Connect the orange lead from output transformer T1 to lug 3 of terminal strip BF (S-1).

( ) Connect the yellow lead from output transformer T1 to lug 4 of terminal strip BF (NS).

( ) Connect the black lead from output transformer T1 to lug 1 of terminal strip B (NS).

( ) At one end of a 13" twisted pair, connect the light wire to lug 2 of tube socket V9 (NS). Connect the dark wire to lug 1 of terminal strip A (NS).

( ) At the other end of this twisted pair, connect the light wire to lug 2 of terminal strip L (NS). The dark wire is not used at this end.

( ) At one end of a 14" twisted pair, connect the light wire to lug 2 of tube socket V10 (NS). Connect the dark wire to lug 2 of terminal strip A (NS).

( ) At the other end of this twisted pair, connect the light wire to lug 1 of terminal strip L (NS). The dark wire is not used at this end.

( ) At one end of a 16-1/2" twisted pair, connect the light wire to lug 2 of tube socket V7 (NS). Connect the dark wire to lug 1 of terminal strip B (NS).

( ) At the other end of this twisted pair, connect the light wire to lug 4 of terminal strip L (NS). The dark wire is not used at this end.

( ) At one end of an 18-1/2" twisted pair, connect the light wire to lug 2 of tube socket V8 (NS). Connect the dark wire to lug 2 of terminal strip B (NS).

( ) At the other end of this twisted pair, connect the light wire to lug 3 of terminal strip L (NS). The dark wire is not used at this end.

( ) Connect the blue lead of output transformer T1 to lug 2 of terminal strip H (NS).

( ) Connect the green lead of output transformer T1 to lug 1 of terminal strip H (NS).

( ) Connect the green-yellow lead of output transformer T1 to lug 1 of terminal strip G (NS).

( ) Connect the blue-yellow lead of output transformer T1 to lug 2 of terminal strip G (NS).

( ) Connect the red lead of output transformer T1 to lug 1 of terminal strip F (NS).

( ) Connect the green lead of output transformer T2 to lug 3 of terminal strip G (NS).

( ) Connect the blue lead of output transformer T2 to lug 4 of terminal strip G (NS).

( ) Connect the red lead of output transformer T2 to lug 1 of terminal strip F (NS).

( ) Connect the green-yellow lead of output transformer T2 to lug 2 of terminal strip F (NS).

( ) Connect the blue-yellow lead of output transformer T2 to lug 3 of terminal strip F (NS).

Refer to Pictorial 6 (fold-out from Page 27) for the following steps.

( ) Connect a 3-1/2" length of hookup wire from lug 1 of AC socket BA (NS) to lug 2 of AC socket BB (S-2).

( ) Connect a 3-1/2" length of hookup wire from lug 1 of AC socket BB (S-2) to lug 2 of fuse holder BC (NS).

( ) Connect a 4" length of hookup wire from lug 4 of electrolytic capacitor D (S-1) to lug 1 of terminal strip A (NS).

( ) Connect a 2-1/2" length of hookup wire from lug 8 of tube socket V11 (S-2) to lug 2 ▬ of electrolytic capacitor D (NS).

( ) Connect a 3" length of hookup wire from lug 2 ▬ of electrolytic capacitor D (NS) to lug 1 of terminal strip F (S-3).

( ) Connect a 7" length of hookup wire from lug 1 of electrolytic capacitor D (NS) to lug 1 of terminal strip M (NS).

( ) Connect a 7" length of hookup wire from lug 1 ■ of electrolytic capacitor E (NS) to lug 1 of terminal strip R (NS).

( ) Connect an 8-1/2" length of hookup wire from lug 2 ▲ of electrolytic capacitor E (NS) to lug 3 of tube socket V2 (NS).

( ) Connect a 10-1/2" length of hookup wire from lug 3 of electrolytic capacitor E (NS) to the bus wire (S-1). This wire should be connected to the bus wire between tube sockets V1 and V2.

( ) Connect a 4" length of hookup wire from lug 2 of control K (NS) to lug 2 of control J (S-1).

( ) Connect a 7" length of hookup wire from lug 3 of terminal strip F (S-2) to lug 7 of tube socket V9 (S-1). Dress this wire under the output transformer leads.

( ) Connect a 7" length of hookup wire from lug 2 of terminal strip F (S-2) to lug 9 of tube socket V9 (S-1). Dress this wire under the output transformer leads.

( ) Connect a 3" length of hookup wire from lug 3 of tube socket V9 (S-1) to lug 3 of tube socket V10 (NS).

( ) Connect a 4" length of hookup wire from lug 2 of terminal strip A (NS) to lug 1 of terminal strip B (NS).

( ) Connect a 5-1/4" length of hookup wire from lug 2 of terminal strip A (NS) to lug 1 of screw-type terminal strip BF (NS).

( ) Connect a 2-1/4" length of hookup wire from lug 1 of terminal strip BF (S-2) to lug 1 of switch BE (NS).

( ) Connect a 1" length of hookup wire between lugs 1 (S-2) and 6 (S-1) of switch BE.

( ) Connect a 1" length of hookup wire between lugs 3 (S-1) and 4 (NS) of switch BE.

( ) Referring to Pictorial 6, install a #6 spade lug on the end of the heavy black wire.

( ) Place the free end of this wire through hole HR in the chassis and connect it to lug 4 of switch BE (S-2).

( ) Connect a 2" length of hookup wire from lug 2 of switch BE (S-1) to lug 4 of screw-type terminal strip BD (S-1).

( ) Connect a 2" length of hookup wire from lug 5 of switch BE (S-1) to lug 5 of terminal strip BD (S-1).

( ) Connect a 9" length of hookup wire from lug 3 of terminal strip BD (S-2) to lug 1 of terminal strip P (NS).

( ) Connect a 6" length of hookup wire from lug 7 of tube socket V10 (S-1) to lug 4 of terminal strip G (S-2).

( ) Connect a 5" length of hookup wire from lug 9 of tube socket V10 (S-1) to lug 3 of terminal strip G (S-2).

( ) Connect a 2-3/4" length of hookup wire from lug 3 of tube socket V10 (S-2) to lug 3 of tube socket V7 (NS).

( ) Connect a 2-3/4" length of hookup wire from lug 3 of tube socket V7 (S-2) to lug 3 of tube socket V8 (NS).

( ) Connect a 3" length of hookup wire from lug 3 of tube socket V8 (S-2) to lug 1 of terminal strip C (NS).

( ) Connect a 4-1/2" length of hookup wire from lug 7 of tube socket V7 (S-1) to lug 2 of terminal strip G (S-2).

( ) Connect a 4-1/2" length of hookup wire from lug 9 of tube socket V7 (S-1) to lug 1 of terminal strip G (S-2).

( ) Connect a 15" length of hookup wire from lug 4 of terminal strip BF (S-2) to lug 1 of terminal strip Q (NS).

( ) Connect a 5-1/2" length of hookup wire from lug 2 of terminal strip B (NS) to lug 3 of terminal strip H (NS).

( ) Connect a 5-1/2" length of hookup wire from lug 7 of tube socket V8 (S-1) to lug 2 of terminal strip H (S-2).

( ) Connect a 5" length of hookup wire from lug 9 of tube socket V8 (S-1) to lug 1 of terminal strip H (S-2).

( ) Connect a 3-1/2" length of hookup wire from lug 3 of tube socket V1 (NS) to lug 3 of tube socket V2 (NS).

( ) Connect a 1-1/2" length of hookup wire between lugs 1 (NS) and 2 (NS) of terminal strip R.

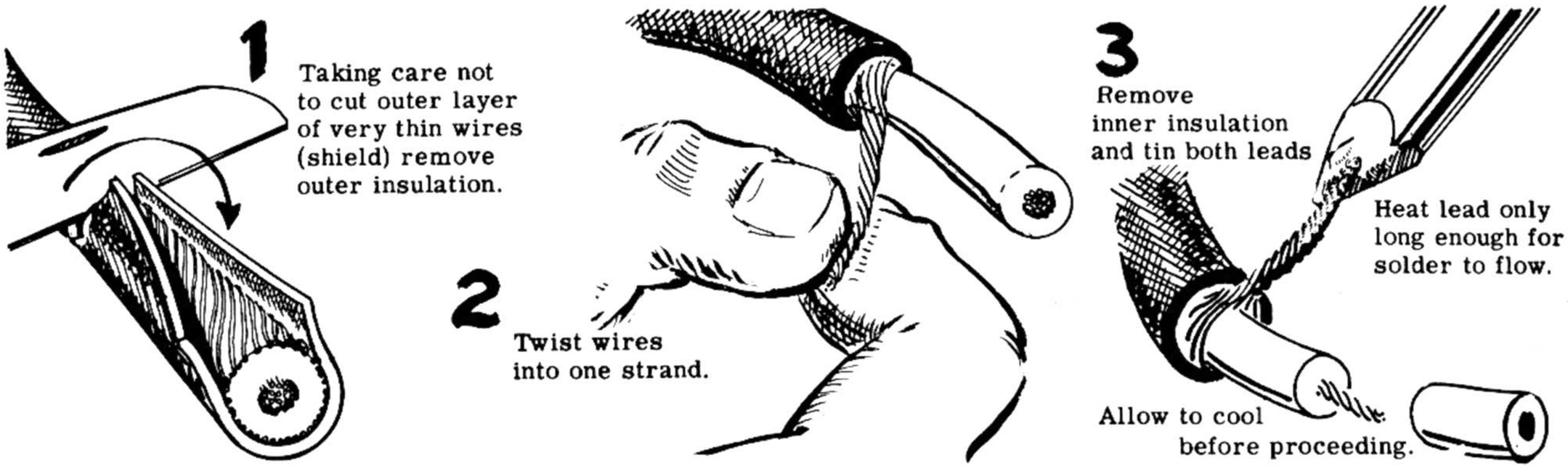
( ) Connect a 3" length of hookup wire from lug 3 of terminal strip P (NS) to lug 3 of terminal strip Q (NS).

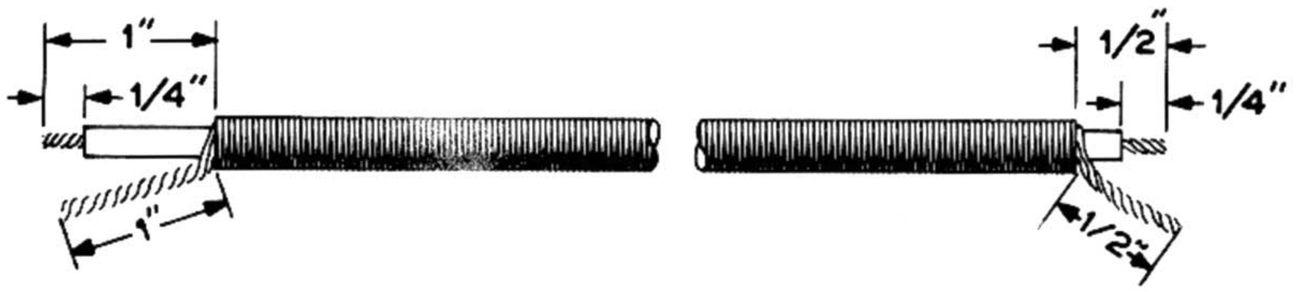
( ) Connect a 3-1/2" length of hookup wire from lug 2 of terminal strip P (NS) to lug 9 of tube socket V5 (S-1).

( ) Connect a 5-1/2" length of hookup wire from lug 4 of terminal strip P (NS) to lug 1 of terminal strip M (NS).

( ) Connect a 2-1/2" length of hookup wire from lug 2 of terminal strip Q (NS) to lug 9 of tube socket V6 (S-1).

( ) Connect a 6" length of hookup wire from lug 5 ▲ of electrolytic capacitor D (NS) to lug 3 of terminal strip P (NS).





Detail 6A

( ) Referring to Detail 6A, prepare a 10" length of shielded audio cable.

( ) At the 1/2" prepared end of the shielded audio cable, connect the shield pigtail to lug 4 of phono socket BG (NS). Connect the inner wire to lug 3 of phono socket BG (NS). Pass the free end of this audio cable through hole HQ in the chassis.

( ) Dress the above audio cable along the top of the chassis and place it through the hole in the chassis nearest to tube socket V2.

( ) Connect the shield pigtail at this end of the audio cable to the bus wire (S-1). Connect the inner wire to lug 5 of tube socket V2 (S-1).

( ) Referring to Detail 6A, prepare a 9" length of shielded audio cable.

( ) At the 1/2" prepared end of this cable, connect the shield pigtail to lug 1 of phono socket BG (NS). Connect the inner wire to lug 2 of BG (NS). Place the free end of this audio cable through hole HQ in the chassis.

( ) Dress this audio cable along the top of the chassis and place it through the hole in the chassis nearest tube socket V1.

( ) Connect the shield pigtail at this end of the cable to the bus wire (S-1). Connect the inner wire to lug 5 of tube socket V1 (S-1).

Refer to Pictorial 7 for the following steps.

( ) C47. Connect a .01 μfd 1.6 kv disc ceramic capacitor from lug 2 of fuse holder BC (S-2) to lug 1 of electrolytic capacitor D (S-3). Use sleeving on both leads. (Apply enough solder and heat to lug 1 of D to melt the solder onto the mounting wafer. Use sleeving on both leads and position this capacitor as shown in Pictorial 7.

