

STEP-BY-STEP ASSEMBLY

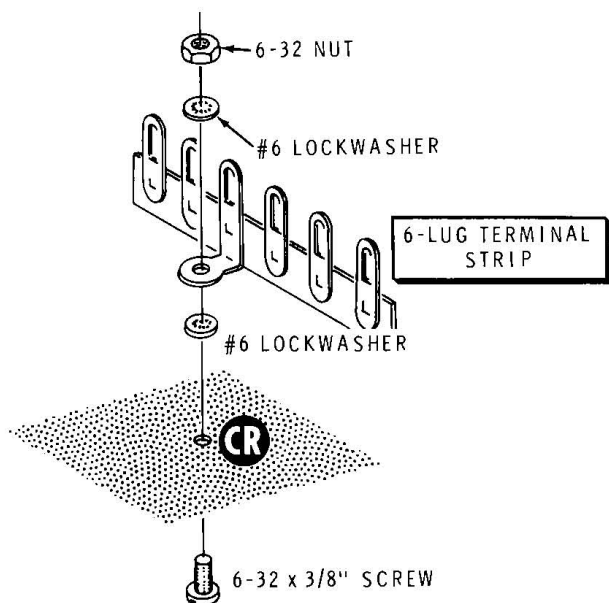
The illustrations in this section of the Manual are called Pictorials and Details. Pictorials show the overall operation for a group of assembly steps; Details are used in addition to the Pictorials to illustrate a single step. When you are directed to refer to a certain Pictorial "for the following steps," continue using that Pictorial until you are referred to another Pictorial for another group of steps.

As the drawings in the Manual may be slightly distorted to show all the parts clearly, look at the "Chassis Photos" (Page 109) from time to time to see the actual positions of wires and components.

Lockwashers and nuts will be used with most screws when you are mounting parts, unless the assembly steps state otherwise. Consequently, the applicable steps will call out only the size and type of hardware used. For example, the phrase "Use 6-32 x 1/4" hardware" means to use 6-32 x 1/4" screws, one or more #6 lockwashers, and 6-32 nuts. Refer to the Details for the proper installation of hardware. Be sure to position each part as shown in the Pictorials. Follow the instructions carefully, and read the entire step before performing the operation.

When a step directs you to "connect" an insulated wire, first prepare its ends by removing 1/4" of insulation.

RF CHASSIS

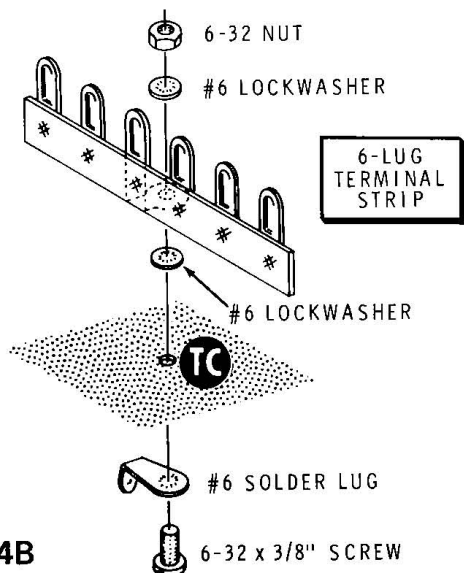


Detail 4A

Refer to Pictorial 4 on Page 31 for the following steps.

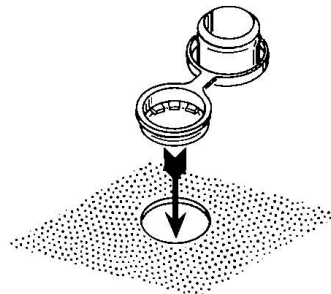
NOTE: Use the nut starter provided with this kit to hold and start 6-32 and 4-40 nuts on screws.

- () Refer to Detail 4A and mount a 6-lug terminal strip in hole CR on the bottom of the RF chassis. Use 6-32 x 3/8" hardware. Position the terminal strip as shown and then tighten the screw from the top side of the chassis. This is terminal strip TA.

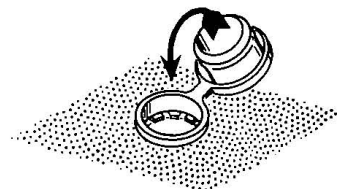


Detail 4B

- () Refer to Detail 4B and mount a 6-lug terminal strip in hole TC. Use 6-32 x 3/8" hardware and a #6 solder lug (under the screw head).
- () Mount a 4-lug terminal strip in hole TD. Use 6-32 x 3/8" hardware. DO NOT use a solder lug with this terminal strip.
- () Refer to Detail 4C and mount a small plastic grommet in hole CL. Be sure the grommet is seated flush against the chassis.

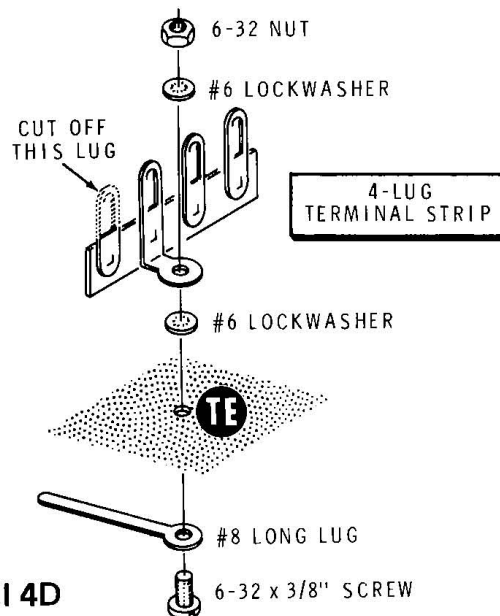


POSITION THE SMALL PORTION OF THE GROMMET INTO THE CHASSIS HOLE.



BEND THE LARGE PORTION OF THE GROMMET OVER AND INTO THE SMALL PORTION. PRESS IT FIRMLY INTO PLACE.

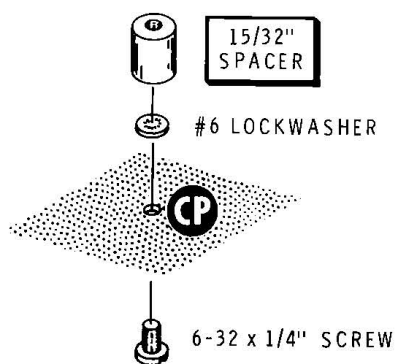
Detail 4C



Detail 4D

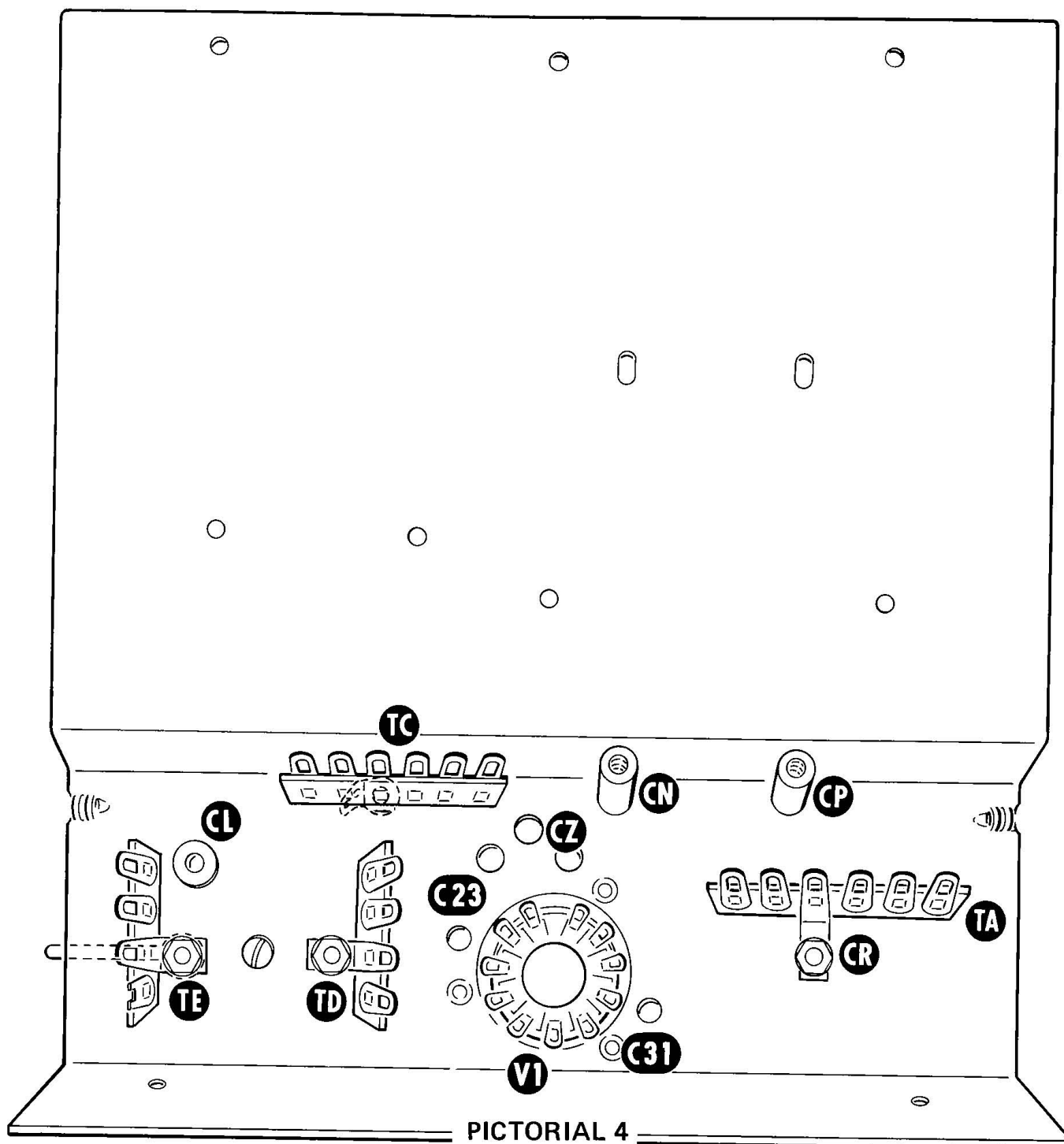
Refer to Detail 4D for the following two steps.

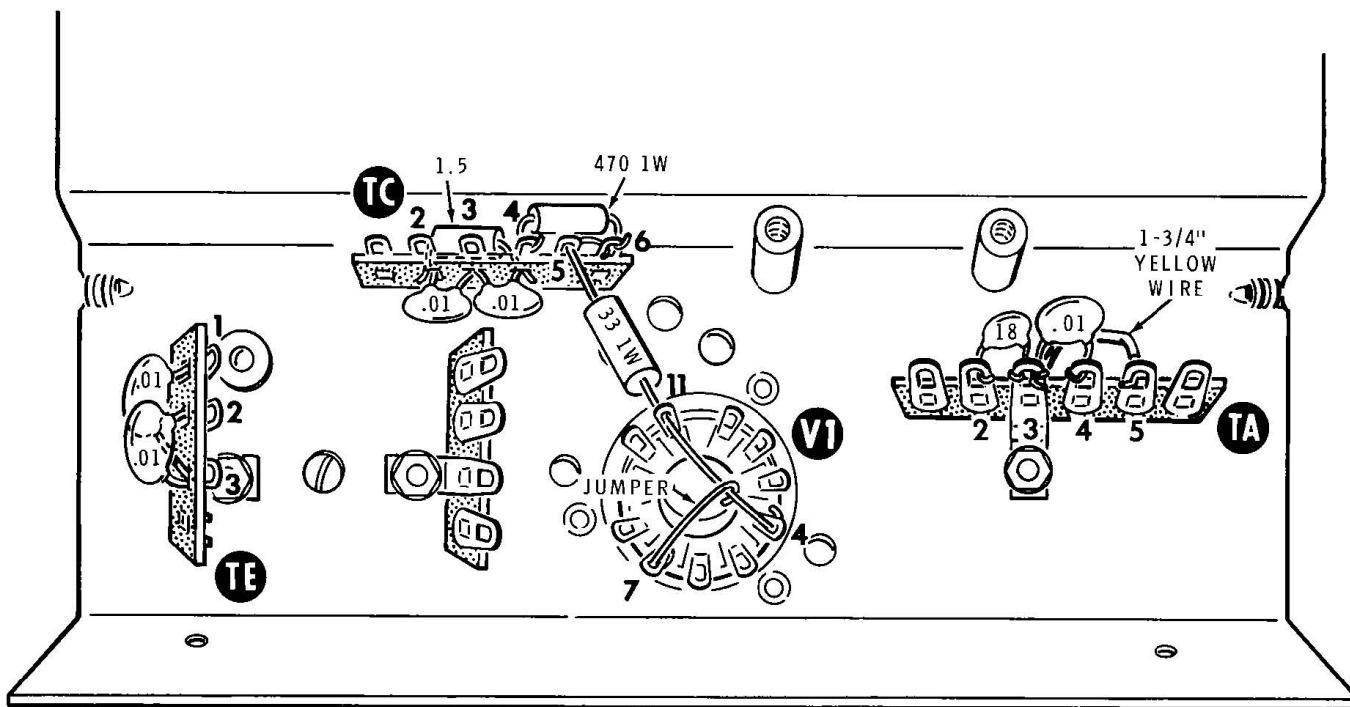
- () Cut off the lug shown. Be sure you select the correct lug.
- () Mount the 4-lug terminal strip in hole TE. Use 6-32 x 3/8" hardware with a #8 long lug (under the screw head).



Detail 4E

- () Refer to Detail 4E and mount a 15/32" long spacer at hole CP. Use a 6-32 x 1/4" screw.
- () Similarly, mount a 15/32" long spacer at hole CN with a 6-32 x 1/4" screw.



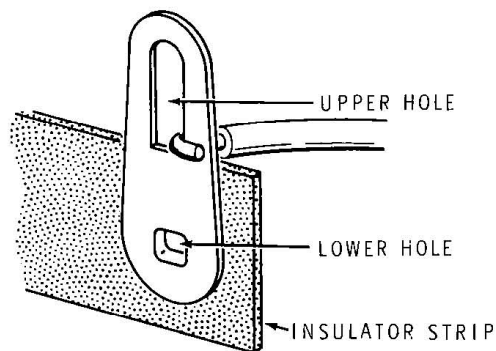


PICTORIAL 5

Refer to Pictorial 5 for the following steps.

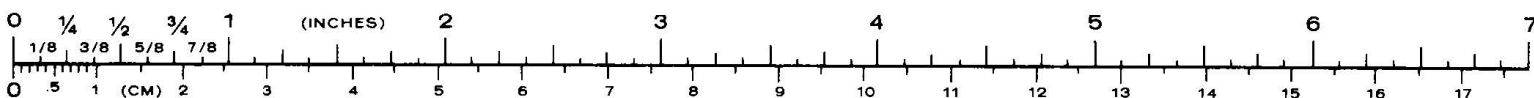
NOTE:

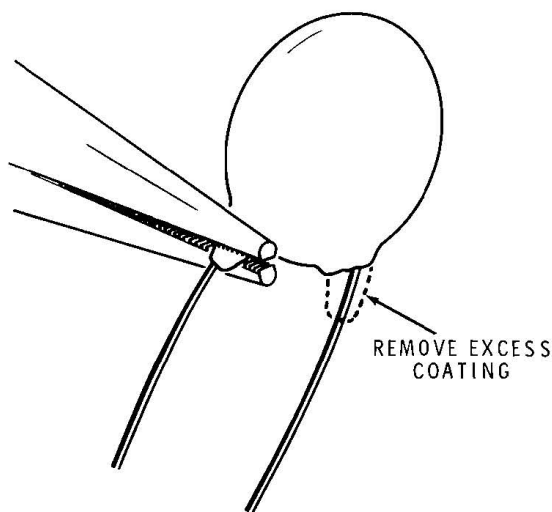
1. You will be instructed to insert component leads and wires into the "lower" holes of terminal strip lugs in some of the following steps. Detail 5A shows the "lower" and the "upper" holes of the terminal strip solder lugs. Always use the upper holes unless you are specifically instructed to use the lower holes.
2. When you are instructed to "push a lead down against the insulator strip," position it as shown in Detail 5A.
3. Save four of the capacitor leads that you cut off in the following steps. They will be used to wire socket V1.



Detail 5A

4. For clarity, the following Pictorials will usually show the position of components after they have been mounted; other parts, not shown, may have been previously mounted.





Detail 5B

5. Before you install a disc capacitor, refer to Detail 5B and remove any excess coating from its leads by exerting a small amount of pressure with pliers and then twisting the lead. This excess coating could otherwise interfere with soldering when a capacitor is installed with very short leads.

6. To "prepare" an insulated wire, cut it to the specified length and then remove 1/4" of insulation from each end. If the wire is stranded, twist the fine strands at each end tightly together and then melt a minimum amount of solder on the bare wire.

7. To avoid confusion with lower voltage capacitors, temporarily lay aside the following high voltage disc capacitors. Use them only when these voltage ratings are specified in a step:

1 .001 μ F, 6000 volt (6 KV)
disc capacitor

2 .01 μ F, 1400 volt (#21-70)
disc capacitor

1 .02 μ F, 1600 volt (1.6 KV)
disc capacitor

() Prepare a 1-3/4" yellow wire.

() Connect the yellow wire to terminal strip TA between lug 3 (NS) and lug 5 (NS). Push the wire down against the insulator strip.

() C24: Connect an 18 pF disc capacitor to terminal strip TA from lug 2 (NS) to lug 3 (NS).

() C25: Connect a .01 μ F disc capacitor to terminal strip TA from lug 3 (NS) to lug 4 (NS).

NOTE: When a wire passes through a connection and then goes to another point, as in the next step, it will count as two wires in the solder instructions (S-2), one entering and one leaving the connection. Be especially careful, when soldering these connections, to apply enough solder and heat to solder these "through wires."

() R17: Connect one lead of a 33 Ω , 1-watt (orange-orange-black) resistor to socket V1. Push the lead through lug 11 (S-2) to lug 4 (NS). Connect the other lead of this resistor to terminal strip TC. Push the lead through lug 5 (S-2) to lug 6 (NS).

NOTE: Use the four cut-off capacitor leads for wiring socket V1 in the following steps.

() Form a small hook at one end of a cut-off capacitor lead. Place this hook over the midpoint of the wire in the preceding step (S-1). Connect the other end of this wire to lug 7 (S-1) of the socket.

() C17: Connect a .01 μ F disc capacitor to terminal strip TC between the lower hole of lug 2 (NS) and the lower hole of lug 3 (NS).

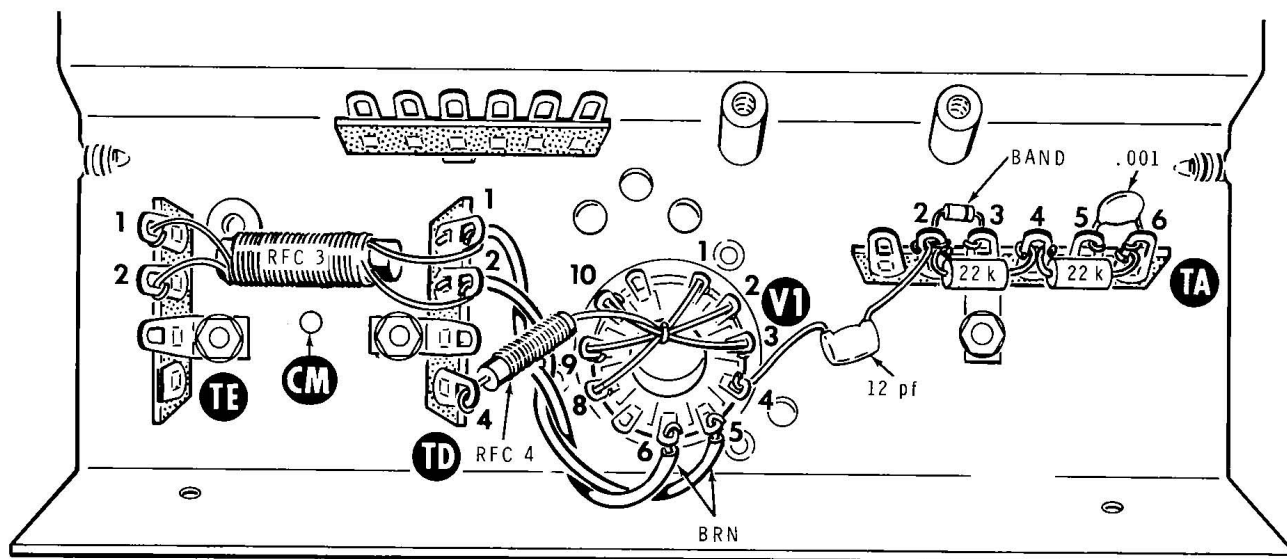
() C19: Connect a .01 μ F disc capacitor to terminal strip TC between the lower hole of lug 3 (S-2) and the lower hole of lug 4 (NS).

() R25: Connect a 1.5 Ω (brown-green-gold) resistor to terminal strip TC between the lower hole of lug 2 (S-2) and the lower hole of lug 4 (S-2).

() R16: Connect a 470 Ω , 1-watt (yellow-violet-brown) resistor to terminal strip TC between lugs 4 (NS) and 6 (NS).

() C29: Connect a .01 μ F disc capacitor to terminal strip TE between the lower hole of lug 1 (S-1) and the lower hole of lug 3 (NS).

