

KG-865
50-WATT
SOLID-STATE
STEREO AMPLIFIER

CONSTRUCTING YOUR KNIGHT-KIT

The solid-state amplifier you will build has been designed to deliver the finest quality sound-reproduction. The construction information given here has been carefully worked out to guide you every step.

The only tools that you require are a large and a small screwdriver, a pair of long-nose pliers, a pair of wire cutters and a 23 to 50 watt soldering iron with a pencil-type tip. Although they are not absolutely necessary, a set of nut drivers is very helpful.

Capacitors come in many shapes, sizes and types. Many of the capacitors used in this kit are of the "electrolytic" type. These units have a positive + and a negative — lead. It is imperative that you connect these leads to the point indicated in the construction step. These capacitors are all marked with two essential characteristics: capacitance, marked in microfarads (Mfd or μfd) and voltage, (V). Typical markings are:

250 MFD 15V | 10 MF 6V | 10-25 DC

In each unit the first number is the capacitance in microfarads, the second number is the working voltage. Notice in the third example that the abbreviation for microfarad is missing, however you can still tell that this unit is a 10 μf at 25V. In this particular kit, the voltage rating may be disregarded.

Ceramic disc capacitors have their value (capacitance) marked in either of two units. The first unit is identical to the electrolytic types, the μfd . The second unit is a million times smaller, it is the micromicrofarad, $\mu\mu\text{fd}$ (sometimes noted as picofarad, pf). Disc capacitors often do not have the unit indicated on them. You can quickly tell what the unit is, however, by the numbers given. If the number starts with a decimal point, such as .0033, read it as .0033 μfd . If a part is marked in whole numbers, such as 6800, read it as 6800 $\mu\mu\text{fd}$. Disregard voltage ratings on disc capacitors also.

The resistors for your kit are supplied on plainly marked cards. Do not remove the resistors from the cards until you need them. Four sizes of resistors are supplied. In order of increasing sizes, these are: $\frac{1}{4}$, $\frac{1}{2}$, 1, and 2-watt units. The majority of them are the $\frac{1}{2}$ -watt size. Unless otherwise specified in the instruction step, the resistor called for is $\frac{1}{2}$ -watt.

The value (resistance) is indicated by the first three color bands. The fourth band indicates the amount the resistance can vary from the stated value, with silver representing 10%, and gold, 5% tolerance. If the tolerance is important in a particular step, this will be specified.

Variable resistors (controls) have their value and part number stamped on the case.

The wire supplied with your kit is precut and prestripped. Be sure to use the color that is called for. Flexible tubing is provided to cover bare wires and leads when called for, or whenever you think there is a possibility that a lead will touch nearby leads or the chassis (even though the instructions do not specify its use).

UNPACKING

This step is important because it gives you a chance to become familiar with the parts used in your kit.

- Carefully unpack all the parts.
- Check the contents of your kit against the PARTS LIST. Use the wiring illustrations for any parts you do not recognize. The controls and large resistors are too large to mount on the cards, so these spaces have been left vacant.

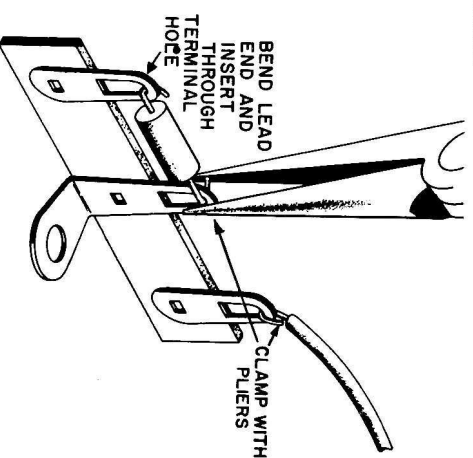
Assort hardware by size. A plastic ice-cube tray or muffin baking pan is very handy for keeping small parts and hardware separate. It will also prevent misplacement.

NOTE: Since hardware is weighed rather than counted, you will find you have extra screws, nuts and lockwashers. Also, we have given you extra wire in case you should need some.

A check box has been placed at the beginning of each step; use it to check off each step when it is completed.

Before you start construction, we want to emphasize some important points:

1. The key to proper operation of any electronic kit is . . . **SOLDERING.** It must be done properly. We suggest that you carefully study the instructions given on the facing page.
2. When you connect wires or leads to terminals, **you must make a good mechanical connection.** Wrap the lead tightly around the terminal and clamp it firmly with your pliers.
3. Follow the instructions!



Check your work frequently. It is a good rule to go back over your work at the end of each page.

One last word before you begin construction—**TAKE YOUR TIME;** relax and enjoy yourself!

THIS KIT MUST BE PROPERLY SOLDERED!

USE ENOUGH HEAT

This is the main idea of good soldering. Apply enough heat to the metal surfaces you are joining to make the solder spread freely, until the contour (shape) of the connection shows under the solder. **AN ELECTRONIC UNIT WILL NOT WORK . . .** unless it is properly soldered. Read these instructions carefully to understand the basic ideas of good soldering.

Enough heat must be used so the solder can actually penetrate the metal surfaces, making an unbroken path over which electricity can travel. You are not using enough heat if the solder barely melts and forms a rounded ball of rough, flaky solder.

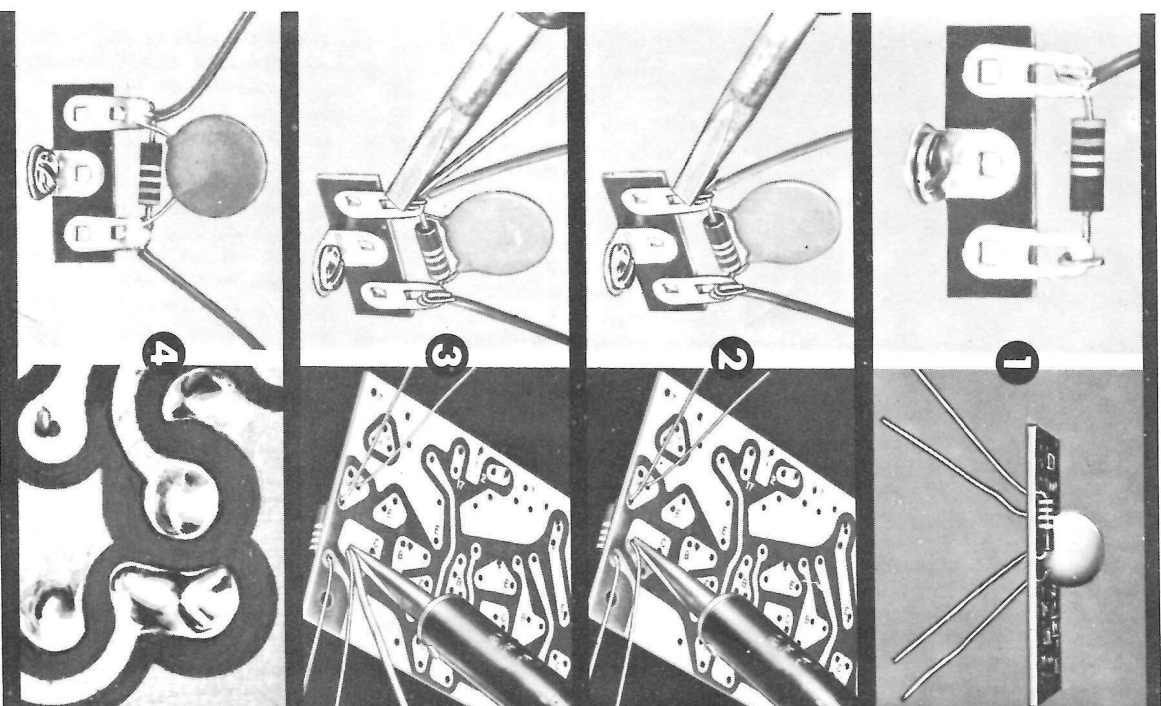
Use the Right Soldering Tool

A soldering iron in the 27-40 watt range is recommended. Any iron in this range with a clean, chisel-shaped tip will supply the correct amount of heat to make a good solder connection. You may also use a solder gun but make sure the tip reaches full heat before you solder.

Keep the iron or gun tip brightly coated with solder. When necessary, wipe the hot tip clean with a cloth. If you are using an old tip, clean it before you start soldering.

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.



HERE'S HOW TO DO IT . . .

1. Join bare metal to bare metal; insulation must be removed. Make good mechanical connections and keep resistor and capacitor leads as short as possible, unless otherwise specified.

2. Coat the tip of a hot iron with solder. Then **Firmly Press the Flat Side of the Tip** against the parts to be soldered together. Keep the iron there while you . . .

3. Apply the solder between the metal to be soldered and the iron tip. Use only enough solder to flow over all surfaces of the connection, and all wires in the connection. Remove the iron.

Do Not Move Parts Until the Solder Hardens. If you accidentally move the wires as the solder is hardening, apply your iron and reheat.

4. 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 and all wires in the connection should be well-soldered.

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.**

MOUNTING PARTS ON THE DRIVER PRINTED CIRCUIT BOARD

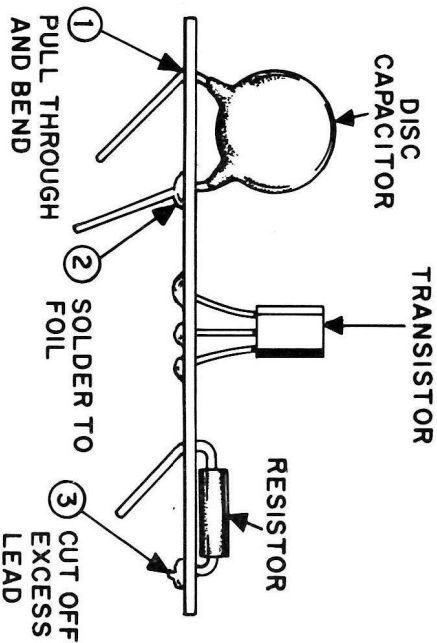


Figure 1

Much of the wiring of your amplifier is supplied by two printed circuit boards. The top of the boards have outlines to show where each part is mounted. The bottom of the board has a metal foil pattern, which takes the place of wires between parts.

To complete the circuit, the leads of the parts are soldered to the foil. The blue pattern is a special coating to prevent solder from flowing between foil paths.

Notice how parts are mounted in Figure 1—tightly down against the board. The leads are soldered on the foil side of the board. Solder the lead right at the point it comes through the foil. Clip off the lead right at the solder connection.

Notice Figure 2. If excess solder is used, it may "bridge" across from one foil path to another and cause a short circuit. Do not allow this to happen.

SEE FIGURE 3.

Identify the Driver Circuit Printed Circuit Board by its part number, 820218. Mount the following group of parts:

- R-61, 1 Ω , 2-watt resistor with brown, black, gold and silver bands.
- R-63, 1 Ω , 2-watt resistor (brown, black, gold).

NOTE: The fourth color band on resistors will not be noted, unless it is gold, which indicates a 5% tolerance resistor.

- R-65, 150 Ω , 1-watt resistor (brown, green, brown).
- R-67, 150 Ω , 1-watt resistor (brown, green, brown).



Figure 2

- R-68, 150 Ω , 1-watt resistor (brown, green, brown).
 - R-66, 150 Ω , 1-watt resistor (brown, green, brown).
 - R-62, 1 Ω , 2-watt resistor (brown, black, gold).
 - R-64, 1 Ω , 2-watt resistor (brown, black, gold).
- Now turn the board over and solder each component as follows:

NOTE: Before you start soldering, is the tip of the iron clean and brightly coated with solder? For good soldering (which you will remember is the key to good electrical operation), you must keep the tip of your iron clean and brightly coated with solder. Frequently wipe the tip of your iron on a rag to keep it clean.

1. **Solder each lead of each part only at the hole in the metal foil where the lead comes through.** Be sure you heat the connection until the solder spreads around the lead and the hole.
2. Cut off each lead as close as possible to the board. Inspect each soldered lead to be sure it does not short across to an adjacent foil area.

Mount the next group of parts.

- R-59, 2.4K, 5% resistor (red, yellow, red, gold).
- R-49, 1K resistor (brown, black, red).
- R-75, 270 Ω , 1-watt resistor (red, violet, brown).
- R-47, 33K resistor (orange, orange, orange).
- R-48, 33K resistor (orange, orange, orange).
- R-50, 1K resistor (brown, black, red).
- R-60, 2.4K, 5% resistor (red, yellow, red, gold).

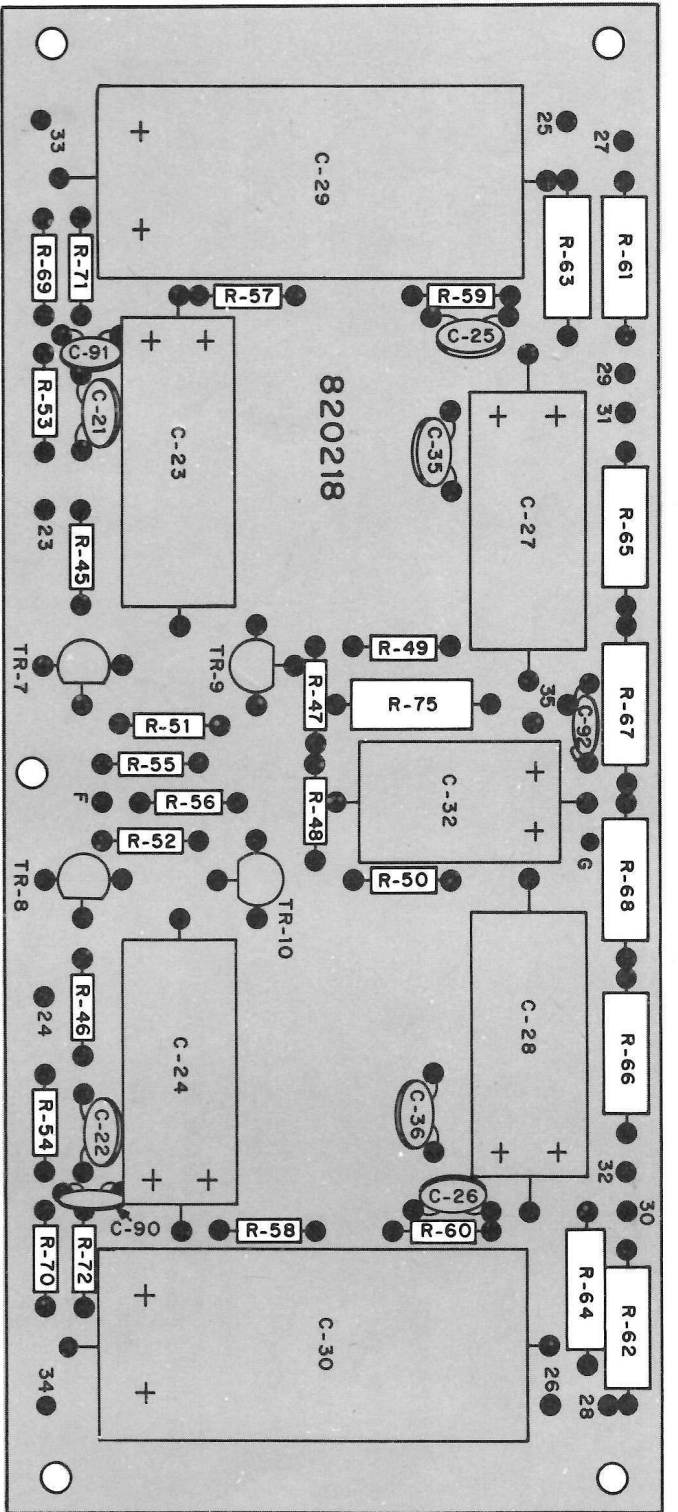


Figure 3

Carefully solder each lead of the parts just mounted. Cut off the leads as close as possible to the board.

