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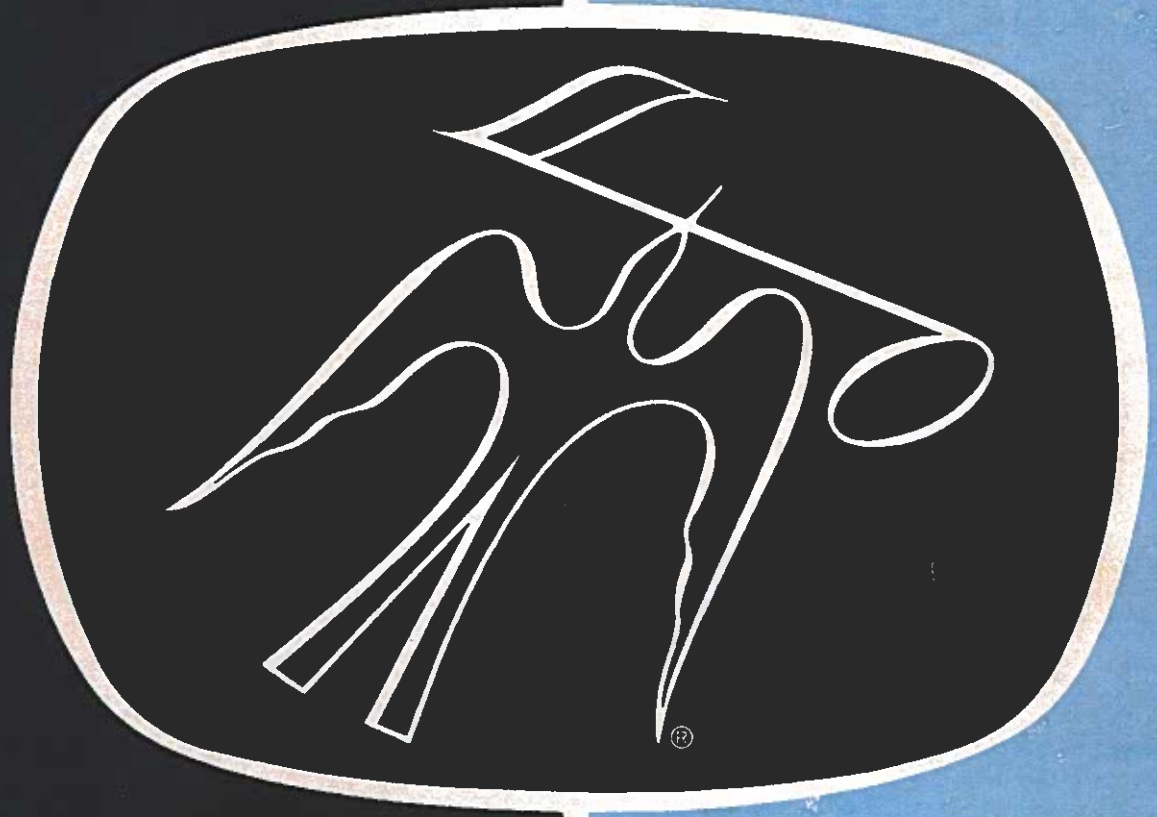


THE FISHER

STRATAKIT

KX-200

STEREOPHONIC

Master Control-Amplifier

ASSEMBLY MANUAL

AVERY FISHER
Founder and President
Fisher Radio Corporation

A Message From Avery Fisher

IT IS NOW almost twenty-five years since we made and delivered our first instrument for high fidelity reproduction of radio and records. (That instrument is now in the Smithsonian Institution, Washington, D. C.) Beginning with that first unit it has been our unfailing policy to manufacture only the very best of equipment, and to make that equipment available to the widest possible audience.

It is with great pleasure that we are now able to furnish Fisher equipment in kit form, thus bringing instruments of Fisher quality within the reach of a wide, new audience.

The kit you have just purchased represents the efforts of the finest single group of engineers in the high fidelity industry. Our entire approach to the problem of designing a kit was based on two simple rules. The first was that the quality must in every particular be on a complete par with the finest comparable Fisher equipment, as built in our own Production Department. The second was that the method of assembly must be so thoroughly simplified and organized that even the most unskilled purchaser could expect a perfect end result. No effort has been spared to achieve these two objectives and I know that the building of this kit will bring you a sense of accomplishment based on the pleasure of creating something fine, and on the knowledge that here is an investment that will bring virtually unnumbered years of musical enjoyment to you and your family.

Technical Specifications
of the KX-200

Music Power Output (IHFM Standard, both channels)	80 watts
RMS Power Output (per channel)	35 watts
Harmonic Distortion (at rated output)	0.4%
IM Distortion (SMPTE, at rated output)	0.8%
Frequency Response: Overall	20-20,000 cps ± 1 db
Power Amplifier	10-110,000 cps +0, −1 db
Total Hum and Noise (below rated output)	
High Level Inputs	80 db (450 mv ref)
Low Level Inputs	66 db (6 mv ref)
Min. Volume	93 db
Input Sensitivity (for rated output)	
High Level Inputs	350 mv
Low Level Inputs	3.5 mv
Channel Separation (at 1 kc)	Better than 50 db
Feedback Factor	22 db
Damping Factor	10
Bass Control Range (at 50 cps)	30 db total
Treble Control Range (at 10 kc)	32 db total
Output Impedance (each channel)	4, 8 and 16 ohms

THE FISHER KX-200
STEREOPHONIC
Master Control-Amplifier

Now It's Fun to Build a Kit!

But before you start — Please . . . read this page carefully . . . It isn't very long!

Building a FISHER StrataKit is a pleasure — not a task. We enjoyed designing it and writing this assembly manual, and as you read on, you may notice our instructions reflect this. We hope you didn't expect stuffy, formal, "college thesis" writing — you won't get it! And if you think we're too flippant, please bear with us — loosen up . . . enjoy yourself . . . that's the purpose of a kit!

What is required to build a kit? The desire, of course, a little mechanical skill, the ability to solder, but most important . . .

Patience

We know you're anxious to get started, get finished, and try it out. But please — read the instructions carefully — examine the illustrations closely, and you'll have no trouble.

And speaking of this, do you know that over 90% of the trouble encountered by kit builders is due to one cause? Indeed it is — and what do you think this trouble-maker is?

Defective parts? . . . nope

Wiring errors? . . . surprisingly not

Errors in the instructions . . . Please!

Turn the page and find out.

Soldering

That's right — poorly soldered connections cause well over 90% of kit trouble. (If this sentence didn't make much sense to you, you didn't read the previous page. Shame on you — go back and read it now.)

Soldering is a simple process, but remember . . .

Solder is not glue . . .

. . . that must be melted before it is used. Soldering is a molecular process and in order for it to take place, certain conditions must be met.

The parts to be soldered must be heated to a temperature hot enough to melt the solder. In other words, the soldering iron is not used to melt the solder — as shown in Figure 1.

Note that the soldering iron tip is held against the "joint" until the joint is hot enough to melt the solder. Then the solder is pressed against the joint until it melts and flows around the joint. Finally, the iron is removed and the melted solder cools and hardens.

The soldered joint must not be disturbed until the melted solder hardens. If the soldered joint is disturbed, you'll have to re-solder it. Normally this can be done by just holding the iron on the joint until the solder melts again without adding more solder. At this point an obvious question is . . . HOW MUCH SOLDER . . . is needed for a properly soldered connection? The answer — not much! Seriously, use only enough solder to coat the parts to be soldered together.

The parts to be soldered together must be perfectly clean. Obviously we cannot scrub the parts — instead, we use a "rosin" flux as a cleaning agent and the rosin, in paste form, is right in the solder supplied to you.

When this "rosin-core" solder is brought in contact with heated parts the rosin paste melts before the solder and coats the parts. So where we only had a "dirty joint" we now have a dirty joint covered with rosin! But wait! The heat vaporizes the rosin and, like a sponge, it picks up all the dirt and grime on the joint, and carries it off in the air! Unfortunately, the melted rosin covering the joint will act as an insulator just as the dirt did. Sufficient heat must be applied to vaporize most of the rosin. More improperly soldered connections are due to insufficient heat than all other causes combined. This is so important let's repeat it . . .

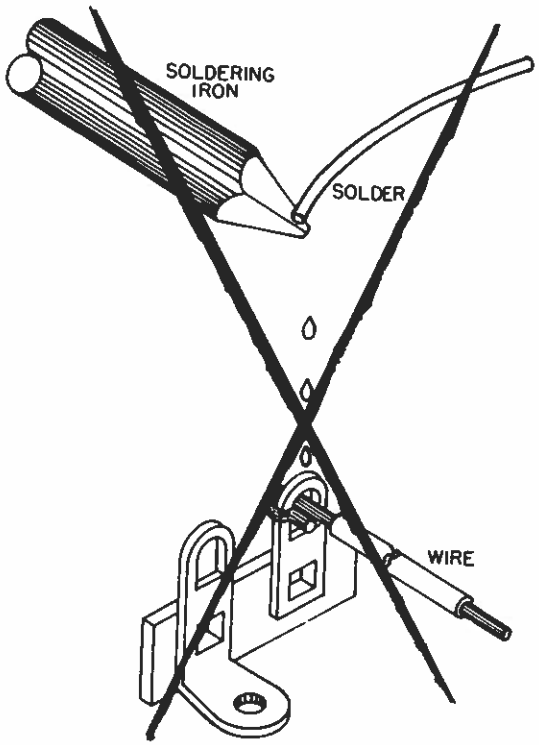


Figure 1a. Solder is not glue — that must be melted before it is used.

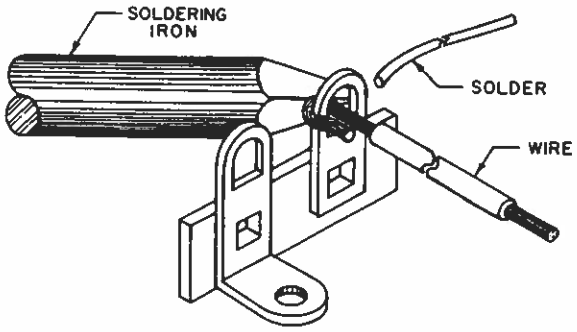


Figure 1b. The "joint" is heated until *it* is hot enough to melt the solder.

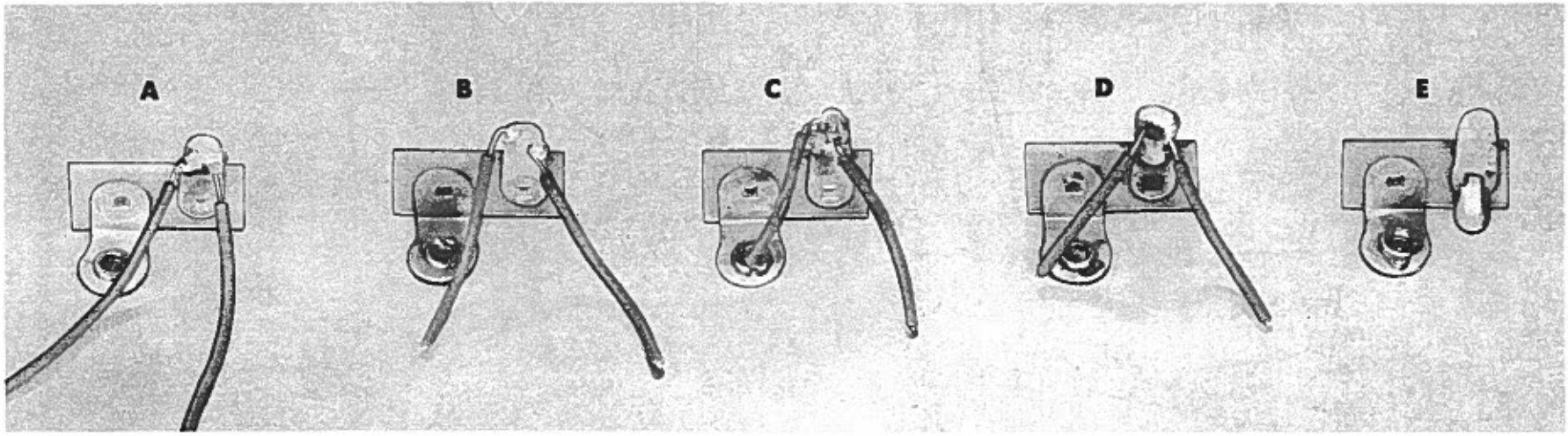


Figure 2. Examples of soldered joints: (a) good; (b) not enough solder; (c) moved before "set"; (d) too much solder; (e) short caused by too much solder.

Sufficient heat must be applied to vaporize the rosin.

Use only rosin core solder; do not use additional flux or pastes.

The rosin flux is a necessary evil — we need it to clean the parts but then we have to boil it away.

Never add more — if more were needed the solder manufacturers would supply it in the solder. You have been supplied more than enough solder to build your amplifier. However, if you do run out make sure you purchase "rosin-core solder" only. Sometimes it is marked "radio rosin-core."

If You Use Acid-Core Solder, All Warranties Will Be Voided And We Cannot Repair The Unit.

The soldering iron tip must be tinned and wiped clean at all times.

No matter what type iron you use the tip must be "tinned", that is, coated with solder. Despite the tinning though, the tip blackens and must be continually wiped clean. Obtain an old piece of cotton cloth about one foot square, fold it up and keep it next to your soldering iron for this purpose.

As a summary take a look at Figure 2. And don't forget . . .

Poor soldering causes over 90% of kit troubles . . . and insufficient heat and too much solder causes most poor soldering.

Tools . . . What do you need?

Very few tools are needed to construct your amplifier — you may already have them. This is what you need:

A pair of long nose pliers
A pair of wirecutters
A pair of combination pliers
A 6 to 10 inch length screwdriver
A soldering iron

We suggest you use a pencil type soldering iron such as the Ungar with a 47½ watt tip. If you have a bench type iron with a 60 to 100 watt element it will be perfectly all right provided the tip is no wider than ⅜ inch (diameter). A soldering gun is designed for repair work and is not recommended for kit construction.

Construction

You will build your Fisher KX-200 in two major sections — the front panel containing the operating controls and the chassis on which most of the circuits are built.

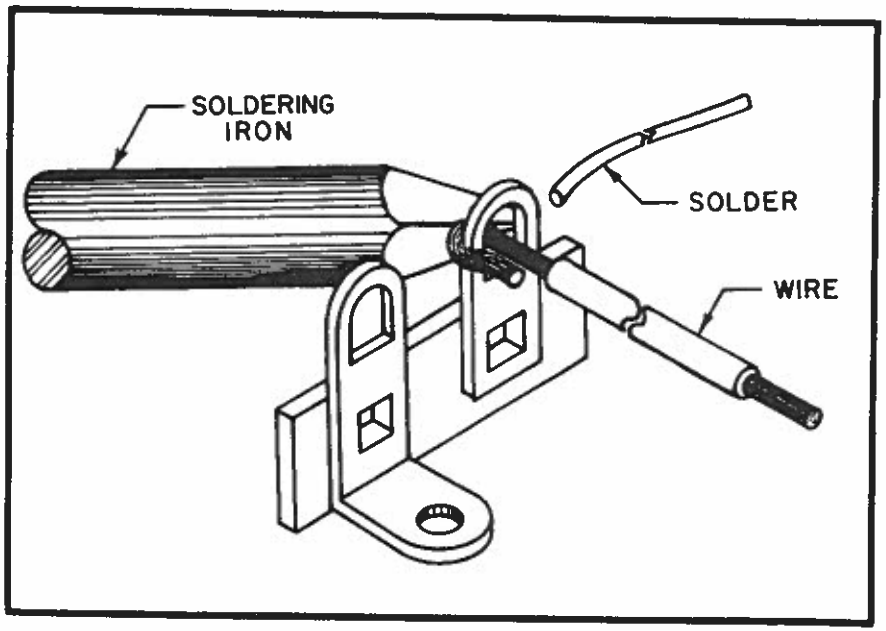


Figure 3. Connecting wires to lugs — just insert the wire in the lug, bend it over, and solder.

Most of the parts in your KX-200 have built-in terminals or lugs such as the controls and the switches. The others — resistors, capacitors, etc., have wire leads. In order to "form" electronic circuits you will simply connect these parts together. When the leads are not long enough wires are used, and to form a rigid assembly these components and wires are connected to lugs on terminal strips as shown in Figure 3.

Dressing

We don't mean clothing or stuffing, but, rather, lead dressing — the proper placement of leads, wires, and components as shown in Figure 4. Both of these photos show the same electrical circuit using the same wire length. However, the resistor and capacitor leads have not been cut properly in Figure 4B and just as important — the wires are not positioned properly. So, when you wire — be neat. The component leads must be cut as directed; the components and wires must be positioned as illustrated.

It is also possible to have "vertical trouble" — and we don't mean your

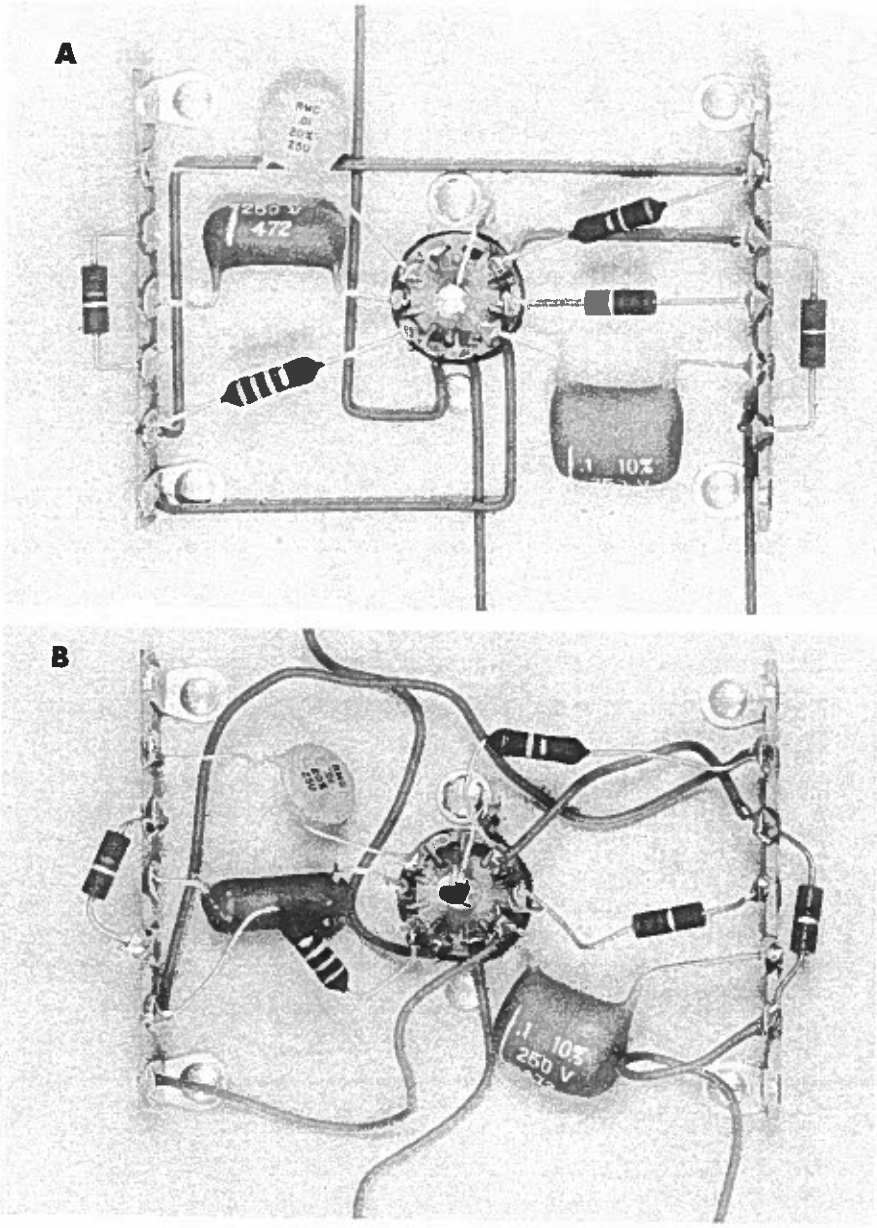


Figure 4. The right way 4 (a); and the wrong way 4 (b). Besides looking neater the assembly in 4 (a) is less apt to cause trouble.

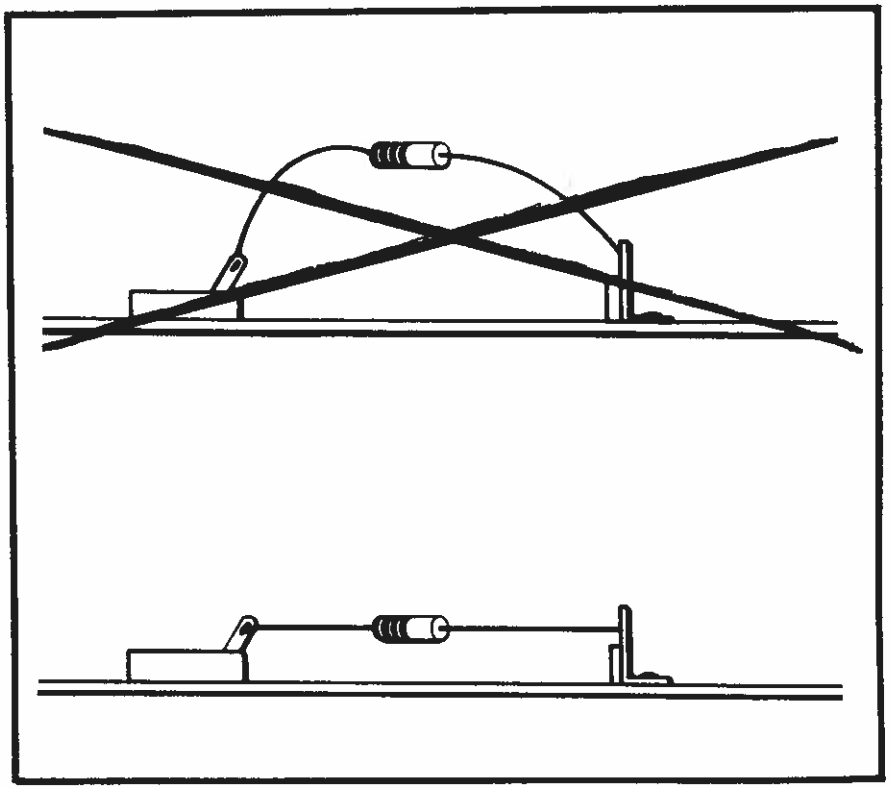


Figure 5. Watch your "vertical", too!

TV picture is flipping up and down. Since you're wiring in three dimensions it is just as important that the wires and parts be properly positioned in respect to height as shown in Figure 5. Normally all wires will be dressed "down" along the chassis while the resistors and capacitors are positioned in a straight line between the lugs.

Let's look at some of the components you will use.

Resistors

The resistors you will use in your KX-200 are identified in two ways. Those rated at under ½ watt (the power the resistor can safely handle) are color-coded by bands of color. The color-code is given on the parts list in the StrataPack as well as in the instructions when you install it.

However, *you must read the colors in the right order.* Note in Figure 6 that the colors are read from the end of the resistor where the colors start (the other end has just the body color). The fourth color band indicates the tolerance of the resistor which, unless otherwise indicated, can be ignored. Whenever low tolerance resistors are needed in your KX-200, they have been supplied.

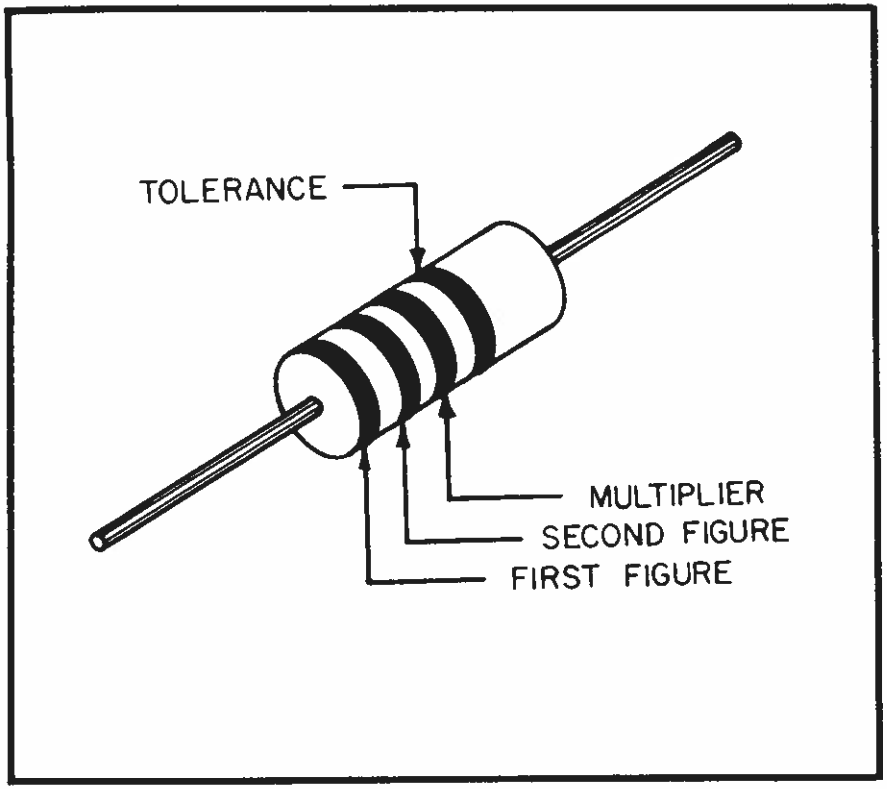


Figure 6. Resistor color-code.

Shielded Cable

In some of the circuits it is necessary to shield the signals from outside interference by using a wire inside "another wire". This "outer" wire is "grounded", so that any hum or noise it picks up is shunted away from the signal.

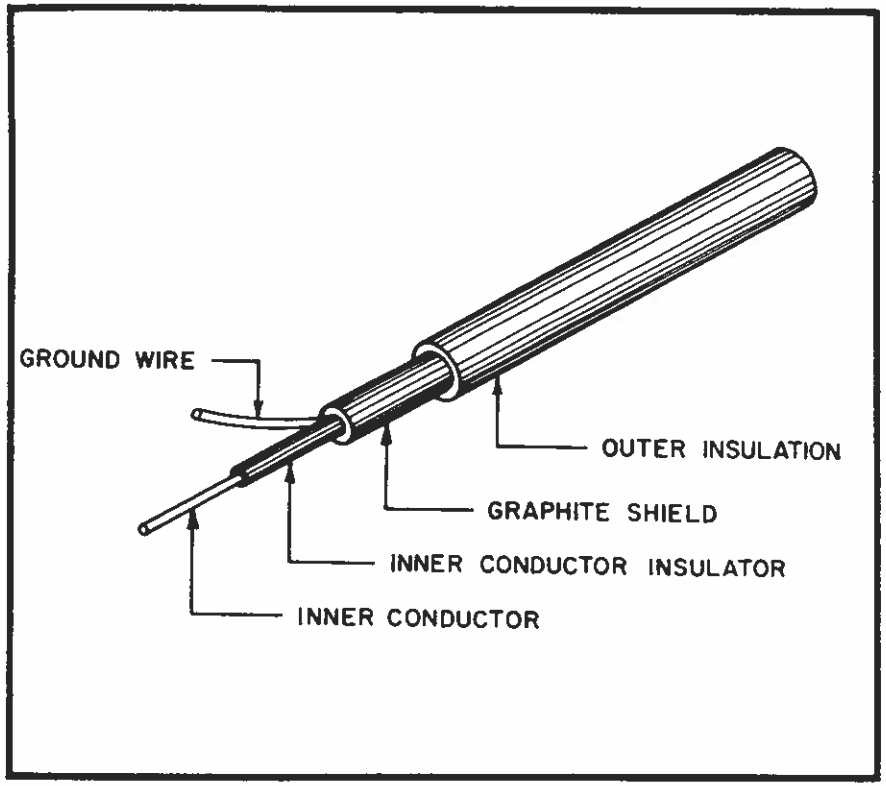


Figure 7. Shielded cable.

The shielded cable supplied to you consists of five sections as shown in Figure 7. This cable has been cut to the proper length and the outer insulation has been stripped off exposing the ground wire and the inner insulated (signal carrying wire). To use it you will need to strip off the insulation covering the inner wire.

No doubt the easiest way to do this is to purchase a small pair of wirestrippers (generally sold for under $1.00). Another method is to hold the insulated inner conductor about 3/8 inch back from the end with your combination pliers, grasp the wire right next to the pliers with the tips of your long-nose pliers, and pull off the insulation. You can also lightly score the insulation with a knife blade but be sure not to cut too deeply or you'll nick the wire and cause it to break off.

Silicon Diodes

These diodes replace the vacuum tube rectifiers used in most amplifiers to improve the power output, stability, and trouble-free operation of your StrataKit.

Despite the fact that these diodes are electrically very rugged (they far out-last tubes) they are sensitive to heat. Serious damage can occur by touching the hot soldering iron on the diode itself or even by holding the iron too long on the leads when soldering them into place. Of course if you don't hold the iron long enough on the joint you'll end up with a rosin joint!

So there you are!

But there is a solution. Before soldering them in place it is best to re-tin the ends of the leads. Hold the silicon diode with your long nose pliers between the diode body and the end of the lead which you will tin. You can now bring the diode lead, solder, and soldering iron together to re-tin the lead end. Holding the pliers between the diode and the hot soldering iron permits the pliers to absorb the heat which would otherwise be passed on to the diode.

Oops! Made A Mistake?

Naturally it isn't likely, but there is just the slightest possibility that you may "goof" by cutting resistor or capacitor leads too short; breaking a piece of hook-up wire or shielded cable; or breaking off a terminal strip or tube socket lug.

If you break or accidentally cut a resistor or capacitor lead too short, all you need do is extend it with a piece of bare wire.

Should you break one of the lengths of pre-cut pre-stripped wire or cable you'll just have to make your own. We supplied a small roll of wire and cable for this purpose — measure it, cut it, strip it, and you're back in business. Of course it probably won't be the right color (no need to paint it!). If you break off a terminal strip or tube socket lug, it is necessary to drill out the rivet(s) using a No. 9 (13/64") drill. After removing the rivet(s) a new part can be installed with ordinary 1/4 inch 4-40 machine screws, 4-40 hex nuts, and No. 4 lockwashers.

If you need any replacement parts, or, in fact, if you have any problem write to us immediately. Most of the components can be identified by the parts list at the end of the assembly manual. Be sure to give the Fisher part number as well as the value and description of the item. The terminal strips can be identified as they are shown in the assembly illustrations.

Address all such requests to:

Fisher Radio Corporation, StrataKit Division,
21-21 44th Drive, Long Island City 1, New York.

"STOP"

Have you read the preceding pages? If not, please go back and do so, even if you've built many kits. You might find them enjoyable and it only takes about 13 minutes.

Preliminary Instructions

The assembly instructions for your KX-200 StrataKit are organized in sections, called stages. Each stage includes a separate StrataPack plastic packet that contains all of the parts you will need for the stage. Therefore, when you finish each stage, you will have used all of the parts — an automatic check on what you have completed!

When the parts you need are not in the numbered StrataPacks or mounted on the chassis, they will be found in a section of the "parts tray" in the carton lid. This section is identified by your StrataKit model number. You have also received a "Spare Parts" plastic packet containing extra hardware and wire.

Each stage of wiring requires an illustration. In most cases the illustration will be on the page facing the text. Some stages require a larger figure — these you will find on separate sheet.

Examine the separate illustrations, particularly Figures 8 and 9. Figures 8 and 9 are over-all views of the chassis and front panel identifying all of the terminals. You can use them throughout construction to quickly identify and locate lugs. In addition, you will note that both contain a chart showing the "color-code" used in the Figures and a handy scale to measure resistor and capacitor leads. If you wish, pin or tape Figures 8 and 9 in front of your work area.

Remove the parts tray from the carton lid by the handles on both sides. Remove the plastic cover (it can be discarded) and locate the Spare Parts StrataPack in the lower right hand section of the tray.

Next remove the chassis from the carton. Pull the knobs from the control shafts and place them in the Spare Parts packet. With your combination pliers, remove the two large hex nuts on the Mode Selector and Balance control shafts — be careful not to scratch the dress panel.

Remove the dress panel and set it aside. It is a good idea to wrap it carefully in a soft cloth for protection.

Next, remove both the front panel shield and the front panel from the chassis — they are held by screws.

You can now turn over the chassis and remove the bottom cover. Place all of the hardware in the Spare Parts packet.

The heavy folded cardboard which held the chassis is your Worktable. Remove it from the carton. Since you will first work on the front panel you can now place the chassis, bottom cover, and front panel shield back in the carton.

This Kit has been approved by the Canadian Standards Association for minimum electrical safety requirements provided it is assembled and wired in accordance with the instructions.

STAGE 1

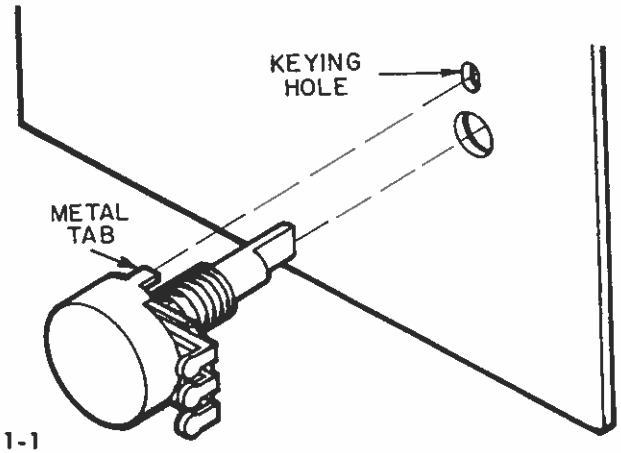


Figure 1-1

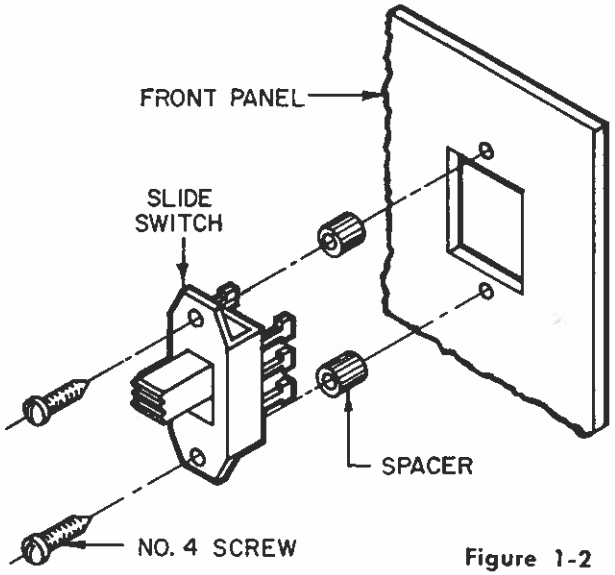


Figure 1-2

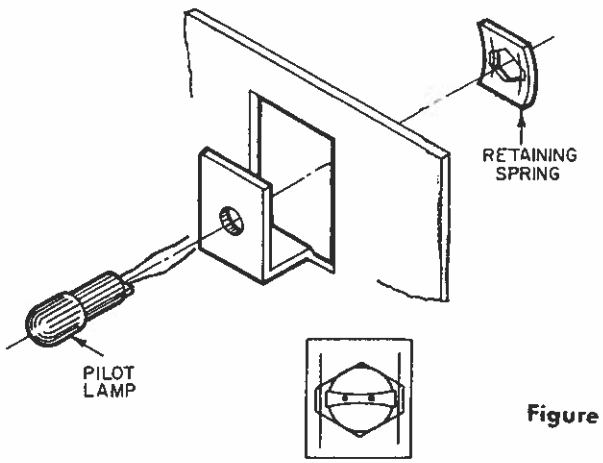


Figure 1-3

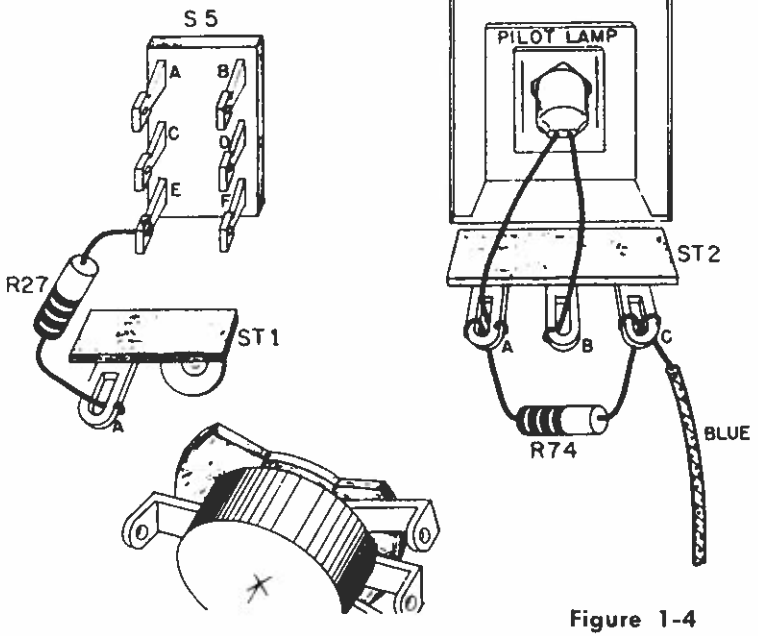


Figure 1-4

AFTER YOU COMPLETE each step, check the appropriate box so you'll know where to begin if you are interrupted or stop working.

By the way, you may notice in both the step and terminal identification that we skipped the letters I (eye) and O (oh) to prevent possible confusion with the numbers 1 (one) and 0 (zero).

Locate StrataPack 1, Fig. 8 on the fold-out sheet, and the front panel. Refer to Fig. 8, the over-all view of the front panel, to locate the section of the panel on which you're working. These sections are illustrated individually right in the assembly book.

Most of the front panel controls have already been mounted to eliminate the necessity of your identifying them. Your first step will be to rotate them properly and tighten them to the panel.

Note that each control has a projecting metal tab and that there is a corresponding keying hole in the chassis near the control.

Step 1A ☒ Rotate each control until the projecting metal tab is positioned in the key-hole as shown in Figure 1-1. Tighten the hex nut on the control with your combination pliers or an open-end wrench.