() C28: Connect a .01 μ F disc capacitor to terminal strip TE between the lower hole of lug 2 (S-1) and the lower hole of lug 3 (S-2).



PICTORIAL 6

Refer to Pictorial 6 for the following steps.

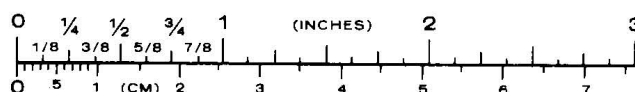
- () Connect a cut-off lead between socket lugs 1 (S-1) and 8 (S-1). Before soldering, curve this wire up at its midpoint so it clears the wires below it by at least 1/8".
- () Connect a cut-off lead between socket lugs 2 (NS) and 9 (S-1). Position this wire so it passes over, and touches, the wire in the preceding step.
- () Connect a cut-off lead between socket lugs 3 (S-1) and 10 (S-1). Position this wire so it passes over, and touches, the wire in the preceding step.
- () D19: Connect the lead at the unbanded end of a type 1N458 diode (#56-24) to terminal strip TA lug 2 (NS), and connect the lead at the banded end to lug 3 (S-4).
- () C26: Connect a .001 μ F disc capacitor to terminal strip TA from lug 5 (S-2) to lug 6 (NS).
- () R19: Connect a 22 k Ω (red-red-orange) resistor to terminal strip TA from lug 4 (NS) to lug 6 (NS).
- () R18: Connect a 22 k Ω (red-red-orange) resistor to terminal strip TA from lug 2 (NS) to lug 4 (S-3).
- () C22: Connect one lead of a 12 pF mica capacitor to terminal strip TA lug 2 (S-4). Connect the other lead to socket V1 lug 4 (S-2).

TWISTED PAIR



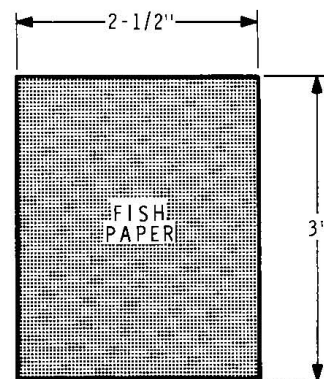
Detail 6A

- () Prepare two 3" lengths of large brown (stranded) wire. Then refer to Detail 6A and form the two wires into a twisted pair.
 - () At one end of the twisted pair, connect one wire to socket V1 lug 5 (S-1), and connect the other lead to lug 6 (S-1).
 - () Connect the other end of the twisted pair to terminal strip TD: one wire to the lower hole of lug 1 (S-1) and the other lead to the lower hole of lug 2 (S-1).
 - () RFC 4: Connect one lead of an 8.5 μ H RF choke (#45-6) to terminal strip TD lug 4 (NS). Wrap the other lead of the choke around the three wires which cross at the midpoint of socket V1. Solder all four wires together.
- NOTE: In the following step, position the RF choke so it clears the chassis by 1/4". Its position must also permit insertion (later) of a 6-32 screw in hole CM.
- () RFC 3: Connect the two leads at one end of a 13.5 μ H RF choke (#45-58) to terminal strip TE lug 1 (NS) and lug 2 (NS). Connect the two leads at the other end of the choke to terminal strip TD lug 1 (NS) and lug 2 (NS). Make sure the choke is positioned as described in the note.



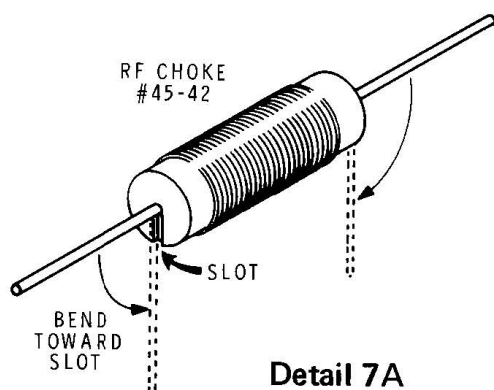
Refer to Pictorial 7 for the following steps.

- () C32: Connect a .02 μ F, 1.6 kV, disc capacitor from socket V1 lug 2 (S-2) to terminal strip TA lug 1 (NS). Position this capacitor as shown. It must clear the chassis by 1/4" to allow passage of a coaxial cable to be installed later. Push the lead on lug 1 down against the insulator strip.
- () C27: Connect a .02 μ F capacitor to terminal strip TD between lugs 1 (S-2) and 2 (S-2).
- () C33: Connect a .02 μ F disc capacitor to terminal strip TD between lugs 3 (S-1) and 4 (NS).



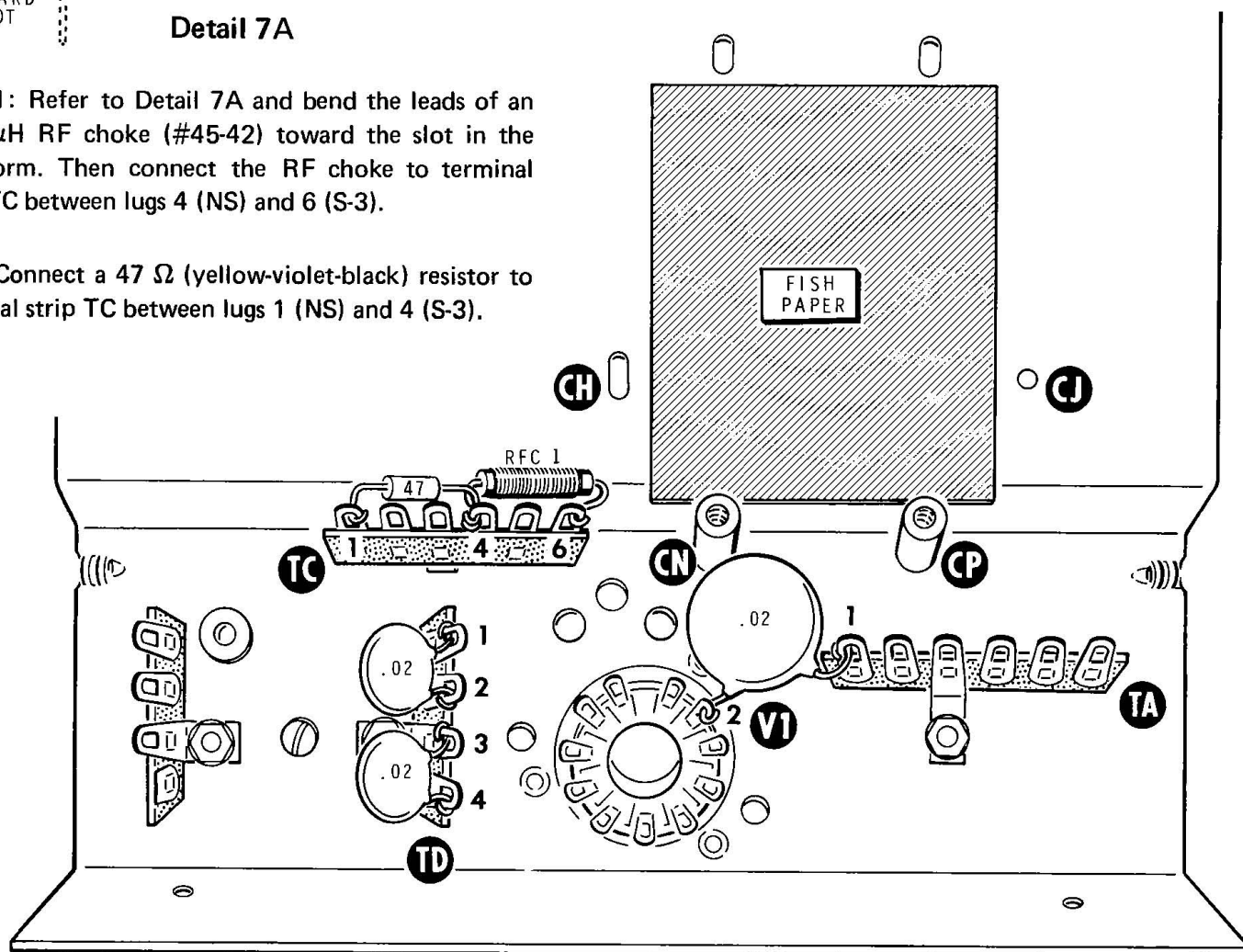
Detail 7B

- () Refer to Detail 7B and cut out a piece of fish paper 2-1/2" x 3".
- () Remove and discard the protective cover from the gray fish paper. Then, with the adhesive side toward the chassis, butt the 2-1/2" edge against the spacers at CN and CP and center the paper between holes CH and CJ. Then lower the paper and rub it firmly into place against the chassis.

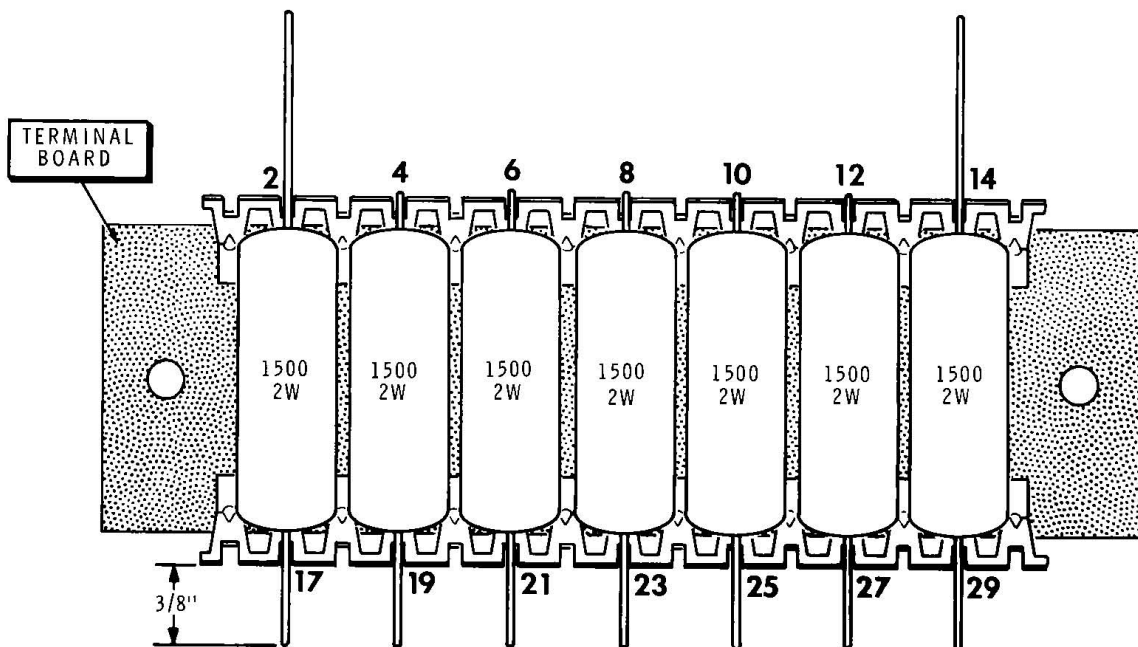


Detail 7A

- () RFC 1: Refer to Detail 7A and bend the leads of an 8.75 μ H RF choke (#45-42) toward the slot in the coil form. Then connect the RF choke to terminal strip TC between lugs 4 (NS) and 6 (S-3).
- () R33: Connect a 47 Ω (yellow-violet-black) resistor to terminal strip TC between lugs 1 (NS) and 4 (S-3).



PICTORIAL 7



PICTORIAL 8

Refer to Pictorial 8 for the following steps.

- () Place a 30-lug terminal board before you and observe how the slots are numbered.
- () Refer to Detail 8A for the following three steps. Place five 1500 Ω , 2-watt (brown-green-red) resistors with their leads in the following pairs of numbered slots.

4 and 19

10 and 25

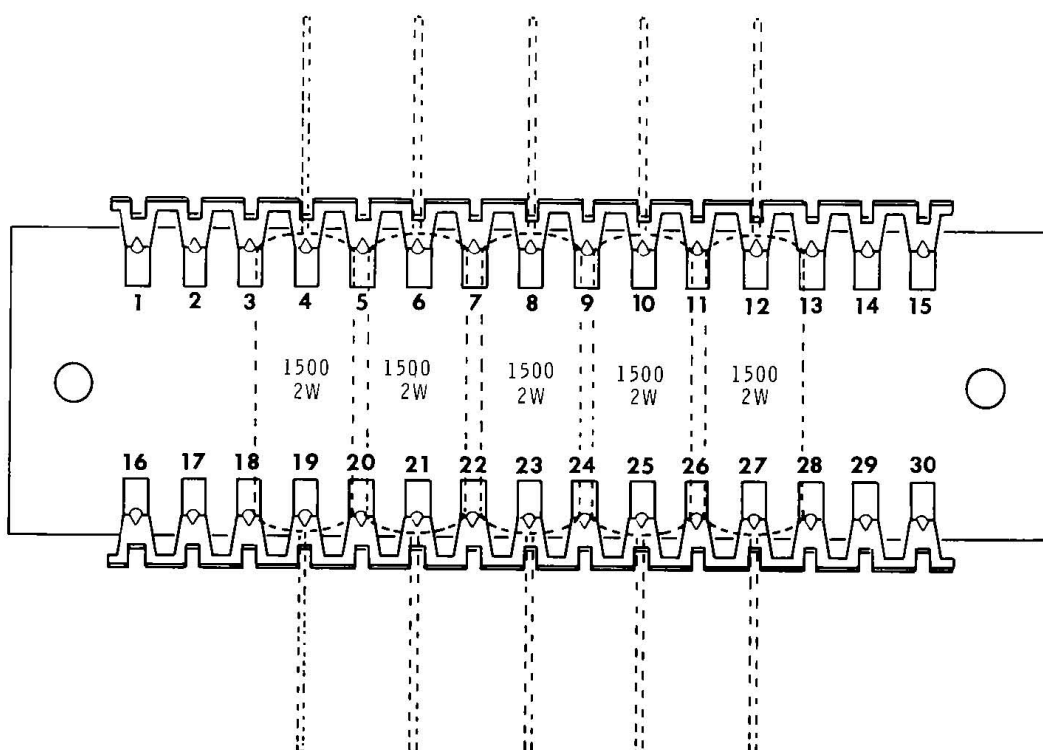
6 and 21

12 and 27

8 and 23

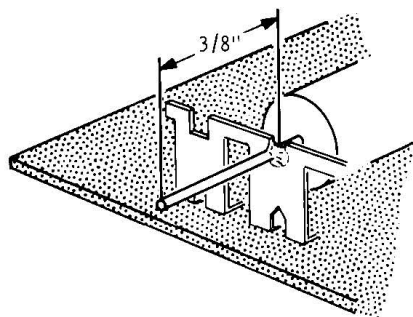
Solder the leads to the terminals, but do not cut off any excess leads yet.

- () **CAUTION:** Cut off the excess lead lengths ONLY at terminals 4, 6, 8, 10 and 12.



Detail 8A

- () Place two 1500 Ω , 2-watt (brown-green-red) resistors with their leads in the pairs of slots at 2 and 17 and at 14 and 29. Solder the leads. DO NOT cut off the leads yet.
- () Refer to Detail 8B and cut the resistor leads at terminals 17, 19, 21, 23, 25, 27 and 29 to 3/8" from the terminals.



Detail 8B

Refer to Pictorial 9 for the following steps.

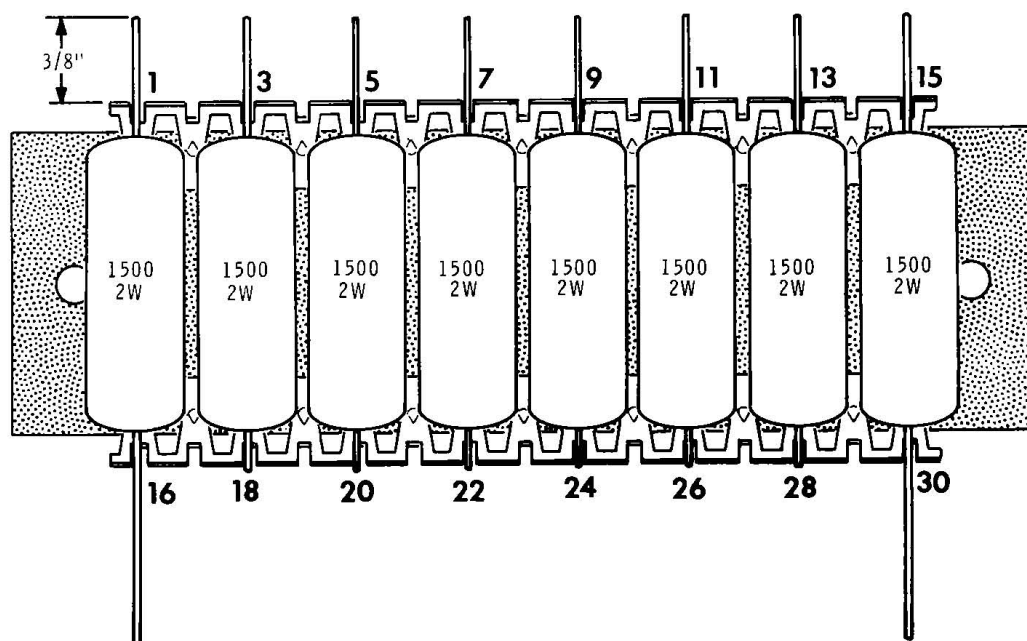
- () On the remaining 30-lug terminal board, place six of the 1500 Ω , 2-watt (brown-green-red) resistors in the following pairs of numbered slots. Solder the leads.

3 and 18	9 and 24
5 and 20	11 and 26
7 and 22	13 and 28

- () CAUTION: Cut off the excess lead lengths ONLY at terminals 18, 20, 22, 24, 26 and 28.

- () Place two of the 1500 Ω , 2-watt (brown-green-red) resistors with their leads in the pairs of numbered slots at 1 and 16 and at 15 and 30. Solder the leads. DO NOT cut off the leads.

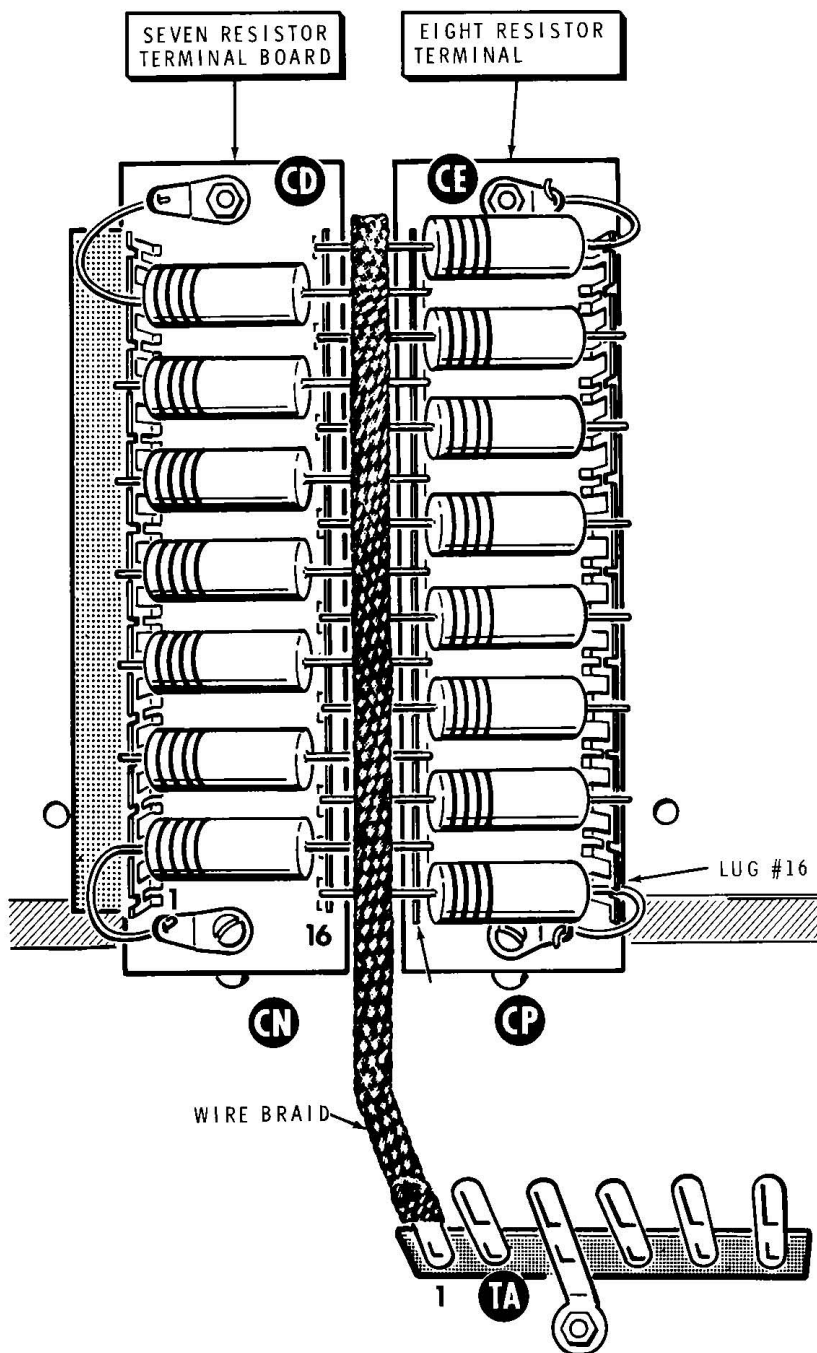
- () Cut the leads at terminals 1, 3, 5, 7, 9, 11, 13 and 15 to 3/8" from the terminals.



