knight-kits

Allied knight®-kit
50-WATT TRANSMITTER
83 YX 255
T-50

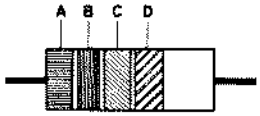
ALLIED RADIO
CORPORATION
100 N. WESTERN AVE. • CHICAGO 80, ILL. HAYMARKET 1-6800

38K095
750012C-13-AP-558

CAPACITOR AND RESISTOR COLOR CODE

RESISTOR-MICA CAPACITOR COLOR CODE				
Color	Significant Figures	Multiplier	Tolerance %	Voltage Rating*
Black	0	1	±20*	—
Brown	1	10	±1*	100
Red	2	100	±2*	200
Orange	3	1,000	±3*	300
Yellow	4	10,000	±4*	400
Green	5	100,000	±5*	500
Blue	6	1,000,000	±6*	600
Violet	7	10,000,000	±7*	700
Gray	8	100,000,000	±8*	800
White	9	—	±9*	900
Gold	—	.1	±5	1,000
Silver	—	.01	±10	2,000
None	—	—	±20	500

*Applies to capacitors only



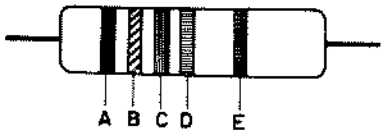
HOW TO DETERMINE THE VALUE OF A RESISTOR

A — First significant figure (digit) of resistance in ohms.
B — Second significant figure.
C — Decimal multiplier (number of zeros to be added).
D — Tolerance of resistor in percent. No color is 20%.

EXAMPLE:

A resistor has the following color bands: A, yellow; B, violet; C, yellow; and D, silver. The significant figures are 4 and 7 (47) and the multiplier is 10,000. The value of resistance is 470,000 ohms and the tolerance is ±10%.

TUBULAR PAPER CAPACITOR COLOR CODE				
Color	Significant Figures	Decimal Multiplier	Tolerance %	Voltage Rating (v d-c)
Black	0	1	±20	—
Brown	1	10	—	100
Red	2	100	—	200
Orange	3	1,000	±30	300
Yellow	4	10,000	—	400
Green	5	—	—	500
Blue	6	—	—	600
Violet	7	—	—	700
Gray	8	—	—	800
White	9	—	—	900
Gold	—	—	—	1,000
Silver	—	—	±10	—

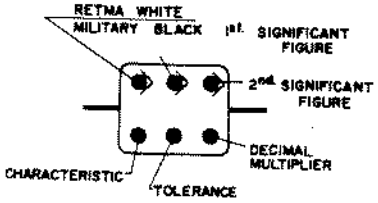


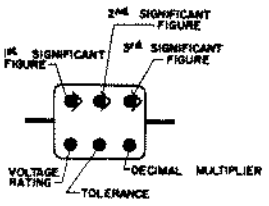
HOW TO DETERMINE THE VALUE OF A PAPER TUBULAR CAPACITOR

A — First significant figure (digit) of capacitance in μμf.
B — Second significant figure.
C — Decimal multiplier (number of zeros to be added).
D — Tolerance of capacitor in percent.
E — Voltage rating.

EXAMPLE:

A paper tubular capacitor has the following color bands: A, brown; B, green; C, orange; D, black; and E, yellow. The significant figures are 1 and 5 (15) and the decimal multiplier is 1,000. The value of capacitance is 15,000 μμf. The tolerance is ±20%. The voltage rating is 400 V DC.





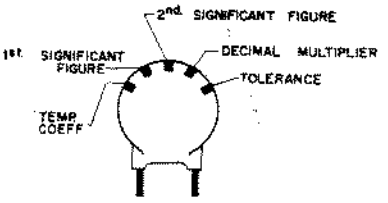
HOW TO DETERMINE THE VALUE OF A MICA CAPACITOR

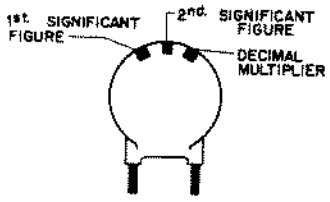
EXAMPLES:

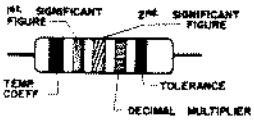
A capacitor with a 6 dot code (new RETMA standard REC-115A and military MIL-C-5A) has the following markings. Top row, left to right, white, green, brown; bottom row, right to left, brown, red, red. The first color white indicates mica. The significant figures are 5 and 1 (51), and the decimal multiplier is 10. So the capacitance is 510 μμf. Tolerance is ±2%. For most general applications the characteristic can be ignored.

A capacitor with a 6 dot code has the following markings: Top row, left to right, brown, orange, red; bottom row, right to left, brown, red, green. Since the first dot is neither black or white, this is the obsolete RETMA code. The significant figures are 1, 3, and 2 (132), and the decimal multiplier is 10. So the capacitance is 1320 μμf. Tolerance is ±2%. Voltage rating is 500 V DC.

CERAMIC CAPACITOR COLOR CODE					
Color	Significant Figures	Decimal Figures	Tolerance		Temp. Coef. (Parts per million per °C.)
			10μμf or less (μμf)	Over 10μμf (%)	
Black	0	1	±2.0	±20	0
Brown	1	10	±0.1	±1	−33
Red	2	100	—	±2	−75
Orange	3	1,000	—	±2.5	−150
Yellow	4	10,000	—	—	−220
Green	5	—	±0.5	±5	−330
Blue	6	—	—	—	−470
Violet	7	—	—	—	−750
Gray	8	0.01	±0.25	—	+150 to −1500
White	9	0.1	±1.0	±10	+100 to −750
Gold	—	—	—	—	—







HOW TO DETERMINE THE VALUE OF A CERAMIC CAPACITOR

EXAMPLES:

A ceramic tubular capacitor has the following color bands: Black, red, red, red, green. The significant figures are 2 and 2 (22), and the decimal multiplier is 100. The capacitance is, therefore, 2200 μμf. Tolerance is ±5%. Temperature coefficient is 0. Voltage rating is always 500 V.

A ceramic disc capacitor has the following 5-dot code: Red, brown, green, red, green. The significant figures are 1 and 5 (15), and the decimal multiplier is 100. The capacitance is, therefore, 1500 μμf. The tolerance is ±5%. The temperature coefficients — 75. Voltage rating is always 500 V.

A ceramic disc capacitor has the following 3-dot code: Green, brown, brown. The significant figures are 5 and 1 (51), and the decimal multiplier is 10. Therefore, the capacity is 510 μμf. Voltage rating is always 500 V and the tolerance is always — 0.

THE KNIGHT 50-WATT TRANSMITTER

SPECIFICATIONS

Output Frequencies . . 3.5— 4 mc
7.0— 7.3 mc
14.0—14.3 mc
21.0—21.5 mc
27.0—27.2 mc
28.0—29.7 mc

Power Input to Final Amplifier . . . 50 watts minimum on all bands.

Frequency Control . . Quartz crystal or external VFO.

Output Circuit . . . . . Pi-network, capable of matching unbalanced loads between 50 and 1200 ohms. Will tune out large amounts of reactance. Connection to the output is through an SO-239 type coaxial connector.

Tubes . . . . . 6AG7 crystal oscillator-multiplier (buffer-multiplier when VFO used) 807 power amplifier 5U4G rectifier.

Modulation . . . . . Provision is made for the connection of an external modulator.

VFO Operation . . . . . The KNIGHT 50-Watt Amateur Transmitter may be controlled by any VFO supplying 8 to 10 volts across 22,000 ohms, and delivering output in the 160, 80, or 40 meter bands. The KNIGHT VFO is ideally suited.

TVI Reduction . . . . . The transmitter is completely shielded by its cabinet, with firm metal-to-metal seals provided at all metal junctions. The chassis is well bonded to both front and rear of the cabinet, thus assuring minimum harmonic radiation. Filtering and bypassing of AC and keying leads is provided, and generous bypassing of the meter and heater circuits is included.

Cabinet Size . . . . . 10½" long by 8½" high by 8¼" deep.

HOW TO BUILD THE KNIGHT 50-WATT TRANSMITTER

The KNIGHT 50-Watt Transmitter is a complete, self-contained crystal-controlled CW transmitter. It has a final amplifier power input of 50 watts on the 80, 40, 20, 15, 11, and 10 meter amateur bands. The various bands are selected by means of a bandswitch. The pi-network output circuit in the amplifier stage permits matching a wide variety of antennas and feed lines. The pi-network also provides a considerable degree of harmonic attenuation, to aid in the reduction of TVI (Television Interference).

The KNIGHT 50-Watt Transmitter has features which appeal to the novice as well as the experienced amateur. The 50-watt power is more than adequate for world-wide contacts. Changing bands has been reduced to simply turning the bandswitch, resonating two circuits, and adjusting the loading. Band changing is thus a matter of a few seconds. There are no coils to change.

Before starting to build your KNIGHT Transmitter check each part against the Parts List on page 20. If you are unable to identify some of the parts by sight, locate them on the pictorial diagrams. Capacitor and resistor values, if not printed on the part, can be found with the aid of the Color Code Chart.

Hardware is listed in the last part of the Parts List. To keep our kits at the lowest possible price, we frequently weigh hardware rather than count it. Therefore, do not be concerned if more nuts and machine screws for example, are supplied than are specified in the Parts List.

The only tools required for building your KNIGHT Transmitter are: Long-nose pliers, diagonal cutters, screwdriver, set-screw driver, and a soldering iron. A good set of tools is listed at the end of the Parts List.

Study the pictorial diagrams and note how the parts are mounted. These pictorial diagrams show the actual location of all parts and wiring. The schematic diagram shows how the parts are connected electrically and is helpful in understanding how the circuits work.

The step-by-step instructions were prepared by a skilled technician while he was actually building the KNIGHT Transmitter. Therefore, they are the best and fastest way of assembling this transmitter. We suggest that you read through the instructions BEFORE you build the transmitter. This will help you to familiarize yourself with the procedure and avoid possible errors. We recommend using the ☐ to check off each step after it is completed.

Each step is clearly illustrated on an accompanying line drawing. Some builders prefer to cross out each wire and component on the drawings with a colored pencil after it is installed. While an excellent way to avoid mistakes, and highly recommended by us, this procedure results in drawings that are difficult to reuse. For this reason each wiring view is reproduced on a separate, folded sheet of paper.

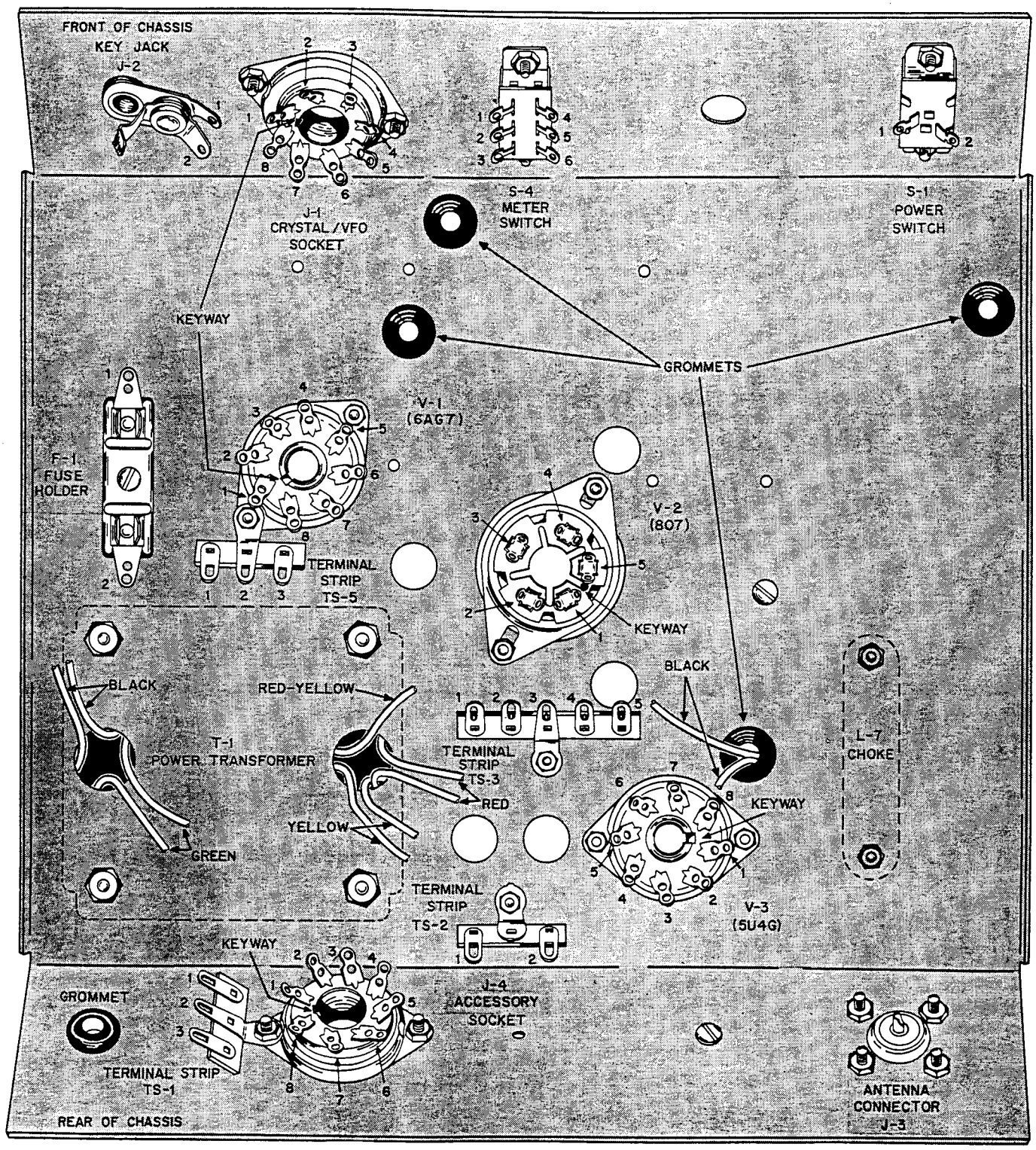


FIGURE 1. MOUNTING THE PARTS UNDERNEATH THE CHASSIS

MECHANICAL ASSEMBLY

MOUNTING THE PARTS ON THE CHASSIS

SEE FIGURE 1.

