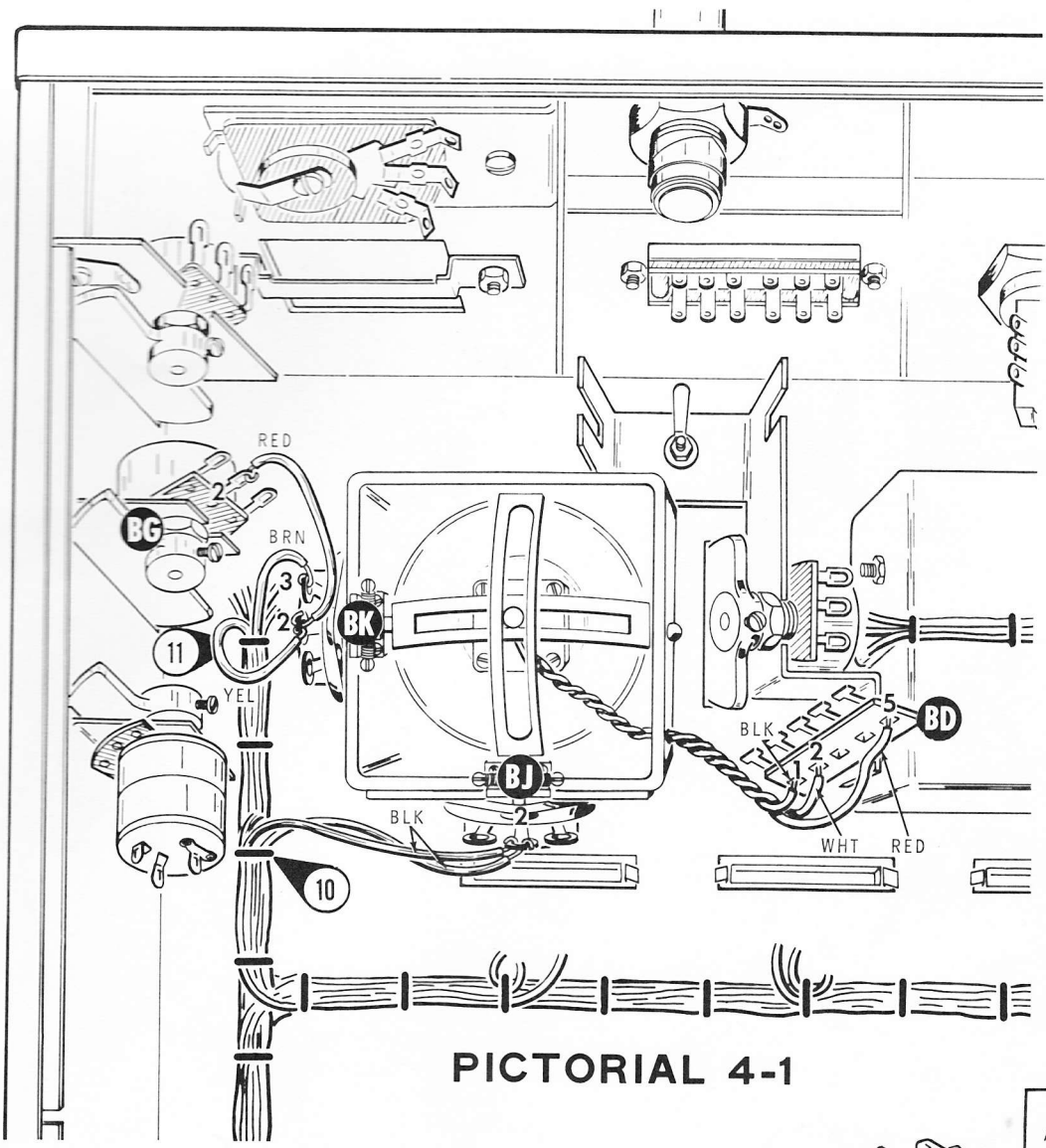


PICTORIAL 4-1

CON
ASSEM

WIRING

Refer to Pictorial 4-1 (fold-out from Page 22) for the following steps.

NOTE: Disregard the lug numbers stamped in the control body in the following steps.

( ) Connect both black wires from BO#10 to lug 2 of control BJ (S-2).

NOTE: The red wire from BO#10 will not be connected until after the Transmitter has been adjusted.

( ) Prepare a 2" large red wire.

( ) Connect this wire from lug 2 of control BG (S-1) to lug 2 of control BK (NS).

Connect the wires from BO#11 of the wiring harness to control BK as follows:

( ) Brown wire to lug 3 (S-1).

( ) Yellow wire to lug 2 (S-2).

Connect the black, red, and white wires coming from the control stick to the lower holes in terminal strip BD as follows; do not shorten any of these wires.

( ) Black wire to lug 1 (S-1).

( ) White wire to lug 2 (S-1).

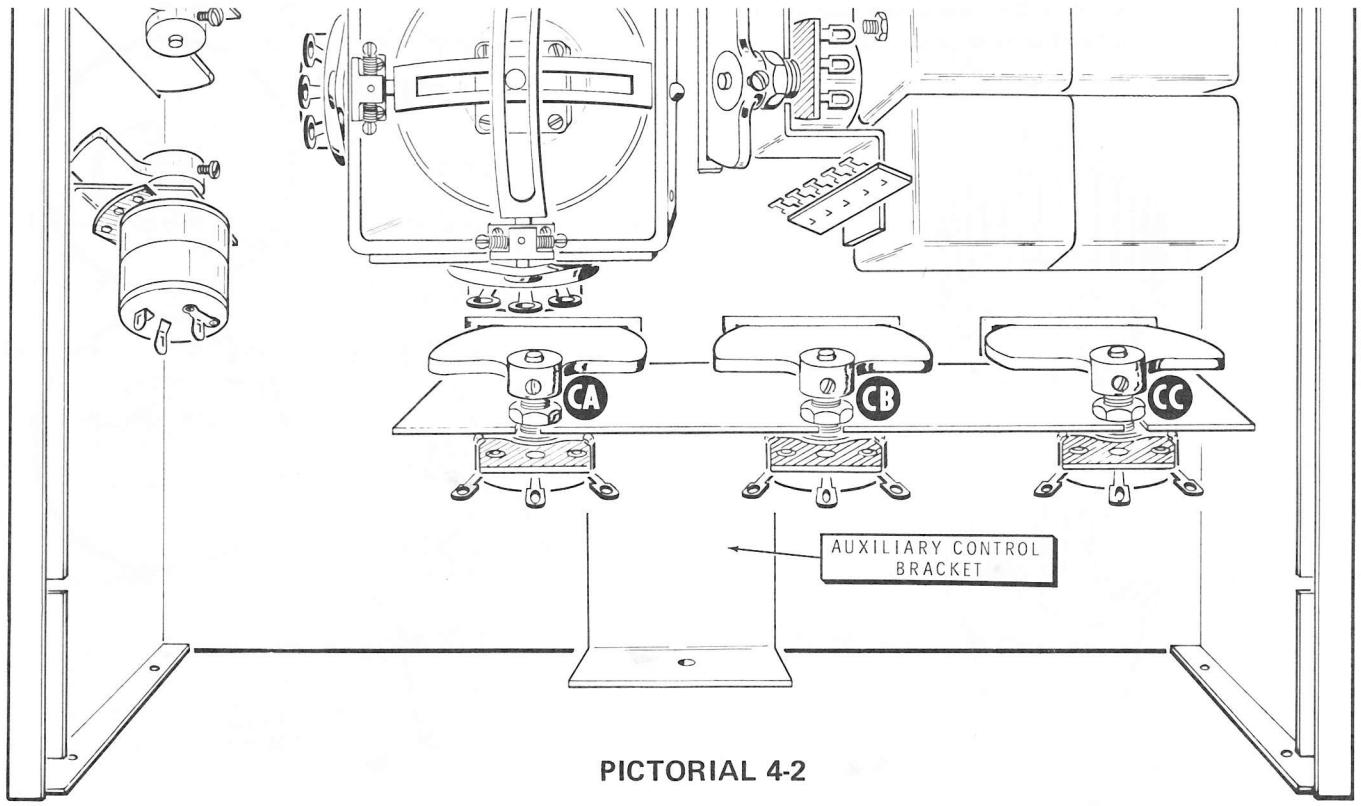
( ) Red wire to lug 5 (S-1).

( ) Move the control stick to make sure the wires do not interfere with its operation.

Refer to Pictorial 4-2 for the following steps.

( ) Place a 1/4" lockwasher and a 1/4" nut on a 15 kΩ control (#10-924). Then turn the control shaft to its center of rotation.

( ) Refer to Detail 4-2A and place a thumb knob onto the shaft. Do not tighten the thumb knob screw. Make sure the thumb knob and control lugs are position as shown.