PICTORIAL 9



Refer to Pictorial 10 for the following steps.

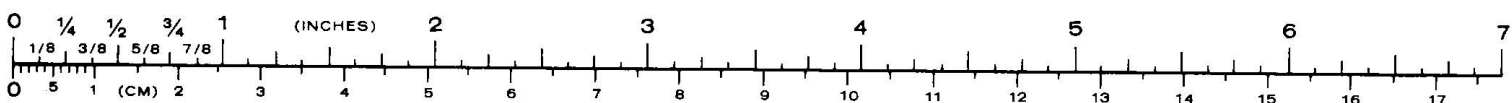


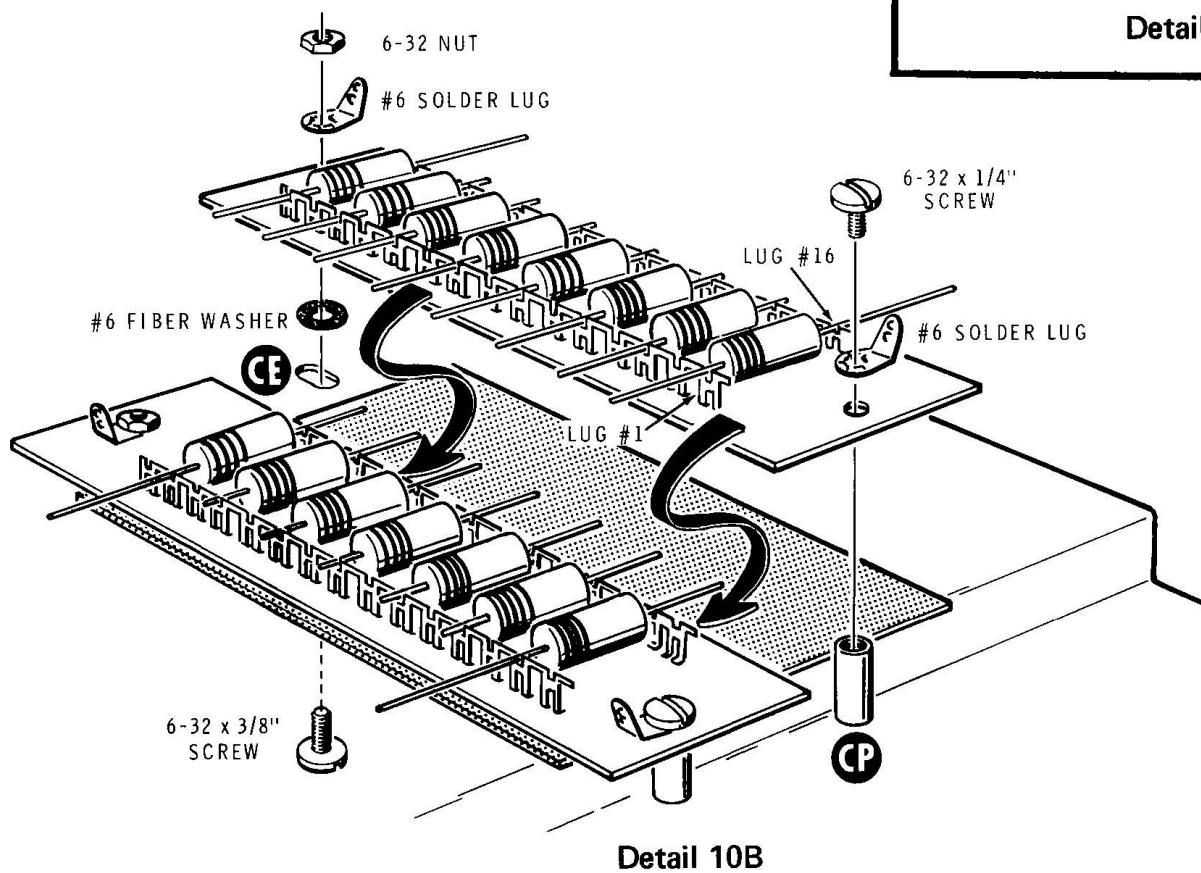
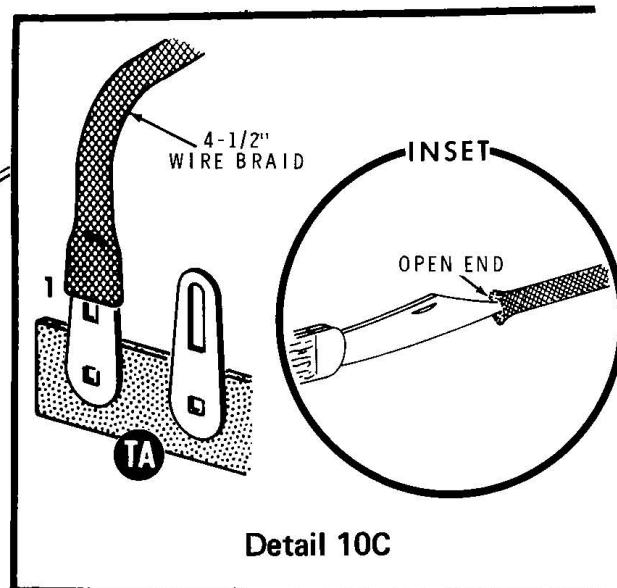
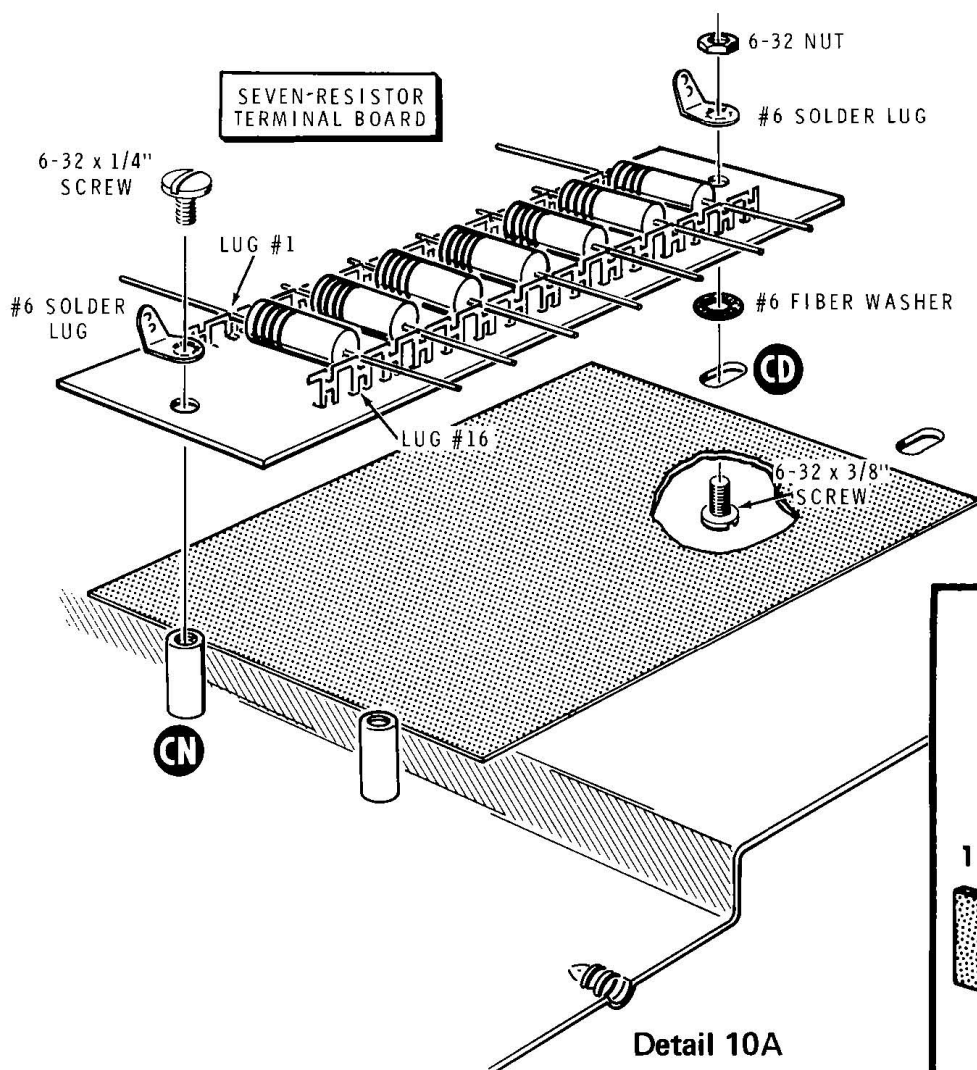
PICTORIAL 10

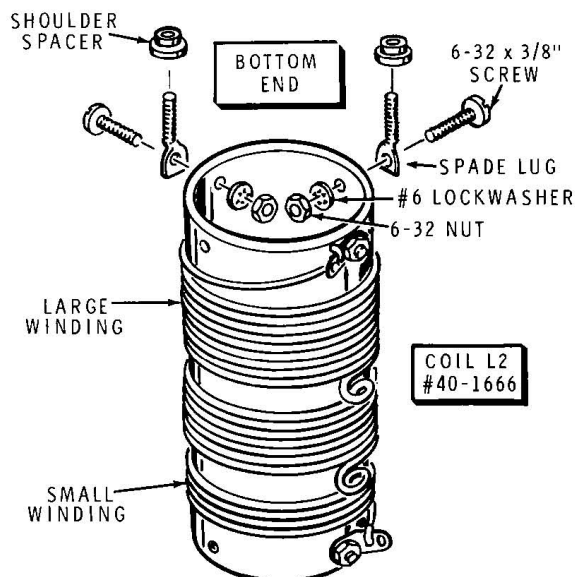
- () R21: Refer to Detail 10A and mount the 30-lug terminal board with seven resistors at hole CD and spacer CN. Position terminals 1 and 16 of the circuit board toward the spacer. Use a #6 solder lug and a 6-32 x 1/4" screw at spacer CN. At hole CD, use a 6-32 x 3/8" screw inserted from the other side of the chassis, a #6 fiber washer, a #6 solder lug, and a 6-32 nut.
- () R18: Refer to Pictorial 10 and Detail 10B. Position the remaining 30-lug terminal board so its mounting holes are aligned with spacer CP and hole CE, its lugs 1 and 16 are toward the spacer, and the 3/8" lead of each resistor rests in the matching slot of the other terminal board, as shown in the Pictorial. Mount the terminal board with a #6 solder lug and a 6-32 x 1/4" screw in spacer CP. At hole CE use a #6 solder lug, a #6 fiber washer, a 6-32 x 3/8" screw, and a 6-32 nut.
- () Solder the remaining 15 unsoldered 3/8" resistor leads along the two middle rows of terminals. Let the solder run out onto the resistor leads between two center rows of terminals, as braid will be soldered to these leads later.
- () Solder the four leads at the ends of the terminal boards to the four #6 solder lugs. Cut off the excess lead lengths.

Refer to Detail 10C and its inset drawing for the following two steps.

- () Cut a 4-1/2" length of wire braid.
- () Open the end of the wire braid with a sharp instrument, such as the point of a knife blade (the braid is actually flattened, tubular braid). Slide the open end of the braid onto lug 1 of terminal strip TA (S-2).
- () Position the other end of the wire braid between the two middle rows of terminals and solder the braid to the 15 resistor leads. Use plenty of heat and solder. Check to make sure the braid is well soldered to the leads.



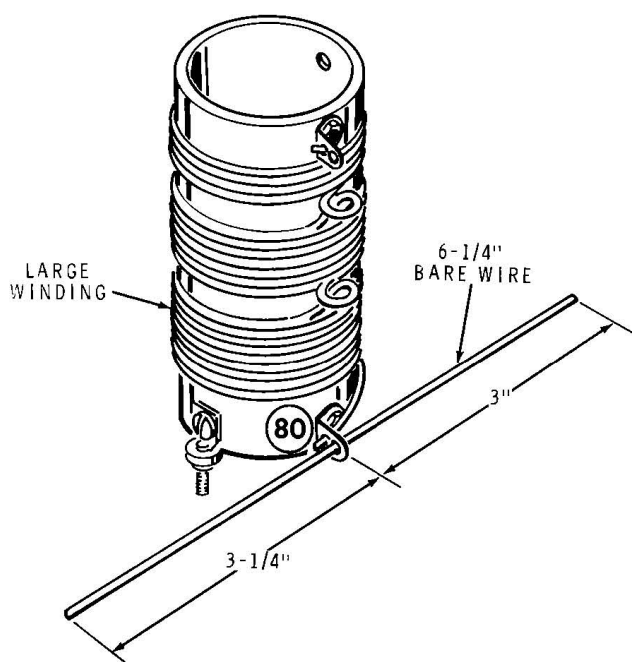




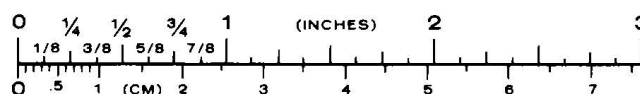
Detail 11A

Refer to Pictorial 11 for the following steps.

- () Refer to Detail 11A and install two spade lugs on the bottom of the 80-40-20 meters coil. Use a 6-32 x 3/8" screw, a #6 lockwasher, and a 6-32 nut for each spade lug. There are three holes at the large winding end of the coil form. Install the spade lugs in the two holes counterclockwise from the end of the coil when viewing the coil from the bottom. Note the position of the offset in the spade lugs.
- () With the larger end toward the coil, screw a 3/16" shoulder spacer (tapped 6-32) onto each spade lug as far as it will go.



Detail 11B



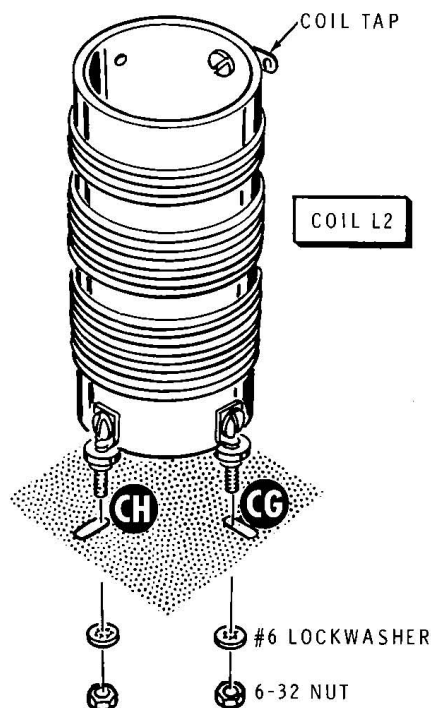
- () Refer to Detail 11B and position the coil with the large winding at the bottom, as shown. Push a 6-1/4" bare wire through the solder lug at 80 until the end of the wire is exactly 3" from the lug. Solder the wire to the lug.

- () L2: Refer to Detail 11C and mount the 80-40-20 meter coil at holes CG and CH. Use a #6 lockwasher and a 6-32 nut for each spade lug. Be sure the coil taps are facing directly away from the tube socket as shown in Pictorial 14.

NOTE: In the following step, refer to Pictorial 11 inset drawing and to Detail 11F for the location of hole CB.

- () Refer to Detail 11D and install a #6 solder lug at hole CB. Use a 6-32 x 1/4" screw and a 6-32 nut. Bend the solder lug up as shown.

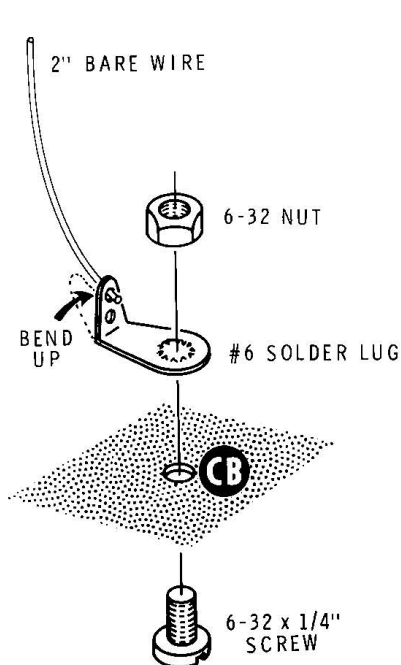
- () Solder a 2" bare wire to the solder lug.



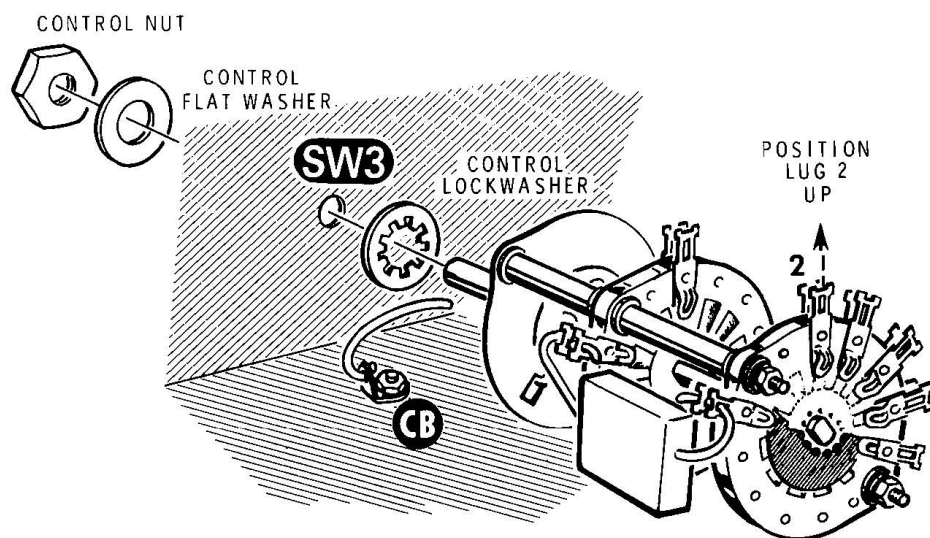
Detail 11C

NOTE: Refer to Detail 11E for the numbering of the 2-wafer switch solder lugs (SW3), as viewed from the rear. There are two switch lugs, one on each side of the wafer, at each position. Always solder a wire or lead to both lugs, and flatten the end of the wire with pliers so it will easily slides into the switch solder lugs.

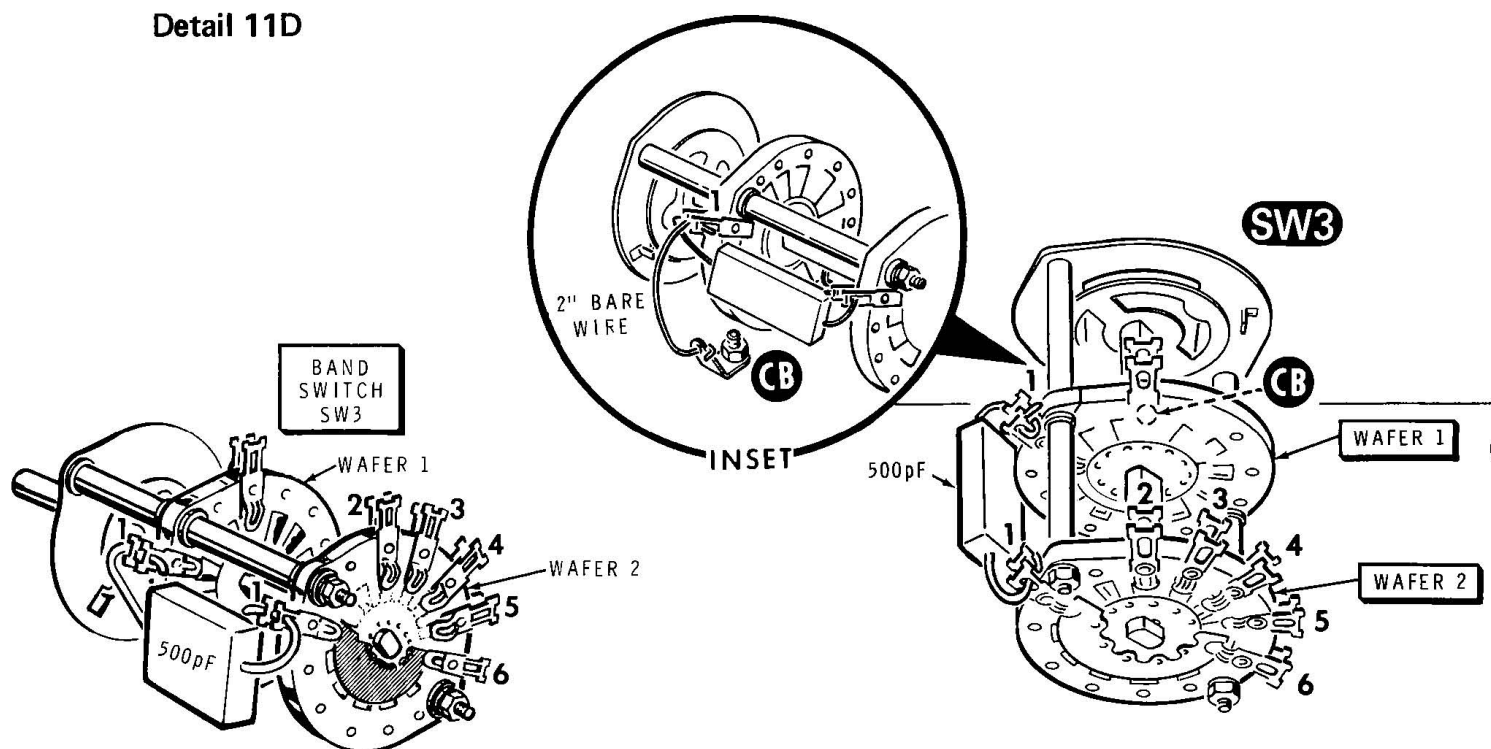
- () C14: Refer to Detail 11E and mount a 500 pF mica capacitor (may be marked .0005) on the 2-wafer switch (SW3) between wafer 1 lug 1 (NS) and wafer 2 lug 1 (S-1).