☐ Insert a rubber grommet in each of the five holes marked "GROMMET" on Figure 1. Grommets are installed by squeezing them into place.

☐ Install J-3, the coaxial cable receptacle, from outside the rear of the chassis, in the hole with four small holes around it. Use four thin 4-36x3/8" screws and four matching nuts to fasten J-3.

NOTE: There are only six, 5/16" long 6-32 screws supplied. These six screws will be used in the next few steps.

☐ Attach the fuse holder, inside the chassis, using one 6-32x5/16" screw and a matching nut.

☐ From inside the back of the chassis, put a 6-32x 5/16" screw through the hole beside J-3. Put a lockwasher and hex nut on the screw outside the chassis and tighten the nut.

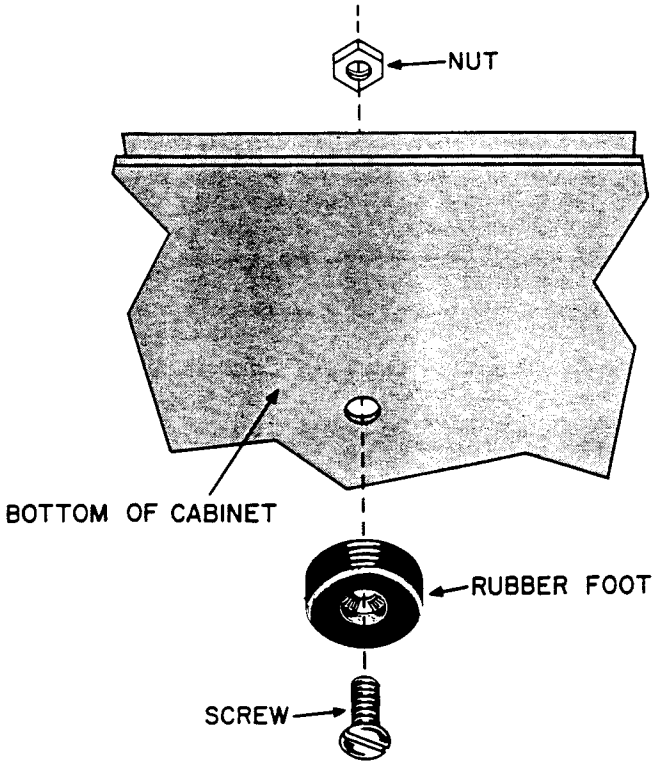


FIGURE 2. HOW TO MOUNT THE RUBBER FEET ON THE CABINET

☐ As shown in Figure 2, put a 6-32x5/16" screw through the large hole in each of the four rubber cabinet feet so the screw head fits into the large hole. Push the protruding threaded ends of the screws through the bottom of the cabinet and fasten them with hex nuts inside the cabinet.

☐ From inside the rear of the chassis, mount J-4, one of four 8-pin sockets, in the large hole. Use two 6-32x1/4" screws and nuts to fasten J-4. The keyway, or notch in the large center hole must be toward the grommet. Fasten TS-1, a 3-terminal strip, with the J-4 mounting screw next to the grommet. A lockwasher is used between the chassis and socket under the nut mounting TS-1 and J-4.

☐ Fasten V-3, an 8-pin socket, with two 6-32x1/4" screws and matching nuts, in the hole near the rear center of the chassis. The keyway must be away from the two large holes next to the socket. A solder lug is attached on top of the chassis under the V-3 mounting screw near the grommet. Use a lockwasher, next to the chassis, under the nut that fastens the solder lug.

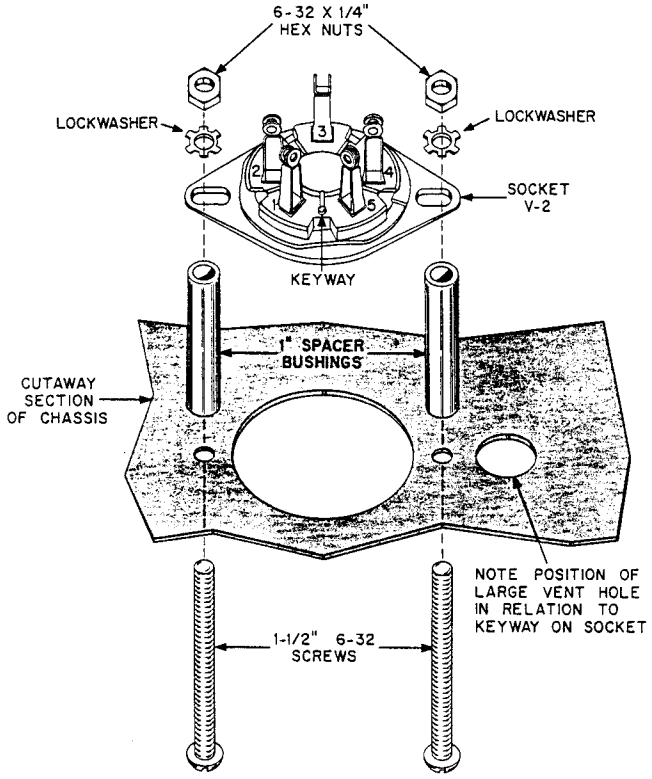


FIGURE 3. HOW TO MOUNT V-2

☐ V-2 is a ceramic 5-pin socket. The keyway of this socket is a raised dot. The keyway must be positioned toward the rear of the chassis. As shown in Figure 3, put the two 6-32x1½" screws thru the holes in the chassis from the top. Place the two 1" spacer bushings on the screws and then put the socket on the two screws. Put a lockwasher on each screw and tighten two 6-32 nuts on them.

☐ Install V-1, an 8-pin socket, with two 6-32x1/4" screws and nuts in the hole near the fuse holder. The keyway must be toward the rear of the chassis. Fasten TS-5, a 3-terminal strip with the V-1 mount-

ing screw and nut nearest to the fuse block. Use a lockwasher next to the chassis under the nut holding TS-5.

☐ Mount TS-2, a 2-terminal strip, with a 6-32x¼" screw and nut.

☐ Mount TS-3, a 5-terminal strip, with a 6-32x¼" screw, a lockwasher next to the chassis, and a nut.

☐ Mount J-1, an 8-pin socket, in the large round hole on the front of the chassis with two 6-32x¼" screws and nuts. The keyway must be positioned away from the center of the chassis.

☐ Mount S-4, the 6-terminal slide switch, in the rectangular hole in the front center of the chassis with two 6-32x¼" screws and nuts.

☐ Mount S-1, the 2-terminal slide switch, in the remaining rectangular hole in the front of the chassis with two 6-32x¼" screws and nuts. This switch must be positioned so that the center terminal is away from the open side of the chassis.

☐ T-1 is the large transformer. Referring to Figure 1, locate the position in which T-1 is mounted on top of the chassis. Begin mounting T-1 by pushing the two green and two black wires through the large hole near the corner of the chassis. Push the two yellow, two red and the red-yellow wires through the other hole. Fasten T-1 with four 8-32x¼" screws through the top of the chassis; put a lockwasher on each screw before tightening the nuts.

☐ Referring to Figure 1, locate the position for mounting L-7, the filter choke, on top of the chassis. The side with the wires must be toward the grommet. Fasten L-7 with two 6-32x¼" screws, lockwashers, and nuts. Push the two wires through the grommet.

☐ Mount J-2, a phone jack, in the round hole next to J-1. Use a ⅜" hex nut to retain J-2. Position the terminals as shown in Figure 1.

ATTACHING THE FRONT PANEL TO THE CHASSIS

SEE FIGURE 4.

☐ From the outside of the front panel, put the pilot light jewel through the round hole between the two small rectangular holes near the bottom. Fasten it with a large $\frac{7}{16}$" hex nut.

☐ Fit the front panel to the chassis. The threaded bushing on the pilot light jewel fits through the one open hole on the front of the chassis. The switch buttons fit through the rectangular holes in the panel. Put a flat washer and a nut on the bushing of J-2. Put the pilot light socket on the

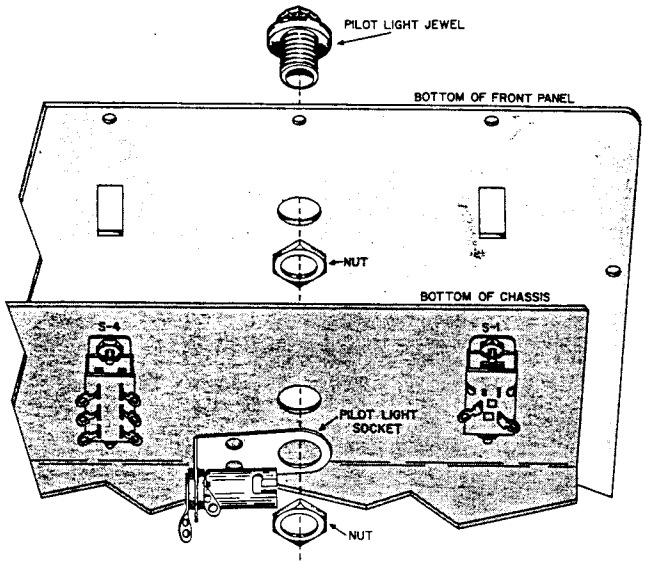


FIGURE 4. HOW TO ATTACH THE FRONT PANEL TO THE CHASSIS

pilot light jewel and fasten it with a large hex nut. See Figure 13 for the position of the pilot light socket.

MOUNTING PARTS ON TOP OF THE CHASSIS

SEE FIGURE 6.

☐ Install S-3, the 2-section ceramic bandswitch, in the hole just below the very large round hole in the center of the front panel. Position the terminals as shown in Figure 6. Use a large lockwasher on the back of the panel, a large flat washer on the front of the panel and a large hex nut to fasten S-3.

NOTE: There are two large coils wound on ceramic forms supplied with the kit. Coil L-2 has 5 terminals and coil L-6 has 6 terminals.