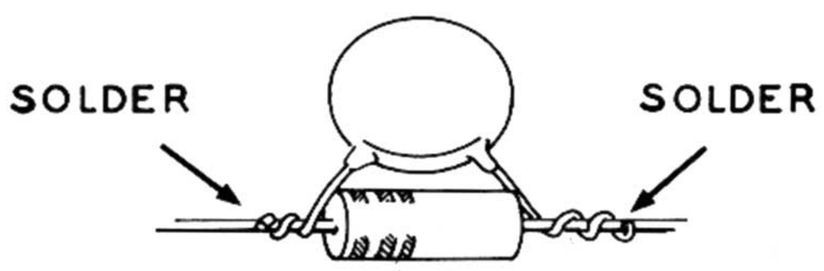
( ) R36. Connect a 4700 Ω (yellow-violet-red) 2 watt resistor between lugs 2 ▲ (S-3) and 5 ▲ (NS) of electrolytic capacitor D.

( ) R25. Connect a 1000 Ω (brown-black-red) 1 watt resistor from lug 5 ▲ of electrolytic capacitor D (S-3) to lug 1 ■ of electrolytic capacitor E (NS).

( ) R34. Connect a 22 KΩ (red-red-orange) 1/2 watt resistor between lugs 1 ■ (S-3) and 2 ▲ (NS) of electrolytic capacitor E.

( ) R70. Connect a 150 KΩ (brown-green-yellow) 1/2 watt resistor from lug 2 ▲ of electrolytic capacitor E (S-3) to lug 2 of control K (NS).

( ) R71, C46. Referring to Detail 7A, prepare a 33 KΩ (orange-orange-orange) 1/2 watt resistor and .02 μfd disc ceramic combination.



Detail 7A

( ) Connect this combination from lug 3 of electrolytic capacitor E (S-2) to lug 2 of control K (S-3).

NOTE: When installing the tubular capacitors, be sure that the end marked with a band or shoulder is placed as shown in Pictorial 7.

( ) C44. Connect a .05 μfd tubular capacitor from lug 3 of tube socket V5 (NS) to lug 1 of terminal strip L (S-2). Use sleeving on both leads.

( ) Connect a .05 μfd tubular capacitor from lug 1 of tube socket V5 (NS) to lug 2 of terminal strip L (S-2). Use sleeving on both leads.

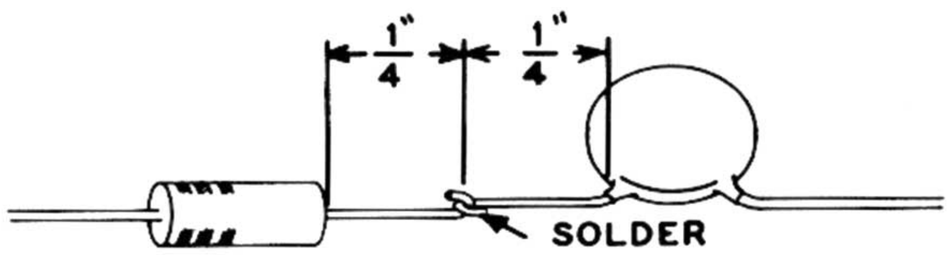
( ) C21. Connect a .05 μfd tubular capacitor from lug 3 of tube socket V6 (NS) to lug 3 of terminal strip L (S-2). Use sleeving on both leads.

( ) C19. Connect a .05 μfd tubular capacitor from lug 1 of tube socket V6 (NS) to lug 4 of terminal strip L (S-2). Use sleeving on both leads.

( ) R66. Connect a 36 KΩ (orange-blue-orange) 1/2 watt resistor from lug 3 of tube socket V5 (S-2) to lug 1 of terminal strip M (NS). Use sleeving on lead to V5.

( ) R30. Connect another 36 KΩ (orange-blue-orange) 1/2 watt resistor from lug 3 of tube socket V6 (S-2) to lug 2 of terminal strip M (NS). Use sleeving on lead to V6.

( ) R63, C43. Referring to Detail 7B, prepare a 22 KΩ (red-red-orange) 1/2 watt resistor and 56 μμf disc ceramic capacitor series combination.



Detail 7B

( ) Connect the capacitor lead of this combination to lug 2 of tube socket V5 (NS), and connect the resistor lead of this combination to lug 1 of terminal strip M (S-4). Use sleeving on lead to V5.

( ) R27, C18. Referring to Detail 7B, prepare another 22 KΩ (red-red-orange) 1/2 watt resistor and 56 μμf disc ceramic capacitor series combination.

( ) Connect the capacitor lead of this combination to lug 2 of tube socket V6 (NS) and connect the resistor lead to lug 2 of terminal strip M (S-2).

( ) R69. Connect a 100 KΩ (brown-black-yellow) 1/2 watt resistor between lugs 2 (S-2) and 3 (S-2) of terminal strip N.

( ) R28. Connect a 36 KΩ (orange-blue-orange) 1/2 watt resistor from lug 1 of tube socket V6 (S-2) to lug 3 of terminal strip Q (S-2). Use sleeving on the lead to V6.

( ) C17. Connect a 33 $\mu\mu$f disc ceramic capacitor between lugs 1 (NS) and 2 (NS) of terminal strip Q.

( ) R29. Connect a 27 KΩ (red-violet-orange) 1/2 watt resistor between lugs 1 (S-3) and 2 (NS) of terminal strip Q.

( ) R24. Connect a 1000 Ω (brown-black-red) 1/2 watt resistor from lug 2 of terminal strip Q (S-4) to the bus wire (S-1).

( ) C42. Connect a 33 $\mu\mu$f disc ceramic capacitor between lugs 1 (NS) and 2 (NS) of terminal strip P.

( ) R65. Connect a 27 KΩ (red-violet-orange) 1/2 watt resistor between lugs 1 (S-3) and 2 (NS) of terminal strip P.

( ) R60. Connect a 1000 Ω (brown-black-red) 1/2 watt resistor from lug 2 of terminal strip P (S-4) to the bus wire (S-1).

( ) C41. Connect a .1 μfd tubular capacitor from lug 4 of terminal strip P (NS) to lug 7 of tube socket V5 (NS). Use sleeving on the lead to V5.

( ) C16. Connect a .1 μfd tubular capacitor from lug 4 of terminal strip P (S-6) to lug 7 of tube socket V6 (NS). Use sleeving on the lead to V6.

( ) R62. Connect a 220 KΩ (red-red-yellow) 1/2 watt resistor from lug 6 (NS) of tube socket V5 to lug 3 of terminal strip P (NS).

( ) R70. Connect a 150 KΩ (brown-green-yellow) resistor between lugs 2 (S-2) and 6 (S-2) of tube socket V5.

( ) R61. Connect a 680 KΩ (blue-gray-yellow) 1/2 watt resistor from lug 7 of tube socket V5 (S-2) to lug 3 of terminal strip P (NS).

( ) R64. Connect a 36 KΩ (orange-blue-orange) 1/2 watt resistor from lug 1 of tube socket V5 (S-2) to lug 3 of terminal strip P (NS). Use sleeving on the lead to V5.

( ) R26. Connect a 220 KΩ (red-red-yellow) 1/2 watt resistor from lug 6 of tube socket V6 (NS) to lug 3 of terminal strip P (NS).

( ) R71. Connect a 150 KΩ (brown-green-yellow) resistor between lugs 2 (S-2) and 6 (S-2) of tube socket V6.

( ) R25. Connect a 680 KΩ (blue-gray-yellow) 1/2 watt resistor from lug 7 of tube socket V6 (S-2) to lug 3 of terminal strip P (S-7). Use sleeving on lead to P.

( ) C35. Connect a .1 μfd tubular capacitor from lug 6 of tube socket V4 (NS) to the bus wire (S-1).

( ) C10. Connect a .1 μfd tubular capacitor from lug 6 of tube socket V3 (NS) to the bus wire (S-1). Use sleeving on lead to V3.

( ) R18. Connect a 100 KΩ (brown-black-yellow) 1/2 watt resistor from lug 5 of tube socket V3 (S-2) to lug 2 of terminal strip R (NS).

( ) R17. Connect a 270 KΩ (red-violet-yellow) 1/2 watt resistor from lug 6 of tube socket V3 (S-2) to lug 2 of terminal strip R (S-3).

( ) R54. Connect a 100 KΩ (brown-black-yellow) 1/2 watt resistor from lug 5 of tube socket V4 (S-2) to lug 1 of terminal strip R (NS).

( ) R53. Connect a 270 KΩ (red-violet-yellow) 1/2 watt resistor from lug 6 of tube socket V4 (S-2) to lug 1 of terminal strip R (S-4).

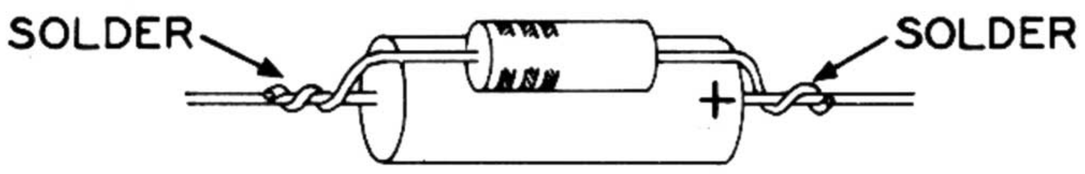
( ) R52. Connect one end of a 1000 Ω (brown-black-red) 1/2 watt resistor through lug 2 (NS) to lug 7 (S-1) of tube socket V4. Now solder lug 2 of V4 (S-2).

( ) Connect the other lead of this resistor to lug 1 of terminal strip S (S-1).

( ) R16. Connect one lead of another 1000 Ω (brown-black-red) 1/2 watt resistor through lug 2 (NS) to lug 7 (S-1) of tube socket V3. Now solder lug 2 of V3 (S-2). Connect the other lead of this resistor to lug 2 of terminal strip S (S-1).

( ) C30. Connect a .1 μfd tubular capacitor from lug 6 of tube socket V2 (NS) to lug 4 of terminal strip W (NS).

( ) C33. Connect a .022 μfd tubular capacitor from lug 7 of tube socket V2 (NS) to lug 3 of terminal strip W (S-2).



Detail 7C

( ) R37, C26. Referring to Detail 7C, prepare a 2700 Ω (red-violet-red) 1/2 watt resistor and 50 μfd miniature electrolytic capacitor combination.

( ) Connect the positive (+) capacitor lead of this combination to lug 4 of tube socket V2 (S-1). Connect the other lead of this combination to the bus wire (S-1).

( ) R50. Connect a 100 KΩ (brown-black-yellow) 1/2 watt resistor between lugs 3 (NS) and 7 (S-2) of tube socket V2.

( ) R47. Connect a 100 KΩ (brown-black-yellow) LOW-NOISE resistor between lugs 3 (S-4) and 6 (S-2) of tube socket V2.

( ) R49. Connect a 2700 Ω (red-violet-red) 1/2 watt resistor from lug 9 of tube socket V2 (S-1) to the bus wire (S-1).

( ) R48. Connect a 1 megohm (brown-black-green) 1/2 watt resistor from lug 8 of tube socket V2 (S-2) to the bus wire (S-1).

( ) C28. Connect a .01 μfd disc ceramic capacitor from lug 1 of terminal strip W (NS) to the bus wire (S-1).

( ) C29. Connect a .0035 μfd disc ceramic capacitor between lugs 1 (NS) and 2 (NS) of terminal strip W.

( ) R45. Connect a 22 KΩ (red-red-orange) 1/2 watt resistor between lugs 1 (S-3) and 2 (NS) of terminal strip W.

( ) R46. Connect a 470 KΩ (yellow-violet-yellow) 1/2 watt resistor between lugs 2 (S-4) and 4 (S-2) of terminal strip W.

( ) C3. Connect a .01 μfd disc ceramic capacitor from lug 1 of terminal strip X (NS) to the bus wire (S-1).

( ) C4. Connect a .0035 μfd disc ceramic capacitor between lugs 1 (NS) and 2 (NS) of terminal strip X.

( ) R9. Connect a 22 KΩ (red-red-orange) 1/2 watt resistor between lugs 1 (S-3) and 2 (NS) of terminal strip X.

( ) R10. Connect a 470 KΩ (yellow-violet-yellow) 1/2 watt resistor between lugs 2 (S-4) and 4 (NS) of terminal strip X.

( ) C5. Connect a .1 μfd tubular capacitor from lug 6 of tube socket V1 (NS) to lug 4 of terminal strip X (S-2).

( ) C8. Connect a .022 μfd tubular capacitor from lug 7 of tube socket V1 (NS) to lug 3 of terminal strip X (S-2).

( ) R8, C2. Referring to Detail 7C, prepare a 2700 Ω (red-violet-red) 1/2 watt resistor and 50 μfd miniature electrolytic capacitor combination.

( ) Connect the positive (+) capacitor lead of this combination to lug 4 of tube socket V1 (S-1). Connect the other lead of this combination to lug 2 of terminal strip T (S-1).

( ) R14. Connect a 100 KΩ (brown-black-yellow) 1/2 watt resistor between lugs 3 (NS) and 7 (S-2) of tube socket V1.

( ) R11. Connect a 100 KΩ (brown-black-yellow) LOW-NOISE resistor between lugs 3 (S-3) and 6 (S-2) of tube socket V1.

( ) R13. Connect a 2700 Ω (red-violet-red) 1/2 watt resistor from lug 9 of tube socket V1 (S-1) to the bus wire (S-1).