Detail 11D

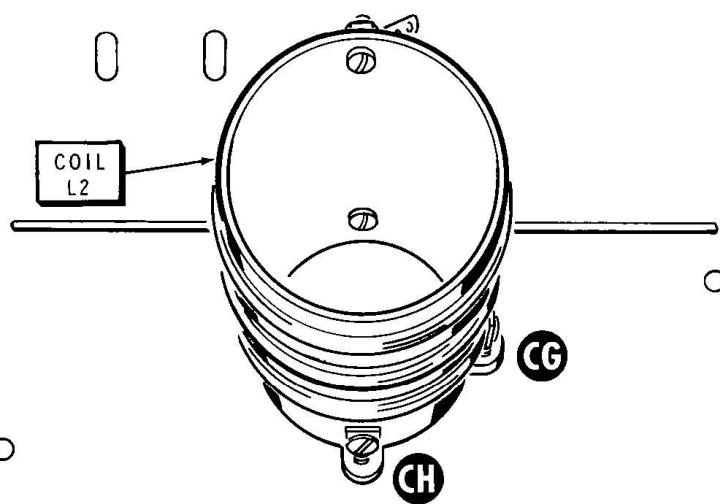


Detail 11F

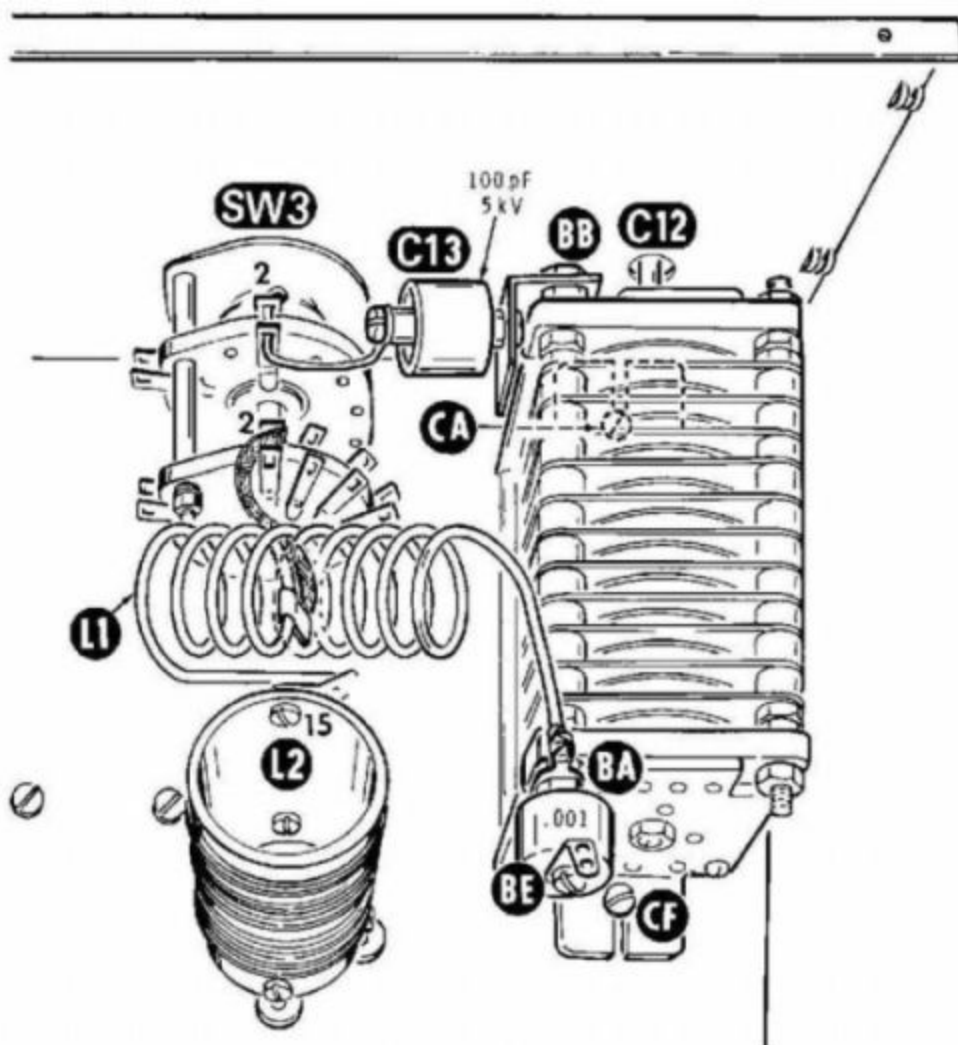


Detail 11E

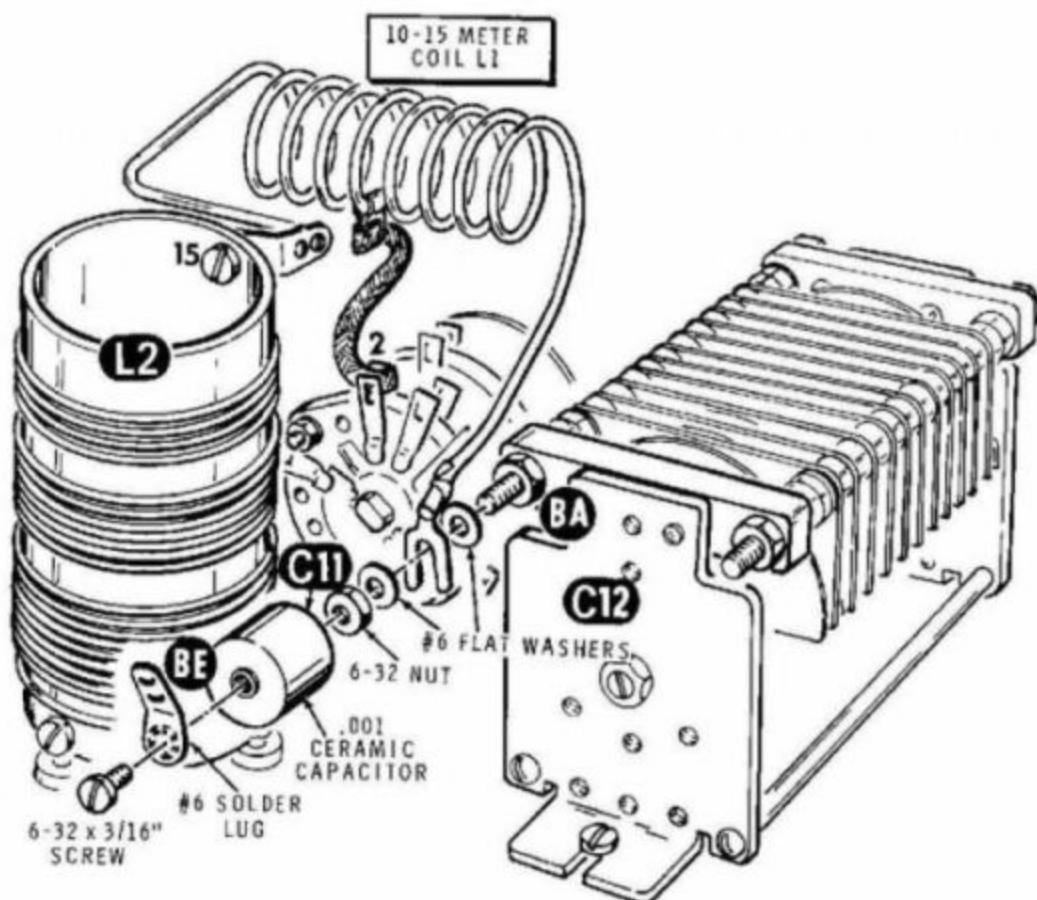
- () SW3: Refer to Detail 11F and mount the 2-wafer switch in hole SW3. Use a control lockwasher, a control flat washer, and a control nut. Be sure to position the switch lugs as shown. As you position the switch, insert the end of the bare wire (coming from solder lug CB) between the two lugs of wafer 1 lug 1. After the switch is mounted, solder together the two switch lugs, the capacitor lead, and the bare wire. Cut off any excess length of bare wire.



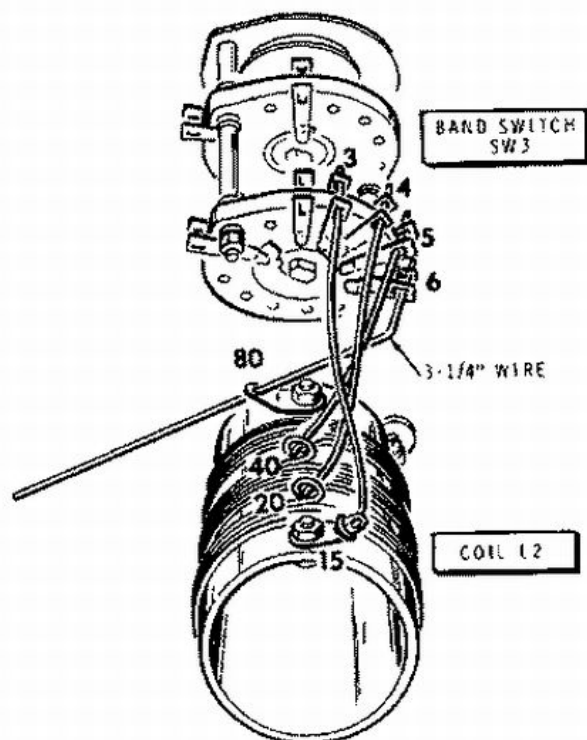
PICTORIAL 11



PICTORIAL 13



Detail 13F



PICTORIAL 12

Refer to Pictorial 12 for the following steps.

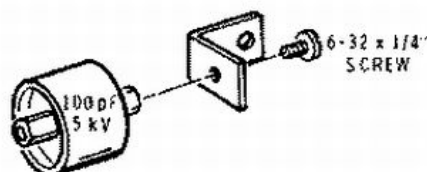
CAUTION: Switch SW3 will be wired in the following steps. The large bare wire is stiff and the switch lugs can be easily bent. Therefore, **DO NOT** bend the bare wire with one end connected to the switch lugs, or the switch will probably be damaged. Form each wire so it fits, put it in position, and solder it in place. Flatten the ends of the wires with pliers so they will enter both switch lugs at each position.

- () Connect the 3-1/4" bare wire from the 80 coil tap to SW3 lug 6 (S-2).

In the following steps, connect bare wires from the designated lugs of wafer 2 of switch SW3 to the designated coil terminals.

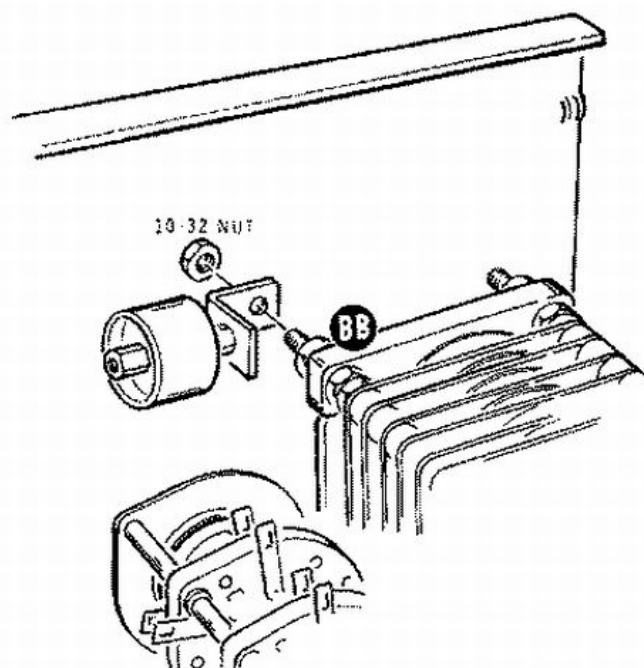
	Wire	Switch Lug	Coil Terminal
()	2-1/2"	5 (S-2)	40 (S-1)
()	2-3/4"	4 (S-2)	20 (S-1)
()	3"	3 (S-2)	15 (NS)

Refer to Pictorial 13 (fold-out from Page 42) for the following steps.

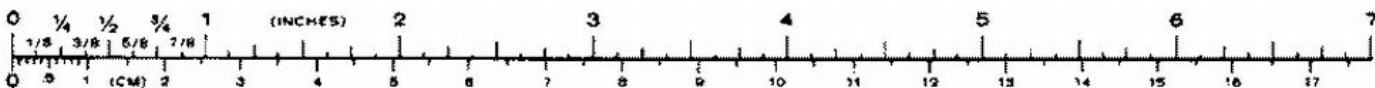


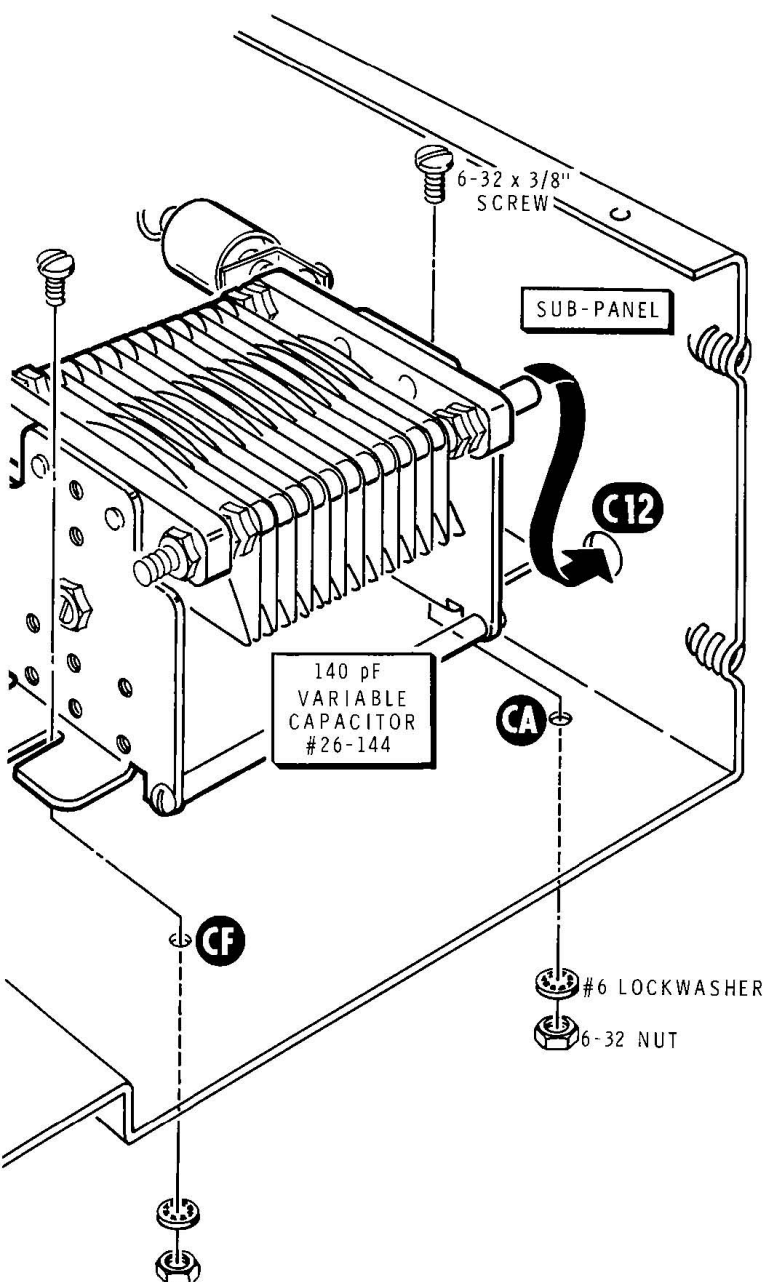
Detail 13A

- () Refer to Detail 13A and install the 100 pF 5 kV capacitor (may be marked 100 MMF) on the capacitor bracket with a 6-32 x 1/4" screw. Use the smaller hole.
- () C13: Refer to Detail 13B and mount the capacitor and bracket assembly on bolt BB on the shaft end of the 140 pF variable capacitor (#26-144). Use a 10-32 nut. If necessary, bend the bracket so the capacitor body does not touch any part of the band switch.



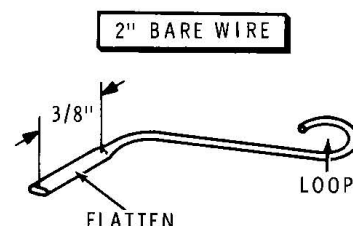
Detail 13B



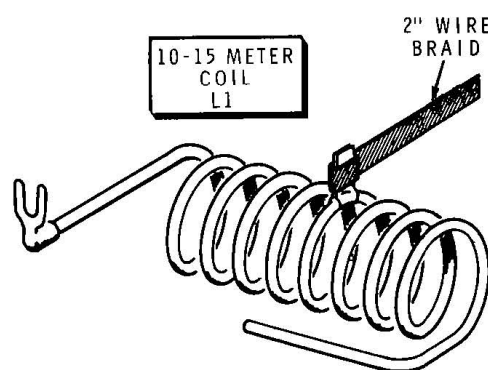


Detail 13C

- () C12: Refer to Detail 13C and install the 140 pF variable capacitor (#26-144) at holes CA and CF with its shaft in subpanel hole C12. Use 6-32 x 3/8" hardware at each mounting hole.
- () Refer to Detail 13D and make a loop in the end of a 2" wire to pass a 6-32 screw. Flatten the other end so it will enter both terminals of an SW3 switch lug.
- () Connect the wire loop to the remaining terminal of C13, the 100 pF ceramic capacitor. Use a 6-32 x 1/4" screw. Solder the other end of the wire to SW3, wafer #1, lugs 2.



Detail 13D

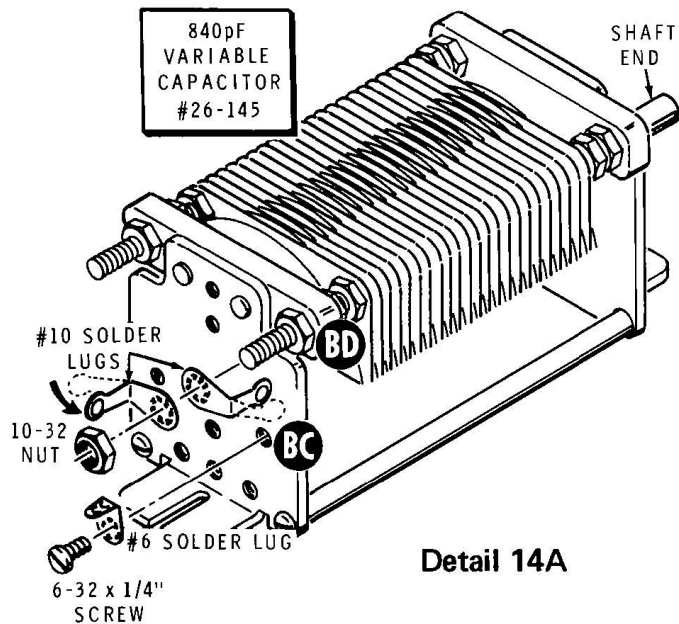


Detail 13E

- () Refer to Detail 13E and solder a 2" length of wire braid to the tab on the 10-15 meter coil, L1.

Refer to Detail 13F (fold-out from page 42) for the next five steps.

- () L1: Place two #6 flat washers and the solder lug of the 10-15 meter coil over stator plate screw BA of variable capacitor C12. Secure the solder lug with a 6-32 nut.
- () L1: Carefully fit the 10-15 meter coil so it is parallel to both the subpanel and the chassis, and so the free end of the coil butts against the solder lug at L2 coil terminal 15 (S-2).
- () Position the wire braid coming from the 10-15 meter coil tap so the braid passes between the two terminals at lug 2 of switch SW3. Solder the braid to both terminals.
- () After the braid is connected and soldered, melt enough solder into the braid between the two connections to stiffen it.
- () C11: Install a .001 μ F ceramic capacitor (may be marked 1000 MMFD) on the stator bolt of variable capacitor C12 at BA. Turn the tapped capacitor snugly onto the bolt (the capacitor threads are 6-32).
- () Install a #6 solder lug at BE on the other end of the ceramic capacitor. Use a 6-32 x 3/16" screw.

