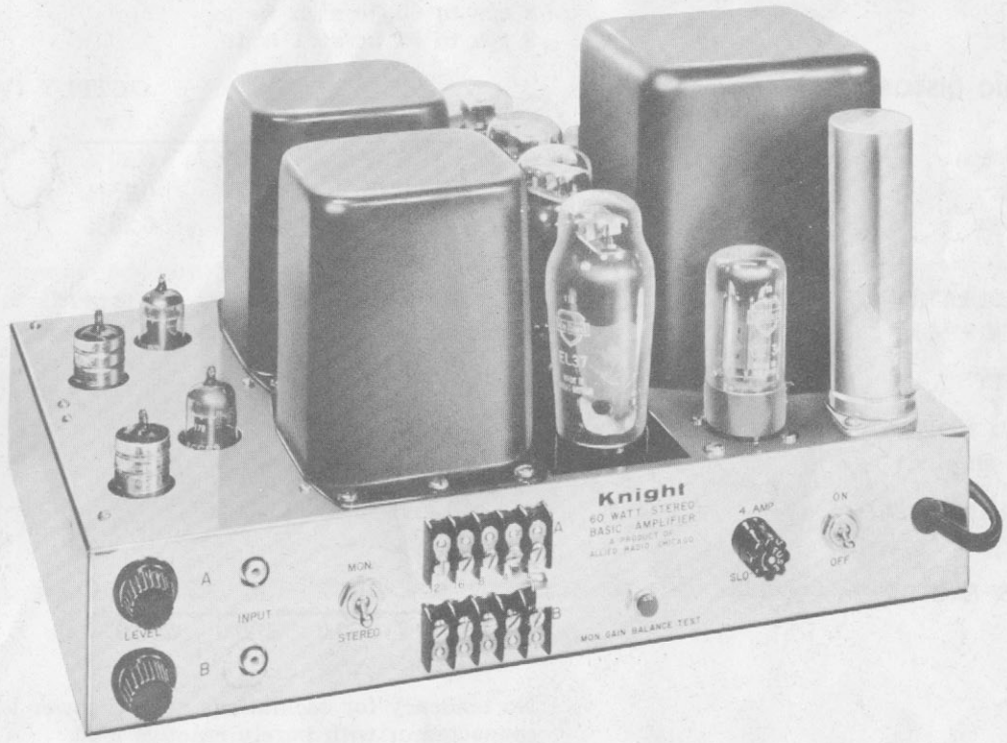
knight-kits

Allied knight®-kit

BASIC 60-WATT DELUXE STEREO AMPLIFIER

83 YU 777



ALLIED RADIO
CORPORATION
100 N. WESTERN AVE. • CHICAGO 80, ILL. HAYMARKET 1-6800

37K296
750151-17-AP-1158

SPECIFICATIONS

	STEREO	MONAURAL
RATED POWER OUTPUT	30 watts, each channel	60 watts
PEAK POWER	60 watts, each channel	110 watts
FREQUENCY RESPONSE:	± .5 db 15 cps to 31 kc at 30 watts 10 cps to 42 kc at 15 watts 8 cps to 60 kc at 5 watts 8 cps to 62 kc at 1 watt	± .5 db 17 cps to 31 kc at 60 watts 16 cps to 42 kc at 30 watts 16 cps to 51 kc at 5 watts 15 cps to 52 kc at 1 watt

HARMONIC DISTORTION:

	OUTPUT (WATTS)							
	30 w	15 w	5 w	1 w	60 w	30 w	5 w	1 w
at 30 cps	0.30%	0.30%	0.30%	0.30%	1.00%	0.50%	0.30%	0.30%
1 kc	0.15%	0.15%	0.15%	0.15%	0.08%	0.08%	0.08%	0.08%
15 kc	1.50%	0.55%	0.40%	0.20%	1.40%	0.50%	0.16%	0.11%

INTERMODULATION DISTORTION:	60 cps and 7 kc (4:1) 0.15% at 30 watts 40 cps and 12 kc (4:1) 0.35% at 30 watts	1.0% at 60 watts 2.1% at 60 watts
SENSITIVITY	.54 volt for 30 watts output	.54 volt for 60 watts output
HUM AND NOISE (inputs shorted)	90 db below 30 watts each channel	95 db below 60 watts
OUTPUT IMPEDANCES	4, 8, 16 and 32 ohms, each channel	2, 4, 8 and 16 ohms

DAMPING FACTOR

TAPS	4	8	16	32
	17.4	29.0	100.0	290.0

2	4	8	16
33.3	50.0	67.0	155.0

STABILITY: No tendency for oscillations at any power level, even with no speaker connected or with purely reactive load.

CROSSTALK BETWEEN CHANNELS: 70db

TUBE COMPLEMENT:
2—EF86/Z729/6267, voltage amplifier
2—ECC83/12AX7/7025, driver-inverter
4—EL37, power output
2—GZ34/5AR4, rectifier

POWER REQUIREMENTS: 110-125 volts, 60 cycle AC, 280 watts

TEST CONDITIONS: Load impedance—variable resistance of 2Ω to 32Ω.
Line voltage—125 volts, 60 cycle AC.

DIMENSIONS: 14″ x 9″ x 8¼″

See page 5 for list of equipment used for specifications measurements.

THE KNIGHT-KIT BASIC 60-WATT DELUXE STEREO AMPLIFIER

This deluxe basic amplifier easily meets the most exacting requirements for professional quality hi-fi systems. It supplies 60 watts of virtually flawless audio power–either 30 watts on each of two channels for stereo use or 60 watts at a single output for monaural use. A convenient switch provides quick conversion from stereo to monaural use, making this unit an ideal amplifier even for those who are not yet ready for stereo.

Outstanding circuit features include the use of high amounts of negative feedback to reduce distortion to an extremely low level, and the use of direct coupling to achieve exceptional stability. The careful selection of components, especially the output transformer, contribute to the outstanding overload and recovery characteristics. In terms of music listening, these features mean that your amplifier can quickly respond to all the changes in the music from softest notes to loudest peaks without any loss in naturalness.

Construction is greatly simplified by the use of two printed circuit boards. The printed circuits also standardize most of the wiring, assuring that each kit built according to this manual will meet or exceed the specifications stated on the facing page. Building this fine amplifier is a rewarding experience in itself. There is the additional satisfaction of knowing that you save more than half the cost of factory-wired amplifiers of this class.

FEATURES

- QUICKLY CONVERTS FROM STEREO TO MONAURAL
- EXTREMELY STABLE AT ALL POWER LEVELS
- EXCEPTIONALLY WIDE FREQUENCY RESPONSE
- DISTORTION REDUCED FAR BELOW AUDIBLE LEVEL
- NEGLIGIBLE HUM AND NOISE
- OUTSTANDING OVERLOAD RECOVERY
- 2 PRINTED CIRCUIT BOARDS FOR EASY WIRING
- INDIVIDUAL LEVEL SET CONTROLS
- CONVENIENT CONTROLS FOR BALANCING OUTPUT TUBES
- AUDIBLE BALANCING OF CHANNELS FOR MONAURAL USE
- LOW-NOISE RESISTORS IN ALL CRITICAL CIRCUITS
- 2 CATHODE-TYPE RECTIFIERS PROLONG COMPONENT LIFE
- HIGH FIDELITY TYPE TUBES THROUGHOUT
- DELUXE CHROME-PLATED CHASSIS

PERFORMANCE CURVES

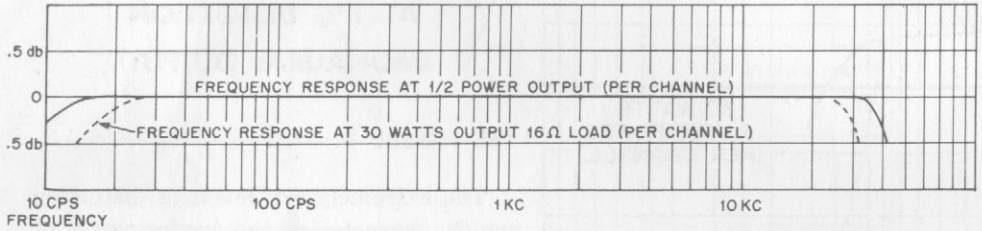


FIGURE 1. FREQUENCY RESPONSE CURVES FOR STEREO OUTPUT

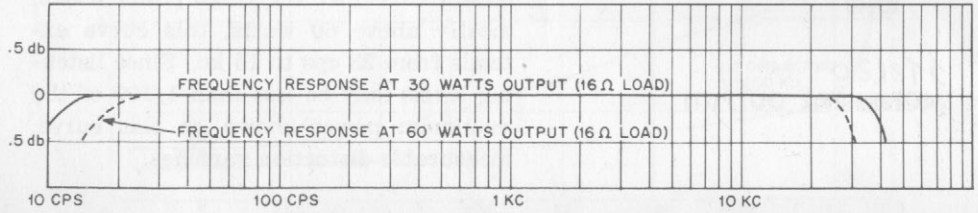


FIGURE 2. FREQUENCY RESPONSE CURVES FOR MONAURAL OUTPUT

FREQUENCY RESPONSE CURVES FOR STEREO OUTPUT

SEE FIGURE 1.

This curve is absolutely flat between 25 cps and 25 kc, at full rated output of 30 watts per channel. At actual listening levels, which are far below 30 watts, frequency response is flat over an even more extended range. This means that all frequencies present in the original program, from very low to very high, are faithfully reproduced by this amplifier.

FREQUENCY RESPONSE CURVES FOR MONAURAL OUTPUT

SEE FIGURE 2.

Notice the similarity to the frequency response curves for stereo output. These curves indicate that the frequency response of the amplifier is as flat at 60 watts monaural output as it is at 30 watts stereo.

FIGURE 3. MAXIMUM POWER CURVE AT 1% DISTORTION (STEREO OUTPUT)

MAXIMUM POWER CURVE AT 1% DISTORTION (STEREO OUTPUT)

SEE FIGURE 3.

This is one of the most significant curves describing an amplifier's performance. It is actually a composite of the many curves which show the percentage distortion versus frequency for various power levels. Notice that this curve is mostly above the rated power level at frequencies between 20 cps and 15 kc which is indicative of its tremendous undistorted power reserve.

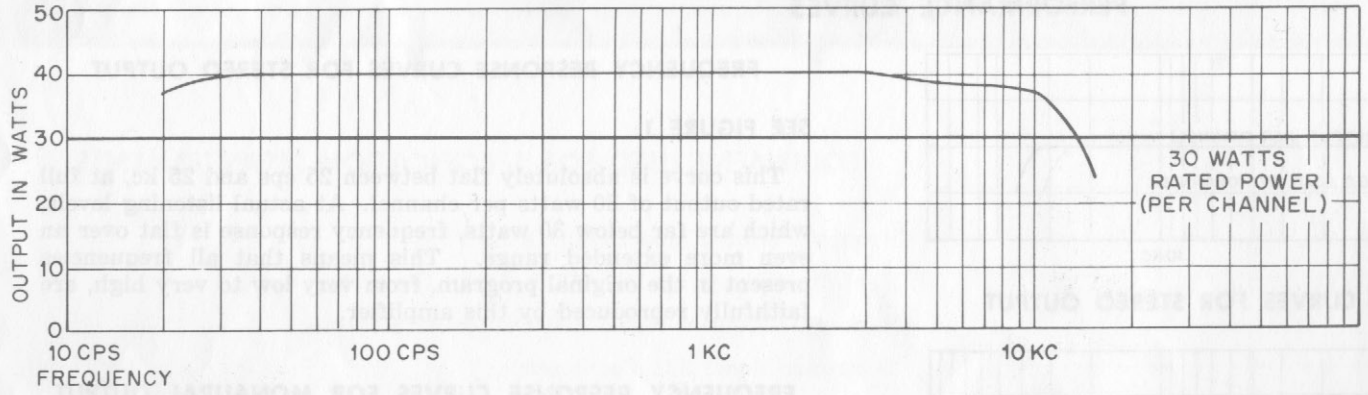


FIGURE 4. MAXIMUM POWER CURVE AT 1% DISTORTION (MONAURAL OUTPUT)

MAXIMUM POWER CURVE AT 1% DISTORTION (MONAURAL OUTPUT)

SEE FIGURE 4.

The extremely low levels of distortion which characterize the performance of this amplifier are indicated by this excellent curve. At very high power levels, mostly above 60 watts, this curve extends from 23 cps to 15 kc. Since listening levels may be less than 1/100 of the maximum power shown on this curve, measurable distortion vanishes.

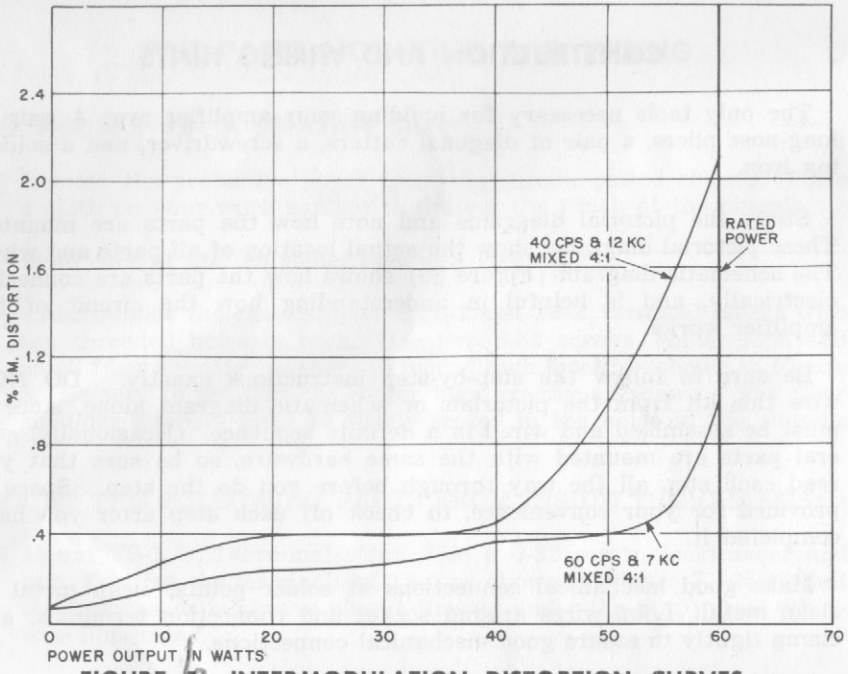


FIGURE 5. INTERMODULATION DISTORTION CURVES FOR STEREO OUTPUT

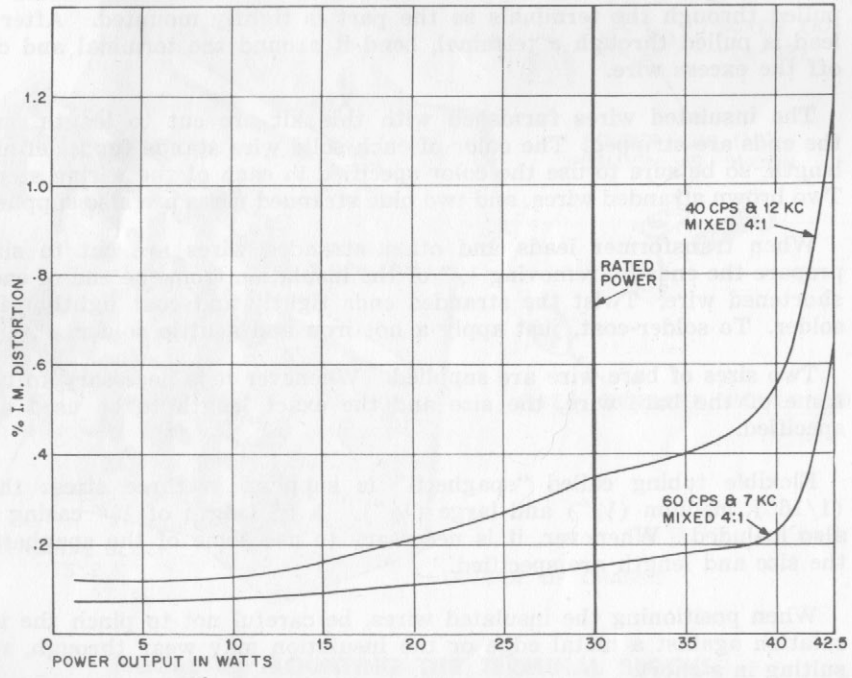


FIGURE 6. INTERMODULATION DISTORTION CURVES FOR MONAURAL OUTPUT

INTERMODULATION DISTORTION CURVES FOR STEREO OUTPUT

SEE FIGURE 5.