( ) R12. Connect a 1 megohm (brown-black-green) 1/2 watt resistor from lug 8 of tube socket V1 (S-2) to the bus wire (S-1).

( ) R33. Connect a 100 Ω 7 watt resistor from lug 1 of terminal strip C (S-2) to lug 3 of terminal strip H (NS). Position the body of this resistor against the chassis.

( ) C20. Connect the positive (+) lead of the 50 μfd 25 volt electrolytic capacitor to lug 2 of terminal strip C (S-1). Connect the other lead of this capacitor to lug 3 of terminal strip H (S-3).

( ) R7. Connect a 47 KΩ (yellow-violet-orange) 1/2 watt resistor between lugs 1 (S-2) and 2 (S-2) of phono socket BG.

( ) R38. Connect a 47 KΩ (yellow-violet-orange) 1/2 watt resistor between lugs 3 (S-2) and 4 (S-2) of phono socket BG.

( ) R32. Connect a 470 KΩ (yellow-violet-yellow) 1/2 watt resistor from lug 2 of terminal strip B (S-3) to lug 2 of tube socket V8 (S-2).

( ) R31. Connect a 470 KΩ (yellow-violet-yellow) 1/2 watt resistor from lug 1 of terminal strip B (S-4) to lug 2 of tube socket V7 (S-2).

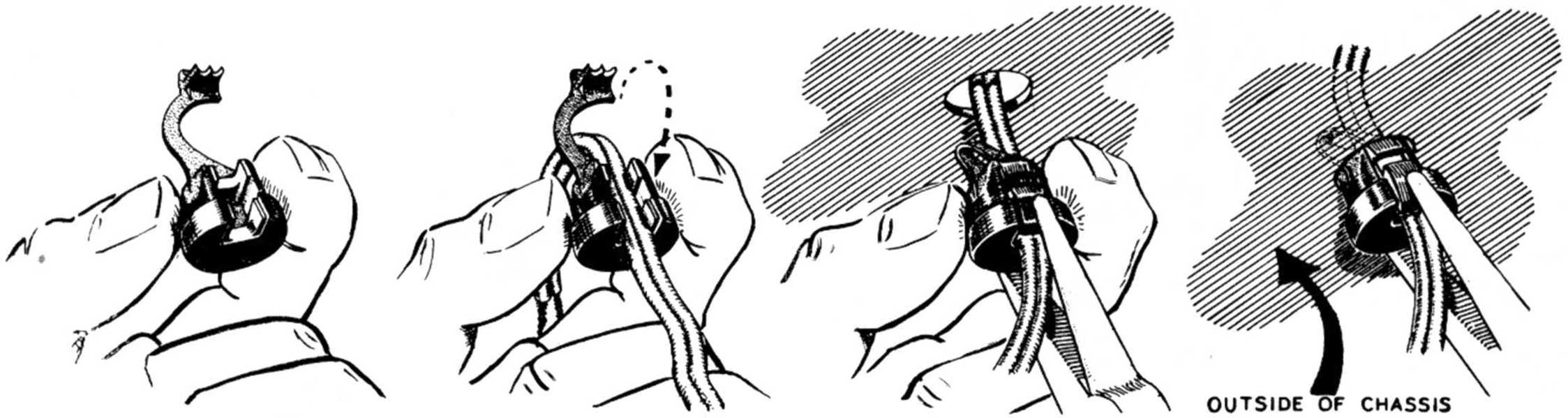
( ) R67. Connect a 470 KΩ (yellow-violet-yellow) 1/2 watt resistor from lug 2 of terminal strip A (S-4) to lug 2 of tube socket V10 (S-2).

( ) R68. Connect another 470 KΩ (yellow-violet-yellow) 1/2 watt resistor from lug 1 of terminal strip A (S-4) to lug 2 of tube socket V9 (S-2).

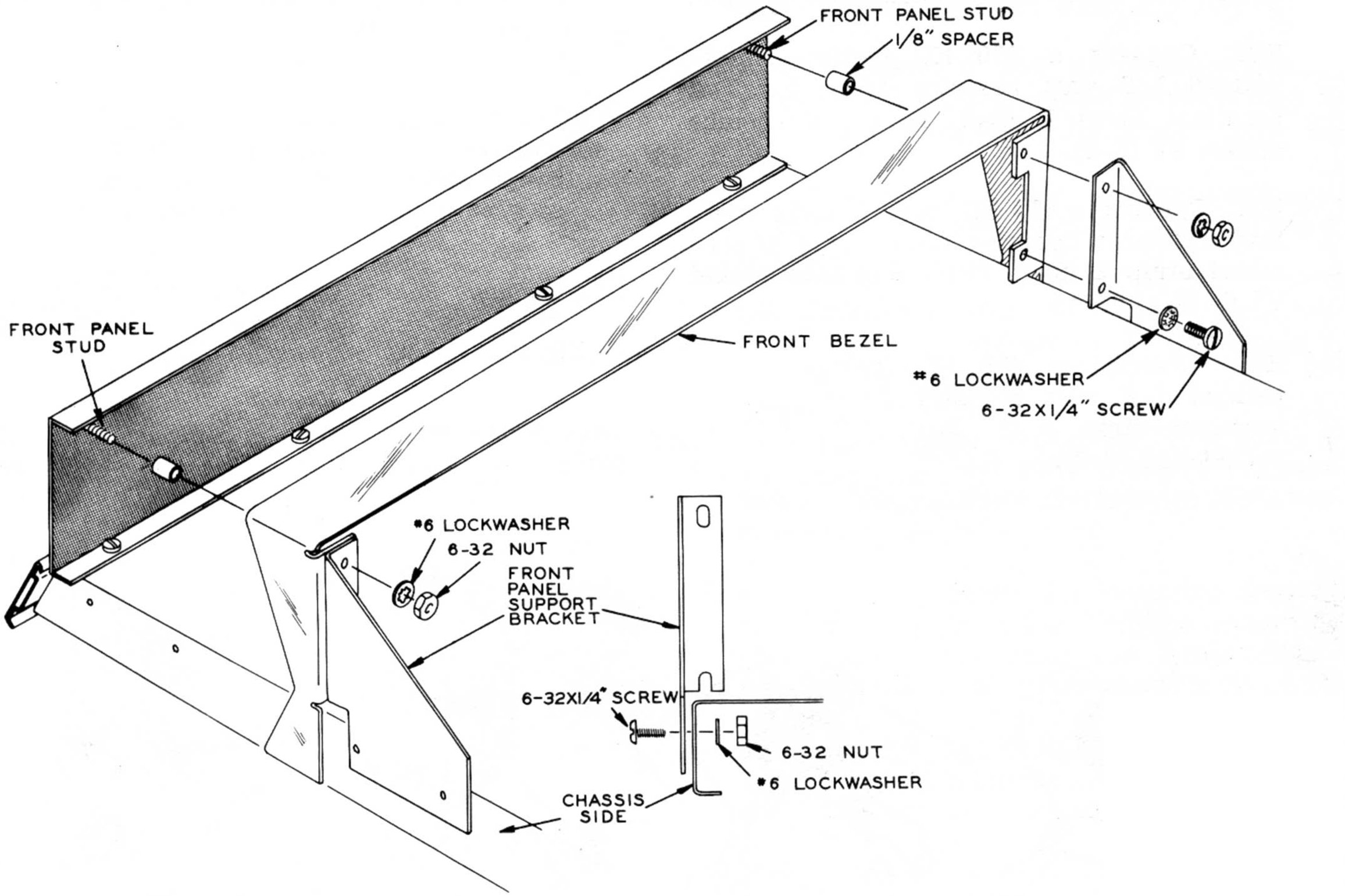
( ) Referring to Detail 7D, mount the line cord and line cord strain relief in the hole between the two AC sockets. Leave 2-1/2" of wire inside of the chassis.

( ) Connect either line cord wire to lug 1 of AC socket BA (S-3). Connect the other wire to lug 2 of AC socket BA (S-2).

This completes the wiring of your HEATHKIT AA-151 Stereo Amplifier.



Detail 7D



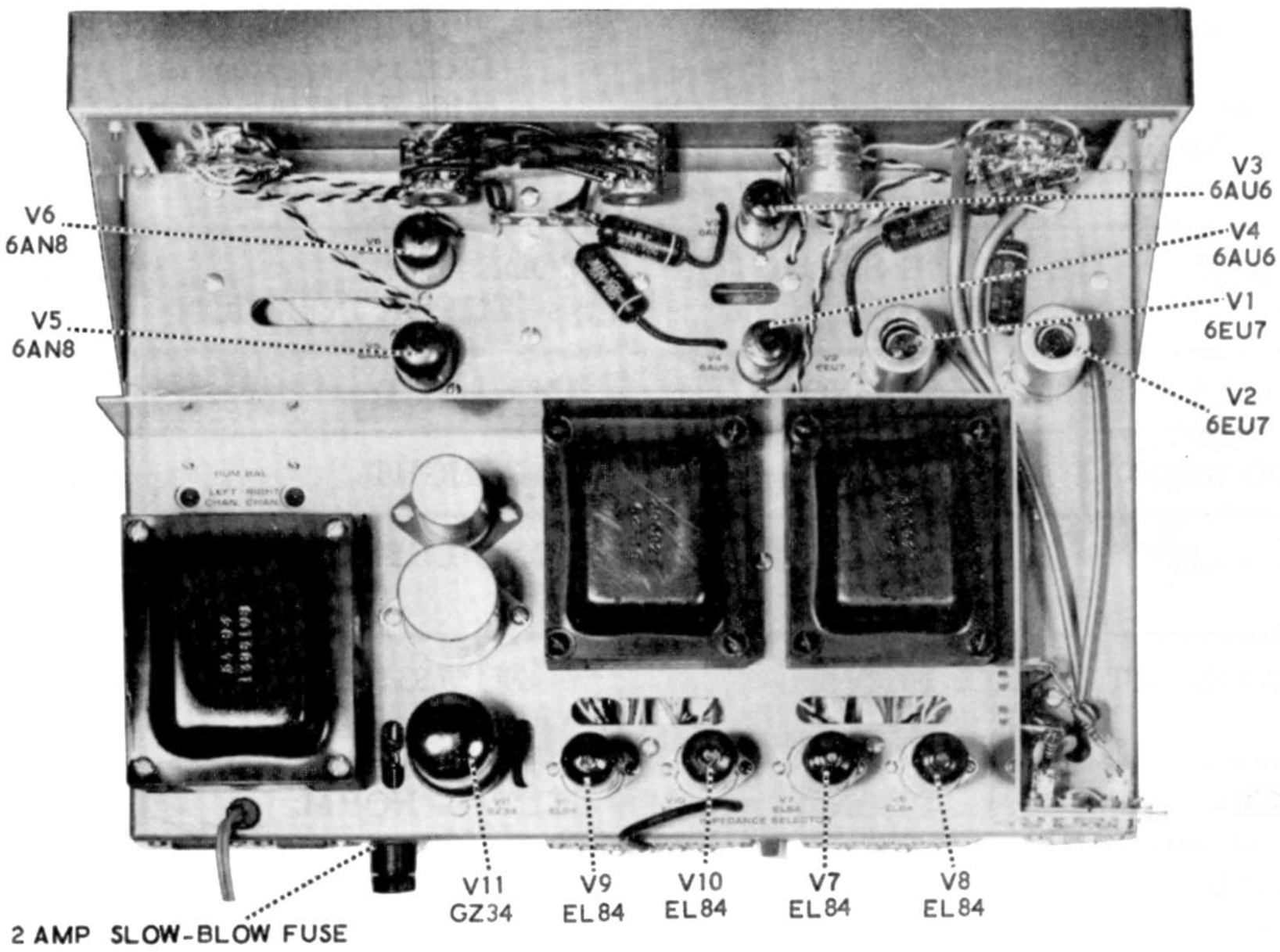
Pictorial 8

Refer to Pictorial 8 for the following steps.

( ) Locate the front bezel and place a 6-32 self-tapping screw in the bottom hole of each mounting flange. Now remove the 6-32 self-tapping screws. Using these prethreaded holes, secure a front panel support bracket to each end of the front bezel. Use 6-32 x 1/4" screws and #6 lockwashers.

( ) Mount the front bezel and support brackets to the front panel and chassis as shown in Pictorial 8. Place 1/8" spacers on each stud on the front panel. Place the bezel on the studs, then secure the support brackets to the chassis with #6 hardware. Now secure the bezel to the front panel with #6 lockwashers and 6-32 nuts on the studs.

TEST AND CONNECTIONS



Pictorial 9

Refer to Pictorial 9 for the following steps.

( ) Carefully inspect the bottom of the chassis to be sure that all solder splashes or excess lead lengths have been removed. Inspect each solder connection to be sure that a poor solder joint does not exist and that solder has not overflowed from a connection, causing a short circuit.

IMPORTANT WARNING: TUBES CAN BE DAMAGED WHEN INSTALLING THEM IN THEIR SOCKETS. THEREFORE, USE EXTREME CARE WHEN INSTALLING TUBES, AS WE DO NOT GUARANTEE OR REPLACE TUBES BROKEN DURING HANDLING OR INSTALLATION.

( ) Referring to Pictorial 9, install the tubes in their appropriate tube sockets. Mount the tube shields on tube sockets V1 and V2.

( ) Install a 2 amp fuse in the fuse holder.

( ) Referring to Detail 9A, install the knobs on the front panel and control panel shafts.