PICTORIAL 4-2

( ) Bend the lugs of the control straight.

( ) Mount this control to the auxiliary control bracket at CA. Use the open-end wrench to tighten the hardware.

( ) Remove the protective backing from a piece of insulating paper. Press the adhesive side of the insulating paper on the auxiliary control bracket, centered between the two notches, as shown.

( ) Place a 1/4" lockwasher and a 1/4" nut on a 75 kΩ control (#10-922). Then turn the control shaft to its center of rotation.

( ) Place a thumb knob on the shaft. Do not tighten the thumb knob screw. Make sure the thumb knob and control lugs are positioned as shown.

( ) Bend the lugs of the control straight.

( ) Mount this control to the auxiliary control bracket at CB.

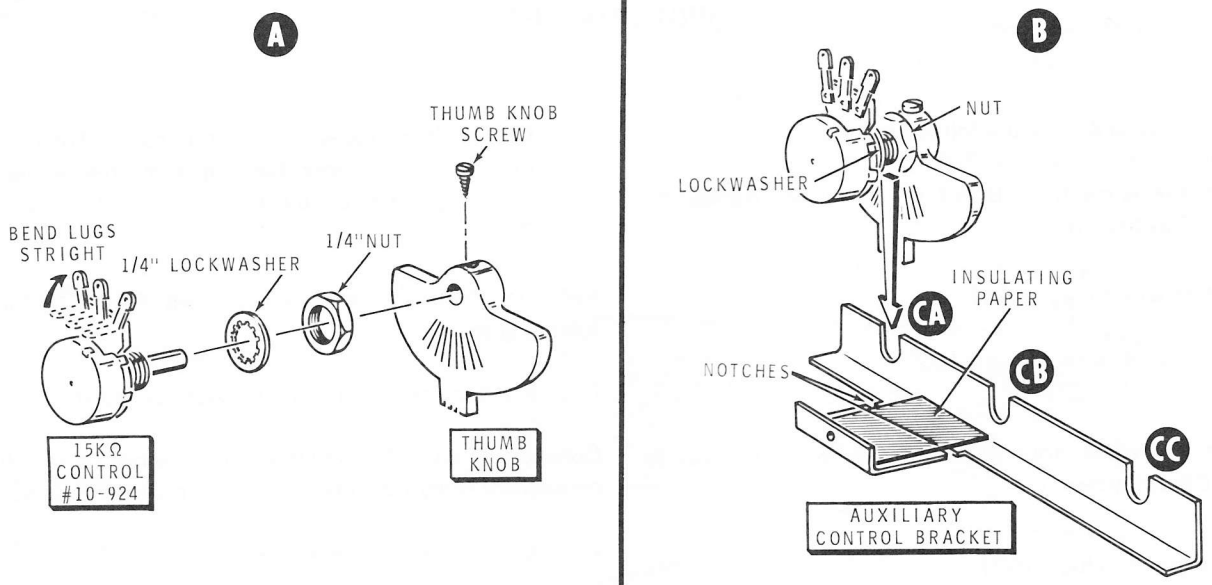
( ) Place a 1/4" lockwasher and a 1/4" nut on the remaining 75 kΩ control (#10-922). Then turn the control shaft to its center of rotation.

( ) Place a thumb knob onto the shaft. Do not tighten the thumb knob screw. Make sure the thumb knob and control lugs are positioned as shown.

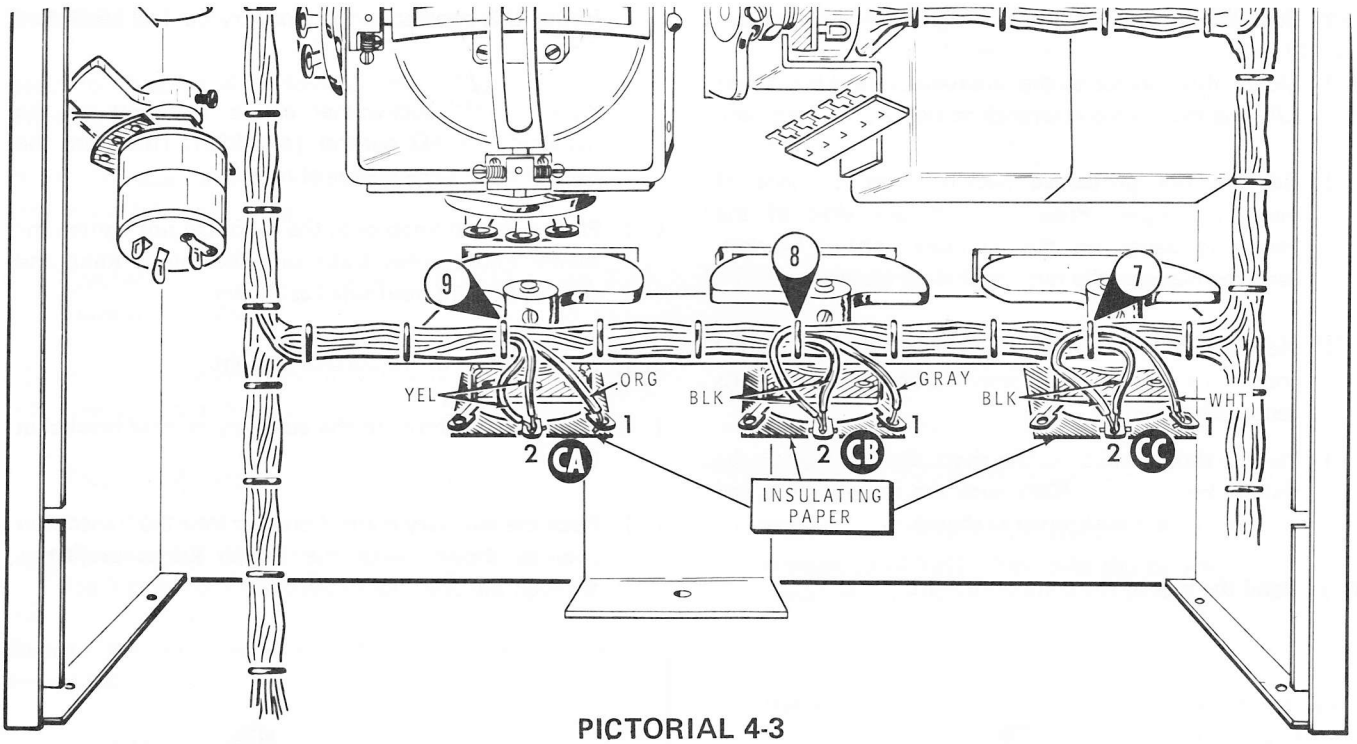
( ) Bend the lugs of the control straight.

( ) Mount this control to the auxiliary control bracket at CC.

( ) Place the auxiliary control bracket into the transmitter case as shown, with the thumb knobs projecting through the openings in the case.



Detail 4-2A



PICTORIAL 4-3

Refer to Pictorial 4-3 for the following steps.

Connect the wires from BO#7 of the wiring harness to control CC as follows:

( ) White wire to lug 1 (S-1).

( ) Both black wires to lug 2 (S-2).

Connect the wires from BO#8 of the wiring harness to control CB as follows:

( ) Gray wire to lug 1 (S-1).

( ) Both black wires to lug 2 (S-2).

Connect the wires from BO#9 of the wiring harness to control CA as follows:

( ) Orange wire to lug 1 (S-1).

( ) Both yellow wires to lug 2 (S-2).

( ) Locate three pieces of insulating paper. Then remove the protective paper backing and press a piece of insulating paper on the back of control CA, CB, and CC.

Refer to Pictorial 4-4 (fold-out from Page 31) for the following steps.

( ) Position the encoder circuit board as shown.

Connect the wires from BO#13 of the wiring harness to the component side of the encoder circuit board as follows:

( ) Brown wire to hole A (S-1).

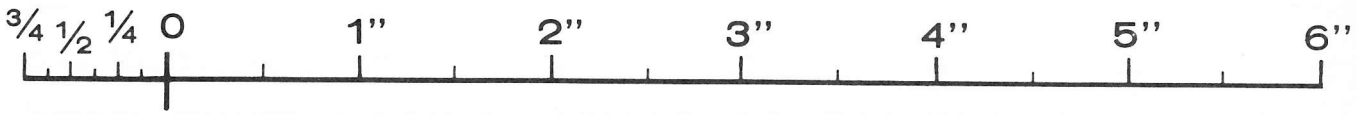
( ) Red wire to hole F (S-1).