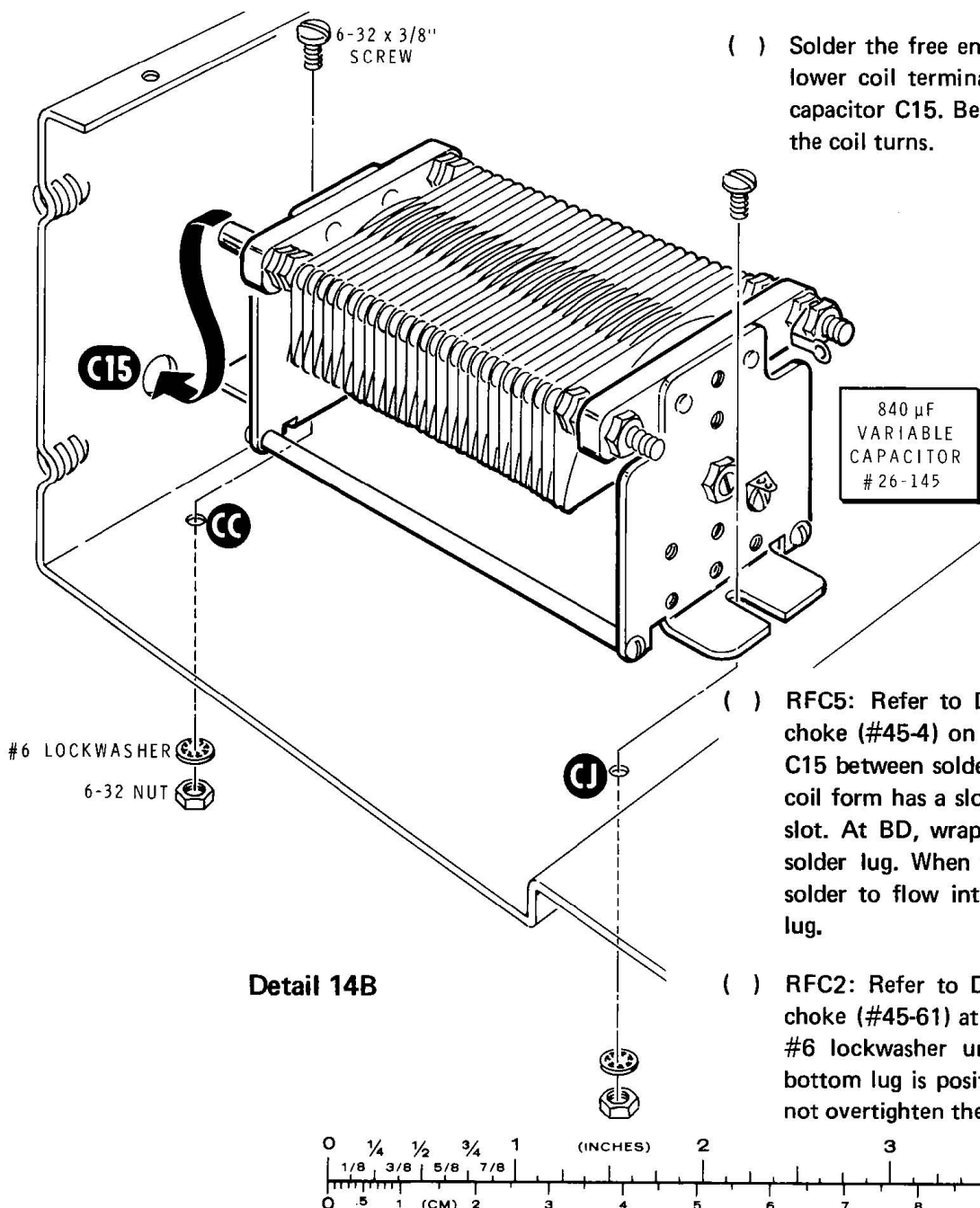


Detail 14A

Refer to Pictorial 14 for the following steps.

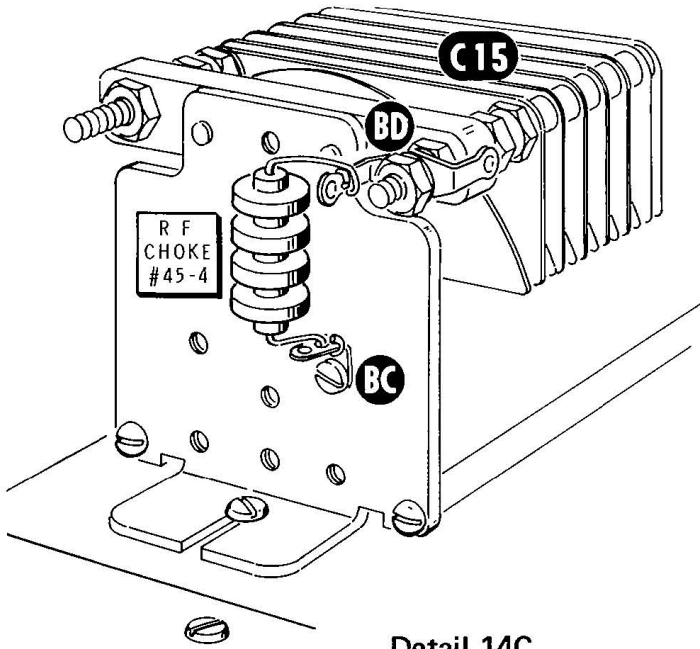
Refer to Detail 14A for the next two steps.

- () Mount a #6 solder lug on the rear frame of an 840 pF variable capacitor at BC. Use a 6-32 x 1/4" screw. After tightening the screw, bend the solder lug so it points to the rear.
- () Install two #10 solder lugs on the stator bolt of the 840 pF variable capacitor (#26-145) at BD. Use a 10-32 nut. Bend both lugs as shown.
- () C15: Refer to Detail 14B and mount the 840 μ F variable capacitor at holes CC and CJ with its shaft in subpanel hole C15. Use 6-32 x 3/8" hardware at each mounting foot.
- () Solder the free end of the bare wire coming from the lower coil terminal to a solder lug at BD on variable capacitor C15. Be sure the wire does not touch any of the coil turns.

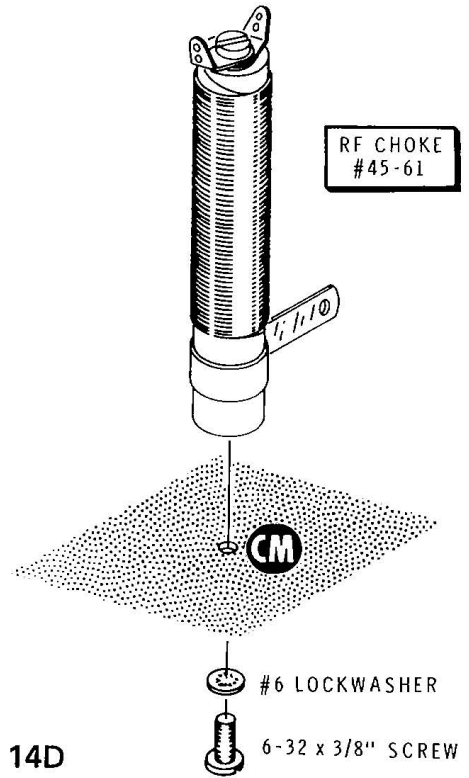


Detail 14B

- () RFC5: Refer to Detail 14C and mount 1.1 mH RF choke (#45-4) on the rear frame of variable capacitor C15 between solder lugs BC (NS) and BD (S-1). If the coil form has a slot, bend the choke leads toward the slot. At BD, wrap the lead of the choke around the solder lug. When you solder this lead, do not allow solder to flow into the hole in the end of the solder lug.
- () RFC2: Refer to Detail 14D and install a 50 μ H RF choke (#45-61) at CM. Use a 6-32 x 3/8" screw with a #6 lockwasher under the screw head. Be sure the bottom lug is positioned as shown in the Pictorial. Do not overtighten the screw.

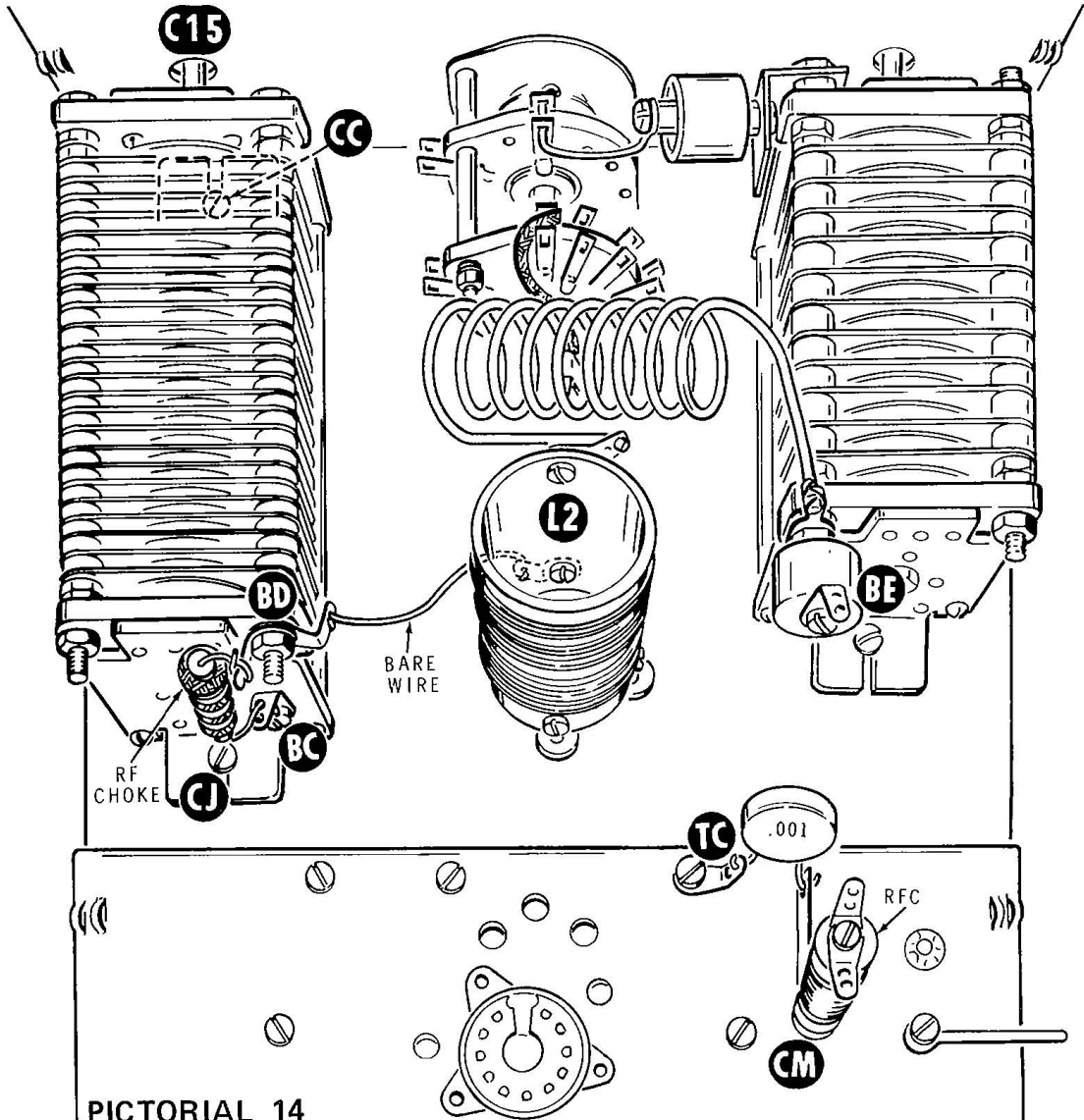


Detail 14C



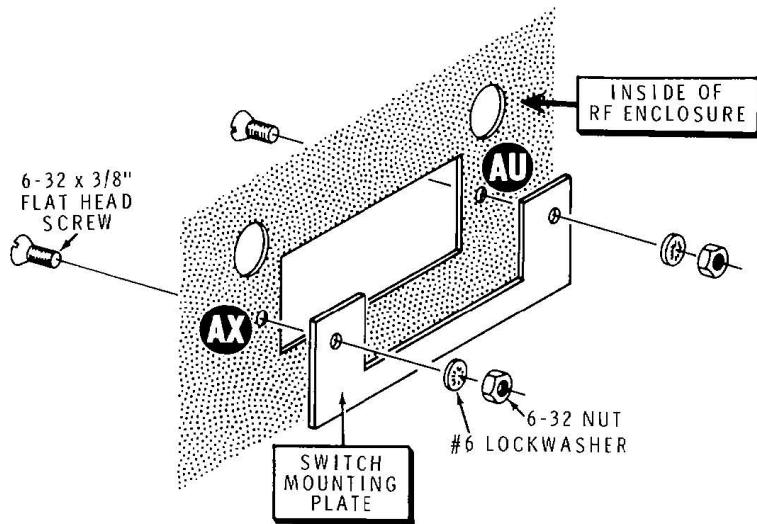
Detail 14D

- () C9: Cut the leads of a .001 μ F, 6 kV, disc capacitor to 1/2". Connect the capacitor from solder lug TC (S-1) to the bottom lug of RFC2 (NS).



PICTORIAL 14

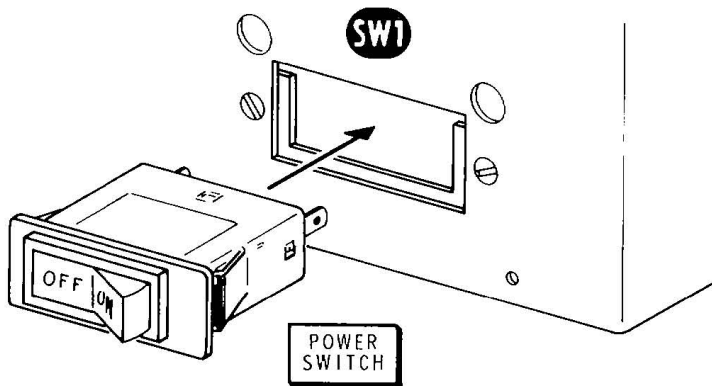
RF ENCLOSURE



Detail 15A

Refer to Pictorial 15 for the following steps.

- () Refer to Detail 15A and install a switch mounting plate at SW1 on the inside of the RF enclosure. Use 6-32 x 3/8" flat head screws, #6 lockwashers, and 6-32 nuts at holes AU and AX.



Detail 15B

- () SW1: Refer to Detail 15B and install the rocker switch at SW1. Be sure the words OFF and ON are positioned correctly. Then push the switch into the opening until both spring catches snap into place.



POSITION THE SMALL PORTION OF THE GROMMET INTO THE ENCLOSURE HOLE.

BEND THE LARGE PORTION OF THE GROMMET OVER AND INTO THE SMALL PORTION. PRESS IT FIRMLY INTO PLACE.

Detail 15C

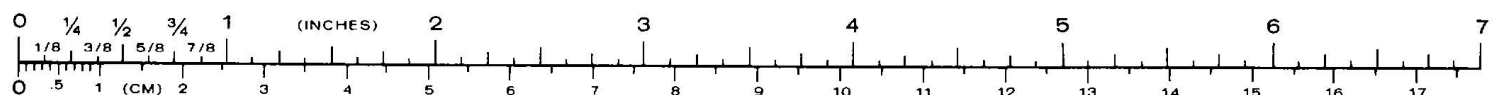
- () Refer to Detail 15C and install a large plastic grommet in hole BN on the left side of the RF enclosure. Seat the grommet firmly in place.

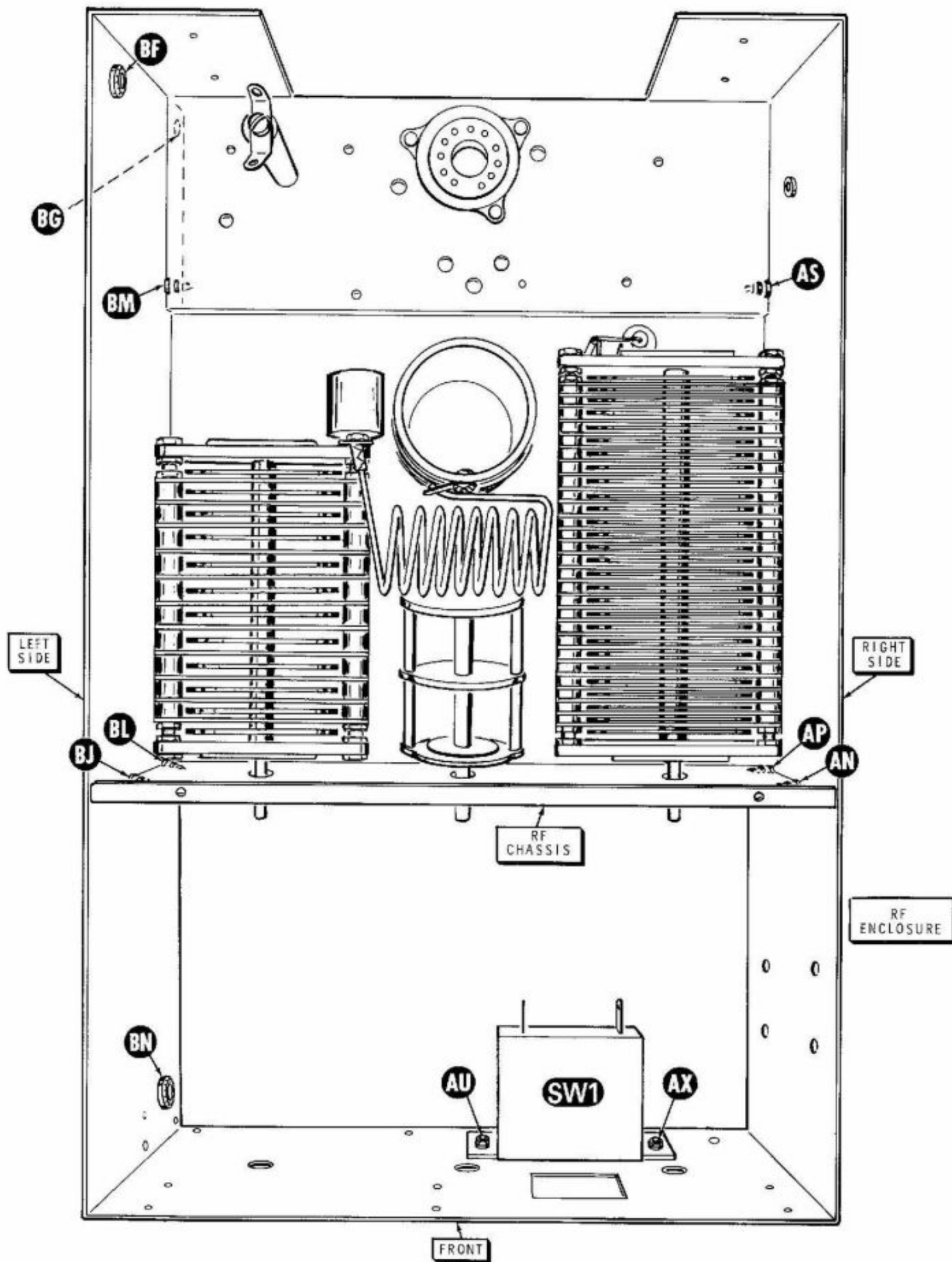
- () Similarly, install a large plastic grommet in hole BF.

- () Similarly, install a small plastic grommet in hole BG on the left side of the RF enclosure.

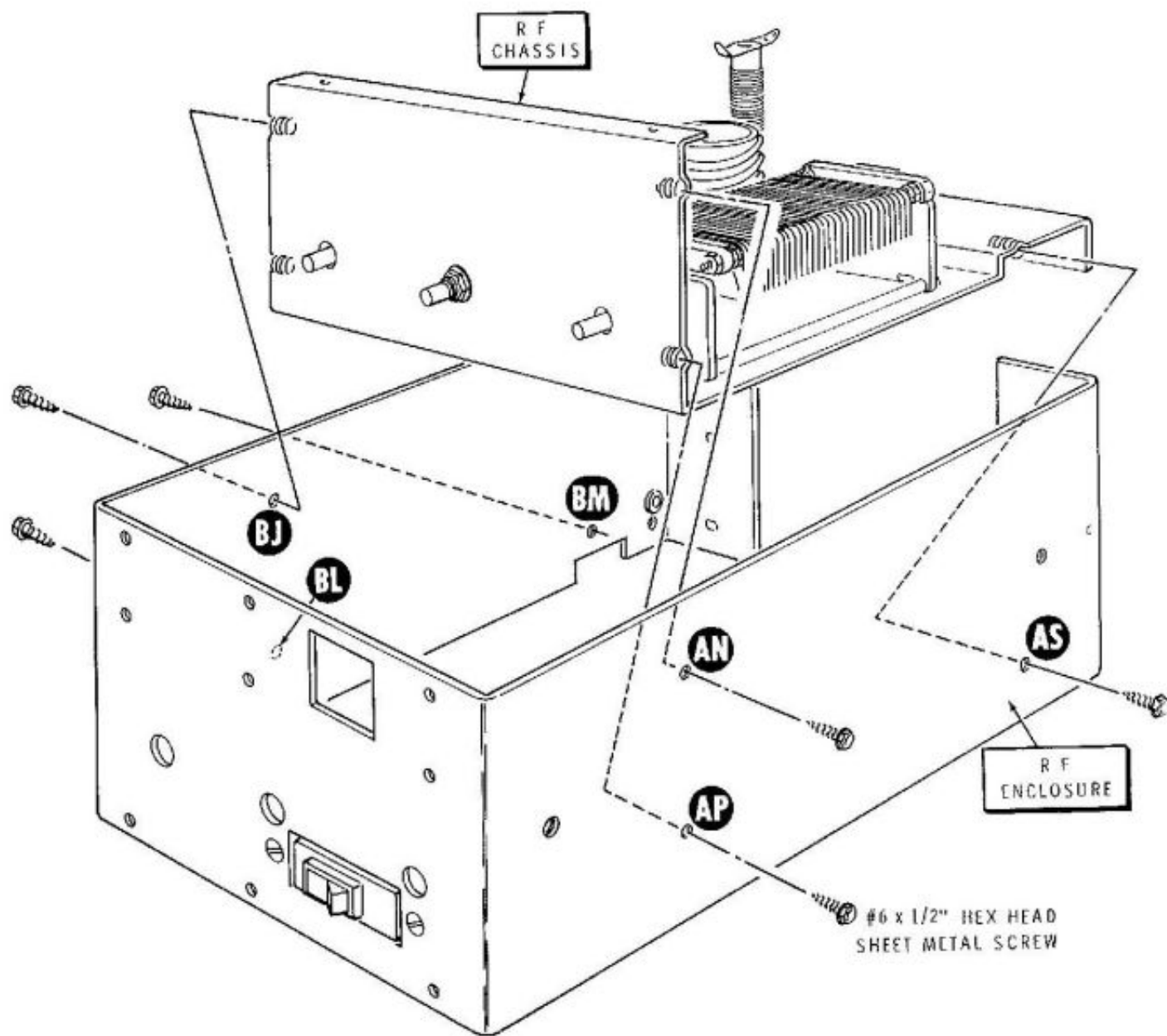
- () Refer to Detail 15D (fold-out from Page 47) and attach the RF enclosure to the RF chassis. Use #6 x 1/2" hex head sheet metal screws at BJ, BL, and BM on the left side of the RF enclosure, and at holes AN, AP, and AS on the right side of the chassis.