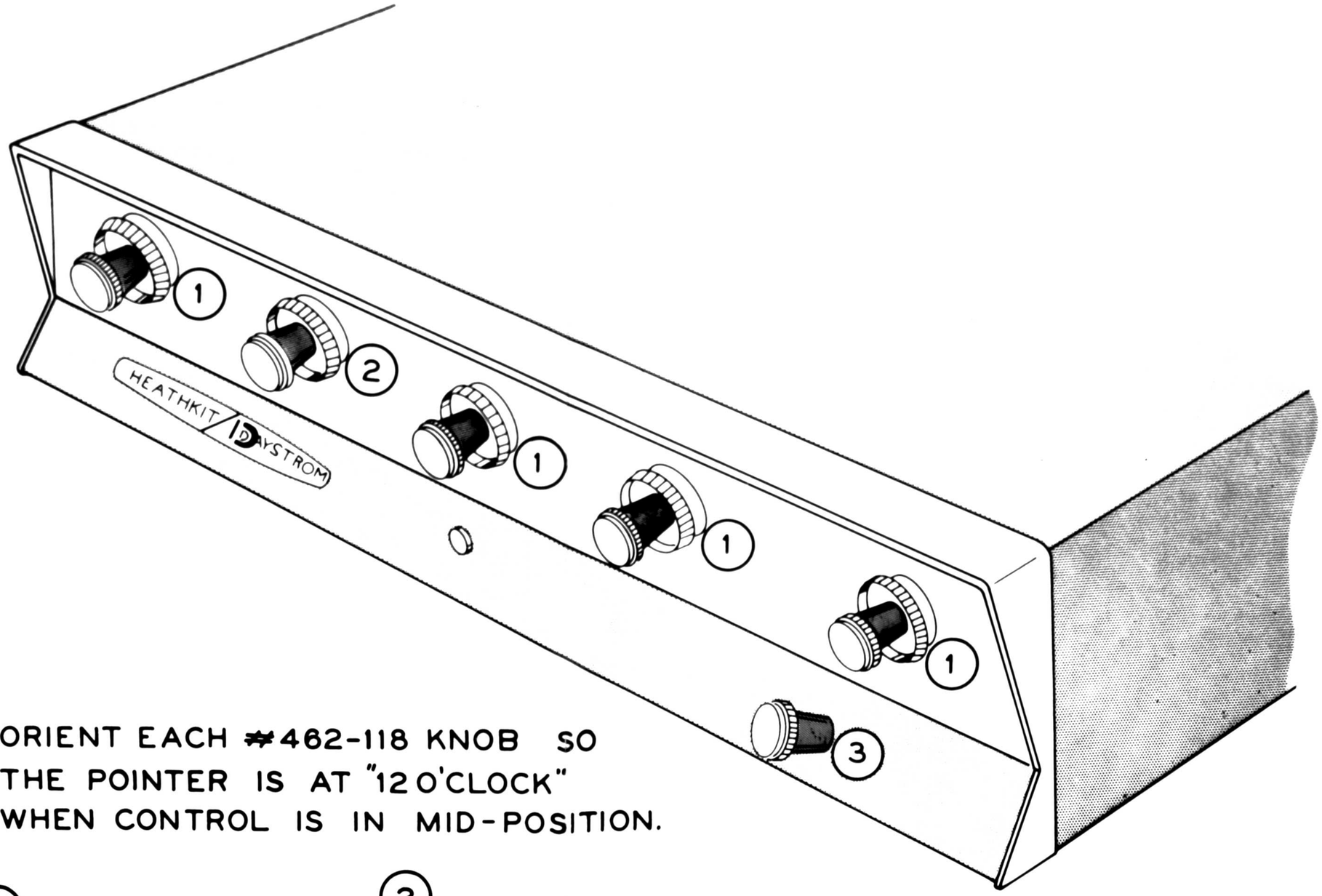
( ) Connect one end of the left channel speaker leads to the left channel "C" terminal. Connect the other lead of the left channel speaker to the tap that matches the speaker coil impedance, 4 Ω, 8 Ω, or 16 Ω.

( ) Connect the right channel speaker leads to the right channel speaker "C" and "S" SPKR terminals. Connect the impedance matching wire to the terminal which corresponds to the right speaker impedance, 4 Ω, 8 Ω, or 16 Ω. CAUTION: Do not operate the amplifier without a load across the speaker terminals.

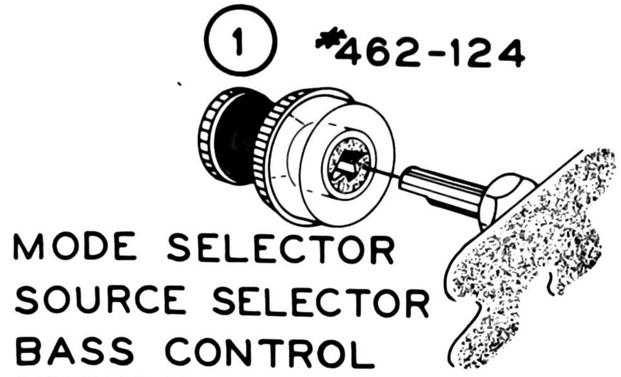
( ) Plug the amplifier into a 117 volt 50/60 cycle AC receptacle. Turn the amplifier POWER switch to ON.

( ) The pilot lamp should glow and the tube filaments should light.

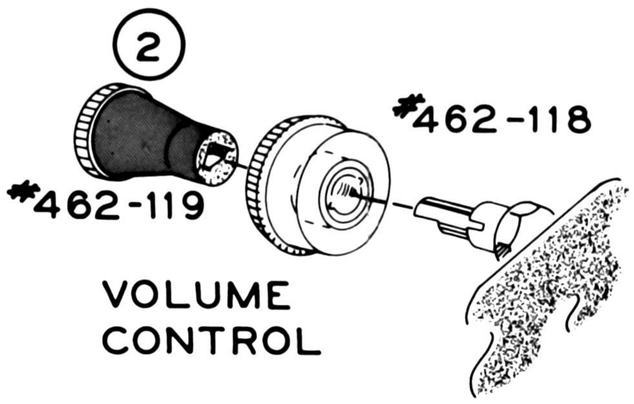
( ) Insert a small screwdriver into the input jacks. This injects a 60 cycle test signal for testing purposes. There is no shock hazard in a properly wired amplifier. Slowly advance each section of the VOLUME control until hum is heard from the speakers.



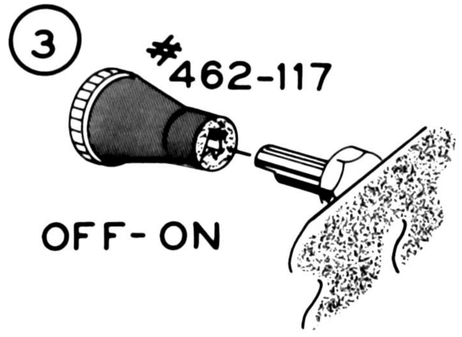
ORIENT EACH #462-118 KNOB SO
THE POINTER IS AT "12 O'CLOCK"
WHEN CONTROL IS IN MID-POSITION.



MODE SELECTOR
SOURCE SELECTOR
BASS CONTROL
TREBLE CONTROL



VOLUME
CONTROL



OFF-ON

#462-124

#462-119

#462-118

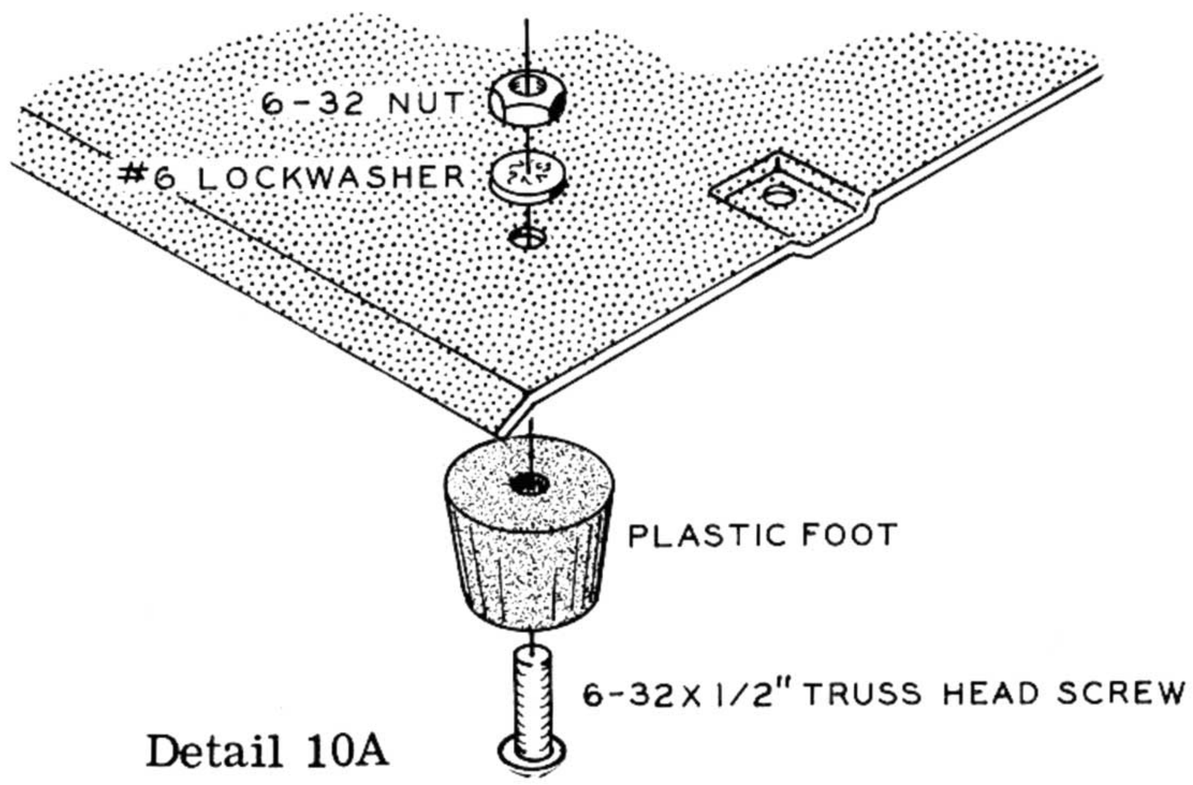
#462-117

Do not advance the VOLUME control further than necessary. The tone controls should be at 1/2 of rotation.

( ) Refer to the following chart and place the controls in the indicated positions.

( ) If difficulty is encountered in the steps below, refer to the In Case Of Difficulty section. If operation thus far seems satisfactory, unplug the amplifier and proceed with Final Assembly.

PLACE NAIL IN INPUT JACK	SOURCE SELECTOR POSITION	MODE SELECTOR POSITION	HUM SHOULD BE HEARD FROM SPEAKER ONLY
MAG. PHONO LEFT	MAG. PHONO	AMP LEFT	LEFT CHANNEL
MAG. PHONO RIGHT	MAG. PHONO	AMP RIGHT	RIGHT CHANNEL
MAG. PHONO LEFT	MAG. PHONO	MONO LEFT SOURCE	LEFT AND RIGHT CHANNEL
MAG. PHONO RIGHT	MAG. PHONO	MONO RIGHT SOURCE	LEFT AND RIGHT CHANNEL
MAG. PHONO LEFT	MAG. PHONO	STEREO NORM.	LEFT CHANNEL
MAG. PHONO RIGHT	MAG. PHONO	STEREO NORM.	RIGHT CHANNEL
MAG. PHONO LEFT	MAG. PHONO	STEREO REV.	RIGHT CHANNEL
MAG. PHONO RIGHT	MAG. PHONO	STEREO REV.	LEFT CHANNEL
XTAL PHONO LEFT	XTAL PHONO	STEREO NORM.	LEFT CHANNEL
XTAL PHONO RIGHT	XTAL PHONO	STEREO NORM.	RIGHT CHANNEL
TUNER LEFT	TUNER	STEREO NORM.	LEFT CHANNEL
TUNER RIGHT	TUNER	STEREO NORM.	RIGHT CHANNEL
AUX. LEFT	AUX.	STEREO NORM.	LEFT CHANNEL
AUX. RIGHT	AUX.	STEREO NORM.	RIGHT CHANNEL



Detail 10A

FINAL ASSEMBLY

Refer to Pictorial 10 for the following steps.

( ) Locate the bottom plate and referring to Detail 10A, firmly mount a plastic foot in each corner. Use 6-32 x 1/2" truss head screws, #6 lockwashers, and 6-32 nuts.

( ) Mount the bottom cover to the chassis with eight #6 sheet metal screws, two on each edge and four on the rear apron. The bent edge of the bottom cover must fit under the bottom edge of the control panel.

( ) Taking care that the top cover clears the electrolytic capacitor, slide the top cover over the amplifier from the back and fasten it to the bottom, using six sheet metal screws, three in each side.

( ) Carefully remove all of the paper backing from the nameplate. Apply the nameplate to the front of the amplifier with firm, even finger pressure.

This completes the assembly of your Model AA-151 Stereo High Fidelity Amplifier. Normally, the output of both channels of this amplifier are connected to suitable speaker systems. If you intend to use only one speaker system, connect it to one of the channels, and connect the other channel to a resistive load. The resistive load will prevent the unused channel from "running free," which could damage the circuit parts in the output stage of an unused channel.