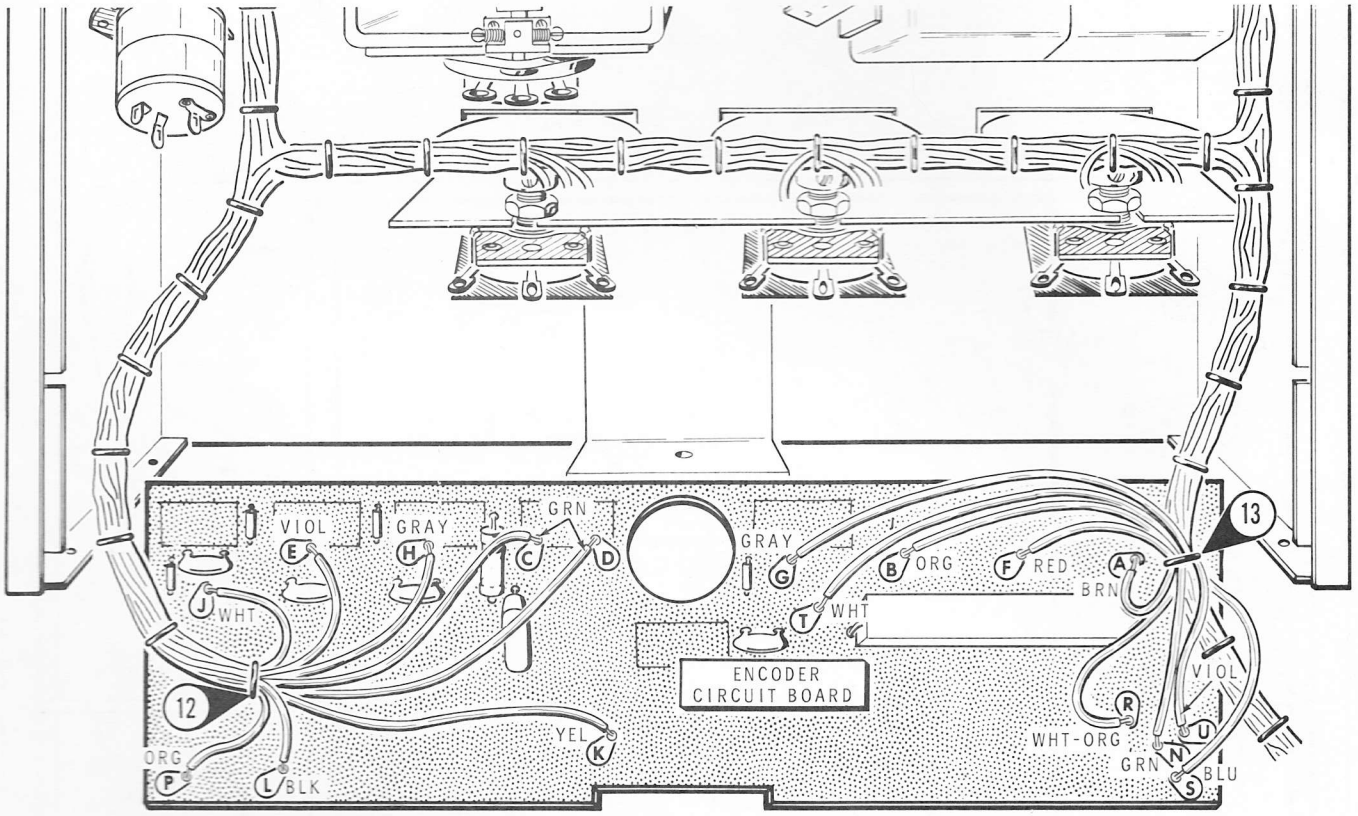
( ) Orange wire to hole B (S-1).

( ) Gray wire to hole G (S-1).

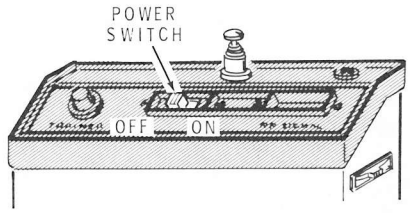
( ) White wire to hole T (S-1).

( ) Refer to Detail 4-3A and make sure the Power switch is in the OFF position.





PICTORIAL 4-4



Detail 4-3A

( ) White-orange wire to hole R (S-1).

( ) Green wire to hole N (S-1).

( ) Violet wire to hole U (S-1).

( ) Blue wire to hole S (S-1).

Connect the wires from BO#12 of the wiring harness to the encoder circuit board as follows:

( ) Either green wire to hole D (S-1).

( ) Other green wire to hole C (S-1).

( ) Gray wire to hole H (S-1).

( ) Violet wire to hole E (S-1).

( ) White wire to hole J (S-1).

( ) Orange wire to hole P (S-1).

( ) Black wire to hole L (S-1).

( ) Yellow wire to hole K (S-1).

( ) Check the encoder circuit board foil to be sure each wire and lead has been soldered with a good connection.

( ) Make sure that the solder from one connection has not bridged across to another connection. (This is alright if both connections are on the same foil.)

( ) Cut all excess lead lengths from the foil side of the circuit board.

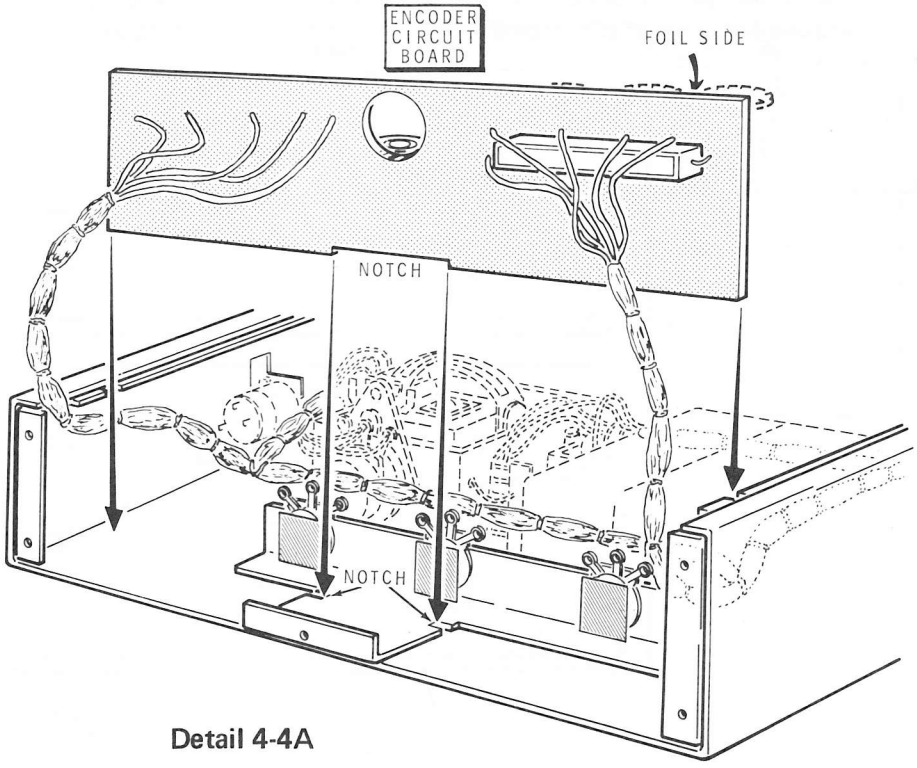
Refer to Detail 4-4A and install the encoder circuit board into the case in the following manner:

( ) First position the encoder circuit board with the foil side toward the auxiliary control bracket. Then route the wiring harness around each end of the circuit board.

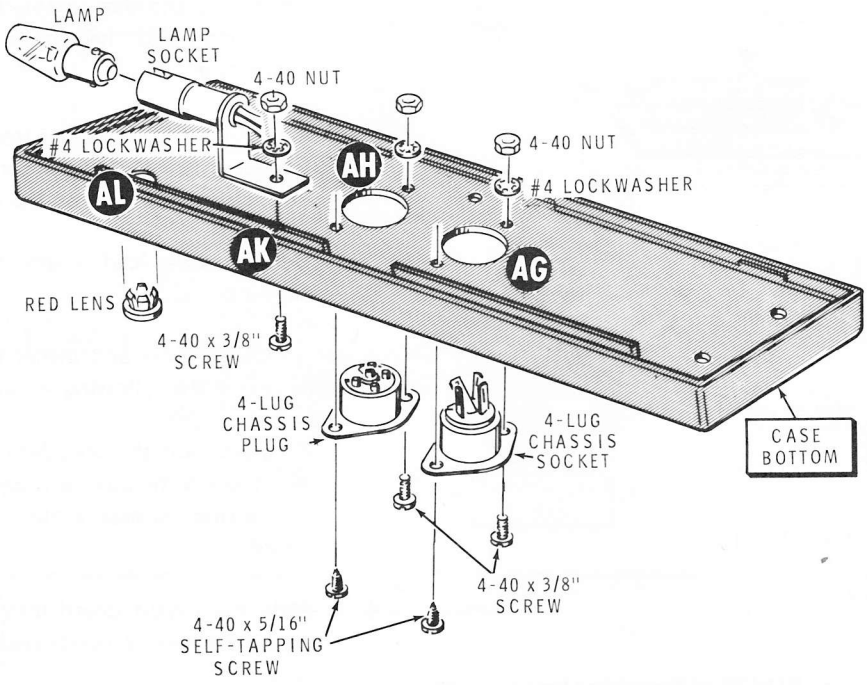
( ) Slide the circuit board into the case. Make sure the wiring harness is positioned around the ends of the board.