Next, you will mount the four slide switches in StrataPack 1 on the front panel. These switches are identified in Fig. 8 as S6, S5, S4, and S3 — they are mounted at the top of the panel in the rectangular holes.

Step 1B ☑ Mount the four slide switches as shown in Fig. 8 and Fig. 1-2 using the appropriate hardware. While tightening the switches in place, hold them in the approximate center of the panel hole.

Step 1C ☑ Mount the neon pilot lamp in the hole in the center of the panel, as shown in Figure 1-3. First insert the bulb in the hole from the front of the panel and rotate it as shown. Place the retaining spring over the other end of the bulb in the position shown, with the bulb leads through the hole in the spring. Force the spring down over the bulb (with your pliers, if necessary).

If your soldering iron isn't heated, plug it in now . . . and while you're waiting you can check over what you've done so far!

Refer to Figure 1-4 for the following steps.

Step 1D ☑ Cut both pilot lamp leads to one inch.

Step 1E ☑ Solder one lead to lug B of strip ST2.

Step 1F ☑ Connect the other lead to lug A of ST2. Be sure the bare pilot lamp leads do not touch each other or the lamp won't light (and you must admit — this would seriously reduce its usefulness!).

Step 1G ☑ Cut both leads of the 220K ohm resistor R74 (red, red, yellow) to 3/8 inch.

Step 1H ☑ Bend the resistor leads and connect R74 between lugs A and C of strip ST2 as shown in Fig. 4. Solder lug A.

Step 1J ☑ Cut both leads of the 47K ohm resistor R27 (yellow, violet, orange) to 3/8 inch.

Step 1K ☑ Connect R27 between lug E of switch S5 and lug A of strip ST1. Solder lug E of the switch.

Step 1L ☑ Solder one end of the blue wire to lug C of strip ST2. The other end of the wire will be connected into the chassis later. You'll find, as you progress, that there will be many leads connected this way.

This completes Stage 1. Remember — if you have any parts left over from StrataPack 1, you goofed! Go back and check.

(There is the remote possibility that we generously supplied you with, say, an extra screw or perhaps even two 47K ohm resistors instead of one. If so, don't try to use them up!) But, instead, please do two things. First put the extra part aside so it can't cause you further trouble. Second, please write us and tell us what happened — be as nasty as you feel! Be sure to address your gripe to the "Fisher Kit Division."

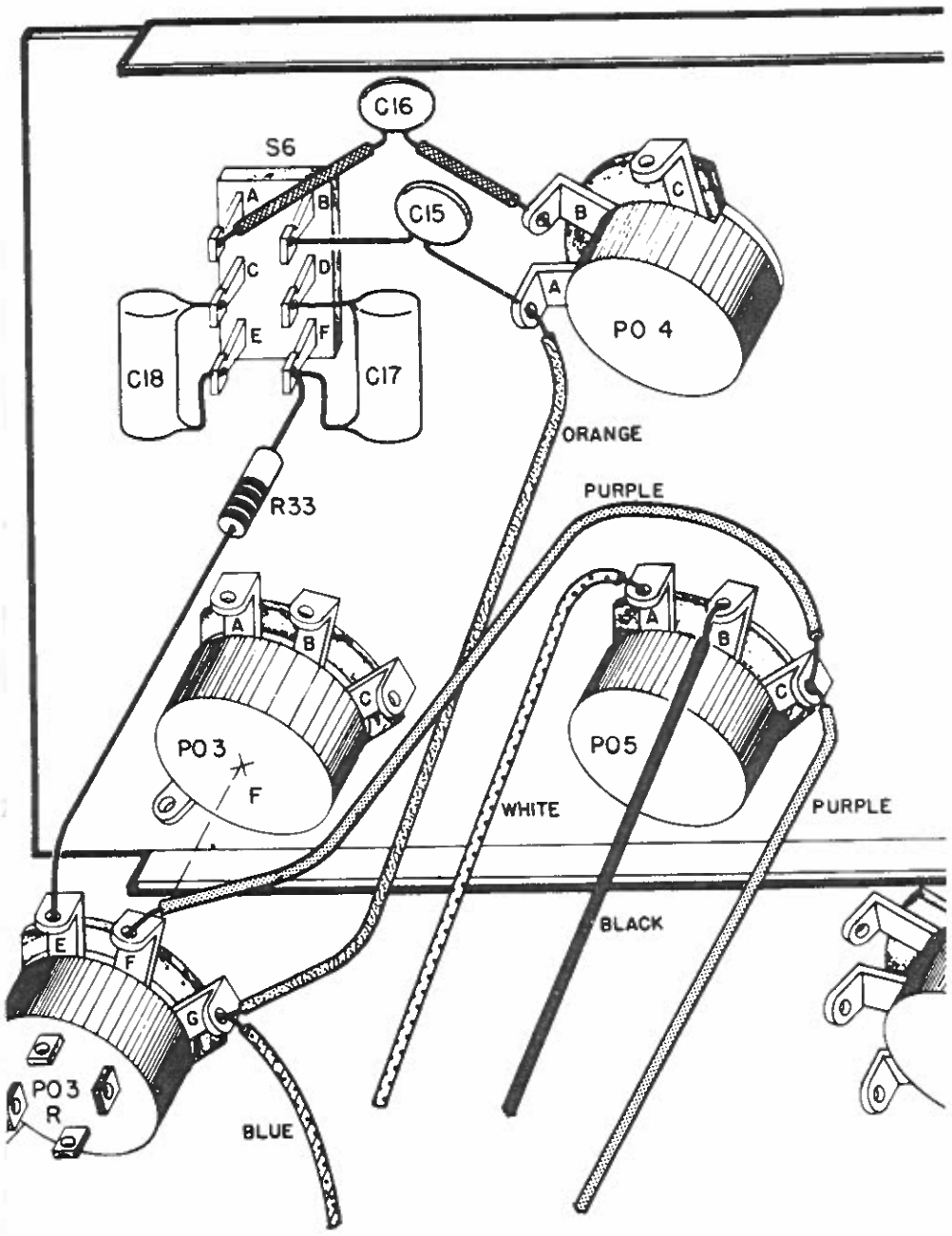


Figure 2-2

STAGE 2

IN THIS STAGE you will wire the dual Volume control P03, the Loudness Contour switch S6, the Balance control P05 and the Stereo Dimension control P04. Use the parts in StrataPack 2 and if necessary, refer to Fig. 8 as before.

Refer to Fig. 2-1 for the following steps:

Step 2A ☑ Solder one end of the brown wire to lug D on the front section of control P03. Connect the other end of the wire to lug C of switch S6. Dress the wire against the front panel.

Step 2B ☑ Solder one end of the red wire to lug H on the rear section of control P03. Connect the other end of the wire to lug D on switch S6. Dress the wire against the panel.

Step 2C ☑ Cut a ¾" length of bare wire and connect it between lug A on the front section of control P03 and lug E on the rear section.

Step 2D ☑ Connect the 3" black wire (the longer of the two) between lug A on the front section of control P03 and center lug B of control P05.

Step 2E ☑ Cut one lead of one of the 22K ohm resistors (red, red, orange) to ½ inch and solder this lead (of R34) to lug A on the front section of control P03.

Step 2F ☑ Connect the other resistor lead to lug E of switch S6 — cut it as short as possible as shown in Fig. 2-1.

Step 2G ☑ Connect the green wire between lug B on the front section of control P03 and lug A of control P05. Solder lug B of P03.

Step 2H ☑ Connect the 2½ inch white wire (the shorter of the two) between lug C on the front section of control P03 and lug B of control P04.

Step 2J Strip the insulation from ¼ inch of both ends of the 7 inch

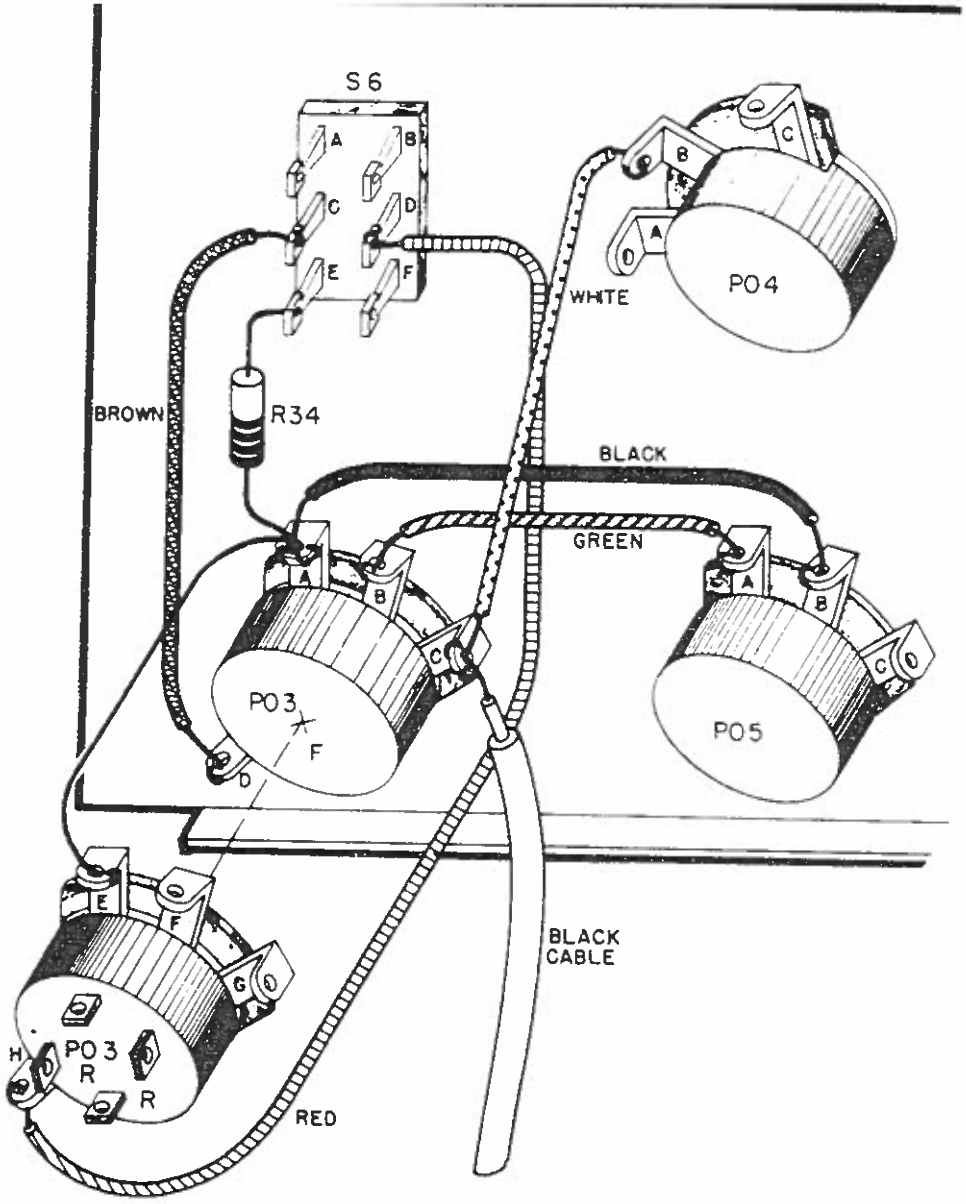

S6
A
B
C
D
E
F
WHITE
P04
BROWN
R34
BLACK
GREEN
P03
F
P05
BLACK
CABLE
P03
R
R
RED

Figure 2-1

☑ black shielded cable as previously explained. Cut the ground lead off one end and solder this end of the cable to lug C on the front section of control P03.

Refer to Fig. 2-2 for the following steps:

Step 2K ☑ Connect the orange wire between lug G on the rear section of control P03 and lug A of control P04.

Step 2L ☑ Solder one end of the blue wire to lug G on the rear section of control P03.

Step 2M ☑ Solder one end of the 3¼ inch purple wire (the shorter of the two) to lug F on the rear section of control P03. Connect the other end to lug C of control P05.

Step 2N ☑ Solder one end of the remaining purple wire to lug C of control P05.

Step 2P ☑ Solder one end of the remaining white wire to lug A of control P05.

Step 2Q ☑ Solder one end of the remaining black wire to lug B of control P05.

Step 2R ☑ Cut one lead of the remaining 22K ohm resistor R33 (red, red, orange) to ½ inch and solder it to lug E on the rear section of control P03.

Step 2S ☑ Connect the other resistor lead to lug F of switch S6 — cut it as short as possible.

Step 2T ☑ Cut both leads of one of the 68 mmf disc capacitors to ⅞ inch — this is capacitor C16. Cut two ½ inch lengths of insulating spaghetti.

Step 2U ☑ Slip one of the ½ inch lengths of spaghetti over one of the leads of capacitor C16 and solder this lead to lug B of control P04.

Step 2V ☑ Slip the other length of spaghetti over the other lead of C16 and solder it to lug A of switch S6.

Step 2W ☑ Cut both leads of the remaining 68 mmf disc capacitor (C15) to ¾ inch and solder it between lug A of control P04 and lug B of switch S6.

Step 2X ☑ Cut both leads of one of the .022 mfd mylar capacitors to ½ inch. Bend the leads as shown and solder it, as C17, between lugs D and F of switch S6.

Step 2Y ☑ Cut both leads on the other .022 mfd mylar capacitor to ½ inch and solder it, as C18, between lugs C and E of switch S6.

This completes Stage 2 — and this is fortunate since ending at Step 2Y we almost ran out of letters! With only one left over let's use it up.

Step 2Z ☑ Check to be sure all of the lugs of switch S6 and Controls P03, P04, and P05 are soldered. (No connections to Lug C of P04.)

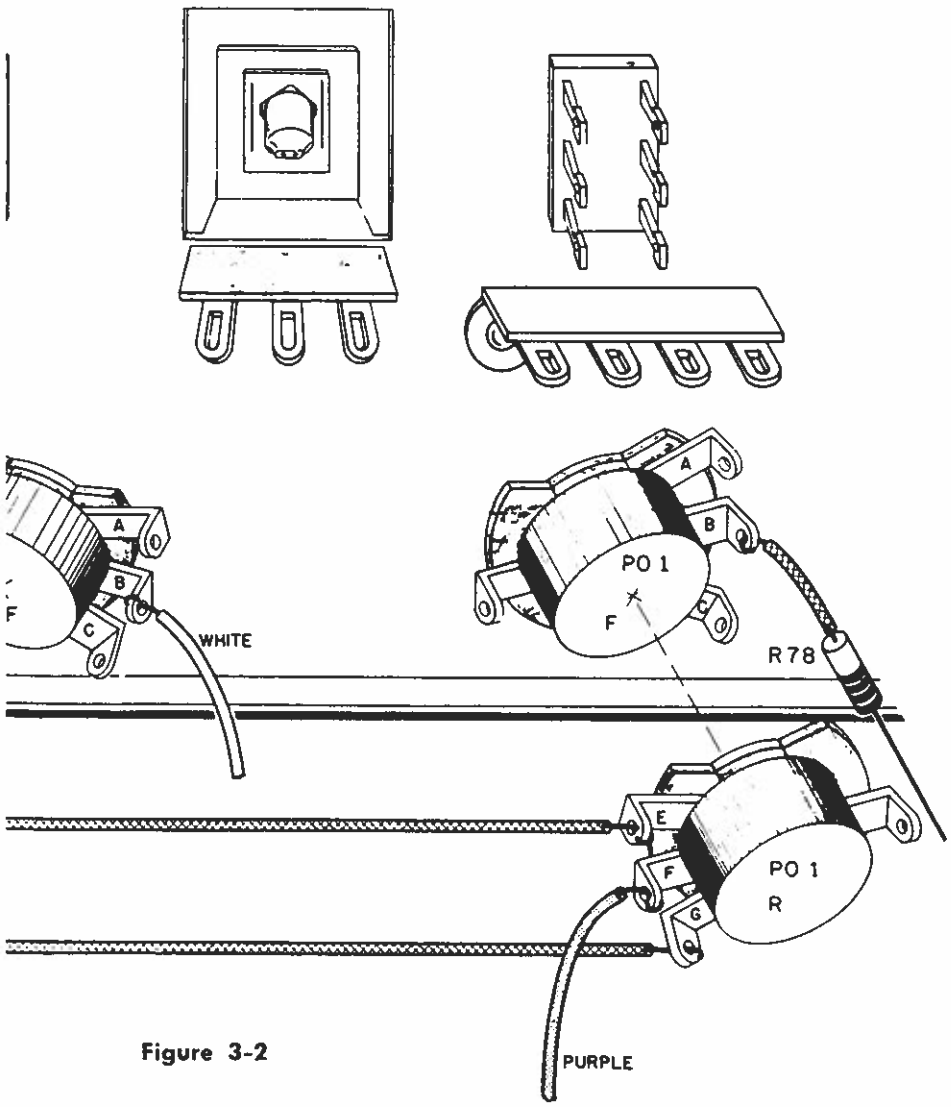


Figure 3-2

STAGE 3

NOW YOU WILL WIRE the dual tone controls. Instead of using individual resistors and capacitors, special Fisher designed printed circuit plates will be used to save time and insure uniformity.

The tone control printed circuits each contain 7 leads. You will first cut these leads to the correct length. Each lead will be covered with insulating spaghetti before it is soldered in place.

Step 3A Locate one of the (7-lead) tone control printed circuits CP6 and cut the leads as follows:

- ☐ No. 1 — 3½ inch
- ☐ No. 2 — 1¾ inch
- ☐ No. 3 — 2¼ inch
- ☐ No. 4 — 2¾ inch
- ☐ No. 5 — 2¼ inch
- ☐ No. 6 — 1¾ inch
- ☐ No. 7 — 2½ inch

Step 3B Place CP6 about half-way between controls P02 and P01 as shown in Fig. 3-1. Remember to slip a piece of insulating spaghetti over each lead before you solder it in place. The first line of each step will tell you the required length of spaghetti.

Step 3C 1¼ inch spaghetti. Solder lead No. 6 to lug A on the front section of control P02.

Step 3D 1¼ inch spaghetti. Solder lead No. 2 to lug C on the front section of control P02.

Step 3E 2 inch spaghetti. Solder lead No. 5 to lug A on the front section of control P01.

Step 3F 2½ inch spaghetti. Connect lead No. 4 to center lug B on the front section of control P01.

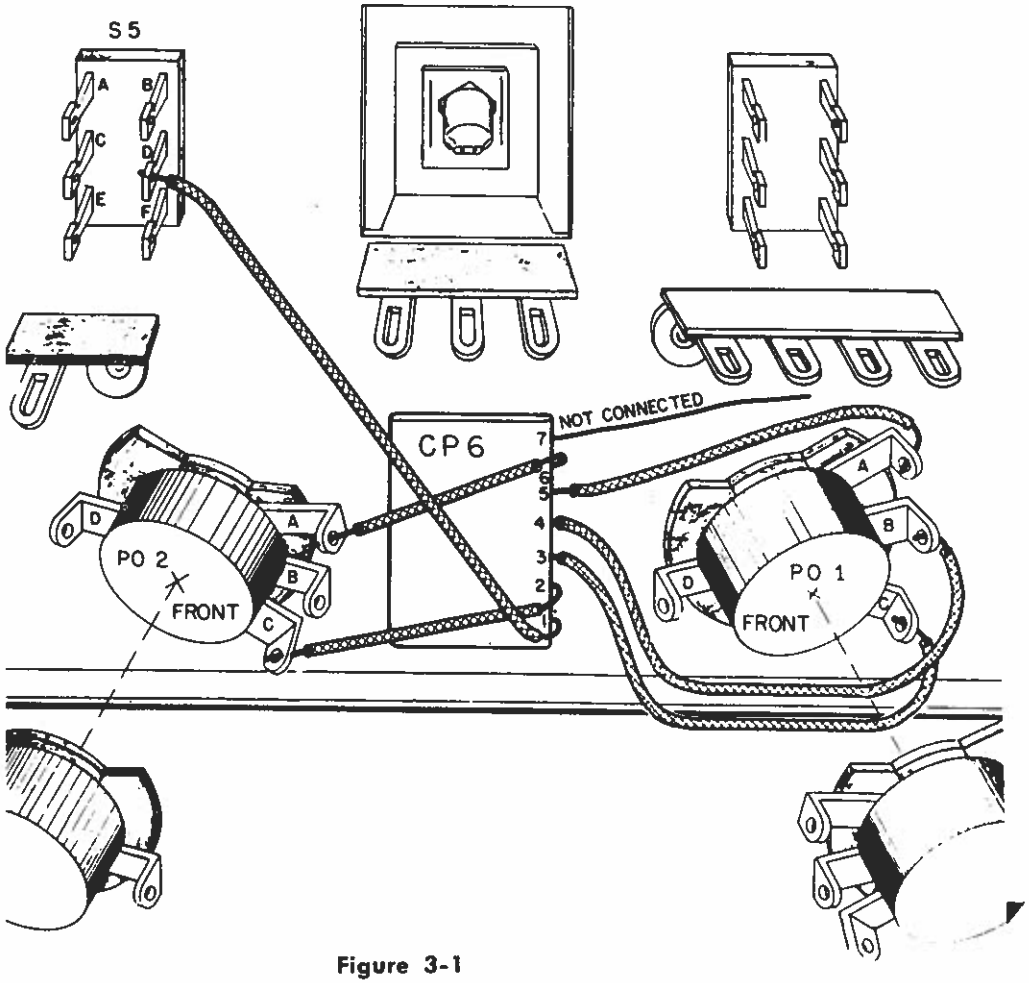


Figure 3-1

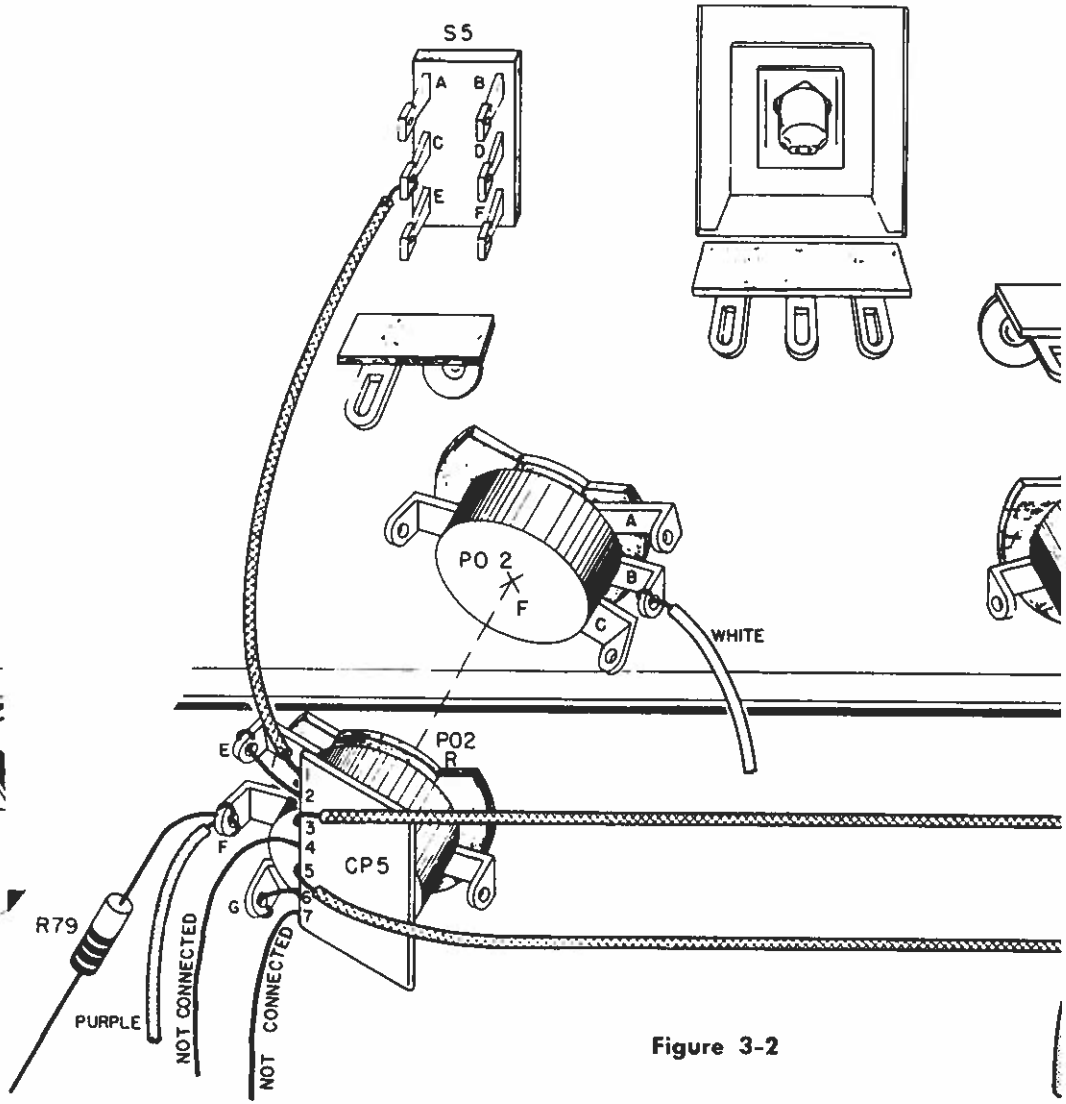


Figure 3-2

*Fig 3-2

Step 3G 2 inch spaghetti. Solder lead No. 3 to lug C on the front section of control P01.

Step 3H 3¼ inch spaghetti. Solder lead No. 1 to lug D of switch S5.

Lead No. 7 will not be connected yet.

Step 3J Solder one end of the white wire to lug B on the front section of control P02.

Step 3K Locate the other 7-lead tone-control printed circuit CP5 and cut the leads as follows:

- ☐ No. 1 — 2¼ inch
- ☐ No. 2 — ⅜ inch
- ☐ No. 3 — 3¾ inch
- ☐ No. 4 — 1¼ inch
- ☐ No. 5 — 3¾ inch
- ☐ No. 6 — ⅜ inch
- ☐ No. 7 — 1 inch

Position CP5 on the back of control P02 as shown in Fig. 3-2 and wire it as follows. Be sure to use the insulating spaghetti, where required, as you did before.

Step 3L No spaghetti. Solder lead No. 2 to lug E on the rear section of control P02.

Step 3M No spaghetti. Solder lead No. 6 to lug G on the rear section of control P02.

Check to be sure these bare leads (No. 2 and 6) are not shorted to the metal back cover of control P02.

Step 3N 2 inch spaghetti. Solder lead No. 1 to lug C of switch S5.

Step 3P 3¼ inch spaghetti. Solder lead No. 3 to lug E on the rear section of control P01.

Step 3Q 3½ inch spaghetti. Solder lead No. 5 to lug G on the rear section of control P01.

Leads 4 and 7 will not be connected at this time.

Step 3R Solder one end of one of the purple wires to lug F on the rear section of control P01.

Step 3S Connect one end of the remaining purple wire to lug F on the rear section of control P02.

Step 3T Cut both leads on one of the 39K ohm resistors (orange, white, orange) to ½ inch. Solder one of the leads (of R79) to lug F on the rear section of control P02.

Step 3U Cut each lead on the remaining 39K ohm resistor (orange, white, orange) to 1¼ inch. Cut a piece of insulating spaghetti 1 inch long.

Step 3V Slip the spaghetti over one lead of this resistor, R78, and solder the lead to lug B on the front section of control P01.

This completes the tone-control wiring. See it wasn't so bad!

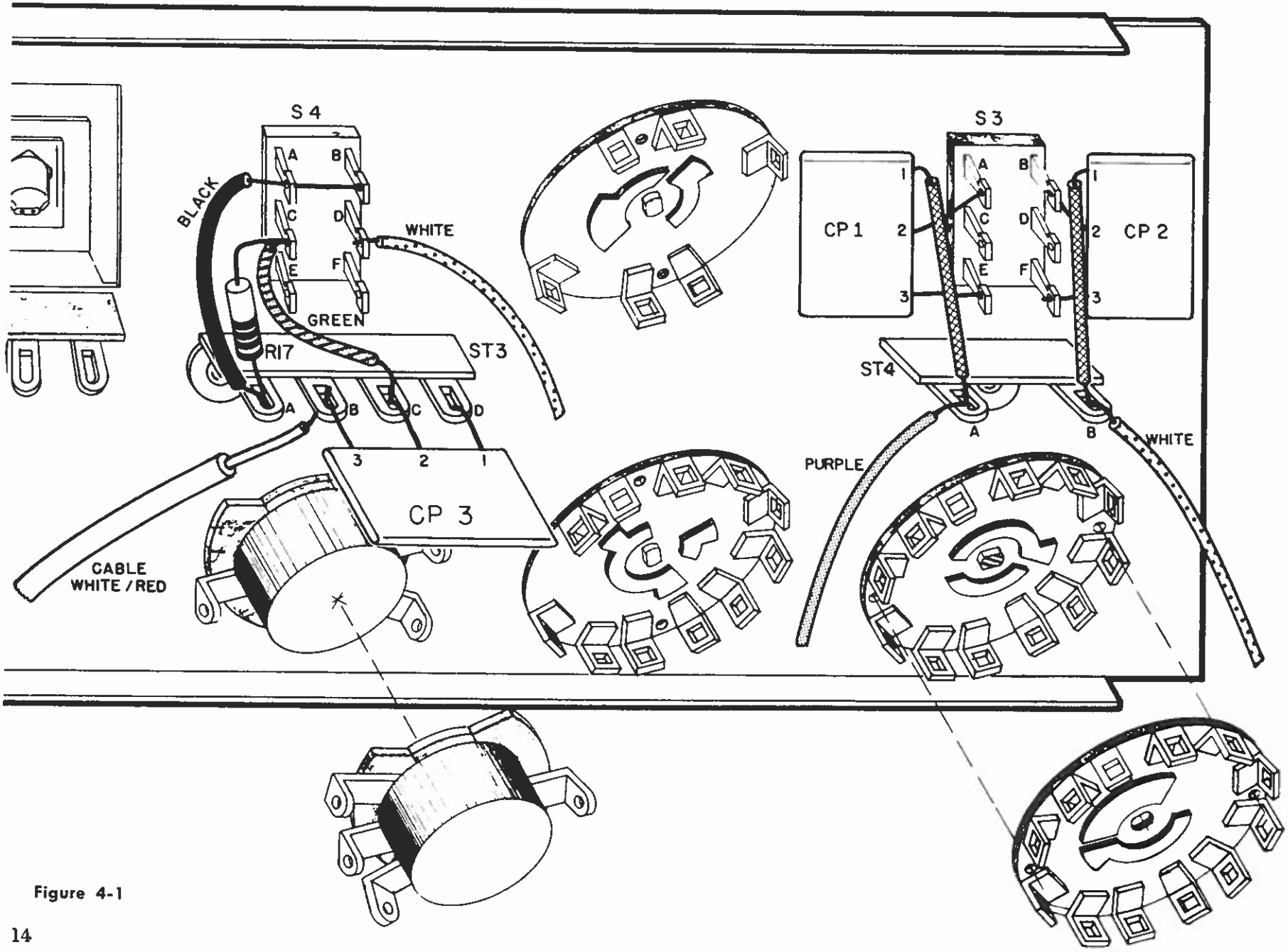

S 4
A
B
C
D
E
F
BLACK
WHITE
GREEN
RI7
ST3
A
B
C
D
3
2
1
CP 3
CABLE
WHITE / RED
S 3
CP 1
CP 2
ST4
PURPLE
WHITE

Figure 4-1

STAGE 4

IN THIS STAGE you will wire the Channel A High Frequency Filter, the High Frequency Filter switch S4 and some of the wiring in other circuits.

Step 4A Connect the green wire between lug C of switch S4 and lug C of strip ST3.

Step 4B Cut a ¾ inch length of bare wire and connect it between lugs A and B of switch S4. Solder lug B.

Step 4C Connect the black wire between lug A of switch S4 and lug A of strip ST3. Solder lug A of the switch.

Step 4D Cut both leads on the 10 megohm resistor R17 (brown, black, blue) to ¾ inch. Connect the resistor between lug C of switch S4 and lug A of strip ST3. Solder both lugs.

Step 4E Remove ¼ inch of insulation from one end of the shielded cable and cut off the ground wire. Connect this end of the cable to lug B of strip ST3.

Step 4F Locate the high frequency filter printed circuit CP3 — it is the smallest of the three in StrataPack 4. Cut each lead to ½ inch.

Step 4G Position CP3 vertically to the panel as shown in Fig. 4-1. Solder lead No. 3 to lug B of strip ST3.

Step 4H Solder lead No. 2 of CP3 to lug C of strip ST3.

Step 4J Connect lead No. 1 of CP3 to lug D of strip ST3.

Step 4K Solder one end of the 4 inch white wire (the shorter one) to lug D of switch S4.

Step 4L Locate the two Equalization printed circuits and cut the leads of both as follows:

- ☐ No. 1 — 1⅞ inch
- ☐ No. 2 — ⅜ inch
- ☐ No. 3 — ⅜ inch

Step 4M Position one of the printed circuits as CP2 on the right hand side of switch S3. The printing on the circuit plate should be facing you. Solder lead No. 3 to lug F of switch S3.

Step 4N Solder lead No. 2 of CP2 to lug B (the top lug) of switch S3.

Step 4P Cut a 1½ inch length of insulating spaghetti and slip it over lead No. 1 of CP2. Connect lead No. 1 to lug B of strip ST4.

Step 4Q Position the remaining printed circuit CP1 as shown in Fig. 4-1 with the printing on the circuit plate facing away from you. (so you can't read it this way — but it isn't very interesting anyway!) Solder lead No. 3 to lug E of switch S3.

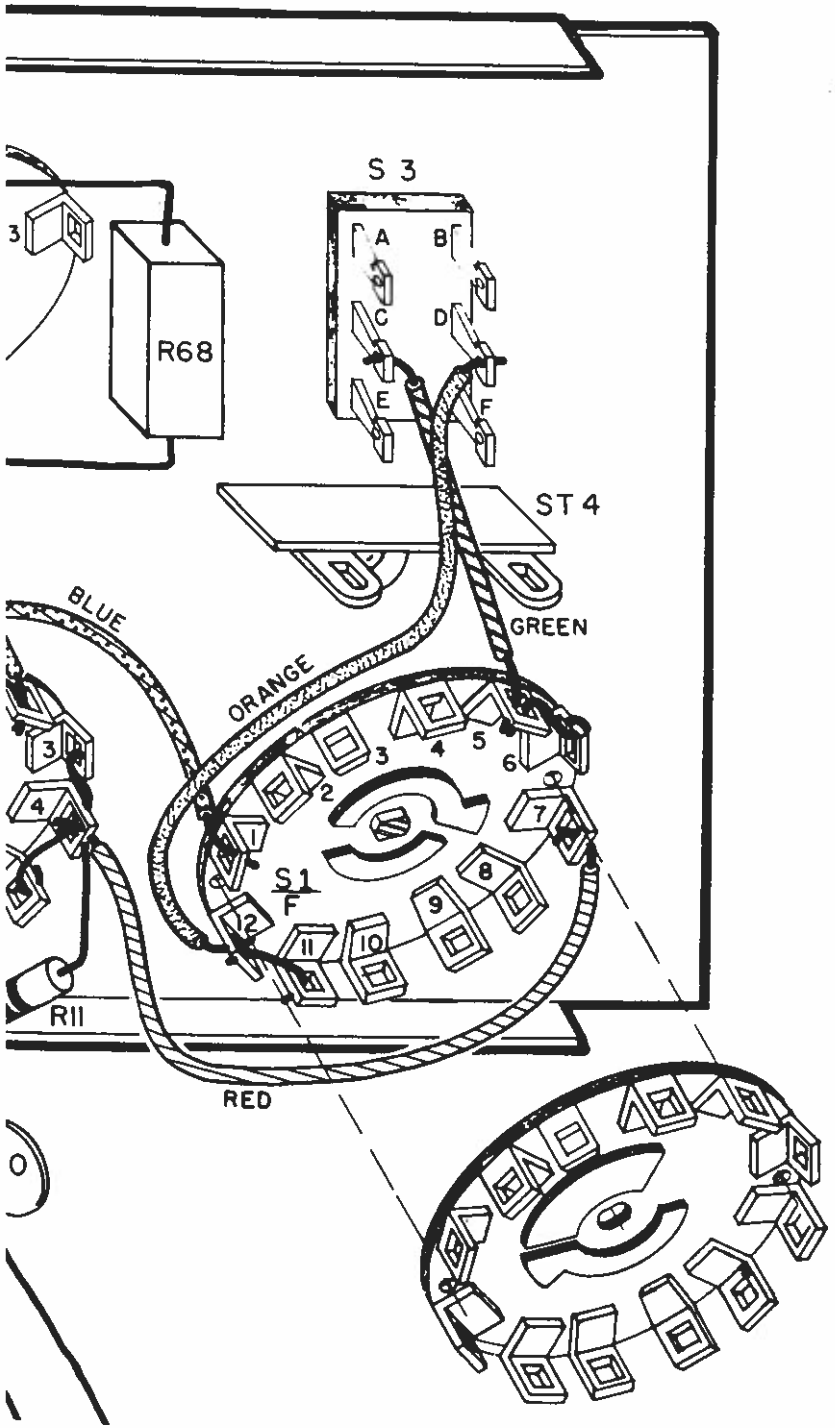
Step 4R Solder lead No. 2 of CP1 to lug A of switch S3.

Step 4S Cut a 1½ inch length of insulating spaghetti and slip it over lead No. 1 of CP1. Connect lead No. 1 to lug A of strip ST4.

Step 4T Solder one end of the remaining white wire to lug B of strip ST4.

Step 4U Solder one end of the purple wire to lug A of strip ST4.

This completes Stage 4. This was a short one but the next, Stage 5, will be longer and will contain some critical wiring. So if you've been working steadily so far this is a good time to take a break before beginning Stage 5. A sleepy kit builder tends to make mistakes.



STAGE 5

IN THIS STAGE you will wire the three rotary switches S1, S2, and S8. Experience has shown that rotary switches unfortunately cause considerable trouble to kit builders.

Part of this trouble is because these switches are delicate. Both the lugs and the phenolic wafers are easily broken — so be extra careful. A greater cause of trouble to the kit builder is in soldering these switches. If the switch is positioned so that the lug projects up in the air when it is soldered, the solder (and rosin) can be pulled by gravity down on to the switch contact. This will either short the contacts, freeze them so the switch won't rotate or the rosin can cause poor contact. In short it becomes quite messy!

To prevent this it would be best to wire the stage with the panel in a perfectly horizontal position. First, then, prop up the panel so that it is horizontal.