You may use a 4 ohm, 8 ohm, or 16 ohm high wattage resistor for the resistive load. Connect this resistor to the proper output terminals of the unused channel.

FILAMENT BALANCE CONTROL ADJUSTMENT

Plug the amplifier into a 117 volt AC receptacle. Place the SOURCE selector switch in the MAG. PHONO position and the MODE selector in AMP LEFT position. With no connection to the input jacks, turn the VOLUME control clockwise until hum is clearly heard from the left speaker. Turn the amplifier on its side and adjust the LEFT FILAMENT BALANCE control for minimum hum from the left speaker.

( ) Place the MODE selector switch in the AMP RIGHT position. Rotate the VOLUME control until hum is heard clearly from the right speaker. Adjust the RIGHT FILAMENT BALANCE control for minimum hum from the right speaker. NOTE: Some benefit may be obtained by readjustment if the entire system is installed.

INSTALLATION AND OPERATION

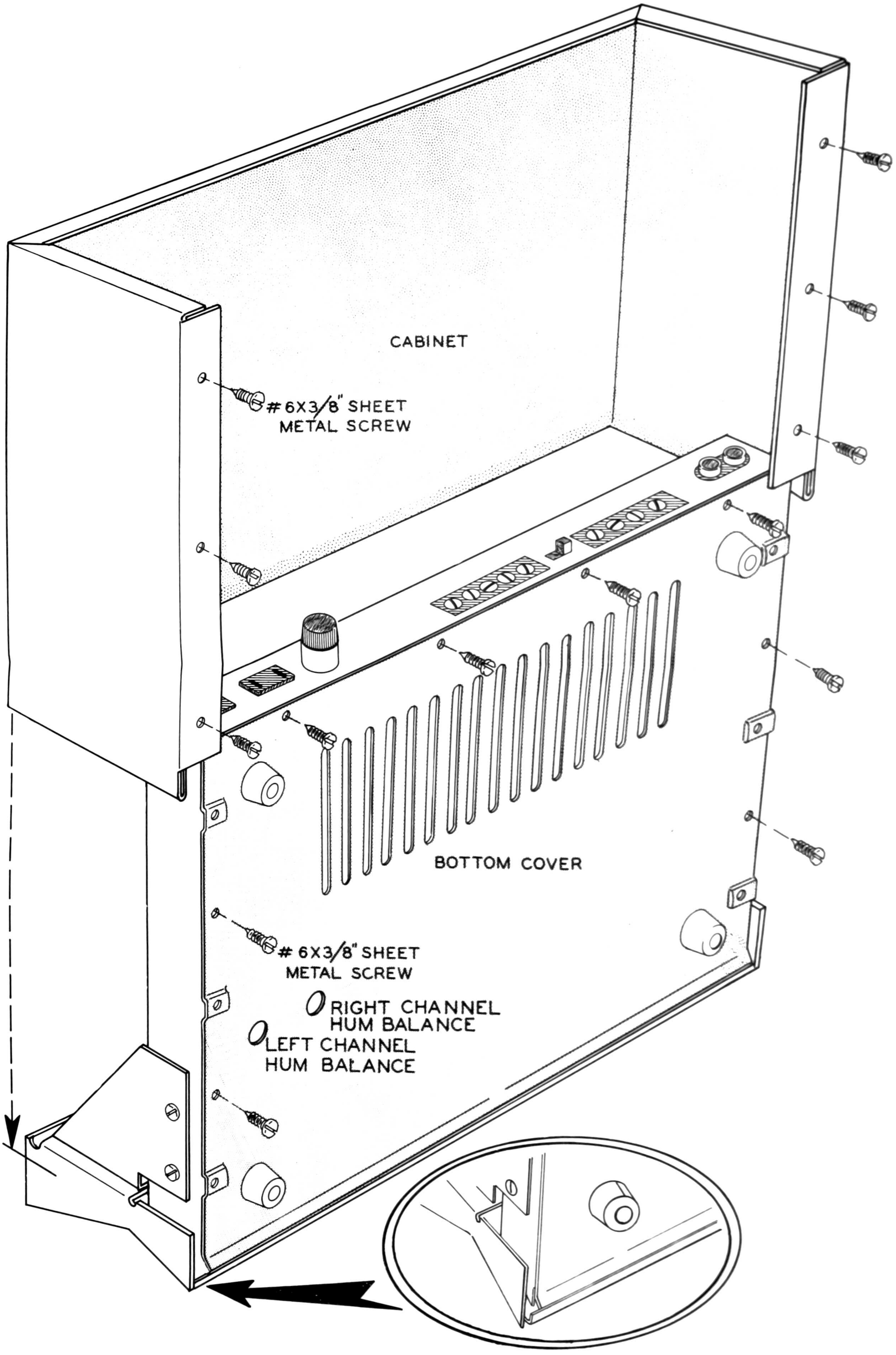
Heat is normally generated in all power amplifiers, therefore, adequate ventilation around the cabinet is necessary. At least 1" of open area behind the rear apron and 3" above the top of the cabinet is considered minimum for adequate ventilation. Vertical mounting of the chassis is not recommended due to the high operating temperature of the amplifier.

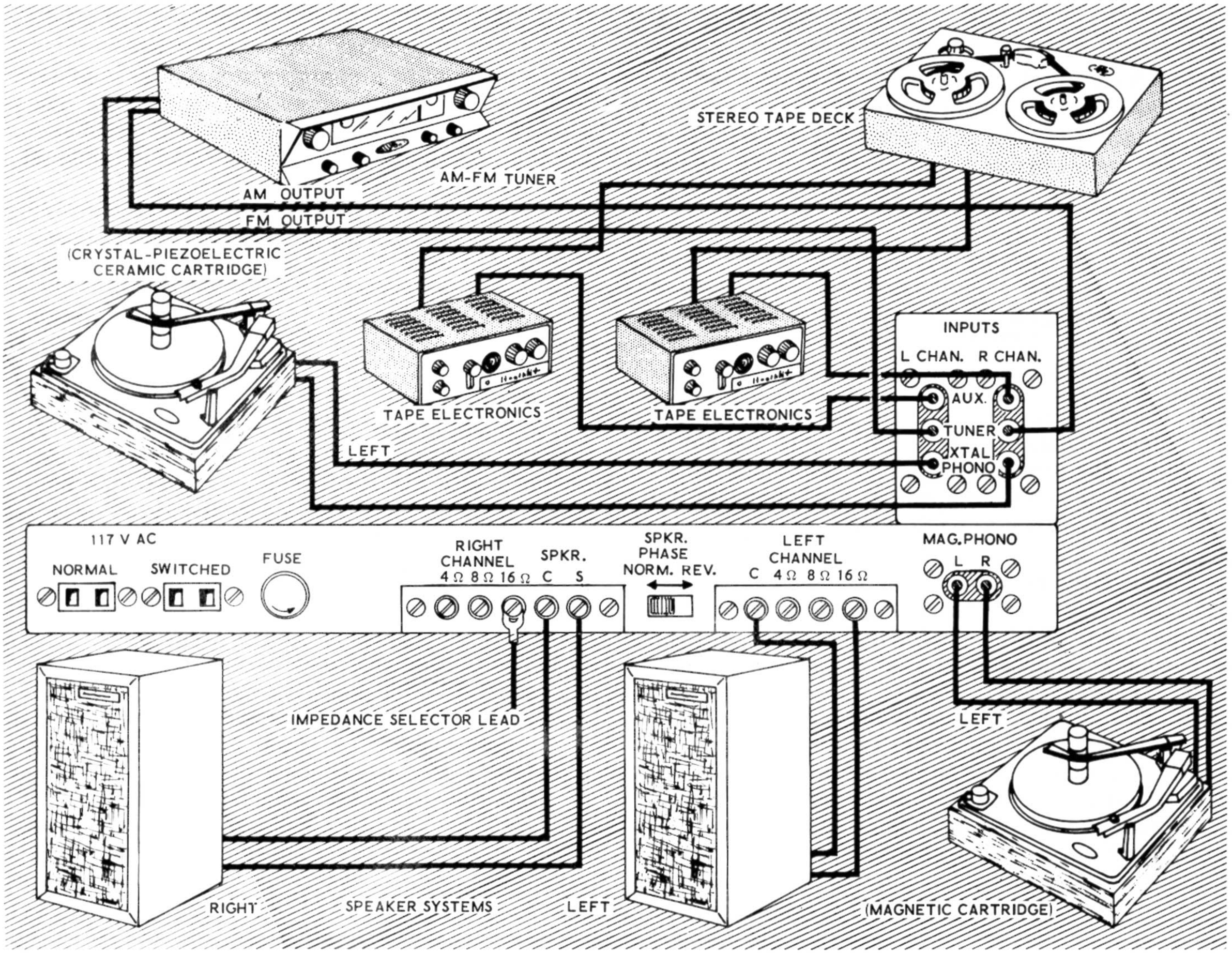
Refer to Pictorial 11 on Page 36 which shows a typical installation of this amplifier in a stereo system. The system illustrated in Pictorial 11 is provided simply as an example and should be used only as a guide in connecting your system. There are, of course, many other possible combinations of equipment that will provide similar results.

The XTAL PHONO input was designed for crystal or piezoelectric phono cartridges, but may be used for any high level input source. The TUNER and AUX. inputs are identical in design and may be used for high level inputs from practically any type of signal source.

The SOURCE selector switch selects the desired signal source, as indicated on the front panel, without interference from the other inputs.

The MODE selector switch routes either or both input signals from the selected sources to the input of the power amplifiers. AMP LEFT and AMP RIGHT positions route the input signal only through its respective power amplifier and speaker. No audio will be reproduced by the opposite speaker. MONO LEFT SOURCE and MONO RIGHT SOURCE positions route the input signal to both power amplifiers and it will be reproduced by both the left and right speakers.


CABINET
6X3/8" SHEET METAL SCREW
BOTTOM COVER
6X3/8" SHEET METAL SCREW
RIGHT CHANNEL HUM BALANCE
LEFT CHANNEL HUM BALANCE



Pictorial 11

STEREO NORM. and STEREO REV. positions route the left and right input signals to their respective amplifiers and speakers, or opposite amplifiers and speakers. As an example, the listener can change the direction of travel of a recorded train sound from left to right, to right to left. He may place the string section of an orchestra to the left or to the right of the brass section as desired.

The VOLUME control may be operated as a dual–tandem or concentric control. For concentric operation simply hold one knob stationary, and turn the free knob. This feature allows the control to be used as a balance control.

The BASS and TREBLE controls are dual-tandem and therefore adjust the tone emphasis or attenuation of both amplifiers simultaneously. These tone controls make it possible to reproduce tones as they were recorded, or to adjust the tones for individual listening preference.

The SPKR. PHASE switch is located on the rear apron of the AA-151. This switch is used to reverse the right channel speaker connections. The NORM. position is correct if the signal sources selected are in phase with one another and the speakers are in phase. When either the input signals or the speakers are out of phase, the phase reversal switch will compensate for the

difference. If the material being produced is out of phase there will be slight cancellation of program material, especially at the low frequencies. To determine whether or not the reproduced audio is in or out of phase, adjust the output of each speaker individually to produce the same level of audio. This can be done by setting the MODE selector switch in the AMP LEFT position and adjusting the left channel VOLUME control for normal listening level from the left speaker. Switch the MODE selector switch to AMP RIGHT. Holding the left channel VOLUME control knob in a stationary position, set the right channel VOLUME control to a normal listening level from the right speaker.

Once the two speaker output levels are balanced, place the MODE selector switch in the stereo NORM. position and switch the SPKR. PHASE switch from NORM. to the REV. position. You will note a slight difference in total output level and a difference in the direction from which the program material seems to be originating. The highest output level and fullness of sound will coincide with the proper position of the SPKR. PHASE switch. With some stereo material, this test may be difficult to make because of extreme separation between channels. It is suggested that a standard monophonic record be used under the conditions described above. The sound will be full and centered when proper phase relationships are achieved.

It is a good practice to leave the VOLUME control for the unused preamplifier in its full counterclockwise position when operating the amplifier for monophonic reproduction. This will avoid any possibility of interference from the unused channel.

IN CASE OF DIFFICULTY

1. Recheck the wiring. Trace each lead in colored pencil on the Pictorial as it is checked. It is frequently helpful to have a friend check your work. Someone who is not familiar with the unit may notice something consistently overlooked by the constructor.

2. It is interesting to note that about 90% of the kits that are returned for repair, do not function properly due to poor connections and soldering. Therefore, many troubles can be eliminated by reheating all connections to make sure that they are soldered as described in the Proper Soldering Techniques section of this manual.

3. Check to be sure that all tubes are in their proper locations. Make sure that all tubes light up properly.

4. Check the tubes with a tube tester or by substitution of tubes of the same types and known to be good.

5. Check the values of the component parts. Be sure that the proper part has been wired into the circuit, as shown in the pictorial diagrams and as called out in the wiring instructions.

6. Check for bits of solder, wire ends or other foreign matter which may be lodged in the wiring beneath the chassis.

7. If, after careful checks, the trouble is still not located and a voltmeter is available, check voltage readings against those found on the Schematic Diagram. NOTE: All voltage readings were taken with a HEATHKIT Vacuum Tube Voltmeter. Voltages may vary as much as 10% due to line voltage variations.

8. A review of the Circuit Description will prove helpful in indicating where to look for trouble.

CAUTION: There is high voltage present at various points throughout the AA-151. Do not touch these. Be certain you have the proper test point located before proceeding with the following checks. Do not touch the chassis other than at the points indicated.