Mount the next group of parts.

- R-57, 82 Ω resistor (gray, red, black).
 - R-71, 560 Ω resistor (green, blue, brown).
 - R-69, 560 Ω resistor (green, blue, brown).
 - R-53, 100K resistor (brown, black, yellow).
 - R-45, 4.7K resistor (yellow, violet, red).
 - R-51, 100K resistor (brown, black, yellow).
 - R-55, 100 Ω , 5% resistor (brown, black, brown, gold).
- Carefully solder each lead of the parts just mounted. Cut off the leads as close as possible to the board.
- Mount the next group of parts.
- R-56, 100 Ω , 5% resistor (brown, black, brown, gold).
 - R-52, 100K resistor (brown, black, yellow).

R-46, 4.7K resistor (yellow, violet, red).

R-54, 100K resistor (brown, black, yellow).

R-58, 82 Ω resistor (gray, red, black).

R-72, 560 Ω resistor (green, blue, brown).

R-70, 560 Ω resistor (green, blue, brown).

Carefully solder each lead of the parts just mounted. Cut off the leads as close as possible to the board.

Now, carefully inspect all soldering on the foil side of the board.

1. Are there any solder "bridges", as illustrated in Figure 2? If there are, hold the board foil side down,—place your hot soldering iron (no solder) against the solder "bridge" and let the solder run down and away from the foil area.

2. Be sure to cut off any excess lead ends.

3. Does each solder connection have a shiny, metallic finish? They should! If not, reheat the connection and add a little solder if necessary.

MOUNTING PARTS ON THE DRIVER PRINTED CIRCUIT BOARD--Continued

SEE FIGURE 4.

Mount the following group of parts.

- C-25, 0.005 μf disc capacitor.
- C-35, 0.01 μf disc capacitor.
- C-92, 0.05 μf disc capacitor.
- C-36, 0.01 μf disc capacitor.
- C-26, 0.005 μf disc capacitor.

Be sure the tip of your soldering iron is clean and brightly coated with solder. Carefully solder each lead of the parts just mounted. Cut off the leads as close as possible to the board.

Mount the next group of parts.

- C-91, 0.0015 μf disc capacitor (may be marked 1500 μmf or pf).
- C-21, 10 μmf (or pf) disc capacitor.
- C-22, 10 μmf (or pf) disc capacitor.
- C-90, 0.0015 μf disc capacitor (may be marked 1500 μmf or pf).

Carefully solder each lead of the parts just mounted. Cut off the leads as close as possible to the board.

The following 7 capacitors must be installed with the positive and negative ends positioned as shown.

- C-29, 2500 μf , 30-volt electrolytic capacitor. Be sure the positive end is positioned as shown.
- C-27, 500 μf , 15-volt electrolytic capacitor. Be sure to position the positive end correctly.
- C-23, 500 μf , 15-volt electrolytic capacitor. Again, be sure you position the positive end correctly.
- C-32, 100 μf , 30-volt electrolytic capacitor. Be sure of the positive end positioning.
- C-28, 500 μf , 15-volt electrolytic capacitor. Be sure you have the positive end positioned correctly.
- C-24, 500 μf , 15-volt electrolytic capacitor. Position the positive end correctly.
- C-30, 2500 μf , 30-volt electrolytic capacitor. Be sure the positive end is correctly positioned.

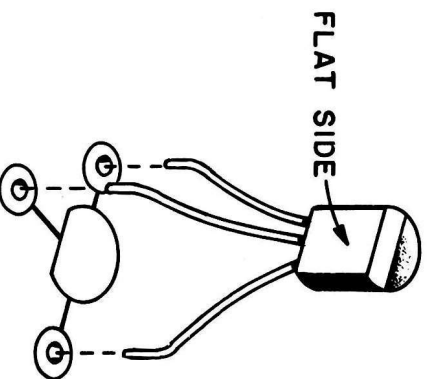
Turn the board over and carefully solder each lead of the parts just mounted. Cut off all excess wire ends as close as possible to the board.

The next parts you are going to mount are transistors. They must be installed with the correct lead going into the holes in the board. Do this by positioning the flat-side of the transistor as indicated on the board and in Figure 4.

Each of these transistors will be marked with 660133 or just 0133 (or they may be identified with MPS 6522).

- TR-9 transistor. Position the flat side as shown and insert each lead into the board as shown in Figure 5. Solder each lead on the foil side.
- TR-10 transistor. Be sure to position the flat side correctly. Solder each lead.
- TR-7 transistor. Position the flat side correctly. Solder each lead.
- TR-8 transistor. Position the flat side correctly. Solder each lead.

Figure 5



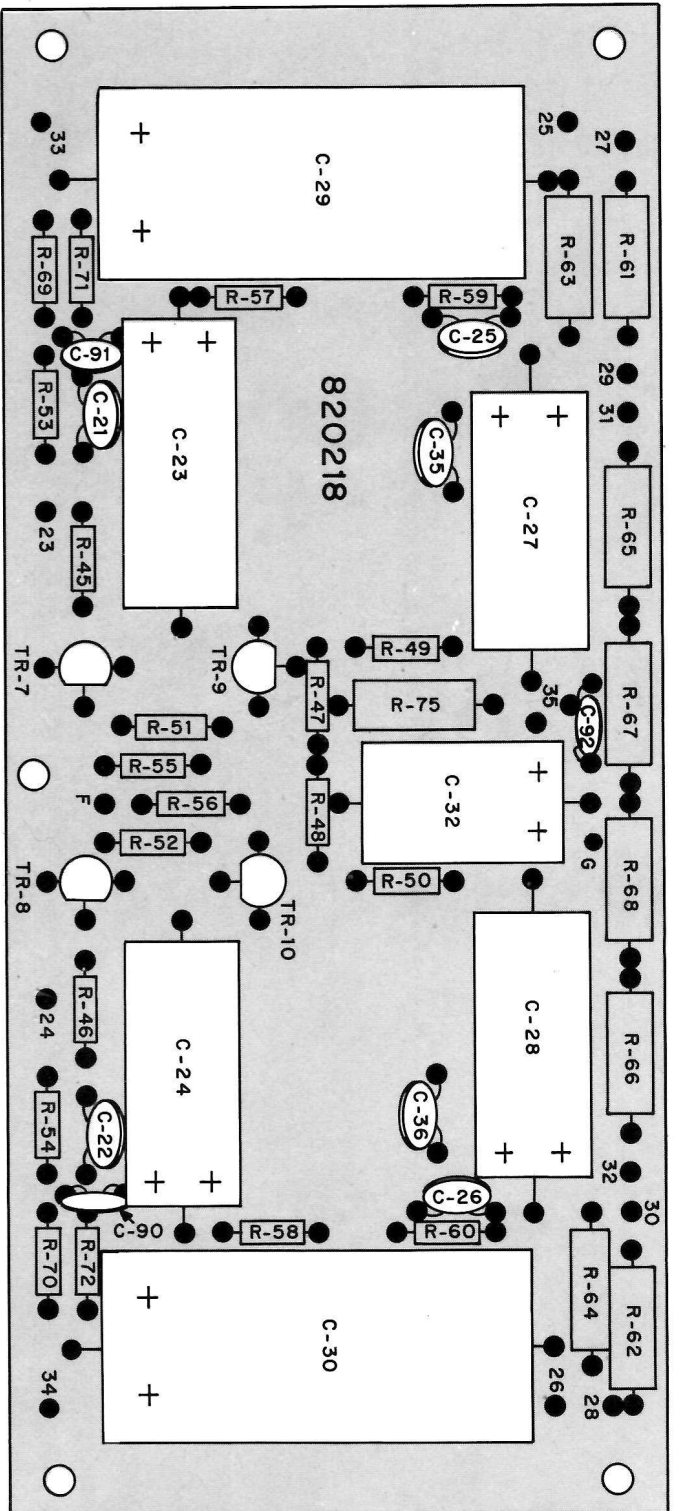
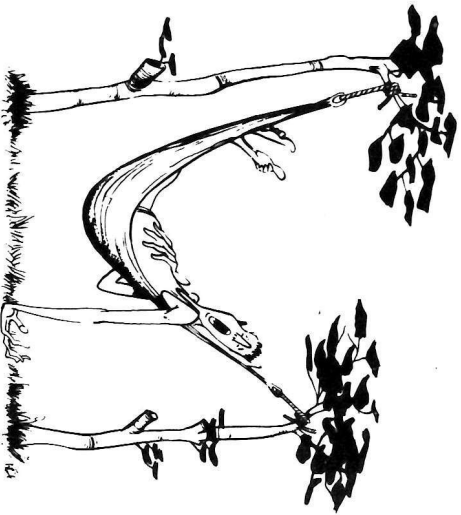


Figure 4

You have completed all work on this printed circuit board. Before you set it aside, check the following:

- Inspect the entire printed circuit board for solder bridges. If there are any areas where solder has flown across foil paths, melt and draw away the excess solder with the hot tip of your iron.
 - Do all solder connections have a shiny, metallic finish? If any connection does not have a shiny, smooth appearance, reheat it and add a little fresh solder.
 - Can any lead be moved in a solder connection (especially the leads of the transistors)? If any can, reheat the connection so the solder holds the lead firmly.
 - Are all transistors positioned with the flat side facing in the proper direction? Check again, just to be sure—compare each with Figure 4.
 - Set the board aside in a safe place.
- May we suggest a rest? Set your kit aside for a few hours and do something else. We know you are eager to finish your kit, but you will find that you will enjoy building far more if you work on your kit for two hours or less at one sitting. Also, you will be less likely to make a mistake.



MOUNTING PARTS ON THE PREAMPLIFIER PRINTED CIRCUIT BOARD

Did you take out time for a rest? Or at least stop for coffee. We hope so, because you will enjoy building even more if you are relaxed.

SEE FIGURE 6.

Identify the Preamplifier Printed Circuit Board by its part number, 820217.

Mount the following group of parts.

- R-41, 200K resistor (red, black, yellow).
- R-35, 5.6K resistor (green, blue, red).
- R-43, 6.8K resistor (blue, gray, red).
- R-33, 10K resistor (brown, black, orange).
- R-39, 39K resistor (orange, white, orange).
- R-37, 5.6K resistor (green, blue, red).
- R-31, 5.6K resistor (green, blue, red).

Turn the board over and solder each lead of the parts just mounted. Is the tip of your soldering iron clean and brightly coated with new solder? Remember, for proper soldering it must be kept clean. Cut off excess wire ends as close as possible to the board.

Mount the next group of parts.

- R-29, 470 Ω resistor (yellow, violet, brown).
- R-27, 39K resistor (orange, white, orange).
- R-19, 100 Ω resistor (brown, black, brown).
- R-17, 1K resistor (brown, black, red).
- R-15, 390K resistor (orange, white, yellow).
- R-13, 390 Ω resistor (orange, white, brown).
- R-11, 56K resistor (green, blue, orange).

Turn the board over and solder each lead of the parts just mounted. Cut off excess wire ends as close as possible to the board.

Mount the following group of parts.

- R-42, 200K resistor (red, black, yellow).
- R-36, 5.6K resistor (green, blue, red).
- R-44, 6.8K resistor (blue, gray, red).

- R-34, 10K resistor (brown, black orange).
- R-40, 39K resistor (orange, white, orange).
- R-38, 5.6K resistor (green, blue, red).
- R-32, 5.6K resistor (green, blue, red).

Turn the board over and solder each lead of the parts just mounted. Cut off excess wire ends as close as possible to the board.

Mount the next group of parts.

- R-30, 470 Ω resistor (yellow, violet, brown).
- R-28, 39K resistor (orange, white, orange).
- R-20, 100 Ω resistor (brown, black, brown).
- R-16, 390K resistor (orange, white, yellow).
- R-18, 1K resistor (brown, black, red).
- R-14, 390 Ω resistor (orange, white, brown).
- R-12, 56K resistor (green, blue, orange).

Turn the board over and solder each lead of the parts just mounted. Cut off all excess wire ends as close as possible to the board.

Mount the next group of parts.

- R-77, 1.5K resistor (brown, green, red).
- R-26, 10K resistor (brown, black, orange).
- R-25, 10K resistor (brown, black, orange).
- R-21, 33K resistor (orange, orange, orange).
- R-22, 33K resistor (orange, orange, orange).
- R-23, 68K resistor (blue, gray, orange).
- R-24, 68K resistor (blue, gray, orange).

Turn the board over and solder each lead of the parts just mounted. Cut off any excess wire ends as close as possible to the board.

Before you go on, check all soldering to be sure each connection has a smooth, shiny, metallic finish. Repeat any connection that appears questionable. Also, check very carefully for any solder bridges. Be sure to correct any problem now.