Refer to Fig. 5-1 for the following steps.

Step 5A ☐

Cut the leads of both 10 ohm resistors to one inch. Position one of them as R67 on the left side of switch S8. Solder the leads to lugs 7 and 12 of S8 as shown.

Note that both lugs 7 and 12 are "double lugs" as compared to lug 9. When connecting to a double lug insert the lead (or wire) through *both lugs* and be sure to solder both together.

Step 5B ☐

The other 10 ohm resistor R68 will be placed on the right side of switch S8 as shown. First lift up the CP1 printed circuit and place the resistor underneath it right up against the panel. Solder the leads to lugs 1 and 6 of switch S8.

Step 5C ☐

Bend the printed circuit CP1 back down on top of resistor R68. Both resistors R68 and R67 should be dressed right up against the panel.

Step 5D ☐

Cut a 1¼ inch length of bare wire and a ¾ inch length of insulating spaghetti. Solder one end of the wire to lug 7 of switch S2.

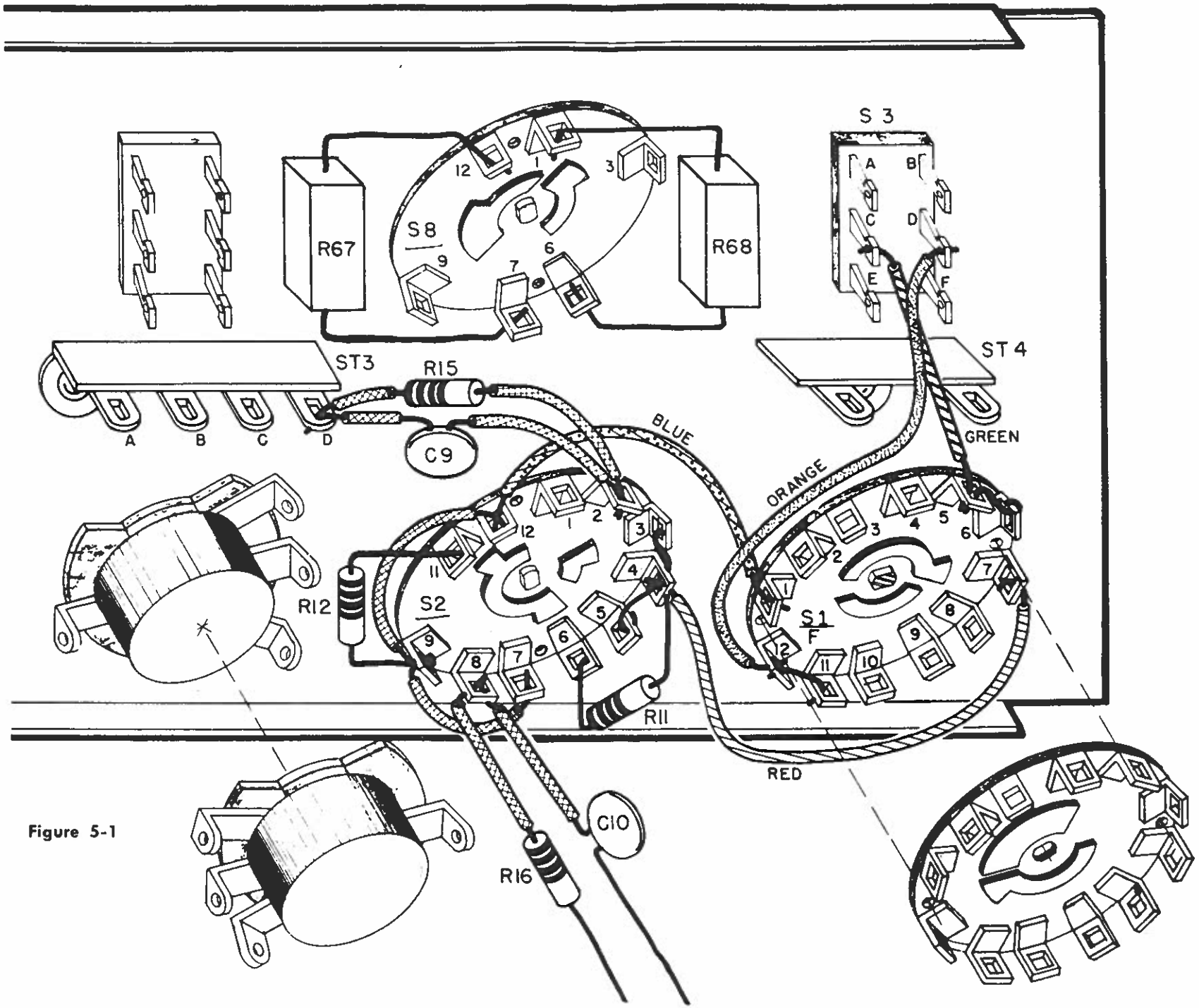

S 3
A
B
C
D
E
F
R67
S8
R68
12
1
3
9
7
6
ST3
ST 4
R15
A
B
C
D
C9
BLUE
GREEN
ORANGE
R12
S2
S1
F
R11
RED
C10
R16

Figure 5-1

Step 5E Slip the spaghetti over the wire and connect the other end to lug 9 of switch S2.

Step 5F Cut a 2 inch length of bare wire and a 1½ inch length of spaghetti. Connect one end of the wire to lug 9 of switch S2.

Step 5G Slip the spaghetti over the wire and connect the other end to lug 12 of switch S2.

Step 5H Solder one end of the blue wire to lug 12 of switch S2. Solder the other end to lug 1 on the front deck (section) of the two-deck switch S1.

Step 5J Solder one end of the red wire to lug 7 on the front deck of switch S1.

Step 5K Connect the other end of the red wire to lug 4 of switch S2.

Step 5L Dress the wires you have just connected to the switches as far down against the panel as possible. Be sure any bare portions are not causing shorts.

Step 5M Connect one end of the orange wire to center lug D of switch S3. Dress it down between the lugs of strip ST4 and connect the other end to lug 12 on the front deck of switch S1.

Step 5N Connect one end of the green wire to center lug C of switch S3. Dress it as shown in Fig. 5-1 and connect the other end to lug 5 on the front deck of switch S1.

Step 5P Cut a ¾ inch length of bare wire and solder it between lugs 5 and 6 on the front deck of switch S1. (No spaghetti.)

Step 5Q Cut a ¾ inch length of bare wire and solder it between lugs 11 and 12 on the front deck of switch S1. (No spaghetti.)

Step 5R Cut the leads on both 100K ohm resistors (brown, black, yellow) to ½ inch. Connect one resistor (R11) between lugs 4 and 6 of switch S2. Solder lug 6.

cut 1 - 1½ etc feed thru 4 etc.

Step 5S Cut two ¾ inch lengths of bare wire. Connect one between lugs 3 and 4 of switch S2; connect the other between lugs 4 and 5 of switch S2. Solder all three lugs: 3, 4, and 5.

Step 5T Connect the other 100K ohm resistor R12 (brown, black, yellow) between lugs 9 and 11 of switch S2. Solder both lugs.

Step 5U Cut the leads on one of the 560K ohm resistors (green, blue, yellow) to 1¼ inches. Cut two 1 inch lengths of spaghetti.

Step 5V Slip the spaghetti on the resistor (R15) leads and connect R15 between lug 2 on switch S2 and lug D of strip ST3.

Step 5W Cut the leads of one of the 24 mmf disc capacitors (C9) to 1¼ inches; cut two 1 inch lengths of spaghetti.

Step 5X Slip the spaghetti on the capacitor leads and solder C9 between lug 2 of switch S2 and lug D of strip ST3.

Step 5Y Cut all four leads on both the remaining 560K ohm resistor R16 (green, blue, yellow) and the remaining 24 mmf disc capacitor to 1 inch. Cut two ¾ inch lengths of spaghetti.

Step 5Z Slip the spaghetti over one lead of the resistor and one lead of the capacitor. Solder these leads to lug 8 of switch S2.

Well we ran out of letters again so we'll have to stop. But we're almost finished with the front panel now. In the next stage we'll wire the rear deck of switch S1 and hang a few more leads on the panel (to make it look oven more like an octopus)!

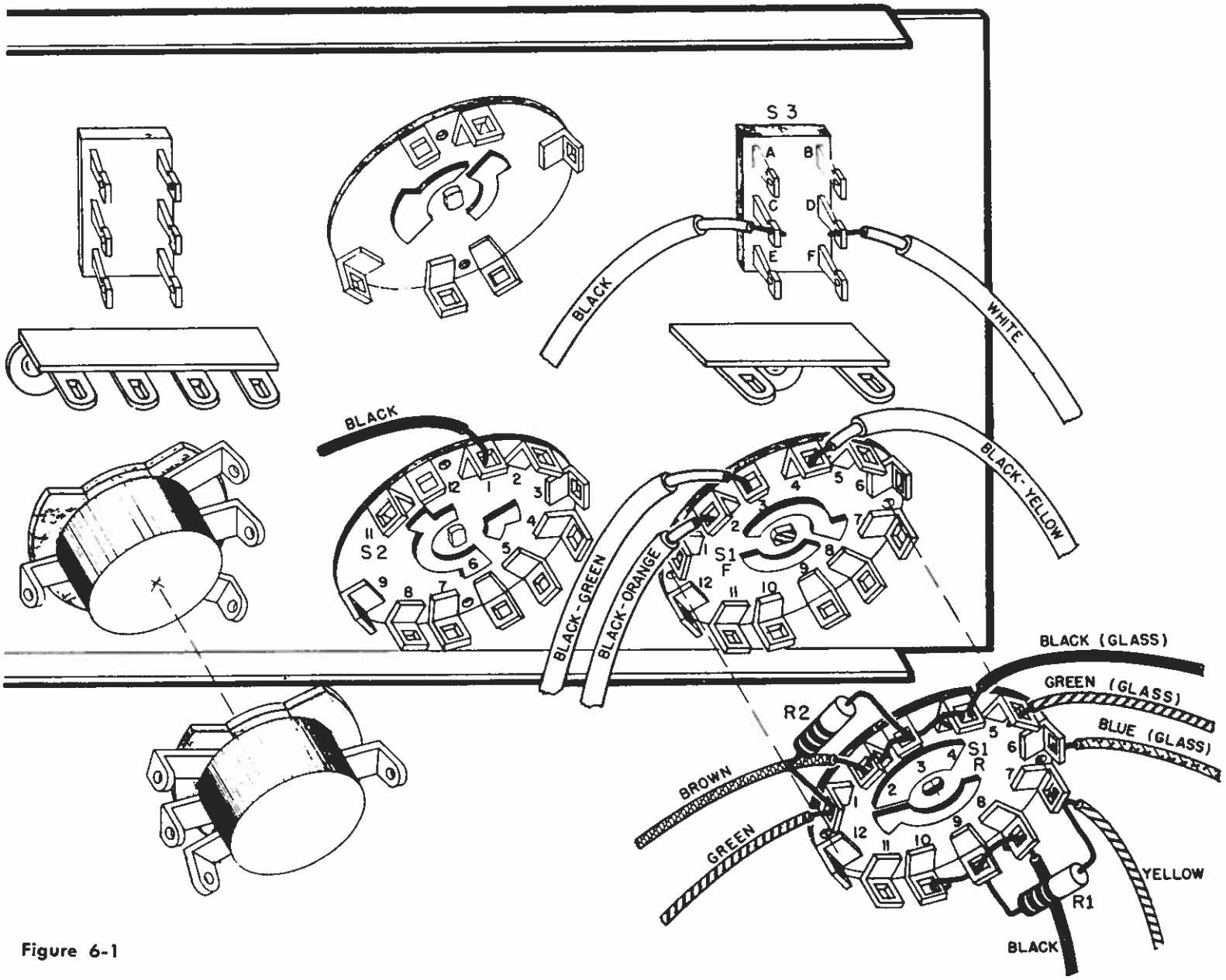

S 3
A
B
C
D
E
F
BLACK
WHITE
BLACK
S2
S1
F
BLACK-GREEN
BLACK-ORANGE
BLACK-YELLOW
BLACK (GLASS)
GREEN (GLASS)
BLUE (GLASS)
R2
S1
R
BROWN
GREEN
YELLOW
R1
BLACK

Figure 6-1

STAGE 6

THIS IS THE LAST STAGE of wiring the front panel. Now aren't you sorry you worked so fast? But don't worry — next we'll start on the chassis and there's a few (?) hours work there!

Step 6A ☑ Connect one end of the yellow wire to lug 7 on the rear deck of switch S1.

Step 6B ☑ Connect one end of the 2 inch black wire, the shortest one, to lug 8 on the rear deck of switch S1.

Step 6C ☑ Cut a 1¼ inch length of bare wire. Insert this wire through lug 9 on the rear deck of S1. Bend the one end down through lug 8 and the other up through lug 10. This connects lugs 8, 9, and 10 (all on the rear deck) together. Solder lug 8.

Step 6D ☑ Cut all four leads of the 47K ohm resistors (yellow, violet, orange) to ½ inch. Solder one of these (R1) between lugs 7 and 9 on the rear deck of switch S1.

Step 6E ☑ Connect one end of the green wire to lug 1 on the rear deck of switch S1.

Step 6F ☑ Connect one end of the brown wire to lug 2 on the rear deck of switch S1.

Step 6G ☑ Cut a 1¼ inch length of bare wire and insert it in lug 3 on the rear deck. Similar to step 6C, bend the wire over to connect lugs 2, 3, and 4 together. Solder lug 2.

Step 6H ☑ Connect the remaining 47K ohm resistor, R2, (yellow, violet, orange) between lugs 1 and 3 on the rear deck of switch S1. Solder both lugs.

Step 6J ☑ Remove ¼ inch of insulation from both ends of the pieces of shielded cable. Do not cut off any of the ground wires.

Step 6K ☑ Cut the ground lead off one end of the white shielded cable. Solder this end to lug D of switch S3.

Step 6L ☑ Cut the ground lead off one end of the black shielded cable. Solder this end to lug C of switch S3.

Step 6M ☑ Solder one end of the 3½ inch black wire to lug 1 of switch S2.

Step 6N ☑ Cut the ground lead off one end of the black with orange tracer shielded cable. Solder this end to lug 2 on the front (not the rear) deck of switch S1.

Step 6P ☑ Cut the ground lead off one end of the black with green tracer shielded cable. Solder this end to lug 3 on the front deck of switch S1.

Step 6Q ☑ Cut the ground lead off one end of the black with yellow tracer shielded cable. Solder this end to lug 4 on the front deck of switch S1.

Step 6R ☑ Solder one end of the 12 inch black glass insulated wire to lug 4 on the rear deck (not the front one!) of switch S1.

Step 6S ☑ Solder one end of the 12 inch green glass insulated wire to lug 5 on the rear deck of switch S1.

Step 6T ☑ Solder one end of the 12 inch blue glass insulated wire to lug 6 on the rear deck of switch S1.

This completes the front panel wiring — for now at least. Later you'll mount it on the front of the chassis and connect a few more wires to it. Although it doesn't look it, the fact that all the wires are color coded will make it easy to connect it into the chassis circuits.

P.S. This is a good time for a break, too.

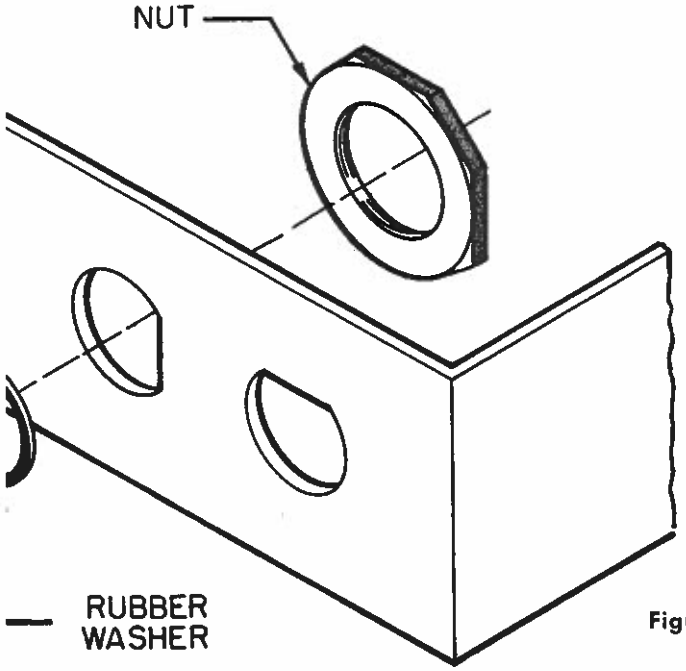
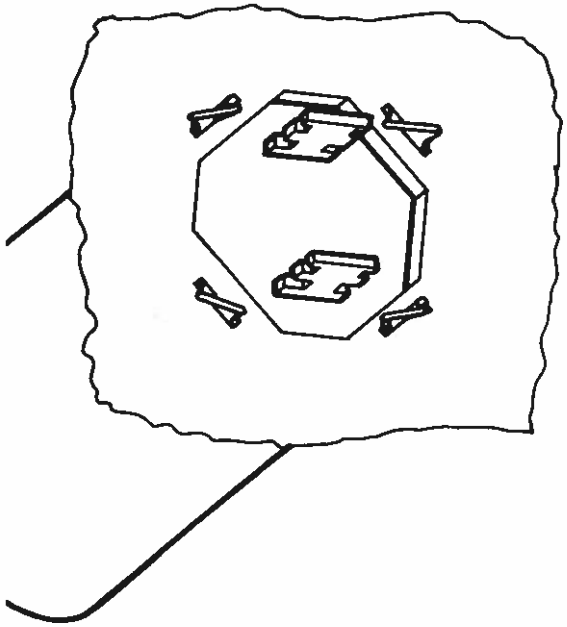


Figure 7-2



STAGE 7

REMOVE THE CHASSIS and place it on your work table. Now you can set the front panel back in place of the chassis for protection.

In this stage you will completely wire the output tube heater circuits and then you'll connect most of the transformer leads (so they won't flop around and get in your way!).

In addition to the parts in StrataPack 7 you will also need the four electrolytic capacitor cans C1, C2, C3 and C4. Let's mount them first and get them out of the way.

All four capacitors are mounted as shown in Fig. 7-1. Note that the four tabs on the capacitor can are inserted in the appropriate holes on the chassis. While holding the can *firmly* against the chassis the tabs are twisted about 90 degrees to lock the can in place.

These capacitor cans contain from one to four (three in the KX-200) electrolytic capacitors. Normally, the can itself forms the negative side common to all the capacitors while the inner lugs serve to connect to the positive side of the capacitors. The individual capacitors can be identified by square, triangle, straight line, or half-round cut-outs next to the positive lugs. It is, therefore, important that the cans be oriented properly before insertion.

Refer to Fig. 7-1 and to Fig. 9 on the fold-out sheet.

Step 7A ☐ Locate capacitor C1, 200 mfd., 250V.; it is the only can covered with insulation. Mount it on the insulating wafer with its single inner lug near tube socket V10.

Step 7B ☐ Locate the dual capacitor C2-200 mfd., 250V.; 40 mfd., 500V. Mount it as shown with the 40 mfd. (triangle) toward terminal strip ST9.

Step 7C ☐ Locate the triple capacitor C3-40, 40, 40 mfd., 450, 400, 300V. Mount it as shown with the 40 mfd., 300V. (Triangle) toward strip ST9.

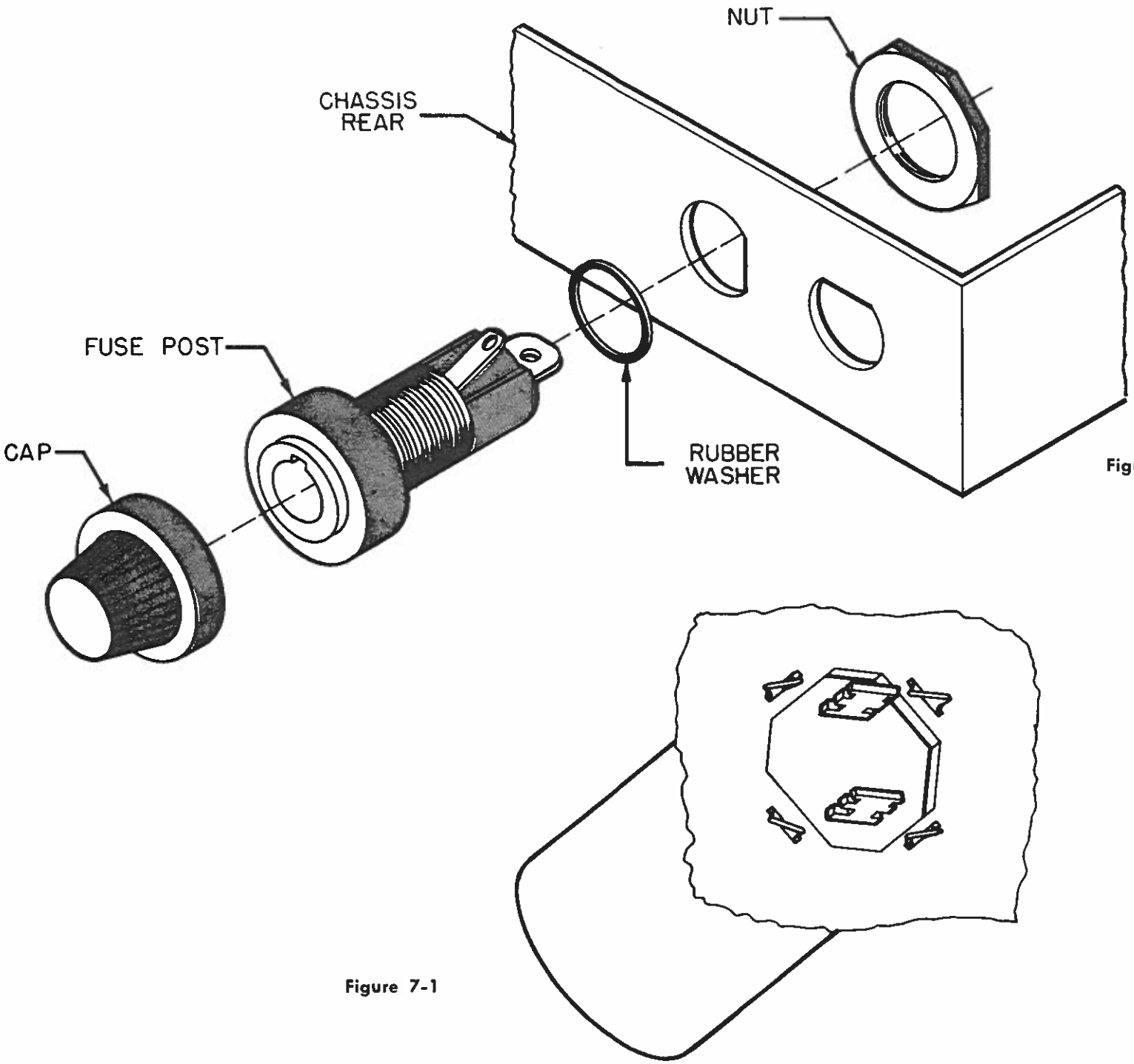


Figure 7-2

Figure 7-1

Step 7D ☑ Mount the remaining dual electrolytic capacitor C4, with the triangle toward the output transformers T2 and T3.

Step 7E ☑ Refer to Figure 7-2 and mount the fusepost in the hole in the back skirt of the chassis marked "3.2 AMP SLO-BLO". Slip the rubber washer over the post and then insert the post in the chassis hole.

Step 7F ☐ The two 5000 ohm potentiometers will be mounted in the holes in the chassis near output transformer T2. These controls snap into place — they do not require hex nuts. Mount them as shown in Fig. 9 — be sure the keying tabs fit into the slot properly. NOTE: The controls may have two keying tabs, if so bend one over with your pliers.

You will now wire the heater circuits of the 7591 power output tubes. It is important that these AC carrying wires be positioned as shown in Fig. 7-3 on the separate sheet. Be sure, also, that your "vertical" is satisfactory. Dress these wires down on the chassis.

Step 7G ☑ Twist the green and yellow power transformer leads (from hole J-J) together. Position them as shown in Fig. 7-3 and connect the green wire to lug 7 of tube socket V10. Connect the yellow wire to lug 2 of socket V10.

Step 7H ☑ Solder one end of the 2¼ inch green wire to lug 7 of socket V10. Connect the other end to lug 7 of socket V9.

Step 7J ☑ Solder one end of the 4¾ inch green wire to lug 7 of socket V9. Connect the other end to lug 7 of socket V8.

Step 7K ☑ Solder one end of the remaining 2¼ inch green wire to lug 7 of socket V8. Solder the other end to lug 7 of socket V7.

Step 7L ☑ Solder one end of the 4¾ inch yellow wire to lug 2 of socket V10. Connect the other end to lug 2 of socket V9.

Step 7M ☑ Solder one end of the 2 inch yellow wire to lug 2 of socket V9. Connect the other end to lug 2 of socket V8.

Step 7N ☑ Solder one end of the remaining 4¾ inch yellow wire to lug 2 of socket V8. Solder the other end to lug 2 of socket V7.

7K Why solder when 9A Solder agai

Step 7P ☑ Did you dress these wires down to the chassis?

Step 7Q ☑ Cut four 1¼ inch lengths of bare wire. Connect one between lugs 4 and 8 of socket V10. Run the wire right across the top of the tube socket and cut off the excess wire at both lugs. Solder lug 8.

Step 7R ☑ Connect one of these bare wires between lugs 4 and 8 of socket V9. Solder lug 4.

Step 7S ☑ Connect one of these bare wires between lugs 4 and 8 of socket V8. Solder lug 8.

Step 7T ☑ Connect the remaining bare wire between lugs 4 and 8 of socket V7. Solder lug 4.

Step 7U ☑ Cut a piece of bare wire ¾ inch long. Connect it to lugs C and D of strip ST17. Solder lug D.

Step 7V ☑ Solder the red-yellow power transformer (T1) lead (from hole J-J) to lug C of strip ST17.

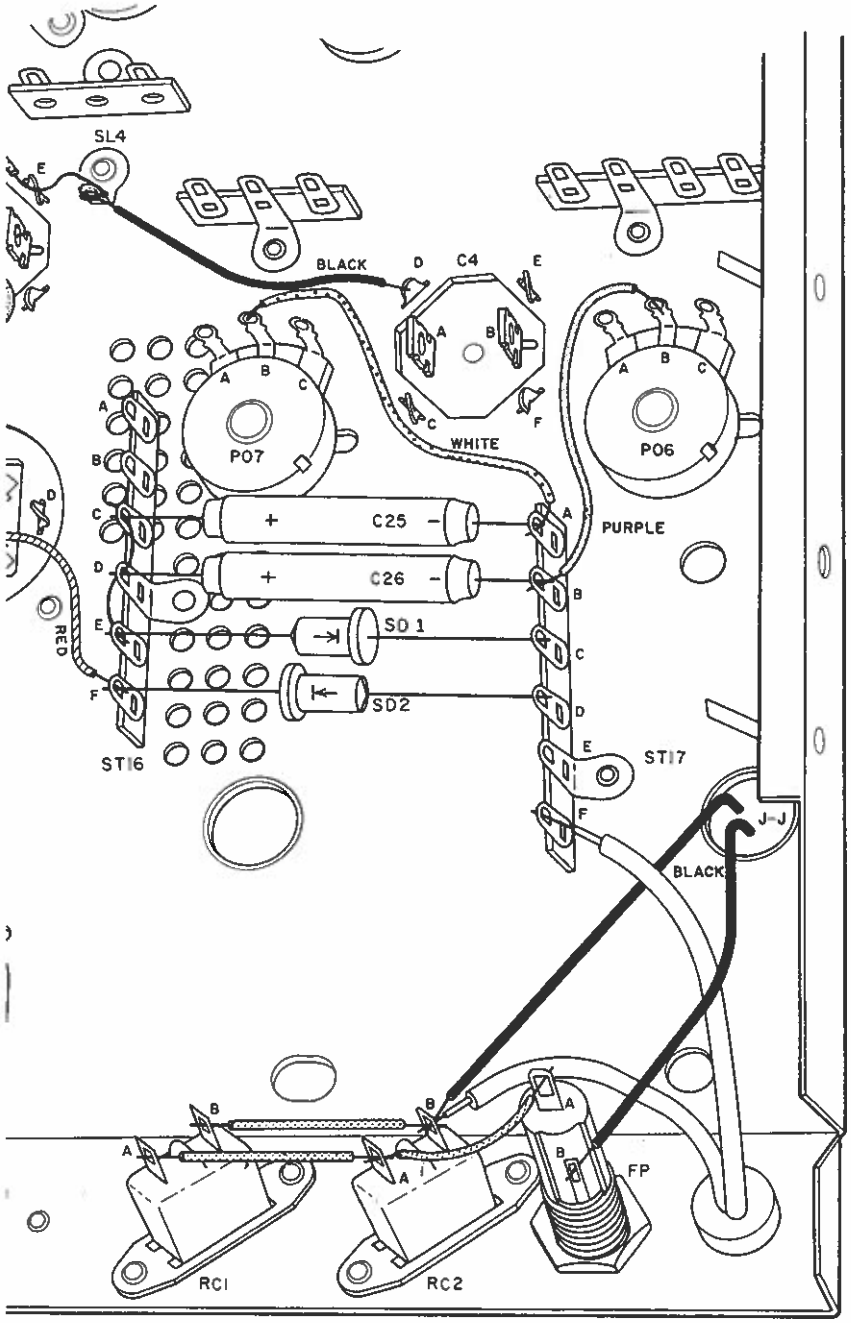
Step 7W ☑ Solder the red T1 lead (also from hole J-J) to lug D of electrolytic capacitor C1. Make sure the soldered connection is *not* shorted to the chassis.

Step 7X ☑ Twist together the orange and brown T1 leads from hole H-H. Solder the brown lead to lug A of strip ST16.

Step 7Y ☑ Solder the orange T1 lead to lug B of strip ST16.

Step 7Z ☑ Connect the white T1 lead (from hole H-H) to lug A of electrolytic capacitor C4. Lug A is identified as a triangle.

Oops, we ran out of letters again! It cannot be overemphasized that all of the wiring in this stage must be carefully dressed. These transformer leads and heater wires all carry AC voltage and could be a source of hum in your completed amplifier if you are not careful.



STAGE 8

IN STAGE 8 you will continue to wire the power supply. Refer to the separate diagram Fig. 9 and Fig. 8-1.

Step 8A ☐ Connect the red wire between lug F of strip ST16 and inner lug A of electrolytic capacitor C1. Solder lug F of ST16.

Step 8B ☐ Cut a 1¼ inch length of bare wire. Insert the wire in lug D of strip ST16. Connect one end of the wire to lug C and the other end to lug E. Solder lug E of strip ST16.

Step 8C ☑ Tin all four ends of both silicon diodes — see page 6 Using your pliers as a heat sink, solder SD1 between lug E of strip ST16 and lug C of strip ST17. Note that the wide portion of the diode (the cathode) must be connected to lug C of ST17.

Step 8D ☑ Using your pliers as a heat sink, solder silicon diode SD2 between lug F of strip ST16 and lug D of strip ST17. Again note the polarity. The (wide) cathode end must be connected to lug F of ST16. Spread the diodes apart so they do not touch each other.

Step 8E ☐ Connect the red wire from output transformer T3 to inner lug A of capacitor C1.

Step 8F ☐ Connect the red wire from output transformer T2 to inner lug A of capacitor C1.

Step 8G ☐ Solder the orange wire between outer lug B of capacitor C1 and inner lug B (half-round) of capacitor C2.

Step 8H ☐ Cut a 2½ inch bare wire and 1¼ inch length of insulating spaghetti. Solder one end of the bare wire to outer lug E of capacitor C3. Slip the spaghetti over the wire. Insert the free end through outer lug E of capacitor C2 and bring it over to solder lug SL4. Do not push the wire into the hole of SL4 — instead, wrap it around SL4 right near the chassis (away from the hole).

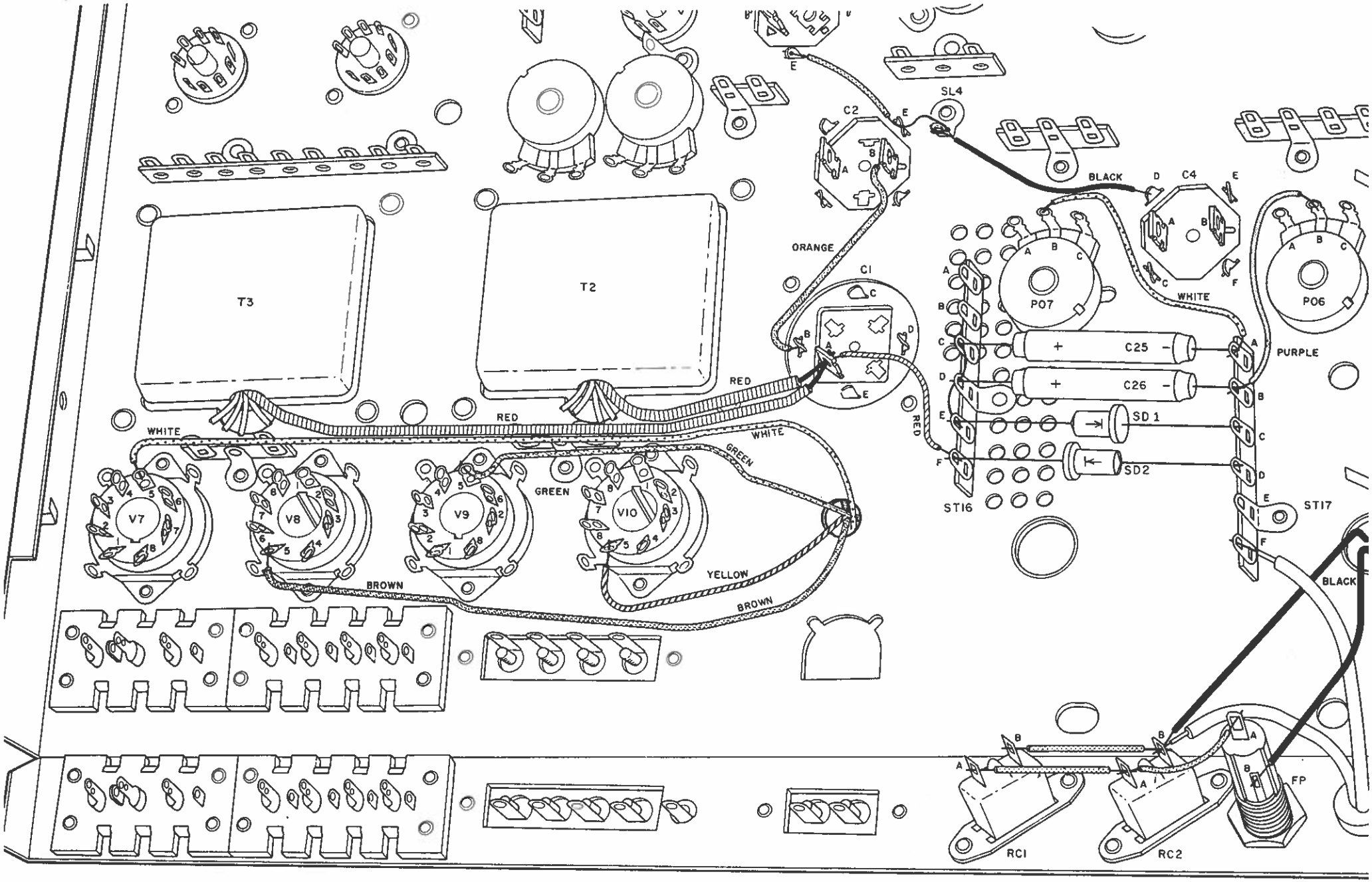

T3
T2
C1
C2
SL4
C4
PO7
PO6
C25
C26
SD 1
SD2
ST16
ST17
V7
V8
V9
V10
RC1
RC2
FP
ORANGE
RED
WHITE
GREEN
BROWN
YELLOW
BLACK
PURPLE

Figure 8-1

Step 8J ☑ Solder one end of the black wire to outer lug D of capacitor C4. Wrap the other end of the wire around solder lug SL4. Solder lug SL4 and lug E of capacitor C2. Make sure this connection at lug E does not short against lug B.

Step 8K ☑ Install the 25K ohm potentiometers P06 and P07 in the holes near electrolytic capacitor C4. Be sure the keying tabs are positioned above the appropriate locating holes before snapping them in place. You may need to bend down one of the keying tabs.

Step 8L ☑ Connect the purple wire between center lug B of control P06 and lug B of strip ST17.

Step 8M ☑ Connect the shorter white wire between center lug B of control P07 and lug A of strip ST17.

Step 8N ☑ Connect the 50 mfd., 70v. capacitor C26 between lug D of strip ST16 and lug B of strip ST17. The end of the capacitor marked "+" or "positive" must be connected to lug D of ST16. Cut off the excess wire and solder both lugs.

Step 8P ☑ Solder the other 50 mfd. capacitor C25 between lug C of strip ST16 and lug A of strip ST17. The positive end must be connected to lug C of strip ST16.

Step 8Q ☐ Cut three 2 inch lengths of bare wire and three 1¼ inch lengths of insulating spaghetti. Solder one end of a 2 inch bare wire to lug B of the AC receptacle RC1. Slip the spaghetti over the wire and connect the other end to lug B of RC2.

Step 8R ☐ Use a bare wire and a piece of spaghetti to connect lug A of RC1 to lug A of RC2. Solder lug A of RC1.

Step 8S ☐ Connect the longer black power transformer lead (from hole J-J) to lug B of RC2; connect one of the power cord leads to lug B of RC2. Solder lug B.

Step 8T ☐ Solder one end of the remaining bare wire to lug A of RC2. Slip the spaghetti over the wire and connect the other end to center lug A of the fusepost.

Step 8U ☐ Connect the remaining power cord lead to lug F of strip ST17.

Step 8V ☐ Solder the remaining black transformer lead to (side) lug B of fusepost FP.

You will now connect four wires to the octal tube sockets, V7, V8, V9, and V10. These wires should be dressed down to the chassis and run over to the hole near capacitor C1. Later they will be connected to a switch you will install in this hole. In the meantime, to keep them out of the way, just push them through the hole.

Step 8W ☑ Connect one end of the remaining white wire to lug 5 of socket V7.

Step 8X ☑ Connect one end of the brown wire to lug 5 of socket V8.

Step 8Y ☑ Connect one end of the green wire to lug 5 of socket V9.