To obtain these curves the amplifier was subjected to severe tests — by mixing pure signals of widely separated frequencies—40 cps and 12 kc and 60 cps and 7 kc. The mixture in both cases was 4:1. (The amplitude of the low frequency was four times as high as the amplitude of the high frequency.) I.M. distortion does not begin to rise sharply until power levels in excess of rated output are reached. At all power levels below and up to rated power, intermodulation distortion is far below audible levels.

INTERMODULATION DISTORTION CURVES FOR MONAURAL OUTPUT

SEE FIGURE 6.

The low I.M. percentages shown on these curves assure clean sound, without "muddying" of the output. Notice that a low frequency like 40 cps, when mixed with 12 kc in a 4:1 ratio, produces no audible "modulation" of the higher frequency. Any audible I.M. distortion would be most objectionable because it would be heard as flutter in the high notes, with the flutter taking place at the frequency of the low note. These low I.M. distortion figures at high power levels are an outstanding feature of this amplifier.

EQUIPMENT USED FOR SPECIFICATION MEASUREMENTS

Hewlett Packard Model 400D AC VTVM

Hewlett Packard Model 200CD Audio Generator

Barker-Williamson Model 400 Distortion Analyzer

Tektronix Model 531 Oscilloscope

Simpson Model 390 Wattmeter

Altec Lansing TI 401 Dual Frequency Generator

Altec Lansing TI 402 Intermodulation Distortion Analyzer

Triplett Model 630A VOM

Simpson Model 260 VOM

CHECKING YOUR KIT

Before starting to build this amplifier, check each part against the parts list on page 26. This will help you become acquainted with each part. If you are unable to identify some parts by sight, locate their pictures on the wiring diagrams.

Symbols are used to describe certain parts. The Greek letter "μ" means micro, "Ω" means ohms, "K" means one-thousand, "m" (or meg) means one million, hy means henry and μfd means microfarad.

Resistors are supplied carded and numbered for immediate identification. Precision resistors are used in all critical circuits. In some cases two resistors may have the same value in ohms but have different tolerance ratings. Where 1% and 5% tolerance resistors are specified, the correct tolerance resistors must be used. The 1% resistors have their values stamped on them. 5% resistors use gold for the fourth color band and 10% resistors use silver for the fourth band.

Some of the tubular capacitors have a band marked around one end. Where these are shown in the pictorial wiring views, be sure to position the capacitors as shown or the amplifier will not work as designed. In other cases, the location of the bands is not significant.

The following table lists the screws supplied with the kit according to size, starting with the thinnest and going to the thickest. The self-tapping screws resemble wood screws.

SCREWS

THICKNESS	THREADS PER INCH AND LENGTH IN INCHES	QUANTITY
No. 4	40 x 1-5/16	8
No. 4	Self-tapping	12
No. 6	32 x 3/8	43
No. 8	32 x 3/8	22
No. 10	32 x 5/16	6

☑ Group the screws according to the above table.

CONSTRUCTION AND WIRING HINTS

The only tools necessary for building your amplifier are: A pair of long-nose pliers, a pair of diagonal cutters, a screwdriver, and a soldering iron.

Study the pictorial diagrams and note how the parts are mounted. These pictorial diagrams show the actual location of all parts and wires. The schematic diagram (Figure 30) shows how the parts are connected electrically, and is helpful in understanding how the circuit of the amplifier works.

Be sure to follow the step-by-step instructions exactly. DO NOT wire this kit from the pictorials or schematic diagram alone, since it must be assembled and wired in a definite sequence. Occasionally, several parts are mounted with the same hardware, so be sure that you read each step all the way through before you do the step. Space is provided for your convenience, to check off each step after you have completed it.

Make good mechanical connections at solder points, clean metal to clean metal. Loop wires around socket and connection terminals, and clamp tightly to assure good mechanical connections.

Unless otherwise stated, all the leads on the resistors, capacitors and transformers should be as short as possible. Figure 12 illustrates the best way to connect a component. As shown the end leads should be pulled through the terminals so the part is tightly mounted. After a lead is pulled through a terminal, bend it around the terminal and cut off the excess wire.

The insulated wires furnished with this kit are cut to length, and the ends are stripped. The color of each solid wire stands for a definite length, so be sure to use the color specified in each of the wiring steps. Two brown stranded wires, and two blue stranded wires are also supplied.

When transformer leads and other stranded wires are cut to size, prepare the ends by removing ¼" of the insulation from the end of each shortened wire. Twist the stranded ends tightly and coat lightly with solder. To solder-coat, just apply a hot iron and a little solder.

Two sizes of bare wire are supplied. Whenever it is necessary to use some of the bare wire, the size and the exact length to be used are specified.

Flexible tubing called "spaghetti" is supplied in three sizes: thin (1/16"), medium (⅛") and large (¼"). A 5" length of ½" casing is also included. Whenever, it is necessary to use some of the spaghetti, the size and length are specified.

When positioning the insulated wires, be careful not to pinch the insulation against a metal edge or the insulation may wear through, resulting in a short.

FIRST PARTS MOUNTING AND WIRING

SEE FIGURE 7 ON A SEPARATE SHEET.

☑ Remove the protective paper from the chrome-plated chassis. Place a cloth on your work surface to protect the finish of the chassis.

☑ Bend each of the ten solder lugs at a right angle.

☑ From outside the chassis, mount TS-2 and TS-3, terminal blocks with ten threaded holes in each. Use five 6-32 screws, solder lugs and small fiber shoulder washers to mount each block, as shown in Figure 8. Be sure to position the solder lugs exactly as shown. The fiber shoulder washers must be firmly seated in the holes in the chassis.

MOUNT THE FOLLOWING PARTS FROM INSIDE THE CHASSIS:

☑ Mount TS-1, a 2-terminal strip. Use a 6-32 screw, lockwasher and nut. Position the terminals of TS-1 as shown in Figure 7. Note that the lockwasher is always placed directly under the nut, unless otherwise illustrated.

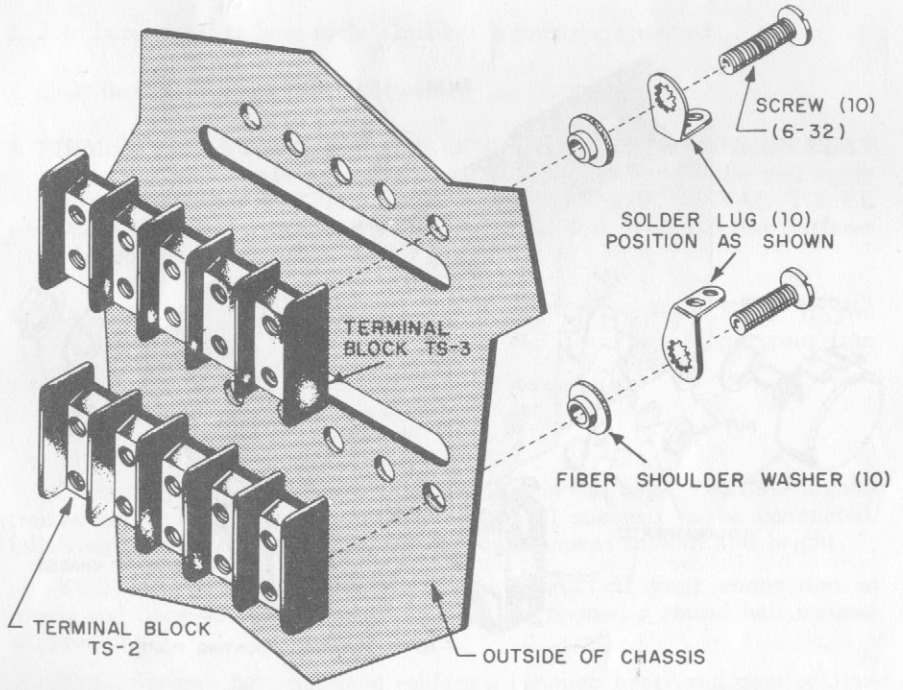


FIGURE 8. MOUNTING THE TERMINAL BLOCKS

☑ Position and mount the perforated plate with eight 8-32 screws, lockwashers and nuts. These eight screws are marked "1st" in Figure 7. Do not tighten these nuts at this time. The other four screws, lockwashers and nuts will be used later when mounting T-2 and T-3.

☑ Mount the 8-pin socket for V-9. Use two 6-32 screws, lockwashers and nuts. Be sure to position the notched keyway as shown.

☑ In a like manner, mount the 8-pin socket for V-10. Position the keyway as shown.

☑ Mount F-1, the fuse holder, as shown in Figure 9. Bend terminal 1 of F-1 slightly away from the body.

☑ Mount S-2, the MON. GAIN BALANCE TEST push-button switch. Use a small metal flatwasher in addition to the lockwasher and nut supplied with the switch. The hardware is mounted in the same order as shown in the Control Mounting detail, Figure 10. DO NOT TIGHTEN THE NUT AT THIS TIME.

☑ Insert the rubber grommet in the hole as shown.

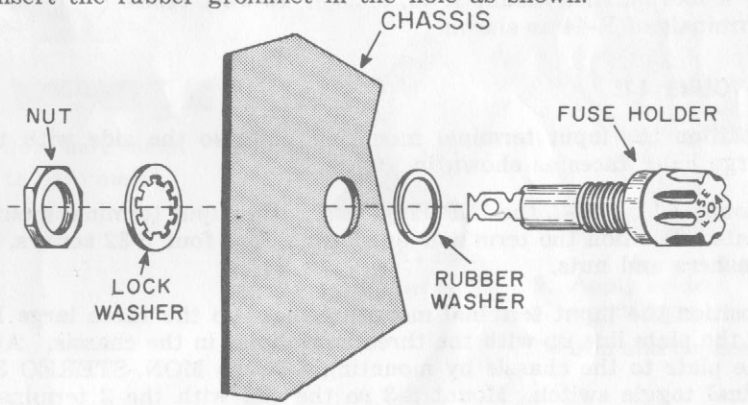


FIGURE 9. FUSE HOLDER DETAIL

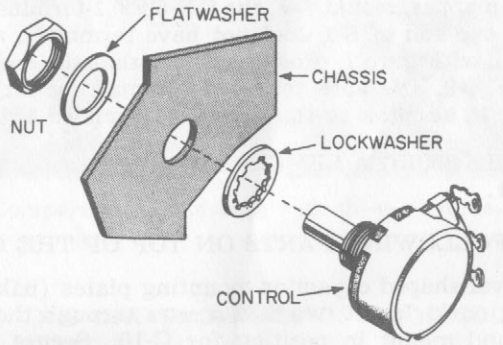


FIGURE 10. CONTROL MOUNTING DETAIL

☐ Mount the shield bracket. Use two of the long 4-40 screws, lockwashers and nuts.

☐ From outside the chassis, insert the 6 remaining long screws in the 6 small holes. Secure each screw with a lockwasher and a nut.

MOUNT THE FOLLOWING PARTS ON THE PERFORATED PLATE INSIDE THE CHASSIS:

☐ Mount an 8-pin socket for V-4. Use two 6-32 screws, lockwashers and nuts. Be sure to position the keyway (a notch near two of the pins) as shown.

☐ In a like manner, mount 8-pin sockets for V-3, V-8 and V-7. Be sure to position the keyways as shown.

☐ Position and mount R-19, a 260Ω 10 watt stand-up type resistor. Use a 6-32 screw, lockwasher and nut. Gently bend both terminals of R-19 as shown.

☐ In a like manner mount R-44, a 260Ω 10-watt resistor. Bend both terminals of R-44 as shown.

SEE FIGURE 11.

☐ Position the input terminal mounting plate so the side with the 2 large holes faces as shown in Figure 11.

☐ Mount J-1 and J-2, the INPUT jacks, on the input terminal mounting plate. Position the terminals as shown. Use four 6-32 screws, lockwashers and nuts.

☐ Position the input terminal mounting plate so the three large holes in the plate line up with the three large holes in the chassis. Attach the plate to the chassis by mounting S-3, the MON.-STEREO 3-terminal toggle switch. Mount S-3 so the end with the 2 terminals is positioned as shown. Use one of the two large-center metal flatwashers in addition to the hardware supplied with the switch.

☐ In a similar manner, mount S-1, the ON-OFF 4-terminal toggle switch. Notice that one end of S-1 does not have terminals, as illustrated in the S-1 detail on Figure 7. Position S-1 so that the end with terminals is closest to V-9. Be sure to use the remaining large-center metal flatwashers, in addition to the hardware supplied with the switch.

☐ Mount R-1, the 500KΩ A LEVEL control (with short shaft) as shown in Figure 11.

MOUNT THE FOLLOWING PARTS ON TOP OF THE CHASSIS:

☐ Stack two oval-shaped capacitor mounting plates (bakelite piece with a square cut out). Insert two 6-32 screws through the round holes in the plates and mount in position for C-10. Secure with two lockwashers and nuts.

☐ In a like manner, stack and mount two capacitor mounting plates for C-13.

NOTE: The output transformers T-2 and T-3 are identical, so it makes no difference which you use as T-2 or T-3. Each output transformer has two groups of leads. One group has a blue, blue-yellow, brown, brown-yellow, and a red lead. The other group has a white, black, green, yellow and an orange lead.

☐ Clip the leads of T-2 to the following lengths:

Orange and yellow leads	2½"
Green and white leads	2¼"
Black lead	2¾"
Red lead	10"

☐ Prepare the ends by removing ¼" insulation from the end of each lead. Twist the stranded wires tightly and coat lightly with solder.

☐ To mount T-2, lay T-2 upside down on your work surface. Position the chassis over T-2 and insert the two groups of leads into the holes in the chassis. Mount T-2 to the chassis with six 8-32 screws, lockwashers and nuts. Do not tighten these nuts at this time.

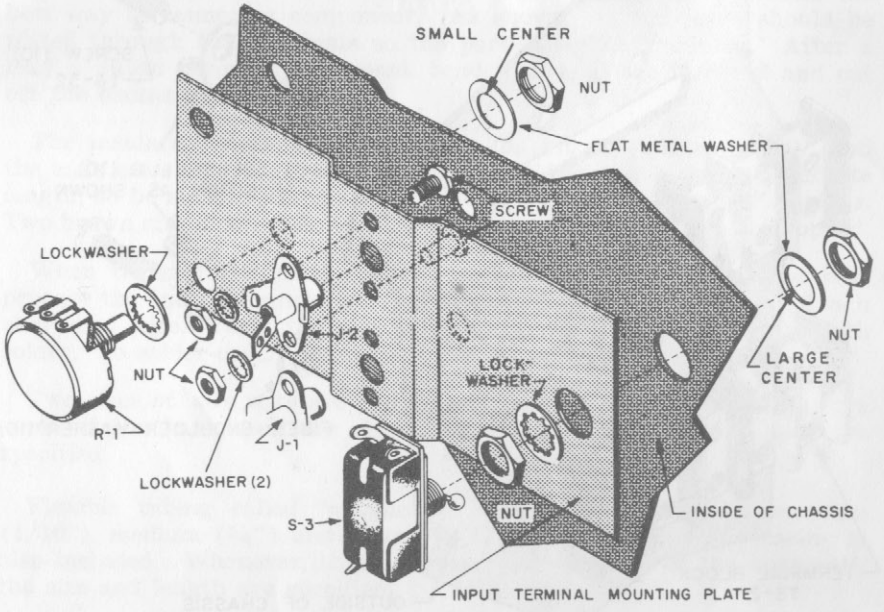


FIGURE 11. INPUT TERMINAL MOUNTING DETAIL

THIS KIT MUST BE *PROPERLY* SOLDERED!