☐ Prepare L-6, the 6-terminal coil, for installation by attaching the spade screws as shown in Figure 5. Note that the flat side of the spade screws must be against the coil. On a 6-32x1½" screw put a solder lug, a spade screw, and a fiber washer. Push the screw through the holes in the coil from the side opposite the terminals. On the threaded end

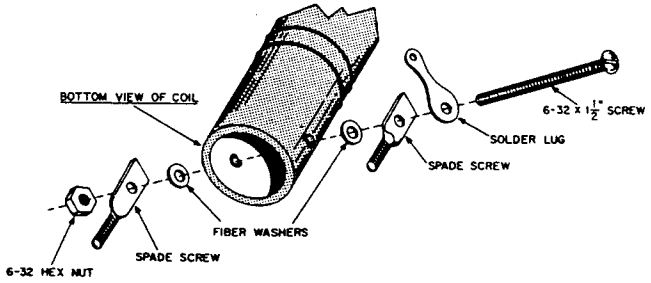


FIGURE 5. MOUNTING L-2 AND L-6

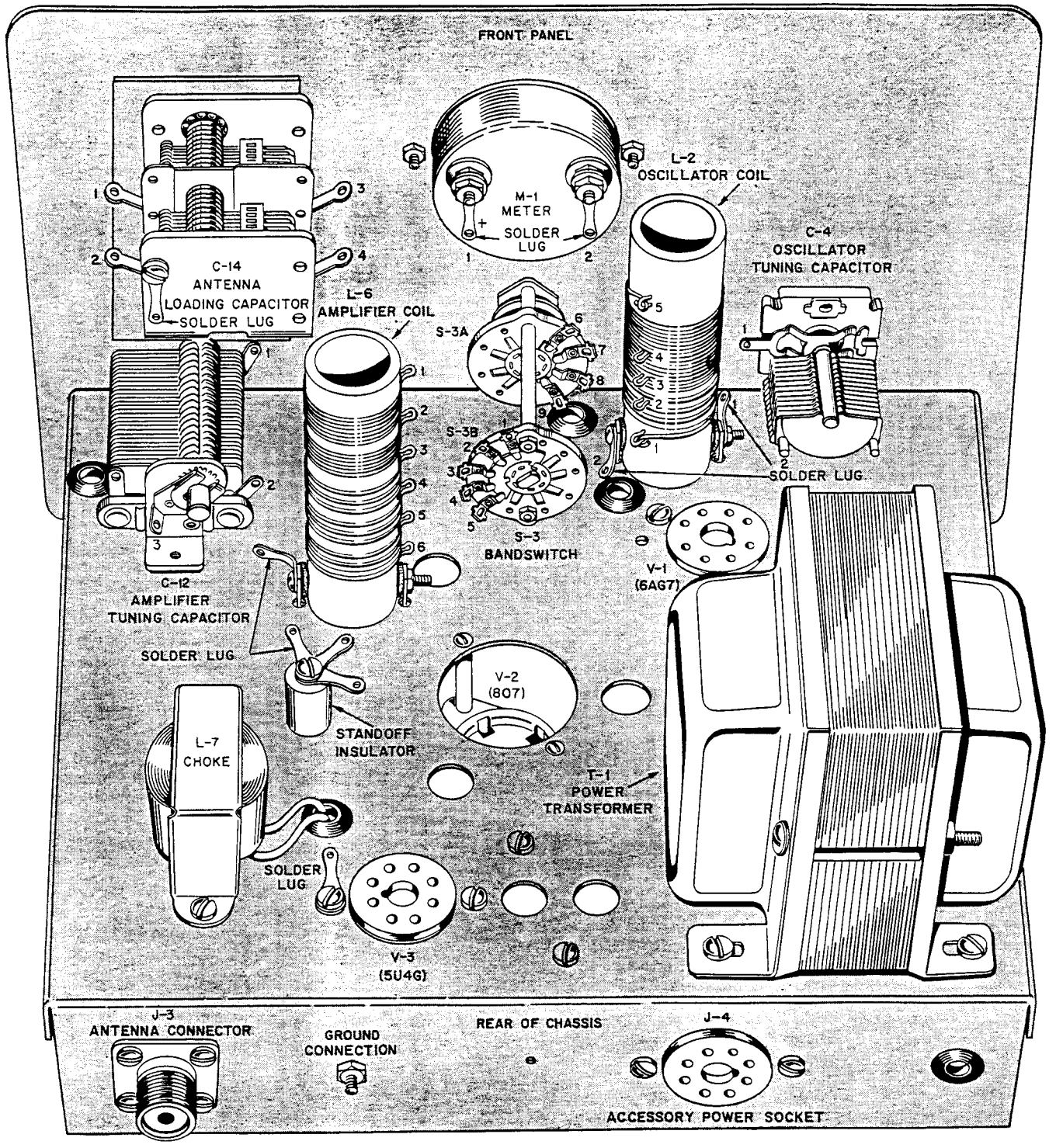


FIGURE 6. MOUNTING THE PARTS ON TOP OF THE CHASSIS

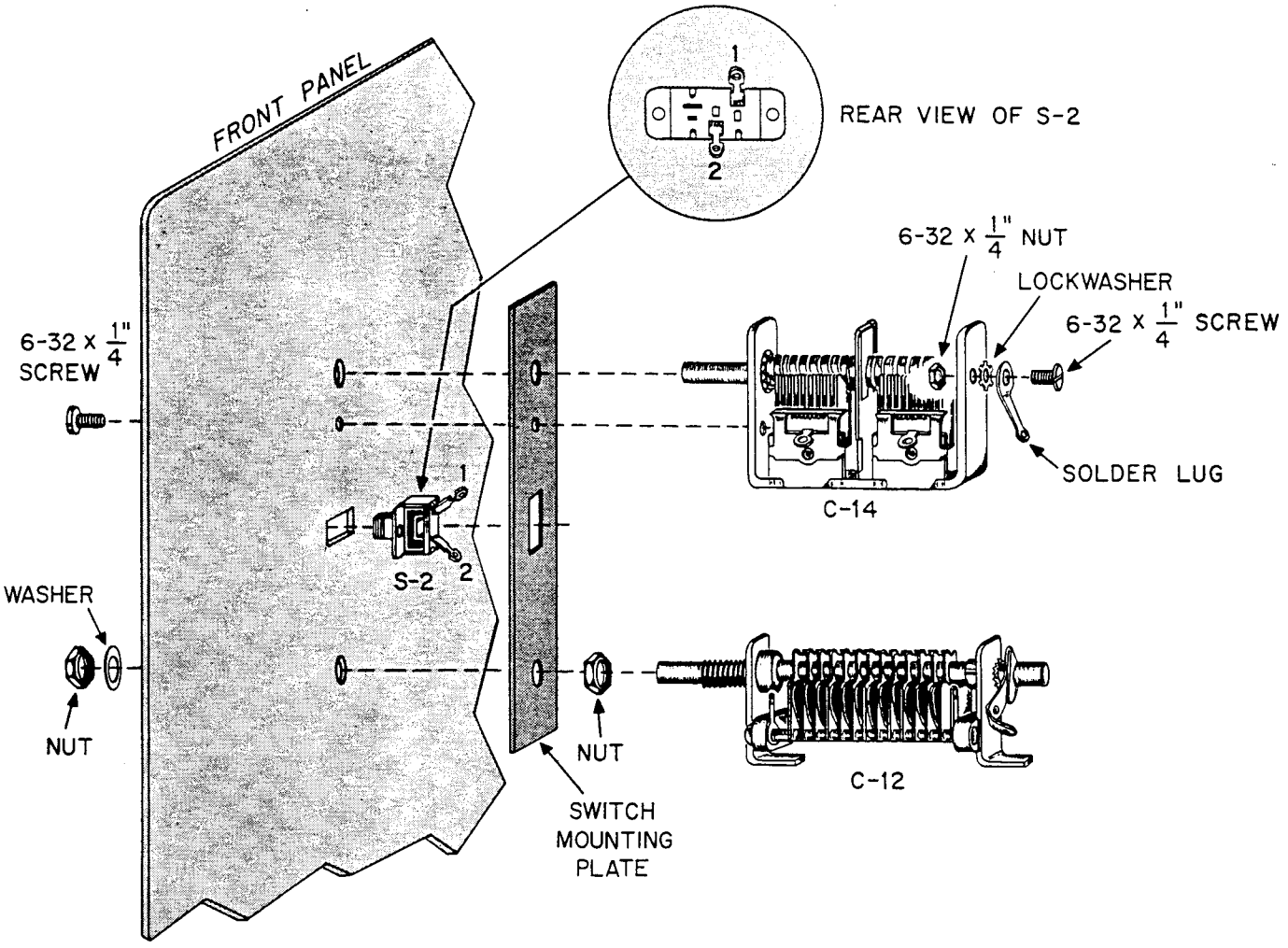


FIGURE 7. HOW TO MOUNT C-14, S-2 AND C-12

of the screw put a fiber washer, a spade screw and a 6-32 nut. **CAUTION: This nut must be fastened carefully. If it is tightened too much the coil form may break.**

☐ Mount L-6 by putting the two spade screws through the holes in the chassis as shown in Figure 6. Put a lockwasher on both spade screws under the chassis. Put a solder lug on the spade screw nearest to V-2. Fasten the coil with two 6-32 nuts.

☐ Attach spade screws to L-2 in the same way they were fastened to L-6 (see Figure 5) except that two solder lugs are used, one on each side.

☐ Mount L-2 in the position shown in Figure 6. Put a small lockwasher on both spade screws under the chassis and a solder lug on the spade screw near the two grommets. Fasten the spade screws with two 6-32 hex nuts.

There are three tuning capacitors supplied with the kit. The capacitor with two separate sections of plates is C-14. The longer of the two other capacitors is C-12. The shorter is C-4.

☐ Study Figure 7. Mount C-14, C-12, S-2 and the switch mounting plate as shown in Figure 7. Note that the terminals of S-2 are positioned toward the center of the chassis.

☐ Put a hex nut seven full turns over the threaded shaft bushing of C-4. Put the shaft of C-4 through the hole in the front panel above J-2. Put a flat washer on the shaft of C-4. Tighten another hex nut on C-4 to fasten it.

☐ Mount the ¾" ceramic standoff insulator with a 6-32x¼" screw up through the chassis. The insulator mounting hole is located between L-6 and L-7.

☐ Put three solder lugs on a 6-32x¼" screw and screw it into the top of the insulator. Do not fasten this screw more than "finger" tight.

☐ Mount a solder lug on the back of C-14 using a lockwasher, one 6-32x¼" screw, and a matching nut. See Figure 7 for the location.

☐ Mount M-1, the indicating meter, in the large hole in the center of the front panel. Use two 4-36x⅜" screws and matching nuts to mount M-1.

☐ Remove a nut from each terminal on M-1. Put a solder lug on each terminal, position them downward, and replace each nut.

WIRING AND SOLDERING

How well electronic equipment works will often depend upon the quality of workmanship used in its construction. For this reason the following suggestions are given. These wiring and soldering hints are mainly for the beginner in electronics, however, even the advanced enthusiasts may benefit from a brief review.

The insulated wire furnished with this kit is cut to length and the ends are stripped. Each different colored wire is a different length, therefore, be sure to use the color specified in each of the wiring steps.

A long piece of bare wire is included. Whenever it is necessary to use some of it, the exact length of the piece required is given.

The flexible tubing supplied is called "spaghetti". Spaghetti is used to cover the bare end leads of some of the components and portions of some of the bare wires where there is danger they will touch other bare wires or the chassis.

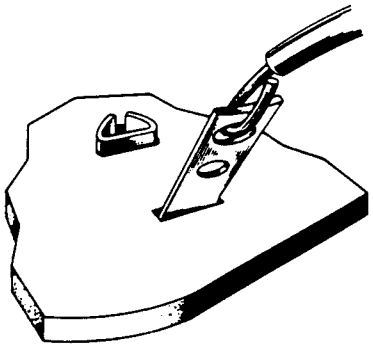


FIGURE 8. HOW TO CONNECT A WIRE TO A TERMINAL

The proper way to connect a wire or lead to a solder terminal is shown in Figure 8. To insure a good mechanical connection, squeeze the wire against the terminal with your long nose pliers after it has been hooked on. Make sure the wire leads and terminals are clean before connecting them. If necessary, scrape them with a pocket knife until any foreign substance, such as wax is removed. Be extremely careful not to nick the wire with the knife, or it may break when it is bent.

Unless otherwise stated, all the leads on the resistors, capacitors, and transfromer should be as short as possible. Figure 9 illustrates the best way to connect a component. As shown, the end leads should be pulled through the terminals so that the parts are tightly mounted. After a lead is pulled through a terminal, bend it around the terminal and cut off the excess wire.

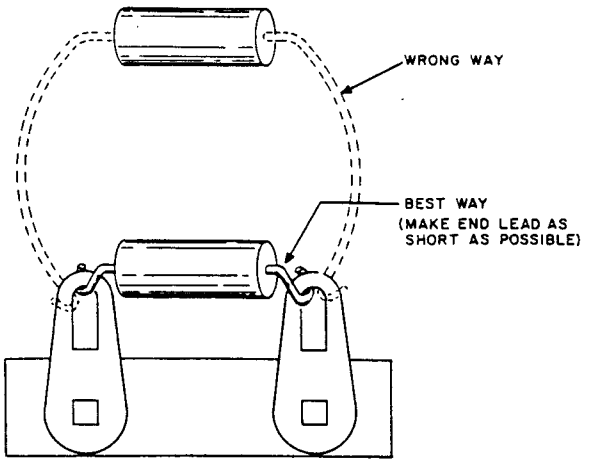


FIGURE 9. THE BEST WAY TO CONNECT A COMPONENT

USE ONLY ROSIN CORE SOLDER

USE THE ROSIN CORE SOLDER SUPPLIED WITH THE KIT. KITS SOLDERED WITH ACID CORE SOLDER, ACID FLUX, OR WITH IRONS CLEANED ON A SAL AMMONIAC BLOCK WILL SOON CORRODE AND WILL NOT WORK LONG. SUCH KITS ARE NOT ELIGIBLE FOR REPAIR OR SERVICE.