Step 8Z ☑ Connect one end of the yellow wire to lug 5 of socket V10.

Run all four wires as shown, keeping them dressed down to the chassis, over to the hole near C1. Push them through the hole.

This completes stage 8. Before continuing check your wiring to be sure it is carefully dressed down.

STAGE 9

IN THIS STAGE you will complete the wiring of both the high voltage power supply and the low voltage (heater and bias) power supply. You will also complete the wiring of the output transformers.

You will first connect the low voltage supply silicon diodes. To do this use Fig. 9-1 as a template for bending and cutting the diode leads. That is, hold the diodes right over the illustration, bend the leads, and then cut them off (leaving, of course, about ¼ inch lead for soldering).

Step 9A ☐ Bend and cut the leads of one of the diodes as SD3. Using your pliers as a heat sink, tin the ends of both leads. Connect the cathode (larger) side of the diode to solder lug SL4. Again using your pliers as a heat sink, solder the other lead to lug B of strip ST16 as shown in Fig. 9-2 on the separate sheet.

Step 9B ☐ Bend and cut the leads of the other silicon diode SD4 and tin the ends of both leads. Connect the (larger) cathode lead to solder lug SL4. Using your pliers as a heat sink solder the other lead to lug A of strip ST16. Make sure the diodes are not touching each other.

Step 9C ☐ Since the cathode leads of both SD3 and SD4 are connected to solder lug SL4, you cannot use your pliers as a heat sink unless you have three hands! Of course, if you can get someone to help you by holding the pliers as a heat sink, then do so and solder SL4. Otherwise you'll just have to be careful. Solder lug SL4 but do not hold the hot iron on the lug as long as you usually do (to boil away the rosin) and be sure to use very little solder. Wait for the solder to cool and harden. Then gently tug on the diode leads to check the joint. If you do have a "rosin joint" the leads will come loose and you will need to re-heat it — but be careful.

Step 9D ☐ Cut the leads on all four 10 ohm resistors (brown, black, black) to ⅜ inch.

Step 9E ☐ Solder one of the 10 ohm resistors as R61 between solder lug A on socket V7 and lug 5 on this same socket (V7).

Step 9F ☐ Solder R63 between lugs 5 and C of socket V8.

Step 9G ☐ Solder R62 between lugs 5 and A of socket V9.

Step 9H ☐ Solder R64 between lugs 5 and C of socket V10.

Step 9J ☐ Solder the blue-white T3 output transformer lead to lug 3 of socket V7.

Step 9K ☐ Solder the blue T3 output transformer lead to lug 3 of socket V8.

Step 9L ☐ Solder the blue-white T2 output transformer lead to lug 3 of socket V9.

Step 9M ☐ Solder the blue T2 output transformer lead to lug 3 of socket V10.

Step 9N ☐ Make sure these four transformer leads are carefully dressed down to the chassis.

Twist together the yellow, green, brown and black leads from transformer T3 and position them as shown in Fig. 9-2. These leads will be connected to the screw-type terminal strip SS1 as follows:

Step 9P Transformer T3 connections to strip SS1:

- ☐ Solder the yellow lead to lug A.
- ☐ Solder the green lead to lug B.
- ☐ Connect the brown lead to lug C.
- ☐ Connect the black lead to lug D.
- ☐ Only the yellow and green leads should be soldered.

Twist together the yellow, green, brown and black leads of output transformer T2 and position them as shown in Fig. 9-2. These leads will be connected to the screw-type terminal strip SS2 as follows:

Step 9Q Transformer T2 connections to strip SS2:

- ☐ Connect the yellow lead to lug A.
- ☐ Solder the green lead to lug B.
- ☐ Connect the brown lead to lug C.
- ☐ Connect the black lead to lug D.
- ☐ Only the green lead should be soldered.

Step 9R Cut two 1¼ inch lengths of bare wire and two ½ inch lengths of insulating spaghetti. Solder one end of one of the bare wires to lug C of strip SS1. Slip the spaghetti over the wire and connect the other end to lug C of strip SS2.

Step 9S Solder one end of the other bare wire to lug C of strip SS2. Slip the spaghetti over the wire and connect the other end to solder lug SL5.

Step 9T Cut a 1½ inch length of bare wire and a ¾ inch length of spaghetti. Solder one end of the wire to lug A of control P09. Slip the spaghetti over the wire and connect the other end to lug A of control P08.

Step 9U Solder one end of the blue wire to lug A of control P08. Run this wire across the chassis *under* the silicon diodes SD3 and SD4 to electrolytic capacitor C4. Connect this end of the wire to inner lug A (triangle) of C4.

Step 9V Cut both leads on the 15 ohm, 5W resistor (R75) to 1 inch. Cut two ½ inch lengths of spaghetti and slip the spaghetti over the resistor leads. Position the resistor as shown in Fig. 9-2 and solder one lead to lug A (triangle) of capacitor C4. Connect the other lead to lug B (half-round) of C4.

Dress the 15 ohm resistor R75 right on (touching) the chassis. Make sure the resistor leads are not shorting against the C4 capacitor outer (ground) lugs nor the case of potentiometer P06.

Step 9W Solder one end of the purple wire to center lug B of control P06. Run the lead along the chassis (under the silicon diodes) in parallel with the blue wire. Solder the other end of the wire to center lug B of control P08.

Step 9X Solder one end of the white wire to center lug B of control P07. Run this wire under the diodes in parallel with the other two, over to control P09. Solder this end of the wire to center lug B of P09.

Step 9Y Cut the leads of one of the 8.2K ohm resistors (grey, red, red) to ⅜ inch. Connect this resistor as R76 between lug C of control P08 and lug A of strip ST9. Solder lug C of P08.

Step 9Z Cut both leads of the other 8.2K ohm resistor (R77) to ¾ inch; cut two ½ inch lengths of spaghetti. Slip the spaghetti on the resistor leads and connect R77 between lug C of control P09 and lug A of strip ST9. Solder lug C of the control.

Well, well — it looks like we used up all the letters again! But we did complete the power supplies.

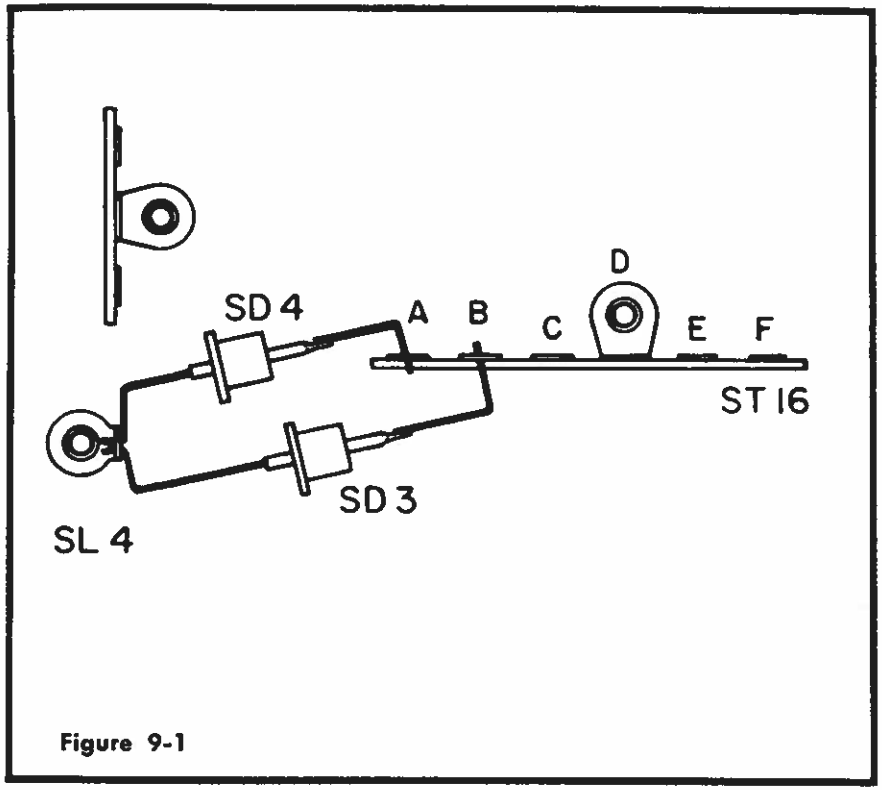
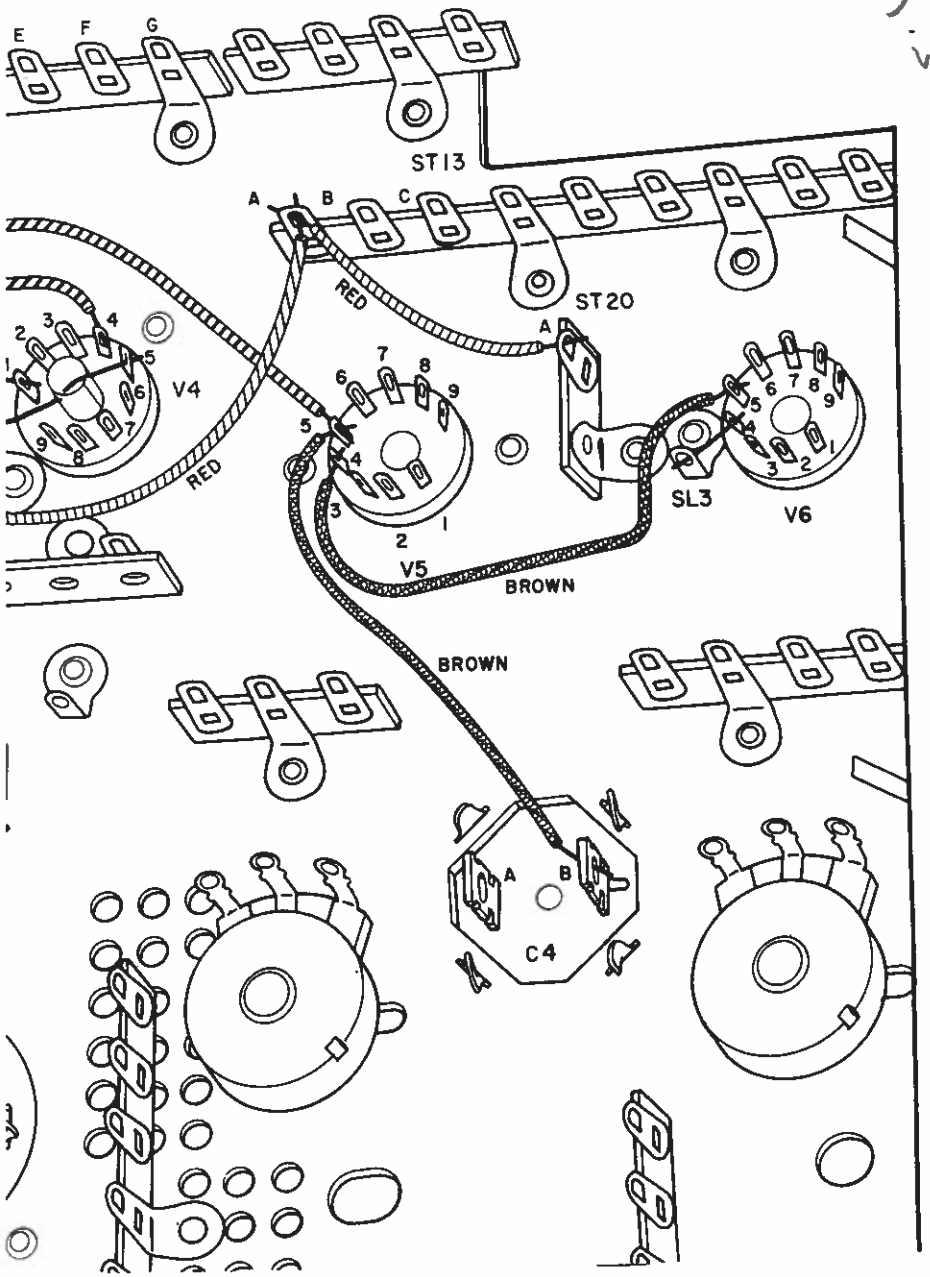


Figure 9-1



STAGE 10

YOU WILL NOW WIRE the DC heater circuits for tubes V1 through V6. Again, be sure to dress the wires down neatly. (If you're tired of hearing this, we're tired saying it . . . but it is important!)

Step 10A ☑ Connect one of the 3½ inch brown wires from lug B of capacitor C4 to lug 5 tube socket V5. Solder lug B of C4.

Step 10B ☑ Connect another 3½ inch brown wire from lug 4 of V5 to lug 5 of V6. Solder both connections.

Step 10C ☑ Connect the remaining 3½ inch brown wire from lug 5 of V2 to lug 5 of V3. Solder lug 5 of V2.

Step 10D ☑ Connect the 2¼ inch white wire from lug 5 of V1 to lug 4 of V2. Solder both lugs.

Step 10E ☑ Connect the 6 inch yellow wire (the longer one) from lug 5 of V3 to lug 5 of V5. Solder both lugs.

Step 10F ☑ Connect the remaining (4½ inch) yellow wire from lug 4 of V3 to lug 4 of V4. Solder both lugs.

The small metal cylinder in the center of tube sockets V1, V2, V3 and V4 forms a shield between the pins. You will now connect this as well as some socket lugs to ground by inserting a wire in one of the holes in the shield. If necessary, the shield can be rotated with your long-nose pliers.

Step 10G ☑ Cut a 2¼ inch bare wire and a ¾ inch length of spaghetti. Insert this wire through lug 8 of socket V1, through the center shield and through lug 4 thereby connecting lugs 4 and 8 and the shield together. Slip the spaghetti over the wire protruding from lug 8. Connect this free end to lug C of strip ST6. Solder the center shield and lugs 4 and 8 of the socket.

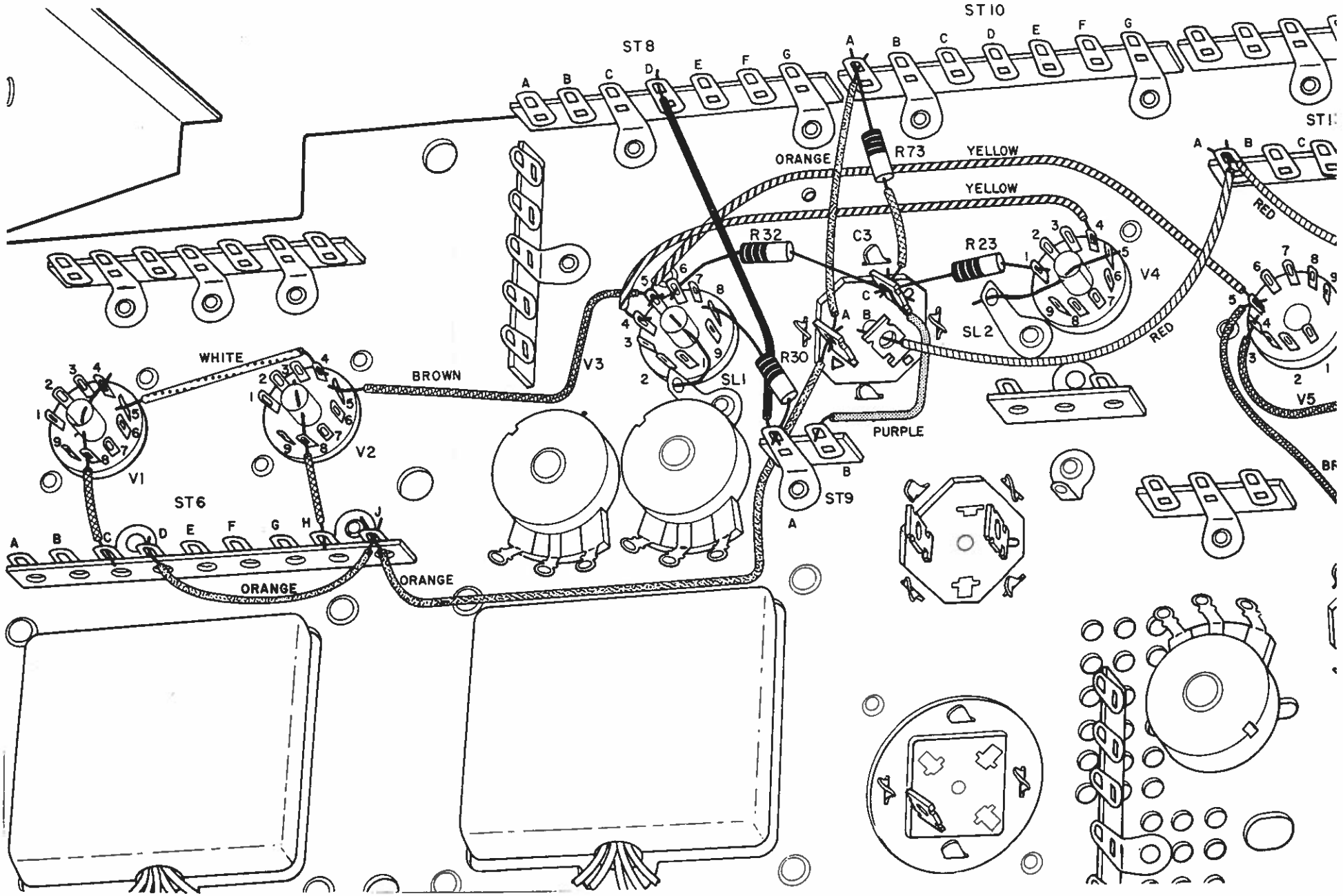

ST10
ST8
ST6
ST9
ORANGE
R73
YELLOW
YELLOW
R32
C3
R23
V4
RED
SL2
WHITE
BROWN
V3
SL1
R30
PURPLE
V1
V2
ORANGE
ORANGE
RED
V5

Figure 10-1

Step 10H Cut a 2 inch bare wire and a ¾ inch length of spaghetti. As in step 10G, use this bare wire (and spaghetti) to solder the center shield and lug 8 of socket V2 to lug H of strip ST6. Note that lug 4 of this socket is *not* connected to the shield.

Step 10J Cut a 1 inch bare wire. Connect it from the center shield of socket V3 to solder lug SL1. Solder both connections.

Step 10K Cut a 1¼ inch bare wire. On socket V4, use the bare wire to connect lug 5 to the center shield and to solder lug SL2. Solder all three connections.

Step 10L Cut a ¾ inch bare wire. Solder it between lug 4 of socket V6 and solder lug SL3.

Step 10M Make sure none of the bare wires you just installed are causing shorts. Particularly check where the wire leaves the center shield and passes by the tube socket lugs.

Step 10N Connect one of the 3 inch orange wires between lugs D and J of strip ST6.

Step 10P Connect the (longer) 6¼ inch orange wire from lug J of strip ST6 to lug A (triangle) of capacitor C3. Be sure to run it as shown in Fig. 10-1 — and keep it dressed down to the chassis.

Step 10Q Connect the remaining 3 inch orange wire from lug A (triangle) of C3 to lug A of strip ST10. Solder lug A of C3.

Step 10R Connect the black wire from lug A of strip ST9 to lug D of strip ST8.

Step 10S Cut both leads on the 820 ohm resistor (grey, red, brown) R30 to ⅝ inch. Connect the resistor from lug 8 of socket V3 to lug A of strip ST9. Solder both connections.

Step 10T Connect the purple wire from lug C (half-round) of capacitor C3 to lug B of strip ST9.

Step 10U Cut the leads on the 100K ohm resistor R73 (brown, black, yellow) to ¾ inch. Cut a ½ inch length of spaghetti and slip it over one lead of the resistor. Connect this lead to lug C (half-round) of C3. Connect the other lead to lug A of strip ST10.

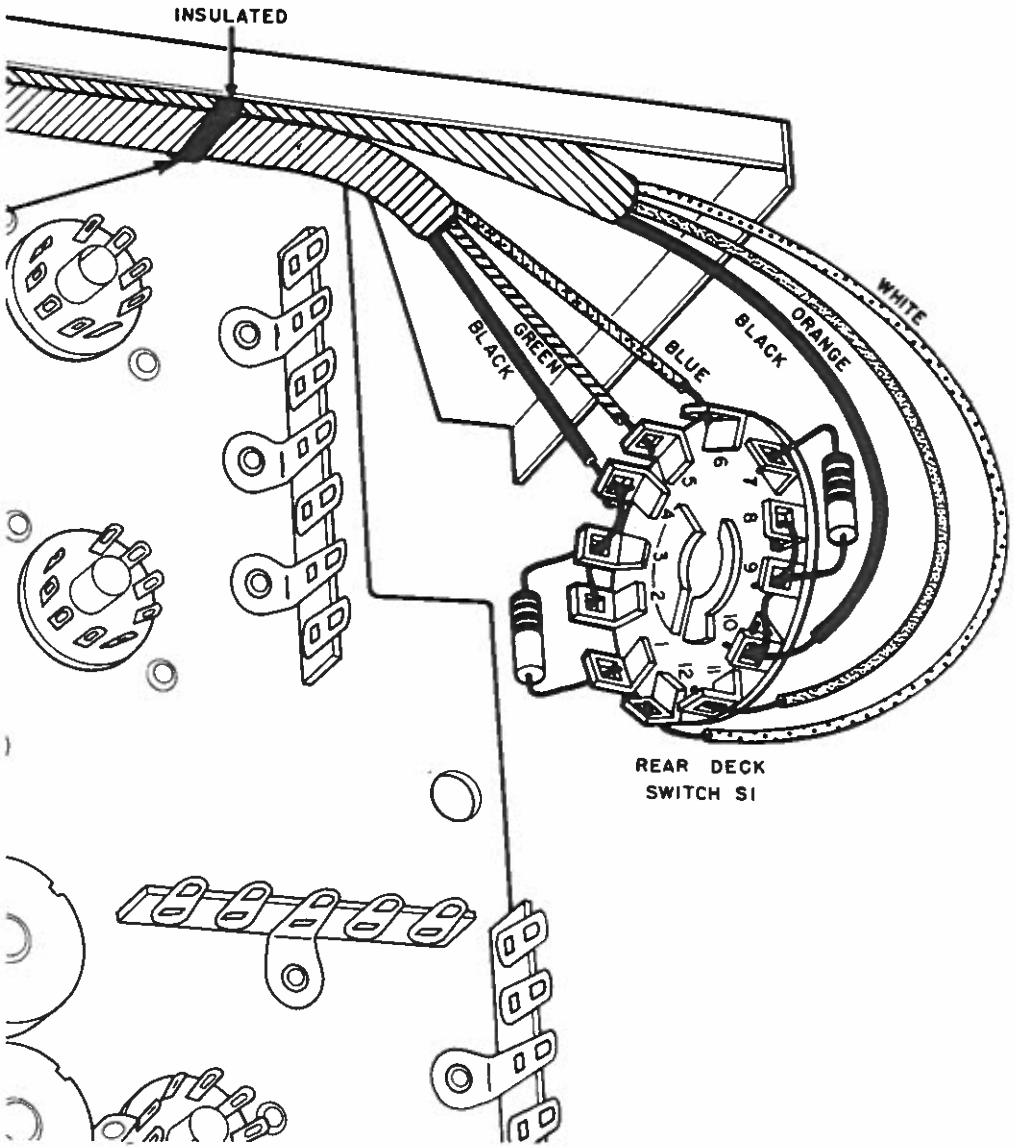
Step 10V Cut both leads on one of the 220K ohm resistors (red, red, yellow) to ¾ inch. Connect this resistor, R32, between lug 6 of socket V3 and lug C (half-round) of capacitor C3.

Step 10W Cut both leads on the remaining 220K ohm resistor to ½ inch. Connect it (R23) between lug C (half-round) of C3 and lug 1 of socket V4. Solder lug C of capacitor C3. Make sure all four leads are soldered.

Step 10X Connect the 4 inch red wire between lug B (square) of capacitor C3 and lug A of strip ST13.

Step 10Y Connect the remaining red wire between lug A of strip ST13 and lug A of strip ST20.

Step 10Z All the wires dressed down to the chassis?



STAGE 11

NOW COMES THE NASTY PART — mounting the front panel! (Just kidding, of course.)

Turn over the chassis and remove the front panel from the box. Locate the two 6-32 screws and brass bushings that originally held the panel to the chassis (these parts should be in the packet containing the extra wire).

Open StrataPack 11 and remove the lockwashers. You will mount the front panel on the chassis as shown in Fig. 11-1 (on a separate sheet). Note that No. 6 self-tapping screws are used on the bottom edge while 6-32 screws and bushings are used on the top. Lockwashers are used on the top between the screw head and the metal.

Place the front panel up against the chassis as shown. Be sure all the wires connected to the panel are positioned underneath the chassis. You may need to temporarily bend up the printed circuit on the right hand side.

Fasten the top of the panel to the chassis with the screws, lockwashers and bushings. Don't tighten the screws yet.

Rotate the chassis so that the panel faces you and fasten the bottom edge to the chassis with the self-tapping screws. Now tighten the top screws.

If you bent up the printed circuit, push it back in place. Now turn over the chassis and position it as you did before.

Locate two of the 8-inch lengths of spiral metal shield and remove the length of large spaghetti from StrataPack 11.

Step 11A ☑ Cut four ¾ inch lengths of the large spaghetti.

Step 11B ☑ Note that there are three metal lugs on each side (edge) of the chassis. Bend these out nearly straight with your pliers.

Step 11C ☐ On the left side, slip a piece of spaghetti over the metal lug near socket V1 and the metal lug near socket V7. The center lug is not insulated.

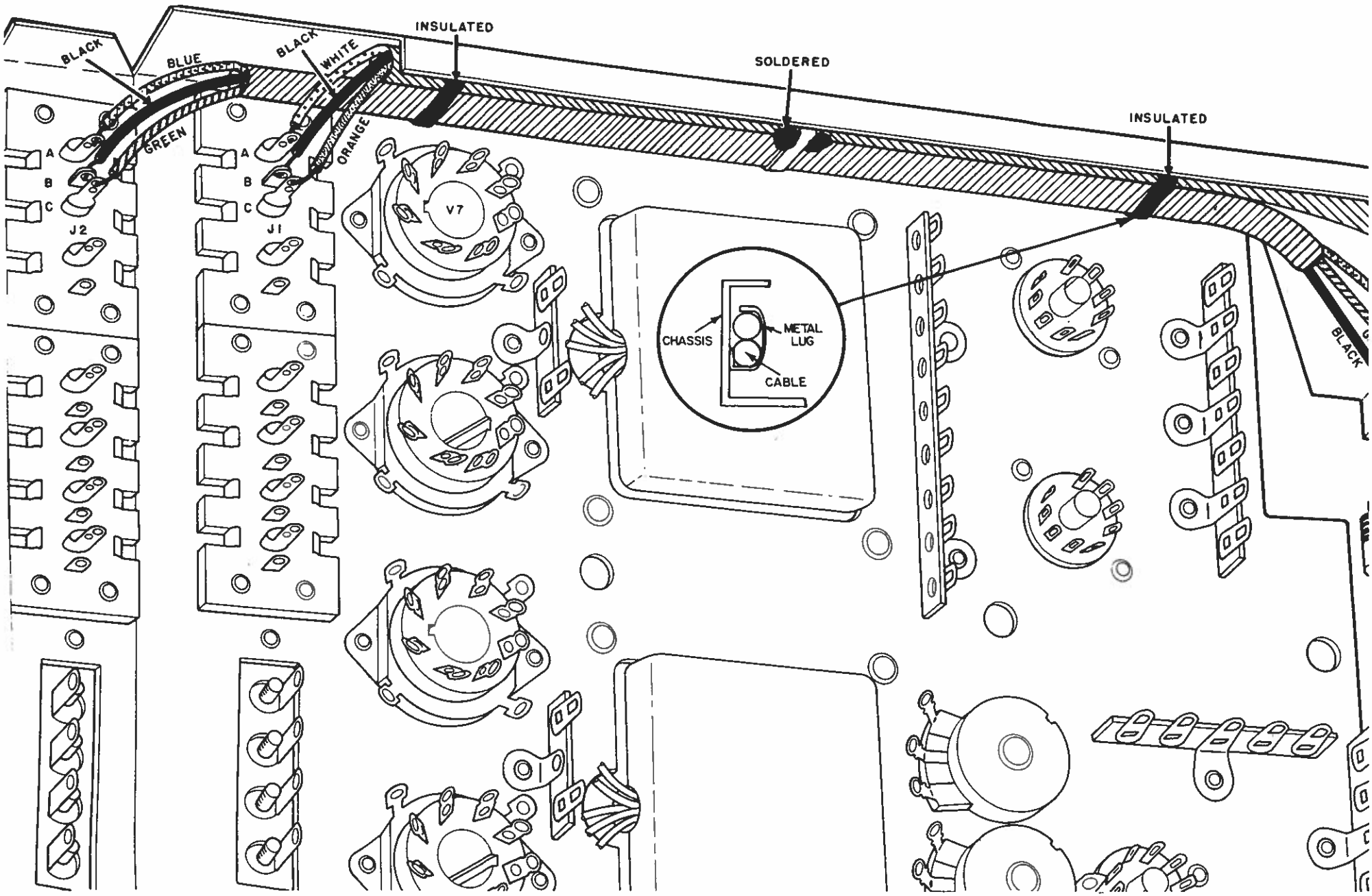

BLACK
BLUE
BLACK
WHITE
INSULATED
SOLDERED
INSULATED
GREEN
ORANGE
A
B
C
J2
A
B
C
J1
V7
CHASSIS
METAL LUG
CABLE
BLACK

Figure 11-2

Step 11D On the right side slip the spaghetti over the lug near socket V6 and the lug near control P06. The lug near the power cord is not insulated.

Step 11E Locate the green, blue and black glass covered wires connected to the rear deck of switch S1. Straighten out these wires and push them through one of the spiral metal shields. Position the shield along the edge of the chassis resting on the metal lugs as shown in Fig. 11-2.

Step 11F You will now solder the three leads from the "cable" you have made to the input jacks on J2. If you find the leads are a little too long, don't hesitate to cut them shorter. Solder the black lead to lug B on J2.

Step 11G Solder the blue lead to lug A on J2.

Step 11H Solder the green lead to lug C on J2.

Step 11J Insert the black, orange, and white glass insulated wires (in StrataPack 11) through the other 8 inch spiral metal shield. Position the shield on top of the other one as shown in Fig. 11-2.

Step 11K Solder one end of the white lead to lug 12 on the rear deck of switch S1. The switch is not in the "best" position as was previously mentioned so be sure not to use too much solder.

Step 11L Solder one end of the orange lead to lug 11 on the rear deck of switch S1.

Step 11M Solder one end of the black lead to lug 10 on the rear deck of switch S1.

Step 11N At the other end of the "cable", solder the black wire to lug B of input jack J1.

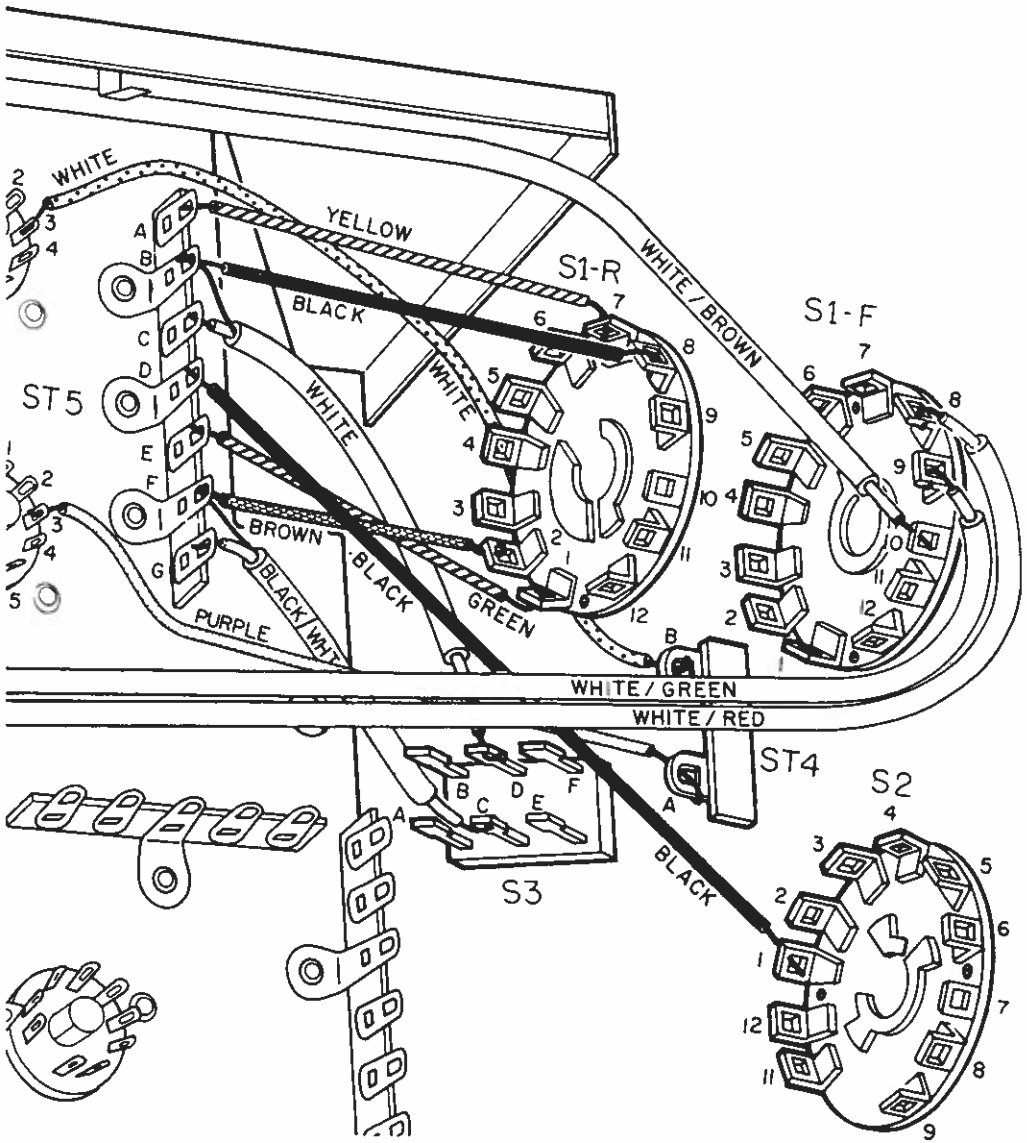
Step 11P Solder the orange wire to lug C of J1.

Step 11Q Solder the white wire to lug A of J1.

Step 11R This completes the shielded cable wiring and the cables must now be secured in place with the metal lugs. Bend both insulated clips up and over the cable as shown in the insert in Fig. 11-2.

Step 11S The center bare lug is soldered to the cables to ground them. First tin the inside of the lug and both cables where the lug will touch them.

Step 11T Bend the lug up and over both cables as you did with the insulated lugs. Finally solder the lug to the cables as shown. As little solder (and heat) as is necessary should be used but be sure both cables are soldered.



STAGE 12

WE WILL CONTINUE, in this stage, to connect the front panel into the chassis.

Step 12A ☒ Connect the white lead from lug B of strip ST4 on the front panel to lug 3 of socket V1.

Step 12B ☐ Connect the yellow lead from lug 7 on the rear deck of switch S1 to lug A on strip ST5.

Step 12C ☐ Connect the black lead from lug 8 of switch S1 (rear) to lug B of strip ST5.

Step 12D ☐ Solder the black lead from lug 1 of switch S2 (the single deck switch) to lug D of strip ST5.

Step 12E ☐ Connect the brown wire from lug 2 on the rear deck of switch S1 to lug F of strip ST5.

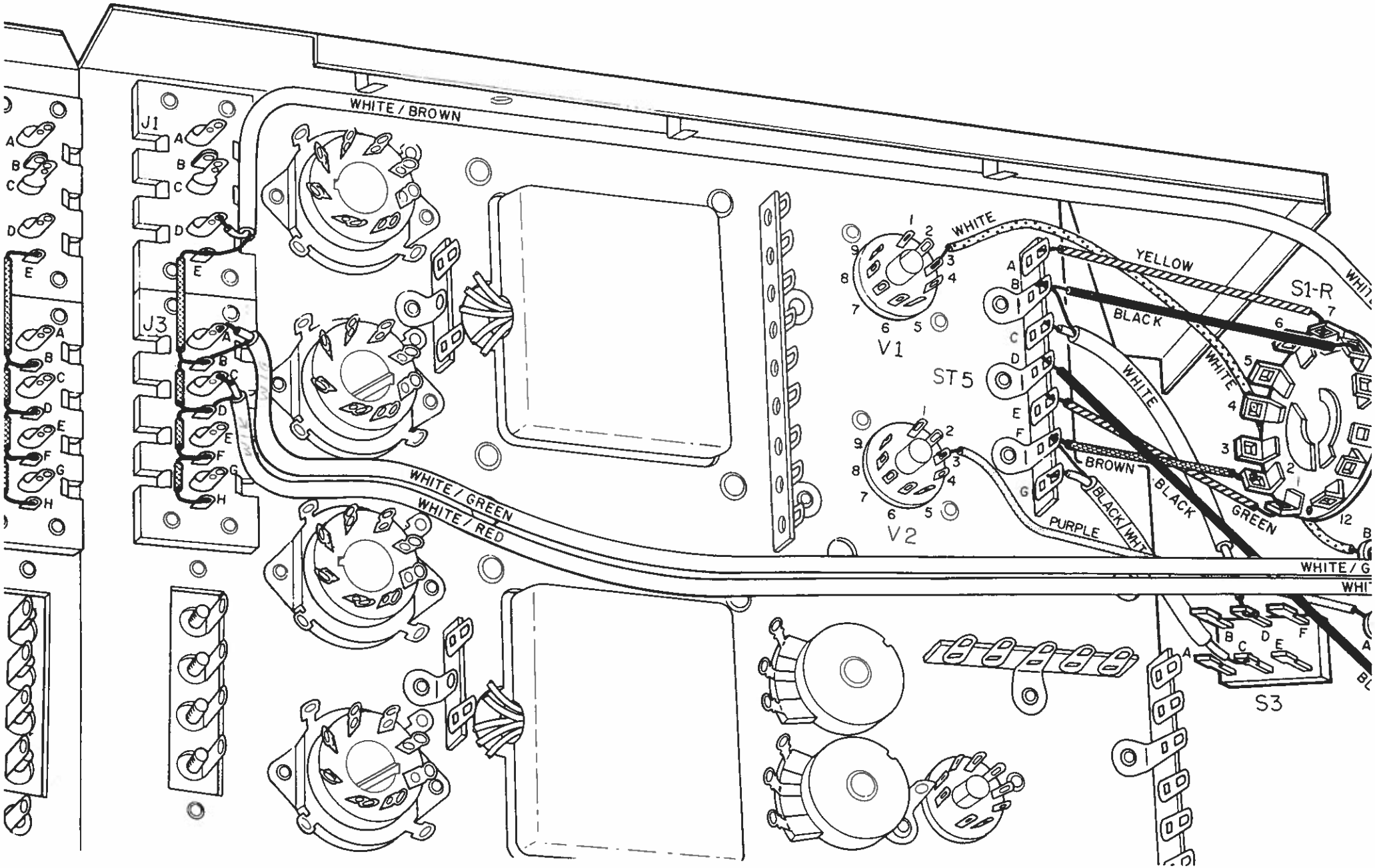
Step 12F ☐ Connect the green wire from lug 1 on switch S1 (rear) to lug E of strip ST5.