( ) Note the notch in the lower center of the circuit board. Then position the auxiliary control bracket so it sets in this notch.

Set the Transmitter aside temporarily and locate the case bottom.



Detail 4-4A



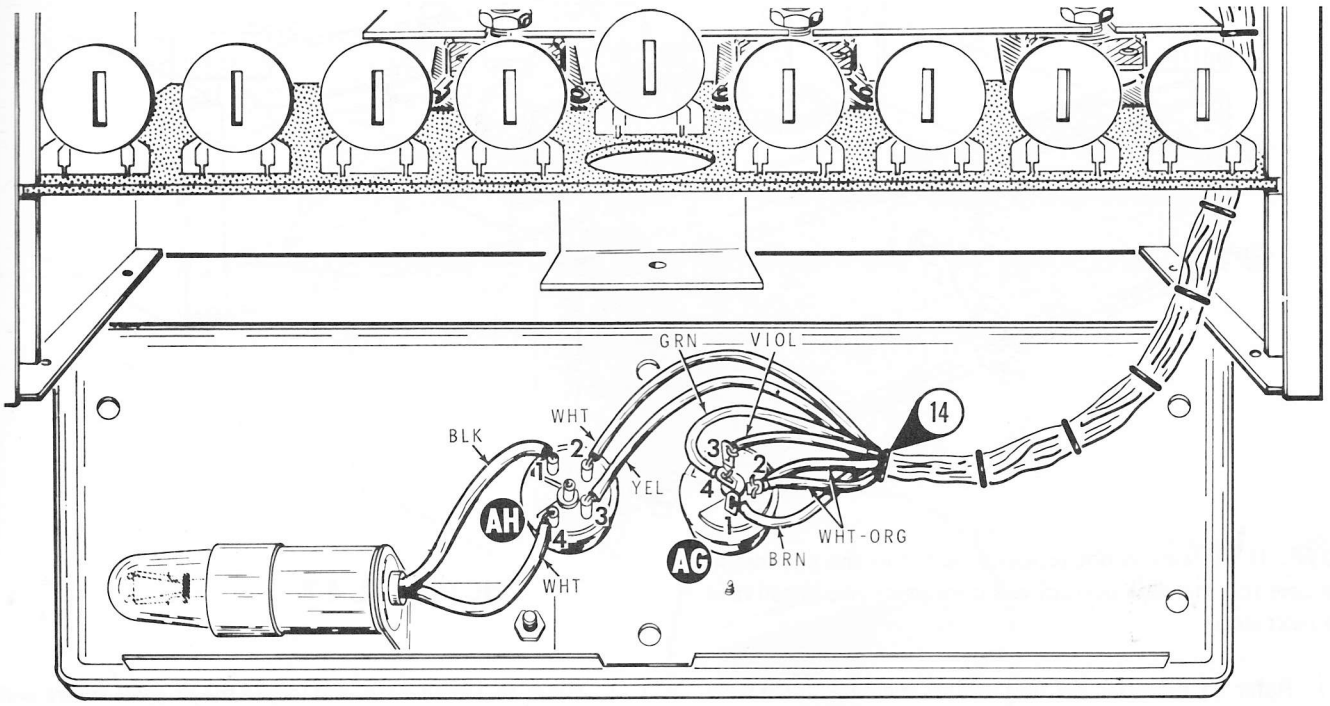
PICTORIAL 4-5

Refer to Pictorial 4-5 for the following steps.

( ) Install the 4-lug chassis plug at AH with one 4-40 x 3/8" screw, one #4 lockwasher, one 4-40 nut (large), and one 4-40 x 5/16" self-tapping screw.

( ) Install the 4-lug chassis socket at AG with one 4-40 x 3/8" screw, one #4 lockwasher, one 4-40 nut (large), and one 4-40 x 5/16" self-tapping screw.

( ) Push the red lens into hole AL in the case bottom as shown.



PICTORIAL 4-6

Refer to Pictorial 4-6 for the following steps.

( ) Cut the black lamp socket lead to a length of 1-3/4". Remove 1/4" of insulation and twist together the small wire strands. Then melt a small amount of solder on the strands to hold them together.

( ) Cut the white lamp socket lead to a length of 1-1/2". Remove 1/4" of insulation and twist together the small wire strands. Then melt a small amount of solder on the strands to hold them together.

( ) Install the lamp in the lamp socket. Then mount the lamp socket to the case bottom at AK as shown. Use a 4-40 x 3/8" screw, a #4 lockwasher, and a 4-40 nut (large).

( ) Connect the black lead from the lamp socket to lug 1 of plug AH (S-1).

( ) Connect the white lead from the lamp socket to lug 4 of plug AH (S-1).

( ) Position the case bottom next to the Transmitter as shown.

Connect the wires from BO#14 of the wiring harness as follows:

( ) Yellow wire to lug 3 of plug AH (S-1).

( ) White wire to lug 2 of plug AH (S-1).

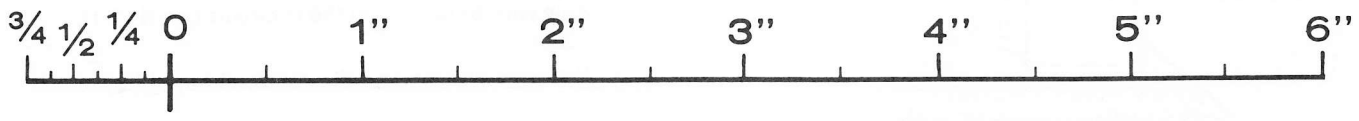
( ) Violet wire to lug 3 of socket AG (S-1).

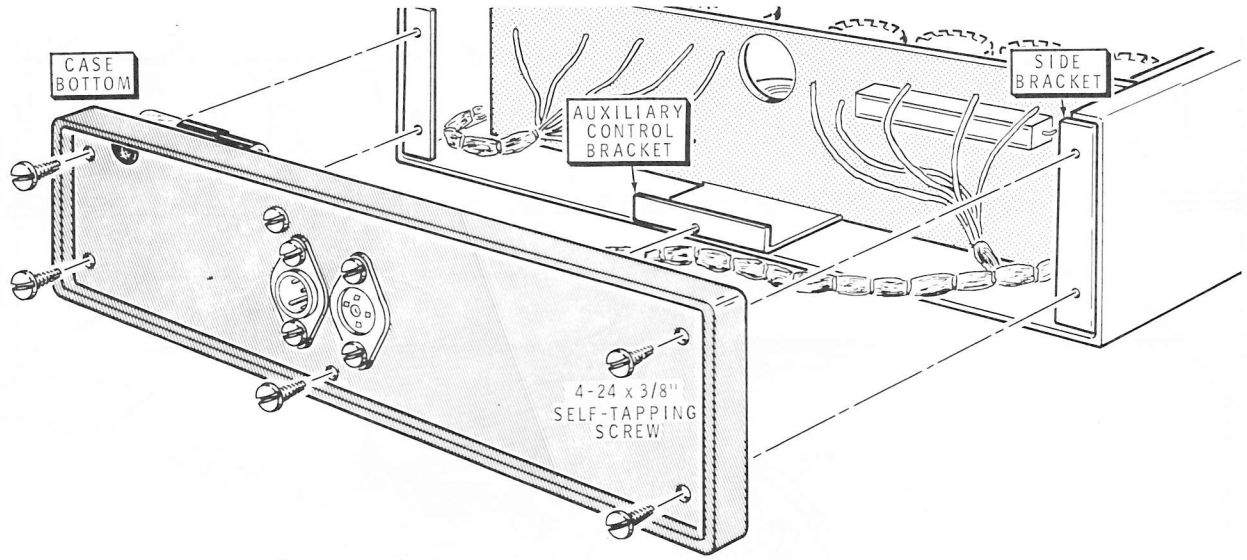
( ) Both white-orange wires to lug 2 of socket AG (S-2).

( ) Brown wire to lug 1 of socket AG (S-1).

( ) Green wire to lug 4 of socket AG (S-1).

( ) Check the wires connected to socket AG. Bend the lugs out slightly so there is no danger of the connections touching together.