Before soldering, the tip of your soldering iron must be properly tinned. To do this, clean the surfaces of the tip with steel wool, or a fine file, until the bright copper surface is exposed. Plug the iron in and allow it to heat until it melts solder. Apply solder to the tip until it is well covered with a thin coat. Wipe off the excess solder with a rag. The tip should now be shiny. Re-tin the tip whenever it becomes covered with a layer of scale.

Before soldering a connection be sure the iron is hot enough to melt solder. Preheat the **connection** by holding the tip of the iron against the joint to be soldered. After the joint is heated, apply solder to the joint, **not** to the iron tip. Use only enough solder to fill the crevices and cover all of the wire and the terminal. Do not solder any connection until told to do so.

Right after a connection is soldered it should **not** be jiggled or moved until the solder has a chance to cool and "set". If a soldered connection is disturbed before it has cooled it will have a frosty appearance. This condition is called a "cold solder joint". A cold solder joint is not strong and may crumble apart. If you should accidentally make a cold solder joint, reheat it with your soldering iron and add a very small amount of fresh solder.

After you have soldered a connection, push any insulation or spaghetti as close to the connection as possible. This will prevent close connections from touching one another and causing a short.

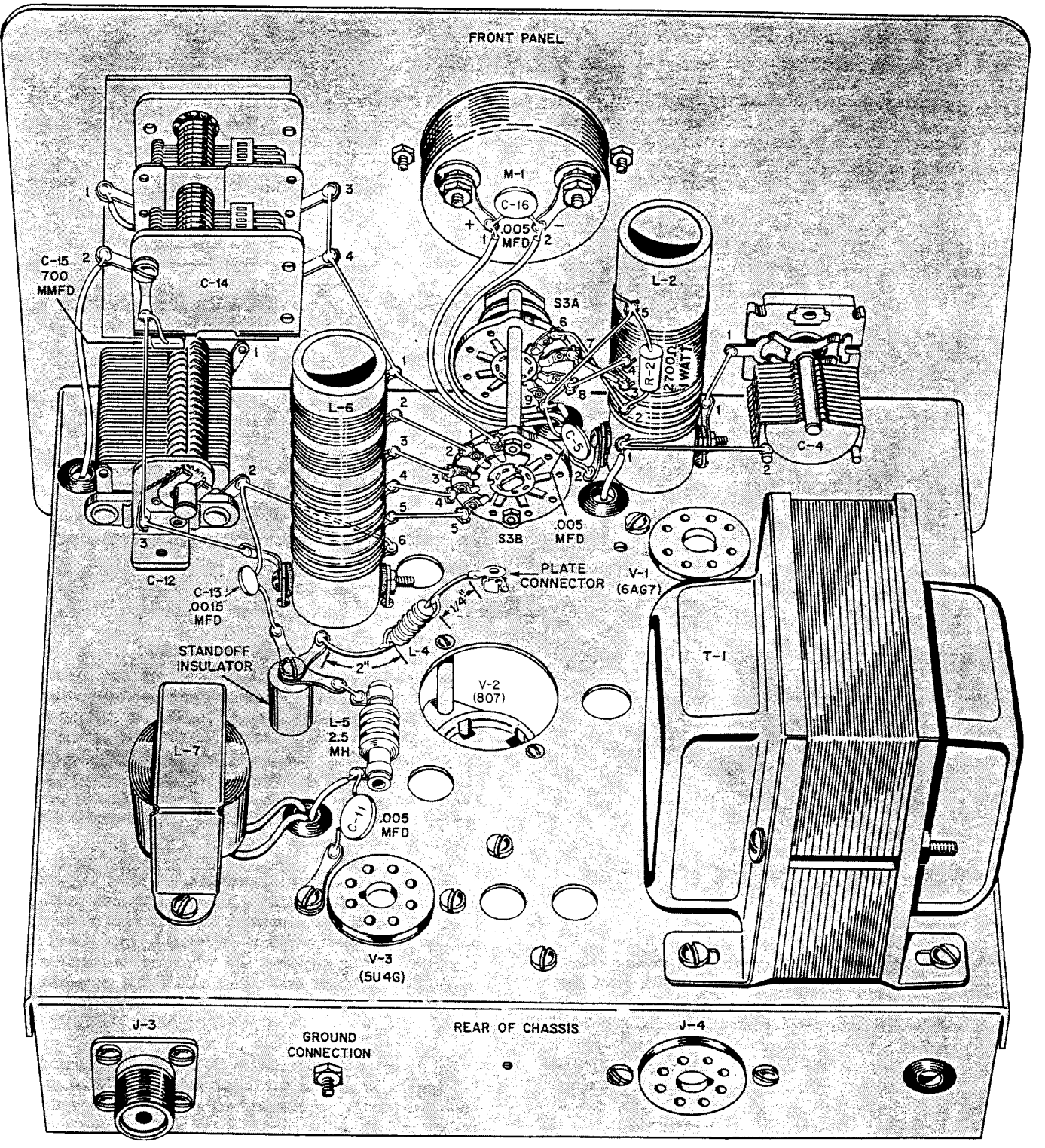


FIGURE 10. WIRING THE TOP OF THE CHASSIS

When wiring the contacts of switches, be careful not to bend the switch contacts; this will reduce the spring pressure of the contacts.

You are now ready to wire your KNIGHT Transmitter. Remember, ***use only rosin core solder.***

WIRING ON TOP OF THE CHASSIS

SEE FIGURE 10.

☐ Connect, but do not solder, one lead of C-16, a .005 MFD disc capacitor, to either solder lug on M-1. Connect, but do not solder, the other lead of C-16 to the other solder lug of M-1.

☐ Solder a blue wire to the terminal of M-1 **not** marked "+". Push the other end of this wire through the grommet which is almost directly below M-1. Turn the chassis over and solder the blue wire to terminal 2 of S-4, which is in the center of the front of the chassis.

☐ Solder another blue wire to the terminal of M-1 marked "+". Push this blue wire through the same grommet as the other wire. The other end will be connected later.

☐ Connect, but do not solder, a gray wire to terminal 9 of S-3A (the BAND switch). Push the free end of this wire down through the grommet just below terminal 9 of S-3A where it will be connected later.

WARNING: The wiring from the BAND switch, S-3, to the coils, L-2 and L-6, must be as short and straight as possible.

☐ Connect, but do not solder, one lead of C-5, a .005 disc capacitor, to terminal 9 of switch S-3A. Solder the other lead of C-5 to solder lug 2 at the bottom of coil L-2.

☐ Solder a 1¾" bare wire to terminal 7 of S-3A. Put a ¾" piece of spaghetti on this wire. Solder the other end of this wire to terminal 3 of L-2.

☐ Solder a 1¾" bare wire to terminal 6 of S-3A. Connect, but do not solder, the other end of this wire to terminal 2 of L-2.

☐ Solder a 2⅛" bare wire to terminal 8 of S-3A. Solder the other end of this wire to terminal 4 of L-2.

☐ Solder a 3½" bare wire to terminal 9 of S-3A. Connect, but do not solder, the other end of this wire to terminal 5 of L-2.

☐ Solder one lead of R-2, a large 1-watt 2700 ohm resistor, with the color stripes red, violet, and red, to terminal 5 of L-2. Solder the other lead of R-2 to terminal 2 of L-2.

☐ Solder a 2⅛" bare wire to terminal 2 of C-4, the ceramic insulated capacitor next to L-2. Connect, but do not solder, the other end of this wire to terminal 1 of L-2.

☐ Solder one end of a yellow wire to terminal 1 of L-2. Push the other end of this wire down through the grommet just below terminal 1 of L-2. This end will be connected later.

☐ Solder one end of a 1" bare wire to terminal 1 of C-4. Solder the other end of this wire to solder lug 1 on L-2.

☐ Solder a 2" bare wire to terminal 6 of coil L-6. Connect, but do not solder, the other end of this wire to terminal 2 of C-12, the large ceramic insulated capacitor near L-6.

☐ Solder a 1¾" bare wire to terminal 5 of L-6. Solder the other end of this wire to terminal 5 of S-3B.

☐ Solder a 2" bare wire to terminal 4 of S-3B. Solder the other end of this wire to terminal 4 of L-6.

☐ Solder a 2" bare wire to terminal 3 of S-3B. Solder the other end of this wire to terminal 3 of L-6.

☐ Solder a 2½" bare wire to terminal 2 of S-3B. Solder the other end of this wire to terminal 2 of L-6.

☐ Connect the following terminals together with a 4½" bare wire in the order given: terminal 1 of S-3B, terminal 1 of L-6, terminal 4 of C-14 and terminal 3 of C-14. Solder each terminal.

☐ Solder a white-brown wire to terminal 2 of C-14. Push the other end of this wire through the grommet directly below it in the chassis.

☐ Connect the following terminals together with a 4¾" bare wire: The solder lug at the base of L-6 terminal 3 of C-12, and the solder lug screwed on the back of C-14. Solder only the first two terminals.

☐ As shown in Figure 11, (see next page) solder one lead of C-15, a 700 MMFD mica capacitor, to terminal 1 of S-2. Solder the other lead of C-15 to the solder lug on the back of C-14.

☐ As shown in Figure 11, solder one end of a red wire to terminal 2 of S-2. Solder the other end of this wire to terminal 1 on C-14.

☐ Solder one lead of C-13, a .0015 MFD disc capacitor, to terminal 2 of C-12. Solder the other lead of C-13 to the closest solder lug on top of the standoff insulator.

L-3 and L-4 are identical parasitic chokes. They are slightly over ½" long in the body and have about 8 turns of wire wound on them.

☐ Cut one lead of L-4 to ¾". Solder this lead to the metal plate connector so that there is ¼" spacing between the end of the coil and the connector. Leave the other lead full length. Solder it to the closest empty solder lug on top of the standoff insulator.

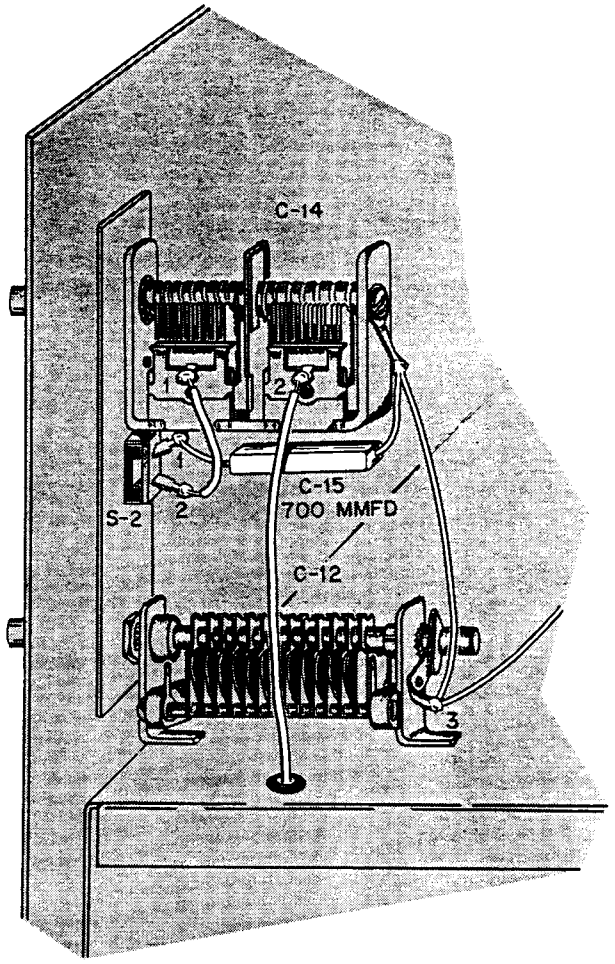


FIGURE 11. HOW TO WIRE C-15

L-5 is a 2.5 millihenry radio-frequency choke. It s easily identified by its four separate windings.

☐ Pull one lead of L-5 as close as possible to the remaining empty solder lug on the standoff insulator. Solder this lead of L-5. Make a small hook in the other lead of L-5 as close to the body of the choke as possible and cut off the excess lead.

☐ Solder one lead of C-11 (make these connections as close as possible), a .005 disc capacitor, to the solder lug near V-3. Connect, but do not solder, the other lead of C-11 to the hook on L-5.

☐ Solder an orange wire to the hook on L-5. Push the other end of this wire through the grommet next to L-7.

INSTALLING THE SHIELD PARTITION

☐ As shown in Figure 12, install the shield partition. Note that a solder lug and terminal strip TS-4 are mounted with the shield fastening nuts. The spade screws must be attached to the sides of the shield as illustrated in Figure 12.

WIRING THE CHASSIS

SEE FIGURE 13.

☐ Solder the short black wire from T-1, the power transformer, to terminal 1 of F-1, the fuse holder.

☐ Solder the long black wire from T-1 to terminal 2 of S-1.