WITHOUT GOOD SOLDERING, AN ELECTRONIC UNIT WILL NOT WORK . . . just as a suit of clothing will fall apart if the stitches are loose . . . no matter how excellent the material.

USE ENOUGH HEAT

This is the main idea of good soldering. The purpose of soldering is to join metal parts, making an UNBROKEN metal path over which electricity can travel. To do this you must apply enough heat to the metal surfaces to make the solder spread freely on them, until the contour (shape) of the connection shows under the solder. If the solder barely melts and forms a rounded ball, *you are not using enough heat.* If you do not use enough heat, there may be no electrical connection, although it appears soldered.

HERE'S HOW TO DO IT . . .

1. Join bare metal to bare metal. Insulation must be removed.

2. Coat the tip of a hot iron with solder.

3. FIRMLY PRESS THE FLAT SIDE OF THE TIP OF A HOT IRON FLAT against the parts to be soldered together. Keep it there while you apply the solder BETWEEN THE IRON TIP AND THE METAL TO BE SOLDERED. Use only enough solder for it to flow over ALL the surfaces of the connection. Remove the iron.

4. DO NOT MOVE PARTS UNTIL THE SOLDER HARDENS. If you accidentally move the wires as the solder is hardening, apply your iron and reheat.

Compare your soldering with the pictures on this page. You have a good connection if your solder has flowed over all surfaces to be connected, following the shape of the surfaces. It should appear smooth and bright.

YOU HAVE NOT USED ENOUGH HEAT: If your connection is rough and flaky-looking, or if the solder has formed a round ball instead of spreading.

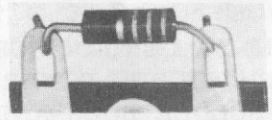
The difference between good soldering (enough heat) and poor soldering (not enough heat,) is just a few extra seconds with a hot iron FIRMLY applied. Remember, larger metal surfaces take a longer time to heat.

USE A 100-WATT IRON

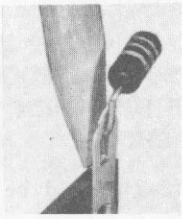
A 100-watt soldering iron with a clean, chisel-shaped tip will supply the right amount of heat when used correctly. Notice how the iron is held in the picture. Heat the iron for 10 minutes before you start soldering. Keep the tip brightly coated with solder. When necessary, wipe the hot tip clean with a cloth. (If you use a soldering gun, be sure the tip reaches full heat before you solder.)

USE ONLY ROSIN CORE SOLDER

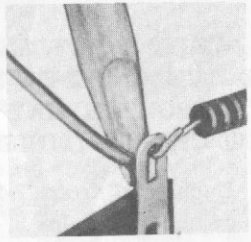
We supply the right kind of solder *(rosin core solder).* Do not use any other kind of solder! USE OF ACID CORE SOLDER, PASTE, OR IRONS CLEANED ON A SAL AMMONIAC BLOCK WILL RUIN ANY ELECTRONIC UNIT AND WILL VOID THE GUARANTEE.



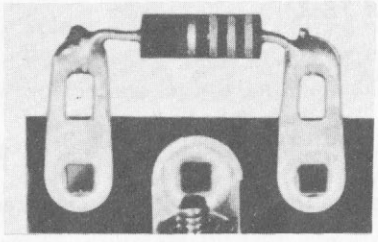
1. Join bare metal to bare metal

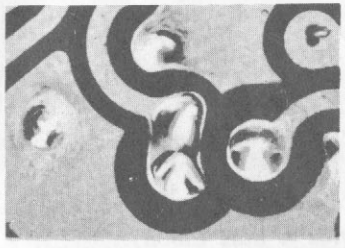


2. Press FLAT side of a HOT iron



3. Apply solder BETWEEN iron and connection





Compare your soldering with these pictures.

FIGURE 12. THE ONE-TWO-THREE OF GOOD SOLDERING

SEE FIGURE 7.

NOTE: C-10 and C-13 are both 60-30-40-40 μfd, 500-450-250-100 volt, electrolytic capacitors. The terminals of these capacitors are marked with a bar, a half moon, a square, and a triangle.

☑ Mount C-10 by inserting the tabs in the mounting plate, positioning the terminals so the triangle is toward the corner of the chassis. Secure by twisting each mounting tab ⅛ turn with your pliers.

☑ Mount C-13. Notice the terminals are positioned differenty from C-10.

☐ **READ THE HOW TO SOLDER INSTRUCTIONS ON PAGE 9.**

WHEN SOLDERING LEADS OF T-2 TO THE SOLDER LUGS OF TS-2 BE CAREFUL NOT TO USE TOO MUCH SOLDER OTHERWISE SOLDER MAY DROP BETWEEN THE SOLDER LUGS AND THE CHASSIS CAUSING A SHORT.

Each lead from T-2 to TS-2 should be connected to the rear hole of the solder lug.

☑ Solder the orange lead to terminal 1 of TS-2.

☑ Connect, but do not solder, the yellow lead to terminal 2 of TS-2.

☑ Solder the green lead to terminal 3 of TS-2.

☑ Solder the white lead to terminal 4 of TS-2.

☑ Connect, but do not solder, the black lead to terminal 5 of TS-2.

☑ Connect, but do not solder, the red lead to terminal 4 of C-10 (marked with a half moon).

☑ Twist the blue and blue-yellow leads together. Solder the blue lead to pin 3 of V-4. Solder the blue-yellow lead to pin 4 of V-4.

☑ Twist the brown and brown-yellow leads together. Solder the brown lead to pin 3 of V-3. Solder the brown-yellow lead to pin 4 of V-3.

☑ To mount T-3, lay T-3 upside down on your work surface. Position the chassis over T-3 and insert the two groups of leads through the holes in the chassis. The orange, yellow, green, white and black leads go through the hole closest to T-2. Secure T-3 to the chassis with six 8-32 screws, lockwashers and nuts.

☑ Tighten all nuts used to mount the perforated plate, T-2 and T-3.

☑ Twist the brown and brown-yellow leads together. Solder the brown lead to pin 3 of V-7. Solder the brown-yellow lead to pin 4 of V-7.

☑ Twist the blue and blue-yellow leads together. Solder the blue lead to pin 3 of V-8. Solder the blue-yellow lead to pin 4 of V-8.

☑ Connect, but do not solder, the red lead to terminal 3 of C-13. (marked with a half moon).

☑ To mount T-1, the power transformer, lay T-1 upside down on your work surface. Insert the leads in the large hole between V-9 and V-10. Position the chassis so the holes in the chassis line up with the mounting holes of T-1. Secure T-1 with six 10-32 screws, lockwashers and nuts.

☑ Solder one of the yellow leads from T-1 to pin 2 of V-9. Solder the other yellow lead to pin 2 of V-10.

☑ Twist the two red leads as shown. Connect, but do not solder, one of the red leads to pin 6 of V-9. Connect, but do not solder, the other red lead to pin 4 of V-10.

☑ Connect, but do not solder, the red-yellow lead to the mounting tab of C-13, as shown.

☑ Connect, but do not solder the green-yellow lead to terminal 2 of C-13 (marked with a bar).

☑ Twist the black and brown leads together. Thread the bare end of the black lead through terminals 3 and 4 of S-1. Solder terminals 3 and 4. Connect, but do not solder, the brown lead to terminal 2 of F-1.

☑ Cut the green leads to 4½". Prepare the ends and twist the leads together. Connect, but do not solder one of the green leads to pin 2 of V-8. Connect, but do not solder, the other to pin 7 of V-8.

SECOND WIRING

SEE FIGURE 13 ON A SEPARATE SHEET.

☑ Insert the orange, yellow, green, white, and black leads of T-3 into the 5″ piece of ½″ diameter casing and route as shown.

The following leads of T-3 are connected to the rear hole of the specified solder lug. (See detail A on Figure 13).

☑ Solder the orange lead to terminal 1 of TS-3.

☑ Connect, but do not solder the yellow lead to terminal 2 of TS-3.

☑ Solder the green lead to terminal 3 of TS-3.

☑ Solder the white lead to terminal 4 of TS-3.

☑ Connect, but do not solder the black lead to terminal 5 of TS-3.

☑ See Figure 14. Wrap the leads of C-12, a 220 $\mu\mu$fd disc capacitor around the leads of R-22, a 4KΩ, 1% resistor (marked 4K). Cut off the excess leads of C-12 and solder as shown.

☑ Connect, but do not solder one lead of R-22 to terminal 1 of TS-1. Solder the other lead to terminal 2 of TS-2 (2 wires).

Note: (2 wires) means there are 2 wires or leads in this connection and both should now be soldered.

☑ Connect, but do not solder, one lead of R-4, a 100Ω, 5% resistor (may be marked with color bands brown, black, brown, gold or stamped 100Ω) to terminal 1 of TS-1. Connect, but do not solder, the other lead to terminal 5 of TS-2.

☑ Connect, but do not solder, one lead of R-30, a 100Ω resistor (may be marked brown, black, brown, gold or stamped 100Ω) to terminal 2 of TS-1. Connect, but do not solder, the other lead to terminal 5 of TS-2.

☑ Connect, but do not solder, one end of a yellow wire to terminal 2 of R-1. Solder the other end to terminal 3 of S-3.

☑ Connect, but do not solder one end of a white wire to terminal 2 of J-1. Solder the other end to terminal 1 of S-2.

☑ Solder one end of a red wire to terminal 2 of J-1 (2 wires). Bend the other end up. This end will be connected later.

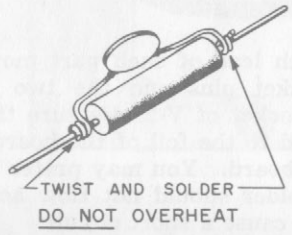


FIGURE 14.
RESISTOR-CAPACITOR ASSEMBLY

☑ Connect, but do not solder one lead of R-5, a 3.3KΩ resistor (orange, orange, red) to terminal 2 of S-2. Connect, but do not solder the other lead to terminal 3 of S-2.

☑ Slip ½″ thin spaghetti on each lead of C-15, a .005 μfd disc capacitor (may be marked 5000 or 5K). Solder one lead to terminal 3 of S-2 (2 wires). It is easier to solder this terminal if S-2 is temporarily dismounted. Connect, but do not solder, the other lead to pin 8 of V-9. Remount S-2 and tighten the nut.

☑ Connect, but do not solder, one end of a gray wire to pin 8 of V-9, and route as shown. Connect but do not solder, the other end to pin 8 of V-10.

☑ Solder one end of a red wire to pin 4 of V-10 (2 wires). Solder the other end to pin 6 of V-10.

☑ Solder one end of a red wire to pin 4 of V-9. Solder the other end to pin 6 of V-9 (2 wires).

☑ Connect, but do not solder one end of the 10″ brown wire to terminal 4 of C-10. Connect, but do not solder, the other end to terminal 3 of C-13. Position this wire along the bottom of the chassis.

☑ Slip 7¼″ of medium spaghetti on a 7¾″ heavy bare wire. Solder one end to the mounting tab of C-13. Solder the other end to the mounting tab of C-10. Bare wire must not touch chassis.

☑ Connect, but do not solder, one lead of R-20, a 1KΩ resistor (brown, black, red) to pin 6 of V-4. Solder the other lead to pin 5 of V-4.

☑ Connect, but do not solder, one lead of R-21, a 1KΩ resistor (brown, black, red) to pin 6 of V-3. Solder the other lead to pin 5 of V-3.

☑ Connect, but do not solder, one lead of R-45, a 1KΩ resistor (brown, black, red) to pin 6 of V-8. Solder the other lead to pin 5 of V-8.

☑ Connect, but do not solder, one lead of R-46, a 1KΩ resistor (brown, black, red) to pin 6 of V-7. Solder the other lead to pin 5 of V-7.

☑ Connect, but do not solder, one end of an orange wire to pin 1 of V-4. Connect, but do not solder, the other end to pin 1 of V-3.

☑ Solder one end of an orange wire to pin 1 of V-3 (2 wires). Connect, but do not solder, the other end to pin 1 of V-8.

☑ Solder one end of an orange wire to pin 1 of V-8 (2 wires). Solder the other end to pin 1 of V-7.

☑ Put a spacer over each of the eight 4-40 screws already mounted. Using your diagonal cutters, crimp each spacer. Only moderate crimping is necessary to keep the spacers on the screws.

☑ Insert the bare ends of the line cord through the rubber grommet. Tie a knot in the cord 4″ from the end. Split the cord back to the knot. Solder one lead of the line cord to terminal 1 of F-1.

☑ Clip the other wire 2″ from the knot. Remove ½″ insulation from the end and twist the bare wires very tightly. Wrap this end around terminals 1 and 2 of S-1. Be sure there are no loose strands that may short other terminals. Solder terminal 1.

WIRING OF THE PRINTED CIRCUIT BOARDS

Notice that the printed circuit board has two different sides — a component side which has an outline of the parts printed on it and a metal foil side which has the wiring pattern etched on it. All parts mount from the component side of the board. The holes in the board are spaced to accept the terminals of the parts to be mounted. Bend the part leads with your fingers, so that the leads are parallel. Insert the leads through the correct holes. Bend them over on the other side to hold the part tightly in place.

NOTE: Be sure to use the correct numbered board. One board is numbered 820048 and the other 820046.

MOUNTING THE PARTS ON PRINTED CIRCUIT BOARD 820048

SEE FIGURE 15.

MOUNT THESE PARTS:

All resistors are ½ watt unless otherwise stated.

☐ R-18, a 100Ω 1-watt resistor (brown, black brown).

☐ R-11, a 33Ω resistor (orange, orange black). R-11 mounts in the 2 small holes inside the outline for the V-2 socket.

☐ R-15, a 150KΩ resistor (brown, green, yellow).

The banded ends of C-7 and C-8, and the plus end of C-2 must be positioned as shown. Bands on other capacitors on this board can be disregarded. C-8, a .25 μfd, 400 v capacitor must not be confused with C-1, a .25 μfd 150 v capacitor.

☐ C-8, a .25 μfd tubular capacitor. Be sure banded end is positioned as shown.

☐ C-6, a 2 μfd tubular capacitor.

☐ R-3, a 2.2 KΩ resistor (red, red, red).

☐ C-2, a 50 μfd 10v electrolytic capacitor. Position the plus end (may be marked + or positive) as shown. The minus end may be marked (—) or negative.

☐ C-4, a .02 μfd disc capacitor (may be marked 20,000 or 20K).

☐ C-5, a .02 μfd disc capacitor (20,000 or 20K).

☐ C-1, a .25 μfd 150v tubular capacitor.

☐ R-8, a 390KΩ resistor (orange, white, yellow).

☐ R-2, a 4.7KΩ, 5% resistor (yellow, violet, red, gold).

☐ R-27, a 68KΩ 1-watt resistor (blue, gray, orange).

☐ R-7, a 100KΩ 5% resistor (brown, black, yellow, gold).

☐ R-9, a 1 megΩ resistor (brown, black, green).

☐ R-6, a 6.8KΩ resistor (blue, gray, red).

☐ C-3, a 680 μμfd disc capacitor.

☐ R-10, a 68KΩ resistor (blue, gray, orange).

☐ R-12, a 205KΩ, 1% resistor (stamped 205K).

☐ R-13, a 200KΩ, 1% resistor (stamped 200K).

☐ R-26, a 68KΩ, 2-watt resistor (blue, gray, orange).