- () Set the RF enclosure aside. It will be assembled later.

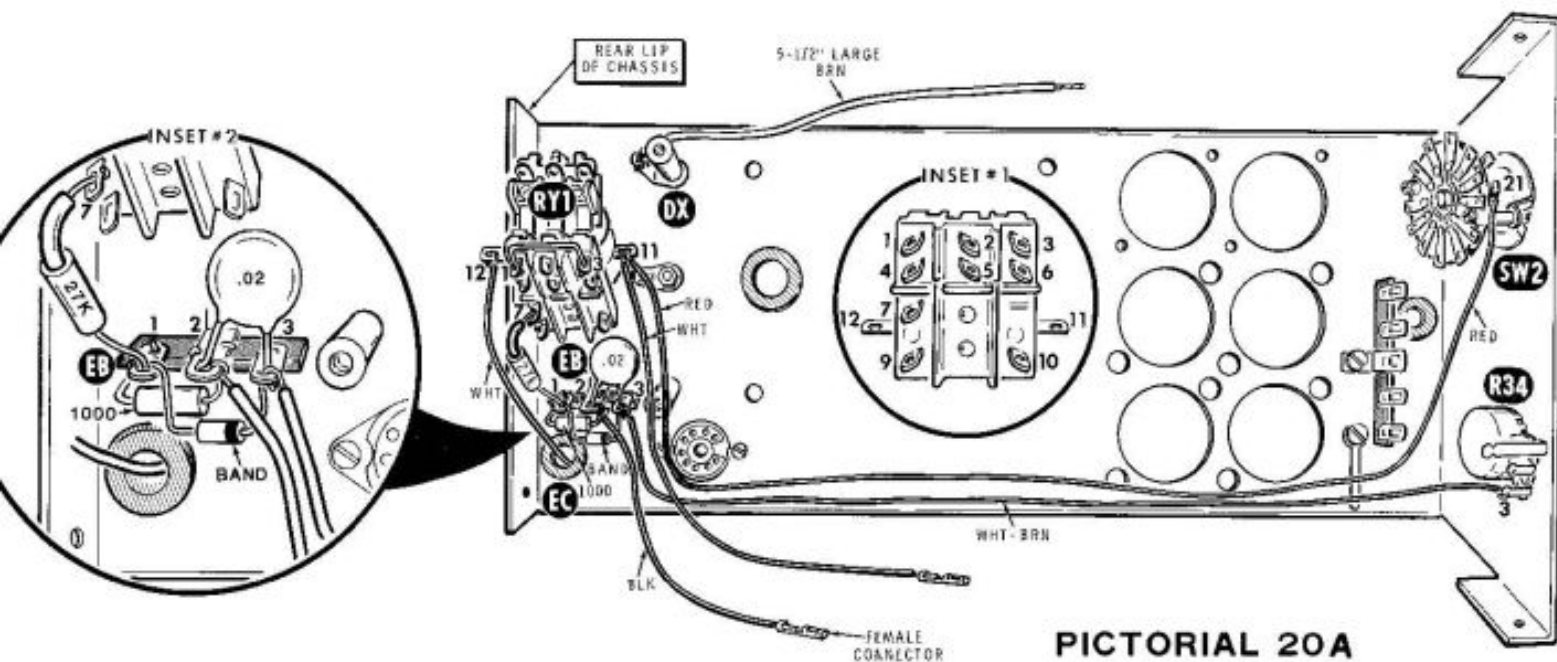
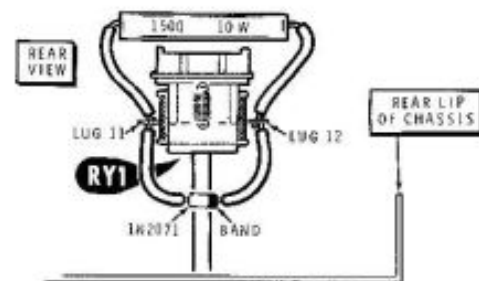
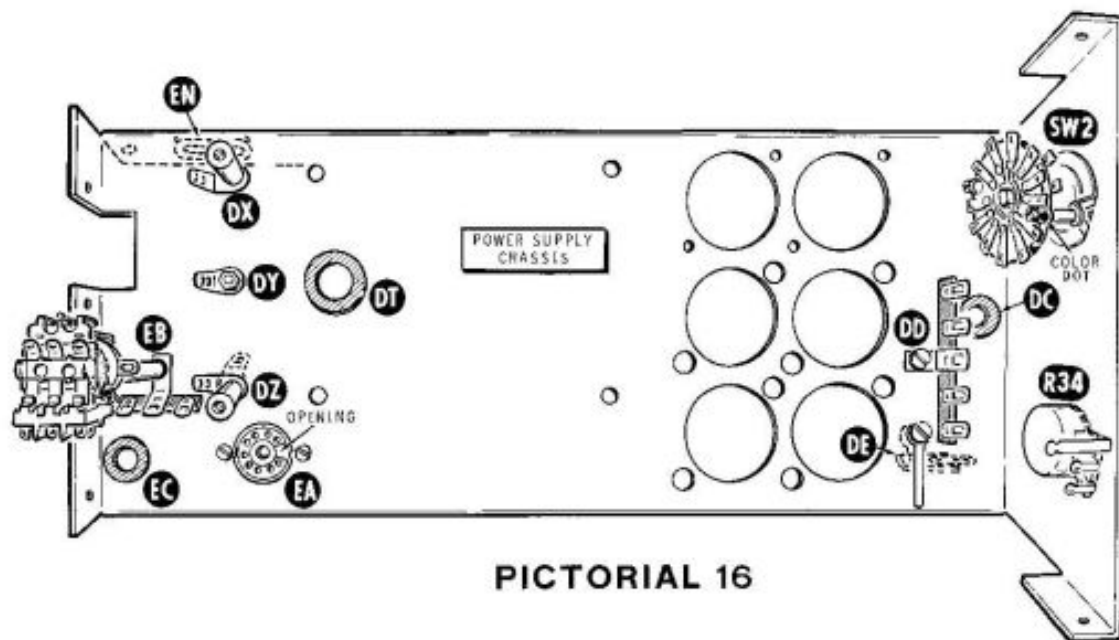




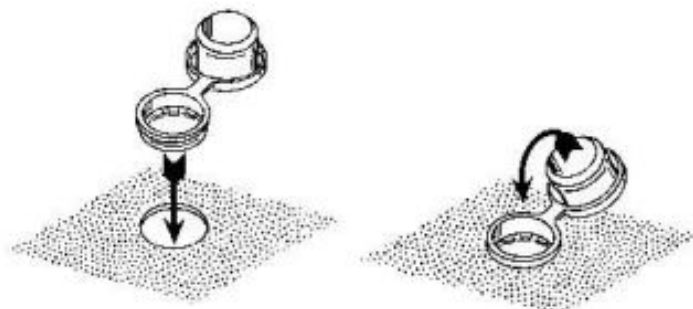
PICTORIAL 15



Detail 15D



POWER SUPPLY CHASSIS



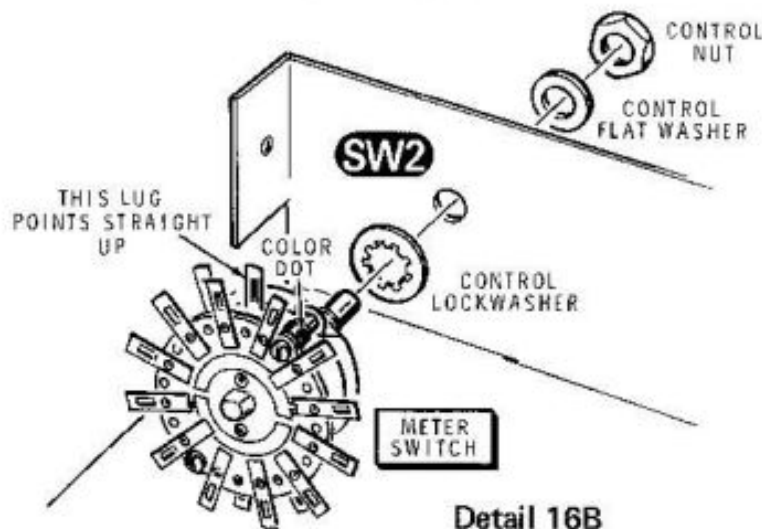
POSITION THE SMALL PORTION OF THE GROMMET INTO THE CHASSIS HOLE.

Detail 16A

BEND THE LARGE PORTION OF THE GROMMET OVER AND INTO THE SMALL PORTION. PRESS IT FIRMLY INTO PLACE.

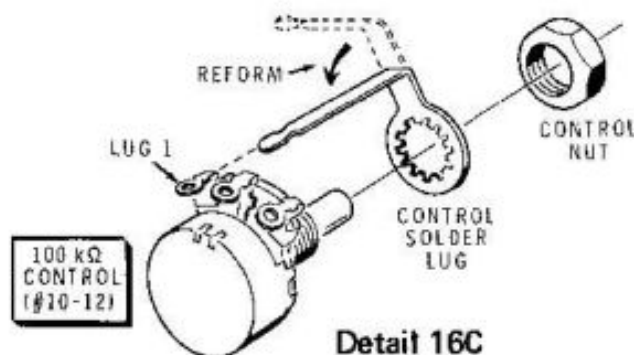
Refer to Pictorial 16 for the following steps.

- () Refer to Detail 16A and install a large plastic grommet in hole DC on the power supply chassis.



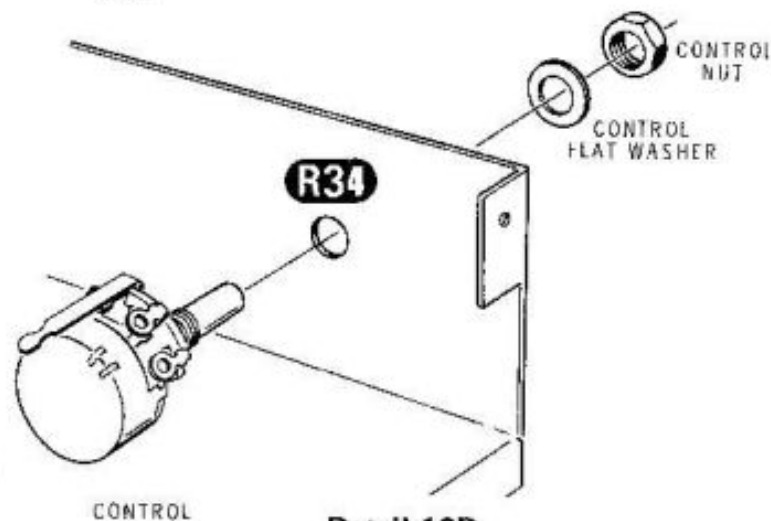
Detail 16B

- () SW2: Refer to Detail 16B and mount the 1-wafer switch at SW2 on the power supply chassis. Be sure to position the color dot on the edge of the wafer as shown. All switch wiring is keyed to the position of this color dot. Use a control lockwasher, a control flat washer, and a control nut.



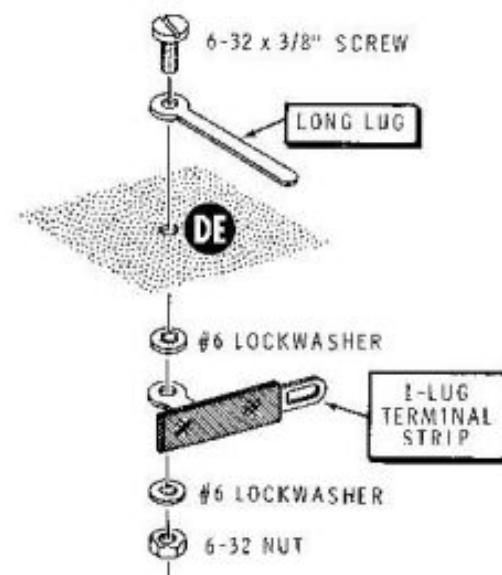
Detail 16C

- () Refer to Detail 16C and place a control solder lug and a control nut on the 100 kΩ control (#10-12). Form the solder lug so it touches lug 1 of the control and solder the two lugs together. Then remove the control nut.



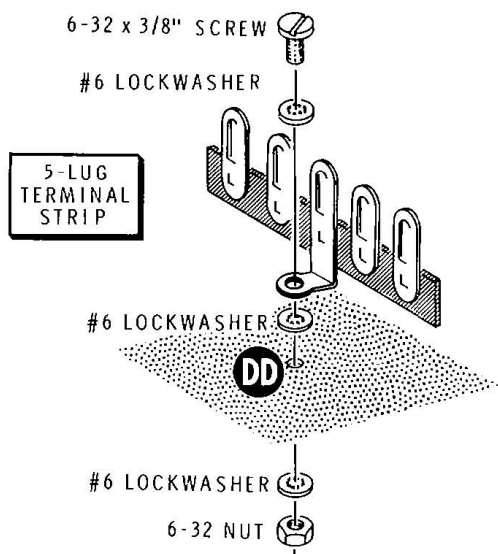
Detail 16D

- () R34: Refer to Detail 16D and mount the 100 kΩ control at R34 with a control flat washer and a control nut.



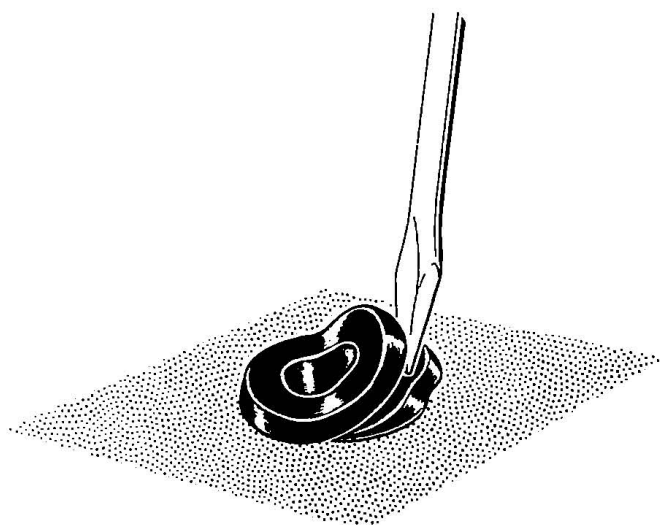
Detail 16E

- () Refer to Detail 16E and install a long lug on top of the chassis and a one-lug terminal strip below the chassis at hole DE. Use 6-32 x 3/8" hardware.



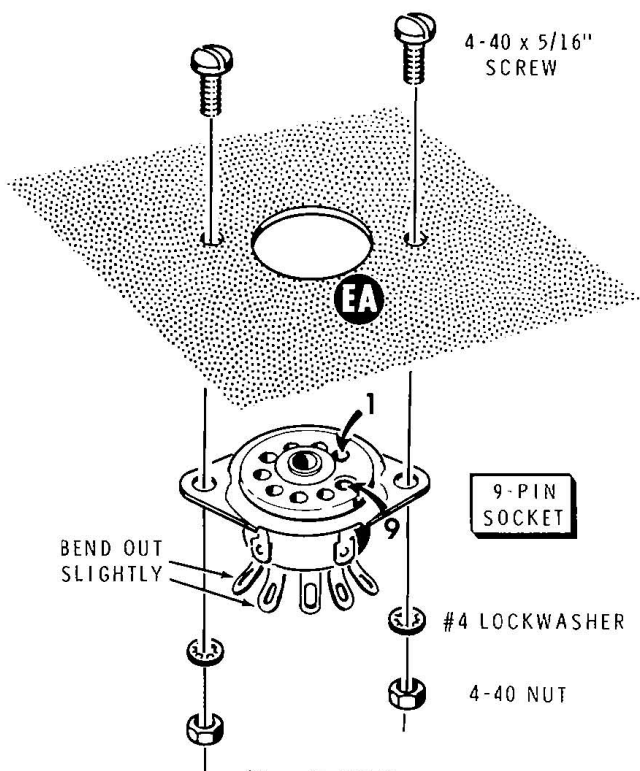
Detail 16F

- () Refer to Detail 16F and install a 5-lug terminal strip at DD. Use 6-32 x 3/8" hardware.
- () Install a large plastic grommet in hole EC.



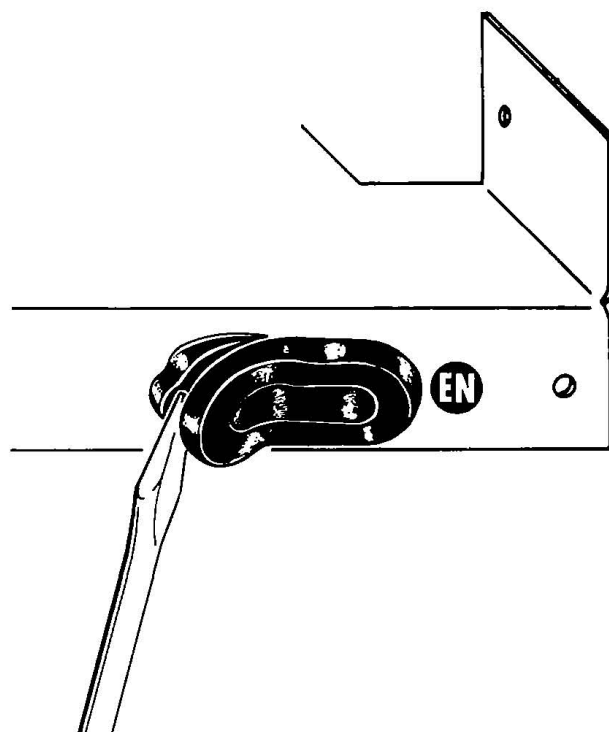
Detail 16H

- () Refer to Detail 16H and install a rubber grommet in hole DT.



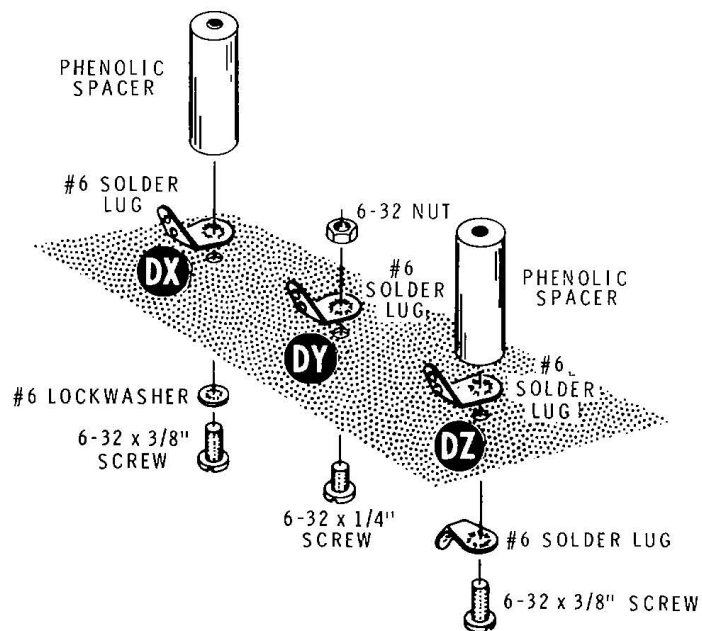
Detail 16G

- () Refer to Detail 16G and install a 9-pin socket in hole EA from the underside of the chassis. Use 4-40 x 5/16" hardware. Position the opening between the lugs 1 and 9 toward the front of the chassis.