PICTORIAL 4-7

NOTE: If the case is not properly seated in the channel in the case top, the case bottom will bow when you install it in the next step.

( ) Refer to Pictorial 4-7 and mount the case bottom to the side brackets with four 4-24 x 3/8" self-tapping screws. Make sure the case is properly seated in the case top and case bottom before you tighten the screws.

( ) Secure the auxiliary control bracket to the case bottom with a 4-40 x 5/16" self-tapping screw.

RF CIRCUIT BOARD WIRING

Refer to Pictorial 4-8 (fold-out from Page 32) for the following steps.

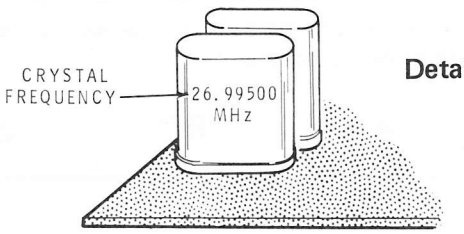
( ) Locate the assembled rf circuit board and position it as shown in the Pictorial.

NOTE: Your rf circuit board may have a 7.5 pF capacitor missing from it. This is normal.

( ) Connect the red wire coming from lug 1 of rotary switch AA to hole B on the rf circuit board (S-1).

( ) Connect the red wire coming from lug 3 of rotary switch AA to hole A on the rf circuit board (S-1).

( ) Connect the black wire coming from lug 2 of rotary switch AA to hole C on the rf circuit board (S-1).



Detail 4-8A

( ) Refer to Detail 4-8A and locate the crystals (there will be one or two) on the prewired rf circuit board.

( ) Each crystal has its frequency stamped on its side or top. Record the frequencies on the rear cover of this Manual. They will be referred to later.

NOTE: If your Transmitter operates on the 27 MHz band, refer to inset drawing #1 for the next two steps. If your Transmitter operates on the 53 MHz band, refer to inset drawing #2 for the next two steps. If your Transmitter operates on the 72 MHz band, refer to inset drawing #3 for the next two steps.

Connect the wires from BO#2 as follows:

( ) Violet wire to hole E on the rf circuit board (S-1).

( ) White wire to hole D on the rf circuit board (S-1).

The green wire will be connected later.

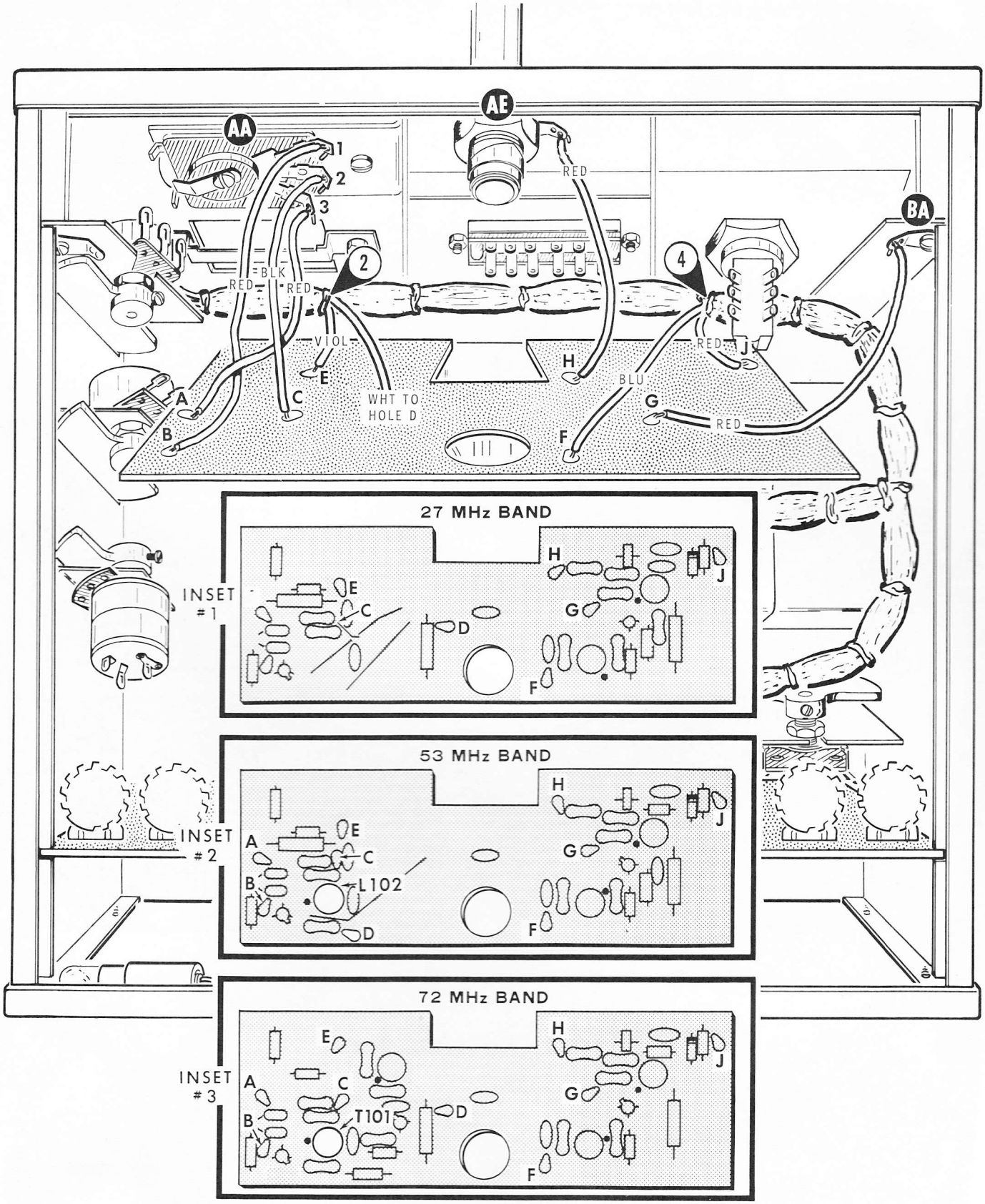
( ) Connect the red wire coming from the antenna solder lug to hole H on the rf circuit board (S-1).

( ) Connect the red wire coming from solder lug BA to hole G on the rf circuit board (S-1).

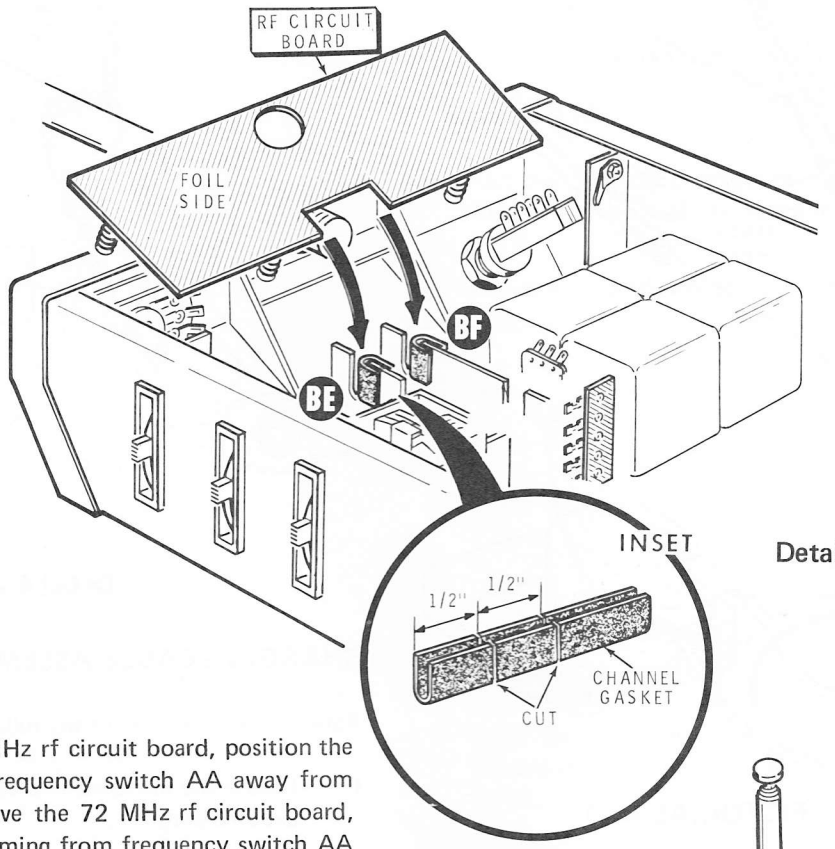
Connect the remaining wires from BO#4 as follows:

( ) Blue wire to hole F on the rf circuit board (S-1).

( ) Red wire to hole J on the rf circuit board (S-1).