Step 12G ☐ Locate the white shielded cable from center lug D of switch S3 on the front panel. Connect the center wire to lug C of strip ST5. Connect the ground wire to lug B of strip ST5.

Step 12H ☐ Connect the purple wire from lug A of ST4 on the front panel to lug 3 of socket V2.

Step 12J ☐ Locate the black with white shielded cable from lug C of switch S3. Connect the center wire to lug G of strip ST5. Connect the ground wire to lug F.

The "ground" connections on the input jacks J1, J2, J3, and J4 must be connected together. You will use bare wire and spaghetti to do this. The first line in each step will indicate the necessary lengths of wire and spaghetti.


J1
J3
WHITE / BROWN
WHITE / GREEN
WHITE / RED
V1
V2
ST5
S1-R
S3
WHITE
YELLOW
BLACK
BROWN
PURPLE
BLACK / WHT
GREEN

Step 12K ☑ 1¾ inch wire; 1 inch spaghetti. Connect lug E of J1 to lug B of J3.

Step 12L ☐ 1 inch wire; ⅜ inch spaghetti. Connect lug B of J3 to lug D of J3.

Step 12M ☐ 1 inch wire; ⅜ inch spaghetti. Connect lug D of J3 to lug F of J3.

Step 12N ☐ 1 inch wire; ⅜ inch spaghetti. Connect lug F of J3 to lug H of J3.

Step 12P ☐ 1¾ inch wire; 1 inch spaghetti. Connect lug E on J2 to lug B on J4.

Step 12Q ☐ 1 inch wire; ⅜ inch spaghetti. Connect lug B on J4 to lug D on J4.

Step 12R ☐ 1 inch wire; ⅜ inch spaghetti. Connect lug D on J4 to lug F on J4.

Step 12S ☐ 1 inch wire; ⅜ inch spaghetti. Connect lug F on J4 to lug H on J4.

Step 12T ☐ Locate the three shielded cables from StrataPack 12. Remove ¼ inch insulation from the center wire of all six ends of the cables.

Step 12U ☐ Cut the ground lead off one end of the white with brown tracer cable. Solder the center wire to lug 10 on the front deck of switch S1. Bend the cable over toward the left edge of the chassis and position it under both (spiral) shielded cables. Run it along the edge of the chassis under both cables toward input jack J1.

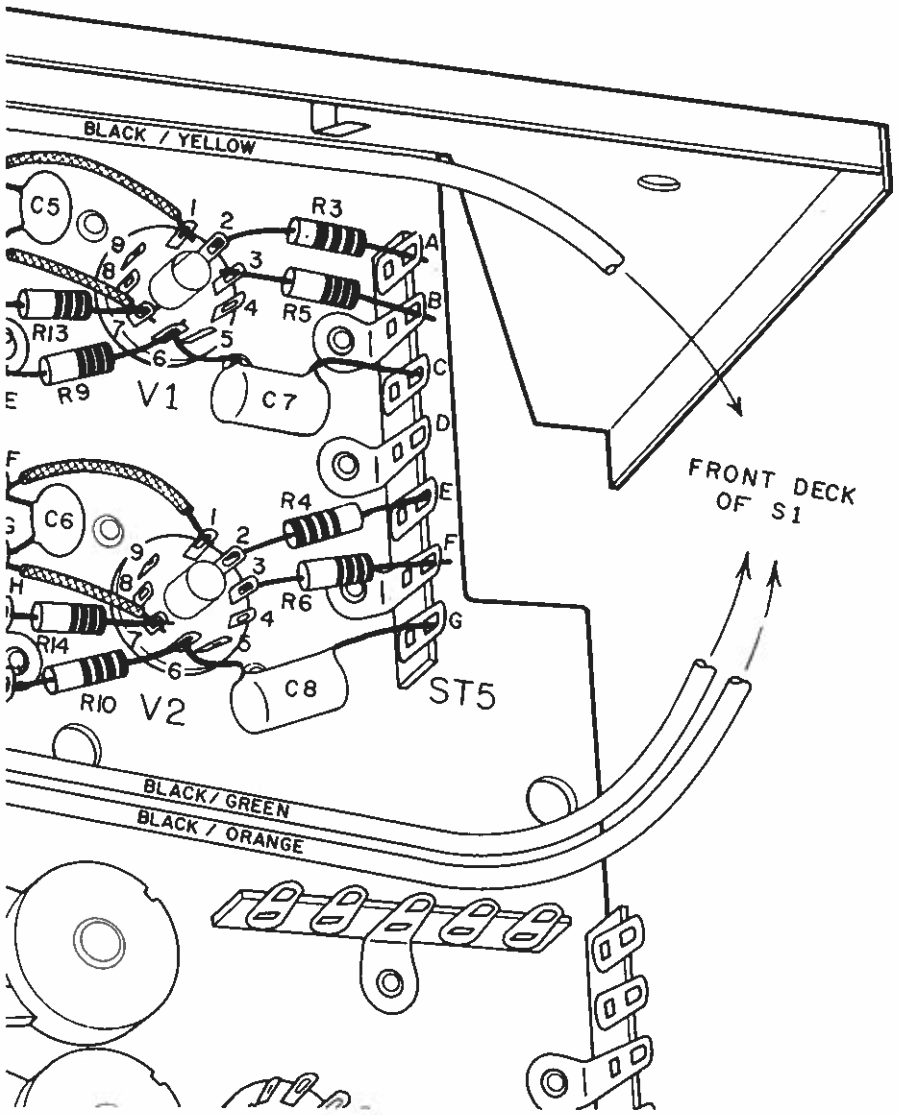
Step 12V ☐ Solder the center wire to lug D of input strip J1. Solder the ground wire to lug E of J1.

Step 12W ☐ Locate the white with red tracer shielded cable. Cut off the ground wire and solder the center wire to lug 8 on the front deck of switch S1.

Step 12X ☐ Run the cable over to the right and down along the chassis as shown in Fig. 12-1. Solder the center wire to lug C of J3. Solder the ground wire to lug D of J3.

Step 12Y ☐ Cut the ground lead off one end of the white with green tracer cable. Solder the center wire to lug 9 on the front deck of switch S1.

Step 12Z ☐ Run this cable in parallel with the other one down to input jack J3. Solder the center wire to lug A of J3. Solder the ground wire to lug B of J3.



STAGE 13

THERE ARE THREE shielded cables still connected to the front deck of switch S1. There is no need to identify the switch lugs — just follow the color code.

Locate the black with yellow tracer cable. Bend it to the left, tuck it under the two spiral shielded cables and run it down the edge of the chassis in parallel with the white with brown tracer cable.

Step 13A ☐ Solder the center wire to lug D of J2. Solder the ground wire to lug E of J2. Make sure the ground wire is not shorted to lug D.

Locate the black with green tracer cable from the front deck of switch S1. Bend it to the right and run it down toward the rear of the chassis in parallel with the other two white (with tracer) cables.

Step 13B ☐ Solder the center wire to lug A of J4; solder the ground wire to lug B of J4.

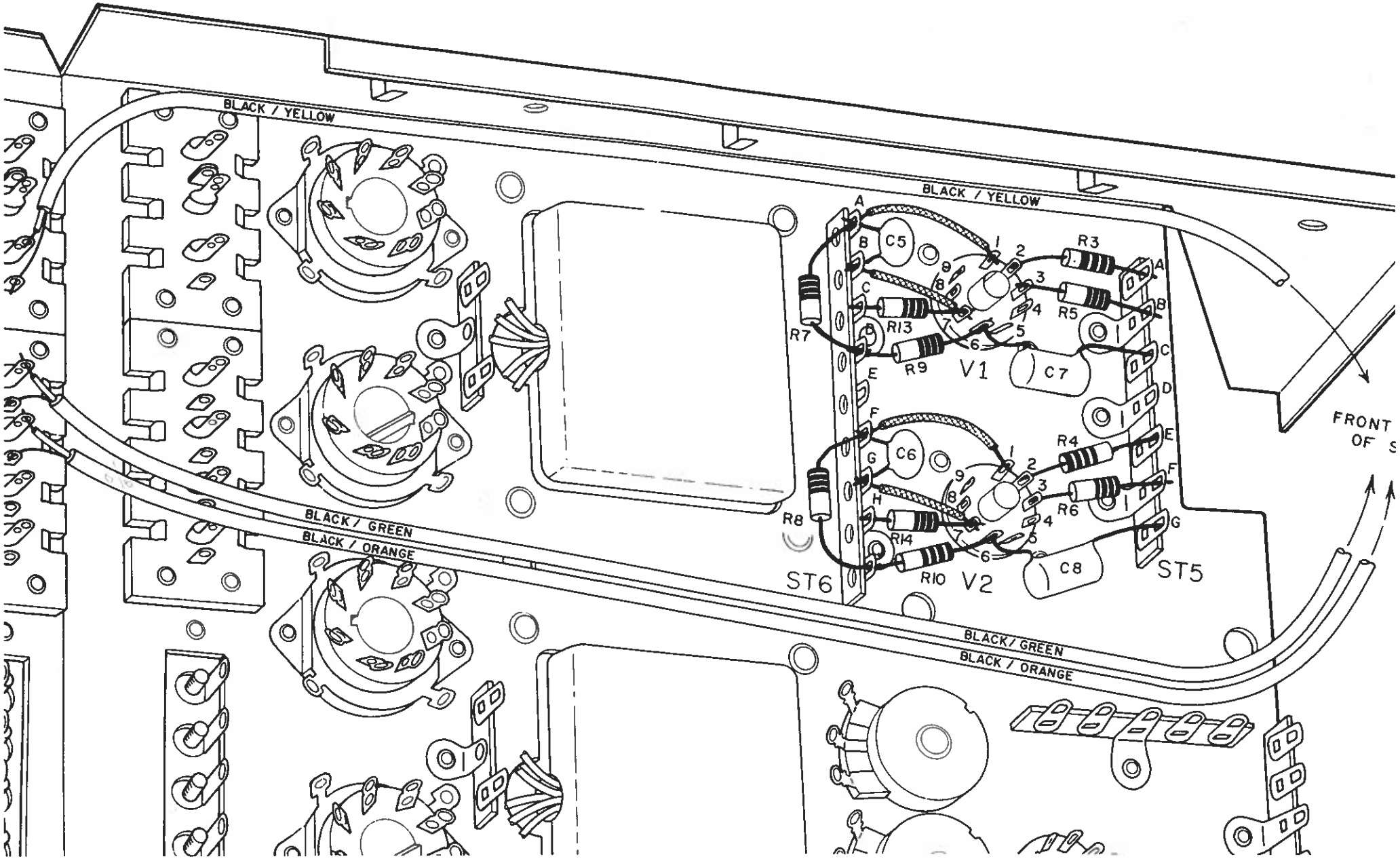
Locate the black with orange tracer shielded cable from the front deck of switch S1. Bend it to the right and run it down toward the rear of the chassis in parallel with the other three cables.

Step 13C ☐ Solder the center wire to lug C of J4; solder the ground wire to lug D of J4.

Step 13D ☐ Cut two 1½ inch lengths of bare wire and two 1 inch lengths of spaghetti.

Step 13E ☐ Solder one end of one of the bare wires to lug 1 of socket V1. Slip the spaghetti over the wire and connect the other end to lug A of strip ST6.

Step 13F ☐ Solder one end of the other bare wire to lug 1 of socket V2. Slip the spaghetti over the wire and connect the other end to lug F of strip ST6.


BLACK / YELLOW
BLACK / YELLOW
BLACK / GREEN
BLACK / ORANGE
BLACK / GREEN
BLACK / ORANGE
C5
R3
R5
R7
R13
R9
V1
C7
C6
R4
R6
R8
R14
R10
V2
C8
ST6
ST5
FRONT
OF S

igure 13-1

There are four glass resistors in StrataPack 13. These are special low noise units but their construction is such that the color code may be difficult to read. However, they are rated at 1 watt and are physically larger than the other resistors in the pack. Locate them and examine them carefully to determine the color-code.

Step 13G ☐ Locate the two 330K ohm (orange, orange, yellow) glass resistors. Cut all four leads to ¾ inch.

Step 13H ☐ Connect one 330K ohm resistor (R7) between lugs A and D of strip ST6.

Step 13J ☐ Connect the other 330K ohm resistor, R8, between lugs F and J of strip ST6.

Step 13K ☐ Locate the two 2.2K ohm (red, red, red) glass resistors. Cut all four leads to ⅜ inch.

Step 13L ☐ Connect one of the 2.2K ohm resistors R5 between lug 3 of socket V1 and lug B of strip ST5. Solder both connections.

Step 13M ☐ Connect the other 2.2K ohm resistor, R6, between lug 3 of socket V2 and lug F of strip ST5. Solder both connections.

Step 13N ☐ Cut all four leads on both 10K ohm resistors (brown, black, orange) to ½ inch. Connect one, R3, between lug 2 of socket V1 and lug A of strip ST5. Solder both lugs.

Step 13P ☐ Connect the other 10K ohm resistor between lug 2 of socket V2 and lug E of strip ST5. Solder both lugs.

Step 13Q ☐ Cut a 1¼ inch length of bare wire and a ¾ inch length of spaghetti. Connect one end of the wire to lug 7 of socket V1. Slip the spaghetti over the wire and connect the other end to lug B of strip ST6.

Step 13R ☐ Cut a 1½ inch length of bare wire and a ⅞ inch length of spaghetti. Connect one end of the wire to lug 7 of socket V2. Slip the spaghetti over the wire and connect the other end to lug G of strip ST6.

Step 13S ☐ Cut all four leads on both 2.2 megohm resistors (red, red, green) to ½ inch. Connect one, R13, between lug 7 of socket V1 and lug C of strip ST6. Solder both lugs.

Step 13T ☐ Connect the other 2.2 megohm resistor, R14, (red, red, green) between lug 7 of socket V2 and lug H of strip ST6. Solder both lugs.

Step 13U ☐ Cut all four leads on both .022 mfd capacitors to ¾ inch. Connect one, C7, between lug 6 of socket V1 and lug C of strip ST5. Solder lug C.

Step 13V ☐ Connect the other .022 mfd capacitor, C8, between lug 6 of socket V2 and lug G of strip ST5. Solder lug G.

Step 13W ☐ Cut all four leads on both 220K ohm resistors (red, red, yellow) to ⅝ inch. Connect one, R9, between lug 6 of socket V1 and lug D of strip ST6. Solder both ends.

Step 13X ☐ Connect the other 220K ohm resistor, R10, between lug 6 of socket V2 and lug J of Strip ST6. Solder both lugs.

Step 13Y ☐ Cut all four leads on both .01 mfd disc capacitors to ½ inch. Connect one, C5, between lugs A and B of strip ST6. Solder both lugs.

Step 13Z ☐ Connect the other .01 mfd disc capacitor, C6, between lugs F and G of strip ST6. Solder both lugs.

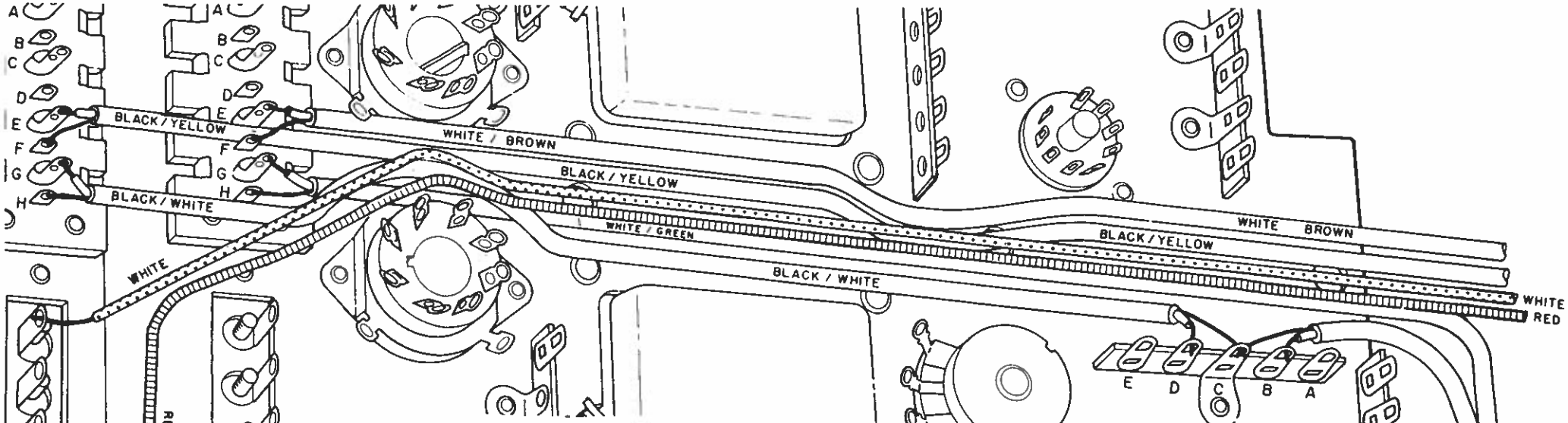


Figure 14-2

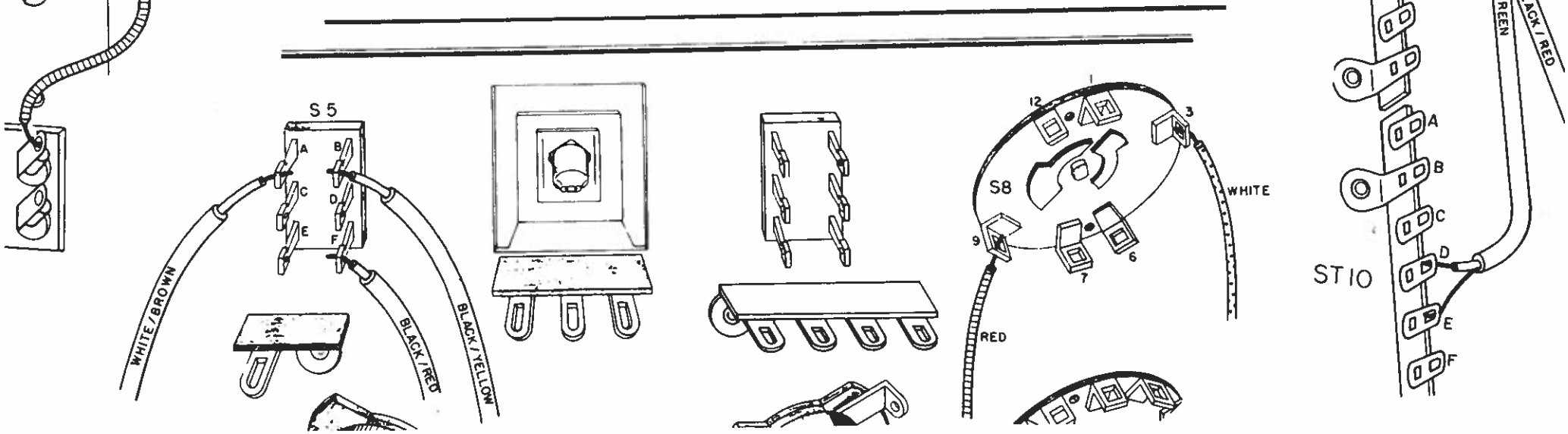


Figure 14-1

STAGE 14

IN THIS STAGE you will complete the wiring of the input (output) jacks. To do this a few more leads will be attached to two switches on the front panel.

Step 14A Remove all the shielded cables from StrataPack 14. Strip ¼ inch of insulation from both ends of each cable.

Turn over the chassis, to its normal position, with the front panel away from you. Refer to Fig. 14-1.

Step 14B Cut the ground lead off one end of the white with brown tracer shielded cable. Solder the center wire of this end to lug A of switch S5.

Step 14C Cut the ground lead off one end of the black with yellow shielded cable. Solder the center wire of this end to lug B of switch S5.

Step 14D Cut the ground lead off one end of the black with red tracer shielded cable. Solder the center wire at this end of the cable to lug F of switch S5.

Step 14E Solder one end of the white wire to lug 3 of switch S8.

Step 14F Solder one end of the red wire to lug 9 of switch S8.

Turn over the chassis so you can connect these wires into the circuits. Notice that all of the wires connected to lugs at the rear of the chassis are run in parallel with those already connected. See Fig. 14-2.

Step 14G Locate the white with brown tracer shielded cable from switch S5. Run it in parallel with the other cables and solder the ground wire to lug F on jack J3. Solder the center wire to lug E on J3.

Step 14H Run the black with yellow tracer cable down to jack J4. Solder the ground wire to lug F of J4. Solder the center wire to lug E on J4.

Step 14J Run both the red and the white wires from switch S8 down the chassis in parallel with the cables. Solder the white wire to lug A of screw strip SS2.

Step 14K Solder the red wire to lug Y of screw strip SS3.

Step 14L Locate the black with red tracer cable from switch S5. Run it as shown in Fig. 14-2. Connect the center wire to lug B of strip ST7; connect the ground wire to lug C of ST7.

Step 14M Locate the white with green tracer cable from StrataPack 14. Connect the center wire to lug D of strip ST10. Connect the ground wire to lug E of ST10.

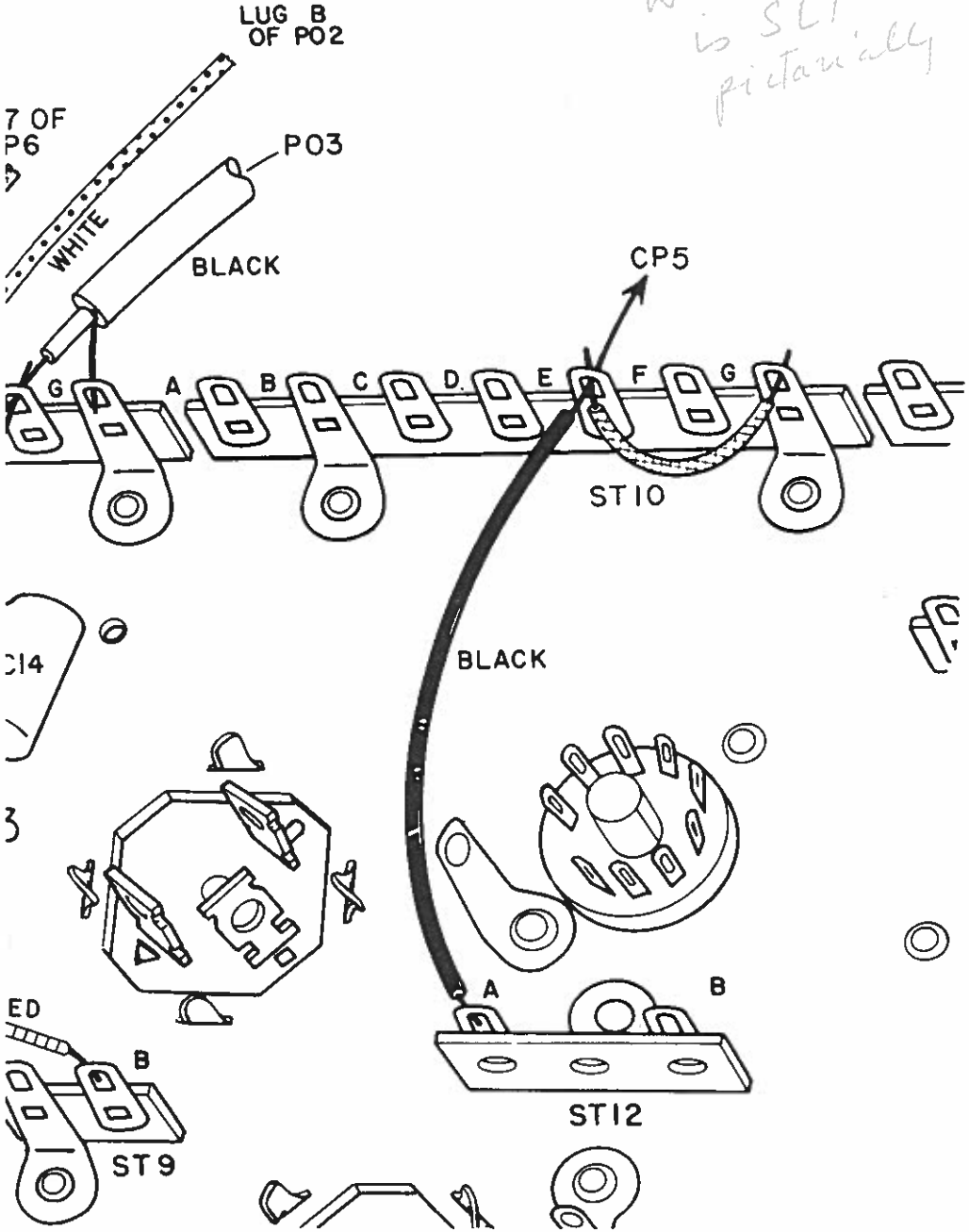
Step 14N Run this cable to the left, around the terminal strips, and down the chassis in parallel with the other cables. Solder the ground wire to lug H of jack J3. Solder the center wire to lug G of J3.

Step 14P Locate the black with white tracer shielded cable from StrataPack 14. Connect the center wire to lug D of strip ST7. Connect the ground wire to lug C of ST7.

Step 14Q Run the cable down the chassis in parallel with the others. Solder the ground wire to lug H of jack J4. Solder the center wire to lug G of J4.

Well this completes the wiring of the input-output jacks — you have the right to feel relieved. These jacks are always a bit tedious to wire; both because shielded cable is used and they are close together.

Because of this it is desirable to go back and check them — a short here would stop the signal from entering the amplifier circuits.



STAGE 15

IN THIS STAGE you'll start on the tone-control amplifier stages. More of the "hanging wires" from the front panel will be connected into the circuits. Additional components will also be used, of course.

Step 15A ☐ Connect the blue wire between lug 2 of socket V3 and lug A of strip ST7.

Step 15B ☐ Cut both leads on the .022 mfd mylar capacitor C12 to ½ inch. Connect C12 between lug 1 of socket V3 and lug D of strip ST7.

Step 15C ☐ Cut both leads on the 220K ohm resistor (red, red, yellow), R24, to ½ inch. Connect R24 between lug 1 of socket V3 and lug E of strip ST7. Solder lug 1 of V3.

Step 15D ☐ Connect the red wire between lug E of strip ST7 and lug B of strip ST9. Note that this wire is run between solder lug SL1 and socket V3. Keep it dressed down to the chassis. Solder lug E of strip ST7.

Step 15E ☐ Cut the leads on the 3.3 megohm resistor (orange, orange, green), R26, to ⅝ inch. Connect it between lug 2 of socket V3 and lug D of strip ST7. Solder lug 2 of V3.

Step 15G ☐ Cut both leads on the 47K ohm resistor, R28, (yellow, violet, orange) to ⅝ inch. Connect R28 between lugs B and D of strip ST7. Solder both lugs.

Step 15H ☐ Locate the white wire from lug D of switch S4. This is the slide switch next to the rotary switch to which are connected the 10 ohm, 5 watt resistors. Connect this white lead to lug A of strip ST8.

Step 15J ☐ Cut both leads on the 10 megohm resistor (brown, black, blue), R18, to ⅝ inch. Connect R18 between lugs A and C of strip ST8.

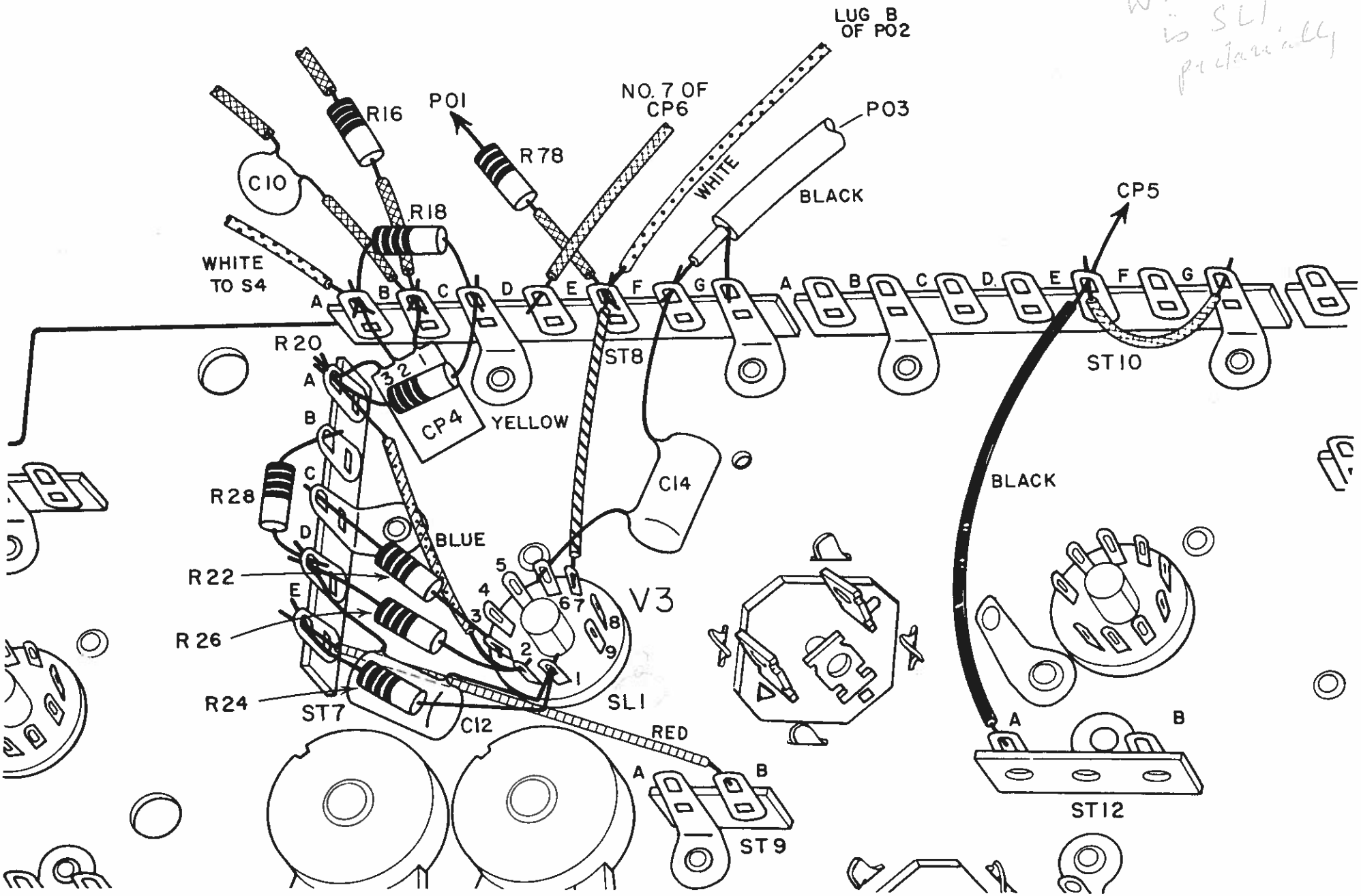

LUG B
OF P02
NO. 7 OF
CP6
P03
P01
R16
R78
C10
R18
WHITE
BLACK
CP5
WHITE
TO S4
A
B
C
D
E
F
G
R20
ST8
ST10
CP4
YELLOW
C14
BLACK
R28
BLUE
R22
R26
R24
ST7
C12
V3
SL1
RED
ST9
ST12

Figure 15-1

Step 15K Locate the 560K ohm resistor (green, blue, yellow), R16, and the 24 mmf capacitor, C10 — one lead of both parts is connected to lug 8 of rotary switch S2. Cut two ¾ inch lengths of spaghetti.

Step 15L Slip spaghetti over the leads of both R16 and C10 and connect the leads to lug B of strip ST8.

Step 15M Locate the 3-wire High Filter printed circuit, CP4, and cut the leads as follows:

No. 1 — ½ inch
No. 2 — ¾ inch
No. 3 — ½ inch

Step 15N As shown in Fig. 15-1, connect CP4 with the No. 1 lead to B of strip ST8, the No. 2 lead to lug A of strip ST8, and the No. 3 lead to lug A of strip ST7. Solder lugs A and B of strip ST8.

Step 15P Cut both leads on the 2.2 megohm resistor (red, red, green), R20, to ½ inch. Connect R20 between lug A of strip ST7 and lug C of strip ST8. Solder both lugs.

Step 15Q Cut a 2 inch length of spaghetti. Now locate lead No. 7 of the tone control printed circuit CP6. This circuit is positioned between the dual tone control potentiometers. Slip the spaghetti over the No. 7 lead and solder this lead to lug D of strip ST8.

Step 15R Solder one end of the yellow wire to lug 7 of socket V3. Run the wire over to strip ST8. Connect this end of the wire to lug E of ST8.

Step 15S Locate the 39K ohm resistor, R78, (orange, white, orange) connected to the center lug on the front section of control P01. Cut a 1 inch length of spaghetti. Slip the spaghetti over the lead of R78 and connect this lead to lug E of strip ST8.

Step 15T Locate the white wire connected to the center lug on the front section of the other dual tone control potentiometer (P02). Connect this wire to lug E of strip ST8. Solder lug E.

Step 15U Cut both leads on the .047 mfd mylar capacitor, C14, to ¾ inch. Connect C14 from lug 6 of socket V3 to lug F of strip ST8. Solder lug 6 of V3.

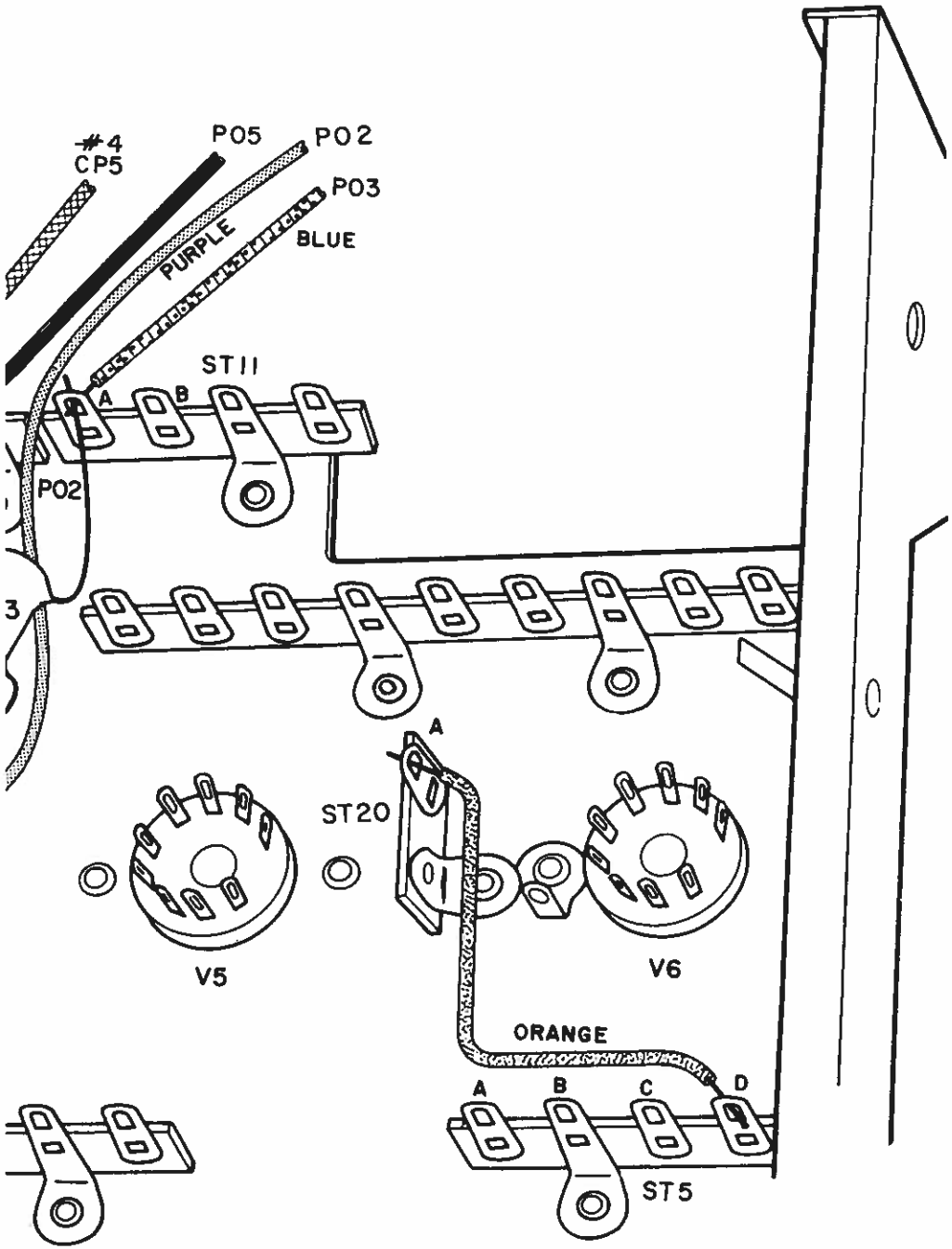
Step 15V Locate the black cable from the front section of the volume control potentiometer P03. Run the lead over to the left and connect the ground wire to lug G of strip ST8. Connect the center wire to lug F. Solder both lugs.

Step 15W Connect one end of the black wire to lug A of strip ST12. Run the wire over to strip ST10 — dress it down on the chassis and run it under the 220K ohm (red, red, yellow) resistor. Connect the other end to lug E of strip ST10.

Step 15X Cut a 1¼ inch length of bare wire and a ½ inch length of spaghetti. Slip the spaghetti over the wire and connect it between lugs E and G of strip ST10.

Step 15Y Locate the No. 7 lead of the tone control printed circuit CP5 (on the back of control P02). Connect lead No. 7 of CP5 to lug E of strip ST10. Solder lug E.