☐ R-25, a 10KΩ, 1-watt resistor (brown, black, orange).

☐ C-7, a .25 μfd 400 v tubular capacitor. Be sure banded end is positioned as shown.

☐ R-14, a 150KΩ resistor (brown, green, yellow).

From the component side of the board mount the tube sockets. These tube sockets "snap" through the holes to their proper position.

☐ Mount a 9-pin socket (without center pin) for V-2. The socket fits over R-11 as shown.

☐ Mount a 9-pin socket (with a center pin) for V-1.

Note: R-17 is mounted later.

☐ Turn the board over and solder each lead of each part mounted on the board. Solder all of the socket pins and the two leads of R-11, which is mounted under the socket of V-2. Be sure the center pin of the V-1 socket is well soldered to the foil of the board. After soldering, clip all leads close to the board. You may prefer to solder and clip a few leads at a time. Solder should not flow across two different foil conductors as this will cause a short circuit.

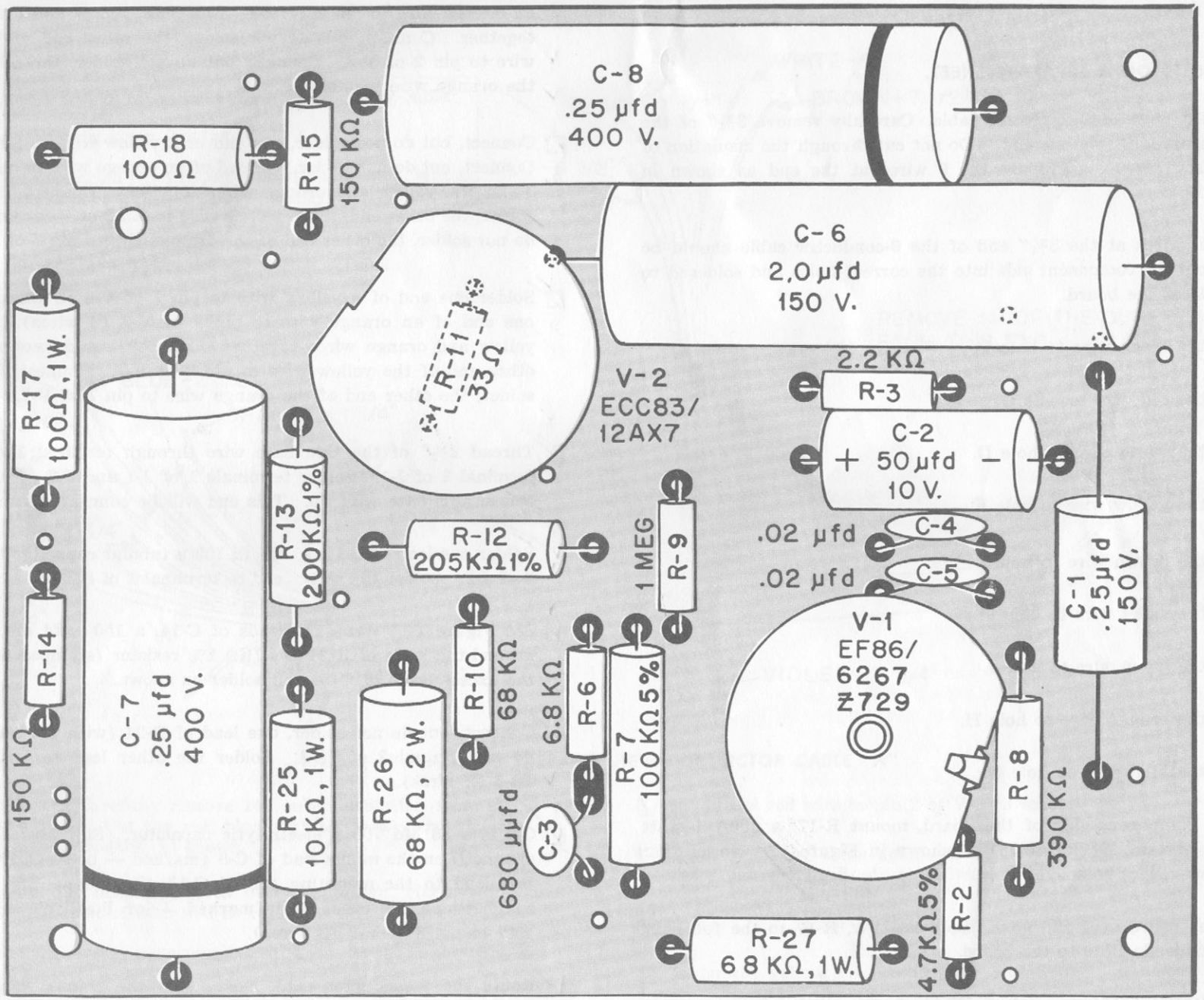


FIGURE 15. MOUNTING PARTS ON PRINTED CIRCUIT BOARD 820048

THIRD WIRING

SEE FIGURE 16 ON A SEPARATE SHEET.

☑ Cut a 30" piece of 9-conductor cable. Carefully remove 3¾" of the outer insulation from one end. (Do not cut through the insulation of the innner wires.) Prepare the 9 wires at the end as shown in Figure 17.

NOTE: All wires at the 3¾" end of the 9-conductor cable should be inserted from the component side into the correct holes and soldered to the foil side of the board.

☑ Solder the black wire to hole P.

☑ Solder the red wire to hole Q.

☑ Solder the white wire to hole U.

☑ Solder the yellow wire to hole K.

☑ Solder the brown wire to hole L.

☑ Solder the violet wire to hole M.

☑ Solder the green wire to hole J.

☑ Solder the orange wire to hole H.

☑ Solder the blue wire to hole G.

☑ On the component side of the board, mount R-17, a 100Ω 1 watt resistor (brown, black, brown) as shown in Figure 15. Notice that R-17 now covers hole U.

☑ Turn the board over and solder both leads of R-17 to the foil side. Clip both leads close to the board.

Put the 820048 printed circuit board aside for the time being.

☑ Solder one end of a yellow wire to pin 7 of V-4. Solder one end of an orange wire to pin 2 of V-4. Twist the yellow and orange wires together. Connect, but do not solder, the other end of the yellow wire to pin 2 of V-3. Connect, but do not solder, the other end of the orange wire to pin 7 of V-3.

☑ Connect, but do not solder, one end of a yellow wire to pin 7 of V-3. Connect, but do not solder, one end of an orange wire to pin 2 of V-3. Twist the yellow and orange wires together. Connect, but do not solder, the other end of the yellow wire to pin 2 of V-8. Connect, but do not solder, the other end of the orange wire to pin 7 of V-8.

☑ Solder one end of a yellow wire to pin 7 of V-8 (3 wires). Solder one end of an orange wire to pin 2 of V-8 (3 wires). Twist the yellow and orange wires together. Connect, but do not solder, the other end of the yellow wire to pin 2 of V-7. Connect, but do not solder, the other end of the orange wire to pin 7 of V-7.

☑ Thread 2½" of the thin bare wire through terminal 1 of J-2 and terminal 1 of J-1. Solder terminals 1 of J-1 and J-2. Pull the free end of this bare wire up. This end will be connected later.

☑ Solder one lead of C-16, a .25 μfd 150 v tubular capacitor to terminal 2 of J-2. Solder the other lead to terminal 1 of S-3.

☑ See Figure 14. Wrap the leads of C-14, a 150 μμfd disc capacitor around the leads of R-24, a 4.7KΩ 1% resistor (stamped 4.7K). Cut the excess leads of C-14 and solder as shown.

☑ Connect, but do not solder, one lead of R-24 (with C-14 attached to it) to terminal 2 of TS-1. Solder the other lead to terminal 2 of TS-3 (2 wires).

☑ C-9 is a 16 μfd 700 v electrolytic capacitor. Slip 2½" of the thin spaghetti on the minus lead of C-9 (marked — or Negative). Solder this lead to the mounting tab of C-13 (2 wires). Slip 1½" thin spaghetti on the other lead (marked + or Positive). Solder this lead to pin 8 of V-9 (3 wires).

☑ Route the 9-conductor cable "A" (with the printed circuit board 820048 attached to it) through the bottom notch in the shield bracket and around the screws and spacers as shown. The cable must be positioned away from the 2 large holes.

Remove specified length of outer insulation from the cable.

Cut individual wire to given lengths.

Remove ¼" of insulation from the ends of the individual wires. Twist the stranded ends tightly and coat lightly with solder.

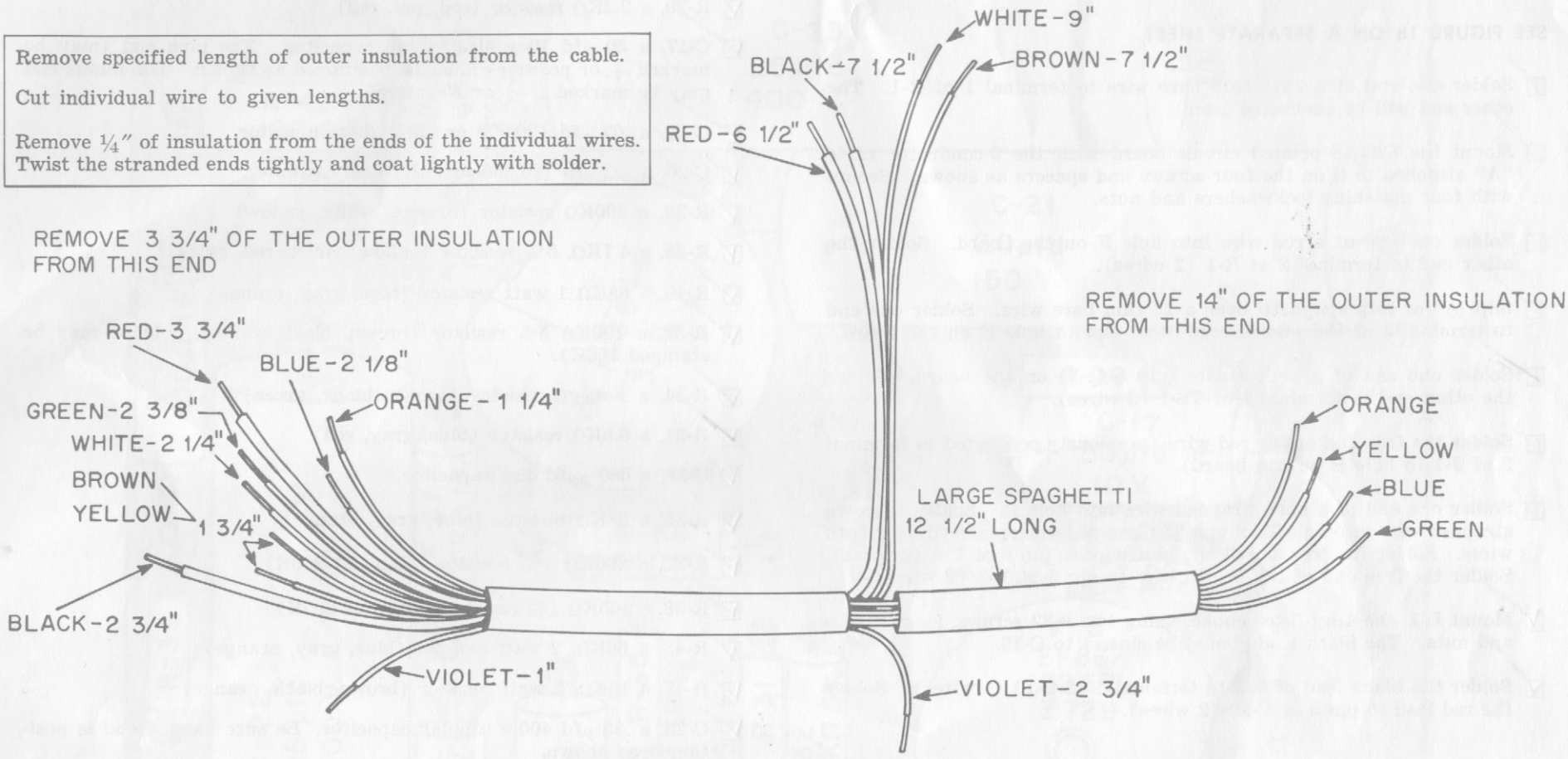


FIGURE 17. HOW TO PREPARE THE 9-CONDUCTOR CABLE "A"

- ☑ See Figure 17. Carefully remove 14" outer insulation from the free end of the cable. Cut the red, black, white, brown and violet wires to the specified lengths, as shown.
- ☑ Slip 4½" of the large spaghetti over the brown, black, white and red wires. The violet wire will be connected in a later view.
- ☑ Solder the white wire to terminal 1 of R-19. Position the wire away from the body of R-19.
- ☑ Solder the brown wire to terminal 2 of R-19.
- ☑ Solder the black wire to pin 7 of V-3 (3 wires).
- ☑ Solder the red wire to pin 2 of V-3 (3 wires).
- ☑ Slip 11" of the large spaghetti over the orange, yellow, blue and and green wires. Route as shown.
- ☑ Connect, but do not solder, the orange wire to terminal 4 of C-10.
- ☑ Solder the yellow wire to terminal 3 of C-10.
- ☑ Solder the blue wire to terminal 2 of C-10.
- ☑ Solder the green wire to terminal 1 of C-10.

FOURTH WIRING

SEE FIGURE 18 ON A SEPARATE SHEET.

☑ Solder one end of a 2¼" thin bare wire to terminal 1 of R-1. The other end will be connected later.

☑ Mount the 820048 printed circuit board with the 9-conductor cable "A" attached to it on the four screws and spacers as shown. Secure with four matching lockwashers and nuts.

☑ Solder one end of a red wire into hole F on the board. Solder the other end to terminal 2 of R-1 (2 wires).

☑ Slip ½" of thin spaghetti over a 1" thin bare wire. Solder one end to terminal 3 of R-1. Solder the other end to hole E on the board.

☑ Solder one end of a yellow wire into hole D on the board. Solder the other end to terminal 1 of TS-1 (3 wires).

☑ Solder the free end of the red wire (previously connected to terminal 2 of J-1 to hole B on the board).

☑ Solder one end of a blue stranded wire into hole R. Solder a brown stranded wire into hole T. Slip a 3" piece of large spaghetti over both wires. Solder the free end of the blue wire to pin 6 of V-4 (2 wires). Solder the free end of the brown wire to pin 6 of V-3 (2 wires).

☑ Mount L-1, the 4 hy filter choke, using two 8-32 screws, lockwashers and nuts. The black lead should be closest to C-10.

☑ Solder the black lead of L-1 to terminal 4 of C-10 (4 wires). Solder the red lead to pin 8 of V-10 (2 wires).

MOUNTING ON PRINTED CIRCUIT BOARD 820046

MOUNT THESE PARTS AS SHOWN IN FIGURE 19:

☑ R-43, a 100Ω 1 watt resistor (brown, black, brown)

☑ R-36, a 33Ω resistor (orange, orange, black)

☑ R-40, a 150KΩ resistor (brown, green, yellow)

Be sure the banded ends of C-22 and C-23 are positioned as shown.

☑ C-23, a .25 μfd 400v tubular capacitor. Position banded end as shown.

☑ C-21, a 2 μfd tubular capacitor.

☑ R-29, a 2.2KΩ resistor (red, red, red)

☑ C-17, a 50 μfd 10 v electrolytic capacitor. The plus end (may be marked + or positive) must be positioned as shown. The minus end may be marked (—) or Negative.

☑ C-19, a .02 μfd (20,000 or 20K) disc capacitor.

☑ C-20, a .02 μfd (20,000 or 20K) disc capacitor.

☑ R-33, a 390KΩ resistor (orange, white, yellow)

☑ R-28, a 4.7KΩ, 5% resistor (yellow, violet, red, gold)

☑ R-49, a 68KΩ 1 watt resistor (blue, gray, orange)

☑ R-32, a 100KΩ 5% resistor (brown, black, yellow, gold or may be stamped 100K).