☐ Solder either red wire from T-1 to pin 6 of V-3.

☐ Solder the other red wire from T-1 to pin 4 of V-3.

☐ Solder either yellow wire from T-1 to pin 2 of V-3.

☐ Connect, but do not solder, the other yellow wire from T-1 to pin 8 of V-3.

☐ Connect, but do not solder, either black wire coming through the grommet near L-7, the power supply choke, to pin 8 of V-3.

☐ Connect, but do not solder, the red-yellow wire from T-1 to terminal 3 of TS-3 (the terminal strip between V-2 and V-3).

☐ Connect, but do not solder, either green wire from T-1 to pin 2 of J-4, the accessory power socket.

☐ Connect, but do not solder, the other green wire from T-1 to pin 1 of J-4.

☐ Connect, but do not solder, the remaining black wire in the grommet near L-7 to terminal 1 of TS-3.

☐ Connect, but do not solder, the orange wire in the grommet near L-7 to terminal 5 of TS-3.

☐ Solder the long white-brown wire in the grommet near S-1 to the center terminal of J-3.

☐ There are one gray and two blue wires in the grommet near S-4. One blue wire is already soldered to terminal 2 of S-4. Solder the remaining blue wire to terminal 5 of S-4.

☐ Connect, but do not solder, the gray wire in the grommet near S-4 to terminal 1 of TS-3.

☐ Connect, but do not solder, the yellow wire in the grommet near V-1 to pin 8 of V-1.

☐ Solder a blue wire to pin 2 of J-4. Connect, but do not solder, the other end to pin 7 of V-1.

☐ Solder a blue wire to pin 7 of V-1. Route this wire **under** the gray wire that goes to terminal 1 of TS-3. Connect, but do not solder, it to pin 1 of V-2.

☐ Solder a brown wire to pin 5 of J-4. Connect, but do not solder, the other end to terminal 2 of J-2.

☐ Solder a brown wire to terminal 1 of S-1. Route this wire under the gray wire coming from the grommet near S-4. Connect, but do not solder, the other end to terminal 1 of TS-5.

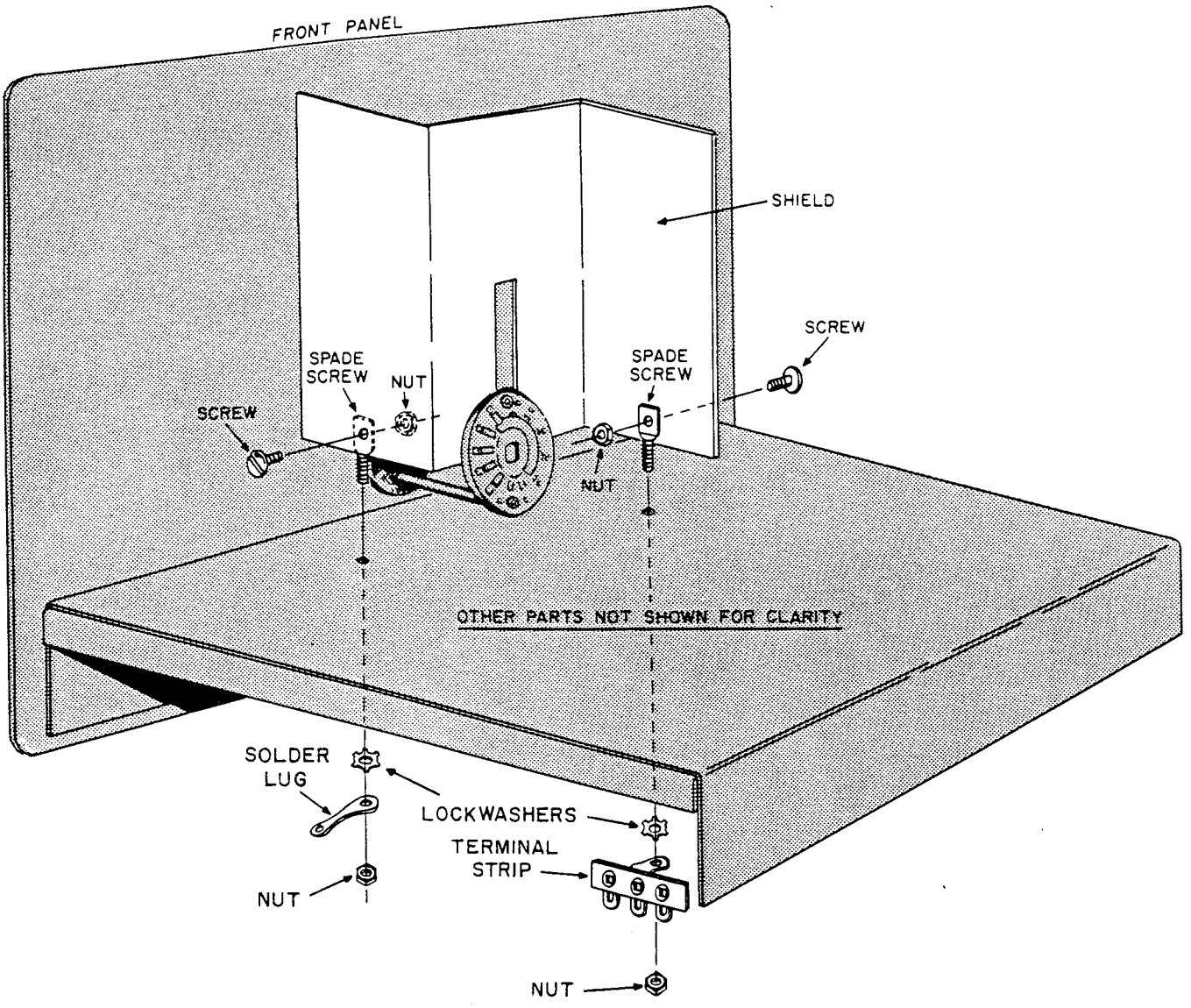


FIGURE 12. HOW TO INSTALL THE SHIELD

☐ Solder a green wire to pin 6 of J-4. Route this wire down close to the chassis and **under** the two red and two yellow wires from T-1. Connect, but do not solder, the other end to terminal 1 of TS-3.

☐ Connect, but do not solder, a blue wire to pin 7 of J-4. Route this wire down close to the chassis and **under** the transformer leads. Connect, but do not solder the other end to terminal 4 of TS-3.

☐ Connect, but do not solder, a blue wire to terminal 1 of TS-2. Route this wire **under** the leads of T-1. Connect, but do not solder, the other end to pin 6 of V-1.

☐ Connect, but do not solder, an orange wire to pin 7 of J-1. Connect, but do not solder, the other end to pin 4 of V-1.

☐ Solder a 2″ bare wire from pin 5 to pin 7 of J-1.

☐ Solder an orange wire to terminal 3 of S-4. Connect, but do not solder, the other end to terminal 1 of TS-4.

☐ Solder a red wire to the solder lug on the chassis between J-1 and S-4. Connect, but do not solder, the other end to terminal 6 of S-4.

☐ Solder a red wire to terminal 6 of S-4. Solder the other end to terminal 1 of the pilot light socket.

☐ Connect, but do not solder, a yellow wire to pin 5 of V-1. Connect, but do not solder, the other end to pin 4 of V-2.

☐ Solder a blue wire to terminal 2 of the pilot light socket. Connect, but do not solder, the other end to pin 1 of V-2.

☐ Connect, but do not solder, one lead of C-21, a .005 MFD disc capacitor, to terminal 2 of J-2. Connect, but do not solder, the other lead to terminal 1 of J-2.

☐ Solder a 1½″ bare wire to terminal 1 of J-2. Solder the other end to pin 1 of J-1.

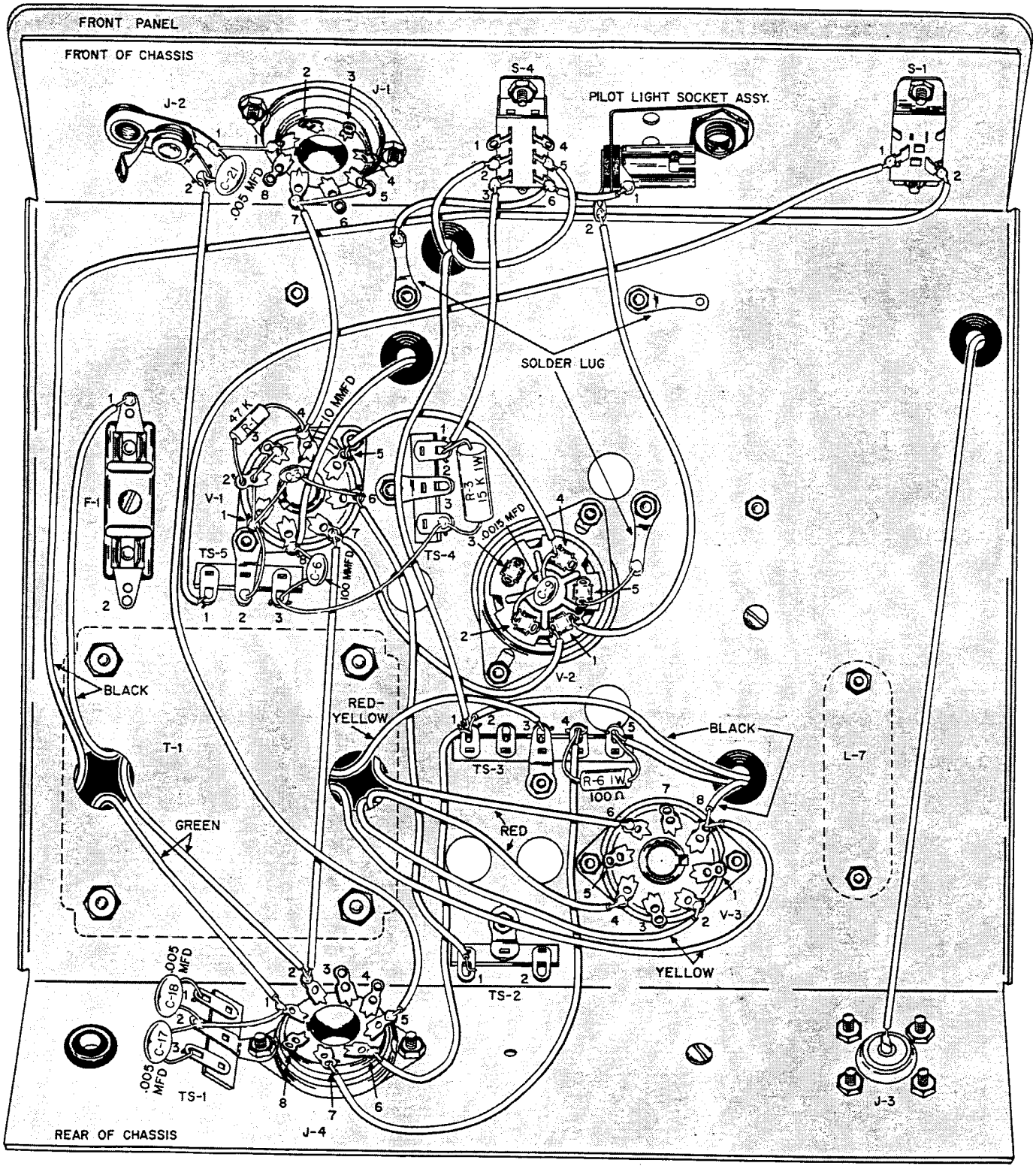


FIGURE 13. FIRST UNDER CHASSIS WIRING VIEW

☐ Solder one lead of R-1, a 47K ohm resistor (yellow, violet, orange), to pin 4 of V-1. Connect, but do not solder, the other lead to pin 2 of V-1.

☐ Pass a 1¾" piece of bare wire through terminal 2 of TS-5, and pins 1, 2, and 3 of V-1. Solder terminal 2 of TS-5 and pin 3 of V-1 only.

☐ Solder one lead of C-3, a 10 MMFD disc capacitor, to pin 1 of V-1. Connect, but do not solder, the other end to pin 6 of V-1.

☐ Solder one lead of C-6, a 100 MMFD disc capacitor, to pin 8 of V-1. Connect, but do not solder, the other lead to terminal 3 of TS-5.

☐ Connect, but do not solder, one end of a 2" bare wire to terminal 3 of TS-5. Connect, but do not solder, the other end to terminal 3 of TS-4.

☐ Solder one lead of R-3, a large 1-watt 15K ohm resistor (brown, green, orange), to terminal 3 of TS-4. Connect, but do not solder, the other lead to terminal 1 of TS-4.

☐ Solder one end of a 2" bare wire to the solder lug near V-2. Connect, but do not solder, the other end to pin 5 of V-2.

☐ Connect, but do not solder, one lead of C-9, a .0015 MFD disc capacitor, to pin 4 of V-2. Connect, but do not solder, the other lead to pin 2 of V-2.