Step 15Z Cut both leads on the 820 ohm resistor, R22, (grey, red, brown) to ½ inch. Solder it from lug 3 of socket V3 to lug C of strip ST7.



STAGE 16

YOU WILL CONTINUE WIRING the tone control amplifiers — this time for channel A. By this time, your chassis should begin to look completed.

Step 16A ☐ Locate the blue wire from lug C of strip ST2 on the panel. (This is the strip to which the pilot lamp is connected.) Solder this blue wire to lug A of strip ST10.

Step 16B ☐ Locate the white with red tracer shielded cable from lug B of strip ST3. Connect the ground wire to lug B of strip ST10. Connect the center wire to lug C of ST10.

Step 16C ☐ Connect the green wire between lug 2 of socket V4 and lug C of strip ST10.

Step 16D ☐ Cut both leads on the 2.2 megohm resistor, R19, (red, red, green) to ½ inch. Connect R19 between lugs B and C on strip ST10. Solder both lugs.

Step 16E ☐ Cut both leads on the .022 mfd capacitor, C11, to ⅝ inch. Connect C11 from lug 1 of socket V4 to lug D of strip ST10 — notice how it is positioned and run the C11 lead under the green wire. Solder lug 1 of socket V4.

Step 16F ☐ Cut both leads on the 3.3 megohm resistor R25 (orange, orange, green) to ¾ inch. Connect R25 between lug 2 of socket V4 and lug D of strip ST10. Solder lug 2 of V4.

Step 16G ☐ Solder one end of the brown wire to lug D of strip ST10. Push the wire down toward the panel. Now turn over the chassis and solder the free end of the brown wire to lug A of strip ST1. At lug A you should also find one lead of a 47K ohm resistor (yellow, violet, orange). Turn the chassis back over when you finish.

Step 16H ☐ Locate the purple wire from the center lug of the rear section of tone control P01 (the dual control to your left). Connect this purple wire to lug F of strip ST10.

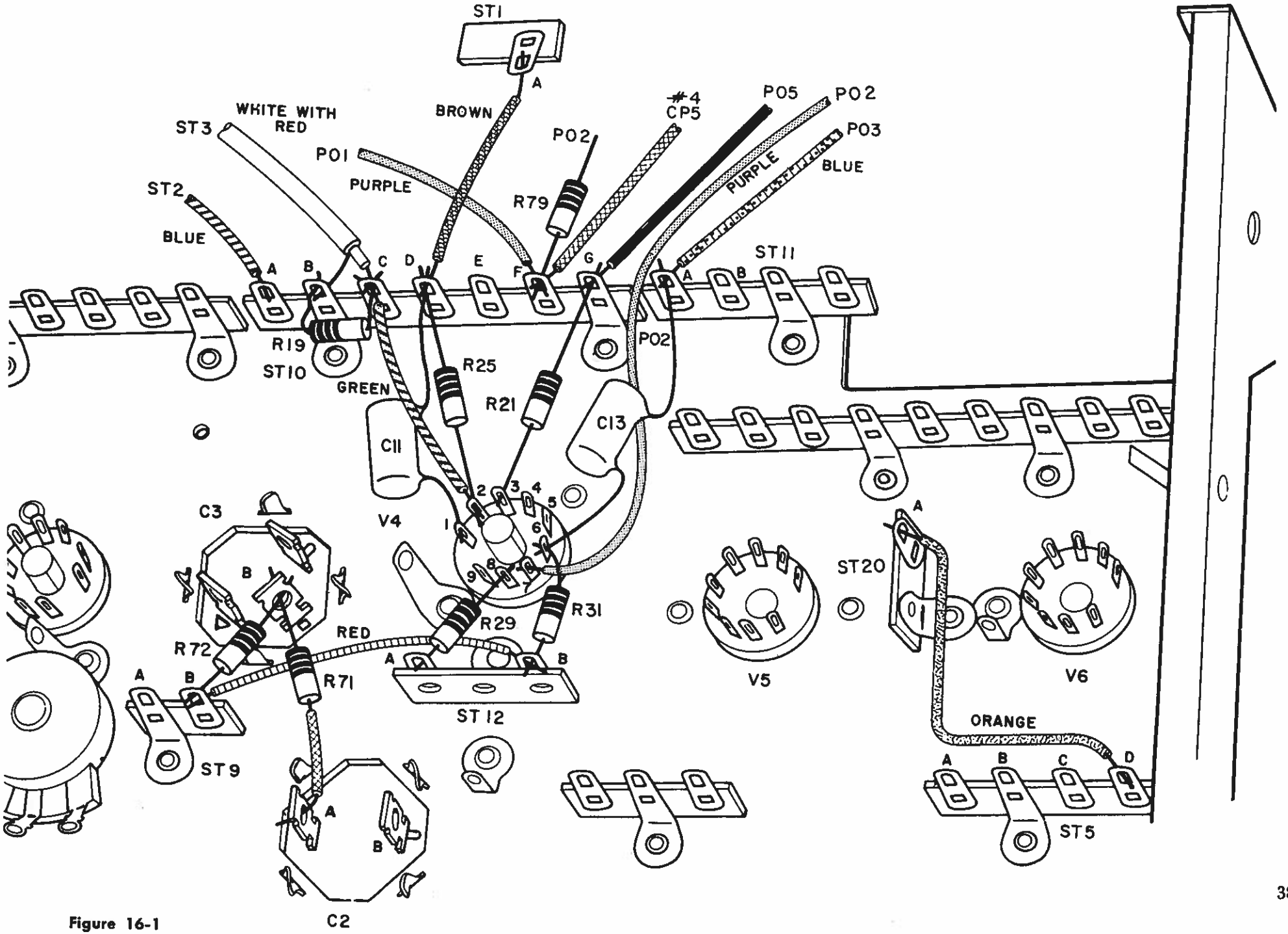

ST1
A
WHITE WITH RED
ST3
BROWN
#4 CP5
P05
P02
P03
P01
PURPLE
P02
R79
PURPLE
BLUE
ST2
BLUE
A B C D E F G
ST11
A B
R19
ST10
GREEN
R25
R21
P02
C11
C13
2 3 4 5
V4
1
6
8
9
C3
B
R72
RED
R71
R29
R31
A B
A B
ST12
ST9
V5
ST20
A
V6
ORANGE
A B C D
ST5
A
B
C2

Figure 16-1

Step 16J On the center lug of the rear section of tone control P02 (to your right) you'll find a purple wire and a 39K ohm resistor, R79 (orange, white, orange). Connect the resistor lead to lug F of strip ST10.

Step 16K Connect the purple wire from the center lug of P02 to lug 7 of socket V4. Solder lug 7.

Step 16L Printed Circuit CP5 is positioned on the back of control P02. Cut a one inch length of spaghetti and slip it over the No. 4 lead of CP5. Connect this lead to lug F of strip ST10. Solder lug F.

Step 16M Cut both leads of one of the 820 ohm resistors (grey, red, brown), R21, to ¾ inch. Connect R21 between lug 3 of socket V4 and lug G of strip ST10. Solder lug 3 of V4.

Step 16N Connect the red wire between lug B of strip ST9 and lug B of strip ST12.

Step 16P Cut both leads on the 2.2K ohm resistor, R72, (red, red, red) to ½ inch. Connect R72 between lug B of strip ST9 and lug B (square) of capacitor C3. Solder lug B of strip ST9.

Step 16Q Cut both leads on the 1K ohm resistor, R71, (brown, black, red) to ¾ inch; cut a ½ inch length of spaghetti. Solder one lead of R71 to lug B of C3. Slip the spaghetti over the other lead and connect it to lug A of capacitor C2.

Step 16R Cut both leads on the remaining 820 ohm resistor (grey, red, brown), R29, to ½ inch. Connect R29 from lug 8 of V4 to lug A of strip ST12. Solder both lugs.

Step 16S Locate the black wire from the center lug of the (single) control P05. Solder this wire to lug G of strip ST10.

Step 16T Cut both leads on the 220K ohm resistor, R31, (red, red, yellow) to ⅝ inch. Connect R31 between lug 6 of V4 and lug B of strip ST12. Solder lug B of ST12.

Step 16U Cut both leads on the .047 mfd capacitor, C13, to ¾ inch. Connect C13 between lug 6 of V4 and lug A of ST11. Solder lug 6 of V4.

Step 16V Locate the blue wire from the rear section of the volume control P03. Solder this wire to lug A of strip ST11.

Step 16W Connect the orange wire between lug A of strip ST20 to lug D of strip ST15. Be sure to position it as shown and dress it down to the chassis.

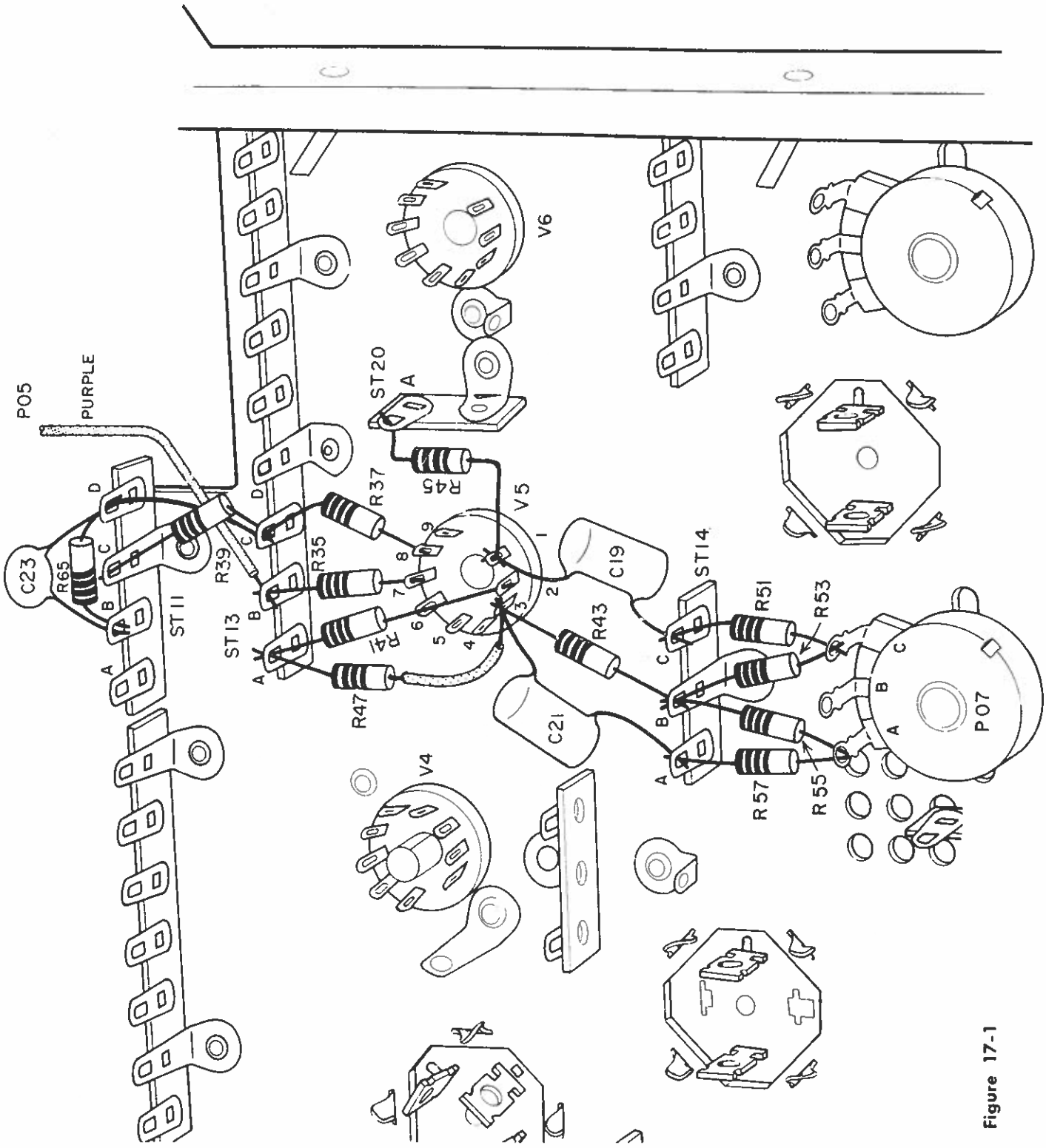

P05
PURPLE
C23
R65
ST11
R39
ST13
R35
R37
ST20
R45
V6
V5
R47
R41
C19
R43
C21
ST14
R51
R53
P07
V4
R57
R55

Figure 17-1

STAGE 17

FROM LOOKING AT THE CHASSIS you may think you are almost finished — you're not! Actually there isn't too much left to do but we do want to caution you to "take it easy." There are a few hours work left. So if it's late at night don't try to finish it — you might make a mistake. So "hit the sack" and tackle it again tomorrow.

Step 17A Locate the purple wire from control P05. (Next to the dual volume control). Run it as shown in Fig. 17-1 and connect it to lug B of strip ST13.

Step 17B Cut a 1½ inch length of bare wire. Connect it between lug D of strip ST11 and lug C of strip ST13.

Step 17C Cut both leads on a 680 ohm resistor, R65, (blue, grey, brown), to ½ inch. Connect R65 between lugs B and D of strip ST11.

Step 17D Cut both leads on a 390 mmf disc capacitor, C23, to ½ inch. Connect C23 between lugs B and D of strip ST11. Solder lug D.

Step 17E Cut both leads on the 220 ohm resistor, R39, (red, red, brown) to ½ inch. Connect R39 between lug C of strip ST11 and lug C of strip ST13. Solder lug C of ST11.

Step 17F Cut both leads on the 1K ohm resistor, R37, (brown, black, red) to ½ inch. Connect R37 between lug C of strip ST13 and lug 8 of socket V5. Solder both lugs.

Step 17G Cut both leads on the 10K ohm resistor, R35, (brown, black, orange) to ⅜ inch. Connect R35 between lug B of strip ST13 and lug 7 of socket V5. Solder both lugs.

Step 17H Cut one lead on a 330K ohm resistor, R41, (orange, orange, yellow) to 1 inch and the other lead to ⅜ inch. Insert the 1 inch lead in lug 6 of socket V5, run it across the socket and through lug 2; bend the lead over at lug 2. Connect the ⅜ inch lead to lug A of strip ST13. Solder lugs 6 and 2 of V5.

Step 17J Cut both leads on a .047 mfd capacitor, C21, to ⅝ inch. Connect C21 from lug 3 of socket V5 to lug A of strip ST14.

Step 17K Cut both leads on an 82K ohm resistor, R43, (grey, red, orange) to ⅝ inch. Connect R43 from lug 3 on V5 to lug B on ST14.

Step 17L Cut both leads on a 680K ohm resistor, R47, (blue, grey, yellow) to ¾ inch; cut a ½ inch length of spaghetti. Slip the spaghetti over one lead of R47 and connect this lead to lug 3 of V5. Connect the other lead to lug A of strip ST13. Solder both lugs.

Step 17M Cut both leads on a .047 mfd capacitor, C19, to ½ inch. Connect C19 between lug 1 of socket V5 and lug C of strip ST14.

Step 17N Cut both leads on a 68K ohm resistor, R45, (blue, grey, orange) to ½ inch. As shown in Fig. 17-1, bend the resistor leads opposite to each other and connect R45 from lug 1 of V5 to lug A of strip ST20. Solder lug 1 of V5.

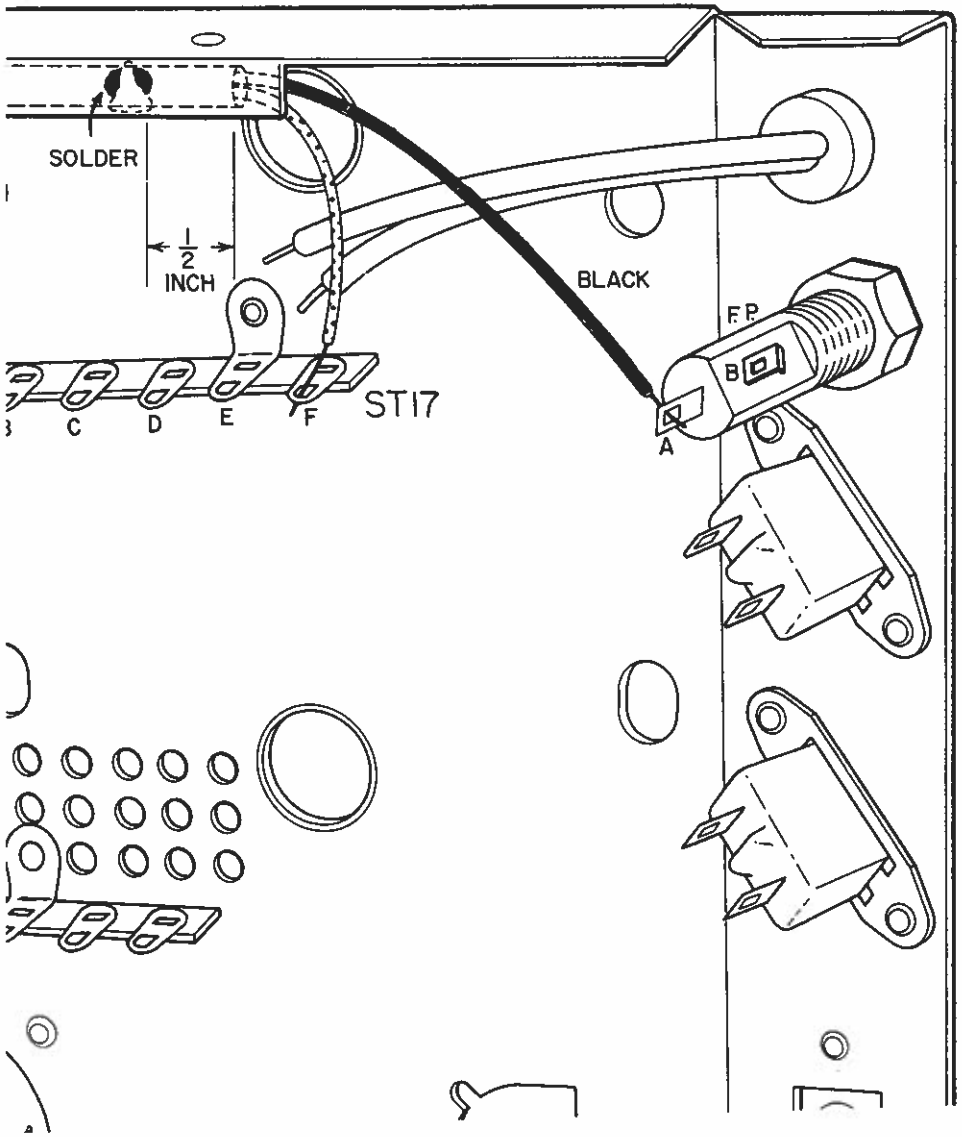
Step 17P Cut all four leads on the 68K ohm resistors (blue, grey, orange) to ½ inch. Connect R55 from lug B of ST14 to lug A of P07.

Step 17Q Connect the other 68K ohm resistor, R53, from lug B of strip ST14 to lug C of P07. Solder lug B of strip ST14.

Step 17R Cut all four leads on the 270K ohm resistors (red, violet, yellow) to ½ inch. Connect R57 from lug A of strip ST14 to lug A of control P07. Solder lug A of P07.

Step 17S Connect the other 270K ohm resistor, R51, from lug C of strip ST14 to lug C of control P07. Solder lug C of P07.

STAGE 18



YOU WILL COMPLETE the wiring of the driver-phase-inverter stages now.

Step 18A ☐ Locate the white wire from control P05. Connect it to lug E of strip ST13.

Step 18B ☐ Cut both leads on the 10K ohm resistor, R36, (brown, black, orange) to ½ inch. Connect R36 between lug E of strip ST13 and lug 7 of socket V6. Solder both lugs.

Step 18C ☐ Cut both leads on the 1K ohm resistor, R38, (brown, black, red) to ½ inch. Connect R38 between lug J of strip ST13 and lug 8 of socket V6. Solder lug 8 of V6.

Step 18D ☐ Cut one lead on the 220 ohm resistor, R40, (red, red, brown) to ½ inch; cut the other lead to 1 inch. Solder the shorter lead to lug G of strip ST13.

Step 18E ☐ Insert the longer lead of R40 through hole J and back to hole H of strip ST13. Solder lug J of ST13.

Step 18F ☐ Cut both leads on the 680 ohm resistor, R66, (blue, grey, brown) to ½ inch. Connect R66 between lugs F and H of strip ST13.

Step 18G ☐ Cut both leads on the 390 mmf disc capacitor, C24, to ½ inch. Connect C24 between lugs F and H of strip ST13. Solder lug H of ST13.

Step 18H ☐ Cut both leads of one of the .047 mfd capacitors, C20, to ½ inch. Connect C20 from lug 1 of socket V6 to lug C of strip ST15.

Step 18J ☐ Cut both leads on the 68K ohm resistor, R46, (blue, grey, orange) to ½ inch. Connect R46 between lug 1 of socket V6 and lug D of strip ST15. Solder both lugs.

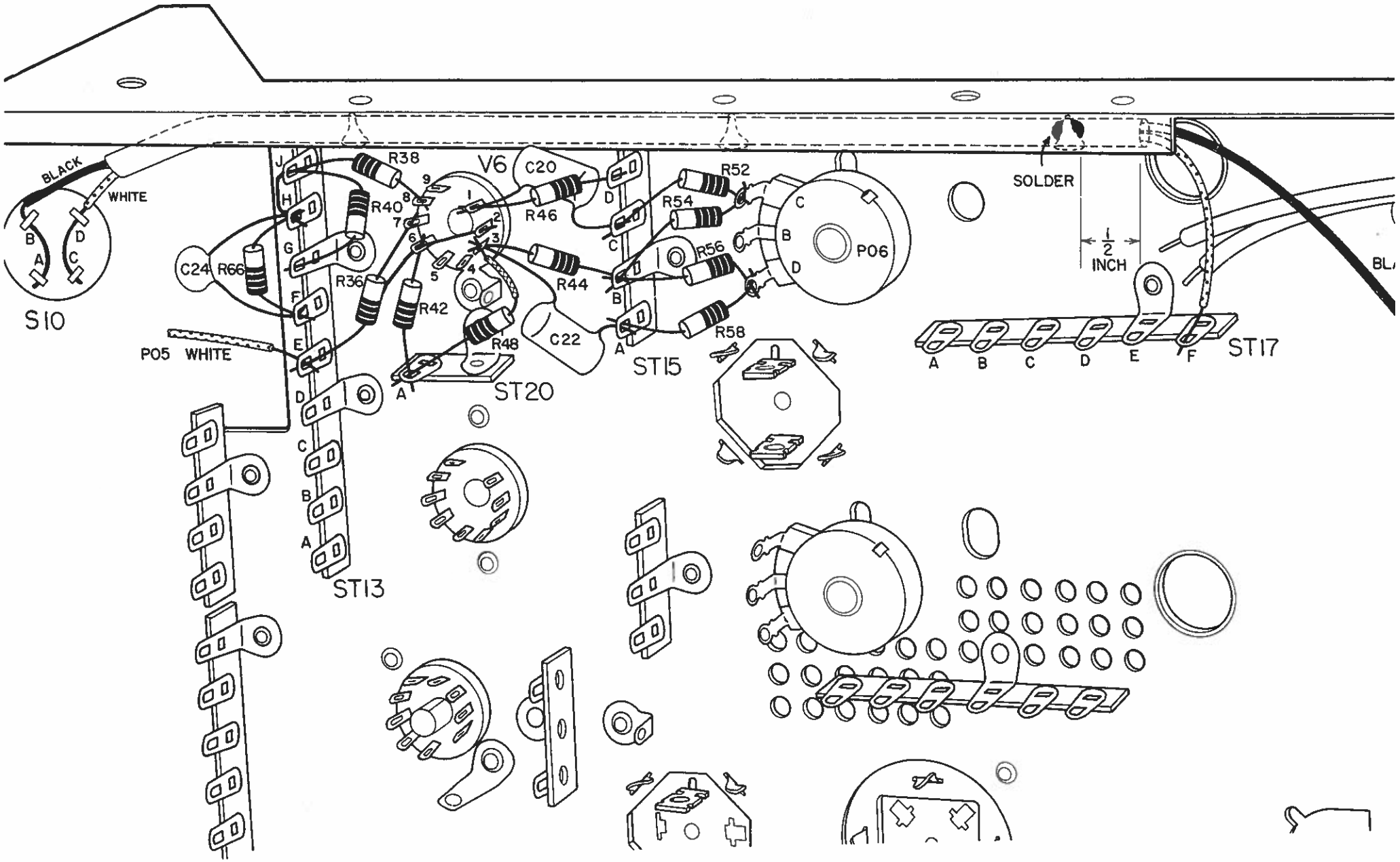

BLACK
WHITE
S10
P05 WHITE
R38
V6
C20
R46
R40
C24
R66
R36
R42
R48
C22
R44
R52
R54
R56
R58
P06
SOLDER
1/2 INCH
ST20
ST15
ST17
ST13
A B C D E F

Figure 18-1

Step 18K Cut both leads on the remaining .047 mfd capacitor, C22, to ½ inch. Connect C22 between lug 3 of socket V6 and lug A of strip ST15.

Step 18L Cut both leads on the 82K ohm resistor, R44, (grey, red, orange) to ½ inch. Connect R44 from lug 3 of socket V6 to lug B of strip ST15.

Step 18M Cut *one* lead of the 680K ohm resistor, R48, (blue, grey, yellow) to ½ inch. Cut the other lead to 1 inch. Connect the shorter lead to lug A of strip ST20. Cut a ¾ inch length of spaghetti. Slip the spaghetti over the free end of R48, bend the lead as shown and connect it to lug 3 of socket V6. Solder lug 3 of V6.

Step 18N Cut one lead of the 330K ohm resistor, R42, (orange, orange, yellow) to 1 inch; cut the other lead to ½ inch. Insert the longer lead into lug 6 of socket V6, run it across the socket and through lug 2. Bend the lead over at lug 2. Bend the resistor as shown and connect the shorter lead to lug A of strip ST20. Solder lug A of ST20 and both lugs 6 and 2 of V6.

Step 18P Cut all four leads of both 68K ohm resistors (blue, grey, orange) to ½ inch. Connect one of them, R54, from lug B of strip ST15 to lug C of control P06.

Step 18Q Connect the other, R56, from lug B of strip ST15 to lug A of control P06. Solder lug B of ST15.

Step 18R Cut all four leads of both 270K ohm resistors (red, violet, yellow) to ½ inch. Connect one of them, R52, from lug C of strip ST15 to lug C of control P06. Solder lug C of P06.

Step 18S Connect the other, R58, from lug A of strip ST15 to lug A of control P06. Solder lug A of P06.

Step 18T Solder one end of the white glass insulated wire to lugs D and C on switch S10 — located on the back of the dual volume control P03.

Step 18U Solder one end of the black glass insulated wire to lugs A and B of switch S10.

Step 18V Locate the remaining 8 inch length of spiral metal shield. Run the black and white wires through the shield. Position the shield on the three metal lugs on the right side of the chassis. Note the position of the shield — it should extend ½ inch past the bare lug (near the power transformer).

Step 18W At the end of the "cable" solder the white wire to lug F of strip ST17. Solder the black wire to center lug A of the fusepost.

Step 18X The bare lug near the rear of the chassis will now be soldered to the spiral metal shield — just as you did with the two shields on the other chassis edge. First tin the inside of the metal lug and then the shield at the point it will contact the lug.

Step 18Y After the shield cools pull it up near the edge — right in the corner — and bend the bare lug up to hold it. Solder them together.

Step 18Z Finally bend the other two insulated lugs over to hold the spiral shield in place. *Make certain* the shield is held away from strips ST13 and ST15.

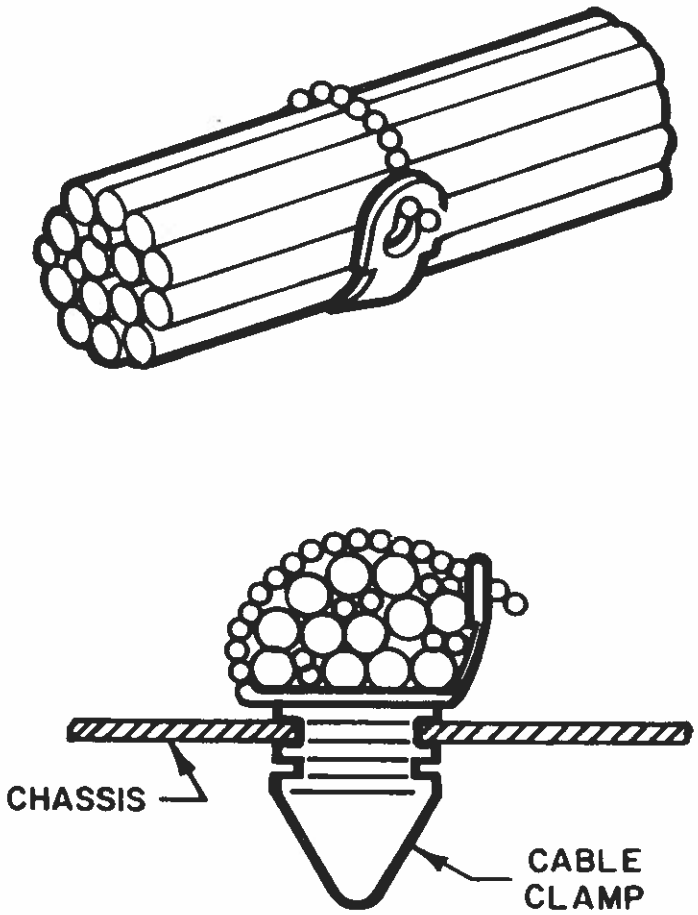


Figure 19-2

STAGE 19

IN THIS STAGE you will first connect the phase inverter stages to the push-pull power output stages and then you will install the over-all feedback networks. Since this requires running some long leads from one end of the chassis to the other we have provided a separate drawing, labeled 19-1. First locate this drawing, and then proceed as follows.

Locate the longer orange wire and note in Fig. 19-1 that it is connected from the front edge of the chassis (ST11) to the rear (SS3). Start from the rear and run it to the front as follows: insert the wire under the silicon diode leads at strip ST16, run it right down on the chassis under all wires and part leads until you reach strip ST12.

Step 19A ☐ At this point lift the wire up over both the red and the yellow leads. Solder the end to lug B of strip ST11.

Step 19B ☐ Dress the other end of the wire over the red, and the twisted green and yellow transformer wires. Connect this end to lug X of screw strip SS3.

Step 19C ☐ Solder the blue wire from lug X of SS3 to lug D of screw strip SS1. Dress the wire down to the chassis but over any existing wires.

Locate the green wire and note in Fig. 19-1 that it also runs from the front to the rear of the chassis. Run it in parallel with the orange wire dressed down to the chassis as is the orange wire.

Step 19D ☐ At the front of the chassis solder the green wire to lug F of strip ST13.

Step 19E ☐ At the rear of the chassis, solder the other end of the green wire to lug D of screw strip SS2.

Locate the yellow, brown, white, and (the longest) red wires. Note in Fig. 19-1 that these wires also run quite a long distance — from strips ST14 and ST15 to strips ST18 and ST19. As with those you just installed, most of these wires will also be dressed down to the chassis.

Step 19F Connect one end of the yellow wire to lug A of strip ST19. Connect one end of the brown wire to lug B of strip ST19.

Bend both the yellow and the brown wires to the left and run them over to the group of shielded cables. Run the wires along with the cables and then bend them to the right and pass them between the transformer and the controls.

When you reach capacitor C2 pass the wires underneath the 1K ohm resistor (brown, black, red) connected from C2 to C3. Run the wires under the parts connected to strips ST14 and ST15.

Step 19G Connect the yellow lead to lug C of strip ST15. Connect the brown lead to lug A of ST15. Solder both lugs.

Step 19H Connect one end of the red wire to lug B of strip ST18. Connect one end of the white wire to lug A of strip ST18.

Bend both the red and the white wires to the right over to the shielded cables. Now run them in parallel with the yellow and brown wires you just installed. When you get to capacitor C2 be sure to dress the wires under the 1K ohm resistor.

Step 19J Connect the white wire to lug C of strip ST14. Connect the red wire to lug A of ST14. Solder both lugs.

Step 19K Locate the remaining 5 inch orange wire. Connect it from lug A (triangle) of capacitor C2 to lug 4 of socket V10. Dress it down to the chassis.

Step 19L Locate the 1.8K ohm, 4 watt resistor, R70. Cut one lead to 1 inch; cut the other lead to 1¼ inch. Cut a ¾ inch length of spaghetti and slip it over the 1 inch lead. Connect this lead to lug A of capacitor C1. Cut a 1 inch length of spaghetti. Slip it over the other lead of R70 and connect this lead to lug A of capacitor C2. Solder both lugs — A of C1 and A of C2.

The 1.8K ohm resistor, R70, gets quite hot — make sure it is not touching any wires.

Step 19M Locate the 3 lengths of 2½ inch red wire. These will be connected from point-to-point — not dressed down to the chassis. Connect one from lug 8 of socket V7 to lug 4 of socket V8; connect another from lug 4 of socket V8 to lug 8 of socket V9. Connect the last one from lug 8 of socket V9 to lug 4 of socket V10. Solder all four lugs.

Step 19N Locate the three cable clamps from StrataPack 19. These clamps plug into holes K-K, L-L, and M-M on the chassis and wrap around all of the cables and wires in that section. Plug the cable clamps into their proper holes (the tips of your long-nose pliers might help here). Rotate the clamps so the "tab" end is toward the right.

Now bring the beaded end around the cables and insert it in the larger hole in the tab end. Pull it up tight and then pull the beads up through the smaller hole in the tab to lock it. Cut off the excess beaded end leaving two beads as shown in Fig. 19-2.

Step 19P Locate the rotary switch S9. This switch will be installed in the round hole near capacitor C1. Pull out the wires that you previously inserted in this hole. Insert the switch in the hole and rotate it so the key is located in the slot. Place the large hex nut over the switch shaft and tighten it with your pliers.

Step 19Q Locate the D'Arsonval meter and the two small mounting screws. Install the meter, from the top of the chassis, in the hole between switch S9 and strip SS3. Do not twist the mounting screws too much or you may crack the meter case. Bend up the two solder lugs on the meter.

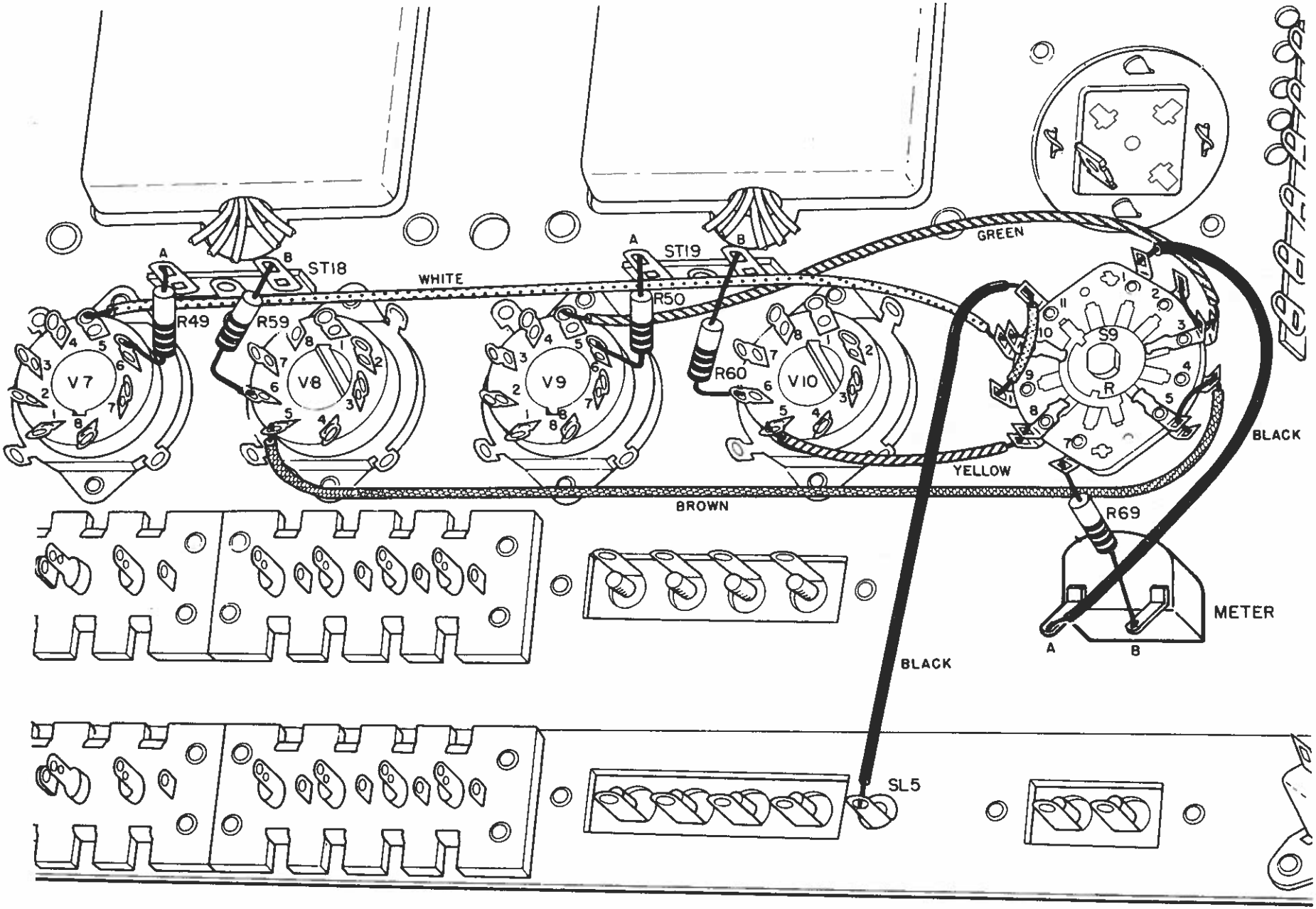

ST18
ST19
WHITE
GREEN
R49
R59
R50
R60
V7
V8
V9
V10
S9
R
BLACK
YELLOW
BROWN
R69
METER
A
B
BLACK
SL5

Figure 20-1

STAGE 20

BELIEVE IT OR NOT — this is the last stage! After you wire the meter, meter switch, and four resistors into the circuit, the electrical wiring will be finished. Then after a little mechanical assembly, power will be applied to the amplifier and you'll adjust the bias and balance controls.