☑ R-34, a 1 megΩ resistor (brown, black, green)

☑ R-31, a 6.8KΩ resistor (blue, gray, red)

☑ C-18, a 680 μμfd disc capacitor.

☑ R-35, a 68KΩ resistor (blue, gray, orange)

☑ R-37, a 200KΩ 1% resistor (stamped 200K)

☑ R-38, a 205KΩ 1% resistor (stamped 205K)

☑ R-48, a 68KΩ, 2 watt resistor (blue, gray, orange)

☑ R-47, a 10KΩ, 1 watt resistor (brown, black, orange)

☑ C-22, a .25 μfd 400 v tubular capacitor. Be sure banded end is positioned as shown.

☑ R-39, a 150KΩ resistor (brown, green, yellow)

☑ 9-pin socket (without a center pin) for V-6. The socket fits over R-36.

☑ 9-pin socket (with a center pin) for V-5.

Note: R-42 is mounted later.

☐ Turn the board over and solder each lead of each part mounted on the board. Solder all of the socket pins and the two leads of R-36, which is mounted under the V-6 socket. Be sure the center pin of V-5 is well soldered to the foil of the board. After soldering, clip all leads close to the board. You may prefer to solder and clip a few leads at a time.

Be sure that solder does not flow across two different conductors on the foil pattern as this will cause a short circuit.

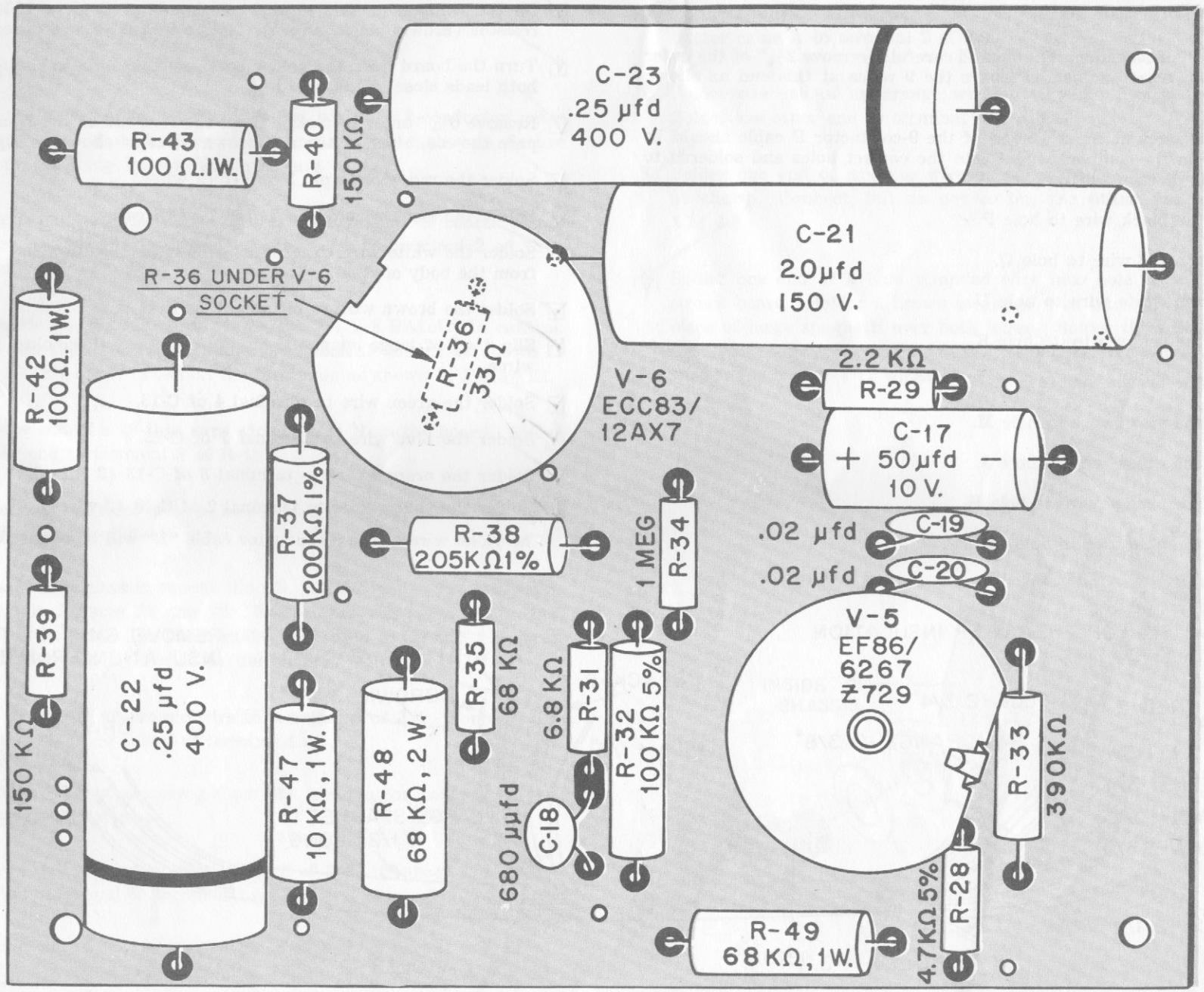


FIGURE 19. MOUNTING PARTS ON PRINTED CIRCUIT BOARD 820046

SEE FIGURES 18 AND 20.

- [ ] Cut 15¾" of 9-conductor cable and carefully remove 2¾" of the outer insulation from one end. Prepare the 9 wires at this end as shown in Figure 20.

NOTE: All wires at the 2¾" end of the 9-conductor B cable should be inserted from the component side into the correct holes and soldered to the foil side of the 820046 board.

- [ ] Solder the black wire to hole P.
- [ ] Solder the red wire to hole Q.
- [ ] Solder the white wire to hole U.
- [ ] Solder the yellow wire to hole K.
- [ ] Solder the brown wire to hole L.
- [ ] Solder the violet wire to hole M.
- [ ] Solder the green wire to hole J.
- [ ] Solder the orange wire to hole H.
- [ ] Solder the blue wire to hole G.
- [ ] On the component side of the board, mount R-42, a 100Ω, 1 watt resistor (brown, black, brown). Notice that R-42 now covers hole U.
- [ ] Turn the board over and solder both leads of R-42 to the foil. Trim both leads close to the board.
- [ ] Remove 6¼" outer insulation from the free end of the B cable. Prepare the red, black, white and brown wires as shown in Figure 20.
- [ ] Solder the red wire to pin 2 of V-7 (2 wires).
- [ ] Solder the black wire to pin 7 of V-7 (2 wires).
- [ ] Solder the white wire to terminal 1 of R-44. Position the wire away from the body of R-44.
- [ ] Solder the brown wire to terminal 2 of R-44.
- [ ] Slip 4½" of large spaghetti on the orange, yellow, blue, and green wires.
- [ ] Solder the green wire to terminal 4 of C-13.
- [ ] Solder the blue wire to terminal 1 of C-13.
- [ ] Solder the orange wire to terminal 3 of C-13 (3 wires).
- [ ] Solder the yellow wire to terminal 2 of C-13 (2 wires).

The violet wire of the 9-conductor cable "B" will be connected later.

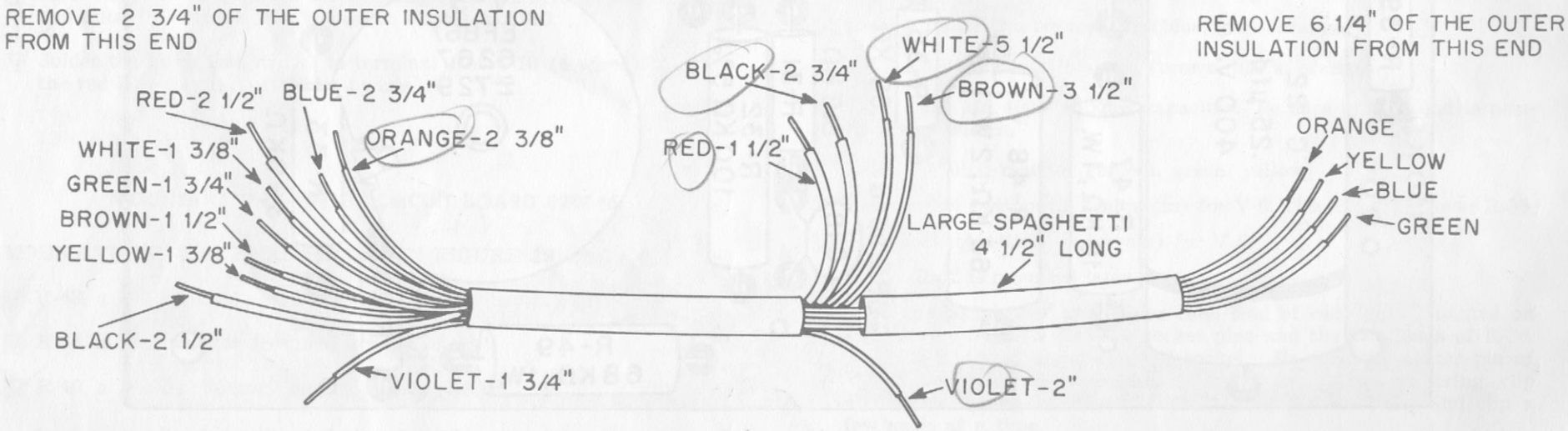


FIGURE 20. HOW TO PREPARE THE 9-CONDUCTOR CABLE "B"

FIFTH WIRING

SEE FIGURE 21 ON A SEPARATE SHEET.

☑ Mount the 820046 printed circuit board with the 9-conductor cable "B" attached to it on the four screws and spacers as shown. Secure with four matching lockwashers and nuts.

☑ Solder one end of a violet wire to hole D of the 820046 board. Route this wire as shown and solder the other end to terminal 2 of TS-1 (3 wires).

☑ From inside the chassis, mount R-41, the V-7 V-8 BALANCE control. R-41 is the 100Ω control with the short shaft. Mount as shown in Figure 10 on page 7. Position the terminals as shown in Figure 21.

☑ Solder one end of a 1" thin bare wire to hole N on the board. Solder the other end to terminal 3 of R-41.

☑ Solder one end of a red wire to hole S on the board. Solder the other end to terminal 1 of R-41.

☑ From inside the chassis, mount the J-3, J-4, J-5 and J-6 meter jacks, as shown in Figures 21 and 22. Notice that the jacks are turned slightly to the side. The fiber washers are used to insulate the jacks and must be properly seated in the chassis.

☑ Solder one end of an orange wire to terminal 2 of J-6. Connect, but do not solder the other end to terminal 2 of J-5.

☑ Solder the violet wire coming from the 9-conductor cable B to terminal 2 of J-5 (2 wires).

☑ Solder one end of a green wire to pin 8 of V-7. Connect, but do not solder, the other end to terminal 1 of J-6.

☑ Solder one end of a blue wire to pin 8 of V-8. Connect, but do not solder, the other end to terminal 1 of J-5.

☑ Solder one end of a violet wire to pin 8 of V-3. Route this wire as shown. Connect, but do not solder, the other end to terminal 1 of J-4.

☑ Connect, but do not solder, the violet wire coming from the 9-conductor cable A to terminal 2 of J-4.

☑ Solder one end of an orange wire to terminal 2 of J-4 (2 wires). Solder the other end to terminal 2 of J-3.

☑ Solder one end of a white wire to pin 8 of V-4. Route this wire as shown. Connect, but do not solder, the other end to terminal 1 of J-3.

☑ Solder one end of a blue stranded wire into hole R of the 820046 circuit board. Solder a brown stranded wire into hole T. Slip a 3" piece of large spaghetti over both wires. Solder the free end of the blue wire to pin 6 of V-8 (2 wires). Solder the free end of the brown wire to pin 6 of V-7 (2 wires).

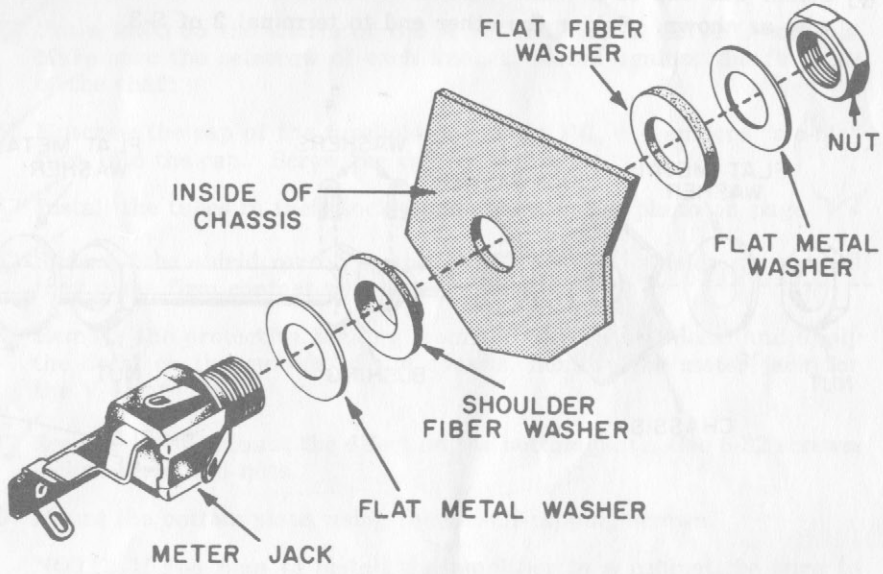


FIGURE 22. METER JACK DETAIL

SEE FIGURE 23.

☑ Slip two flat washers and a nut on the bushing of R-23, the 500KΩ B LEVEL control (with the long shaft). Notice there are two grooves in the shaft. Insert a "C" washer in the groove nearest the body of R-23. Slip a bushing on the shaft and insert a "C" washer in the other groove. Crimp both "C" washers with your pliers to hold the bushing securely in place. Each "C" washer should be crimped several times until it follows the contour of the groove as closely as possible.

☑ Put a large lockwasher over the bushing and insert the bushing through the large hole in the chassis (marked B LEVEL). Position R-23 so the locating tab fits into the locating hole in the shield bracket. Be sure that there is a flat metal washer on each side of the shield bracket. Fasten R-23 to the shield bracket by tightening the large nut. Fasten the bushing to the chassis with a flat metal washer and a large nut.

☑ Solder one end of a white wire to terminal 3 of R-23. Route this wire as shown. Solder the other end to terminal 2 of S-3.

SIXTH WIRING

SEE FIGURE 24 ON A SEPARATE SHEET.

☑ Mount R-16, the 100Ω V-3 V-4 BALANCE Control, in the same manner R-23 was mounted. See Figure 23.

☑ Solder one end of a red wire into hole F on the printed circuit board 820046. Solder the other end to terminal 2 of R-23.

The heavy bare wire remaining in the kit is used as a continuous length to form the bus bar which provides a common ground for the amplifier. Separate lengths of medium size spaghetti are used to cover the bus bar to insulate it from the bottom plate. Connections are made to the bus bar by hooking the wire around the bar and soldering. EXTRA HEAT WILL BE NEEDED FOR THESE SOLDER CONNECTIONS.

☑ Solder one end of the heavy bare wire (bus bar) to the mounting tab of C-10.

☑ Slip 3¾" of the medium size spaghetti on the bus bar. Put a right-angle bend in the bar.