( ) Place the front panel controls as follows:

SOURCE selector	MAG. PHONO.
VOLUME control	1/4 turn from counter-clockwise position. (Do not adjust this control higher than necessary to obtain an audible sound in the speaker, as serious damage could result to the output tubes or speakers due to the high gain of the amplifier.)
BASS and TREBLE controls	1/2 rotation from counterclockwise.
MODE selector	STEREO NORM.

LEFT CHANNEL TEST

Touch the control grid (pin 2) of V7 and V8 with a screwdriver. A faint sound should be heard from the left channel speaker. Touch the control grid (pin 2) of V6B, the sound should increase slightly. Then proceed to pin 8 of V6A, pin 1 of V3, pin 8 of V1B, then pin 5 of V1A.

RIGHT CHANNEL TEST

Touch the control grid (pin 2) of V9 and V10 with a screwdriver. A faint sound should be heard from the right channel speaker. Touch the control grid (pin 2) of V5B, sound should increase slightly. Proceed to pin 8 of V5A, pin 1 of V4, pin 8 of V2B, then pin 5 of V2A.

The point at which no sound is heard is the stage where the difficulty lies. Recheck the voltages, wiring and components in this particular area.

SERVICE INFORMATION

SERVICE

If, after applying the information contained in this manual and your best efforts, you are still unable to obtain proper performance, it is suggested that you take advantage of the technical facilities which the Heath Company makes available to its customers.

The Technical Consultation Department is maintained for your benefit. This service is available to you at no charge. Its primary purpose is to provide assistance for those who encounter difficulty in the construction, operation or maintenance of HEATHKIT equipment. It is not intended, and is not equipped to function as a general source of technical information involving kit modifications nor anything other than the normal and specified performance of HEATHKIT equipment.

Although the Technical Consultants are familiar with all details of this kit, the effectiveness of their advice will depend entirely upon the amount and the accuracy of the information furnished by you. In a sense, YOU MUST QUALIFY for GOOD technical advice by helping the consultants to help you. Please use this outline:

1. Before writing, fully investigate each of the hints and suggestions listed in this manual under In Case Of Difficulty. Possibly it will not be necessary to write.

2. When writing, clearly describe the nature of the trouble and mention all associated equipment. Specifically report operating procedures, switch positions, connections to other units and anything else that might help to isolate the cause of trouble.

3. Report fully on the results obtained when testing the unit initially and when following the suggestions under In Case Of Difficulty. Be as specific as possible and include voltage readings if test equipment is available.

4. Identify the kit model number and date of purchase if available. Also mention the date of the kit assembly manual. (Date at bottom of Page 1.)

5. Print or type your name and address, preferably in two places on the letter.

With the preceding information, the consultant will know exactly what kit you have, what you would like it to do for you and the difficulty you

wish to correct. The date of purchase tells him whether or not engineering changes have been made since it was shipped to you. He will know what you have done in an effort to locate the cause of trouble and, thereby, avoid repetitious suggestions. In short, he will devote full time to the problem at hand, and through his familiarity with the kit, plus your accurate report, he will be able to give you a complete and helpful answer. If replacement parts are required, they will be shipped to you, subject to the terms of the Warranty.

The Factory Service facilities are also available to you, in case you are not familiar enough with electronics to provide our consultants with sufficient information on which to base a diagnosis of your difficulty, or in the event that you prefer to have the difficulty corrected in this manner. You may return the completed instrument to the Heath Company for inspection and necessary repairs and adjustments. You will be charged a minimal service fee, plus the price of any additional parts or material required. However, if the completed kit is returned within the Warranty period, parts charges will be governed by the terms of the Warranty. State the date of purchase, if possible.

Local Service by Authorized HEATHKIT Service Centers is also available in some areas and often will be your fastest, most efficient method of obtaining service for your HEATHKIT equipment. Although you may find charges for local service somewhat higher than for factory service, the amount of increase is usually offset by the transportation charge you would pay if you elected to return your kit to the Heath Company.

HEATHKIT Service Centers will honor the regular 90 day HEATHKIT Parts Warranty on all kits, whether purchased through a dealer or directly from Heath Company; however, it will be necessary that you verify the purchase date of your kit.

Under the conditions specified in the Warranty, replacement parts are supplied without charge; however, if the Service Center assists you in locating a defective part (or parts) in your kit, or installs a replacement part for you, you may be charged for this service.

HEATHKIT equipment purchased locally and returned to Heath Company for service must be accompanied by your copy of the dated sales receipt from your authorized HEATHKIT dealer in order to be eligible for parts replacement under the terms of the Warranty.

THIS SERVICE POLICY APPLIES ONLY TO COMPLETED EQUIPMENT CONSTRUCTED IN ACCORDANCE WITH THE INSTRUCTIONS AS STATED IN THE MANUAL. Equipment that has been modified in design will not be accepted for repair. If there is evidence of acid core solder or paste fluxes, the equipment will be returned NOT repaired.

For information regarding modification of HEATHKIT equipment for special applications, it is suggested that you refer to any one or more of the many publications that are available on all phases of electronics. They can be obtained at or through your local library, as well as at most electronic equipment stores. Although the Heath Company sincerely welcomes all comments and suggestions, it would be impossible to design, test, evaluate and assume responsibility for proposed circuit changes for special purposes. Therefore, such modifications must be made at the discretion of the kit builder, using information available from sources other than the Heath Company.

REPLACEMENTS

Material supplied with HEATHKIT products has been carefully selected to meet design requirements and ordinarily will fulfill its function without difficulty. Occasionally improper instrument operation can be traced to a faulty component. Should inspection reveal the necessity for replacement, write to the Heath Company and supply all of the following information.

A. Thoroughly identify the part in question by using the part number and description found in the manual Parts List.

B. Identify the type and model number of kit in which it is used.

C. Mention date of purchase.

D. Describe the nature of defect or reason for requesting replacement.

The Heath Company will promptly supply the necessary replacement. PLEASE DO NOT RETURN THE ORIGINAL COMPONENT UNTIL SPECIFICALLY REQUESTED TO DO SO. Do not dismantle the component in question as this will void the guarantee. This replacement policy does not cover the free replacement of parts that may have been broken or damaged through carelessness on the part of the kit builder.

SHIPPING INSTRUCTIONS

In the event that your instrument must be returned for service, these instructions should be carefully followed.

Be sure to include all tubes and interconnecting audio cables. The cabinet and bottom plate should be securely fastened to the chassis.

ATTACH A TAG TO THE EQUIPMENT BEARING YOUR NAME, COMPLETE ADDRESS, DATE OF PURCHASE, AND A BRIEF DESCRIPTION OF THE DIFFICULTY ENCOUNTERED. Wrap the equipment in heavy paper, exercising care to prevent damage. Place the wrapped equipment in a stout carton of such size that at least three inches of shredded paper, excelsior, or other resilient packing material can be placed between all sides of the wrapped equipment and the carton. Close and seal the carton with gummed paper tape, or alternately, tie securely with stout cord. Clearly print the address on the carton as follows:

To: HEATH COMPANY
Benton Harbor, Michigan

Include your name and return address on the outside of the carton. Preferably affix one or more "Fragile" or "Handle With Care" labels to the carton, or otherwise so mark with a crayon of bright color. Ship by insured parcel post or prepaid express; note that a carrier cannot be held responsible for damage in transit if, in HIS OPINION, the article is inadequately packed for shipment.

WARRANTY

Heath Company warrants that for a period of three months from the date of shipment, all Heathkit parts shall be free of defects in materials and workmanship under normal use and service and that in fulfillment of any breach of such warranty, Heath Company shall replace such defective parts upon the return of the same to its factory. The foregoing warranty shall apply only to the original buyer, and is and shall be in lieu of all other warranties, whether express or implied and of all other obligations or liabilities on the part of Heath Company and in no event shall Heath Company be liable for any anticipated profits, consequential damages, loss of time or other losses incurred by the buyer in connection with the purchase, assembly or operation of Heathkits or components thereof. No replacement shall be made of parts damaged by the buyer in the course of handling or assembling Heathkit equipment.

NOTE: The foregoing warranty is completely void and we will not replace, repair or service instruments or parts thereof in which acid core solder or paste fluxes have been used.

HEATH COMPANY

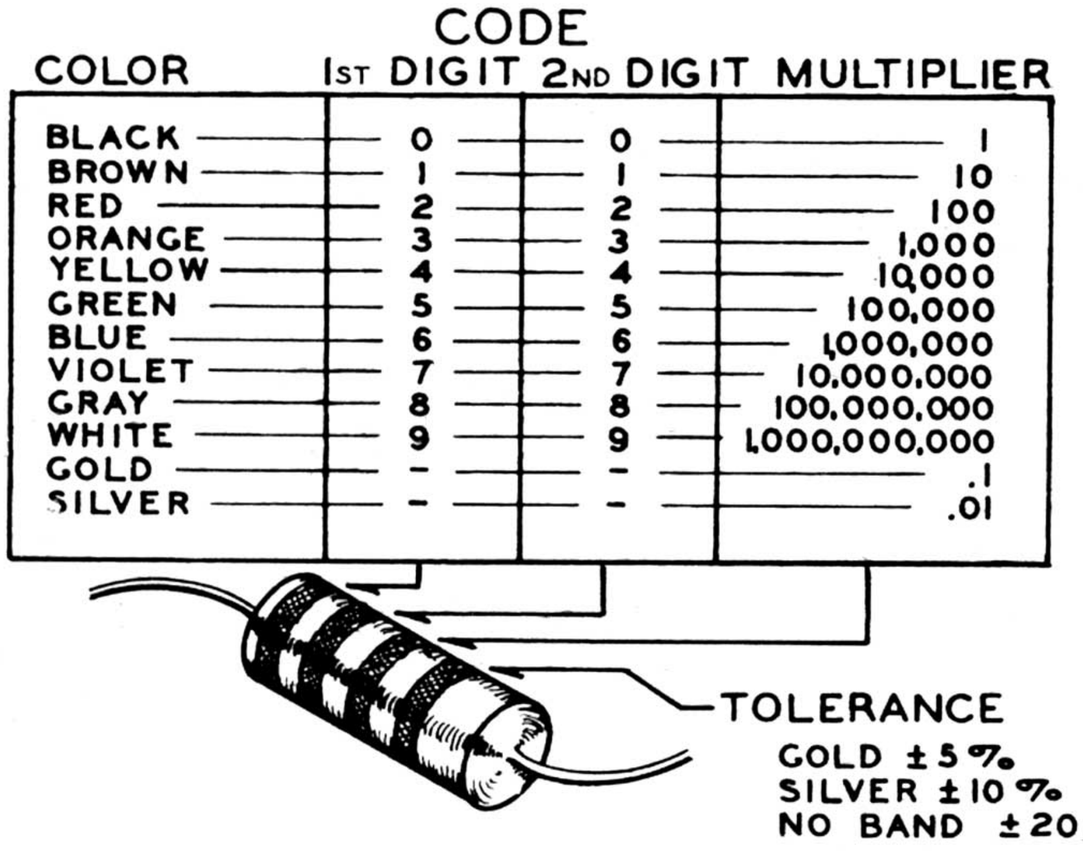
RESISTOR AND CAPACITOR COLOR CODES

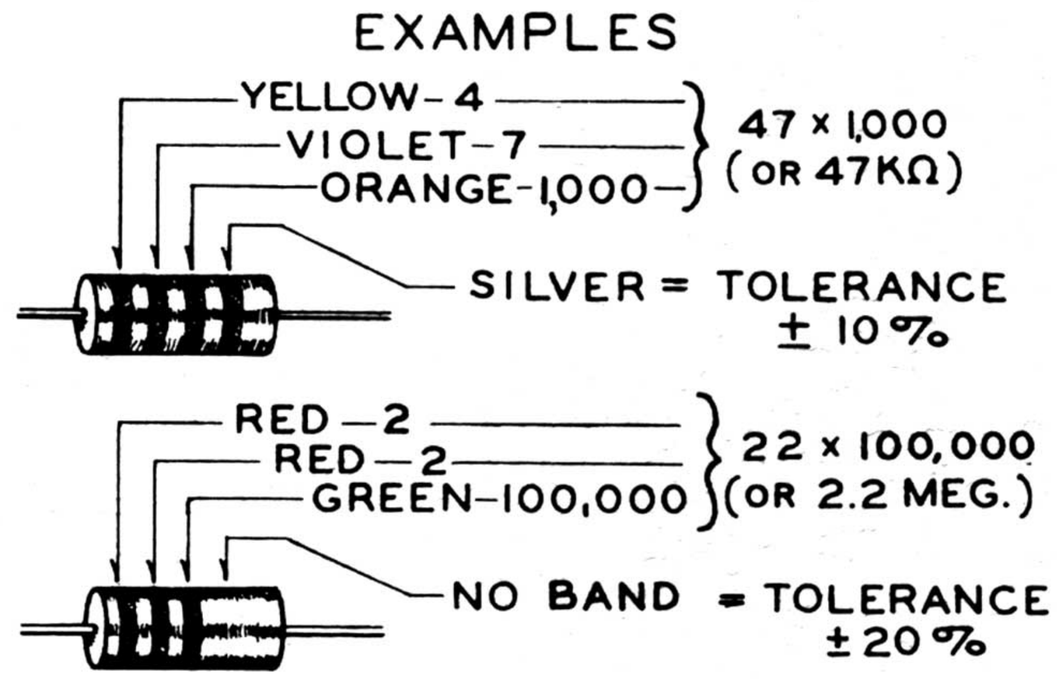
RESISTORS

The colored bands around the body of a color coded resistor represent its value in ohms. These colored bands are grouped toward one end of the resistor body. Starting with this end of the resistor, the first band represents the first digit of the resistance value; the second band represents the second digit; the third band represents the number by which the first two digits are multiplied. A fourth band of gold or silver represents a tolerance of ±5% or ±10% respectively. The absence of a fourth band indicates a tolerance of ±20%.