PICTORIAL 4-8



Detail 4-9A

( ) If you have the 53 MHz rf circuit board, position the wires coming from frequency switch AA away from coil L102. If you have the 72 MHz rf circuit board, position the wires coming from frequency switch AA away from transformer T101.

Refer to Pictorial 4-9 for the following steps.

( ) Extend the first (outer) section of the antenna.

Refer to Detail 4-9A for the following steps.

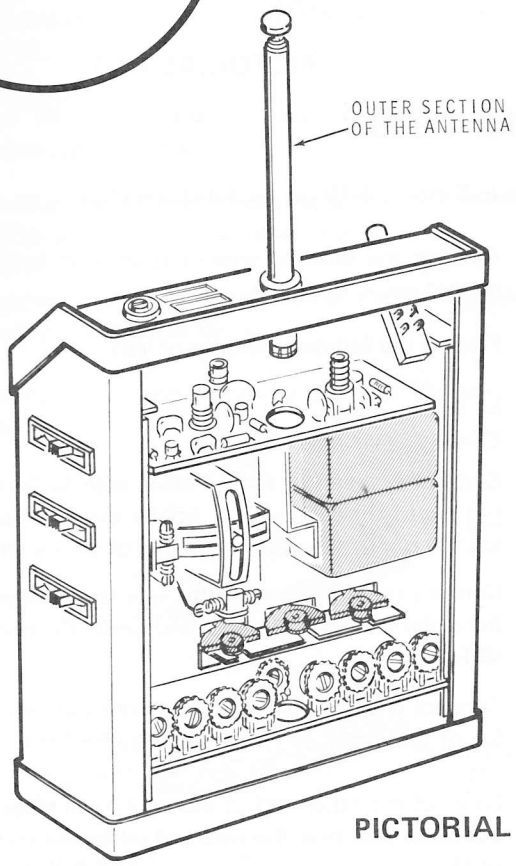
( ) Locate the length of channel gasket and cut two 1/2" lengths as shown in the inset drawing.

( ) Install these 1/2" lengths on the center bracket in slots BE and BF as shown. Then install the rf circuit board as shown.

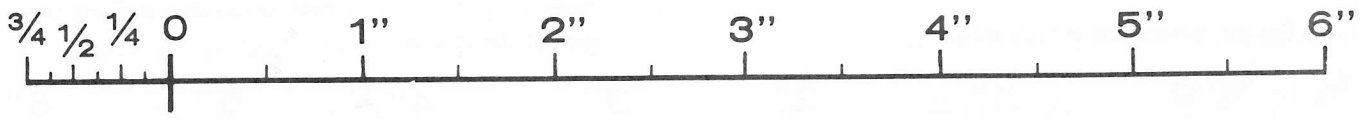
( ) Position the rf circuit board as shown. Then slide it into the rf circuit board bracket.

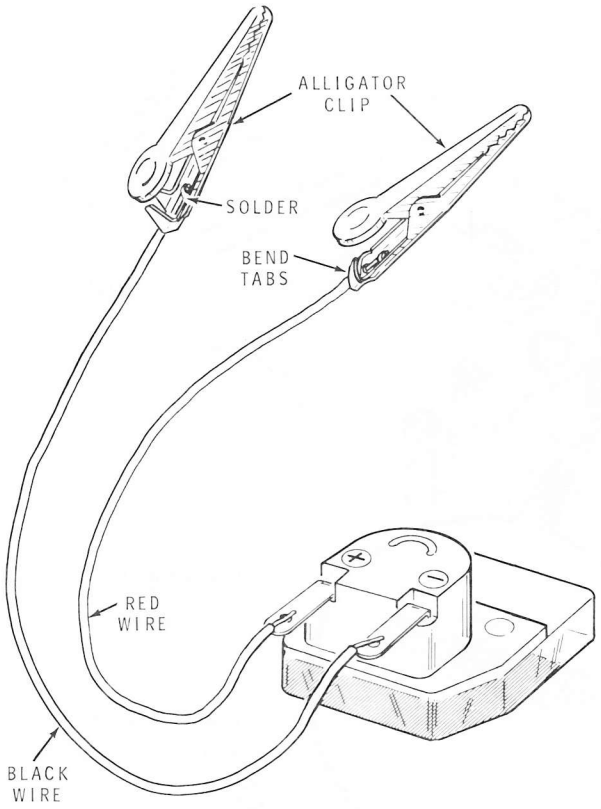
( ) Push the antenna into the transmitter case. Be careful to position the wiring away from the antenna.

The green and red wires coming from BO#1 and BO#2 will be connected later.



PICTORIAL 4-9





PICTORIAL 4-10

METER WIRING

Refer to Pictorial 4-10 for the following steps.

( ) Remove the shorting wire or strap from between the meter lugs.

( ) Prepare the following lengths of wire:

5" black
5" red

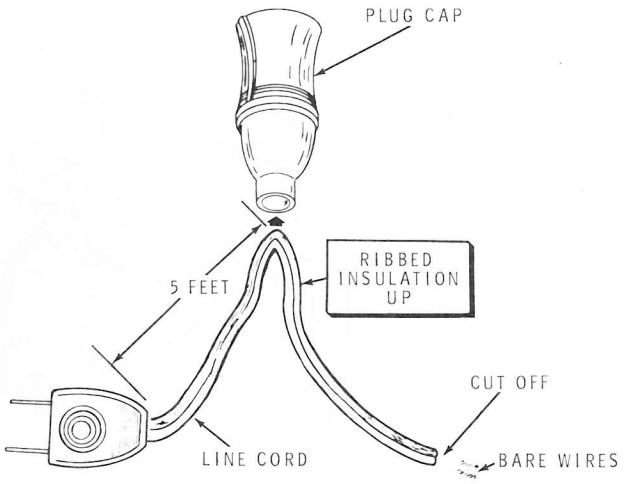
( ) Connect one end of the 5" black wire to the negative (—) lug of the meter (S-1). Solder the wire flat on the lug. Do not use the hole in the lug of the meter.

( ) Connect the other end of this wire to an alligator clip. Bend the tabs over the wire and solder the connection (S-1).

( ) Connect one end of the 5" red wire to the positive (+) lug of the meter (S-1). Solder the wire flat on the lug.

( ) Connect the other end of this wire to an alligator clip. Bend the tabs over the wire and solder the connection (S-1).

( ) Set the meter aside temporarily.



Detail 4-11A

CHARGING CABLE ASSEMBLY

Refer to Detail 4-11A for the following steps.

( ) Locate the line cord and cut off the bare wires at the exposed end.

( ) Locate the 4-pin line cord plug. Remove the cap from the plug if this is not already done. If a metal bushing is supplied with your plug, discard it.

NOTE: The line cord has a silver wire (with ribbed insulation) and a copper wire (with smooth insulation). The proper positioning of the line cord will be important in the following steps.

( ) Position the line cord 2-prong plug to your left-hand side as shown.

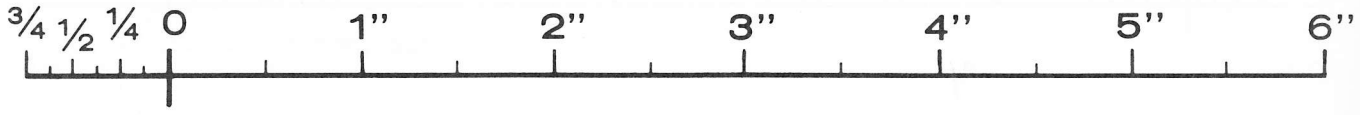
( ) With the ribbed insulation UP, fold the line cord five feet from the 2-prong plug. Then push the folded end through the hole in the small end of the 4-pin plug cap for a length of several inches.