Step 20A Solder one end of one of the black wires to lug A of the meter. (Note: if the wire won't go through the hole in the lug, wrap it around the lug.) Solder the other end to lug 1 of switch S9.

Step 20B Locate the white wire from socket V7. Solder it to lug 10 of switch 9. Be sure it goes through both lugs.

Step 20C Locate the brown wire from socket V8. Connect it to lug 4 of switch S9.

Step 20D Locate the green wire from socket V9. Connect it to lug 3 of switch S9.

Step 20E Locate the yellow wire from socket V10. Solder it to lug 8 of switch S9.

Step 20F Cut two ½ inch lengths of bare wire. Connect one between lugs 2 and 3 of S9; connect the other between lugs 4 and 5 of S9. Solder all four lugs.

Step 20G Cut a 1 inch length of bare wire and a ½ inch length of spaghetti. Solder one end of the wire to lug 9 of S9. Slip the spaghetti over the wire and connect the other end to lug 11 of S9.

Step 20H Solder one end of the remaining black wire to lug 11 of switch S9. Solder the other end to solder lug SL5 on the back edge of the chassis.

Step 20J Cut both leads of the 390 ohm resistor, R69, (orange, white, brown) to ⅝ inch. Solder R69 from lug B of the meter to lug 7 of switch S9.

Step 20K Cut both leads on one of the 1K ohm resistors, (brown, black, red) to ½ inch. Connect it, as R49, from lug A of strip ST18 to lug 6 of socket V7. Solder both lugs.

Step 20L Cut both leads on one of the 1K ohm resistors, (brown, black, red) to ⅝ inch. Connect it, as R59, from lug B of strip ST18 to lug 6 of socket V8. Solder both lugs.

Step 20M Cut both leads of one of the 1K ohm resistors, (brown, black, red) to ½ inch. Connect it, as R50, from lug A of strip ST19 to lug 6 of V9. Solder both lugs.

Step 20N Cut both leads of the remaining one 1K ohm resistors, (brown, black, red) to ⅝ inch. Connect it, as R60, from lug B of strip ST19 to lug 6 of socket V10. Solder both lugs.

Locate the cup shaped AC switch shield. This will be placed over the back of the volume control to cover the 4 lug switch. Note that there is a slot in the shield for the two wires.

Step 20P Place the shield over the AC switch (S10). Now solder the shield and control case together at the point where the shield meets the case of the control.

This completes the electrical wiring. Now you will mount the dress panel and adjust the amplifier.

Mounting the Dress Panel

Remove the dress panel from the box and unwrap it carefully. The dress panel is held on the front panel by two hex nuts — one on the "Mode Selector" (S2) switch and the other on the "Balance" (P05) control. Locate the two large hex nuts from StrataPack 20. Turn the chassis to its normal upright position with the control shafts facing you.

Now place the dress panel on the front of the chassis as shown in Figure 20-2. Although you should have no difficulty getting the control and switch shafts to project through their proper holes in the dress panel, the slide switches may need adjustment. This is done by loosening the screws holding the slide switches and moving the switches

until the knob is in the center of the rectangular hole of the dress panel. Of course, you'll need to slip the dress panel on and off several times until all four slide switches are properly adjusted.

When you are certain all the slide switches are properly centered:

Step 20P ☐ Permanently mount the dress panel. When you tighten the two hex nuts be sure you do not mar the panel.

Now turn over the chassis with the front panel facing you and remove the knobs from the Spare Parts StrataPack. Locate the separate Figs. 20-2, 3, 4, and 5.

Refer to Figure 20-2 and place the knobs on the shafts. You'll find the knobs can only fit on one way — except for the dual tone-control type. It is possible to place the inner sections on upside down. After these dual knobs are on, rotate them counter-clockwise. The indicating "dot" on the brass ring portion of the knob should be pointing to "Min" (minimum). If not remove the knobs and reverse them.

. . . and now the tubes

Remove all of the tubes from the box. Plug the 12AX7/ECC83 tubes in the 9 pin sockets V1 through V6. Note that there is a space between pins 1 and 9 on both the tube and the socket so that it can only be plugged in one way. Locate the four tube shields and place them over tubes V1, V2, V3, and V4.

Remove the four 7591 power output tubes and plug them into the octal sockets at the rear of the chassis. These octal tubes, too, are keyed so they will only fit one way. However, instead of pin spacing, the keying is done by a projection on the center portion of the tube base and a corresponding slot in the socket.

The Front Panel Shield

Locate the front panel shield and the six No. 6 self-tapping screws. Notice that tape has been placed on this shield near one end. This tape is to insure that the lugs of the "Center Speaker Level" control do not short against the shield. Position the shield then, as shown in Figure 20-3, with the tape on the inside and over this control. Use the self-tapping screws and secure the shield in place.

Adjusting the KX-200

Turn all of the front panel controls as follows:

- ☐ Input Selector : Tuner
- ☐ Mode Selector : Stereo
- ☐ Bass (Both) : Normal
- ☐ Treble (Both) : Normal
- ☐ Balance : Normal
- ☐ Master Volume : AC OFF
- ☐ Equalization : Phono
- ☐ Center Speaker Level : Medium
- ☐ High Filter : OFF
- ☐ Tape Monitor : OFF
- ☐ Stereo Dimension : Stereo
- ☐ Loudness Contour : OFF

Note that the "Center Speaker Level" control is turned to "Medium".

Now rotate the chassis so that you can read the meter. Cut a one-inch length of bare wire and bend hooks in both ends. Use your screwdriver to loosen both screws at the "X" and "Y" center speaker terminals. Short these terminals together with the bare wire and tighten the screws — be sure the ends of the wire are not touching the chassis.

Remove the fusepost cap by rotating it counter-clockwise. Insert one of the fuses from StrataPack 20 in the post and replace the cap — note that it is spring-loaded. (The other fuse is an extra.)

We know you're anxious — but before applying power to your KX-200 please check:

- ☐ Any bits of wire or solder under the chassis that could cause a short?
- ☐ Controls all adjusted right?
- ☐ Center speaker terminals X and Y shorted together? . . . . . but not to the chassis?

If all is "A-OK" you can proceed. First plug the power cord into an outlet — but don't turn the KX-200 on yet.

Refer to Figure 20-4 and adjust the bias and balance controls as follows:

Bias A — Fully clockwise
Bias B — Fully clockwise
Bal A — Approximately in the center of rotation
Bal B — Approximately in the center of rotation

At last(!) turn on the KX-200 by rotating the volume control clockwise until the switch clicks — but keep the control in its minimum position. Do not turn it any further clockwise than is necessary to actuate the ON-OFF switch.

Note that the slot in the meter switch shaft acts as a pointer. Use your screwdriver to turn the switch to the "Bias A" position. Rotate the "Bias A" chassis control until the meter pointer moves up to the "Bias" line on the meter face.

Turn the meter switch to "Bal A" and adjust the "Bal A" control until the meter pointer rests at the "Bal" line. Rotate the control completely through its range to be sure it is adjusted properly. Note that near the ends of its range the meter pointer will flicker. The final position of the control should *not* be at the end of rotation.

Turn the meter switch to "Bias B" and rotate the chassis "Bias B" control until the meter pointer moves up to the "Bias" line.

Turn the meter switch to the "Bal B" position and rotate the chassis "Bal B" control until the meter pointer rests on the "Bal" line.

Finally turn the meter switch back to the "Bias A" position. You may find that the pointer has moved off the "Bias" line — this is normal. Simply repeat the entire adjustment procedure. The following simplified table can be used.

Step	Meter Switch	Adjust	Meter Pointer
1	Bias A	Bias A Control	Bias
2	Bal A	Bal A Control	Bal
3	Bias B	Bias B Control	Bias
4	Bal B	Bal B Control	Bal
5	Repeat Steps 1-4		
6	OFF		

IMPORTANT NOTE: If your line voltage is low you may not be able to move the pointer to the "Bias" line in steps 1 and 3. If so, adjust the bias controls until the pointer rests at the left edge of the red portion of the scale near the Bias line.

If you cannot achieve balance, interchanging the 7591 power output tubes should clear up the trouble. Be sure to turn off the amplifier and turn the meter switch to the OFF position before unplugging any tubes.

After you complete the bias and balance adjustments turn off the amplifier and *remove* the power cord from the outlet. Turn the meter switch to the OFF position. Remove the shorting wire from the center speaker "X" and "Y" terminals.

The Bottom Cover

Locate the five remaining No. 6 self-tapping screws. Note that three edges of the bottom cover are bent over while the fourth has only a small tab in the center. This edge, with the tab, should be at the rear of the chassis. Place the bottom cover over the chassis with all edges on the outside of the chassis. The tab at the rear fits inside. Secure the cover in place with the No. 6 self-tapping screws. "Start" all of the screws before tightening any of them.

Installation

Full information on installing your KX-200 is included in your Operating Manual. The four plastic feet are installed on the bottom cover as shown in Figure 20-5. Make certain that you do not use a longer screw than is supplied in the bottom cover hole near the power output tubes.

Maintenance

Your Fisher StrataKit is conservatively designed for long trouble free life and should require little service except normal tube replacement. However, it is suggested that the Bias and Balance adjustments be checked periodically (500 hours or 6 months) and re-adjusted if necessary. Should any of the 7591 output tubes be replaced, all of the adjustments should be repeated.

In case of trouble . . . Experience has shown that most of the difficulties encountered in kits are due to improperly soldered connections or incorrect wiring. Therefore, if your unit does not work properly first check the wiring against the illustrations and, if you are technically minded, the schematic. Note that the schematic diagram lists the operating voltages. If you are still not able to locate the trouble write to us explaining your difficulty. Remember to address your request to the Fisher Radio Corp., Kit Division, 21-21 44th Drive, Long Island City 1, N. Y.

If you wish, you may return the unit to our factory. A $10.00 charge will be made plus the cost of any parts damaged in construction. Ship by prepaid Railway Express to: Fisher Radio Corp., Kit Division, 21-21 44th Drive, Long Island City 1, New York. Return shipment will be made by express collect. Be sure to pack the unit carefully — note that the carrier cannot be held liable for damages in transit if the packing, *in his opinion,* is insufficient. Therefore, pack the unit carefully in a rugged container completely surrounded by packing material (shredded newspaper or excelsior). Attach a tag to the unit giving your name and address and a description of the trouble.

PARTS LIST

Capacitors

10% tolerance for all fixed capacitors, unless otherwise noted or marked.

Symbol	Description		Part No.
C1	Electrolytic, 200uf, 250V		C50180-20
C2	Electrolytic, 2 Section	A—40uf, 500V B—200uf, 250V	C50180-19
C3	Electrolytic, 3 Section	A—40uf, 300V B—40uf, 400V C—40uf, 450V	C50180-26
C4	Electrolytic, 2 Section	A—1000uf, 35V B—1000uf, 35V	C50180-37
C5, 6	Ceramic, .01uf, 20%, 500V		C50089-3
C7, 8	Mylar, .022uf, 400V		C50197-28
C9, 10	Ceramic, 24uuf, 5%, N150, 1000V		C50070-8
C11, 12	Mylar, .022uf, 400V		C50197-28
C13, 14	Mylar, .047uf, 400V		C50197-30
C15, 16	Ceramic, 68uuf, N750, 1000V		C50070-16
C17, 18	Mylar, .022uf, 250V		C50197-49
C19, 20, 21, 22	Mylar, .047uf, 400V		C50197-30
C23, 24	Ceramic, 390uuf, 1000V		C50072-6
C25, 26	Electrolytic, 50uf, 70V		C50283-2

Resistors

In ohms, 10% tolerance, ½ Watt, unless otherwise noted. K=Kilohm, M=Megohm.

Symbol	Description	Part No.
R1, 2	Dep. Carbon, 47K, 5%, 1/3W	R33DC473J
R3, 4	Dep. Carbon, 10K, 5%, 1/3W	R33DC103J
R5, 6	Glass, 2.2K, 5%, 1W	R30G222J
R7, 8	Glass, 330K, 5%, 1W	R30G334J
R9, 10	Dep. Carbon, 220K, 5%, 1/3W	R33DC224J
R11, 12	Dep. Carbon, 100K, 5%, 1/3W	R33DC104J
R13, 14	Dep. Carbon, 2.2M, 5%, 1/3W	R33DC225J
R15, 16	Comp., 560K, 5%	RC20BF564J
R17, 18	Comp., 10M	RC20BF106K
R19, 20	Dep. Carbon, 2.2M, 5%, 1/3W	R33DC225J
R21, 22	Dep. Carbon, 820, 5%, 1/3W	R33DC821J
R23, 24	Dep. Carbon, 220K, 5%	R33DC224J
R25, 26	Comp., 3.3M, 5%	RC20BF335J
R27, 28	Dep. Carbon, 47K, 5%, 1/3W	R33DC473J
R29, 30	Dep. Carbon, 820, 5%, 1/3W	R33DC821J
R31, 32	Dep. Carbon, 220K, 5%, 1/3W	R33DC224J
R33, 34	Dep. Carbon, 22K, 5%, 1/3W	R33DC223J
R35, 36	Dep. Carbon, 10K, 5%, 1/3W	R33DC103J
R37, 38	Dep. Carbon, 1K, 5%, 1/3W	R33DC102J
R39, 40	Dep. Carbon, 220, 5%, 1/3W	R33DC221J
R41, 42	Dep. Carbon, 330K, 5%, 1/3W	R33DC334J
R43, 44	Dep. Carbon, 82K, 5%, 1/3W	R33DC823J
R45, 46	Dep. Carbon, 68K, 5%, 1/3W	R33DC683J
R47, 48	Dep. Carbon, 680K, 5%, 1/3W	R33DC684J
R49, 50	Dep. Carbon, 1K, 5%, 1/3W	R33DC102J

R51, 52	Dep. Carbon, 270K, 5%, 1/3W	R33DC274J
R53, 54, 55, 56	Comp., 68K	RC20BF683K
R57, 58	Dep. Carbon, 270K, 5%, 1/3W	R33DC274J
R59, 60	Dep. Carbon, 1K, 5%, 1/3W	R33DC102J
R61, 62, 63, 64	Comp., 10, 5%	RC20BF100J
R65, 66	Comp., 680, 5%	RC20BF681J
R67, 68	Wirewound, 10, 5W	R779-103
R69	Comp., 390, 5%	RC20BF391J
R70	Glass, 1.8K, 4W	RPG4W182K
R71	Comp., 1K	RC20BF102K
R72	Comp., 2.2K	RC20BF222K
R73	Comp., 100K	RC20BF104K
R74	Comp., 220K	RC20BF224K
R75	Wirewound, 15, 5W	R719-106
R76, 77	Comp., 8.2K	RC20BF822K
R78, 79	Comp., 39K	RC20BF393K

Potentiometers

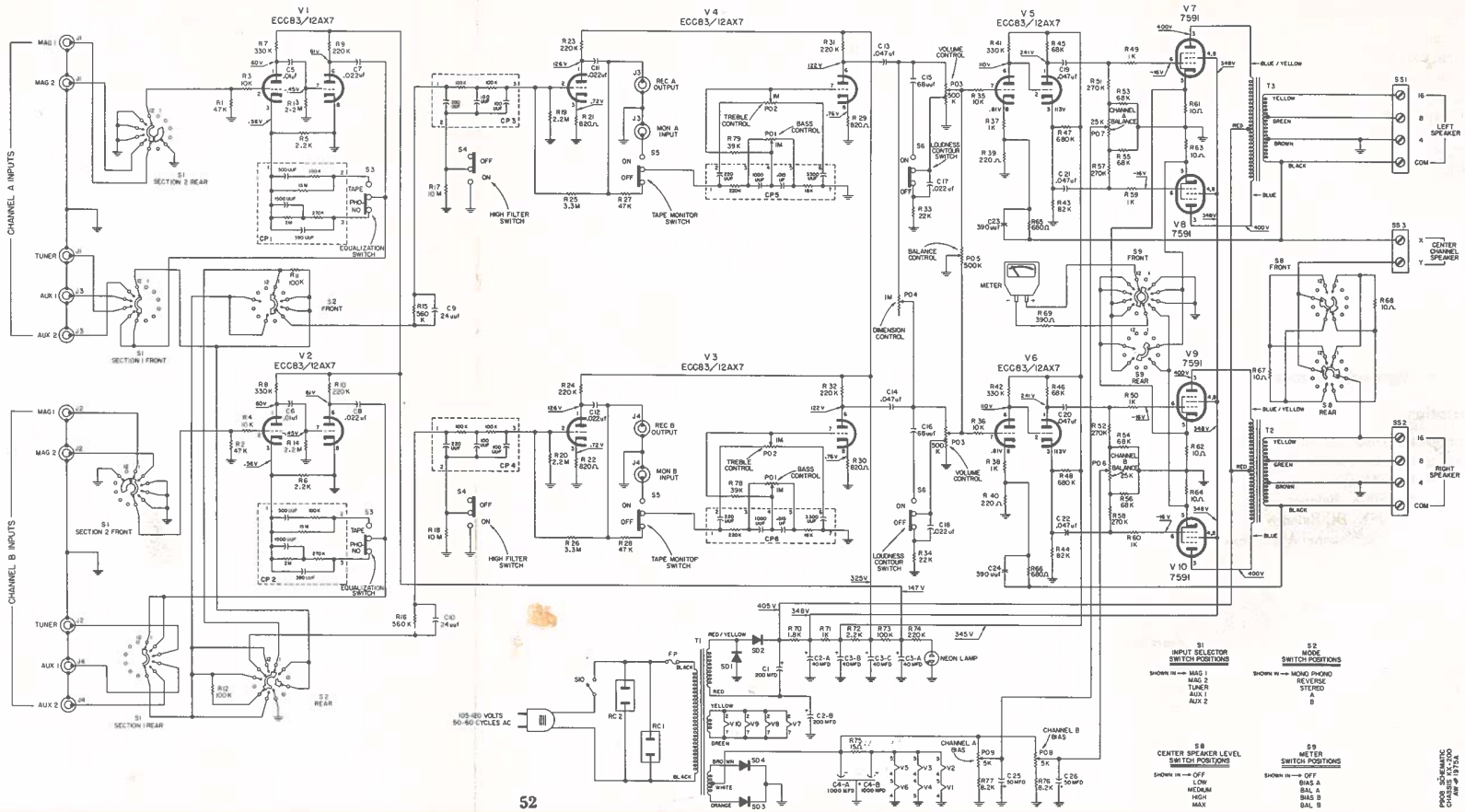
Symbol	Description	Part No.
P01, 2	Potentiometer, Dual, 1M Bass & Treble	R50160-93
P03	Potentiometer, Dual, 500K, Volume	R50160-92
P04	Potentiometer, 1M, Dimension	R50160-111
P05	Potentiometer, 500K, Balance	R50160-110
P06, 7	Potentiometer, 25K, DC Balance	R50103-2
P08, 9	Potentiometer, 5K, Channel A & B Bias	R50103-4

Switches

Symbol	Description	Part No.
S1	Switch, Input Selector	S908-113
S2	Switch, Mode Selector	S908-118
S3, 4, 5, 6	Switch, Slide	S50200-5
S10	Switch, Power	Part of P03
S8	Switch, Center Speaker Level	S908-111
S9	Switch, Meter	S908-117

Miscellaneous

Symbol	Description	Part No.
CP1, 2	Printed Circuit, Phono, Tape Equalization	PC50187-3
CP3, 4	Printed Circuit, High Filter	PC50187-2
CP5, 6	Printed Circuit, Tone Control	PC50187-4
FP	Fuse, 3.2 Amp. Slo-Blo	F 3319
SD1, 2	Silicon Diode, High Voltage	SR806-126
SD3, 4	Silicon Diode Filament & Bias	SR851-122
T1	Transformer, Power	T908-115
T2	Transformer, Output Channel B	T908-116-2
T3	Transformer, Output Channel A	T908-116-1
——	Neon Lamp	I557-144
——	Meter	M908-119
——	Dress Panel	AS908-108
——	Tube Shield	E3287
——	Knob, Dummy Dual	E50324
——	Knob, Dual Rear	E50221
——	Knob, Dual Front	E50323
——	Knob	E50325-1
——	Line Cord	W50023-1
——	Fuse Holder	X563-151


V1 ECC83/12AX7
V2 ECC83/12AX7
V3 ECC83/12AX7
V4 ECC83/12AX7
V5 ECC83/12AX7
V6 ECC83/12AX7
V7 7591
V8 7591
V9 7591
V10 7591
CHANNEL A INPUTS
CHANNEL B INPUTS
MAG 1
MAG 2
TUNER
AUX 1
AUX 2
S1 SECTION 1 FRONT
S1 SECTION 2 REAR
S1 SECTION 2 FRONT
S1 SECTION 1 REAR
S2 FRONT
S2 REAR
S3 TAPE PHONO
EQUALIZATION SWITCH
S4 HIGH FILTER SWITCH
S5 TAPE MONITOR SWITCH
S6 LOUDNESS CONTOUR SWITCH
REC A OUTPUT
REC B OUTPUT
MON A INPUT
MON B INPUT
TREBLE CONTROL
BASS CONTROL
VOLUME CONTROL
BALANCE CONTROL
DIMENSION CONTROL
METER
S8 FRONT
S8 REAR
S9 FRONT
S9 REAR
CHANNEL A BALANCE
CHANNEL B BALANCE
CHANNEL A BIAS
CHANNEL B BIAS
T1
T2
T3
SS1
SS2
SS3
LEFT SPEAKER
RIGHT SPEAKER
CENTER CHANNEL SPEAKER
NEON LAMP
105-125 VOLTS 50-60 CYCLES AC
S1 INPUT SELECTOR SWITCH POSITIONS
SHOWN IN ⟶ MAG 1
MAG 2
TUNER
AUX 1
AUX 2
S2 MODE SWITCH POSITIONS
SHOWN IN ⟶ MONO PHONO
REVERSE
STEREO
A
B
S8 CENTER SPEAKER LEVEL SWITCH POSITIONS
SHOWN IN ⟶ OFF
LOW
MEDIUM
HIGH
MAX
S9 METER SWITCH POSITIONS
SHOWN IN ⟶ OFF
BIAS A
BAL A
BIAS B
BAL B
PIONEER SCHEMATIC CHASSIS TX-7300 AM-FM STEREO

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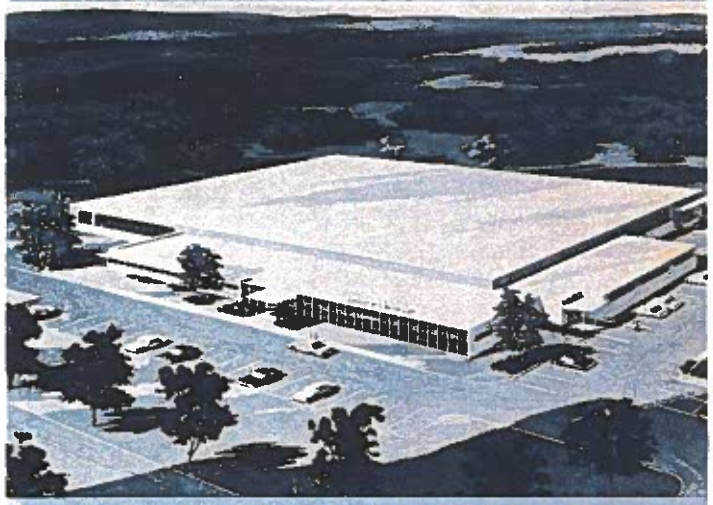
VIEW OF THE NEW

FISHER PLANT No. 2

FISHER PARK · MILROY, PENNSYLVANIA



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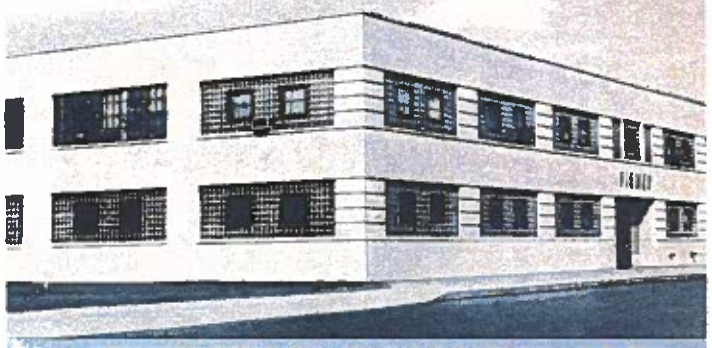
These new facilities are in addition to those at Fisher Plant No. 1 in Long Island City, N. Y., headquarters for Electronic Production, Administrative Offices, Engineering, Sales & Service.



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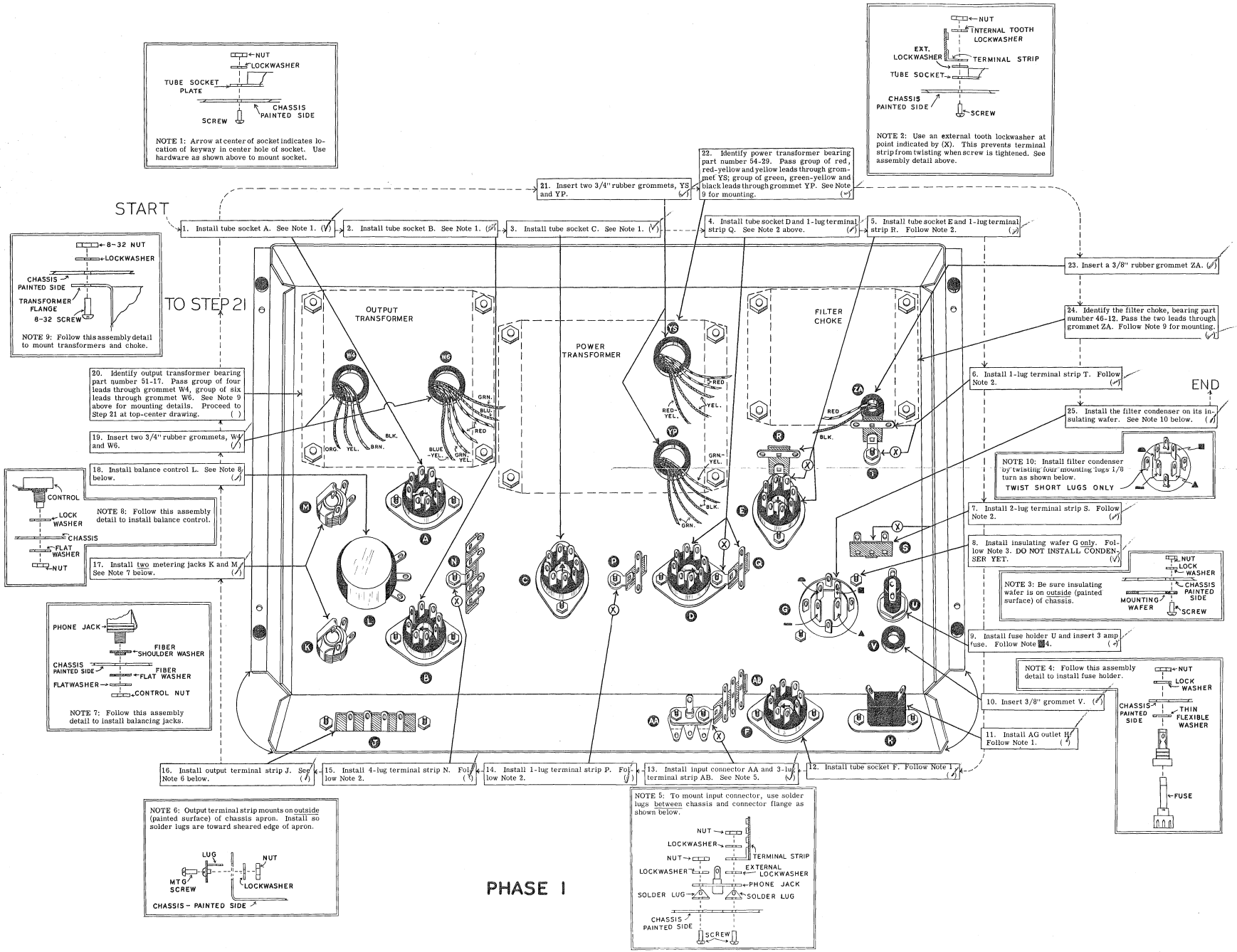

START
1. Install tube socket A. See Note 1.
2. Install tube socket B. See Note 1.
3. Install tube socket C. See Note 1.
4. Install tube socket D and 1-lug terminal strip Q. See Note 2 above.
5. Install tube socket E and 1-lug terminal strip R. Follow Note 2.
6. Install 1-lug terminal strip T. Follow Note 2.
7. Install 2-lug terminal strip S. Follow Note 2.
8. Install insulating wafer G only. Follow Note 3. DO NOT INSTALL CONDENSER YET.
9. Install fuse holder U and insert 3 amp fuse. Follow Note 4.
10. Insert 3/8" grommet V.
11. Install AG outlet H. Follow Note 1.
12. Install tube socket F. Follow Note 1.
13. Install input connector AA and 3-lug terminal strip AB. See Note 5.
14. Install 1-lug terminal strip P. Follow Note 2.
15. Install 4-lug terminal strip N. Follow Note 2.
16. Install output terminal strip J. See Note 6 below.
17. Install two metering jacks K and M. See Note 7 below.
18. Install balance control L. See Note 8 below.
19. Insert two 3/4" rubber grommets, W4 and W6.
20. Identify output transformer bearing part number 51-17. Pass group of four leads through grommet W4, group of six leads through grommet W6. See Note 9 above for mounting details. Proceed to Step 21 at top-center drawing.
21. Insert two 3/4" rubber grommets, YS and YP.
22. Identify power transformer bearing part number 54-29. Pass group of red, red-yellow and yellow leads through grommet YS; group of green, green-yellow and black leads through grommet YP. See Note 9 for mounting.
23. Insert a 3/8" rubber grommet ZA.
24. Identify the filter choke, bearing part number 46-12. Pass the two leads through grommet ZA. Follow Note 9 for mounting.
25. Install the filter condenser on its insulating wafer. See Note 10 below.
END
TO STEP 21
OUTPUT TRANSFORMER
POWER TRANSFORMER
FILTER CHOKE
NOTE 1: Arrow at center of socket indicates location of keyway in center hole of socket. Use hardware as shown above to mount socket.
NOTE 2: Use an external tooth lockwasher at point indicated by (X). This prevents terminal strip from twisting when screw is tightened. See assembly detail above.
NOTE 3: Be sure insulating wafer is on outside (painted surface) of chassis.
NOTE 4: Follow this assembly detail to install fuse holder.
NOTE 5: To mount input connector, use solder lugs between chassis and connector flange as shown below.
NOTE 6: Output terminal strip mounts on outside (painted surface) of chassis apron. Install so solder lugs are toward sheared edge of apron.
NOTE 7: Follow this assembly detail to install balancing jacks.
NOTE 8: Follow this assembly detail to install balance control.
NOTE 9: Follow this assembly detail to mount transformers and choke.
NOTE 10: Install filter condenser by twisting four mounting lugs 1/8 turn as shown below.
TWIST SHORT LUGS ONLY
NUT
LOCKWASHER
TUBE SOCKET PLATE
SCREW
CHASSIS PAINTED SIDE
INTERNAL TOOTH LOCKWASHER
EXT. LOCKWASHER
TERMINAL STRIP
TUBE SOCKET
8-32 NUT
8-32 SCREW
TRANSFORMER FLANGE
CONTROL
LOCK WASHER
CHASSIS
FLAT WASHER
PHONE JACK
FIBER SHOULDER WASHER
FIBER FLAT WASHER
FLATWASHER
CONTROL NUT
LUG
MTG SCREW
MOUNTING WAFER
THIN FLEXIBLE WASHER
FUSE
SOLDER LUG
PHASE 1

START

1. Twist these four leads together, dress cable to terminal strip J. Cut yellow lead to length to reach J1. Strip and tin. Connect yellow lead to J1 (NS). In the same way, connect orange lead to J2 (S), brown to J3 (S), black to J4 (NS). ( )

2. Twist together blue-yellow and green-yellow leads, dress to socket A. As in Step 1, connect blue-yellow lead to A3 (S), green-yellow lead to A4 (S). ( )

3. Twist together blue and green leads, dress to socket B. Connect blue lead to B3 (S), green lead to B4 (S). ( )

4. Twist together two red leads; dress to terminal strip R. Connect both leads to R1 (S). ( )

5. Twist together two green leads; dress to socket A. Connect one green lead to A2 (NS), other to A7 (NS). ( )

6. Cut green-yellow lead to 4" length. Fold remaining end back and tape to lead. (See manual Page 13.) ( )

7. Twist together two black leads; dress to AC outlet H. Connect either lead to H1 (NS); other to H2 (NS). ( )

8. Connect red-yellow lead to G1 (NS). ( )

9. Twist together two yellow leads; dress to socket E. Connect either lead to E2 (S); other to E8 (NS). ( )

10. Twist together two red leads; dress to socket E. Connect either lead to E4 (S); other to E6 (S). ( )

11. Connect black lead to R2 (NS). ( )

12. Connect red lead to E8 (NS). ( )

13. Connect positive lead of 20 μfd 350 volt condenser to X1 (NS). Connect other lead to T1 (NS).

14. Connect 100 KΩ 1 watt resistor (medium body, brown-black-yellow) from X1 (NS) to T1 (S). ( )

15. Connect positive lead of 20 μfd 350 volt condenser to T2 (NS). Connect other lead to X2 (NS). ( )

16. Connect 100 KΩ 1 watt resistor (medium body, brown-black-yellow) from X2 (NS) to T2 (S). ( )

17. Connect a wire from R2 (S) to G ■ (NS). ( )

18. Use bare wire and sleeving to connect E8 (S) to X1 (S). ( )

19. Use bare wire and sleeving to connect X2 (S) to G2 (S). ( )

20. Connect 1.5 KΩ 1 watt resistor (medium body, brown-green-red) from G ▲ (S) to G ▲ (NS). ( )

21. Connect a lead from G ▲ (NS) to N3 (NS). ( )

22. Connect a 22 KΩ 1 watt resistor (medium body, red-red-orange) from G ▲ (NS) to F5 (S). ( )

23. Insert stripped end of line cord through grommet V. Tie knot in cord 3" from end. Connect either lead of line cord to U2 (S). Connect other lead to F6 (S). ( )

24. Connect a wire from U1 (S) to H2 (NS). ( )

25. Connect a wire from H2 (S) to F8 (S). ( )

26. Connect a wire from H1 (S) to F7 (S). ( )

27. Connect a 22 KΩ 2 watt resistor (large body, red-red-orange) from G ▲ (S) to G ▬ (NS). ( )

28. Connect a wire from F4 (S) to G ▬ (NS). ( )

29. Connect a wire from AA4 (NS) to F3 (S). ( )

30. Connect a wire from AA4 (S) to G1 (S). ( )

31. Cut two lengths of wire about 5" long. Strip all four ends. Twist the leads together to form a twisted pair. At one end of this pair, connect either lead to F1 (S); connect adjacent lead to F2 (S). At other end, connect either lead to D7 (NS); connect adjacent lead to D8 (NS). ( )

32. In same way, using 5" leads, form a twisted pair. At one end, connect the pair to D7 (S) and D8 (S). At other end, connect to C7 (NS) and C8 (NS). ( )

33. In same way, using 5" leads, form a twisted pair. At one end, connect the pair to C7 (S) and C8 (S). At other end, connect to A2 (NS) and A7 (NS). ( )

34. Connect a wire from AA3 (NS) to J4 (NS). ( )

35. Connect a wire from AB2 (NS) to J1 (NS). ( )

36. Connect a 47 Ω 1 watt resistor (medium body, yellow-violet-black) from J4 (S) to B6 (NS). ( )

37. Connect a 0.1 μfd 200 volt condenser from J1 (S) to B6 (S). ( )

38. Connect a wire from K3 (S) to B8 (S). ( )

39. Cut a lead 3 1/2" long. Strip both ends to expose 1/2" of bare wire. Slip one end through K1 (NS) to K2 (S). Slip other end through M2 (NS) to M1 (S). ( )

40. Connect the positive lead of a 20 μfd 150 volt condenser to K1 (S). Connect the other lead (use sleeving) to L2 (NS). ( )

41. Connect a 360 Ω 7 watt resistor (rectangular ceramic body) from M2 (S) to N2 (NS). ( )

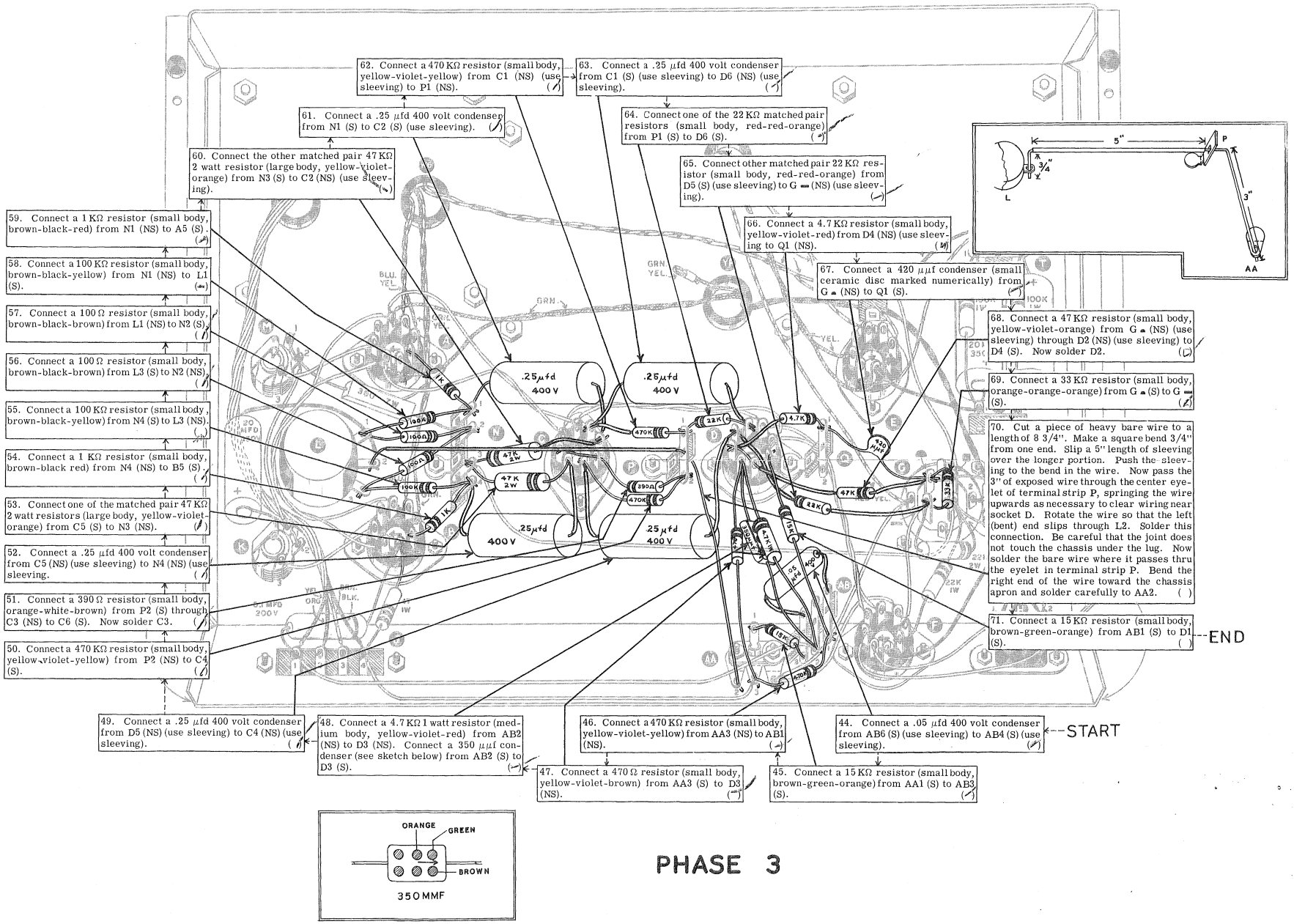
42. Connect a lead from M3 (S) to A8 (S). ( )