The physical size of a composition resistor is related to its wattage rating. Size increases progressively as the wattage rating is increased. The diameters of 1/2 watt, 1 watt and 2 watt resistors are approximately 1/8", 1/4" and 5/16", respectively.

The color code chart and examples which follow provide the information required to identify color coded resistors.

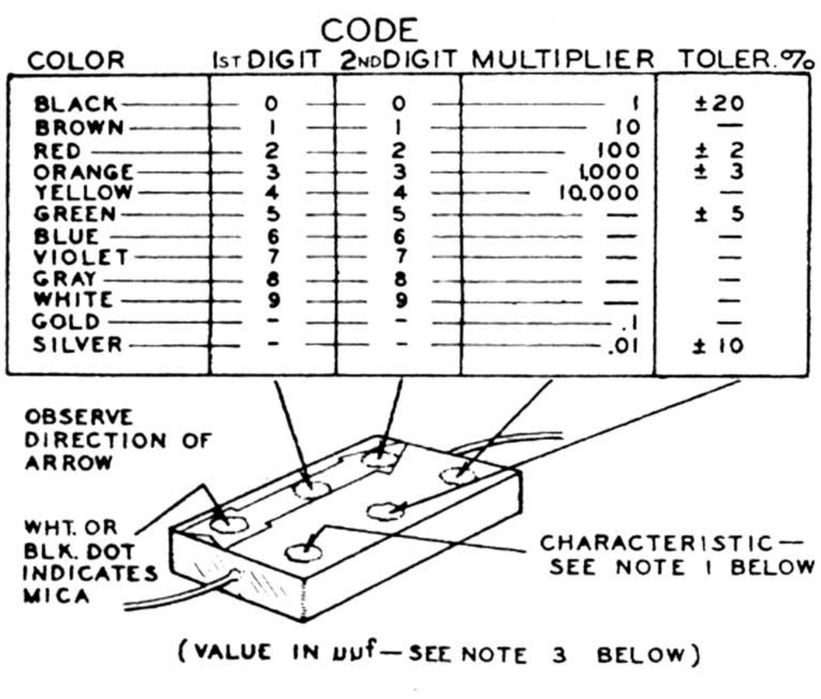


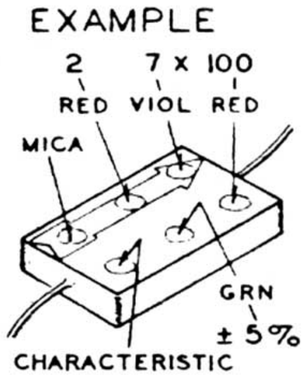


CAPACITORS

Generally, only mica and tubular ceramic capacitors, used in modern equipment, are color coded. The color codes differ somewhat among capacitor manufacturers, however the codes shown below apply to practically all of the mica and tubular ceramic capacitors that are in common use. These codes comply with EIA (Electronics Industries Association) Standards.

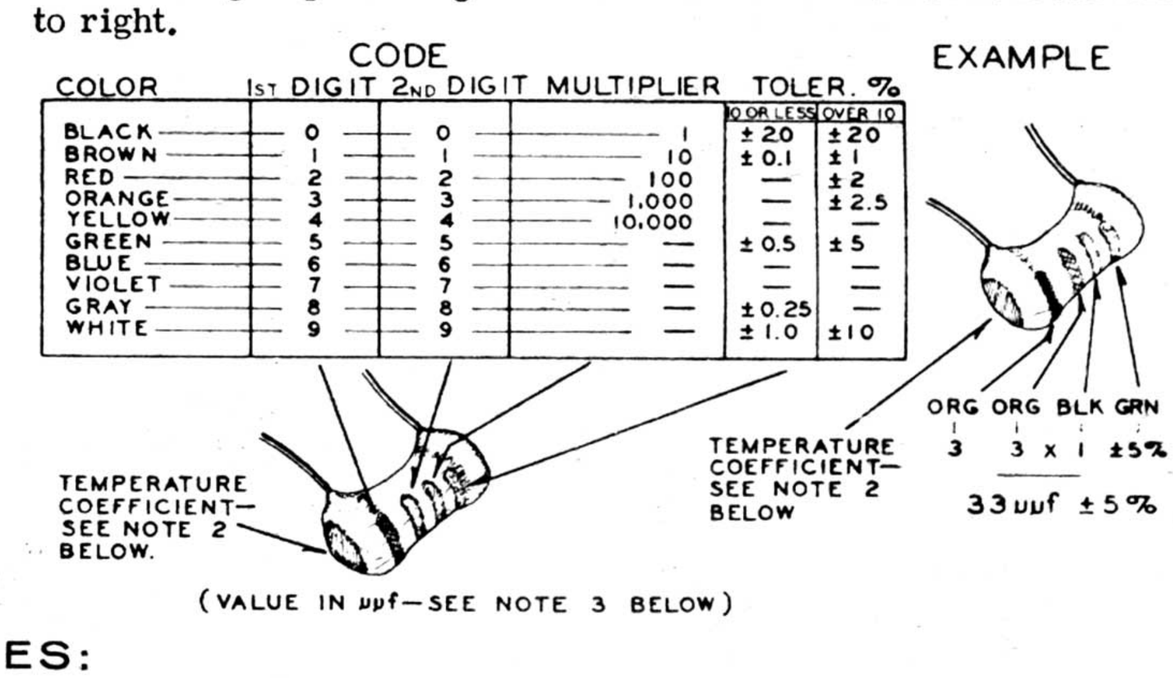
MICA





TUBULAR CERAMIC

Place the group of rings or dots to the left and read from left to right.



NOTES:

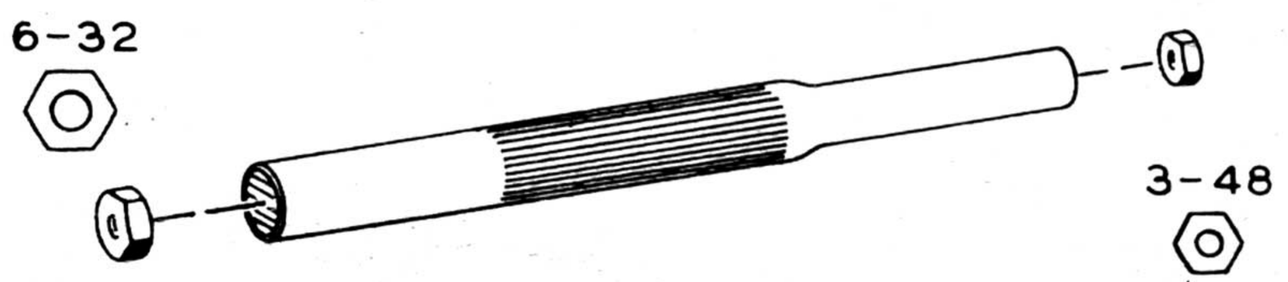
1. The characteristic of a mica capacitor is the temperature coefficient, drift capacitance and insulation resistance. This information is not usually needed to identify a capacitor but, if desired, it can be obtained by referring to EIA Standard, RS-153 (a Standard of Electronic Industries Association.)

2. The temperature coefficient of a capacitor is the predictable change in capacitance with temperature change and is expressed in parts per million per degree centigrade. Refer to EIA Standard, RS-198 (a Standard of Electronic Industries Association.)

3. The farad is the basic unit of capacitance, however capacitor values are generally expressed in terms of μfd (microfarad, .000001 farad) and μμf (micro-micro-farad, .000001 μfd); therefore, 1,000 μμf = .001 μfd, 1,000,000 μμf = 1μfd.

USING A PLASTIC NUT STARTER

A plastic nut starter offers a convenient method of starting the most used sizes: 3/16" and 1/4" (3-48 and 6-32). When the correct end is pushed down over a nut, the pliable tool conforms to the shape of the nut and the nut is gently held while it is being picked up and started on the screw. The tool should only be used to start the nut.



TYPICAL COMPONENT TYPES

This chart is a guide to commonly used types of electronic components. The symbols and related illustrations should prove helpful in identifying most parts and reading the schematic diagrams.

RESISTOR

CAPACITOR

PLATE
SUPPRESSOR
SCREEN
GRID
CATHODE
FILAMENT
TUBE

POTENTIOMETER (CONTROL)

ELECTROLYTIC CAPACITOR

PNP
COLLECTOR
BASE
EMITTER
TRANSISTOR
COLLECTOR
BASE
NPN
EMITTER

TRANSFORMER (IRON CORE)

VARIABLE CAPACITOR

RECTIFIER (DIODE)

TRANSFORMER (ADJUSTABLE POWDERED IRON CORE) ARROW INDICATES DIRECTION OF CORE MOVEMENT TO INCREASE INDUCTANCE

BATTERY

NEON BULB

TRANSFORMER (ADJUSTABLE CORE)

PHONO JACK

ILLUMINATING BULB

POWER TRANSFORMER

PHONE JACK

METER

INDUCTOR (COIL)

RECEPTACLE

SPST
SWITCH (TOGGLE)
DPDT

PIEZOELECTRIC CRYSTAL

SPEAKER

SWITCH (ROTARY)

BINDING POST

MICROPHONE

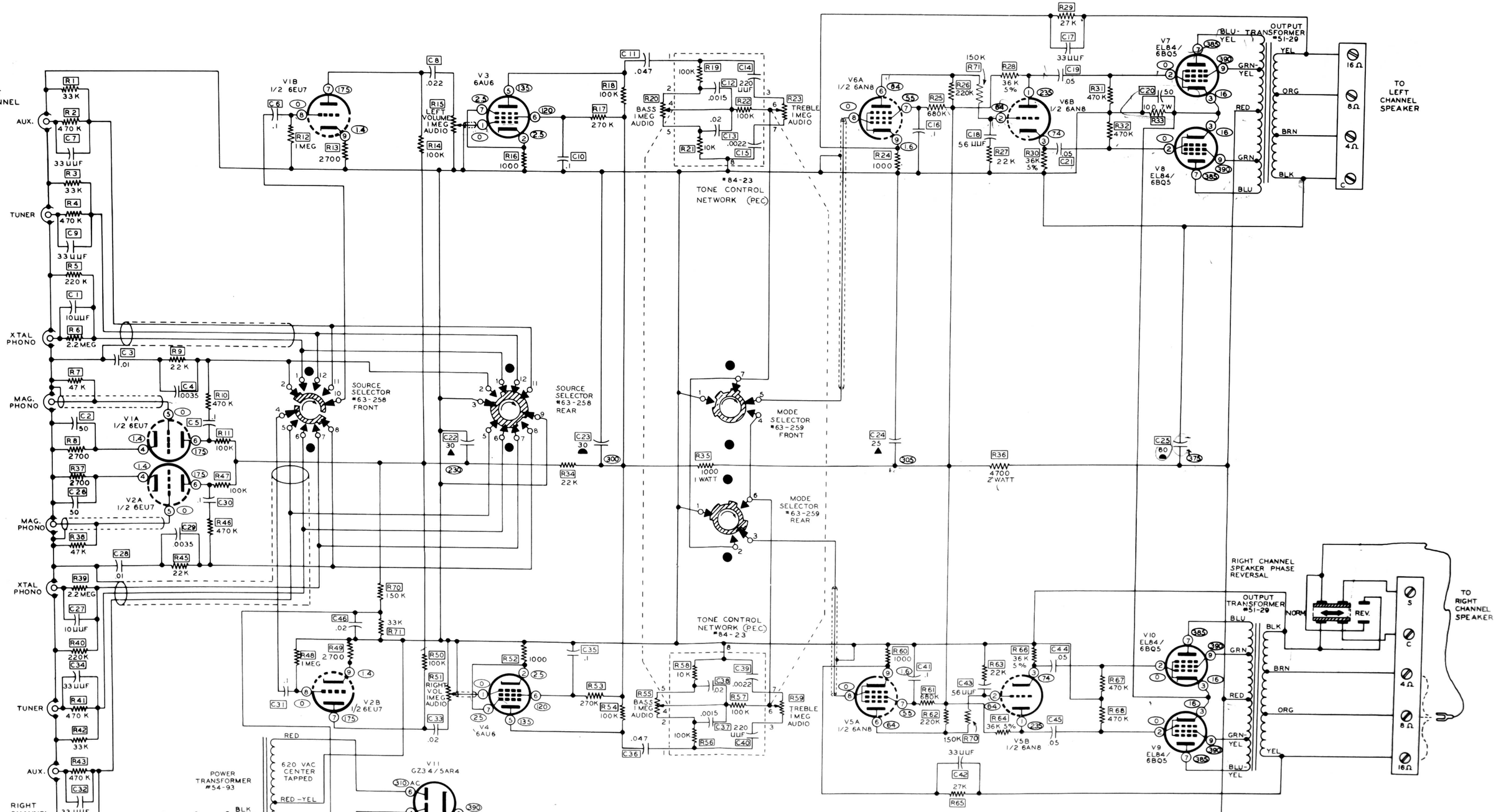
FUSE

ANTENNA
GENERAL
LOOP

EARTH GROUND

CHASSIS GROUND

CONDUCTORS
NOT CONNECTED
CONNECTED
SHIELDED



*SOURCE SELECTOR SHOWN IN MAG PHONO POSITION.
MODE SELECTOR SHOWN IN LEFT AMP POSITION.