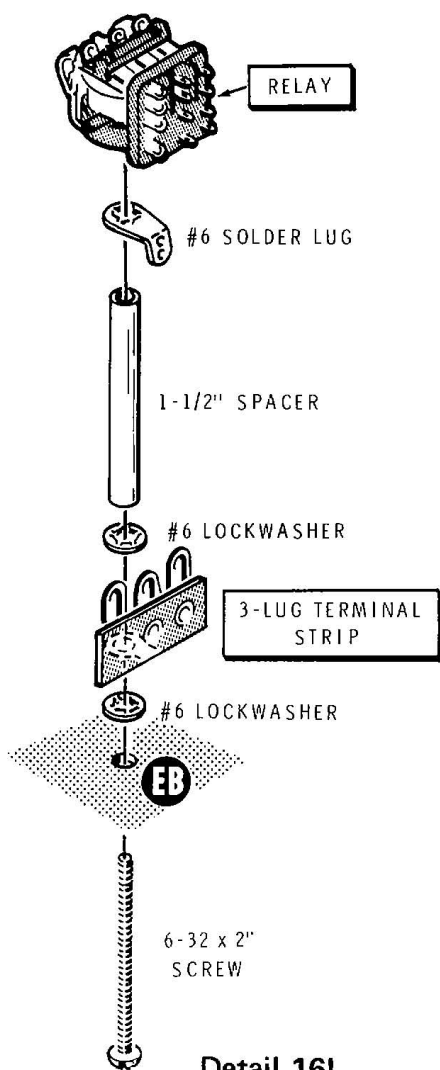


Detail 16J

- () Refer again to Detail 16G and bend the lugs of the 9-pin socket out slightly.
- () Refer to Detail 16J and install a rubber grommet on the right side of the chassis in hole EN.



Detail 16K



Detail 16L

Refer to Detail 16K for the next 3 steps.

CAUTION: Do not overtighten the hardware used with phenolic spacers.

- () Mount a phenolic spacer at DX with a #6 solder lug. Use 6-32 x 3/8" hardware.
- () Mount a phenolic spacer at DZ with #6 solder lugs above and below the chassis. Use 6-32 x 3/8" hardware.
- () Install a #6 solder lug at DY. Use 6-32 x 1/4" hardware.
- () RY1: Refer to Detail 16L and install a relay (#69-55) on a spacer, and a 3-lug terminal strip at hole EB. Use a 6-32 x 2" screw, a 3-lug terminal strip, a 1-1/2" spacer, a #6 solder lug and two #6 lockwashers.

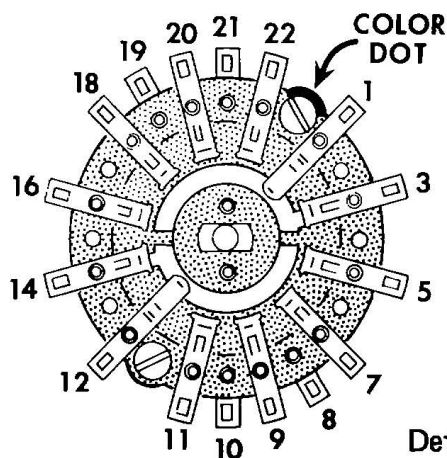
CAUTION: Handle the relay carefully while you assemble the remainder of the chassis.

Refer to Pictorial 17 for the following steps.

- () R1: Connect a 500 Ω , 5-watt resistor to terminal strip DD between lugs 1 (NS) and 4 (NS).
- () R2: Connect a 500 Ω , 5-watt resistor to terminal strip DD between lugs 2 (NS) and 5 (NS).

NOTES:

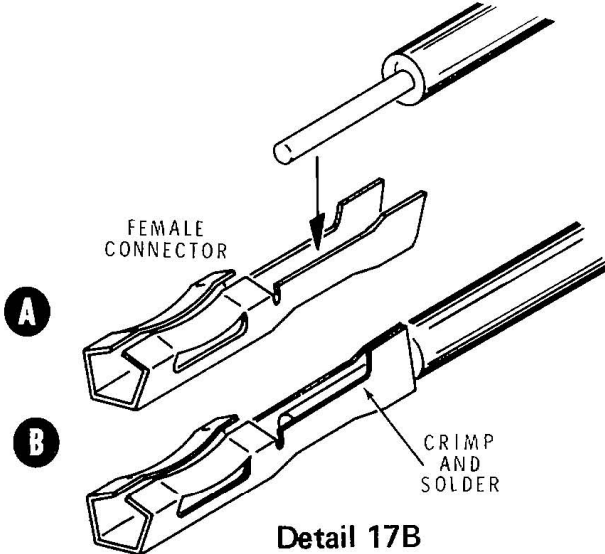
1. The wiring of the subpanel is done before the six filter capacitors are installed. However, when you run wires to other components, keep in mind that the wires must pass around the ends of the group of six large holes so they will not interfere with the capacitors, which will be installed later.



Detail 17A



2. Refer to Detail 17A for the numbering of switch SW2 solder lugs. Every hole in the switch wafer is numbered, whether a switch terminal is installed or not. Four lugs are located on the front side of the wafer (toward the subpanel.)
3. When a step calls for a two-color wire, such as "white-red," the wire will have a white body with a red stripe.
4. When you attach female connectors to wires, use a minimum amount of solder so it will not flow into the end of the connector.

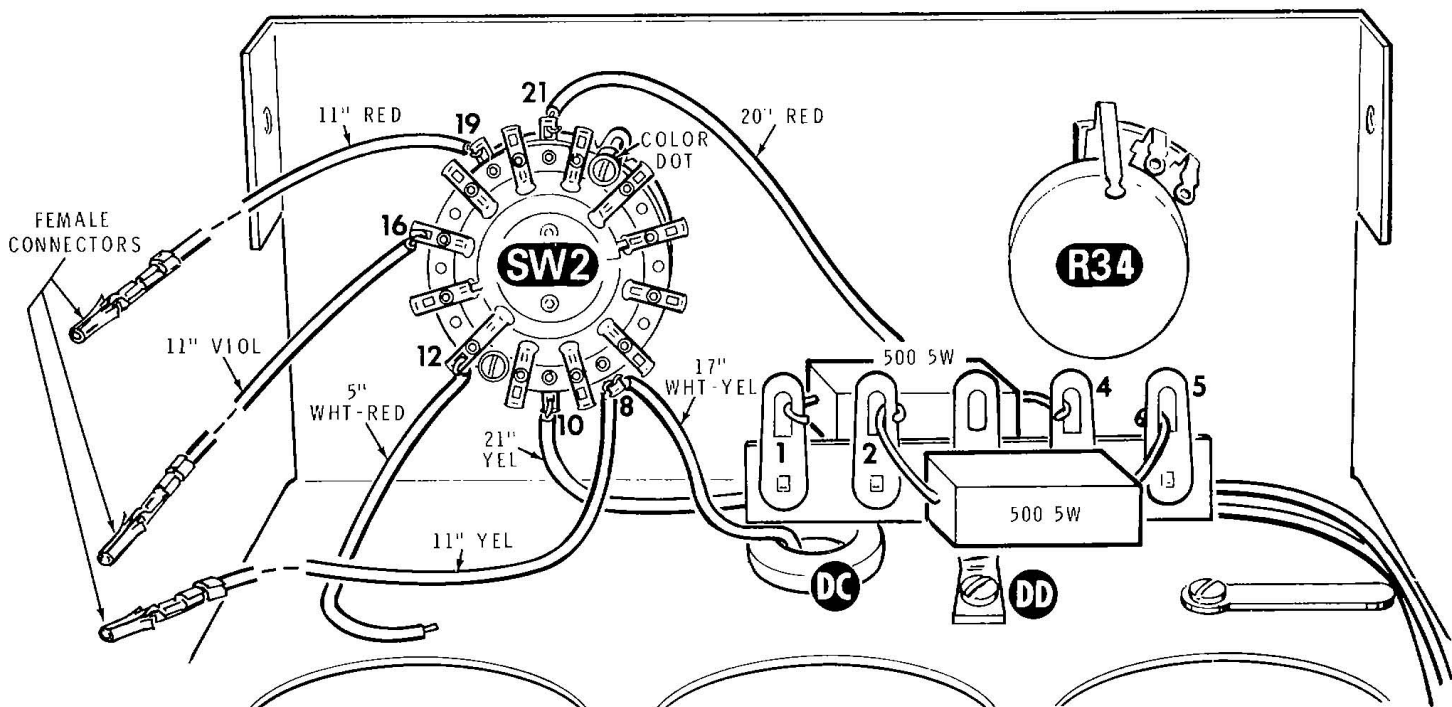


Detail 17B

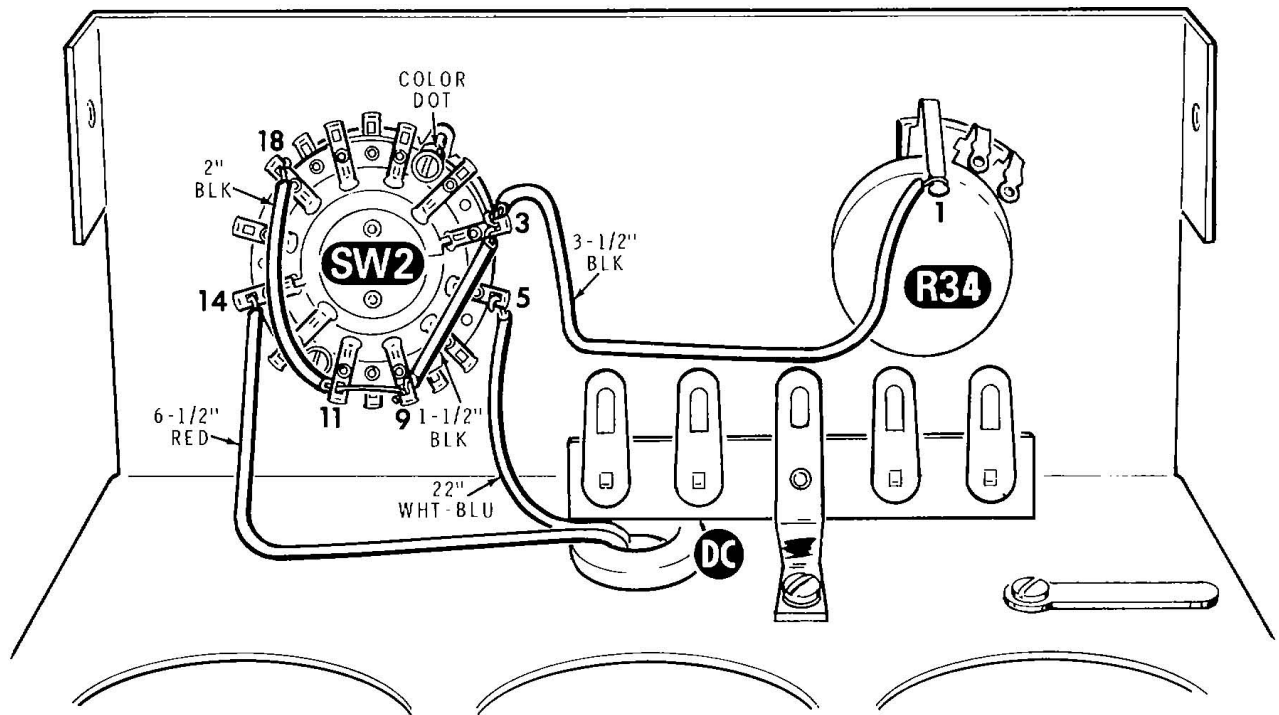
- () Prepare the following lengths of wire. The wires are listed in the order in which they will be used.

11" red	21" yellow
20" red	11" yellow
5" white-red	17" white-yellow
- () Solder a female connector to one end of an 11" red wire. Connect the free end of the 11" red wire to switch SW2 lug 19 (S-1).
- () Connect one end of a 20" red wire to switch SW2 lug 21 (S-1). Position this wire along the edge of the chassis, under control R34, and then back toward the rear of the chassis.
- () Connect one end of a 5" white-red wire to switch SW2 lug 12 (S-1).
- () Connect one end of a 21" yellow wire to switch SW2 lug 10 (S-1). Position this wire along the edge of the chassis, under control R34 and then back toward the rear of the chassis.
- () Solder a female connector to one end of the 11" yellow wire.
- () Connect the free end of the 11" yellow wire and one end of a 17" white-yellow wire to switch SW2 lug 8 (S-2). Push the other end of the 17" white-yellow wire down through grommet DC.

- () Refer to Detail 17B and prepare an 11" violet wire. Solder a female connector to one end of the wire. Connect the other end to switch SW2 lug 16 (NS).



PICTORIAL 17



PICTORIAL 18

Refer to Pictorial 18 for the following steps.

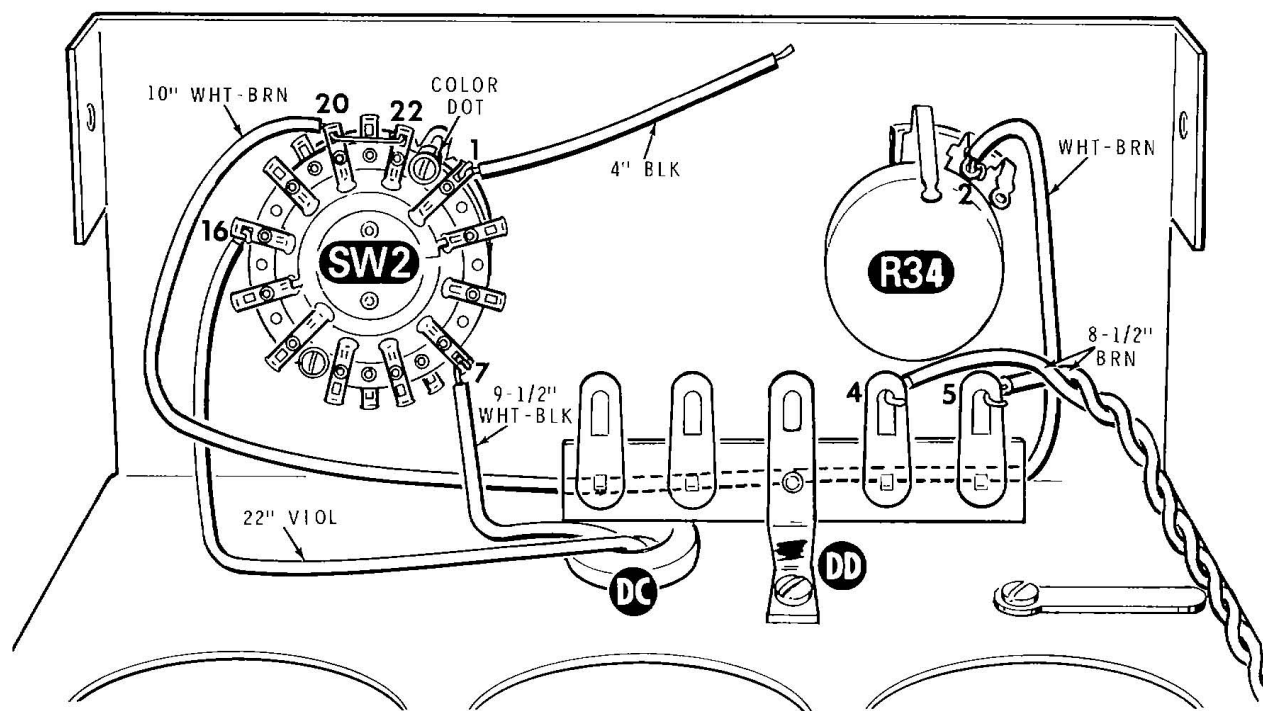
- () Prepare the following lengths of wire:

2" black	22" white-blue
1-1/2" black	6-1/2" red
3-1/2" black	

- () Remove an additional 1/4" of insulation from one end of a 2" black wire. Push this end through switch SW2 lug 11 (S-2) to lug 9 (NS). Connect the other end of the wire to lug 18 (S-1).

- () Connect a 1-1/2" black wire to switch SW2 between lugs 9 (S-2) and 3 (NS).
- () Connect one end of a 3-1/2" black wire to switch SW2, lug 3 (S-2). Connect the other end to the control solder lug at lug 1 of control R34 (S-1).
- () Connect one end of a 22" white-blue wire to switch SW2 lug 5 (S-1). Push the other end of the wire down through grommet DC.
- () Connect one end of a 6-1/2" red wire to switch SW2 lug 14 (S-1). Push the other end of the wire down through grommet DC.





PICTORIAL 19

Refer to Pictorial 19 for the following steps.

- () Prepare the following lengths of wire (be sure to use the small brown wire, which is tinned).

22" violet	4" black
10" white-brown	8-1/2" small brown (tinned)
9-1/2" white-black	8-1/2" small brown (tinned)

- () Connect one end of a 22" violet wire to switch SW2 lug 16 (S-2). Push the other end of this wire down through grommet DC.
- () Remove an additional 1/4" of insulation from one end of a 10" white-brown wire. Push this end through switch SW2 lug 20 (S-2) to lug 22 (S-1). Connect the other end of this wire to control R34 lug 2 (S-1).
- () Connect one end of a 9-1/2" white-black wire to switch SW2 lug 7 (S-1). Push the other end of the wire down through grommet DC.

- () Connect one end of a 4" black wire to switch SW2 lug 1 (S-1).

- () Refer to Detail 19A and form a "twisted pair" with the two 8-1/2" brown wires. Connect one end of the twisted pair to terminal strip DD: one wire to lug 4 (S-2) and the other wire to lug 5 (S-2).



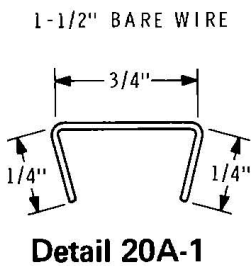
Detail 19A

Refer to Pictorial 20A (fold-out from Page 48) for the following steps.

- () R35: Connect a 1000 Ω (brown-black-red) resistor to terminal strip EB between the lower holes of lugs 1 (S-1) and 2 (S-1).
- () C21: Connect a .02 μ F disc capacitor to terminal strip EB between lugs 2 (NS) and 3 (NS).
- () D18: Connect the lead at the banded end of a 1N191 diode (#56-26, brown-white-brown) to terminal strip EB lug 3 (NS); and connect the other lead to lug 1 (NS).
- () Prepare a 15" white-brown wire. Connect one end to terminal strip EB lug 3 (S-3) and the other end to control R34 lug 3 (S-1).
- () Prepare a 6-1/2" black wire and solder a female connector to one end. Connect the other end to terminal strip EB lug 2 (S-2).

NOTE: Refer to the inset #1 drawing of Pictorial 20 for lug numbering of RY1. Refer to inset drawing #2 for the detail of wiring terminal strip EB.

- () R36: Cut one of the leads of a 27 k Ω , 1-watt (red-violet-orange) resistor to 1" and the other lead to 3/4". Place a 3/4" length of small black sleeving on the 1" lead and connect the lead to lug 7 of relay RY1 (NS). Connect the other resistor lead to terminal strip EB lug 1 (S-2). Provide at least 1/8" clearance between the resistor lead and relay lug #9.

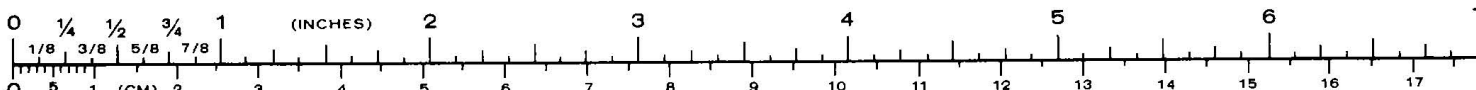
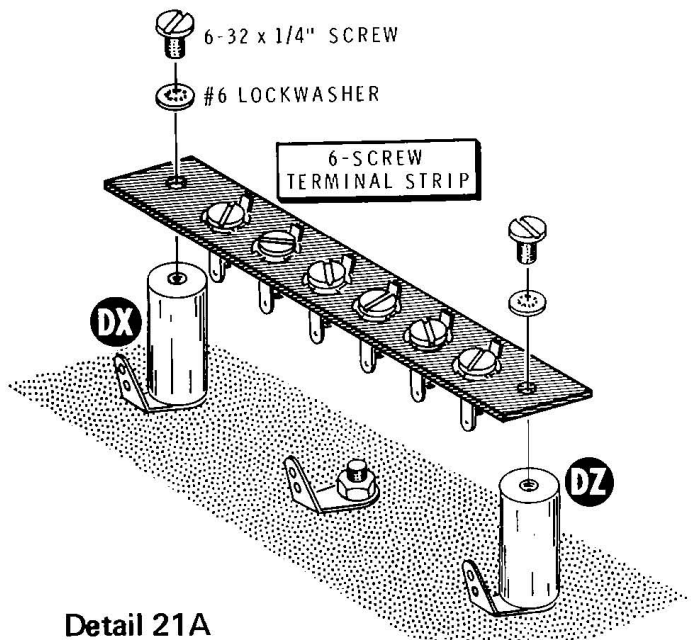


- () Refer to Detail 20A-1 and form a 1-1/2" length of bare wire so it will fit between lugs 1 and 3 of relay RY1. Solder the wire to each lug. Cut off any excess wire which protrudes down toward the relay lugs immediately below.

- () Prepare the following lengths of wire:
 - 9" white 5-1/2" large brown (stranded)
 - 13" white
- () Solder a female connector to one end of a 9" white wire.
- () Connect the other end of the wire to relay RY1 lug 11 (NS).
- () Connect the red wire coming from switch SW2 to relay RY1 lug 11 (NS).
- () Connect one end of a 13" white wire to relay RY1 lug 12 (NS). Push the other end of this wire down through grommet EC.
- () Connect one end of a 5-1/2" large brown (stranded) wire to the solder lug under the spacer at DX (NS).