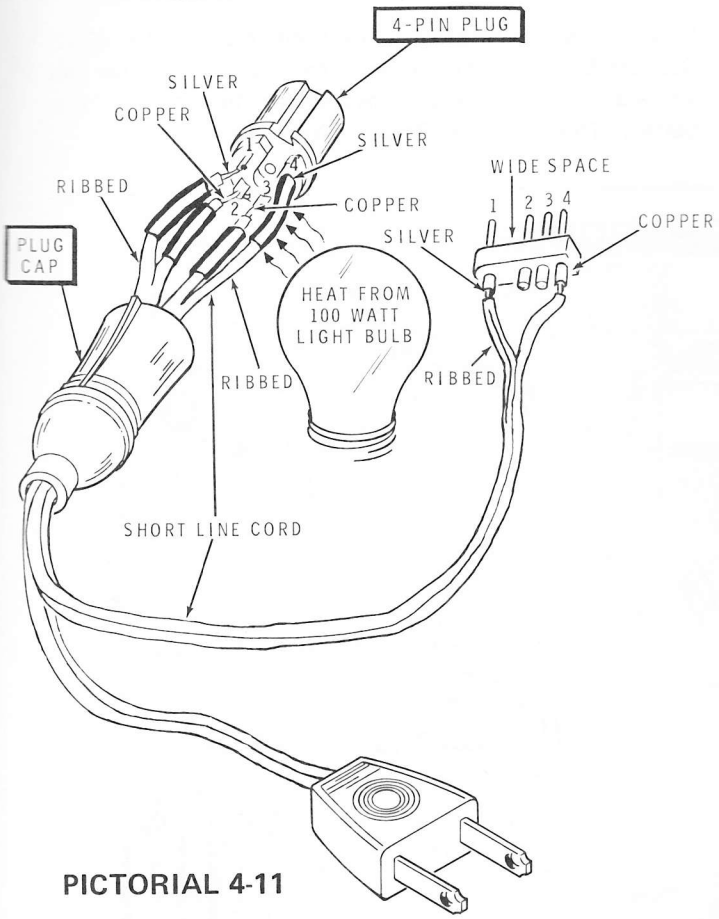
Refer to Pictorial 4-11 for the following steps.

( ) Cut the line cord at the fold.

( ) Split these two cord ends 1" and remove 1/4" of insulation from each of the four wires.

( ) Place a 1/2" length of heat shrinkable sleeving over each of the four wire ends.





PICTORIAL 4-11

CAUTION: Be sure to push the sleeving as far back as possible on the leads before soldering.

NOTE: In the following steps, you will be instructed to connect the silver (ribbed) and copper (smooth) wires of one line cord and then the silver (ribbed) and copper (smooth) wires of the other line cord to the 4-pin plug. Twist the small wire strands together at the end of each lead before you insert the leads into the plug pins.

( ) Connect the silver (ribbed) wire of the longer line cord to pin 1 (S-1).

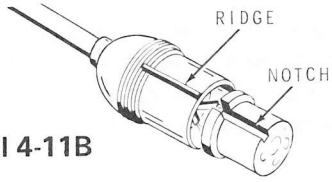
( ) Connect the copper (smooth) wire of the longer line cord to pin 2 (S-1).

( ) Connect the copper (smooth) wire of the shorter line cord to pin 3 (S-1).

( ) Connect the silver (ribbed) wire of the shorter line cord to pin 4 (S-1).

( ) Push the sleeving over each of the four connections.

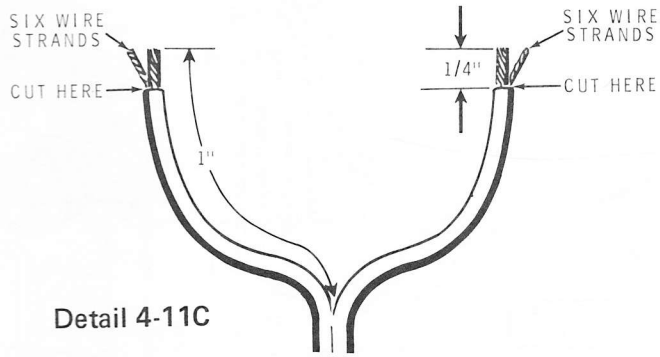
( ) Hold each section of sleeving near a hot 100 watt light bulb so the sleeving will shrink around the connection. NOTE: A match may be used if extreme care is taken.



Detail 4-11B

( ) Push the plug cap over the plug. Be sure to align the ridge of the cap with the notch in the plug. See Detail 4-11B.

The remaining end of the shorter line cord will now be connected.



Detail 4-11C

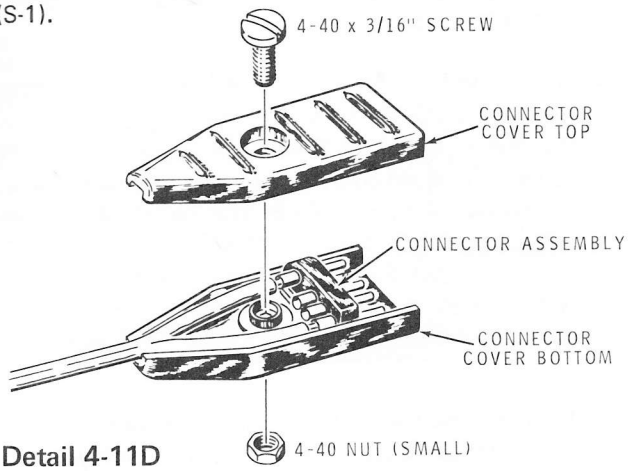
( ) Split the line cord end 1", and remove 1/4" of insulation from each of the two wires. See Detail 4-11C.

( ) Cut six wire strands off each of the two wires as shown. See Detail 4-11C.

( ) Position the 4-pin connector as shown, taking note of the larger space between pins 1 and 2.

( ) Connect the silver (ribbed) wire of the cord to pin 1 of the 4-pin connector (S-1).

( ) Connect the copper wire to pin 4 of the connector (S-1).



Detail 4-11D

( ) Refer to Detail 4-11D and place the connector covers over the connector assembly. Use a 4-40 x 3/16" screw and a 4-40 nut (small).

This completes most of the Transmitter wiring, except for the meter and three harness wires, which will be installed later. Check to see that all other connections are soldered and shake out any wire clippings or solder splashes.

If you have purchased a Heathkit Model GDA-405-3 Receiver Battery, temporarily set the Transmitter aside and proceed to the assembly instructions for the Receiver Battery. Then return to Battery Charging.

BATTERY CHARGING

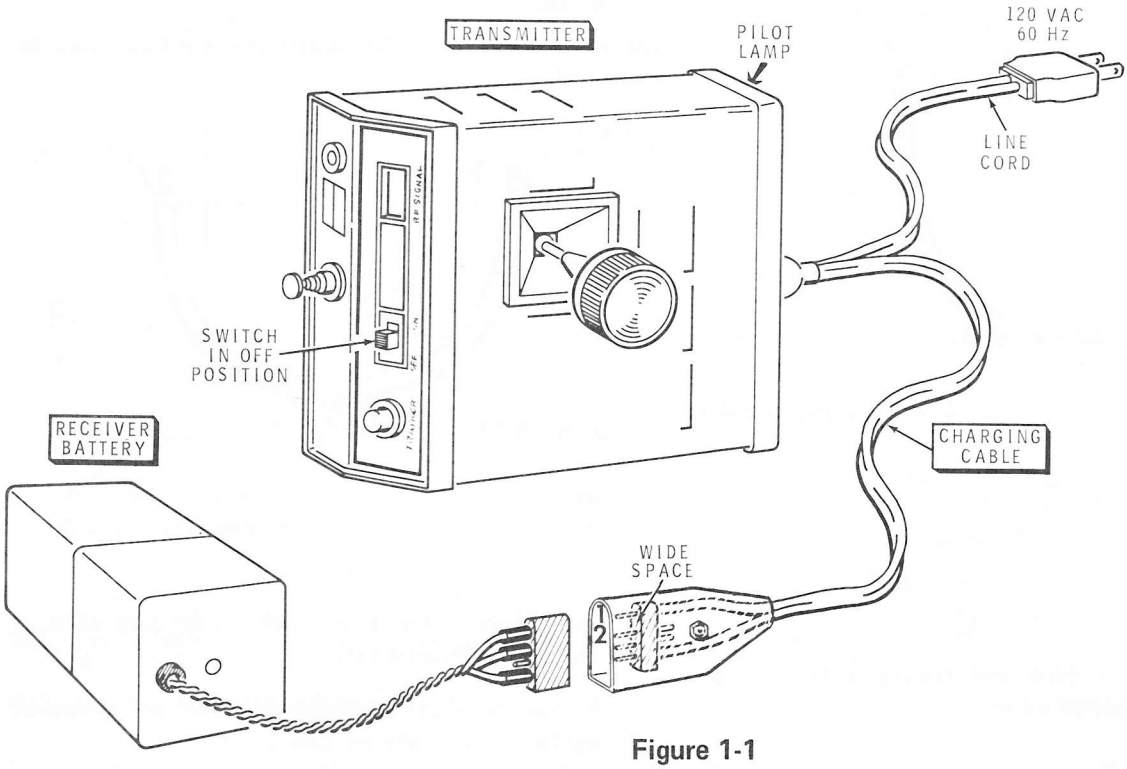


Figure 1-1

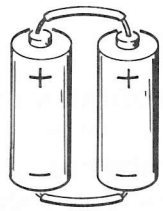


Figure 1-1A

The Heath Company recommends that you do not place the Transmitter or Receiver in operation until the batteries have first been charged. The batteries should be charged for a period of at least fourteen hours, but not more than thirty-six hours.