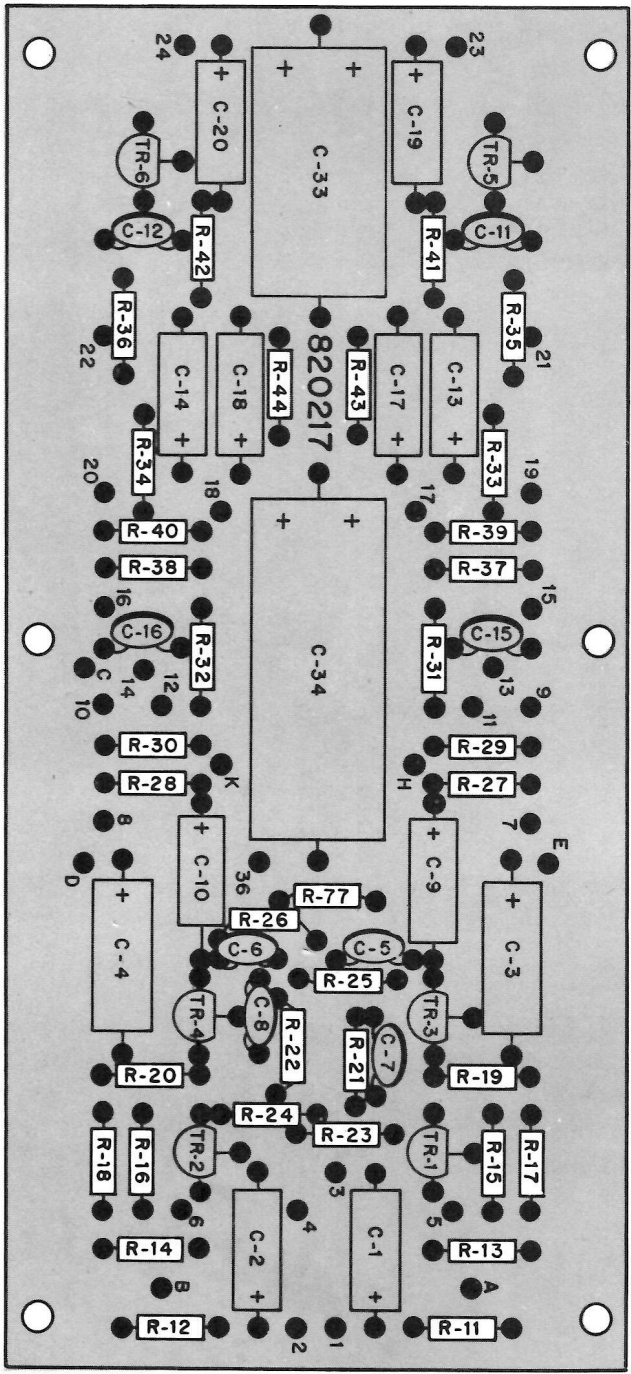


Figure 6

MOUNTING PARTS ON THE PREAMPLIFIER PRINTED CIRCUIT BOARD Cont.

SEE FIGURE 7.

Mount the following group of parts.

- C-11, 0.0022 μf disc capacitor (may be marked 2200 $\mu\mu\text{f}$ or pf).
 - C-12, 0.0022 μf disc capacitor (may be marked 2200 $\mu\mu\text{f}$ or pf).
 - C-15, 0.05 μf disc capacitor.
 - C-16, 0.05 μf disc capacitor.
 - C-5, 0.0068 μf disc capacitor (may be marked 6800 $\mu\mu\text{f}$ or pf).
 - C-6, 0.0068 μf disc capacitor (may be marked 6800 $\mu\mu\text{f}$ or pf).
 - C-7, 0.0022 μf disc capacitor (may be marked 2200 $\mu\mu\text{f}$ or pf).
 - C-8, 0.0022 μf disc capacitor (may be marked 2200 $\mu\mu\text{f}$ or pf).
 - Turn the board over and solder each lead of the parts just mounted.
 - Cut off any excess wire ends as close as possible to the board.
 - The next parts you will mount are transistors. Again, be sure you position them with the flat side facing as illustrated on the board and in Figure 7.
 - Be sure the correct leads go into the correct holes in the printed circuit board.
 - Each of these will be identified by the number 660133 or just 0133 (or they may be marked with MPS 6522).
 - TR-5, transistor. Be sure to position the flat side as shown and mount it as shown in Figure 8. Solder each lead.
 - TR-6, transistor. Solder each lead.
 - TR-3, transistor. Solder each lead.
 - TR-4, transistor. Solder each lead.
 - TR-1, transistor. Solder each lead.
 - TR-2, transistor. Solder each lead.
- All the remaining parts to be mounted on this board are electrolytic capacitors. Remember that these parts must be installed with the positive and negative leads positioned in the direction shown in the illustration and on the board.
- C-19, 10 μf , 15-volt electrolytic capacitor.
 - C-13, 10 μf , 15-volt electrolytic capacitor.
 - C-17, 10 μf , 15-volt electrolytic capacitor.
 - C-9, 10 μf , 15-volt electrolytic capacitor.
 - C-3, 100 μf , 6-volt electrolytic capacitor.
 - C-1, 10 μf , 15-volt electrolytic capacitor.
 - Check to be sure each capacitor is positioned with the + end as illustrated.

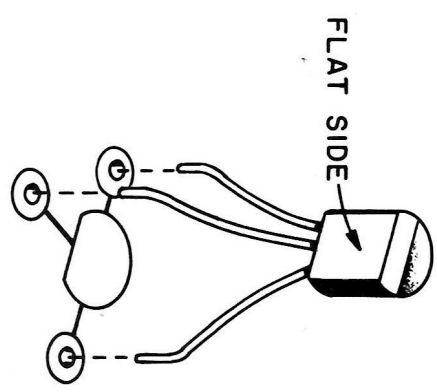


Figure 8

Turn the board over and carefully solder each lead of the parts just mounted. Be sure the tip of your soldering iron is clean and brightly coated with solder. Cut off excess lead lengths as close as possible to the board.

Mount the next group of electrolytic capacitors.

- C-20, 10 μf , 15-volt electrolytic capacitor.
- C-18, 10 μf , 15-volt electrolytic capacitor.
- C-14, 10 μf , 15-volt electrolytic capacitor.
- C-10, 10 μf , 15-volt electrolytic capacitor.
- C-4, 100 μf , 6-volt electrolytic capacitor.
- C-2, 10 μf , 15-volt electrolytic capacitor.
- Check to be sure each of these electrolytic capacitors is positioned with the positive end as illustrated.
- Turn the board over and solder each lead. Cut off all excess wire ends as close as possible to the board.
- Mount the last two electrolytic capacitors.
- C-33, 100 μf , 30-volt electrolytic capacitor.
- C-34, 500 μf , 35-volt electrolytic capacitor.
- Be sure these capacitors are positioned with the positive ends as illustrated. Turn the board over and solder the leads. Cut off excess wires.

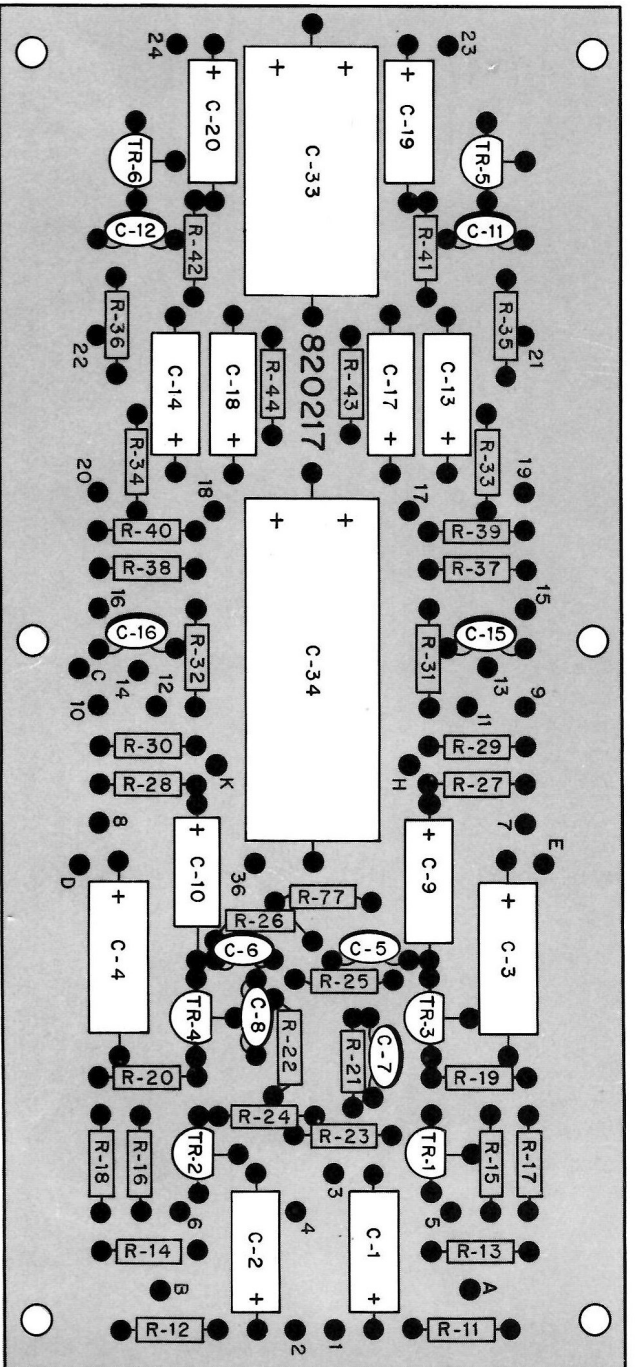


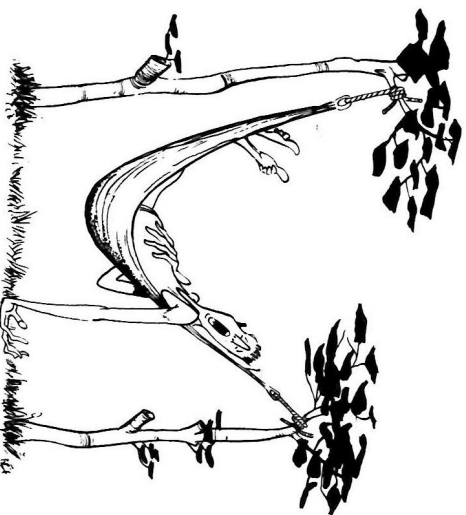
Figure 7

Before you set this completed board aside, check the following:

- Are all transistors positioned with the flat side facing in the proper direction? How about the electrolytic capacitors? Are the positive ends positioned in the proper direction?
- Can any lead be moved in a solder connection? Check the transistor leads especially. If you can move any lead, that solder connection must be reheated and a little solder added if necessary.
- Do all solder connections have a smooth, shiny, metallic finish? If not, reheat the connection and add a little fresh solder as required.
- Carefully inspect the entire board for solder bridges. If there are any areas where the solder has flown across foil paths, melt and draw away the excess solder with the hot tip of your iron.

Set the board aside in a safe place.

How about another rest? Put your kit away for now and come back to it some other time. You will enjoy it more and do a better job if you break up your building sessions into 2 hour stretches or less.



MOUNTING PARTS AND WIRING THE SUB CHASSIS

SEE FIGURE 9.

- Position the sub-chassis in front of you as shown.
- C-31, 4000 μ f, 50-volt, large round electrolytic capacitor. Mount to the chassis with the large metal capacitor mounting clamp, the 6-32 x $\frac{5}{8}$ " screw, lockwasher and nut. Position the capacitor so the + (red dot) and - terminals are as shown. Tighten the screw sufficiently to hold the capacitor firmly.
- TS-1, 4-terminal strip. Mount with a 6-32 x $\frac{1}{8}$ " screw, lockwasher and nut.
- TS-2, 4-terminal strip. Mount as above.
- J-1 and J-2, AC receptacle. Mount each with two 6-32 x $\frac{1}{8}$ " screws, lockwashers and nuts.

Ground screw. Insert the 8-32 x $\frac{1}{2}$ " screw through the sub-chassis, from the inside. From the outside fasten with a lockwasher and nut. Thread on the knurled nut.

Fuse holder. Remove the mounting hardware, except the rubber washer. Insert from the outside of the sub-chassis and fasten with the previously removed hardware. Position so the terminals are as shown.

Line cord and line cord bushing. Mount as shown in Figure 10. Let the ends extend $\frac{1}{4}$ " past the bushing.

IMPORTANT INSTRUCTIONS

The instruction **CONNECT** means: Connect the wire or lead to the given point. Make a firm mechanical connection, **BUT DO NOT SOLDER AT THIS TIME**. Another wire(s) will be connected to this point.

The instruction **SOLDER** means: Connect the wire or lead to the given point, and then solder the connection and all wires in it. If there is more than one wire in the connection, the number will be stated—for example (2 wires). After soldering the connection, trim all wires as close as possible to the terminal.

Before you start soldering again, is the tip of your soldering iron clean and brightly coated with solder? Remember to wipe it frequently.

Connect one end of the line cord to terminal 1 of J-1. Connect the remaining end to terminal 2 of J-1.

Gray wire. Solder one end to the negative terminal of C-31. Connect the other end to terminal 1 of TS-2.

Violet wire. Solder one end to the positive (+ or red dot) terminal of C-31. Connect the other end to terminal 2 of TS-1.

Heavy green wire (there is only one that is heavier than the others). Connect one end to terminal 2 of TS-1. Thread the other end out through the hole shown; it will be connected later.

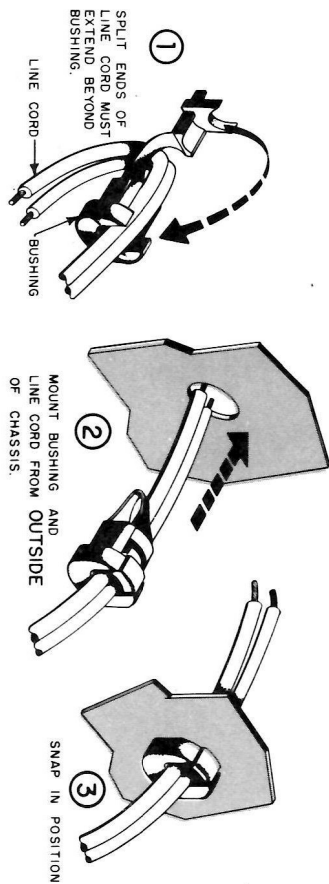


Figure 10

WIRING NOTE: As you add wires to the sub-chassis and later on to other portions of the unit, attempt to keep all wires routed down near the chassis. This will make your amplifier look neat and will assist you in checking your work.

Brown wire. Connect one end to terminal 4 of TS-1. Thread the other end out through the hole shown.

Gray wire. Connect one end to terminal 1 of TS-2. Thread the other end out through the hole shown.

6" blue wire. Connect one end to terminal 1 of TS-2. Thread the other end out through the hole shown.

Green wire. Connect one end to terminal 2 of TS-1. Thread the other end out through the hole shown.

Violet wire. Connect one end to terminal 3 of TS-2. Thread the other end out through the hole shown.

Red wire. Connect one end to terminal 1 of TS-2. Connect the other end to terminal 4 of TS-2.

Red wire. Solder one end to terminal 2 of J-1 (2 wires). Connect the other end to terminal 2 of J-2.

Orange wire. Connect one end to terminal 1 of J-2. Solder the other end to terminal 2 of the fuse holder.

The next four parts you will install are diodes. They must be installed with the marked end positioned in the proper direction. The marked end may be identified by a band, its bullet shape or a + mark. Be sure you identify the marked end before you install a diode. They are marked with part number 622-202.