☐ Connect, but do not solder, one lead of R-6, a 1-watt 100 ohm resistor (brown, black, brown), to terminal 5 of TS-3. Connect, but do not solder, the other lead of R-6 to terminal 4 of TS-3.

☐ Solder one end of a 1½" bare wire to pin 1 of J-4. Connect, but do not solder, the other end to terminal 2 of TS-1.

☐ Connect, but do not solder, one lead of C-18, a .005 MFD disc capacitor, to terminal 1 of TS-1. Connect, but do not solder, the other lead to terminal 2 of TS-1.

☐ Solder one lead of C-17, a .005 MFD disc capacitor, to terminal 2 of TS-1. Connect, but do not solder, the other lead to terminal 3 of TS-1.

SEE FIGURE 14.

☐ Connect, but do not solder, one lead of R-7, a 100 ohm 1-watt resistor (brown, black, brown), to terminal 5 of TS-3. Connect, but do not solder, the other lead to terminal 4 of TS-3.

☐ Connect, but do not solder, one end of a 1½" bare wire to terminal 1 of TS-2. Connect, but do not solder, the other end to terminal 2 of TS-2.

☐ Solder one lead of R-9, a 10-watt 25K ohm resistor, to terminal 2 of TS-2. Solder the other lead to terminal 3 of TS-3.

☐ Solder one lead of R-8, a 10-watt 20K ohm resistor, to terminal 1 of TS-2. Connect, but do not solder, the other lead of R-8 to terminal 1 of TS-3.

☐ Put a 1" piece of spaghetti on both leads of R-5, a 10-watt 20K ohm resistor. Solder one lead to pin 7 of J-4. Solder the other lead to pin 2 of V-2.

☐ Solder a white wire to terminal 1 of S-4. Solder the other end to terminal 5 of TS-3.

☐ Solder a white wire to terminal 4 of S-4. Solder the other end to terminal 4 of TS-3.

In the following two steps two capacitors are connected. Be sure that these parts are mounted as close as possible to the terminals. The leads should not be more than ⅛" long between the capacitors and the terminals.

☐ Connect, but do not solder, one lead of C-10, a .005 MFD disc capacitor, to pin 5 of V-2. Solder the other lead to pin 1 of V-2.

☐ Solder one lead of C-8, a .01 MFD disc capacitor, to pin 5 of V-2. Solder the other lead to pin 4 of V-2.

☐ Connect, but do not solder, one lead of R-4, a 1000 ohm resistor (brown, black, red), to terminal 2 of TS-4. Connect, but do not solder, the other lead to terminal 1 of TS-4.

☐ Solder one lead of C-7, a .005 MFD disc capacitor, to terminal 2 of TS-4. Solder the other lead to terminal 1 of TS-4.

☐ Solder one lead of C-2, a .01 MFD disc capacitor, to terminal 2 of V-1. Connect, but do not solder, the other lead to pin 5 of V-1.

There are three identical small coils (about ⅝" long in the body and with approximately 30 turns of wire) supplied with this kit. These coils are identified as L-1, L-8 and L-9.

☐ Solder one lead of L-1, a small coil, to terminal 2 of J-2. Solder the other lead to pin 5 of V-1.

☐ Solder one lead of C-1, a .001 MFD disc capacitor, to pin 3 of J-1. Solder the other lead to pin 6 of V-1.

Note that the two identical electrolytic capacitors, C-19 and C-20, have one end identified as "POSITIVE" or "+". The other is the negative end.

☐ Put a 2¾" piece of spaghetti on the positive end lead of C-20, an 8 MFD 700 V electrolytic capacitor. Solder the spaghetti covered lead to terminal 1 of TS-3. Connect, but do not solder, the other lead to the solder lug near the pilot light socket.

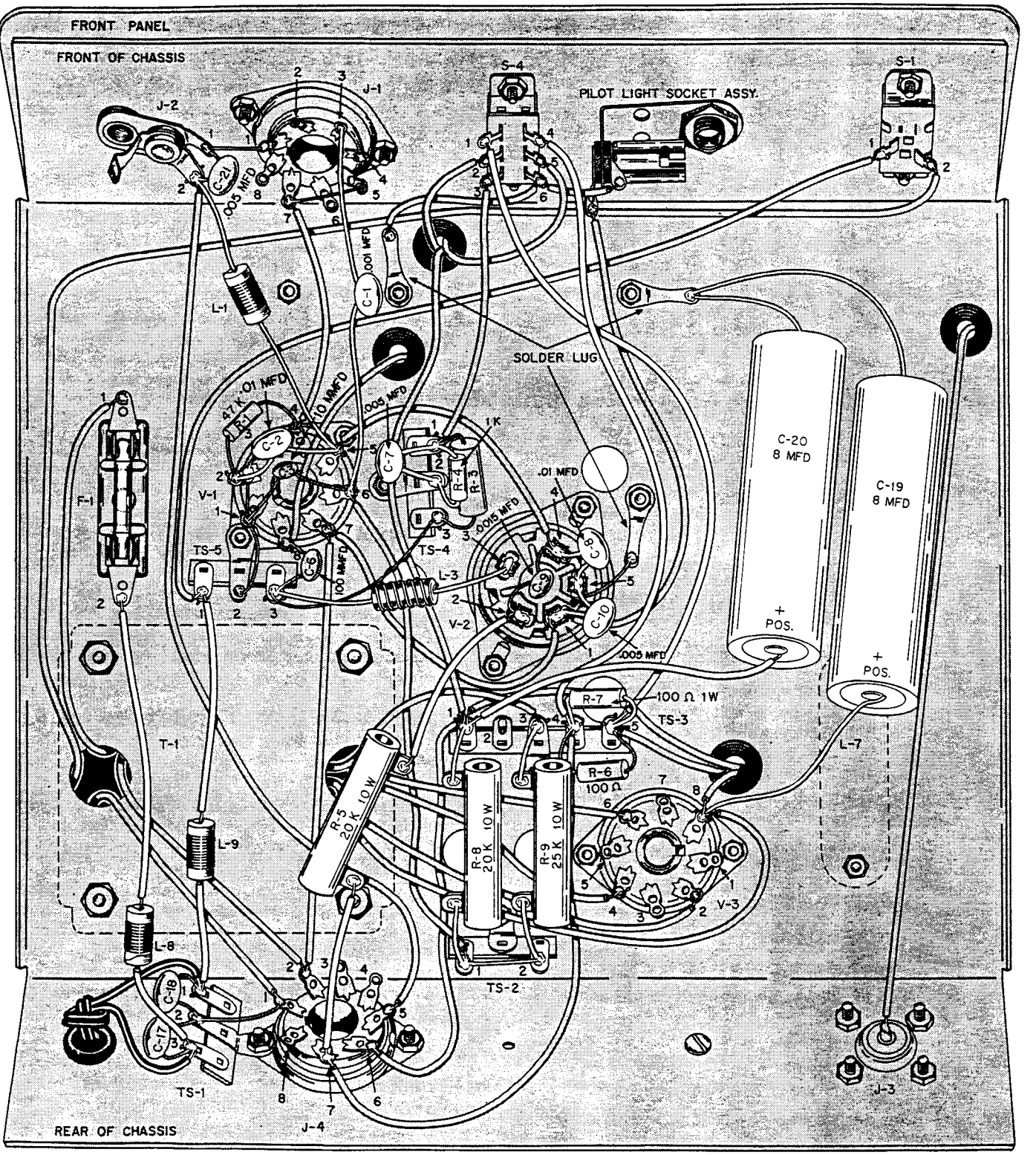


FIGURE 14. FINAL UNDER CHASSIS WIRING VIEW

☐ Solder the positive end lead of C-19, an 8 MFD 700 V electrolytic capacitor, to pin 8 of V-3. Solder the other lead to the solder lug near the pilot light.

☐ Solder one lead of L-3, a parasitic choke, to terminal 3 of TS-5. Solder the other lead to pin 3 of V-2.

CAUTION: NEVER TOUCH ANY PART OF THE WIRING WHILE THIS TRANSMITTER IS PLUGGED INTO A POWER OUTLET. NEVER USE OR TEST THE TRANSMITTER ON OR NEAR A GROUNDED METAL BENCH, RADIATOR, SINK, OR OTHER GROUNDED METAL OBJECT.

☐ From the outside, put the bare end leads of the line cord through the grommet in the rear of the chassis. On the inside of the chassis tie a knot in the line cord 2¼" from the bare ends. Split the two leads back to the knot. Connect, but do not solder, one line cord lead to terminal 1 of TS-1. Connect, but do not solder, the other lead to terminal 3 of TS-1.

☐ Put a ¾" piece of spaghetti on one lead of L-9, a small coil about ⅜" long in the body. Solder the spaghetti covered lead of L-9 to terminal 1 of TS-1. Put a 2¾" piece of spaghetti on the other lead. Solder it to terminal 1 of TS-5.

☐ Put a ⅞" piece of spaghetti on one lead of L-8. Solder this lead to terminal 3 of TS-1. Put a 2" piece of spaghetti on the other lead of L-8. Solder this lead to terminal 2 of the fuse holder.

WIRING THE ACCESSORY PLUG

☐ Clamp the plug, P-1, in the position shown in Figure 15 (if you use a vise be careful not to break the plastic). "Tin" the inside of pins 6 and 7 by melting a small amount of solder into them with your soldering iron. Solder a 3" piece of bare wire in pins 6 and 7 pushing it in as far as it will go while the solder is melting. Cut off the excess wire that protrudes beyond the pins. Scrape off any excess solder on the outside of the pins with a knife.

☐ Push P-1 into socket J-4 on the back of the chassis.

FINAL ASSEMBLY

☐ Carefully put the tubes, V-1 (6AG7), V-2 (807) and V-3 (5U4G) in their respective sockets. See Figure 6.

☐ Put the plate connector on the metal cap of V-2.

☐ Insert the small light bulb in the pilot light socket underneath the chassis.

☐ Put the fuse in the fuse holder, F-1, under the chassis.

☐ Put a knob on the BAND switch shaft and tighten the setscrew on the flat part of the shaft.

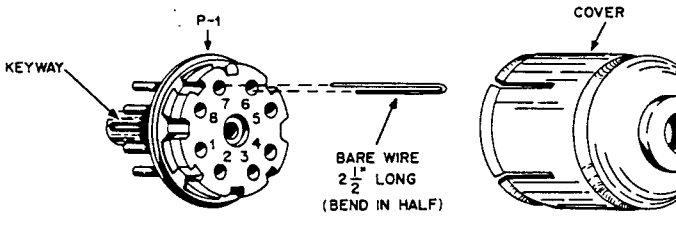


FIGURE 15. HOW TO WIRE THE ACCESSORY PLUG

☐ Place a knob on each of the other three shafts and tighten the setscrews.

Before installing the Transmitter in the cabinet, check for correct operation as explained in the OPERATION paragraphs. **CAUTION:** When the Transmitter is operated out of its cabinet **DANGEROUS** voltages are applied to several exposed parts. **DO NOT TOUCH ANY OF THE EXPOSED WIRING.**

☐ Remove the plug P-1 from its socket at the rear of the chassis.

☐ Install the Transmitter in the cabinet. Pull the line cord out the rear of the cabinet. Fasten the front panel of the Transmitter to the cabinet with the 16 small sheet metal screws. At the rear of the cabinet put one sheet metal screw through the small hole in the center and tighten it in the matching hole in the chassis.

☐ Replace the plug P-1 into its socket at the back of the chassis.

OPERATING YOUR TRANSMITTER

GROUNDING

The pi-network type of output circuit requires a good earth ground to the transmitter chassis for efficient antenna loading. The screw on the rear of the chassis should be connected to a heavy gauge copper wire which should go by the shortest path possible to a water pipe or a metal rod driven eight feet or more into the earth.

If, after the transmitter is loaded into an antenna, the chassis is "hot" with RF, as indicated by a change in plate current when the keyed transmitter is touched, then the ground circuit must be improved.

ANTENNAS

A well designed antenna with a relatively flat, unbalanced transmission line can be easily loaded by tuning the transmitter according to the instructions; assuming that the transmitter chassis is well grounded and that the impedance of the antenna is within the range of the pi network. With the transmitter chassis grounded it may be possible to feed a balanced transmission line if the line is more than ¼-wave long.

Since the complete subject of antennas is too broad to be covered in this manual it is suggested that other books, such as the ARRL handbook, be consulted if more information is desired.

CRYSTALS

The following table lists the crystal frequencies which may be used for full output on the bands indicated.

CRYSTAL	BAND
3.5 MC	80 40 20
7.0 MC	40 20 15 10

PREPARATION FOR TUNING

1. Connect the chassis to a good ground.

2. Select the output frequency desired and plug an appropriate crystal in the **XTAL** socket, or plug an adequate variable frequency oscillator in the **VFO** socket.