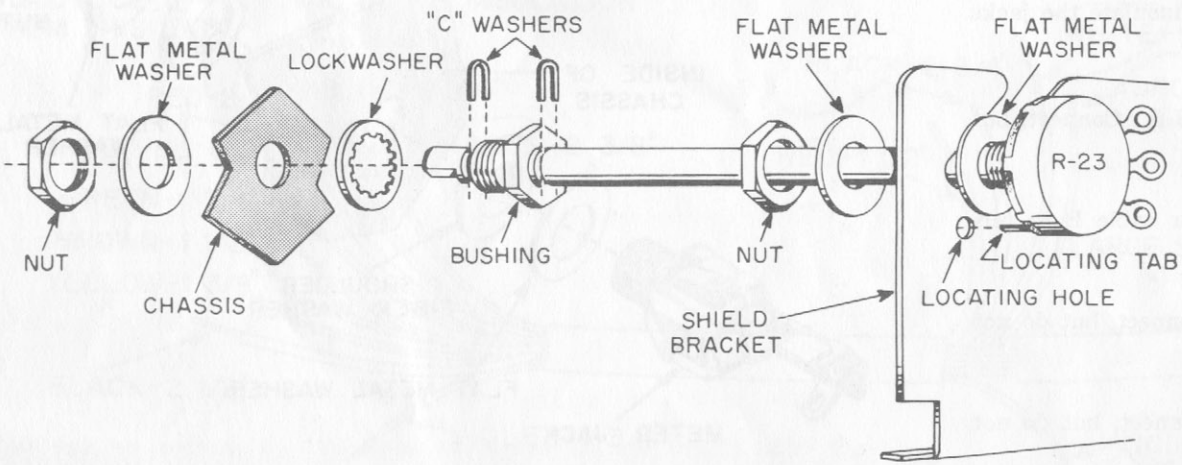


FIGURE 23. MOUNTING DETAIL FOR CONTROL WITH LONG SHAFT

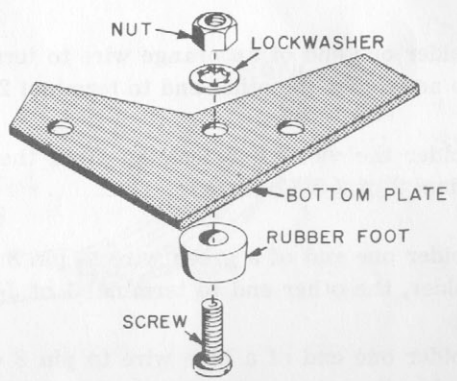


FIGURE 25. MOUNTING FEET ON THE BOTTOM PLATE

See Correction Sheet

- [ ] Slip ½" thin spaghetti on each of the three leads of C-11, a .01-.01 μfd disc capacitor. Solder the center lead to the bus bar. Solder one end lead to terminal 2 of S-1; at the same time, solder the line cord to terminal 2 of S-1. Solder the other lead to terminal 2 of F-1 (2 wires).
- [ ] Slip 1" spaghetti on the bus bar.
- [ ] Slip 1½" thin spaghetti on a 3" thin bare wire. Solder one end to pin 1 of V-4 (2 wires). Thread the other end through terminal 2 of S-2 and solder it to the bus bar. Solder terminal 2 of S-2 (2 wires).
- [ ] Slip 3½" spaghetti on the bus bar.
- [ ] Solder one end of a 2" thin bare wire to terminal 5 of TS-2 (4 wires). Thread the other end through terminal 5 of TS-3 and solder it to the bus bar. Solder terminal 5 of TS-3 (2 wires). Be careful not to melt the insulation of the T-3 leads.
- [ ] Slip 4½" spaghetti on the bus bar.
- [ ] Solder the free end of the bare wire (previously connected to terminals 1 of J-1 and J-2) to the bus bar.
- [ ] Slip ¾" spaghetti on the bus bar. Bend the bar as shown.
- [ ] Slip 2" thin spaghetti on the bare wire (previously connected to terminal 1 of R-1). Connect, but do not solder, the free end of this bare wire to the bus bar as shown.
- [ ] Slip 2" thin spaghetti on a 2½" thin bare wire. Solder one end to hole A of the 820048 board. Solder the other end to the bus bar. Be sure both thin wires connected to this part of the bus bar are soldered.
- [ ] Slip 3" spaghetti on the bus bar.
- [ ] Solder one end of a 1" thin wire to hole N on the 820048 board. Solder the other end to terminal 3 of R-16.
- [ ] Slip 1¼" spaghetti on 1½" thin bare wire. Solder one end to terminal 2 of R-16. Solder the other end to the bus bar.
- [ ] Solder one end of a red wire to hole S on the 820048 board. Solder the other end to terminal 1 of R-16.
- [ ] Slip 1" spaghetti on the free end of the bus bar.
- [ ] Slip 1⅜" thin spaghetti on a 2¼" thin bare wire. Solder one end to hole A on the 820046 board. Thread the other end through terminal 1 of R-23 and then solder it to the bus bar. Be sure terminal 1 of R-23 is also soldered.
- [ ] Slip 3¼" spaghetti on the bus bar. Solder the free end to terminal 2 of R-41 and cut off the excess bus bar.
- [ ] Solder one end of a red wire to terminal 3 of J-6. Solder the other end to terminal 1 of J-6 (2 wires).
- [ ] Solder one end of a red wire to terminal 3 of J-5. Solder the other end to terminal 1 of J-5 (2 wires).
- [ ] Solder one end of a red wire to terminal 3 of J-4. Solder the other end to terminal 1 of J-4 (2 wires).
- [ ] Solder one end of a red wire to terminal 3 of J-3. Solder the other end to terminal 1 of J-3 (2 wires).
- [ ] You have finished wiring your amplifier. Go back and check your work. Be sure each part is correctly mounted and that each connection is well soldered. Exposed parts of the bus bar must not touch any part of the chassis.

FINAL ASSEMBLY

- [ ] From the outside of the chassis, insert ten 6-32 screws in the empty holes of TS-2 and TS-3, as shown in the photograph on the front cover.
- [ ] Put a knob on the shafts of the A LEVEL and B LEVEL controls. Make sure the setscrew of each knob is seated against the flat side of the shaft.
- [ ] Unscrew the cap of the fuseholder. Insert F-1, a 4 ampere "slo-blo" fuse, into the cap. Screw the cap on securely.
- [ ] Install the tubes in their sockets as shown in the photo on page
- [ ] Slide a tube shield over V-1 and V-5. Push the shields down until they make firm contact with the ground clip.
- [ ] Remove the protective backing from the tube layout decal and apply the decal on the outside of the chassis, next to the meter jack for the V-4 cathode.
- [ ] See Figure 25. Mount the 4 feet on the bottom plate. Use 6-32 screws, lockwashers and nuts.
- [ ] Mount the bottom plate, using the 12 self-tapping screws.

NOTE: If you plan to install the amplifier in a cabinet, be sure to provide adequate ventilation.

- [ ] If you have purchased the accessory cover, install it now, using the four self-tapping screws supplied.

PRELIMINARY TEST

CAUTION: NEVER TOUCH ANY PART OF THE WIRING WHILE THE AMPLIFIER IS PLUGGED INTO A POWER OUTLET.

This amplifier is designed to operate from a 110-125 volt, 60 cycle AC outlet. DO NOT ATTEMPT TO OPERATE THIS AMPLIFIER FROM DC (DIRECT CURRENT).

☑ Put the ON-OFF switch in the OFF position.

☑ Turn the A LEVEL and the B LEVEL controls both fully counter-clockwise.

☑ Plug the line cord into a 110-125 volt, 60 cycle AC outlet.

☑ Put the ON-OFF switch ON. If the tubes light, go ahead with the next step. If they do not light, see the section on SERVICE HINTS.

BALANCING THE OUTPUT TUBES

☑ Set the BALANCE controls V-3 V-4 and V-7 V-8 at the middle of their range. The output tubes of both channels are now approximately balanced, and will give excellent performance.

☑ Turn the amplifier OFF and read the OPERATING INSTRUCTIONS.

BALANCING PROCEDURE USING A METER

If you have a DC milliammeter, with a 0 to 100 or larger scale, you can bring the output tubes into more exact balance.

☐ Prepare the meter plug as shown in Figure 27.

☐ Connect the meter plug leads to the terminals of a DC milliammeter that has a range from 0 to 100 milliamperes or more. The currents you will be reading should be approximately 65 ma plus or minus a few ma.

DO NOT PLUG IN THE METER JACK WITHOUT HAVING A METER CONNECTED. THIS WOULD SERIOUSLY UNBALANCE THE TUBES.

☐ Insert the meter plug in the jack labeled CATHODE V-3, then in CATHODE V-4 and compare your readings. With a screwdriver, adjust the BALANCE control for V-3 and V-4 until the two readings are identical.

☐ In the same way, balance V-7 and V-8 by adjusting the BALANCE control until identical meter readings are obtained at the jacks for CATHODE V-7 and V-8.

☐ Turn the amplifier OFF and read the OPERATING INSTRUCTIONS.

OPERATING INSTRUCTIONS

To realize the full capabilities of this fine amplifier, we suggest that it be used with components of equal quality.

Be sure to provide adequate ventilation for the amplifier.

STEREO OPERATION (2 SEPARATE CHANNELS)

For stereo operation, a separate speaker or speaker system and a separate input source are needed for each channel.

☐ Connect one lead of the channel A speaker to screw terminal C of the A speaker terminal block. Connect the other lead to the correct screw terminal of the A speaker terminal block. For example, an 8 ohm speaker is connected to the 8 ohm terminal marked 8 and the common terminal marked C. A 16 ohm speaker is connected to the 16 ohm terminal marked 16 and the common terminal marked C.

☐ Connect one lead of the channel B speaker to the common terminal, and the other lead to the correct numbered terminal of the B speaker terminal block.

☐ Put the MON.-STEREO switch in the STEREO position.

☐ If you are using a stereo preamp, plug the A preamp output cable into the A input of the amplifier. Plug the B preamp output cable into the B input of the amplifier.

If you are using two separate preamps (or two separate tuners) plug the output cable of one preamp into the A input of the amplifier. Plug the output cable of the other preamp into the B input of the amplifier.

☐ Plug the amplifier line cord into an outlet supplying 110-125 volts, 60 cycle AC ONLY.

CAUTION: ALWAYS TURN THE LEVEL CONTROLS DOWN (COUNTERCLOCKWISE) BEFORE PLUGGING IN CABLES FROM ASSOCIATED EQUIPMENT! This precaution is necessary to protect your speaker because the amplifier will deliver rated power with as little as ½ volt input.

☐ Turn the amplifier ON. Turn on all other associated equipment as preamp(s), tuner(s), record player, etc.

☐ Set the LEVEL controls A and B to the settings which give you the control latitude desired at the main volume control of your preamp or tuner.

NOTE: The output link IS NOT USED IN STEREO OPERATION. It can be stored across the common terminals of the A and B speaker terminal blocks for possible future use in monaural operation.

MONAURAL OPERATION (COMBINED CHANNEL)

In monaural operation the two amplifier channels are combined and the power is doubled. Only one input is used. For monaural operation, channels A and B should be balanced to provide equal gain.

☐ Put the MON.-STEREO switch in the MON. position. Turn the A level control all the way to the left.

☐ Temporarily connect your speaker between speaker terminal blocks A and B. If you are using a 16 ohm speaker connect it between the 8 ohm terminal of A and the 8 ohm terminal of B. If you are using an 8 ohm speaker, connect it between the 4 ohm terminals of A and B. (These terminals are marked with the number of ohms.)

☐ Plug the line cord into an outlet supplying 110-125 volts, 60 cycle AC ONLY. Turn the amplifier ON.

☐ Press the MON. GAIN BALANCE TEST button and turn the A LEVEL control to the right until you hear hum at the speaker. Adjust the B LEVEL control until no sound is heard or until hum is minimized.

☐ Turn the A LEVEL control all the way to the right, while continuing to press the MON. GAIN BALANCE TEST button. Adjust the B LEVEL control again until the hum is minimized. You have now equalized the gain of both channels, assuring optimum monaural performance.

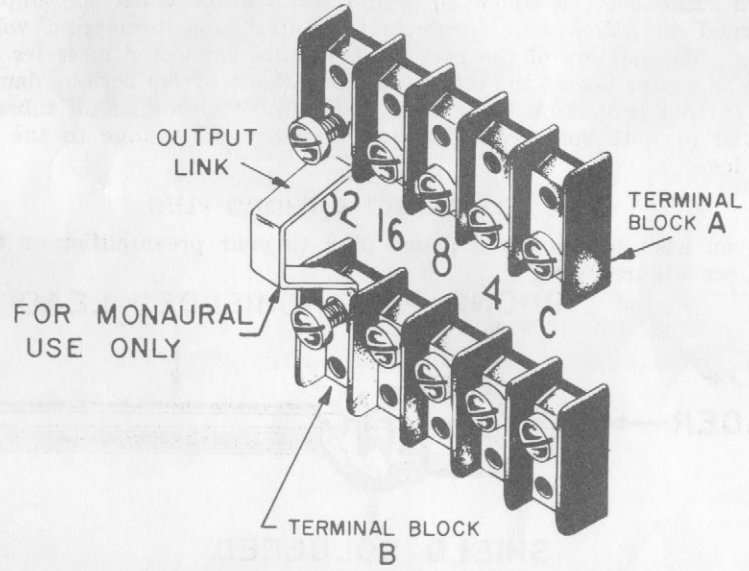


FIGURE 26. INSTALLING THE OUTPUT LINK FOR A 16 OHM SPEAKER

☐ Turn the A LEVEL control back to the fully counterclockwise position. NEVER DISTURB THE SETTING OF THE B LEVEL CONTROL SINCE THE CHANNELS ARE NOW BALANCED.

☐ Install the output link across the correct terminals on speaker terminal blocks A and B, as shown in Figure 26. Notice that the link is placed across the 32 ohm terminals for a 16 ohm speaker. In the same way the link would be across the 16 ohm terminals for an 8 ohm speaker. The 8 ohm speaker IS NOT CONNECTED to the 8 ohm terminal because the nominal output impedance of the amplifier is now half the value marked at the speaker terminals. The reason for this is that the output link has placed the A and B channels in parallel.

☐ Connect one speaker lead to either C terminal on the speaker terminal strips. Connect the other speaker lead to one of the screws holding the output link in place.

CAUTION: ALWAYS TURN THE A LEVEL CONTROL DOWN (COUNTERCLOCKWISE) BEFORE PLUGGING IN AN INPUT CABLE. This precaution is necessary to protect your speaker because the amplifier will deliver rated power with as little as ½ volt input.

☐ Plug the output cable of your preamp or tuner into the A input of the amplifier. NEVER USE THE B INPUT FOR MONAURAL OPERATION.

☐ Turn on all associated equipment as preamp, tuner, record player etc.

☐ Set the A LEVEL control (do not touch the B LEVEL) to the setting which gives you the desired control latitude at the main volume control of your preamp or tuner.

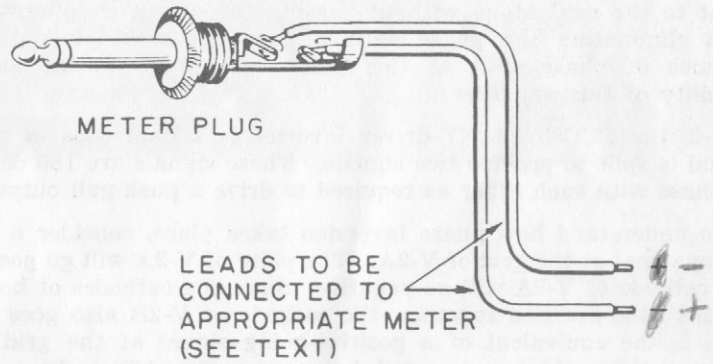


FIGURE 27. CONNECTING LEADS TO THE METER PLUG

HOW IT WORKS

STEREO: Two substantially identical, extremely linear amplifiers are combined on one chassis to make a 2-channel amplifier for stereo use. The channels are completely independent, with crosstalk between channels kept below –70 db by the use of effective filtering in the power supply (C-10, C-13 and filter resistors).