SEE SUPP. B

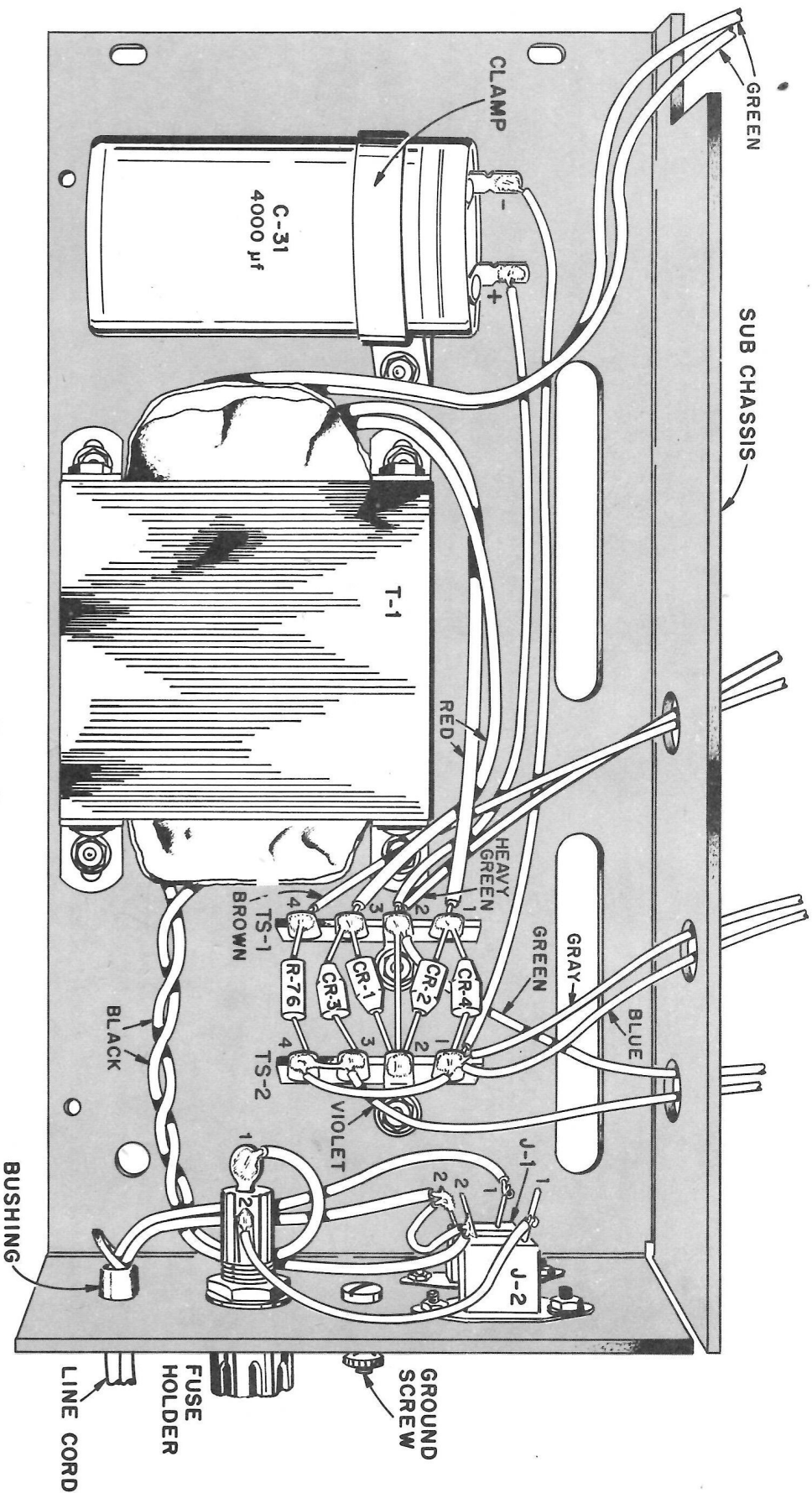


Figure 9

- CR-4 diode. Connect the lead from the marked end to terminal 1 of TS-1. Solder the other lead to terminal 1 of TS-2 (5 wires). Be sure all 5 wires in this connection are covered with solder.
- CR-2 diode. Connect the lead from the marked end to terminal 2 of TS-2. Connect the other lead to terminal 1 of TS-1.
- CR-1 diode. Connect the lead from the marked end to terminal 2 of TS-2. Connect the other lead to terminal 3 of TS-1.
- CR-3 diode. Connect the lead from the marked end to terminal 3 of TS-1. Thread the other end through terminal 3 of TS-2 and connect to terminal 4 of TS-2. Solder terminal 3 of TS-2 (2 wires); be sure the violet wire is soldered in this connection.
- R-76, 820 Ω resistor (gray, red, brown). Solder one lead to terminal 4 of TS-1 (2 wires). Solder the other lead to terminal 4 of TS-2 (3 wires).
- 2" bare wire. Solder one end to terminal 2 of TS-1 (4 wires). Solder the other end to terminal 2 of TS-2 (3 wires).
- T-1 power transformer. Position in the sub chassis so the black leads extend to your right and the red and green leads extend to your left. Mount with four 6-32 x 3/8" screws, lockwashers and nuts. Be sure these screws are tight.
- Twist the black leads together and solder one of them to terminal 2 of J-2 (2 wires). Solder the other black lead to terminal 1 of the fuse holder.
- Twist the red leads together and solder one of them to terminal 3 of TS-1 (3 wires). Solder the other lead to terminal 1 of TS-1 (3 wires).
- Twist the green leads together and position them as shown; they will be connected later.
- How about another rest now? You have been working for quite a while and should take out some time for a stretch.

MOUNTING AND WIRING TRANSISTOR SOCKETS ON THE SUB CHASSIS

SEE FIGURE 11.

- Reposition the sub chassis in front of you as shown.
 - Two smaller transistor sockets. Mount for TR-11 and TR-12 with two 4-40 x 3/8" screws, lockwashers and nuts for each socket. **Mount the sockets so the notches are positioned as shown.**
 - Four remaining transistor sockets. Mount for TR-13, 14, 15 and 16 with two 6-32 x 3/8" fillister-head screws, lockwashers and nuts for each socket. **Be sure to use fillister-head screws to mount these sockets; also, be sure the notches in the sockets are positioned as shown.**
 - Two #6 solder lugs. Mount where shown with a 6-32 x 1/8" screw and nut.
 - Blue wire coming through the hole just below TR-13; connect the free end to terminal C of TR-15.
- NOTE: As you are wiring, you may find it necessary to trim leads and wire ends to keep your wiring neat.
- Gray wire coming through the hole just below TR-13. Connect to terminal C of TR-16.
- NOTE: As you connect wires and leads to the transistor sockets, keep all wires and leads away from the socket pins, screws and mounting-screw holes. This will prevent wires from shorting out to these metal parts.
- CR-5 diode. Identify its marked end by a band. Slip 1/2" of tubing over each lead. Connect the lead from the marked end to terminal B of TR-15. Connect the other end to terminal B of TR-13.
 - CR-6 diode. Identify its marked end by a band. Slip 1/2" of tubing over each lead. Connect the lead from the marked end to terminal B of TR-16. Connect the other lead to terminal B of TR-14.
 - C-37, 0.05 μf disc capacitor. Slip 5/8" of tubing over one lead and solder to terminal C of TR-15 (2 wires). Thread the other lead through the solder lug mounted next to TR-13 and connect to terminal C of TR-13. Solder the lead going through the solder lug.
 - C-38, 0.05 μf disc capacitor. Slip 5/8" of tubing over one lead and solder it to terminal C of TR-16 (2 wires). Thread the other lead through the solder lug mounted next to TR-14 and connect it to terminal C of TR-14. Solder the lead going through the solder lug.
 - C-93, 0.002 μf disc capacitor. Connect one lead to terminal C of TR-11. Connect the other lead to terminal B of TR-11.
 - C-94, 0.002 μf disc capacitor. Connect one lead to terminal C of TR-12. Connect the other lead to terminal B of TR-12.

2 1/2" white/black wire. Solder one end to terminal C of TR-13 (2 wires). Solder the other end to terminal E of TR-11.

Red wire. Solder one end to terminal B of TR-13 (2 wires). Solder the other end to terminal C of TR-11 (2 wires).

Orange wire. Solder one end to terminal B of TR-11 (2 wires). The other end will be connected later.

Red wire. Solder one end to terminal E of TR-13. The other end will be connected later.

2 1/2" white/black wire. Solder one end to terminal B of TR-15 (2 wires). The other end will be connected later.

Red wire. Solder one end to terminal E of TR-15. The other end will be connected later.

Yellow wire. Solder one end to terminal B of TR-16 (2 wires). The other end will be connected later.

Orange wire. Solder one end to terminal E of TR-16. The other end will be connected later.

2 1/2" white/black wire. Solder one end to terminal E of TR-14. The other end will be connected later.

Red wire. Solder one end to terminal B of TR-14 (2 wires). Solder the other end to terminal C of TR-12 (2 wires).

Red wire. Solder one end to terminal C of TR-14 (2 wires). Solder the other end to terminal E of TR-12.

Red wire. Solder one end to terminal B of TR-12 (2 wires). The other end will be connected later.

Very carefully inspect all wiring and soldering of these sockets. Be sure no wires or leads are touching between adjacent terminals, or will interfere with the transistor pins, or mounting screws when they are plugged into the sockets. Also, check to be sure that no excess solder has bridged across between closely spaced terminals.

Check the positioning of the marked end of diodes CR-5 and CR-6. Are they correct?

Now you are going to mount the large transistors. During normal operation they must dissipate some heat; to help dissipate this heat they are mounted on the aluminum sub chassis. In addition to this, to increase the efficiency of transferring this heat, a special compound is spread over the surface of the transistor. This we call heat-sink compound. Handle it with care and spread it lightly over the surfaces as required.

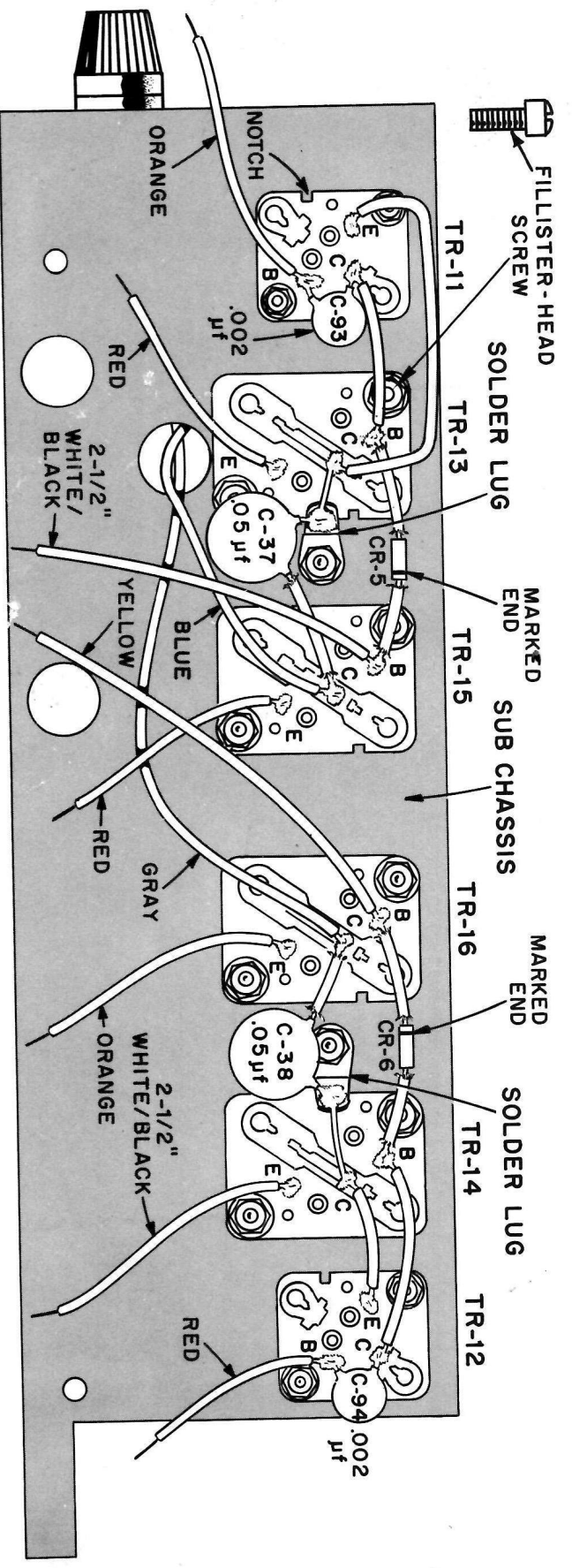


Figure 11

TR-11 and TR-12, marked with part number 660-138. See Figure 12. Spread heat sink compound over the face of the mounting surface of the transistor. Place one of the smaller transistor insulators over the transistor and spread heat sink compound over the face of the insulator. Now plug the transistor into the socket and fasten with two #6 x 1/2" self-tapping screws. Handle the remaining transistor in the same way.

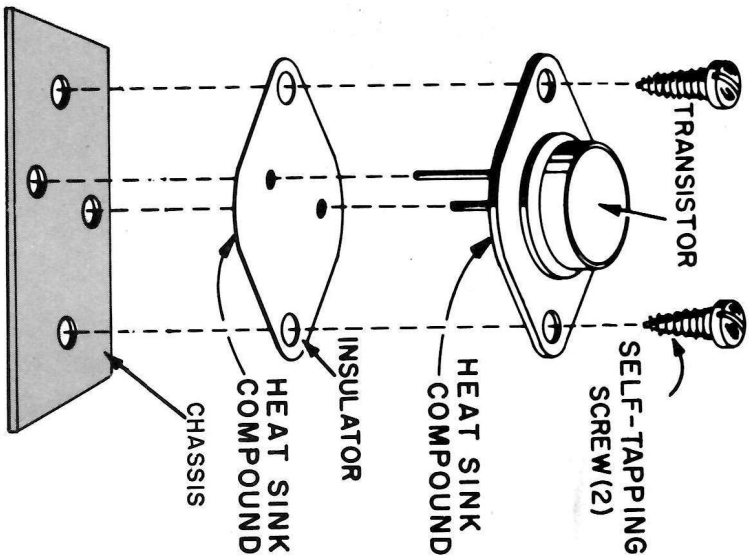
TR-13 and TR-14, marked with part number 660-132. These transistors do not require an insulator. Place the heat sink compound on the mounting face of the transistor and mount and fasten each with two #6 x 1/2" self-tapping screws.

TR-15 and TR-16, marked with part number 660-137. Mount these transistors with a large transistor insulator, spreading heat sink compound on the transistor mounting face and the insulator. Mount and fasten each with two #6 x 1/2" self-tapping screws.

- Check to be sure you have the correct transistors in the proper sockets.
- Check to be sure the transistor mounting screws have not come through the chassis and run into a wire or bare lead. Move leads to be sure they do not touch the mounting screws.

- Set the sub chassis aside; it will be used later.
- Think you could use another rest? At least stop for a cup of coffee.

Figure 12



MOUNTING PARTS AND WIRING THE SUB PANEL

SEE FIGURE 13.

Position the sub panel in front of you as shown—the bent up lips facing you.

Phone jack. Slip a $\frac{3}{8}$ " lockwasher over the bushing of the jack. Mount to the sub panel with a $\frac{3}{8}$ " locknut. Position the jack so the terminals are as shown.

S-4, red rocker switch. Position the terminals as shown and mount with two 4-40 x $\frac{1}{4}$ " screws, lockwashers and nuts.