The recommended way to charge the Transmitter and Receiver batteries is to use the charging cable and the charging circuit in the Transmitter. However, if the Receiver battery is charged on a separate charger, charge it at a rate of 50 mA for 14 hours. NOTE: The Transmitter and Receiver batteries must be charged at the same time or the charging circuit will not operate. The batteries should be charged at this time so they can be placed in operation when you complete the assembly of the Receiver and Servos.

To charge the Transmitter and Receiver batteries at the same time, refer to Figure 1-1 and perform the following steps.

( ) Note the wide space between pins 1 and 2 of the connector on the charging cable. Then connect the charging cable to the Receiver battery.

( ) Look at the Transmitter from the front and make sure the Power switch is Off.

( ) Connect the charging cable to the Transmitter.

NOTE: The batteries will only charge when the Power switch of the Transmitter and the Receiver is in the OFF position.

If the pilot lamp on the Transmitter does not light when the charging cable is plugged into an ac outlet in the next step, unplug the cable right away and check the charging cable wiring. Also, there is the possibility that the charging lamp is burned out.

NOTE: If you find that a battery cell will not take a charge:

1. Disconnect the dead cell from the battery pack.

2. Connect the dead cell across a charged cell for one minute. [Connect the positive (+) ends together and the negative (-) ends together as shown in Figure 1-1A.]

3. Reconnect the cell to the battery pack and charge the batteries for another 14 hours.

If you have purchased a Heathkit Model GDA-405-2 Receiver or Models GDA-405-4 or GDA-505-4 Servos, proceed to the assembly manuals and complete the assembly of those kits while the Transmitter and Receiver batteries are charging.

TEST AND ADJUSTMENTS

NOTE: It is important that all of the adjustments be completed before you put your Transmitter into operation.

The meter furnished with the Transmitter is used as a test meter in this section of the Manual.

If you do not obtain the proper readings in the following steps, turn off the Transmitter and refer to the chart following the step. These charts list possible causes for the malfunction. Also refer to the "In Case of Difficulty" section on Page 52. Correct the problem before proceeding with the next step.

WARNING: The transmitter rf circuit board has been prealigned and pretested. Under no condition should any adjustments on this circuit be changed. To do so will void the warranty of the unit, and will also cause decreased overall performance.

( ) Disconnect the charging cable from the ac line, Transmitter, and Receiver Battery if it is still connected.

Refer to Figure 1-2 for the following steps.

NOTE: At this time the thumb knob screws will be tightened. Tighten each screw only enough so the thumb knob will turn the control shaft. As you make the following adjustments on the Transmitter, the thumb knobs will be repositioned on the control shafts.

( ) Center the thumb knobs in the nylon guides for all the thumb knob controls (except channel #5) and tighten the thumb knob screws. It may be necessary to remove the rf circuit board.

( ) Position the channel #5 thumb knob tab toward the front of the Transmitter. Then tighten the thumb knob screw.

( ) Set all Trim controls and Auxiliary channel controls to their center position.

( ) Set the channel #5 switch so that the thumb knob tab is toward the front of the Transmitter.

NOTE: Be sure you do not change the settings of the Auxiliary controls, Stick controls, or the Trim controls unless you are instructed to do so.

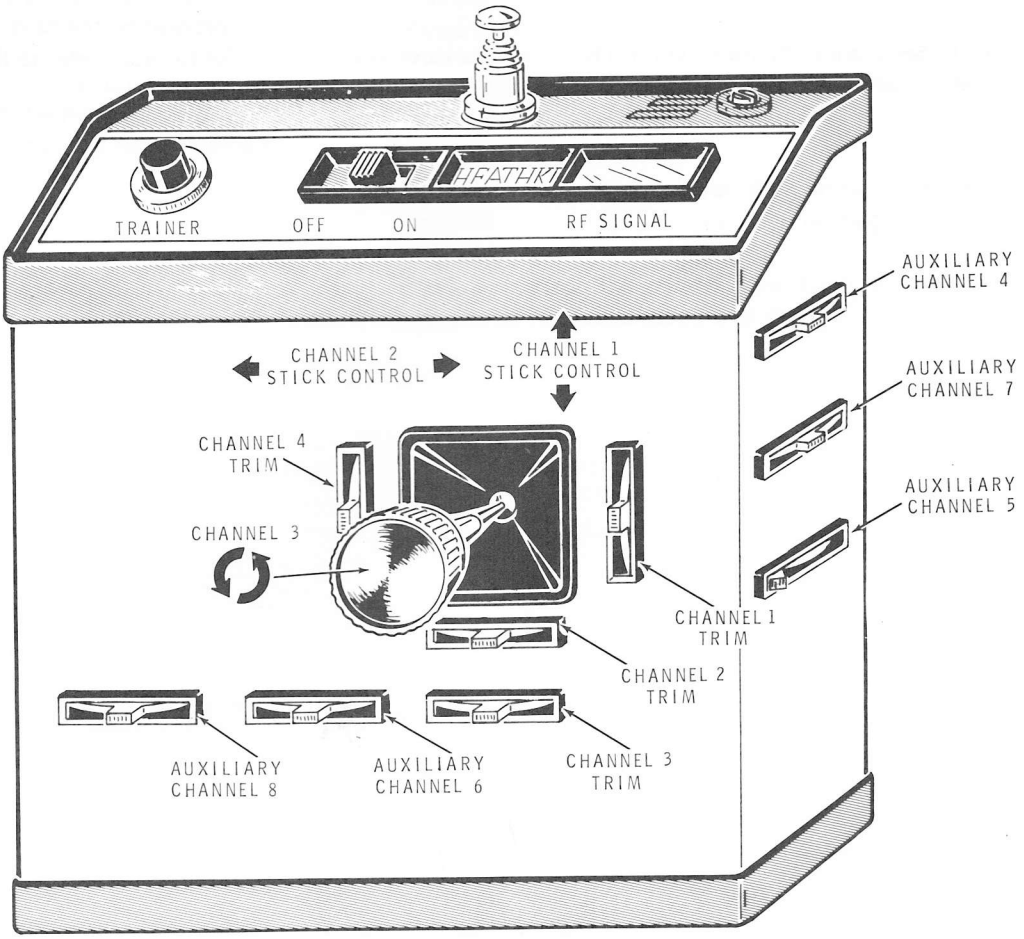
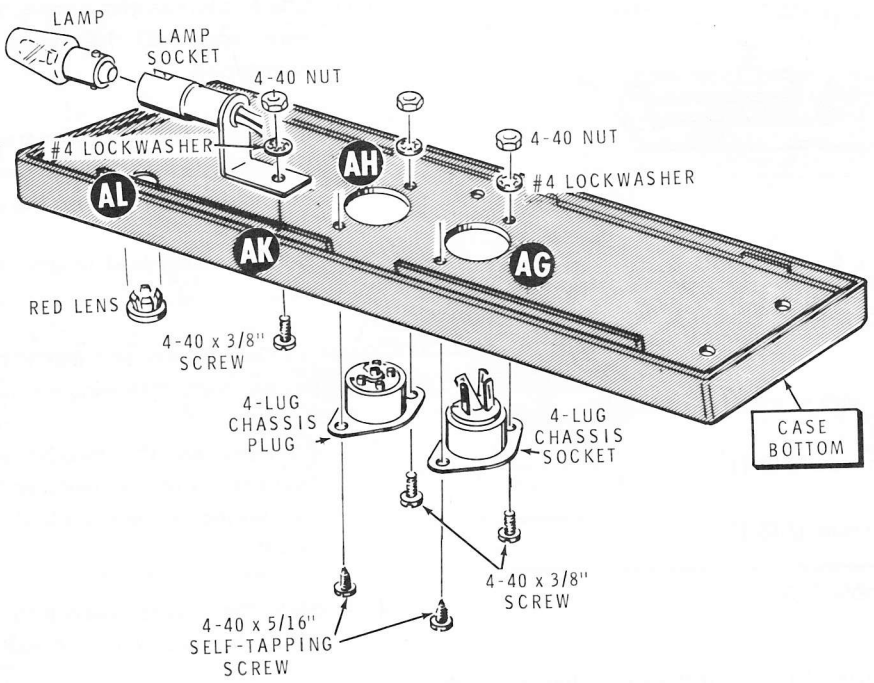


Figure 1-2



PICTORIAL 4-5

Refer to Pictorial 4-5 for the following steps.

( ) Install the 4-lug chassis plug at AH with one 4-40 x 3/8" screw, one #4 lockwasher, one 4-40 nut (large), and one 4-40 x 5/16" self-tapping screw.

( ) Install the 4-lug chassis socket at AG with one 4-40 x 3/8" screw, one #4 lockwasher, one 4-40 nut (large), and one 4-40 x 5/16" self-tapping screw.

( ) Push the red lens into hole AL in the case bottom as shown.