3. Connect the antenna lead to the antenna socket.

4. Insert the telegraph key plug into the **KEY** socket.

CAUTION: With the **ON-OFF** switch in the ON position up to 150 volts is applied to the telegraph key terminals. Turn the power OFF before adjusting the key.

5. With the **ON-OFF** switch in the OFF position, plug the line cord into a 117 volt AC power outlet.

6. Turn the **BAND** knob to the desired output frequency.

7. Turn the **LOADING** knob to the full counter clockwise position and put the **MIN-MAX** switch in the MIN position.

It is possible to get more than one indication of resonance when rotating the **OSCILLATOR TUNING** and **AMPLIFIER TUNING** knobs on the higher frequency amateur bands. Some method must be used to make sure that the desired output frequency is being produced. Listening to a receiver with its antenna disconnected will help identify the output frequency. An absorption wavemeter or a grid dip meter also will help to insure proper tuning.

If you want to use a VFO for code transmission, the Transmitter itself must be keyed and not the VFO. When the **KEY** jack contacts are shorted the Transmitter must have excitation (a good crystal must be plugged into the **XTAL** socket or an appropriate signal must be fed to the **VFO** socket), or the plate and screen dissipation ratings of the 807 will be greatly exceeded.

As soon as the **ON-OFF** switch is pushed to ON more than 700 VOLTS appears both above and below the chassis. **BE CAREFUL.**

TUNING PROCEDURE

1. Put the **ON-OFF** switch in the ON position.

2. If the key has a shorting lever, open it.

3. Put the **METER** switch in the GRID position.

4. Allow one minute for the tubes to warm up. Note: The meter will not deflect unless the key is pressed.

5. Close the key and turn the **OSCILLATOR TUNING** knob for a 3 to 4 ma grid current, **not maximum**, reading on the meter (with the **METER** switch in the GRID position).

NOTE: Do not hold the key down for more than a few seconds without having the **AMPLIFIER TUNING** adjusted or "dipped", for resonance as indicated by a MINIMUM on the meter with the **METER** switch in the PLATE position.

6. Close the key and adjust the **AMPLIFIER TUNING** for a minimum on the meter with the **METER** switch in the PLATE position.

7. Load the antenna by turning the **LOADING** knob toward INCREASE in small amounts and immediately retuning the **AMPLIFIER TUNING** to a minimum on the meter. Turn the **LOADING** knob toward INCREASE until the "dip" in plate current found by adjusting the **AMPLIFIER TUNING** knob is about 100 to 110 milliamperes. As the **LOADING** is increased, it will be found that the "dip" in plate current becomes less pronounced; this indicates power is being delivered to the load. The transmitter is ready to operate. If the proper current of 100 to 110 ma. is not reached with the **LOADING** knob all the way clockwise turn the knob fully counterclockwise again and put the **MIN-MAX** switch in the MAX position and start the **LOADING** procedure over again.

SERVICE HINTS

If all the instructions and diagrams were followed carefully, your KNIGHT Transmitter should operate properly. If it does not, inspect the wiring carefully, comparing it with the final pictorial wiring diagrams. Most troubles are the result of wiring errors. Often it is helpful to have someone else check the wiring, preferably someone with amateur radio experience.

If a tube does not light up, check the wiring at that tube socket. If the wiring is correct, check the tube heater for continuity with an ohmmeter.

If your Transmitter does not operate properly, the following list may be helpful.

TROUBLE	POSSIBLE CAUSE
Fuse blows.	Short in power supply.
No grid current.	Bad crystal. Bad 6AG7. Incorrect wiring.
Meter reads backwards.	Meter leads reversed.
Tube does not "light".	Incorrect wiring or bad tube heater.
Erratic antenna loading.	Poor ground connection.
No meter readings.	Plug not in accessory socket.
Television interference	Poor ground. Too much grid current (more than 3 or 4 ma.).

ALLIED'S SERVICE FACILITIES

In the event that the kit still does not operate properly, we recommend the following:

Please write our Kit Department with full details and include the stock number and the date of purchase of the kit. We may be able to determine any wiring error or replace a component which may be at fault.

This wired KNIGHT kit may be returned for inspection within 1 year after purchase for a special service charge of $4.00. Parts within the standard RETMA 90-day warranty period will be replaced without charge for the parts. An additional charge will be made for parts damaged in construction or because of a wiring error, or for parts which are beyond the 90-day warranty period. After the one year period, service charges, plus cost of parts, are based on the length of time required to repair the unit.

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

Allied's facilities primarily provide an inspection and trouble-shooting service. Kits not completed, which require extensive work, will be returned collect with a letter of explanation.

If you must return this kit, pack it well. Use the original packing carton and use cushioning material around the front panel. Send the kit prepaid and insured. We will return the repaired kit to you C.O.D. as soon as repairs are completed. If you wish to save C.O.D. fees, your advance remittance may be enclosed for standard repair charges plus transportation costs. Any excess remittance will be refunded.

ALLIED'S GUARANTEE ON KNIGHT KITS

The designs and components selected for KNIGHT kits represent over a quarter of a century of experience in kit development. KNIGHT kits are easy to assemble even for the beginner. Instructions are complete, panels are drilled, the chassis is punched and formed, and every part is included as listed.

Allied extends these firm guarantees on KNIGHT kits:

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

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

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

The efficiently engineered KNIGHT kits are moderately priced. When you buy a KNIGHT kit you get best design, quality, and value. Recommend KNIGHT kits to your friends.

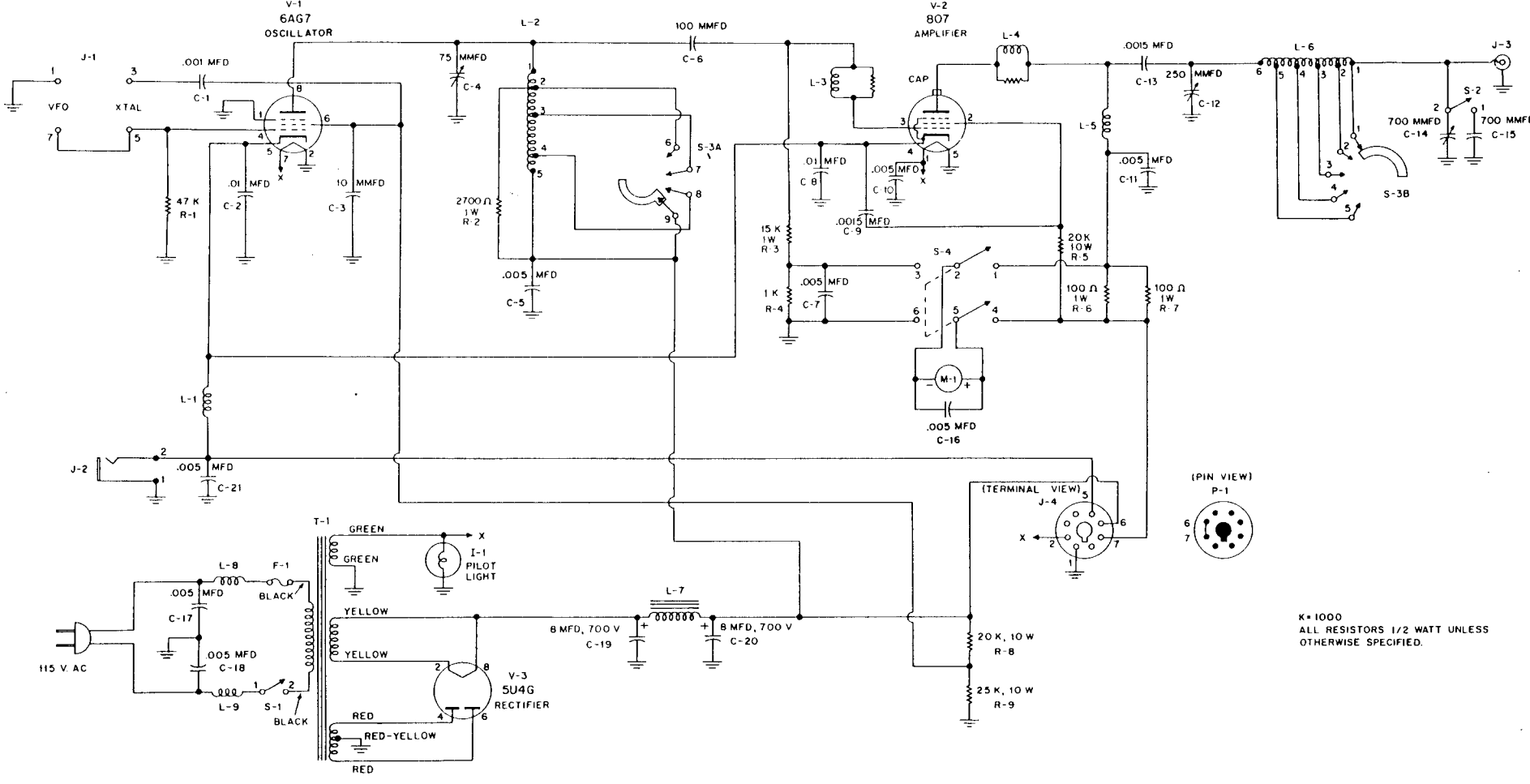


FIGURE 16. SCHEMATIC DIAGRAM, KNIGHT 50-WATT TRANSMITTER

THE KNIGHT 50-WATT TRANSMITTER PARTS LIST

Symbol Number	Description	Allied Part No.
C-1	Capacitor, .001 MFD 20% 600 V disc	276016
C-2	Capacitor, .01 MFD 20% 600V disc	276015
C-3	Capacitor, 10 MMFD 20% 600V disc	276018
C-4	Capacitor, 75 MMFD Air Variable	281001
C-5	Capacitor, .005 MFD GMV 600V disc	296000
C-6	Capacitor, 100 MMFD 20% 600V disc	276015
C-7	Capacitor, .005 MFD GMV 600V disc	296000
C-8	Capacitor, .01 MFD 20% 600V disc	276015
C-9	Capacitor, .0015 MFD 20% 600V disc	276157
C-10	Capacitor, .005 MFD GMV 600V disc	296000
C-11	Capacitor, .005 MFD GMV 600V disc	296000
C-12	Capacitor, 250 MMFD Air Variable	281002
C-13	Capacitor, .0015 MFD 20% 600V disc	276157
C-14	Capacitor, 700 MMFD 2-section variable	282001

Symbol Number	Description	Allied Part No.
R-3	Resistor, 15K ohms, 1 watt, 10%	304153
R-4	Resistor, 1K ohm, ½ watt, 5%	302102
R-5	Resistor, 20K ohms, 10 watt, 10% wirewound	374006
R-6	Resistor, 100 ohms, 1 watt, 5%	305101
R-7	Resistor, 100 ohms, 1 watt, 5%	305101
R-8	Resistor, 20K ohms, 10 watts, 10% wirewound	374006
R-9	Resistor, 25K ohms, 10 watt, 10% wirewound	374007
S-1	Slide Switch SPST	431003
S-2	Slide Switch SPST	431003
S-3	Bandswitch	432201
S-4	Slide Switch DPDT	431301
T-1	Power Transformer	101402

Description	Quantity	Allied Part No.
Screw, 8-32x⅜" BHMS Steel	4	560444
Screw, #6x½" Self-Tapping	17	562396
Screw, 6-32x1½" BHMS Steel	4	564342
Screw, 4-36x⅜" BHMS	6	560234
Screw, 6-32x¾" BHMS	27	560342
Screw, 6-32x¼" BHMS	6	560343
Shield partition, copper flashed	1	470009
Solder, Rosin Core	40"	930001
Socket, Octal Tube	2	501180
Socket, 5-prong Ceramic	1	501351
Spacer, 1-inch metal	2	470008
Spaghetti	14"	812001
Strip, 5-Terminal	1	440501
Strip, 3-Terminal	3	440301

C-15	Capacitor, 700 MMFD mica 10% 500V	296005
C-16	Capacitor, .005 MFD GMV 600V disc	296000
C-17	Capacitor, .005 MFD GMV 600V disc	296000
C-18	Capacitor, .005 MFD GMV 600V disc	296000
C-19	Capacitor, 8 MFD 700V Electrolytic	207080
C-20	Capacitor, 8 MFD 700V Electrolytic	207080
C-21	Capacitor, .005 MFD GMV 600V disc	296000
F-1	Fuse, 3 amperes	491002
I-1	Pilot Lamp, #47	640002
J-1	Octal Socket	501180
J-2	Key Jack	502221
J-3	Coaxial Receptacle	502222
J-4	Octal Socket	501180
L-1	VHF Choke	152005
L-2	Oscillator Coil	152006
L-3	Parasitic Choke	162002
L-4	Parasitic Choke	162002
L-5	RF Choke	151001
L-6	Amplifier Coil	152007
L-7	Filter Choke	140001
L-8	VHF Choke	152005
L-9	VHF Choke	152005
M-1	Meter, 0-10 ma, square	652201
P-1	Octal plug, with cover	502181

Note: When ordering resistors give complete description and part number.