S-3, black rocker switch with 6 terminals. Mount with two 4-40 x $\frac{1}{4}$ " screws, lockwashers and nuts.

S-2, black rocker switch with 4 terminals. Position the terminals as shown and mount with two 4-40 x $\frac{1}{4}$ " screw, lockwashers and nuts.

R-83, dual 50K control (part number 420192). Slip a $\frac{3}{8}$ " lockwasher over the bushing of the control and mount with a $\frac{3}{8}$ " locknut. Be sure the locating tab engages the hole in the sub panel.

R-82, dual 50K control (part number 420192). Mount as above with a $\frac{3}{8}$ " lockwasher and locknut.

R-81, dual 10K control (part number 420193). Mount as above with a $\frac{3}{8}$ " lockwasher and locknut. **Be sure to use the control with the correct part number.**

R-80, dual 10K control (part number 420194). Mount as above with a $\frac{3}{8}$ " lockwasher and locknut.

Bushing. Slip a $\frac{3}{8}$ " lockwasher over the bushing. Mount and fasten with a $\frac{3}{8}$ " locknut from the front side of the sub panel.

Pilot lamp and socket. Install the pilot lamp in the socket and mount the assembly with a 6-32 x $\frac{5}{16}$ " screw, solder lug and nut.

You are going to pre-wire a number of wires to the controls—all the loose ends will be connected later. Route all wires as illustrated.

14" white/yellow wire. Connect one end to terminal 1 of R-83.

12½" white/black wire. Connect one end to terminal 2 of R-83.

R-78, 68K resistor (blue, gray, orange). Solder one lead to terminal 1 of R-83 (2 wires). Solder the other end to terminal 2 of R-83 (2 wires).

13" white/orange wire. Solder one end to terminal 3 of R-83.

12" white/red wire. Solder one end to terminal 1 of R-82.

11" white/brown wire. Solder one end to terminal 2 of R-82.

2½" white/black wire. Solder one end to terminal 3 of R-82. Connect the other end to terminal 2 of R-81.

Orange wire. Solder one end to terminal 1 of R-81. Connect the other end to terminal 2 of R-80.

White wire. Solder one end to terminal 2 of R-81 (2 wires).

2½" white/black wire. Solder one end to terminal 3 of R-81. Connect the other end to terminal 1 of R-80.

Gray wire. Solder one end to terminal 1 of R-80 (2 wires).

Yellow wire. Solder one end to terminal 2 of R-80 (2 wires).

Violet wire. Solder one end to terminal 3 of R-80.

Orange wire. Solder one end to terminal 6 of R-82. Connect the other end to terminal 5 of R-81.

Orange wire. Solder one end to terminal 4 of R-81. Connect the other end to terminal 4 of R-80.

2½" white/black wire. Solder one end to terminal 6 of R-81. Connect the other end to terminal 5 of R-80.

Green wire. Solder one end to terminal 5 of R-80 (2 wires).

White wire. Solder one end to terminal 1 of the phone jack.

Brown wire. Solder one end to terminal 3 of the phone jack.

Route these wires in the direction shown and twist them together for their full length.

Two 14" white/yellow wires. Twist them together for their full length. Strip off an extra $\frac{1}{4}$ " of insulation at one end of the twisted pair. Solder one wire end to terminals 1 and 3 of S-4. Solder the other wire end to terminals 2 and 4 of S-4.

Take time to check over all the wiring and soldering you have done up to this point on the sub panel. Be sure all your solder connections are smooth and have a shiny metallic finish. Reheat any questionable connections, adding solder if necessary.

Set aside this assembly; it will be used later.

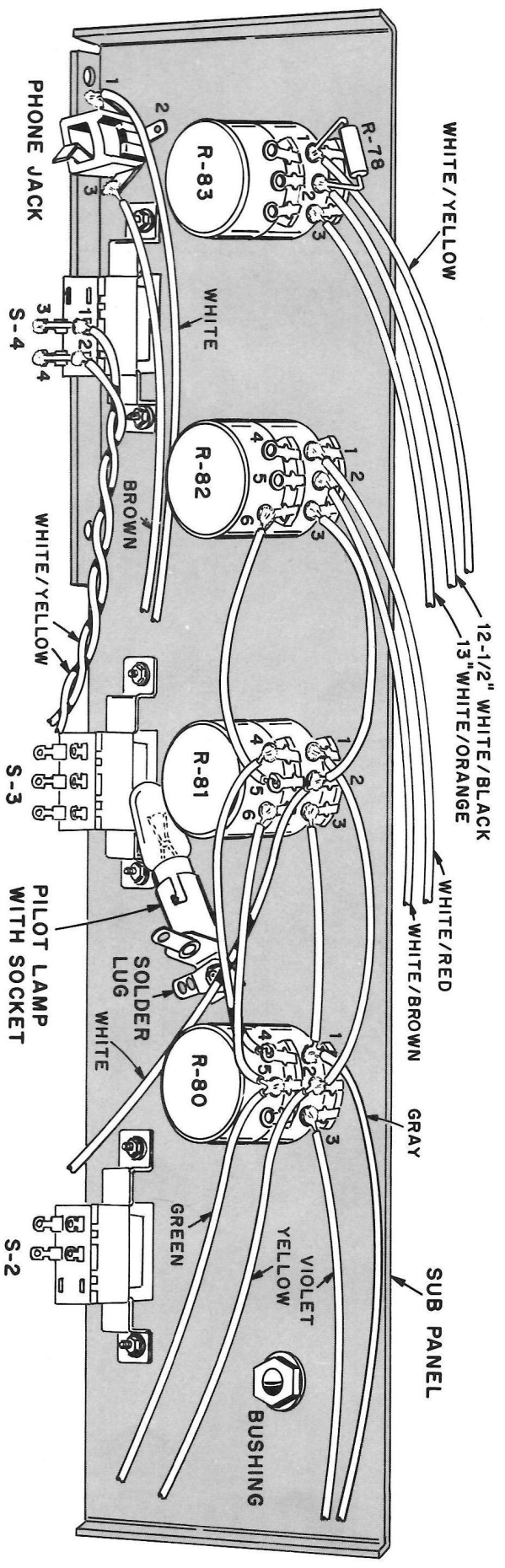


Figure 13

WIRING THE SELECTOR SWITCH

SEE FIGURE 14.

Position the selector switch in front of you as shown—with the locating tab toward you. Examine the switch, count the terminals and examine them; notice that they are quite fragile and so must be handled with care. When you solder to terminals, do not use excess solder—use only enough to cover and hold the connection.

R-7, 4.7K, 1/4-watt resistor (yellow, violet, red). Note that the 1/4-watt resistors are smaller than the 1/2-watt resistors. Cut one lead to 1/2" and connect it to terminal 1 (both terminals) of wafer A. Note that wafer A is the section closest to the shaft of the switch.

R-3, 220K, 1/4-watt resistor (red, red, yellow) Slip 1/2" of tubing over one lead and solder it to terminal 1 of wafer A (2 wires).

R-1, 1K, 1/4-watt resistor (brown, black, red). Slip 1/2" of tubing over one lead and solder it to terminal 3 of wafer A.

NOTE: There is a blank space on the switch where 2 would be; terminals are numbered according to terminals and blank spaces. Thus, when you are counting terminals, count blank spaces as well.

2 1/2" white/black wire. Connect one end to terminal 4 of wafer A.

2 1/2" white/black wire. Solder one end to terminal 4 of wafer A (2 wires).

Orange wire. Solder one end to terminal 5 of wafer A.

2 1/2" white/black wire. Solder one end to terminal 6 of wafer A.

Green wire. Solder one end to terminal 1 of wafer B.

Red wire. Solder one end to terminal 2 of wafer B.

2 1/2" white/black wire. Connect one end to terminal 3 of wafer B.

2" bare wire. Solder one end to terminal 3 of wafer B (2 wires).

R-2, 1K, 1/4-watt resistor (brown, black, red). Slip 1/2" of tubing over one lead and solder it to terminal 5 of wafer B.

R-8, 4.7K, 1/4-watt resistor (yellow, violet, red). Slip 1/4" of tubing over one lead and connect it to terminal 6 of wafer B.

R-4, 220K, 1/4-watt resistor (red, red, yellow). Slip 1/2" of tubing over one lead and solder it to terminal 6 of wafer B (2 wires).

Turn the switch over so the locating tab is on the side away from you . . .

SEE FIGURE 15.

3 1/2" white/orange wire. Solder one end to terminal 7 of wafer A.

6" blue wire. Solder one end to terminal 8 of wafer A.

R-9, 4.7K, 1/4-watt resistor (yellow, violet, red). Cut both leads to 3/8". Connect one lead to terminal 11 of wafer A. Connect the other lead to terminal 12 of wafer A.

R-7, (yellow, violet, red) which is soldered to terminal 1 of wafer A. Solder the free lead to terminal 12 of wafer A (2 wires).

R-5, 220K, 1/4-watt resistor (red, red, yellow). Slip 1/2" of tubing over one lead; insert this lead through the hole in wafer B where terminal 11 would be. Solder the lead to terminal 11 of wafer A (2 wires).

R-6, 220K, 1/4-watt resistor (red, red, yellow). Slip 1/2" of tubing over one lead and connect it to terminal 7 of wafer B.

R-10, 4.7K, 1/4-watt resistor (yellow, violet, red). Cut both leads to 3/8". Solder one lead to terminal 7 of wafer B (2 wires). Connect the other lead to terminal 8 of wafer B.

R-8 (yellow, violet, red), which is soldered to terminal 6 of wafer B. Slip 1/4" of tubing over the free lead and solder it to terminal 8 of wafer B (2 wires).

Yellow wire. Solder one end to terminal 10 of wafer B.

Orange wire. Solder one end to terminal 12 of wafer B.

Carefully check all wiring on the switch. All terminals should have wires or leads connected to them, and all connections should be soldered.

1. Be sure you have not used excess solder on any terminal, causing the solder to flow down the terminal and into the rotor section, or between terminals.
2. Be sure all resistors connected to the terminals have as short leads as possible.

Set the pre-wired switch aside in a safe place. It will be used shortly.

How about another rest? You have been doing some detailed work and should relax a little. Remember, a tired builder is more likely to make mistakes. Also, if you are tired, you will not enjoy building as much as you should.

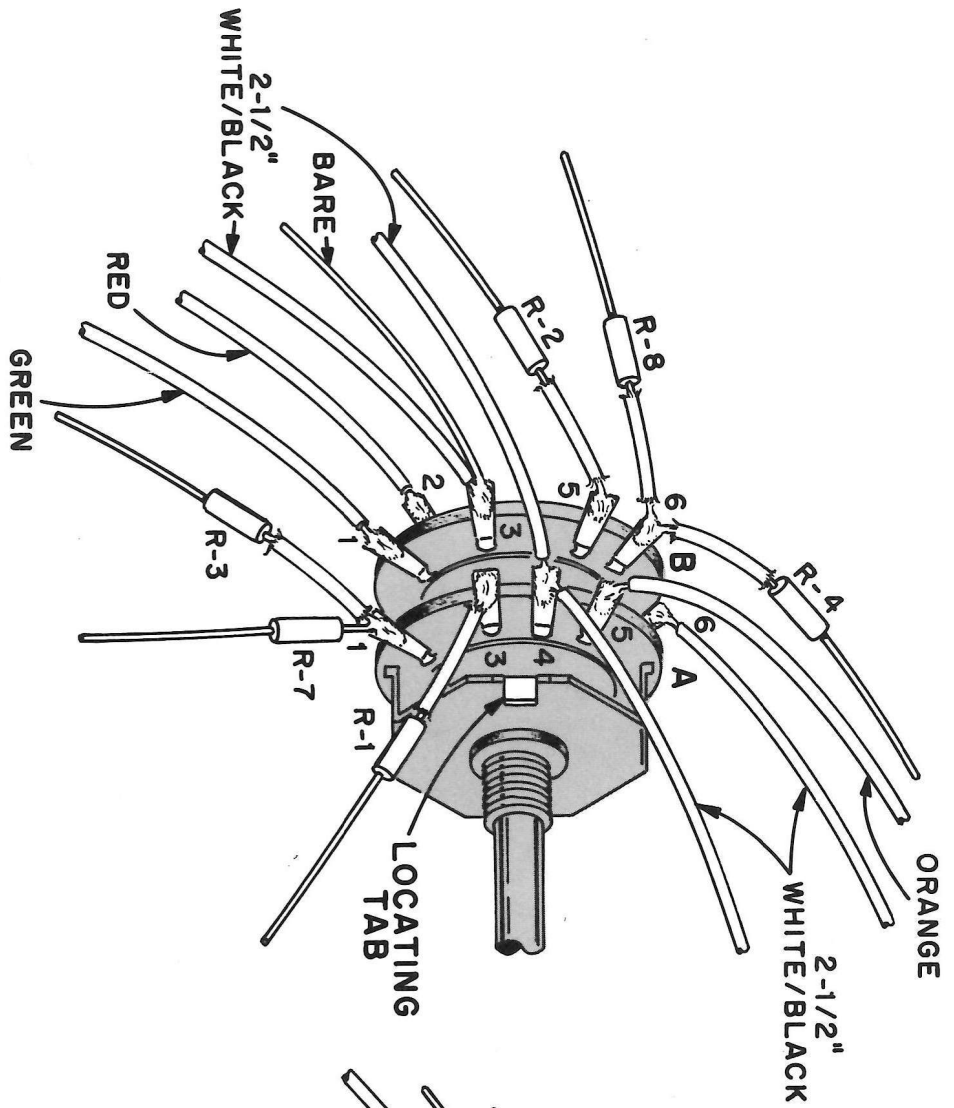


Figure 14

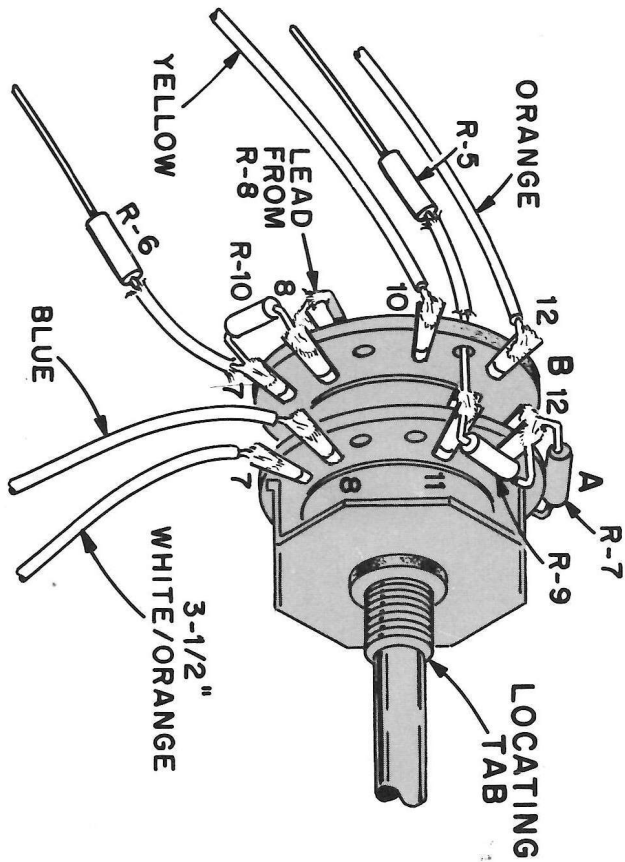


Figure 15

MOUNTING PARTS ON THE CHASSIS

SEE FIGURE 16.