FOR VOLTAGE READINGS:

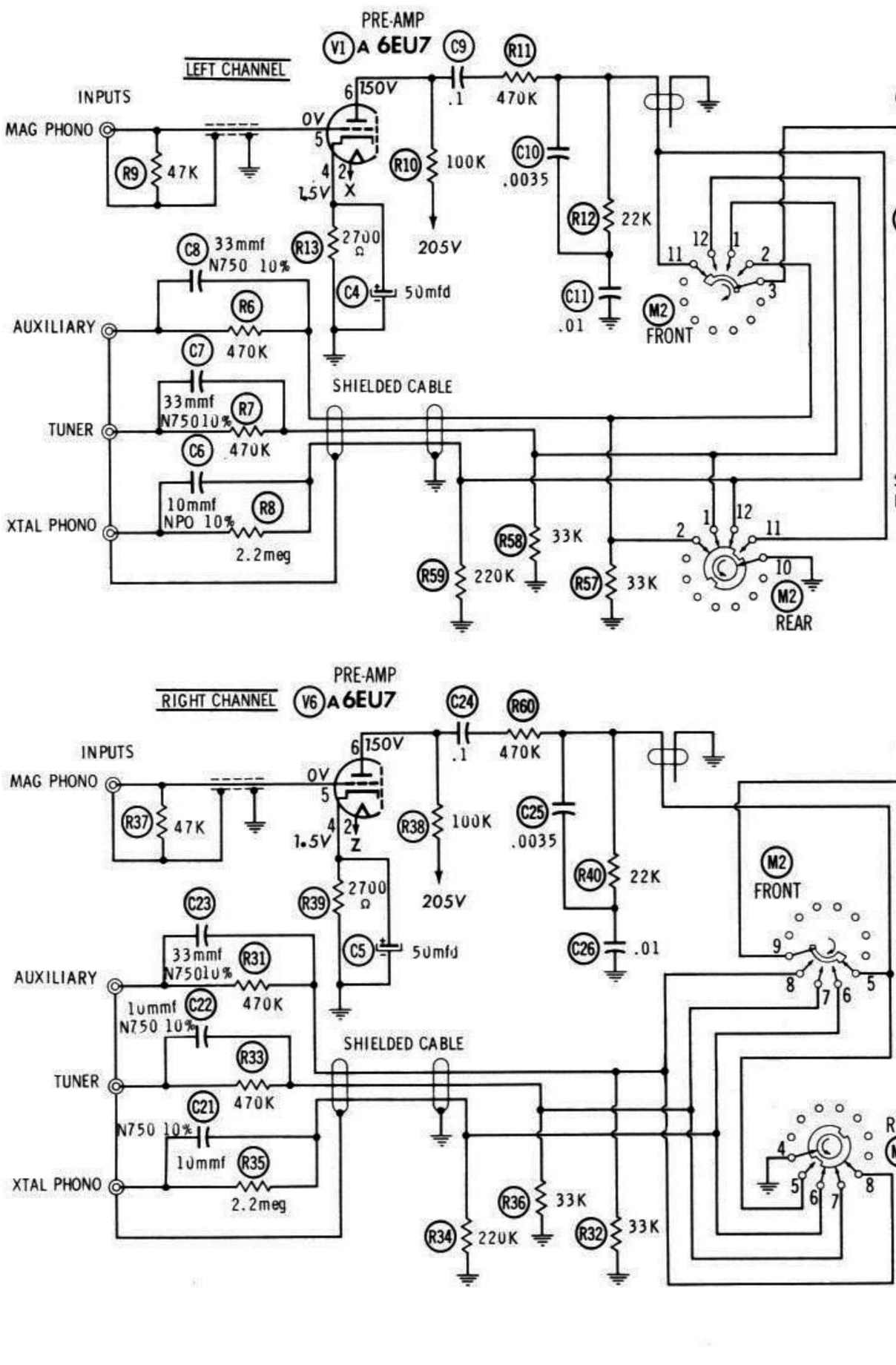
SOURCE SELECTOR	MAG PHONO
MODE SELECTOR	STEREO
VOLUME FULL CW	
BASS AND TREBLE 1/2 ROTATION	

NOTES:

SOURCE AND MODE SWITCHES ARE SHOWN IN MAX. CCW POSITION AS VIEWED FROM FRONT PANEL.
ALL CAPACITORS IN μfd UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED.
→ INDICATES CLOCKWISE TRAVEL.
VOLTAGES TAKEN WITH HEATHKIT VTVM, 117 V AC LINE SOURCE.
VOLTAGES MAY VARY ±10% DUE TO TOLERANCE OF COMPONENTS.
SOURCE SELECTOR IN MAG. POSITION. VOLUME FULL CW, BASS AND TREBLE 1/2 ROTATION.
MODE SELECTOR IN STEREO POSITION FOR VOLTAGE READINGS.
OUTPUTS LOADED WITH 16 Ω 20 W RESISTORS.
( ) INDICATES VOLTAGE READING.
ALL READINGS FROM TEST POINT TO COMMON GROUND.

HEATHKIT

STEREO AMPLIFIER
MODEL AA-151



RESISTANCE READINGS

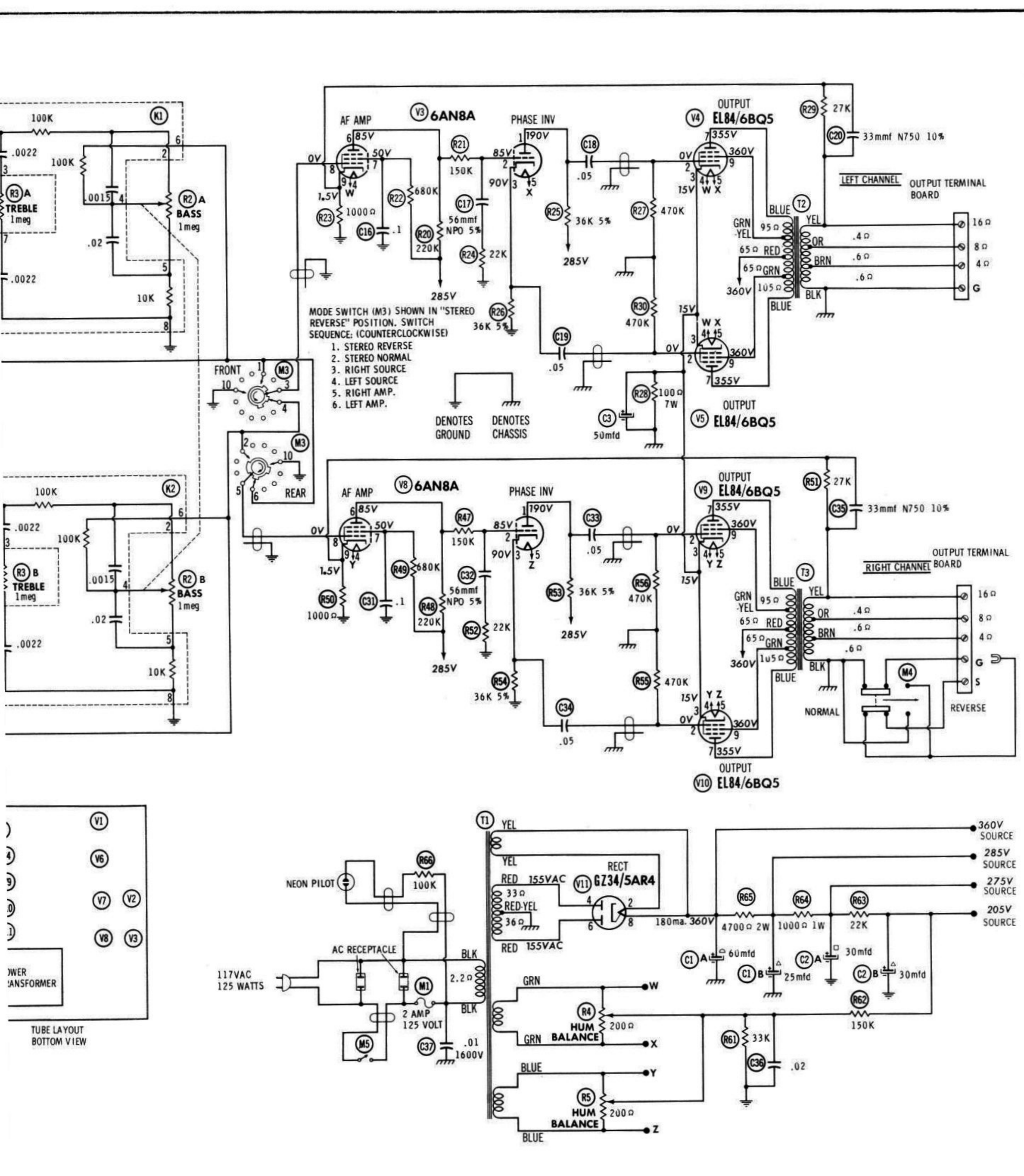
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6EU7	FIL	FIL	TP	2700Ω	47K	†130K	†130K	1meg	2700Ω
V2	6AU6	0Ω	1000Ω	FIL	FIL	†105K	†275K	1000Ω		
V3	6AN8A	†41K	†375K	36K	FIL	FIL	†225K	†685K	110K	1000Ω
V4	EL84 6BQ5	NC	470K	100Ω	FIL	FIL	NC	†160Ω	NC	†65Ω
V5	EL84 6BQ5	NC	470K	100Ω	FIL	FIL	NC	†170Ω	NC	†65Ω
V6	6EU7	FIL	FIL	TP	2700Ω	47K	†130K	†130K	1meg	2700Ω
V7	6AU6	0Ω	1000Ω	FIL	FIL	†105K	†275K	1000Ω		
V8	6AN8A	†41K	†375K	36K	FIL	FIL	†225K	†685K	110K	1000Ω
V9	EL84 6BQ5	NC	470K	100Ω	FIL	FIL	NC	†160Ω	NC	†65Ω
V10	EL84 6BQ5	NC	470K	100Ω	FIL	FIL	NC	†170Ω	NC	†65Ω
V11	GZ34 5AR4	NC	¶	NC	36Ω	NC	33Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V11. NC NO CONNECTION TP TIE POINT

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3 Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15%in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC


100K
K1
.0022
100K
.0015
R3 A
TREBLE
1meg
R2 A
BASS
1meg
.02
.0022
10K
FRONT
M3
REAR
K2
R3 B
TREBLE
1meg
R2 B
BASS
1meg
AF AMP
V3 6AN8A
PHASE INV
V4 OUTPUT EL84/6BQ5
V5 OUTPUT EL84/6BQ5
V8 6AN8A
V9 OUTPUT EL84/6BQ5
V10 OUTPUT EL84/6BQ5
85V
50V
190V
90V
1.5V
0V
15V
355V
360V
285V
275V
205V
R21 150K
R22 680K
R23 1000Ω
R24 22K
R25 36K 5%
R26 36K 5%
R27 470K
R28 100Ω 7W
R29 27K
R30 470K
R47 150K
R48 220K
R49 680K
R50 1000Ω
R52 22K
R53 36K 5%
R54 36K 5%
R55 470K
R56 470K
R51 27K
C16 .1
C17 56mmf NPO 5%
C18 .05
C19 .05
C20 33mmf N750 10%
C31 .1
C32 56mmf NPO 5%
C33 .05
C34 .05
C35 33mmf N750 10%
C3 50mfd
LEFT CHANNEL
RIGHT CHANNEL
OUTPUT TERMINAL BOARD
T2
T3
BLUE
YEL
GRN-YEL
95Ω
OR
.4Ω
65Ω RED
BRN
.6Ω
65Ω GRN
105Ω
BLK
16Ω
8Ω
4Ω
G
S
MODE SWITCH (M3) SHOWN IN "STEREO REVERSE" POSITION. SWITCH SEQUENCE: (COUNTERCLOCKWISE)
1. STEREO REVERSE
2. STEREO NORMAL
3. RIGHT SOURCE
4. LEFT SOURCE
5. RIGHT AMP.
6. LEFT AMP.
DENOTES GROUND
DENOTES CHASSIS
M4
NORMAL
REVERSE
T1
RECT V11 GZ34/5AR4
NEON PILOT
R66 100K
AC RECEPTACLE
117VAC 125 WATTS
M1
2 AMP 125 VOLT
M5
C37 .01 1600V
BLK
2.2Ω
RED 155VAC
33Ω
RED-YEL
36Ω
180ma. 360V
R65 4700Ω 2W
R64 1000Ω 1W
R63 22K
R62 150K
C1 A 60mfd
C1 B 25mfd
C2 A 30mfd
C2 B 30mfd
360V SOURCE
285V SOURCE
275V SOURCE
205V SOURCE
GRN
W
R4 HUM BALANCE 200Ω
X
BLUE
Y
R5 HUM BALANCE 200Ω
Z
R61 33K
C36 .02
TUBE LAYOUT BOTTOM VIEW
POWER TRANSFORMER