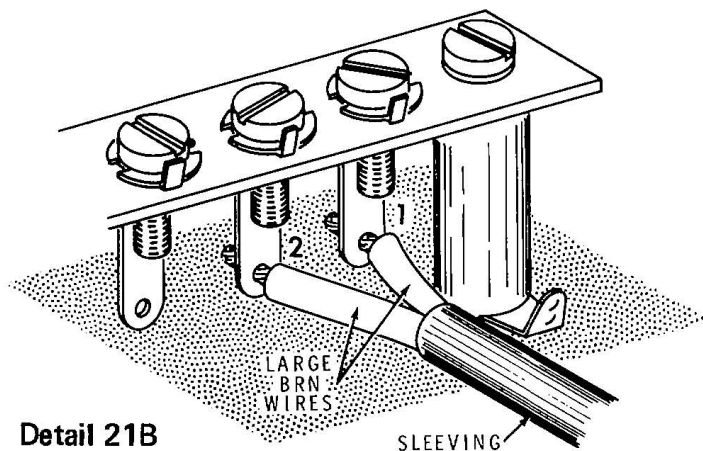
Refer to Pictorial 20B (fold-out from Page 48) for the following two steps.

- () D17: Refer to Detail 20B and place a 1" length of small black sleeving on each lead of a 1N2071 diode (#57-27). Connect the lead at the banded end of the diode to lug 12 of relay RY1 (NS). Position the diode back of the relay and connect the other lead to lug 11 (NS).
- () R23: Place a 1-1/4" length of small black sleeving on each lead of a 1500 Ω , 10-watt resistor. Position the resistor above relay RY1 and connect it to relay lugs 12 (NS) and 11 (S-4).



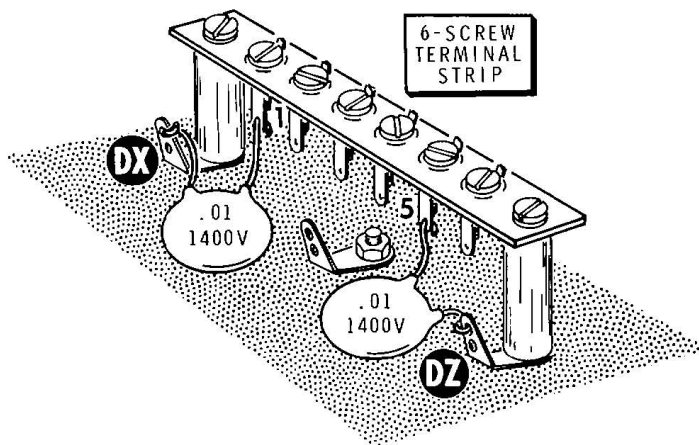
Refer to Pictorial 21 for the following steps.

- () Refer to Detail 21A and install a 6-screw terminal strip on the two phenolic spacers. Use 6-32 x 1/4" screw and #6 lockwashers.
- () Cut a 20-1/2" and a 19" large brown (stranded) wire. DO NOT remove any insulation yet. Insert these wires into a 16" length of large black sleeving. Then remove 1/4" of insulation from the ends of each wire and melt a minimum amount of solder on the small strands at the wire ends.



Detail 21B

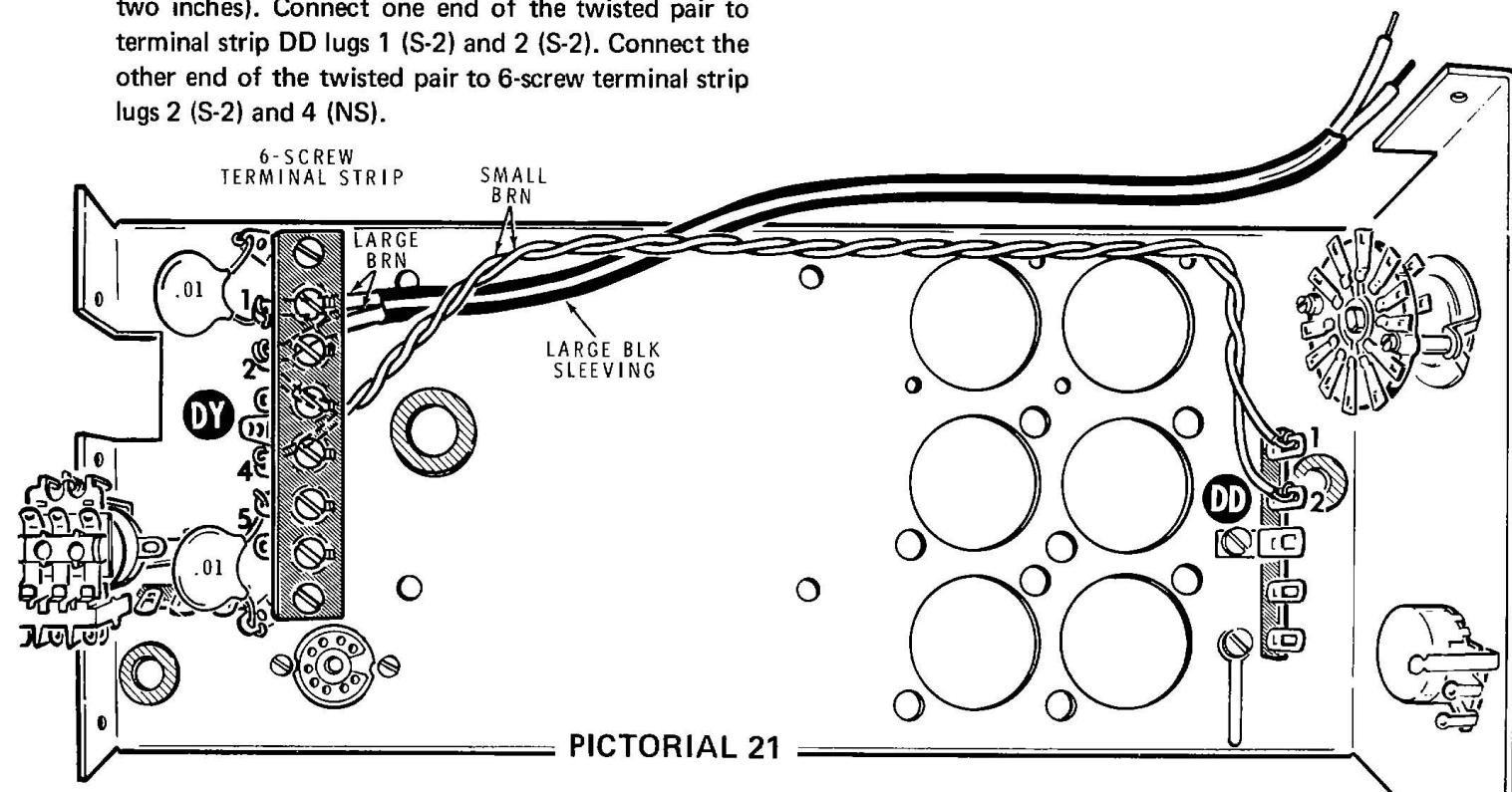
- () Refer to Detail 21B and connect one end of the pair of large brown (stranded) wires to 6-screw terminal strip lugs 1 (NS) and 2 (NS).
- () Prepare a 17" and a 16" small brown (tinned) wire and form a twisted pair (approximately one turn in two inches). Connect one end of the twisted pair to terminal strip DD lugs 1 (S-2) and 2 (S-2). Connect the other end of the twisted pair to 6-screw terminal strip lugs 2 (S-2) and 4 (NS).



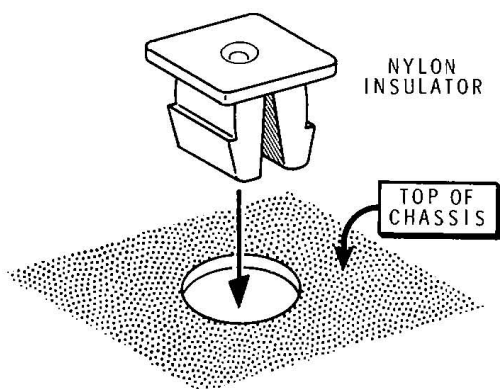
Detail 21C

Refer to Detail 21C for the following two steps.

- () C1: Connect a .01 μ F, 1400 volt disc capacitor (#21-70) between 6-screw terminal strip lug 1 (S-2) and solder lug DX (S-2).
- () C2: Connect a .01 μ F, 1400 volt disc capacitor between 6-screw terminal strip lug 5 (NS) and solder lug DZ (S-1).



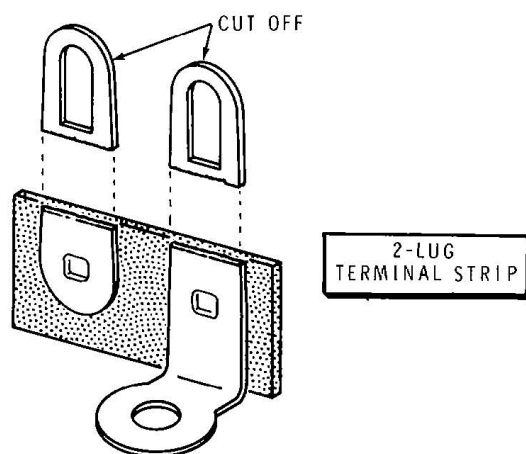
PICTORIAL 21



Detail 22A

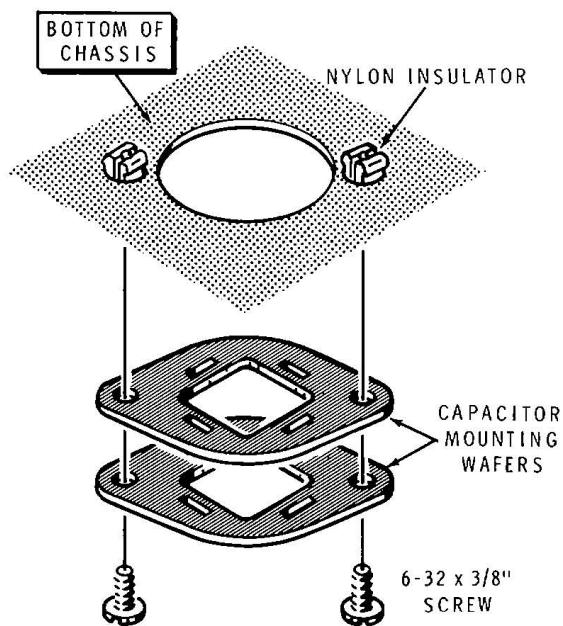
Refer to Pictorial 22 (fold-out from Page 59) for the following steps.

- () Refer to Detail 22A and, from the top of the chassis, press eight nylon insulators into the holes in the power supply chassis at DF, DG, DH, DJ, DK, DL, DM, and DN. Push the insulators down against the chassis as far as they will go.



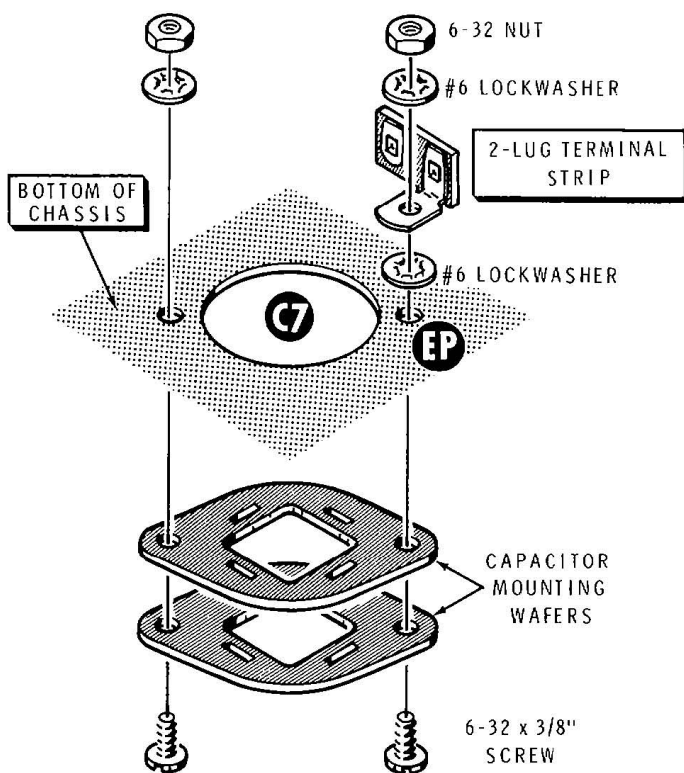
Detail 22C

- () Refer to Detail 22C and cut off the lugs of a 2-lug terminal strip as shown.



Detail 22B

- () Refer to Detail 22B and, on the top of the chassis, install two capacitor mounting wafers at each of holes C3, C4, C5, and C6. Use 6-32 x 3/8" screws. Turn the screws into the nylon insulators.



Detail 22D

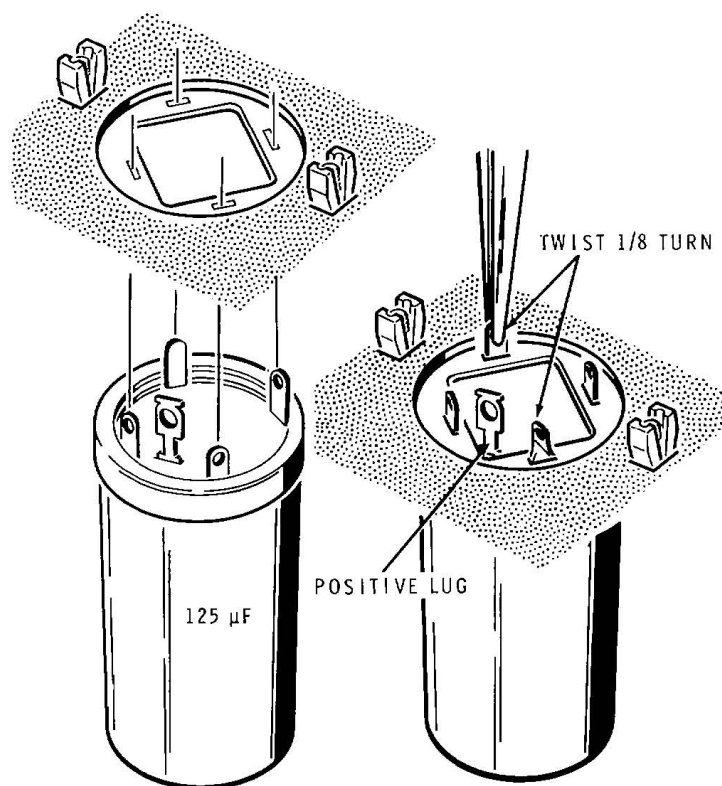


- () Refer to Detail 22D and install two capacitor mounting wafers at C7. Mount the 2-lug terminal strip under the chassis at EP. Use 6-32 x 3/8" screws, #6 lockwashers, and 6-32 nuts.

- () Install two capacitor mounting wafers at hole C8. Use 6-32 x 3/8" screws, #6 lockwashers, and 6-32 nuts.

CAUTION: The filter capacitors in the high voltage circuit will be wired next. To avoid difficulty later, be sure to review each step a second time to make sure there are no wiring errors.

- () C3, C4, C5, C6, C7, C8: Refer to Detail 22E and install six 125 μ F electrolytic capacitors in the six mounting locations. Be sure to position the positive lug of each capacitor as shown in Detail 22F. Note carefully for each capacitor which lugs are twisted to hold the capacitor to the wafer. Use pliers to twist each lug about one-eighth turn.



Detail 22E

- () R3, R4, R5, R6, R7, R8: Refer to Detail 22F and install a 100 k Ω , 2-watt (brown-black-yellow) resistor on the bottom of each filter capacitor. Solder the six

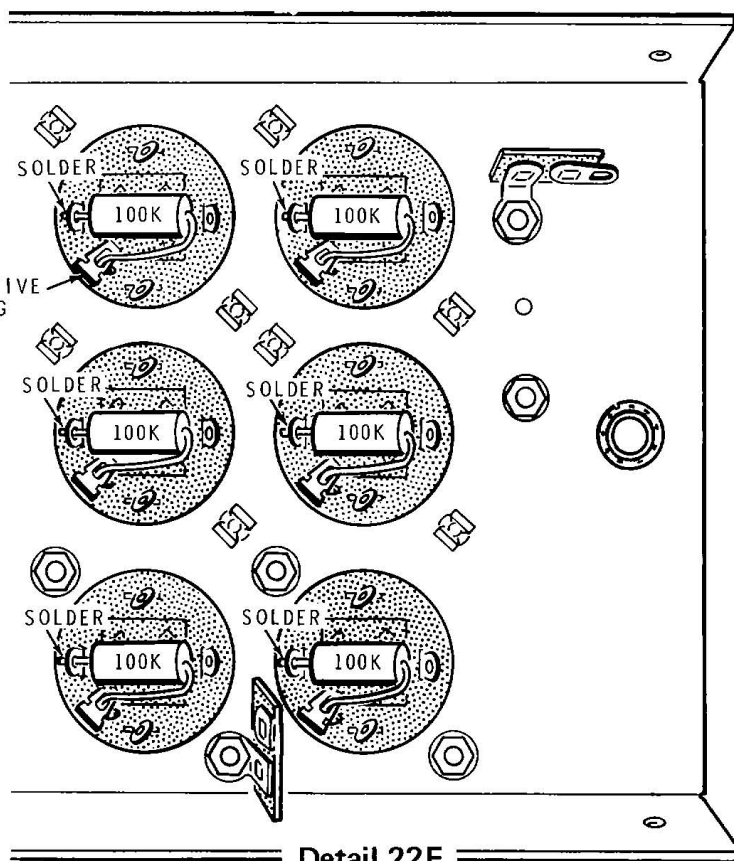
connections marked "solder" in the Detail. Bend the longer lead as closely as possible to the body of the resistor to provide as much clearance as possible from the negative capacitor lug. Position the resistor in the square wafer opening.

- () Prepare the following lengths of large blue wire:

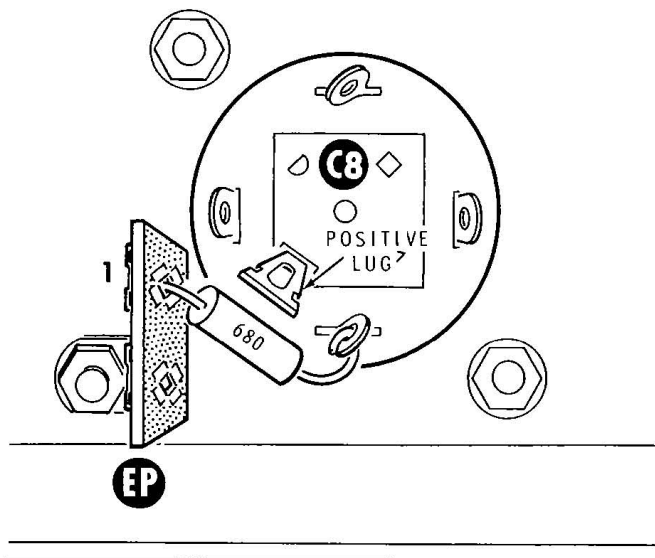
1-1/2"	3"
3-1/4"	1-1/2"
1-1/2"	

Connect these large blue wires between capacitors as follows.

- () 1-1/2" from C3 (S-1) to C4 (S-2).
- () 3-1/4" from C4 (S-1) to C5 (S-2).
- () 1-1/2" from C5 (S-1) to C6 (NS).
- () 3" from C6 (S-1) to C7 (S-2).
- () 1-1/2" from C7 (S-1) to C8 (S-2).



Detail 22F

**Detail 22G**

- () R11: Refer to Detail 22G and connect a 680 Ω (blue-gray-brown-gold) resistor from terminal strip EP, the lower hole of lug 1 (NS), to a mounting lug of C8 (S-1). Provide clearance as shown between this resistor and the positive lug of C8.
- () Connect the white-black wire coming from grommet DC to terminal strip EP, the lower hole of lug 1 (S-2).
- () R9: Cut one lead of a 1 Ω , 5-watt, 1% resistor to 1-1/4". Place a 1" length of small black sleeving on this lead and connect the lead to C8 lug ER (NS). Connect the other lead to terminal strip EP, the lower hole of lug 2 (S-1).

- () Prepare a 15" length of white-black wire and solder a female connector to one end. From the top of the chassis, push the other end of the wire down through grommet DC and connect it to C8 lug ER (S-2).
- () Start with the step for mounting the six filter capacitors and Detail 22F, and check every connection for accuracy and for compliance with the solder instructions. Check the position of the positive lug of each capacitor.
- () Connect the red wire coming from grommet DC to terminal strip DE lug 1 (NS).
- () Remove another 1/4" of insulation from the white-yellow wire coming from grommet DC. Connect this wire to socket EA, through lug 9 (S-2) to lug 8 (S-1).
- () Prepare a 26" white-red wire and solder a female connector to one end. From the top of the chassis, push the free end down through grommet DC.
- () At the free end of the white-red wire, remove an additional 1/4" of insulation. Connect this end of the wire to socket EA, through lug 4 (S-2) to lug 3 (NS).
- () Prepare a 17" black wire. Connect one end of this wire to socket EA, lug 3 (S-2). Push the other end of this wire up through grommet EC.

ASSEMBLED CHASSIS

Refer to Pictorial 23 for the following steps.

- () Place the power supply chassis alongside the RF enclosure as shown. As you position the power supply chassis, start the two brown wires in the black sleeving and the four wires with the female connectors (red,

yellow, violet, and white-red) through grommet BN into the RF enclosure. Check for any wires which might be pinched between the chassis and enclosure. Then fasten the two assemblies together with 6-32 x 3/8" screws, #6 lockwashers, and 6-32 nuts at holes BH, BK, and BP. At hole BR, use 6-32 x 3/8" hardware and a #8 long lug.