- Position the chassis in front of you as shown—bent down lips downward.
- Two large grommets. Press into the holes shown.
- Small grommet. Press into the hole shown.
- Two nylon cable clamps. See Figure 17 and mount where shown.
- Driver printed circuit board (part number 820218) on which you mounted and soldered parts. Mount from **under the chassis** with five 4-40 x 1/4" screws, lockwashers and nuts.
- Preamplifier printed circuit board (part number 820217). Mount with six 4-40 x 1/4" screws, lockwashers and nuts.
- Output terminal strips. Mount each from the outside of the chassis with two 6-32 x 5/16" screws, lockwashers and nuts.

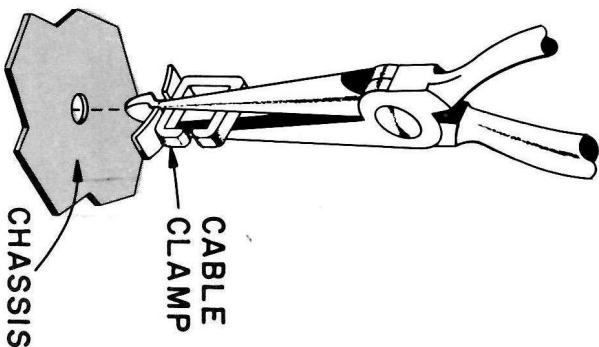


Figure 17

SEE FIGURE 18.

- Jack strips and insulators. The insulators are the same size as the jack strips and fit over them to insulate them from the metal chassis. Mount each jack strip, with an insulator between it and the chassis, with two 6-32 x 3/8" screws—fasten at the bottom two holes only.
- Tape output jack board. Mount at the top four screw mounting holes of the jack strips. Fasten with four 6-32 x 3/8" screws, lockwashers and nuts.
- Two single output jacks. Position them with the terminals as shown and fasten each with two 6-32 x 5/16" screws, lockwashers and nuts.
- Red wire. Solder one end to terminal 2 of the jack assembly. Connect the other end to terminal 4 of the jack assembly.
- Red wire. Connect one end to terminal 4 of the jack assembly. Solder the other end to terminal 7 of the jack assembly.
- Red wire. Solder one end to terminal 9 of the jack assembly. Connect the other end to terminal 11 of the jack assembly.
- Red wire. Connect one end to terminal 11 of the jack assembly. Solder the other end to terminal 14 of the jack assembly.
- Go back and check to be sure all screws and nuts are tight.

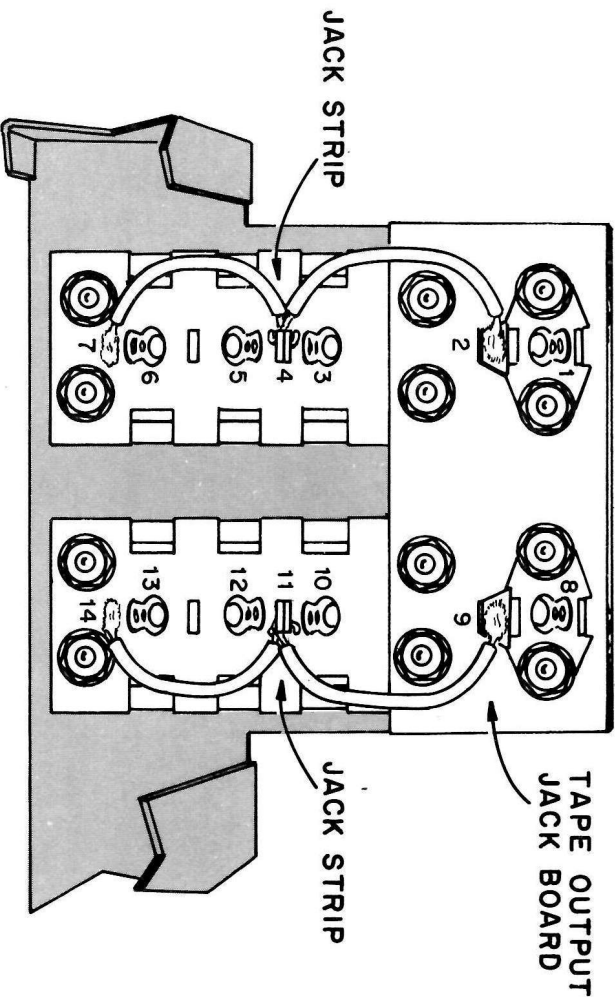


Figure 18

SEE SUPP. G

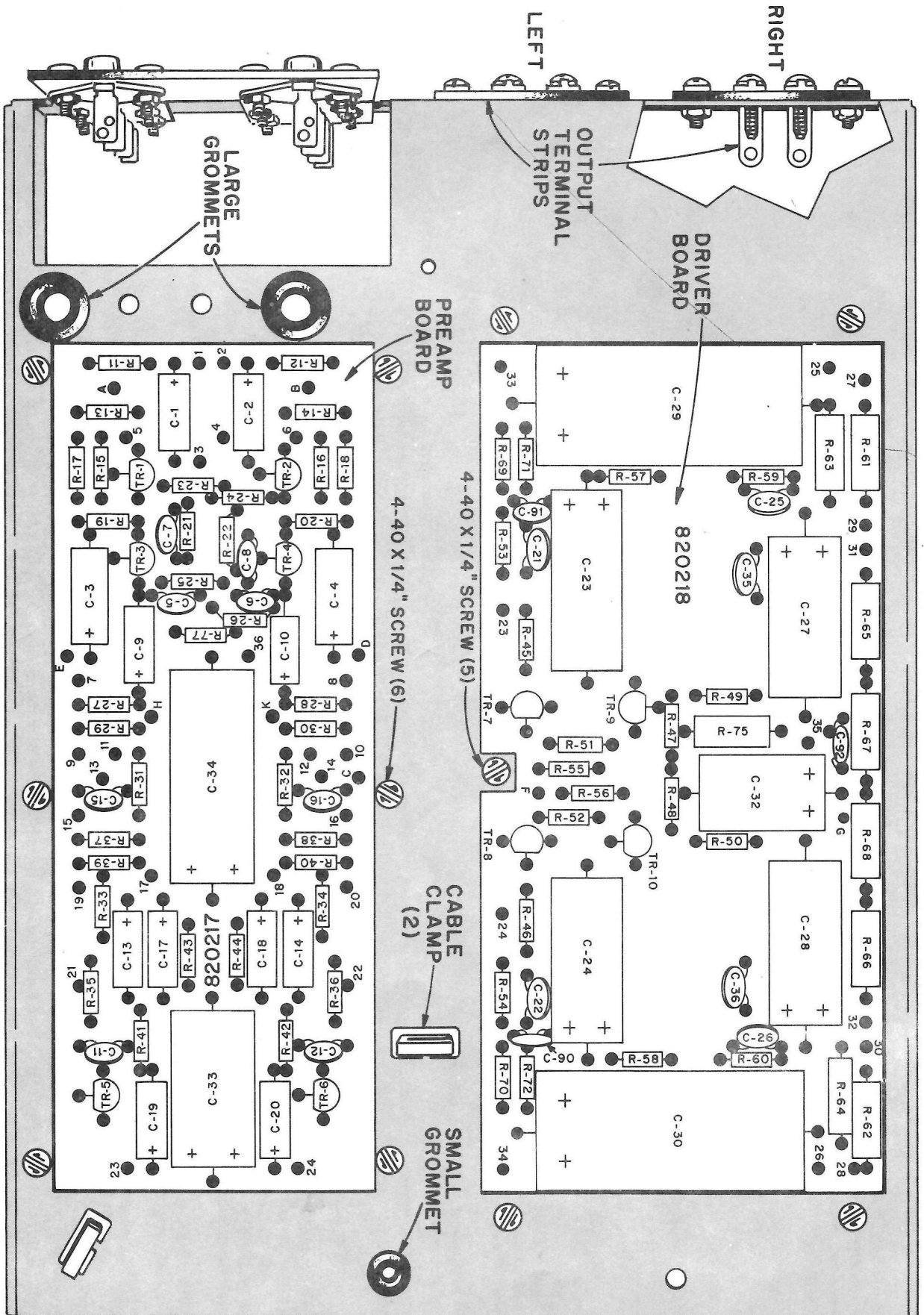


Figure 16

ATTACHING SUB CHASSIS, SUB PANEL AND CHASSIS

SEE FIGURE 19.

- Position the sub chassis and chassis together as shown. Feed the wires from the sub chassis through the matching hole in the chassis. Fasten together with two 6-32 x $\frac{5}{16}$ " screws, lockwashers and nuts through the holes below TR-11 and TR-12 sockets.
 - Position the sub panel in front of the chassis and sub chassis assembly. Fasten with four #6 sheet-metal screws—two up through the bottom of the sub chassis and into the sub panel, and two through the right hand side of the sub panel and into the chassis.
 - Route the twisted white and brown wires from the phone jack through the hole in the chassis and under the chassis—they will be connected later.
 - Yellow and green wires from R-80—pass down through the grommet below R-80.
 - Route all wires from R-83, R-82 and R-81 exactly as shown—along the sub panel, down against the chassis. Bundle these wires together with the wires from R-80 as shown and pass through the cable clamp shown.
 - White/black wire (from R-83). Insert the end down through hole 22 on the preamp board and solder on the foil side.
- NOTE: Remember to trim leads and wire ends to keep them short and neat. Also, route all wires as illustrated—down near the chassis and out of the way. This will make a neat looking wiring job and will make it easy to check your work later on.
- White/brown wire (from R-82). Insert the end down through hole 20 on the preamp board and solder on the foil side.
 - White/red wire (from R-82). Insert the end down through hole 18 on the preamp board and solder on the foil side.
 - White/yellow wire (from R-83). Insert the end down through hole 16 on the preamp board and solder on the foil side.
 - White/orange (from R-83). Insert the end down through hole 14 on the preamp board and solder on the foil side.
 - White wire (from R-81). Insert the end down through hole 12 on the preamp board and solder on the foil side.
 - Violet wire (from R-80). Insert the end down through hole 10 on the preamp board and solder on the foil side.
 - Gray wire (from R-80). Insert the end down through hole D on the preamp board and solder on the foil side.
 - Tie the bundle of wires under the pilot lamp socket with a cable tie as shown in Figure 20.

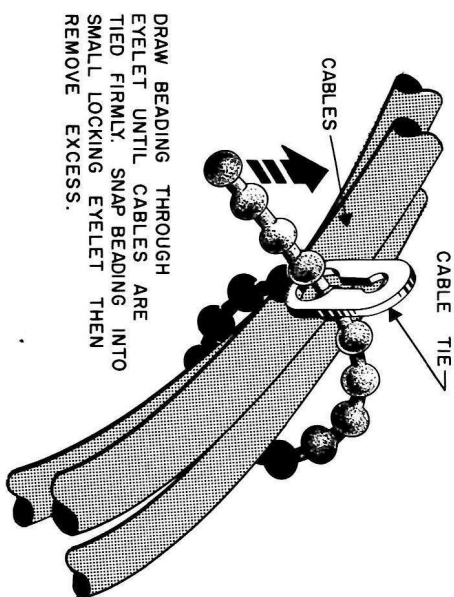


Figure 20

- Red wire from TR-12. Insert down through hole 26 in the driver board and solder on the foil side.
- White/black wire from TR-14. Insert down through hole 28 in the driver board and solder on the foil side.
- Orange wire from TR-16. Insert down through hole 30 in the driver board and solder on the foil side.
- Yellow wire from TR-16. Insert down through hole 32 in the driver board and solder on the foil side.
- Red wire from TR-15. Insert down through hole 29 in the driver board and solder on the foil side.
- White/black wire from TR-15. Insert down through hole 31 in the driver board and solder on the foil side.
- Red wire from TR-13. Insert down through hole 27 on the driver board and solder on the foil side.
- Orange wire from TR-11. Insert down through hole 25 on the driver board and solder on the foil side.
- Green wires from T-1 power transformer. Twist together and route as shown. Solder one to terminal 1 of the pilot lamp socket. Solder the other green wire to the solder lug mounted with the pilot lamp socket.

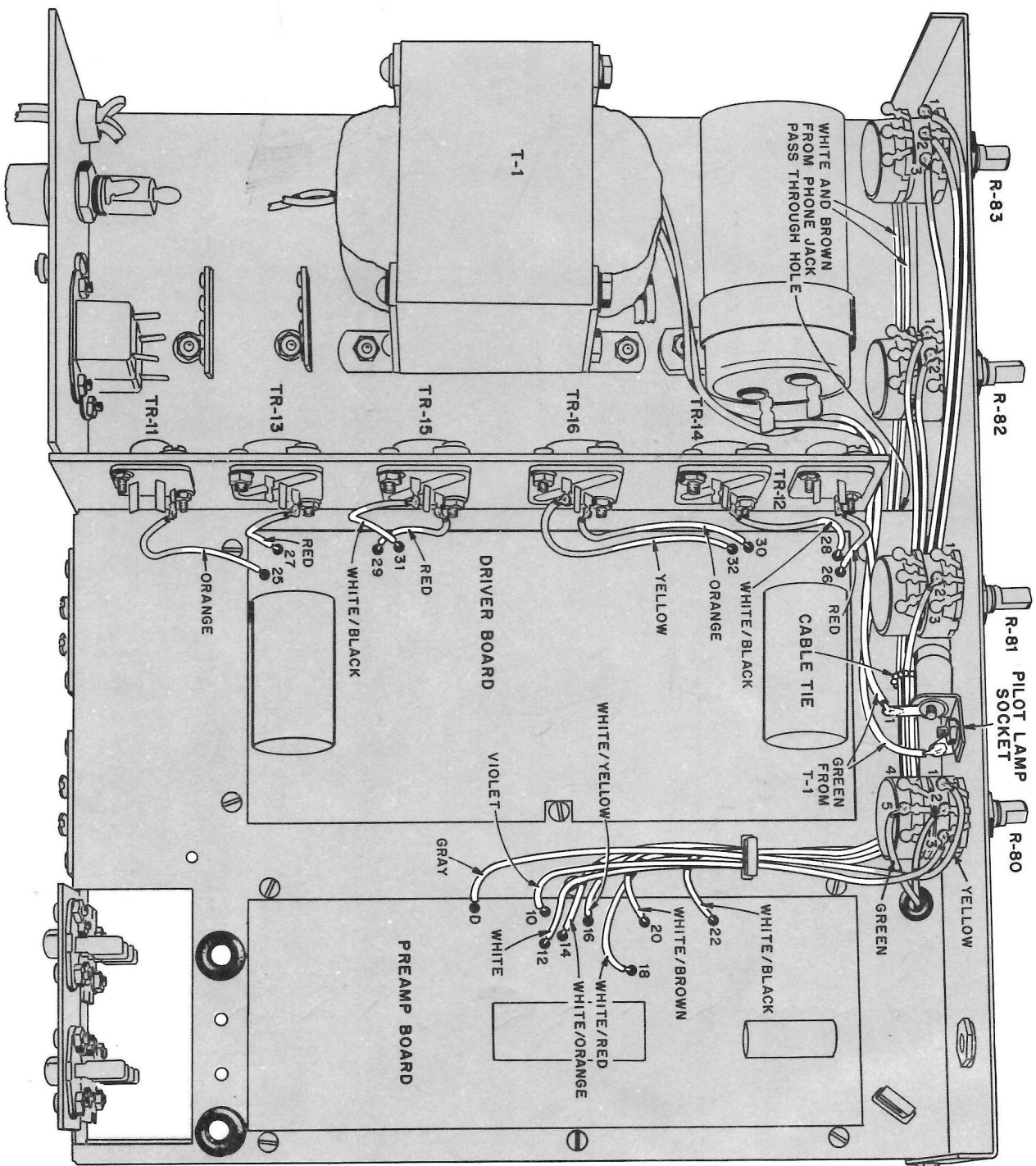


Figure 19

WIRING THE SUB PANEL TO THE CHASSIS--Continued

SEE FIGURE 21.