R-1	Resistor, 47K ohms, ½ watt, 10%	301473
R-2	Resistor, 2700 ohms, 1 watt, 10%	304272
V-1	6AG7 Tube	6AG7
V-2	807 Tube	807
V-3	5U4G Tube	5U4G

Description	Quantity	Allied Part No.
Bolt, Spade 6-32	6	568344
Cabinet	1	700004
Cap, Plate for 807	1	532004
Chassis	1	461401
Cord, Line	1	802001
Foot, Rubber Bumper	4	831001
Fuse Holder	1	492101
Grommet for ⅜" hole	5	830200
Insulator, Ceramic Standoff	1	940001
Jewel, Pilot Light	1	641001
Knob, Instrument gray	4	760201
Lug, Solder #8 hole	14	553002
Manual, Instruction	2	750012
Nut, 1/4"-27 Hex	2	579701
Nut, ⅜"-32 Hex	7	570840
Nut, 4-36 Hex	6	570230
Nut, 6-32 Hex	35	570340
Nut, 8-32 Hex	4	570440
Panel, Front	1	462206
Plate, Switch Mtg.	1	470010
Pilot Light Socket	1	501720
Strip, 2-Terminal	1	440201
Washer, Panel Flat	4	580702
Washer, Lock ⅜" I.D.	1	582700
Washer, Fiber Flat #6 hole	4	590300
Washer, #8 Internal Tooth Lock	4	582400
Washer, #6 External Tooth Lock	16	583300
Wire, #20 Insulated Hookup		
2" Red	3	801002
3" Orange	3	801003
4" Yellow	2	801004
5" Green	1	801005
6" Blue	7	801006
8" Gray	1	801008
9" White	2	801009
10" Brown	2	801010
11" White with Brown Tracer	1	801011
Wire, Tinned #20 Bare	40"	806040

TOOLS YOU MAY NEED

Allied Stock No.	Description	Price*
46 N 852	Soldering iron	$4.73
46 N 449	6" long-nose pliers	1.76
46 N 403	6" diagonal cutters	2.28
45 N 796	6" screwdriver	.72

* All prices subject to change without notice.

KEY UP VOLTAGE CHART

All voltages DC unless otherwise stated and measured from chassis to point specified. No crystal or VFO plugged in; accessory jumper in place; meter reading zero in either grid or plate positions; panel control positions unimportant. Voltage at cap of V-2 (807) not to be read. Line voltage 120 AC. **PLEASE NOTE: EXTREMELY DANGEROUS VOLTAGES ARE PRESENT—BE VERY CAREFUL.** NC—No connection.

TUBE	PIN							
	1	2	3	4	.5	6	7	8
V-1 6AG7	0	0	0	0	120	400	6.4AC	720
V-2 807	6.4AC	720	0	120	0			
V-3 5U4G	NC	720	NC	520AC	NC	520AC	NC	740
Access. Socket	0	6.4AC	NC	NC	120	720	720	NC

KEY DOWN VOLTAGE CHART

All voltages DC unless otherwise stated and measured from chassis to point specified. 80 meter crystal and output; 3 milliamperes grid current; 110 milliamperes plate current; all tuning controls at resonance; dummy load connected. NC—No connection. **—**Radio Frequency voltage present, DO NOT ATTEMPT TO MEASURE.**

TUBE	PIN							
	1	2	3	4	5	6	7	8
V-1 6AG7	0	0	0	**	0	240	6.4AC	**
V-2 807	6.4AC	300	**	0	0			
V-3 5U4G	NC	610	NC	500AC	NC	500AC	NC	610
Access. Socket	0	6.4AC	NC	NC	0	580	580	NC

RESISTANCE CHART

AC power cord disconnected; key closed; accessory socket plug in position. All resistances measured to chassis. NOTE: The 807 plate cap to ground measurement will be 45K ohms.

TUBE	PIN							
	1	2	3	4	5	6	7	8
V-1 6AG7	0	0	0	47K	0	25K	0	45K
V-2 807	0	65K	15K	0	0			
V-3 5U4G	NC	45K	NC	130	NC	130	NC	45K
Access. Socket	0	0	NC	NC	0	45K	45K	NC

Other Famous **knight-kits** For the **AMATEU**

knight-kit
RF Z-BRIDGE KIT
83 Y 253

- Measure Standing Wave Ratio
- Measure Antenna Impedance
- Adjust Antenna Couplers
- Adjust Matching Networks
- Tune Antenna to Resonance
- Wide Frequency Range
- Wide Impedance Range

The KNIGHT-KIT RF Z-Bridge is a very versatile instrument for the amateur. You can measure transmission line standing wave ratio and antenna impedance; adjust antenna couplers and matching networks; or tune your antenna to resonance at any frequency from 100 KC to 150 MC using the simple resistance bridge and diode detector circuit of the RF Z-Bridge. Maximum power transfer is obtained only when your transmitter and antenna system are properly matched. Standing wave ratio is important—the lower the SWR the more efficient your antenna will be. Use any sensitive VOM for a null indicator; the higher its sensitivity the sharper the null.

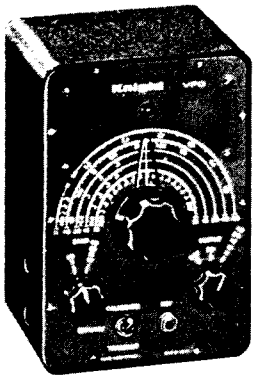
Two crystal diodes are employed. One as the detector in the bridge, and the other to rectify the input signal so that it can be measured. A 1% precision resistor is included for calibrating use. Dial is calibrated in line impedance and the most popular values are encircled. A handy, "quick reference", plasticized SWR chart is also included.

Nothing else to buy—kit is furnished with all parts, SWR chart, and comprehensively illustrated, step-by-step instruction manual.

Shipping weight 1½ lbs. Allied Stock No. 83 Y 253

SPECIFICATIONS

USES:	Measure Antenna Impedance Measure Standing Wave Ratio Adjust Matching Networks Tune Antenna to Resonance
FREQUENCY RANGE:	100 KC to 100 MC for SWR 100 KC to 100 MC for Impedance
IMPEDANCE RANGE:	20 ohms to 400 ohms
METER REQUIRED:	Any Sensitive VOM
DIMENSIONS:	2½ x 3½ x 4"
SHIPPING WEIGHT:	1½ lbs.



knight
V-44
83 Y

- Exceptional Stability
- Compact Design
- Excellent Keying
- TVI Suppression

The KNIGHT-KIT VFO offers high-quality perform at incomparably low cost. Look over its array of standing features and you'll see that it includes ev thing desirable in VFO design. It's a completed VFO built-in transformer-type power supply. Features tremely high stability, excellent oscillator keying c acteristic for fast break-in operation, highly effectiv suppression, easy tuning and ultra-compact construc

Exceptional frequency stability is assured by ca circuit design and rigid mechanical construction. free, series-tuned Clapp oscillator employs 1% s mica capacitors. Oscillator tank coil is wound on h ceramic form. Excellent voltage regulation main stable output, unaffected by changes in line vol Rugged mechanical construction—oscillator chass flange-welded for rigidity; bandswitch is heavy cera Has Calibrate-Standby-Transmit switch for "no-sw tuning. Extra switch contacts are connected to a tern strip on rear of chassis for control of external equipn

Complete with all parts, tubes, pre-cut wire, so and step-by-step instructions.

SPECIFICATIONS

Frequency Coverage: 80, 40, 20, 15, 11, and 10 met bands.

RF Output: 40 volt output on 80 meters; 20 volt ou put on 40 meters. Dial calibrated on a bands.

Tubes: 6BH6 Clapp oscillator, 6BH6 buffer-double 6X4 rectifier, and OA2 voltage regulator.

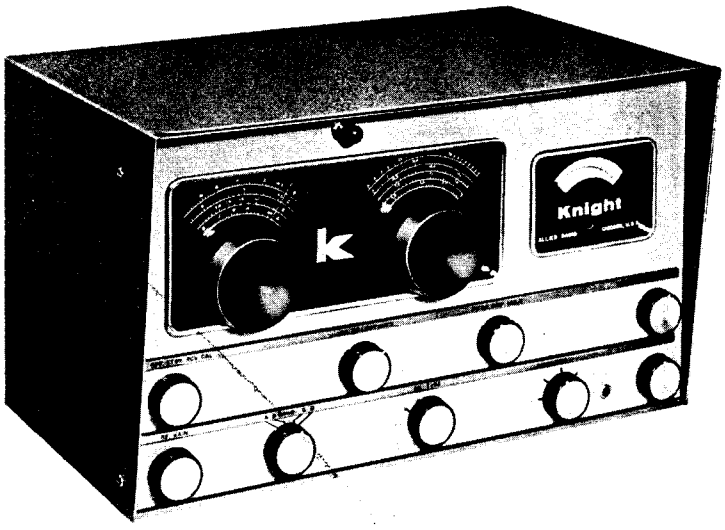
Power Source: 110 to 120 volts, 50 to 60 cycles.

Size: 8¾ x 6 x 6".

Shipping Weight: 8 lbs.

See your latest catalogue for current prices

ild This Fine Quality knight-kit and SAVE



knight-kit
DELUXE ALL-BAND AMATEUR RECEIVER
83 YZ 726

gned by Ham engineers — the ALLIED KNIGHT-KIT e All-band Amateur Receiver has features sug- by Amateurs all over the country. The frequency ge of this fine receiver is from 540 kc to 31 mc d in four tuning ranges. Calibrated electrical read is provided for the Amateur bands.

using multi-purpose tubes, the efficient 7-tube eterodyne circuit provides performance equal to tube receiver costing much more. The indirectly- cathode, full-wave rectifier delays B+, eliminat- maging surges and prolonging tube life. High y is obtained through the use of a voltage regu- tube in the B+ supply for the HFO. This receiver es widely adjustable selectivity and exceptionally ensitivity to bring in solid QSO's.

built-in "Q" Mutliplier peaks desired signals or undesired signals and interference. The highly effective noise limiter allows reception of signals under QRN conditions. A constant-running high-frequency oscillator with voltage-regulated B+ supply, and the extra-heavy chassis and panel contribute to the rock-like stability of this fine receiver.

Circuitry is provided to allow easy addition of the KNIGHT-KIT 100-kc Crystal Calibrator and the accessory S-Meter specially designed for this receiver.

Printed circuitry is used throuhgout — including a printed bandswitch — simplifying assembly, and virtually eliminating wiring errors. The step-by-step instructions and crystal-clear oversized illustrations are very easy to follow.

The smart, professional styling and top-notch performance on all bands make this receiver a unit you'll be proud to have in your ham shack, den or living room.

SPECIFICATIONS

ENCY RANGE

BAND A .54—1.65 mc
BAND B 1.6 —4.6 mc
BAND C 4.4 —12.4 mc
BAND D 12 —30 mc

RATED BANDSPREAD

80 meters 3.5— 4 mc
40 meters 6.9— 7.3 mc
20 meters 14.0—14.4 mc
15 meters 20.5—21.5 mc
10 meters 26.6—30 mc

RATION ACCURACY

0.7% Max. deviation MAIN TUNING
0.15% Max. deviation BANDSPREAD

BLE SELECTIVITY

300 cps — 4.5 kc (6 db down)
Up to 60 db null and 70 db peak

TIVITY

1.5 μV or better at 10:1 signal-to-noise ratio on Band B, C and D
4 μV or better on Band A

IMAGE REJECTION RATIO

	Low end	High end
Band A	80 db	40 db
Band B	68 db	40 db
Band C	30 db	25 db
Band D	40 db	20 db

TUBE COMPLEMENT 1-6BZ6, 1-6BH8, 2-6AZ8, 1-6BC7, 1-6AW8A, 1-ECC83, 1-6X4, and 1-OB2

ACCESSORIES

S-Meter Kit. Essential to the Amateur operator and SWL for giving accurate signal strength readings. **Allied Stock No. 83 Y 727.**

100-kc Crystal Calibrator Kit. Gives marker every 100 kc up to 35 mc. An Amateur "must" for marking band edges. **Allied Stock No. 83 Y 256.**

See your latest catalog for current prices.

knight®

K4XL's  BAMA

This manual is provided FREE OF CHARGE from the "BoatAnchor Manual Archive" as a service to the Boatanchor community.

It was uploaded by someone who wanted to help you repair and maintain your equipment.

If you paid anyone other than BAMA for this manual, you paid someone who is making a profit from the free labor of others without asking their permission.

You may pass on copies of this manual to anyone who needs it. But do it without charge.

Thousands of files are available without charge from BAMA. Visit us at http://bama.sbc.edu