43. As in Step 31, using 6" leads, form a twisted pair. At one end, connect the pair to A2 (S) and A7 (S). At other end, connect the pair to B2 (S) and B7 (S). ( )

END

OCTAL SOCKET NUMBERING

PHASE 2


62. Connect a 470 KΩ resistor (small body, yellow-violet-yellow) from C1 (NS) (use sleeving) to P1 (NS).
63. Connect a .25 μfd 400 volt condenser from C1 (S) (use sleeving) to D6 (NS) (use sleeving).
61. Connect a .25 μfd 400 volt condenser from N1 (S) to C2 (S) (use sleeving).
64. Connect one of the 22 KΩ matched pair resistors (small body, red-red-orange) from P1 (S) to D6 (S).
60. Connect the other matched pair 47 KΩ 2 watt resistor (large body, yellow-violet-orange) from N3 (S) to C2 (NS) (use sleeving).
65. Connect other matched pair 22 KΩ resistor (small body, red-red-orange) from D5 (S) (use sleeving) to G (NS) (use sleeving).
66. Connect a 4.7 KΩ resistor (small body, yellow-violet-red) from D4 (NS) (use sleeving to Q1 (NS).
67. Connect a 420 μμf condenser (small ceramic disc marked numerically) from G (NS) to Q1 (S).
59. Connect a 1 KΩ resistor (small body, brown-black-red) from N1 (NS) to A5 (S).
58. Connect a 100 KΩ resistor (small body, brown-black-yellow) from N1 (NS) to L1 (S).
57. Connect a 100 Ω resistor (small body, brown-black-brown) from L1 (NS) to N2 (S).
56. Connect a 100 Ω resistor (small body, brown-black-brown) from L3 (S) to N2 (NS).
55. Connect a 100 KΩ resistor (small body, brown-black-yellow) from N4 (S) to L3 (NS).
54. Connect a 1 KΩ resistor (small body, brown-black red) from N4 (NS) to B5 (S).
53. Connect one of the matched pair 47 KΩ 2 watt resistors (large body, yellow-violet-orange) from C5 (S) to N3 (NS).
52. Connect a .25 μfd 400 volt condenser from C5 (NS) (use sleeving) to N4 (NS) (use sleeving.
51. Connect a 390 Ω resistor (small body, orange-white-brown) from P2 (S) through C3 (NS) to C6 (S). Now solder C3.
50. Connect a 470 KΩ resistor (small body, yellow-violet-yellow) from P2 (NS) to C4 (S).
68. Connect a 47 KΩ resistor (small body, yellow-violet-orange) from G (NS) (use sleeving) through D2 (NS) (use sleeving) to D4 (S). Now solder D2.
69. Connect a 33 KΩ resistor (small body, orange-orange-orange) from G (S) to G (S).
70. Cut a piece of heavy bare wire to a length of 8 3/4". Make a square bend 3/4" from one end. Slip a 5" length of sleeving over the longer portion. Push the sleeving to the bend in the wire. Now pass the 3" of exposed wire through the center eyelet of terminal strip P, springing the wire upwards as necessary to clear wiring near socket D. Rotate the wire so that the left (bent) end slips through L2. Solder this connection. Be careful that the joint does not touch the chassis under the lug. Now solder the bare wire where it passes thru the eyelet in terminal strip P. Bend the right end of the wire toward the chassis apron and solder carefully to AA2.
71. Connect a 15 KΩ resistor (small body, brown-green-orange) from AB1 (S) to D1 (S).
END
49. Connect a .25 μfd 400 volt condenser from D5 (NS) (use sleeving) to C4 (NS) (use sleeving).
48. Connect a 4.7 KΩ 1 watt resistor (medium body, yellow-violet-red) from AB2 (NS) to D3 (NS). Connect a 350 μμf condenser (see sketch below) from AB2 (S) to D3 (S).
46. Connect a 470 KΩ resistor (small body, yellow-violet-yellow) from AA3 (NS) to AB1 (NS).
44. Connect a .05 μfd 400 volt condenser from AB6 (S) (use sleeving) to AB4 (S) (use sleeving).
START
47. Connect a 470 Ω resistor (small body, yellow-violet-brown) from AA3 (S) to D3 (NS).
45. Connect a 15 KΩ resistor (small body, brown-green-orange) from AA1 (S) to AB3 (S).
5"
3/4"
3"
P
L
AA
ORANGE
GREEN
BROWN
350 MMF
PHASE 3

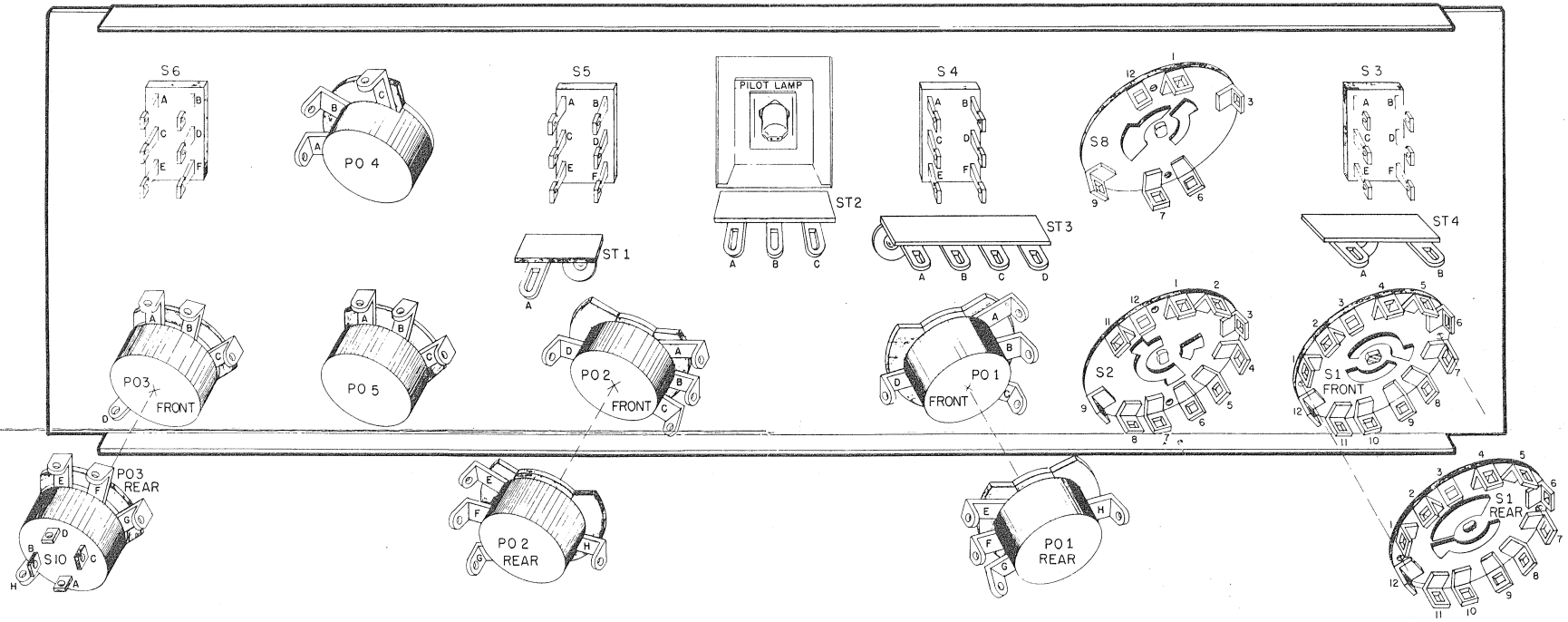
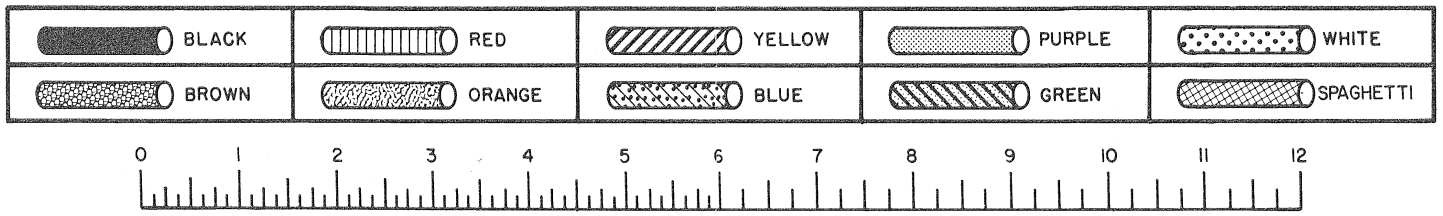

S6
PO 4
S5
PILOT LAMP
ST2
S4
S8
S3
ST 1
ST3
ST4
PO3
FRONT
PO 5
PO2
FRONT
PO 1
FRONT
S2
S1
FRONT
PO3
REAR
S10
PO 2
REAR
PO 1
REAR
S1
REAR

Figure 8


BLACK
RED
YELLOW
PURPLE
WHITE
BROWN
ORANGE
BLUE
GREEN
SPAGHETTI
0 1 2 3 4 5 6 7 8 9 10 11 12

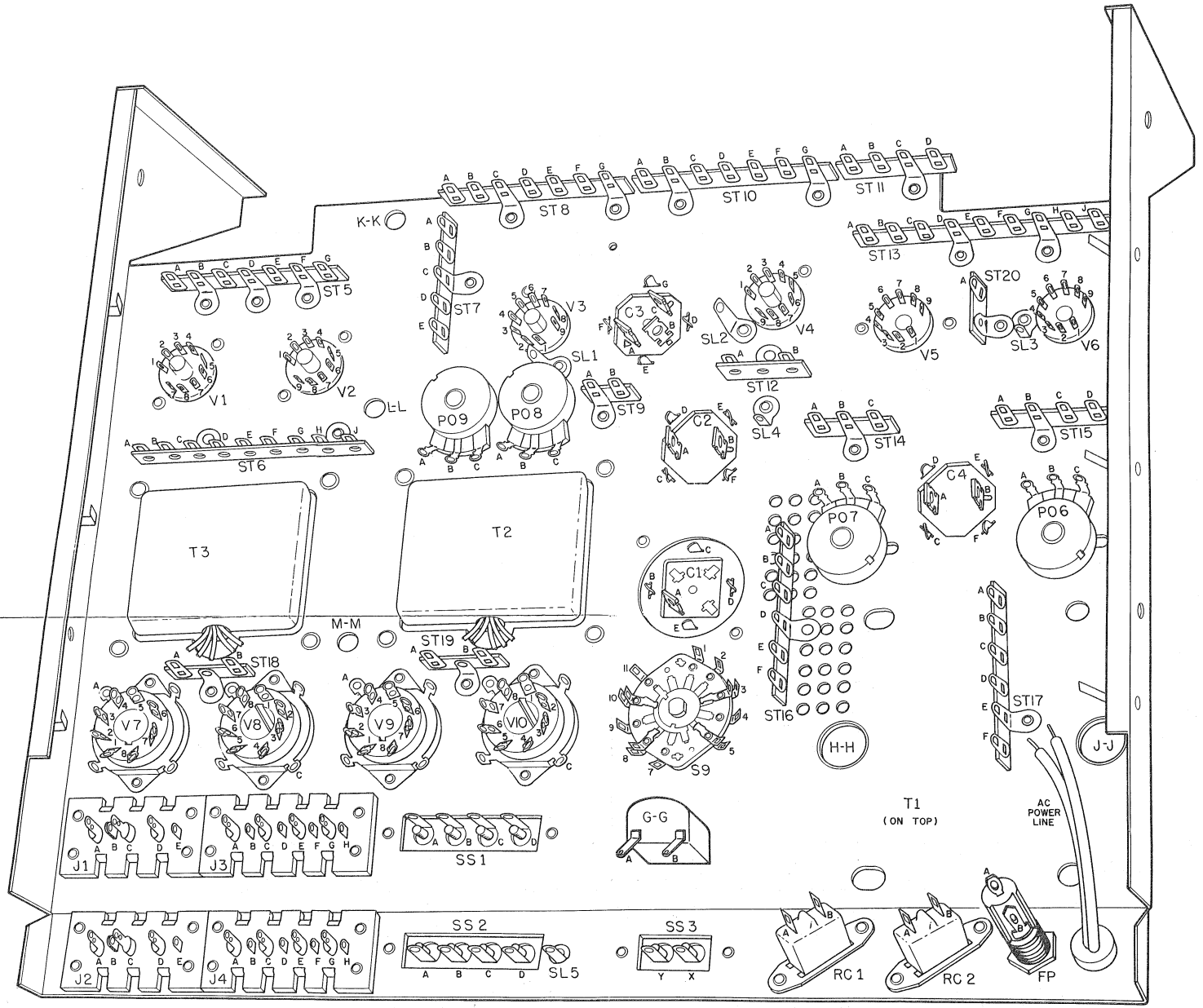
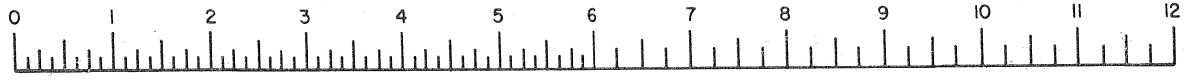


Figure 9

BLACK	RED	YELLOW	PURPLE	WHITE
BROWN	ORANGE	BLUE	GREEN	SPAGHETTI



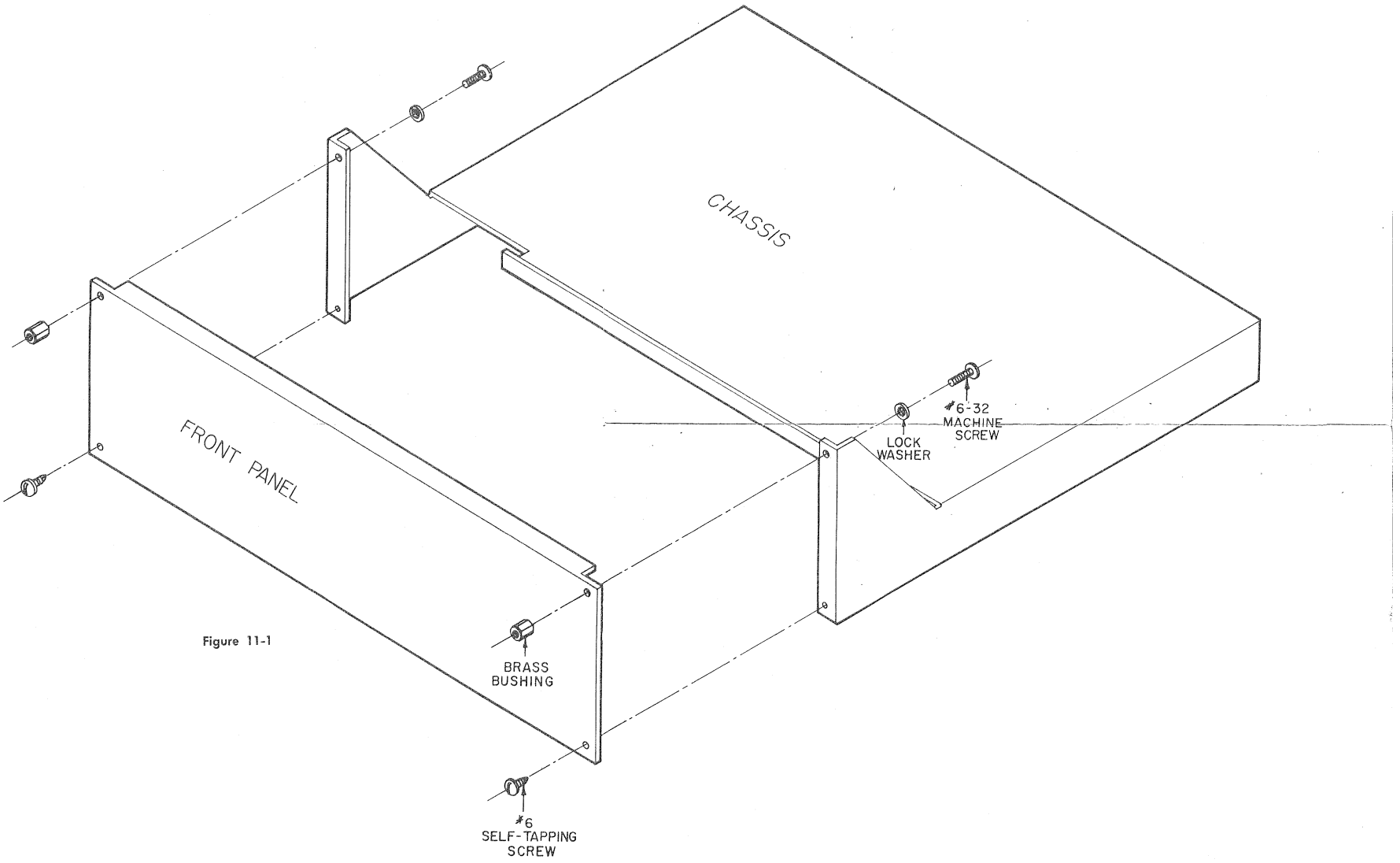

CHASSIS
FRONT PANEL
6-32
MACHINE
SCREW
LOCK
WASHER
BRASS
BUSHING
6
SELF-TAPPING
SCREW

Figure 11-1

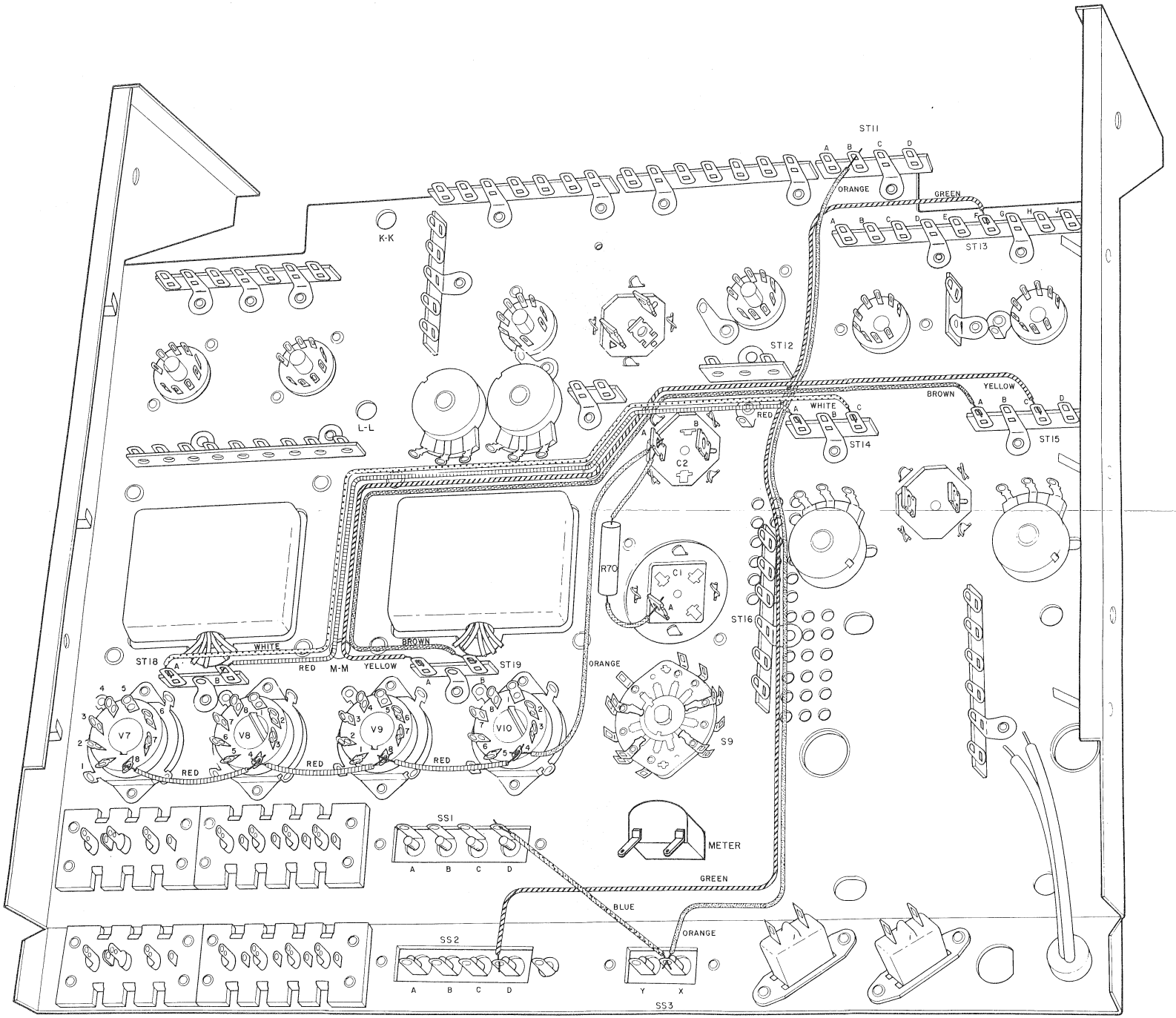

ST11
ORANGE
GREEN
ST13
K-K
ST12
L-L
BROWN
YELLOW
WHITE
RED
ST14
ST15
C2
R70
C1
ST16
ST18
WHITE
RED
M-M
YELLOW
BROWN
ST19
ORANGE
V7
V8
V9
V10
S9
SS1
METER
GREEN
BLUE
SS2
ORANGE
SS3

Figure 19-1

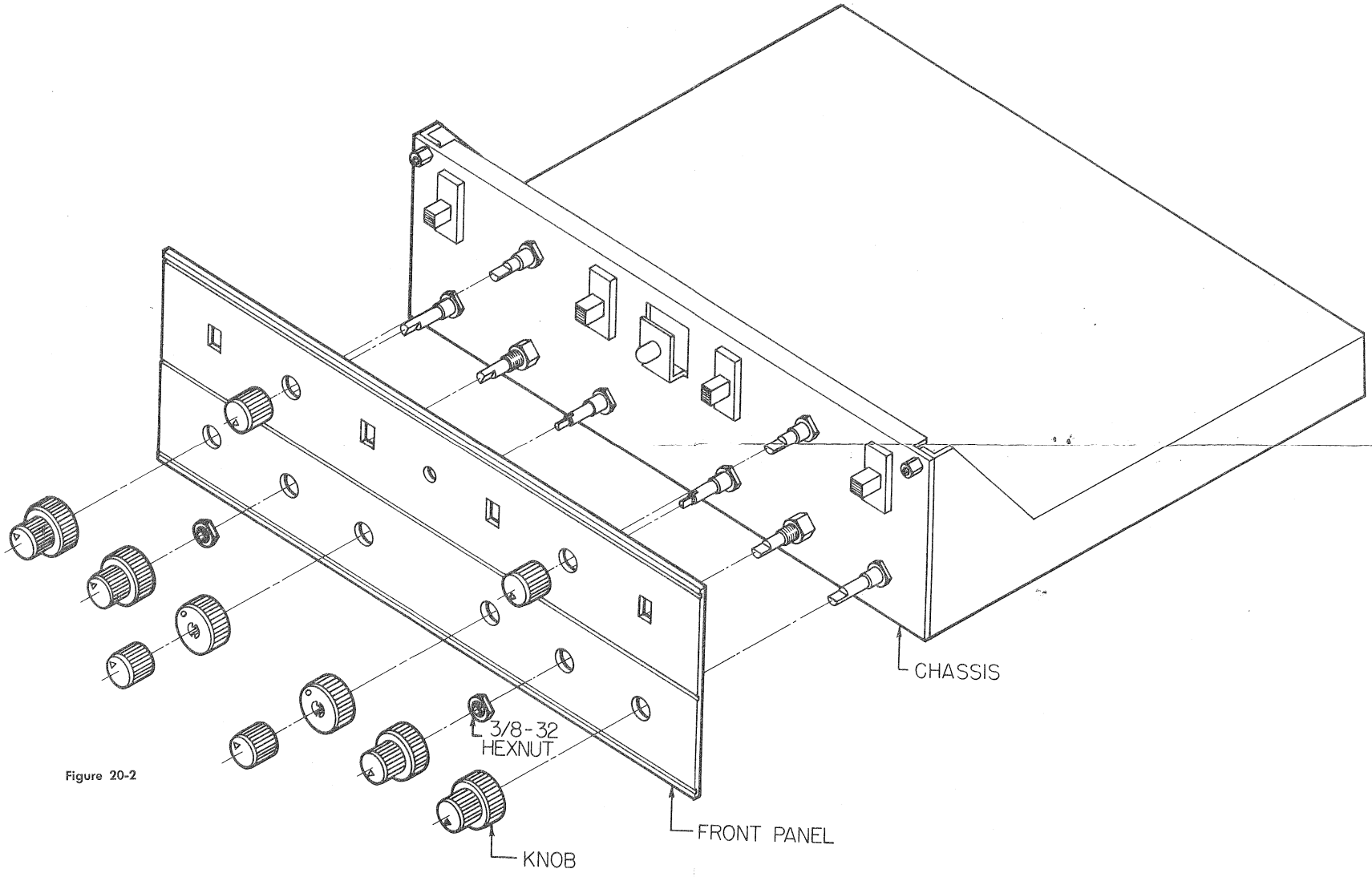


Figure 20-2

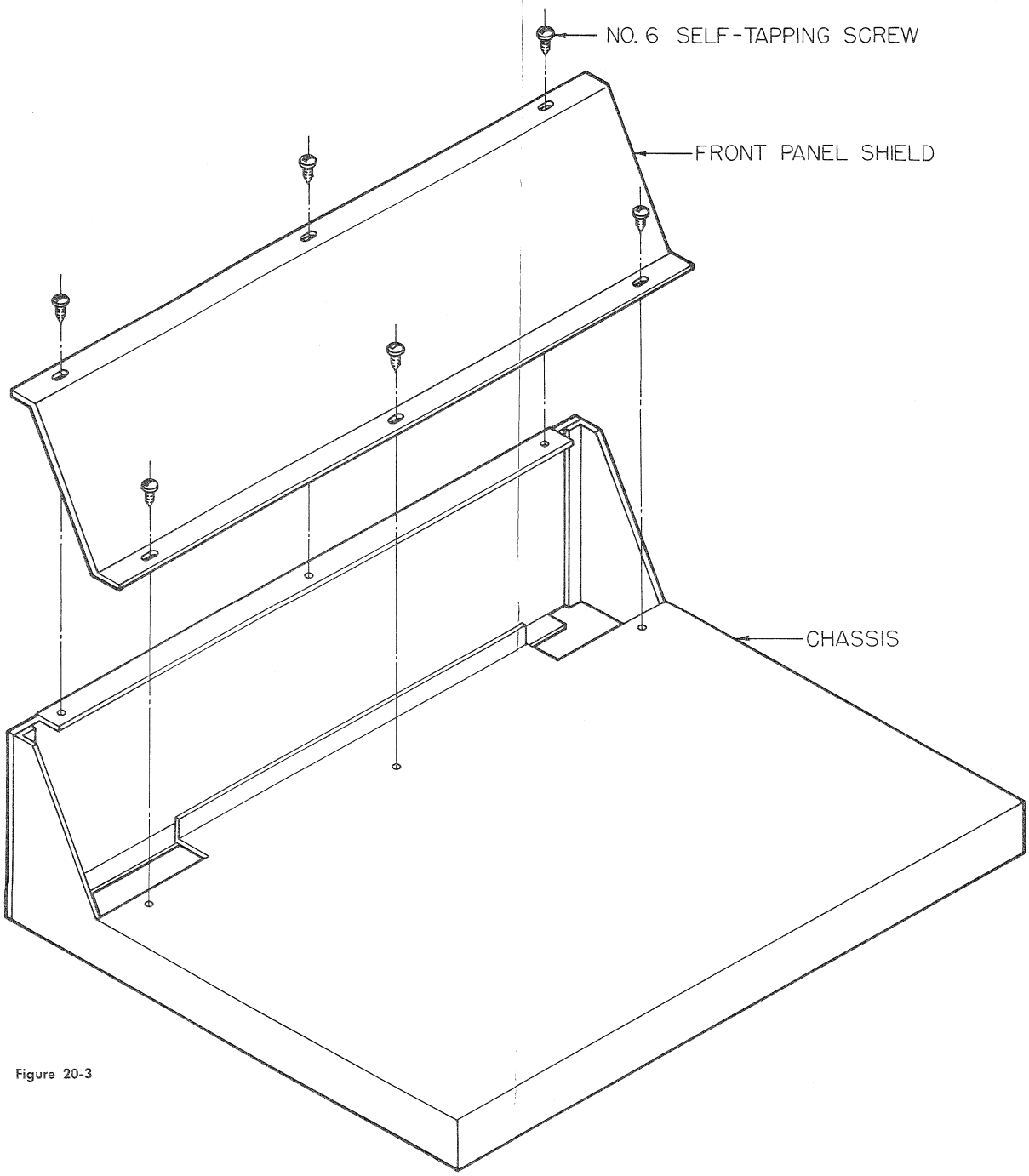


Figure 20-3

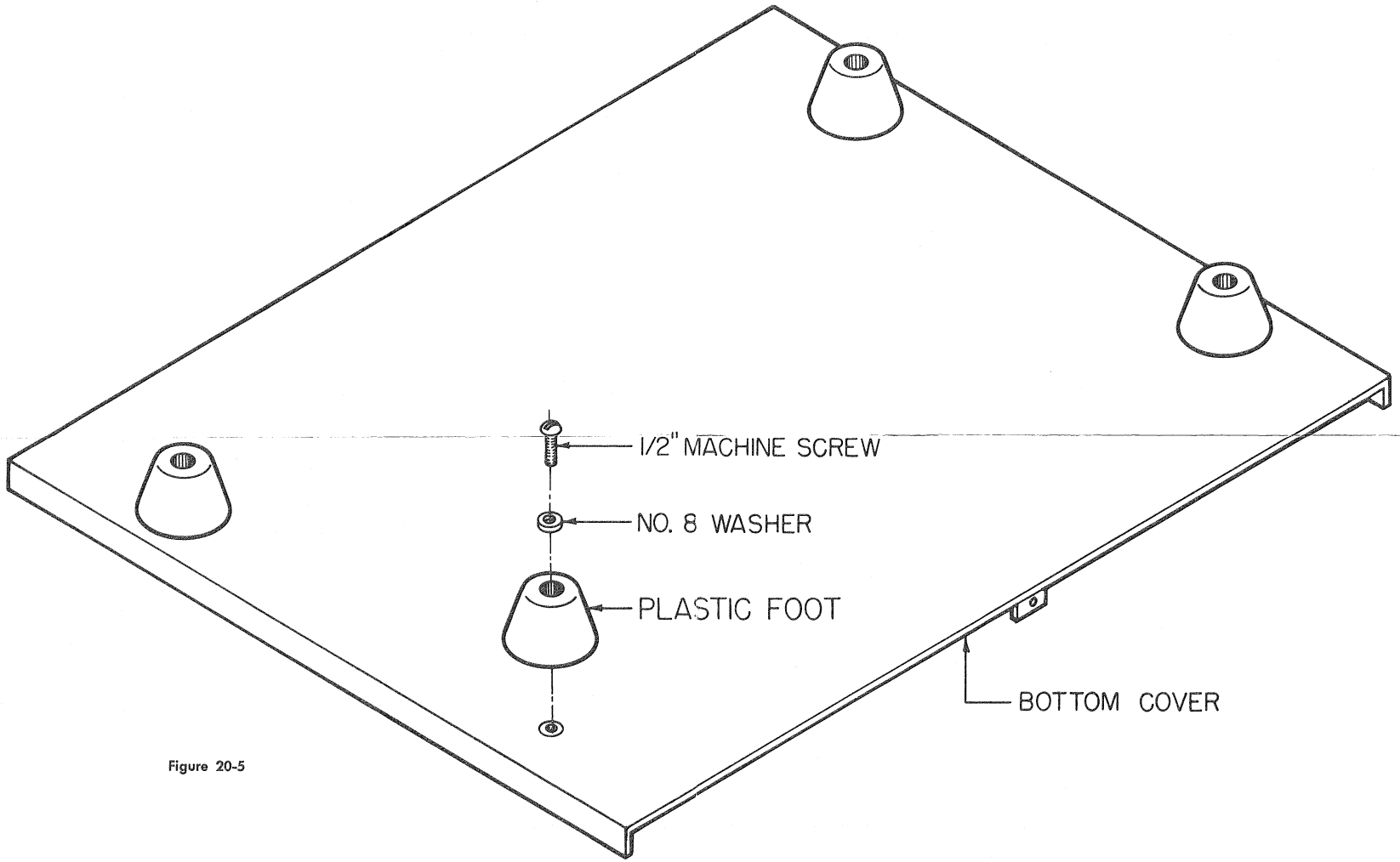


Figure 20-5

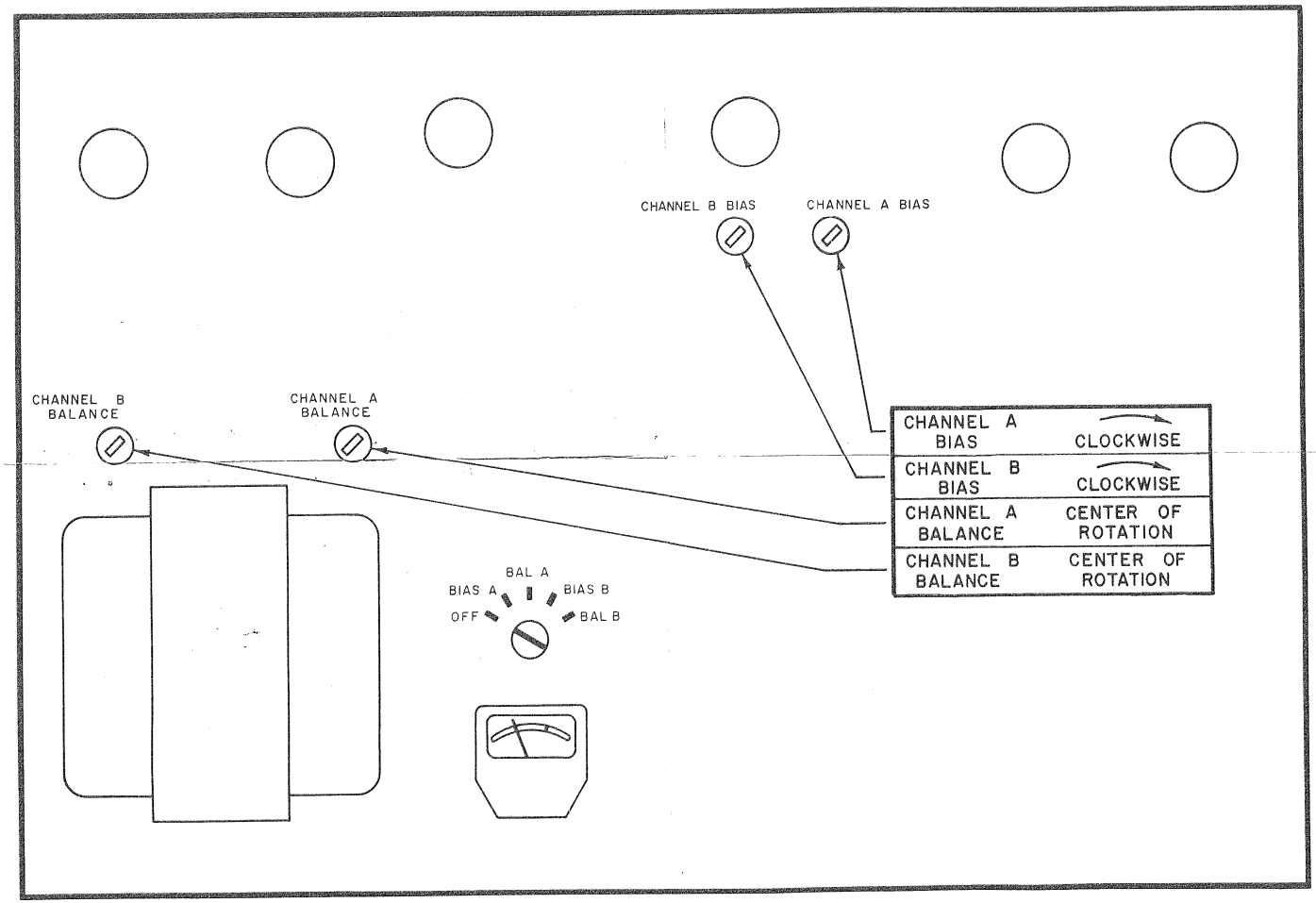

CHANNEL B BIAS
CHANNEL A BIAS
CHANNEL B BALANCE
CHANNEL A BALANCE
CHANNEL A BIAS
CLOCKWISE
CHANNEL B BIAS
CLOCKWISE
CHANNEL A BALANCE
CENTER OF ROTATION
CHANNEL B BALANCE
CENTER OF ROTATION
BAL A
BIAS A
BIAS B
OFF
BAL B

Figure 20-4