- X White/yellow wires from S-4 switch on the sub panel. Twist them together for their full length. Solder one of the wires to terminal 2 of J-1 (2 wires). Solder the other wire to terminal 2 of J-2 (2 wires). Press these wires down into the corner of the sub chassis.
- X 15½" blue wire. Connect one end to terminal 4 of R-83. Route the other end as shown and solder into hole 15 of the preamp circuit board.
- X 14" white/yellow wire. Connect one end to terminal 5 of R-83. Route the other end as shown and solder into hole 21 of the preamp circuit board.
- X R-79, 68K resistor (blue, gray, orange). Solder one lead to terminal 4 of R-83 (2 wires). Solder the other lead to terminal 5 of R-83 (2 wires).
- X 15" white/green wire. Solder one end to terminal 6 of R-83. Route the other end as shown and solder into hole 13 of the preamp circuit board.
- X 13" white/orange wire. Solder to terminal 4 of R-82. Route the other end as shown and solder into hole 17 of the preamp circuit board.
- X 12" white/red wire. Solder one end to terminal 5 of R-82. Route the other end as shown and solder into hole 19 on the preamp circuit board.
- X 11" white/brown wire. Solder one end of terminal 5 of R-81 (2 wires). Route the other end as shown and solder into hole 11 on the preamp circuit board.
- X Brown wire. Solder one end to terminal 4 of R-80 (2 wires). Route the other end as shown and solder into hole E on the preamp circuit board.
- X White wire. Solder one end to terminal 6 of R-80. Route the other end as shown and solder into hole 9 on the preamp circuit board.
- X Group together all the wires from R-83, R-82 and R-81, and tie them with the plastic cable tie.
- X Two clip nuts and switch mounting bracket. Slip the clip nuts over the holes in the mounting foot—the flat-side of the clip nuts on the base of the "L". See Figure 22 for another view of this.
- X Prewired selector switch mounting bracket. Mount the bracket on the switch, with the "L" of the bracket pointing away from the shaft. Be sure the switch locating tab engages the hole in the bracket. Fasten with a ⅜" locknut.
- X You may find it necessary to loosen the bushing mounted on the sub panel, to allow you to insert the shaft of the selector switch through it. Mount the switch and fasten with two 6-32 x 1¼" screws threaded up through the chassis and into the clip nuts on the switch mounting bracket. Retighten the bushing on the front panel.

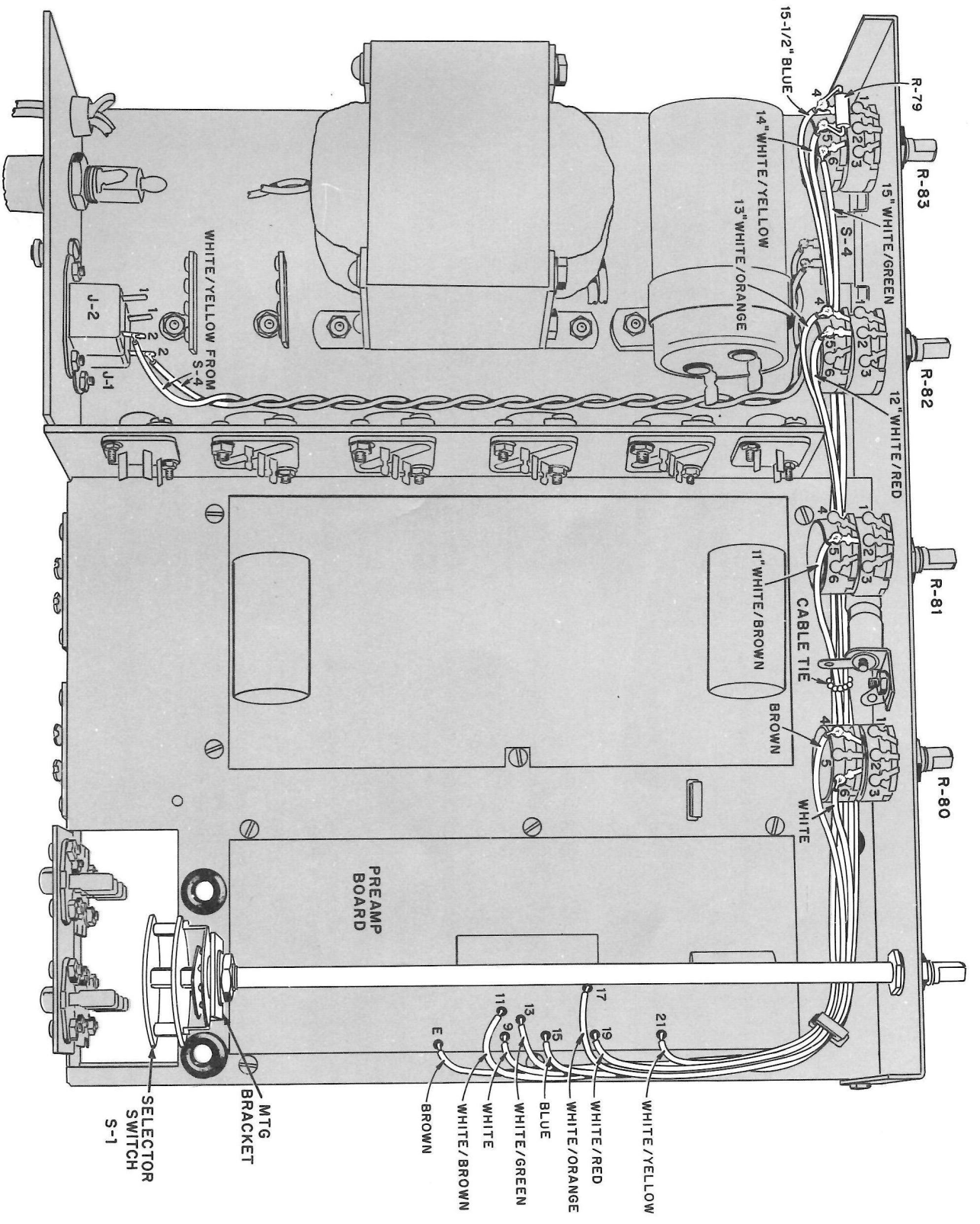


Figure 21

WIRING THE SELECTOR SWITCH TO THE PREAMP CIRCUIT BOARD

SEE FIGURE 22.

- Position the chassis in front of you so you view the selector switch and input panel jack strip as shown.
- Insert the following wires from wafer A of S-1 down through the grommet shown: white/black from terminal 4; orange from terminal 5; white/orange from terminal 7; blue from terminal 8.
- White/black wire from terminal 6 of wafer A. Solder into hole 1 on the preamp circuit board.
- Lead from R-2 (brown, black, red resistor connected to terminal 5 on wafer B). Solder to terminal 6 of the input jack strip. You may find it easier to solder this from the bottom side.
- Lead from R-4 (red, red, yellow resistor connected to terminal 6 of wafer B). Solder to terminal 5 of the input jack strip.
- Bare wire from terminal 3 of wafer B. Slip $\frac{3}{4}$ " of tubing over this wire and solder to terminal 4 of the input jack strip (3 wires). Again, you may find it easier to solder this from the bottom side of the chassis.
- Lead from R-6 (red, red, yellow resistor connected to terminal 7 of wafer B). Solder to terminal 3 of the input jack strip.
- Gray wire. Solder one end to terminal 1 of the input jack strip. Insert the other end down through the chassis—it will be connected later.

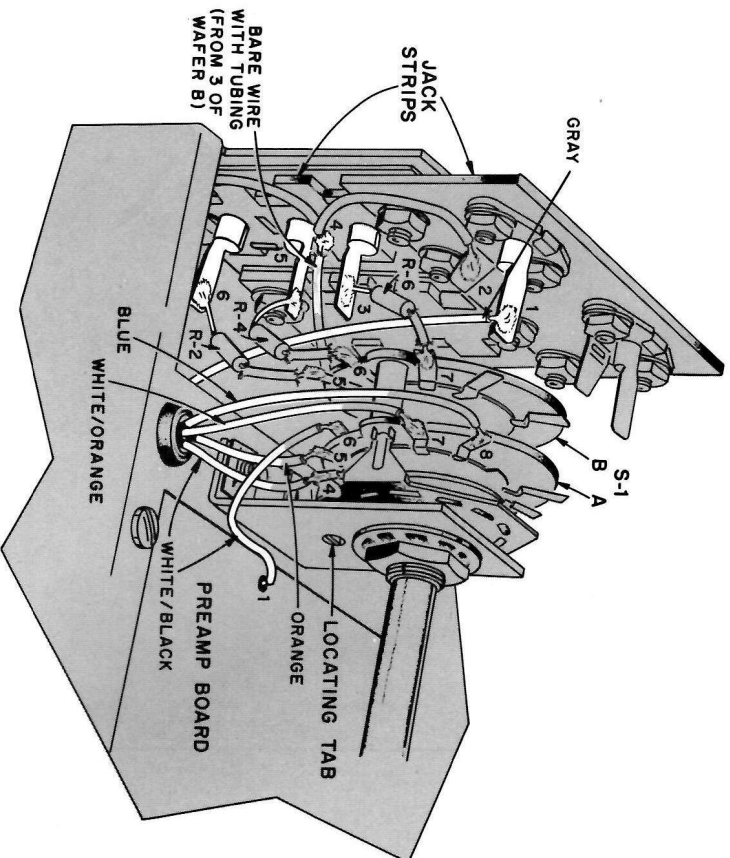


Figure 22

Reposition the chassis so you view the selector switch as shown . . .

SEE FIGURE 23.

- Insert the following wires down through the grommet shown: white/black wire from terminal 3 of wafer B (do not confuse with the black/white wire from wafer A, the front wafer); green wire from terminal 1 of wafer B; orange wire from terminal 12 of wafer B; yellow wire from terminal 10 of wafer B.
- Red wire from terminal 2 of wafer B. Solder into hole 2 of the preamp circuit board.
- Lead from R-1 (brown, black, red resistor connected to terminal 3 of wafer A). Solder to terminal 13 of the input jack strip.
- Lead from R-3 (red, red, yellow resistor connected to terminal 1 of wafer A). Solder to terminal 12 of the input jack strip.
- White/black wire from terminal 4 of wafer A. Solder to terminal 11 of the input jack strip (3 wires).
- Lead from R-5 (red, red, yellow resistor coming from the hole between terminals 10 and 11 on wafer B). Solder to terminal 10 of the input jack strip.
- Violet wire. Solder one end to terminal 8 of the input jack strip. Insert the other end down through the chassis—it will be connected later.
- How about another rest? You have almost completed wiring of your amplifier.

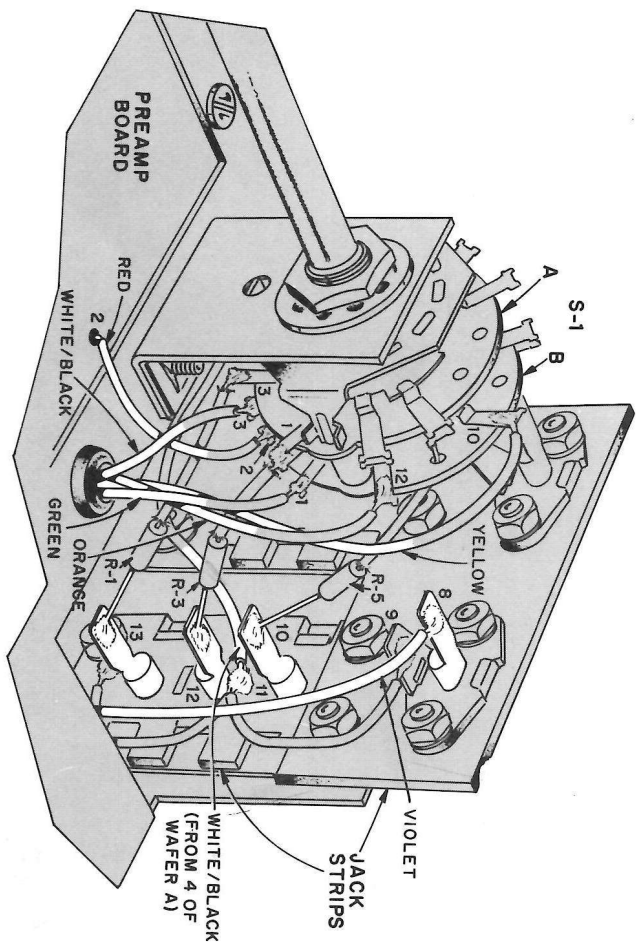


FIGURE 23

WIRING THE BOTTOM OF THE CHASSIS

SEE FIGURE 24.

- Turn the chassis over and position it in front of you as shown.
- White/orange wire from the grommet at the lower left side of the chassis. Solder to hole 5 on the preamp board.

CAUTION: When you insert wires up through the holes in the printed circuit boards, check to be sure the bare end of the wire does not press into a wire or component lead on the top of the board.