MONAURAL: When the S-3 switch is placed in the monaural position the 2 channels are connected in parallel, providing combined channel operation with twice the power of each individual channel. The parallel connection is completed by use of a jumper across the secondaries of the 2 output transformers, T-2 and T-3. Accurate balancing of the two parallel channels can easily be done by ear because a built-in test signal is supplied. When S-3 is pressed, an AC signal (120 cycles) from the power supply is injected into both channels. By connecting a speaker between the corresponding channel A and channel B outputs any difference in the gain of the two channels will be audible and can be eliminated by adjusting the B LEVEL (MONAURAL BALANCE) control. The slight difference between the channel A and channel B circuits (compare R-22, 4K and R-24, 4.7K) allows a wider range for balancing the gain of the 2 channels.

THE AMPLIFIER CIRCUIT: Since the 2 channels are identical except for R-22 and R-24, we will trace the signal only through channel A. The incoming signal, from preamp or tuner, is fed through C-1, across R-1, through R-2 to the grid of the V-1 voltage amplifier tube, EF86/6267. R-1 controls the level of the incoming signal to channel A only, when the amplifier is used for stereo. R-1 controls the level of the signal to both channels when the amplifier is used for monaural, or combined channel operation. Notice that R-23 is the level control for channel B on stereo. But for monaural, R-23 is used only to balance the 2 channels, as explained previously.

The plate of the voltage amplifier is directly connected (coupled) to the grid of V-2A. This means that the amplified signal from V-1 goes right to the next stage without passing through a coupling capacitor, thus eliminating the phase shift a capacitor would introduce. The absence of phase shift at this point contributes to the exceptional stability of this amplifier.

V-2, the ECC83/12AX7 driver inverter is a dual tube in which the signal is split to provide two signals. These signals are 180 degrees out of phase with each other as required to drive a push-pull output stage.

To understand how phase inversion takes place, consider a negative-going signal at the grid of V-2A. The plate of V-2A will go positive, and the cathode of V-2A will go negative. Since the cathodes of both halves of this tube are tied together, the cathode of V-2B also goes negative. This is the equivalent of a positive-going signal at the grid of V-2B because this grid is connected to ground (for AC). As a result, a negative-going signal appears at the plate of V-2B at the same time a positive-going signal appears at the plate of V-2A.

V-3 and V-4, EL37 pentodes, are connected for push-pull operation. Push-pull describes the fact that V-4 output goes negative when V-3 output goes positive. Since the plates of the two tubes are connected to opposite ends of the T-2 primary, and the cathodes are tied together, the two outputs are additive. Even order harmonics cancel out, greatly minimizing distortion. Correct phasing for the output stage is provided by the signals from the phase inverter, V-2.

The V-3 V-4 BALANCE control, R-16, can be adjusted for perfect balance of the two tubes, assuring the greatest cancelling out of distortion. R-16 controls the cathode currents by changing the cathode bias. Meter jacks allow insertion of a meter in either cathode circuit.

T-2, the output transformer, is especially designed for low distortion, minimum phase shift and a wide bandpass free from any resonances. The output transformer has taps on the plate winding to which the screens of the EL37 tubes are connected. In this way the AC currents in plate and screen are combined to achieve linearity approaching that of a triode, yet realizing some of the gain of a pentode.

From the secondary of the output transformer, a full 35 db of negative feedback is injected at the cathode of the input tube through a feedback loop of R-24 and C-13. The high amount of negative feedback reduces distortion virtually to the vanishing point. Because the circuit is so stable, the high degree of feedback is permissable — there is no tendency toward low-frequency instability or ultrasonic oscillation.

The power supply section uses a rugged power transformer, T-1. Multiple filter capacitors, resistors and a filter choke reduce power supply ripple to a negligible level. The GZ34 rectifier tubes are indirectly heated cathode types which delay the B+ voltage when the amplifier is turned on. This delay protects the filter capacitors from voltage surges. The heaters of the rectifier tubes are connected in series so if one tube heater opens, the other tube is protected from serious damage. As a further protection from hum, the filament circuit of all tubes are elevated to +43 volts, reducing any tendency of leakage to the tube cathodes.

HOW TO CONNECT A PHONO PLUG

If you wish to connect a phono plug to your preamplifier or tuner cable, see Figure 28.

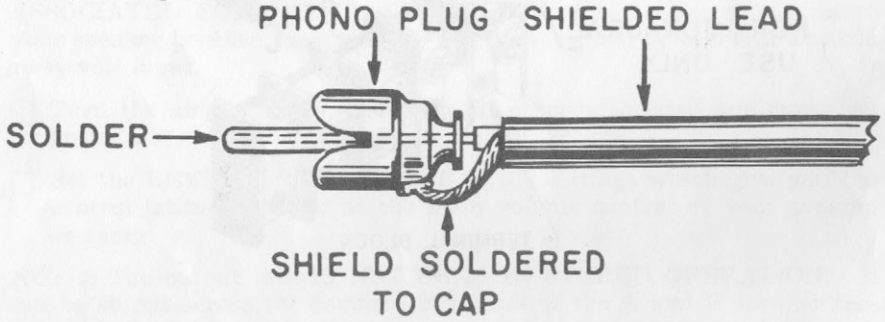


FIGURE 28. HOW TO CONNECT A PHONO PLUG

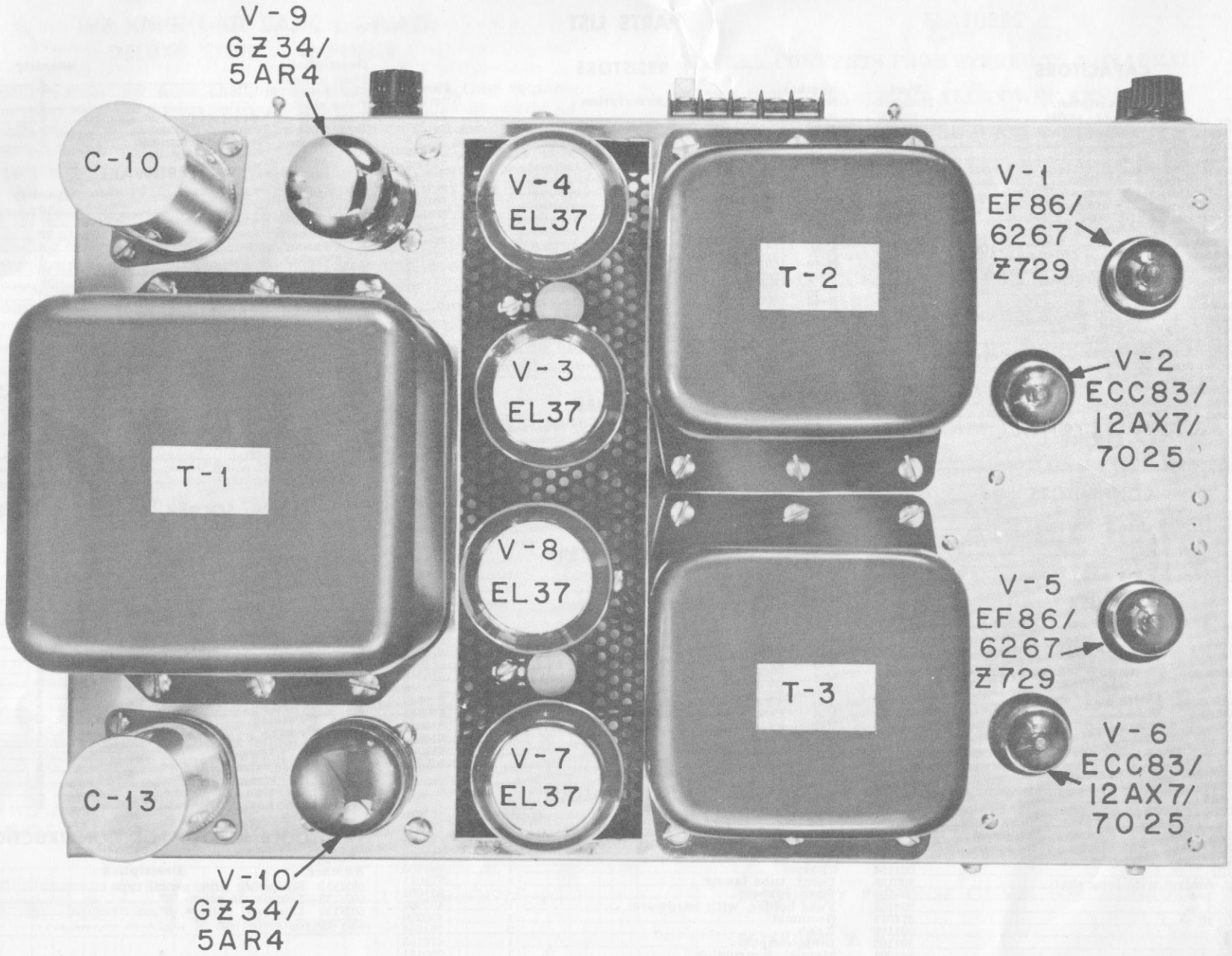


FIGURE 29. TOP VIEW

PARTS LIST

CAPACITORS

Symbol Number	Description	Part Number
C-1	Paper tubular, .25 μfd, 150V	293008
C-2	Electrolytic, 50 μfd, 10V	221500
C-3	Ceramic disc,680 μμfd	277688
C-4	Ceramic disc, .02 μfd	276025
C-5	Ceramic disc, .02 μfd	276025
C-6	Paper tubular, 2 μfd, 150V	293009
C-7	Molded tubular, .25 μfd, 400V	295003
C-8	Molded tubular, .25 μfd, 400V	295003
C-9	Electrolytic, 16 μfd, 700V	207160
C-10	Electrolytic, 60/30/40/40 μfd 500/450/250/100V	236402
C-11A, B	Ceramic disc, dual .01 μfd	297003
C-12	Ceramic disc, 220 μμfd	276228
C-13	Electrolytic, 60/30/40/40 μfd, 500/450/250/100V	236402
C-14	Ceramic disc, 150 μμfd	276158
C-15	Ceramic disc, .005 μfd, 1000V	277054
C-16	Paper tubular, .25 μfd, 150V	293008
C-17	Electrolytic, 50 μfd, 10V	221500
C-18	Ceramic disc, 680 μμfd	277688
C-19	Ceramic disc, .02 μfd	276025
C-20	Ceramic disc, .02 μfd	276025
C-21	Paper tubular, 2 μfd, 150V	293009
C-22	Molded tubular, .25 μfd, 400V	295003
C-23	Molded tubular, .25 μfd, 400V	295003
C-24	Ceramic disc, .01 μfd	276015

CHOKE

L-1	Filter, 4 hy	140005

CONNECTORS

J-1	Jack, INPUT CHANNEL "A"	502220
J-2	Jack, INPUT CHANNEL "B"	502220
J-3	Meter jack for V-3	502231
J-4	Meter jack for V-4	502231
J-5	Meter jack for V-7	502231
J-6	Meter jack for V-8	502231

FUSE

F-1	Fuse, 4 Ampere	491005

RESISTORS

All resistors are ½ watt, 10% tolerance, unless otherwise specified.

R-1	500KΩ control with short shaft	390018
R-2	4700Ω, 5%	330011
R-3	2200Ω	301222
R-4	100Ω, 5%	330012
R-5	3300Ω	301332
R-6	6800Ω	301682
R-7	100KΩ, 5%	330008
R-8	390KΩ	301394
R-9	1 megΩ	301105
R-10	68KΩ	301683
R-11	33Ω	301330
R-12	205KΩ, 1%	342053
R-13	200KΩ, 1%	342003
R-14	150KΩ	301154
R-15	150KΩ	301154
R-16	100Ω, control with long shaft	390138
R-17	100Ω, 1 w	304101
R-18	100Ω, 1 w	304101
R-19	260Ω, 10 w	374011
R-20	1000Ω	301102
R-21	1000Ω	301102
R-22	4000Ω, 1%	344001
R-23	500KΩ, control with long shaft	390019
R-24	4700Ω, 1%	344701
R-25	10KΩ, 1 w	304103
R-26	68KΩ, 2 w	307683
R-27	68KΩ, 1 w	304683

RESISTORS

Symbol Number	Description	Part Number
R-28	4700Ω, 5%	330011
R-29	2200Ω	301222
R-30	100Ω, 5%	330012
R-31	6800Ω	301682
R-32	100KΩ, 5%	330008
R-33	390KΩ	301394
R-34	1 megΩ	301105
R-35	68KΩ	301683
R-36	33Ω	301330
R-37	200KΩ, 1%	342003
R-38	205KΩ, 1%	342053
R-39	150KΩ	301154
R-40	150KΩ	301154
R-41	100Ω, control with short shaft	390137
R-42	100Ω, 1 w	304101
R-43	100Ω, 1 w	304101
R-44	260Ω, 10 w	374011
R-45	1000Ω	301102
R-46	1000Ω	301102
R-47	10KΩ, 1 w	304103
R-48	68KΩ, 2 w	307683
R-49	68KΩ, 1 w	304683

SWITCHES

S-1	4-terminal toggle, with hardware	430200
S-2	Push button	434003
S-3	3-terminal toggle, with hardware	430102

TERMINAL STRIPS

TS-1	2-terminal	440201
TS-2	Terminal block with threaded holes	441500
TS-3	Terminal block with threaded holes	441500

TRANSFORMERS

T-1	Power	101412
T-2	Output, "A" Channel	102210
T-3	Output, "B" Channel	102210

TUBES

V-1	EF86/Z729/6267	610049
V-2	ECC83/12AX7/7025	611012
V-3	EL37	610048
V-4	EL37	610048
V-5	EF86/Z729/6267	610049
V-6	ECC83/12AX7/7025	610012
V-7	EL37	610048
V-8	EL37	610048
V-9	GZ34/5AR4	611020
V-10	GZ34/5AR4	611020

MISCELLANEOUS

Description	Quantity	Part No.
Board, printed circuit, "A" Channel	1	820048
Board, printed circuit, "B" Channel	1	820046
Bushing, threaded, ⅜"	2	470152
Chassis	1	461805
Decal, tube layout	1	724011
Foot, rubber	4	831001
Fuse holder, with hardware	1	492200
Grommet	1	830200
Knob	2	764501
Link, output	1	470155
Manual, instruction	1	750151
Plate, bakelite, capacitor mounting	4	501541
Plate, bottom	1	463108
Plate, for mounting input terminals	1	470153
Plate, perforated, tube sockets mounting	1	470154
Plug, meter	1	502124
Plug, phono	2	502123
Shield bracket	1	470156
Tube shield	2	510004
Tube socket, 8-pin (octal)	6	501180
Tube socket, 9-pin	2	501694
Tube socket, 9-pin, with ground clip	2	501695

HARDWARE

Description	Quantity	Part No.
Lockwasher, #4	16	582200
Lockwasher, #6	27	582300
Lockwasher, #8	22	582400
Lockwasher, #10	6	582500
Lockwasher, ⅜"	4	582700
Nut, 4-40	16	570220
Nut, 6-32	27	570340
Nut, 8-32	22	570440
Nut, 10-32	6	570540
Nut, ⅜	11	570840
Screw, 4-40 x 1-5/16"	8	567221
Screw, 6-32 x ⅜"	47	560344
Screw, 8-32 x ⅜"	22	560444
Screw, 10-32 x 5/16"	6	563543
Screw, self-tapping, #4	12	562292
Solder lug, #6	10	553005
Spacer, 15/16"	8	470158
Washer, "C" shaped	4	470159
Washer, fiber, small shoulder	10	591300
Washer, fiber, large shoulder	4	591701
Washer, fiber, flat	4	590701
Washer, metal, small	17	580702
Washer, metal, large	2	580902

WIRE, SOLDER, AND SPAGHETTI

Description	Quantity	Part No.
Cable, 9-conductor, 4'	1	803027
Casing, 5"	1	812004
Cord, line	1	802007
Lead, test, black	1	804017
Lead, test, red	1	804018
Solder, rosin core, 12'	1	930002
Spaghetti, thin, 24"	1	812006
Spaghetti, medium, 36"	1	812003
Spaghetti, large, 30"	1	812007
Wire, 2", red	11	801002
Wire, 3", orange	8	801003
Wire, 4", yellow	5	801004
Wire, 5", green	1	801005
Wire, 6", blue	1	801006
Wire, 7", violet	2	801007
Wire, 8", grey	1	801008
Wire, 9", white	3	801009
Wire, 10", brown	1	801010
Wire, brown, stranded, 5½"	2	804034
Wire, blue, stranded, 5½"	2	804039
Wire, bare, thin, 22"	1	804071
Wire, bare, heavy, 36"	1	804016

TOOLS NEEDED FOR CONSTRUCTION

Stock Number	Description	Price*
46N852	Soldering iron, pencil type	$5.16
50N132	Long-nose pliers, 6"	1.54
50N133	Diagonal cutters, 5"	1.34
45N796	Screwdriver, 6"	.71

SUGGESTED ACCESSORIES

83YX779	Metal cover for amplifier	$ 6.50
83YX776	Knight-Kit Stereo Preamplifier	62.50

*** Subject to change.**

See Allied Radio Catalog for a Wide Selection of Record Changers or Turntables with Stereo Cartridges, Speakers and Enclosures.