- White/black wire from the same grommet. Solder to hole A on the preamp board.
- Orange wire from the same grommet. Solder to hole 3 on the preamp board.
- Blue wire from the same grommet. Solder to hole 7 on the preamp board.
- Yellow wire from the grommet to the right of the one just mentioned. Solder to hole 4 on the preamp board.
- Orange wire from the same grommet. Solder to hole 6 on the preamp board.
- White/black wire from the same grommet. Solder to hole B on the preamp board.
- Green wire from the same grommet. Solder to hole 8 on the preamp board.
- Gray wire from terminal 1 of the tape output jack board. Solder to hole K on the preamp board.
- Violet wire from terminal 8 of the tape output jack board. Solder to hole H on the preamp board.
- Green wire from grommet near S-2. Solder to terminal 1 of S-2.
- Yellow wire from same grommet. Solder to terminal 2 of S-2.
- TS-3, 2-terminal strip. Mount with a 6-32 x $\frac{3}{16}$ " screw, lockwasher and nut. Be patient, it can be mounted!
- Twisted brown and white wires from the hole near S-3. Connect the brown wire to terminal 1 of TS-3. Connect the white wire to terminal 2 of TS-3.
- 13" white/orange wire. Solder one end to terminal 4 of S-3 (see the detail of S-3). Route the other end as shown and solder it to terminal 2 of the Left Output terminal strip.

CAUTION: Do not let any bare wire ends or the terminals of S-3 touch the printed circuit board.

- 11" white/brown wire. Solder one end to terminal 1 of S-3. Route the other end as shown and solder to terminal 2 of the Right Output terminal strip.
- 12" white/red wire. Solder one end to terminal 2 of S-3. Route the other end as shown and solder to hole 33 on the driver printed circuit board.
- Heavy green wire from the hole near the center of the driver printed circuit board. Solder to hole G on the driver printed circuit board.
- Brown wire from the same hole. Solder to hole 36 of the preamp printed circuit board.
- Violet wire from the hole towards the back of the chassis, next to the driver printed circuit board. Solder to hole 35 on the driver printed circuit board.
- Green wire from the same hole. Connect to terminal 1 of the Right Output terminal strip.
- Orange wire. Solder one end to terminal 1 of the Left Output terminal strip. Solder the other end to terminal 1 of the Right Output terminal strip (2 wires).
- Orange wire. Solder one end to terminal 5 of S-3. Solder the other end to hole 34 on the Driver Printed circuit board.
- R-74, 100 Ω resistor (brown, black, brown). Slip $\frac{3}{4}$ " of tubing over each lead. Solder one lead to terminal 6 of S-3. Solder the other lead to terminal 2 of TS-3 (2 wires).
- R-73, 100 Ω resistor (brown, black, brown). Slip 1" of tubing over each lead. Solder one lead to terminal 3 of S-3. Solder the other lead to terminal 1 of TS-3 (2 wires).
- Yellow wire. Solder one end to hole 24 on the Preamp Board. Solder the other end to hole 24 on the Driver Board.
- Gray wire. Solder one end to hole 23 on the Preamp Board. Solder the other end to hole 23 on the Driver Board.
- Red wire. Solder one end to hole C on the Preamp Board. Solder the other end to hole F on the Driver Board.
- 1 amp fuse. Install in fuse holder.

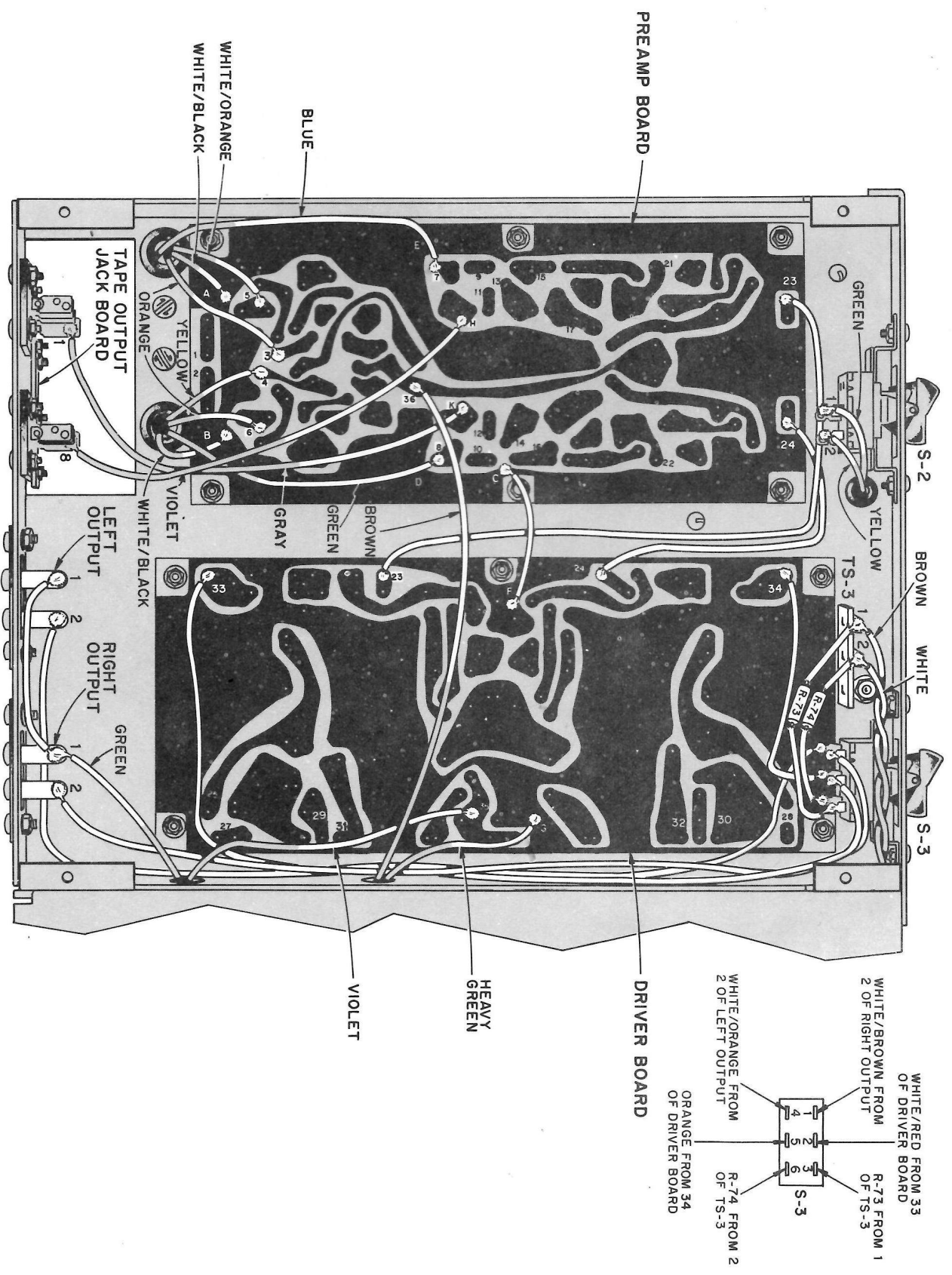


Figure 24

INSTALLING THE FRONT PANEL, SWITCH SHIELD AND BOTTOM PLATE

Now you have completed all the wiring and soldering of your kit. Before you install the feet, or attach the bottom plate or switch shield, carefully go over all the wiring and soldering.

1. Check all solder connections. All connections should be soldered now. All solder connections should have a **smooth**, shiny, metallic finish. Also, try moving wires and leads in each solder connection—if any can, that solder connection must be reheated and a little solder added. Be sure to reheat any questionable connection, adding a little fresh solder if necessary.
2. Check all soldering on the printed circuit boards. Correct any solder bridges by holding your hot soldering iron against excess solder.
3. Are all electrolytic capacitors installed with their + ends in the proper direction? How about the diodes—are they positioned with the marked ends in the right direction?

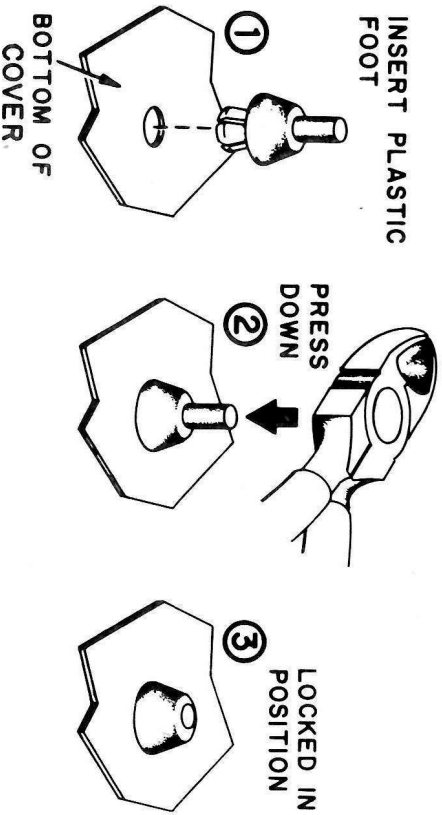
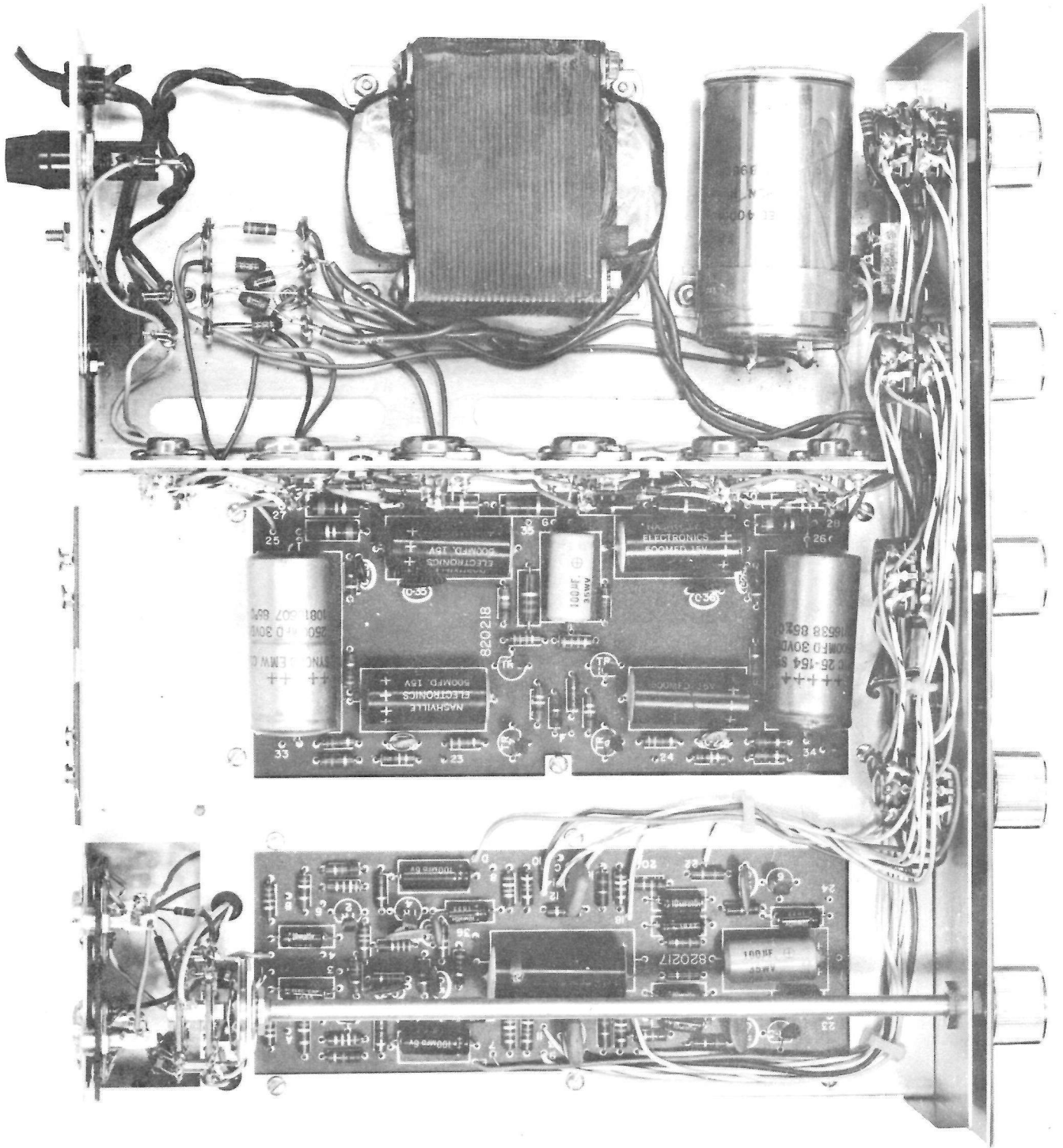


Figure 25

- Metal switch shield. Position over the selector switch and input panel. Fasten to the chassis with three #6 sheet-metal screws.
- Front panel and trim. See the photograph on the front of this manual. Remove the protective backing from the trim and carefully position the trim in the groove provided in the panel.
- Red plastic jewel. Snap into the hole provided in the front panel.
- Fasten the panel to the sub-panel with five flat-washers and $\frac{3}{8}$ "-32 nuts. You may find it necessary to loosen controls, or the slide switches and reposition them, to permit the panel to fit properly and allow the slide switches to move freely without rubbing the panel. Retighten all nuts and screws after everything is properly positioned. Slide a knob over each control shaft.
- Bottom plate. Fasten to the bottom of the chassis with four #6 sheet-metal screws.
- Four plastic feet. Install on the bottom of the chassis as shown in Figure 25.



Typical Wired Unit

ALLIED RADIO CORPORATION
100 N. Western Avenue
Chicago, Illinois 60680

**MANUFACTURED IN JAPAN
TO ALLIED'S SPECIFICATIONS**

Kit Stock No. 22-3700

Production No. 904-001N

Manual Stock No. 22-4104

MANUAL CORRECTIONS

22-3700

KG-865 AMPLIFIER

Before starting to build your kit, please make the following corrections in your assembly manual:

- (A) Page 12, Column 1, Step 8:
If the bushing does not snap in place, tie a knot in the cord before connecting the two leads.
- (B) Page 12, Column 2, Last Paragraph:
The diodes CR-1, 2, 3, 4 you receive may be square, marked with an arrow and bar. The bar is the marked end of the diode.
- (C) Page 14, Column 1, Step 7 and 8:
CR-5 and CR-6 may be bullet shaped. If so, the bullet shaped end is the marked end.
- (D) Page 14, Column 1, Step 2:
The two smaller sockets you have must be mounted so the notch is on the bottom, rather than on the side as shown in Figure 11.
- (E) Page 16, Column 1, Steps 6, 7, 8 and 9:
Mount these controls to the sub panel with two locknuts.
- (F) Page 16, Column 1, Step 10:
Mount this bushing to the sub panel with two locknuts.
- (G) Page 20, Column 1, Step 7:
The holes in your output terminal strips may be too small to accommodate the 6-32 screw. If so, just ream out the holes with your needle-nose pliers.
- (H) Page 22, Column 1, Step 2:
The holes in the sub-chassis may be too large for # 6 sheet metal screws. If so, use 6-32 screws, lock-washers, and nuts for mounting sub-chassis to sub-panel.