RESISTANCE CHART

All measurements made with a VTVM. All resistances indicated in ohms. All resistances to ground except as shown. All controls maximum counterclockwise except CATHODE balance controls. Unit not plugged into a power outlet.

TUBE	PIN								
	1	2	3	4	5	6	7	8	9
V-1 EF86/Z729/ 6267	390K*	0	2.3K	335Ω ~	335Ω ~	100K*	0	2.3K	4.7K
V-2 ECC83/ 12AX7/7025	200K**	100K*	68K	335Ω	335Ω	205K**	1.1M*	68K	335Ω
V-3 EL37	0	335Ω ~	75Ω§	50Ω§	151K	NA	335Ω	335Ω	
V-4 EL37	0	335Ω ~	75Ω§	50Ω§	151K	NA	335Ω	335Ω	
V-5 EF86/ Z729/6267	390K†	0	2.3K	335Ω ~	335Ω ~	100K†	0	2.3K	4.7K
V-6 ECC83/ 12AX7/70??	200K††	100K†	68K	335Ω ~	335Ω ~	205K††	1.1M†	68K	335Ω
V-7 EL37	0	335Ω ~	75Ω§	50Ω§	151K	NA	335Ω	335Ω	
V-8 EL37	0	335Ω ~	75Ω§	50Ω§	151K	NA	335Ω	335Ω	
V-9 GZ34/ 5AR4	NA	90Ω§	NA	55Ω	NA	55Ω	NA	90Ω§	
V-10 GZ34/ 5AR4	NA	90Ω§	NA	55Ω	NA	55Ω	NA	90Ω§	

* To C10 terminal marked with a triangle.
† To C13 terminal marked with a triangle.
§ To C10 or C13 terminal marked with a semi-circle.
** To C10 terminal marked with a square.
†† To C13 terminal marked with a square.
NA — Not Applicable.

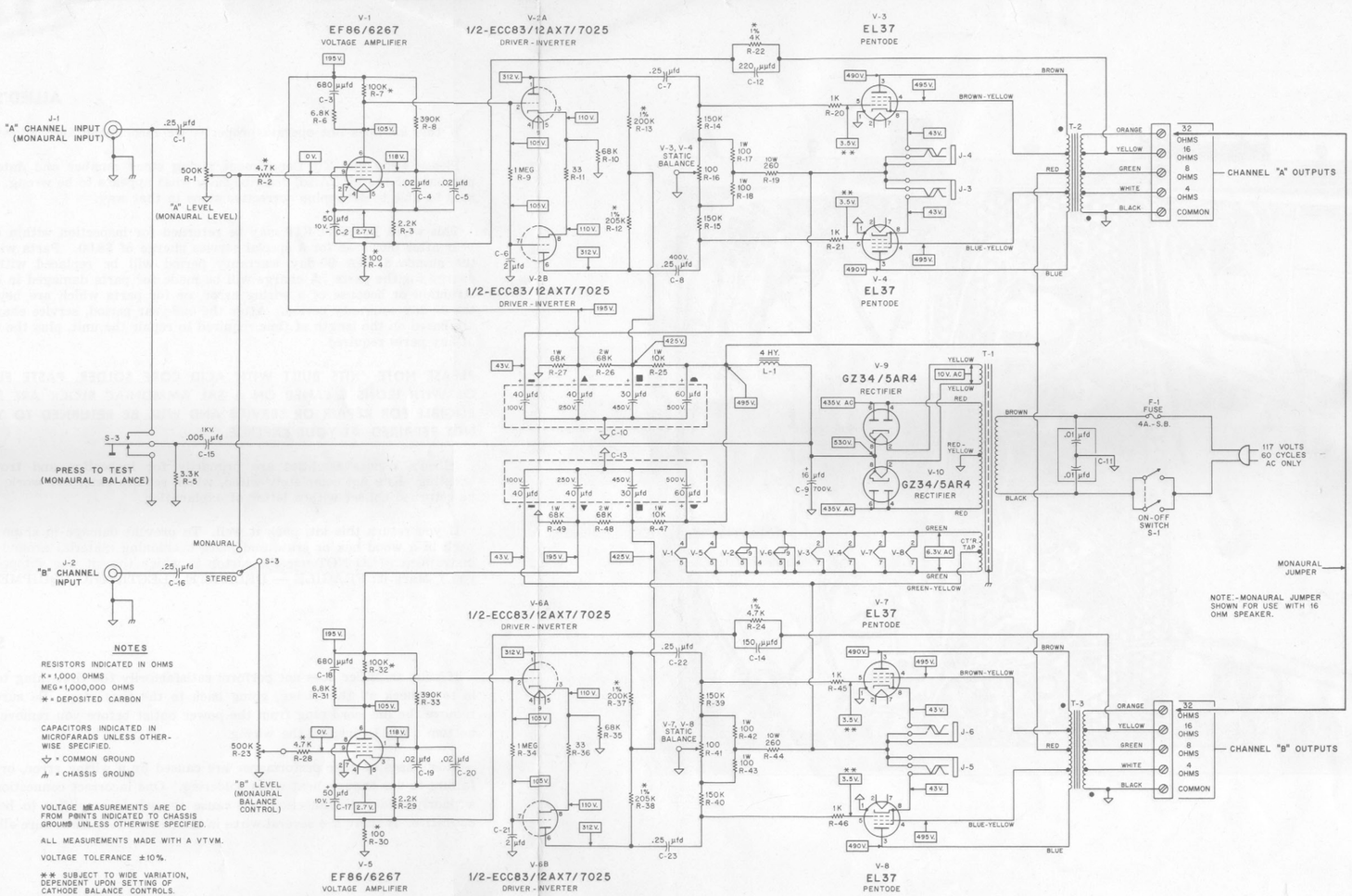
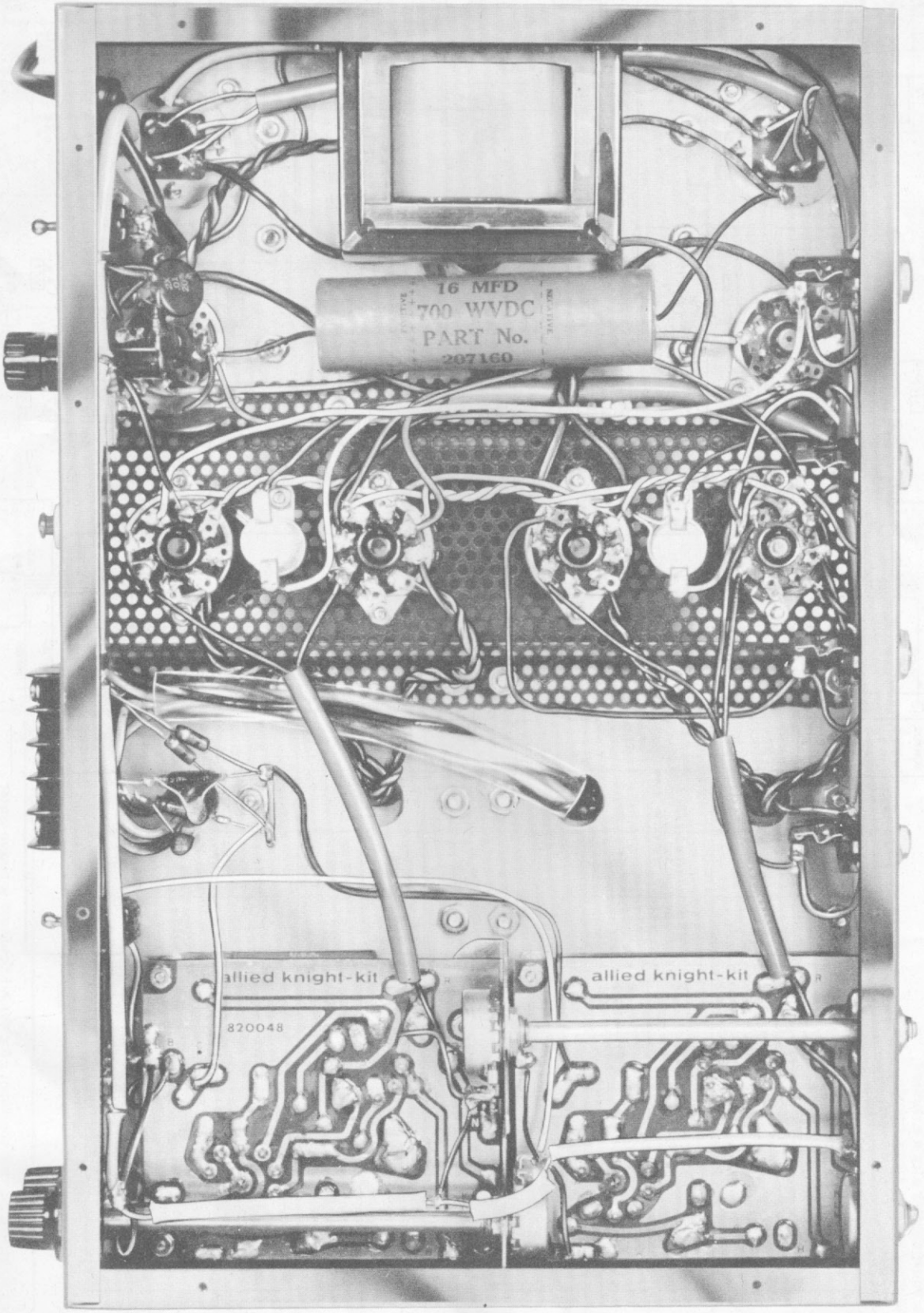


FIGURE 30. SCHEMATIC DIAGRAM


16 MFD
700 WVDC
PART No.
207160
allied knight-kit
allied knight-kit
820048

ALLIED'S SERVICE FACILITIES

If this kit does not operate properly, we recommend the following:

Please write our Kit Department giving stock number and date of purchase of the kit. Also, describe fully what appears to be wrong. We may be able to determine corrective steps in that way.

This wired KNIGHT-KIT may be returned for inspection within one-year after purchase for a special service charge of $8.00. Parts within the standard EIA 90-day warranty period will be replaced without charge for the parts. A charge will be made for parts damaged in construction or because of a wiring error, or for parts which are beyond the 90-day warranty period. After the one-year period, service charges are based on the length of time required to repair the unit, plus the cost of any parts required.

PLEASE NOTE: KITS BUILT WITH ACID CORE SOLDER, PASTE FLUX, OR WITH IRONS CLEANED ON A SAL AMMONIAC BLOCK ARE NOT ELIGIBLE FOR REPAIR OR SERVICE AND WILL BE RETURNED TO YOU NOT REPAIRED, AT YOUR EXPENSE.

Allied's service facilities are primarily for inspection and trouble shooting. Kits not completely wired, which require extensive work, will be returned collect with a letter of explanation.

If you return this kit, pack it well. To prevent damage in shipment, pack in a wood box or crate and place cushioning material around the instrument. (DO NOT use the carton in which the kit was shipped to you.) Mark it: FRAGILE — DELICATE ELECTRONIC EQUIPMENT.

Send the kit prepaid and insured. We will return the repaired kit to you C.O.D. as soon as repairs are completed. If you wish to save C.O.D. fees, your advance remittance may be enclosed for standard repair charges plus transportation costs. Any excess remittance will be refunded.

ALLIED'S GUARANTEE ON KNIGHT-KITS

The designs and components selected for KNIGHT-KITS represent over a quarter of a century of experience in kit development. Allied extends these firm guarantees on KNIGHT-KITS:

We guarantee that the circuits on all KNIGHT-KITS have been carefully engineered and tested.

We guarantee that only high-quality components are supplied. All parts are covered by the standard EIA 90-day warranty. Any faulty components will be replaced prepaid and without charge if reported to us within the warranty period. We reserve the right to request the return of defective parts.

If your kit was damaged in shipment, please write us at once, describing the condition in which the shipment was received. If your kit was part of a Railway Express shipment that was damaged in transit, please notify the Railway Express agent at once and then write us.

SERVICE HINTS

If your amplifier does not perform satisfactorily the first thing to do is to recheck all the wiring, going back to the first step. Be sure to remove the line cord plug from the power outlet before you remove the bottom plate to inspect the wiring.

Most cases of poor performance are caused by a wiring error, or the failure to use enough heat when soldering. One incorrect connection or a poorly soldered connection can cause the whole amplifier to be inoperative. If there are several wires in one connection, make sure all the wires are soldered. Carefully check the soldering on the printed circuit boards. All leads should be soldered to the foil but solder should not bridge across (short) two separate foil areas.

Be sure the V-1, V-2, V-5 and V-6 tubes are in the correct sockets. If the filaments of V-9 and V-10 do not light, one of these two tubes is probably defective. If you have a VTVM or VOM, you can measure voltages at the key points. The proper voltages are shown on the schematic diagram. Voltage measurements may vary within 10% of the listed values without affecting the performance of the amplifier.

ALLIED KNIGHT-KIT Basic 60-Watt Deluxe Stereo Amplifier

83 YU 777

Please correct the following pages in your manual before you build your amplifier:

PAGE 4.

The top figure is for monaural output and should be labeled Figure 4.
The bottom figure is for stereo output and should be labeled Figure 3.

PAGE 5.

The top figure shows monaural curves and should be labeled Figure 6.
The bottom figure shows stereo curves and should be labeled Figure 5.

PAGE 21 AND FIGURE 24ON THE INSERT.

C-11, the dual .01-.01 µfd disc capacitor has been replaced with two separate .01 µfd capacitors. Delete the first step on page 21 and replace it with:

(V) Slip 1/2" thin spaghetti on one lead of C-11, a .01 µfd disc capacitor. Solder the lead to terminal 2 of F-1 (2 wires). Twist the other lead together with one lead of C-24, another .01 µfd disc capacitor. Slip 1/2" thin spaghetti on the twisted leads and solder them to the busbar. Solder the other lead of C-24 to terminal 2 of S-1. At the same time, solder the line cord to terminal 2 of S-1, as shown.

PAGE 23.

FIGURE 27. CONNECTING LEADS TO THE METER PLUG

The lead that is marked plus (+) should be marked minus (-). The lead now marked minus (-) should be marked plus (+).

PAGE 26.

PARTS LIST

Delete the line listing "C" shaped washers and replace it with:

Washer, "C" shaped 4 470157

Delete the line listing C-11, A, B and replace it with:

C-11 Ceramic disc, .01 µfd..... 276015
C-24 Ceramic disc, .01 µfd..... 276015

ALLIED RADIO CORPORATION

37K296
750151-3 1158