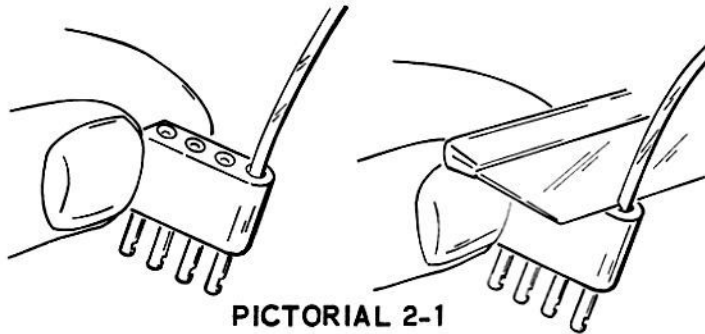


RECEIVER STEP-BY-STEP ASSEMBLY

BATTERY WIRING AND CHARGING



PICTORIAL 2-1

BATTERY WIRING

Refer to Pictorial 2-1 for the following steps.

- () Push one end of the white sleeving into a 4-lug socket opening as shown. Be sure the sleeving is pushed all the way into the opening (approximately 3/16") and is around the connector pin.
- () Cut the sleeving flush with the surface of the socket with a razor blade or sharp knife.
- () In the same manner, install sleeving in the three remaining openings of the same socket.
- () Install white sleeving in all pin openings in the remaining 4-lug sockets and cut each piece flush with the socket surface.
- () Similarly, install and cut the sleeving in each opening in the large block connector.

NOTE: Only one of the 4-lug sockets will be used in the following steps. Lay the large block connector and the remaining 4-lug sockets aside. They will be used later.

Refer to Detail 2-1A for the following steps.

CAUTION: Be careful that the bare wires of the battery leads do not touch each other and do not short circuit between the lugs of the socket or the battery may be damaged.

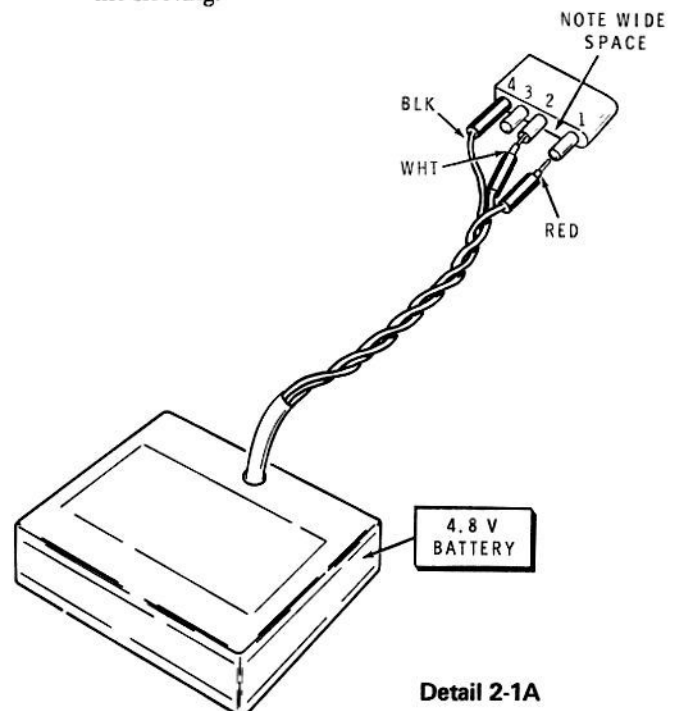
- () Locate the Receiver Battery, Model GDA-19-3 and twist the three leads together as shown.
- () Cut the ends of the three battery leads, one at a time, so that they are all the same length as the shortest lead. Then place a 1/2" length of sleeving over each lead.

NOTE: Prepare only one battery lead at a time when performing the following steps. To prepare a lead, remove 1/8" of insulation, and then melt a small amount of solder on the exposed lead end to hold the small wire strands together.

- () Position a 4-lug socket as shown, taking note of the wide space between lugs 1 and 2.

Connect the leads of the battery to the 4-lug socket as follows:

- () Prepare the end of the black lead.
- () Connect the black lead to lug 4 (S-1). Then push the sleeving over the connection.
- () Prepare the end of the white lead.
- () Connect the white lead to lug 2 (S-1). Then push the sleeving over the connection.
- () Prepare the end of the red lead.
- () Connect the red lead to lug 1 (S-1). Then push the sleeving over the connection.
- () Rotate the 4-lug socket to twist the battery leads up to the sleeving.



Detail 2-1A

BATTERY CHARGING

The manufacturer recommends that you do not place the battery in operation until after it has first been charged. The battery should be charged for a period of at least twenty-four hours, but not more than thirty-six hours.

The recommended way to charge this Receiver battery is by using the charging circuit in the Transmitter. Both the Transmitter and Receiver batteries should be charged at this time so they can be placed in operation when you complete the assembly of the Receiver and Servo. If the Receiver battery is charged on a separate charger, charge it at a rate of 50 mA for 14 hours.

Refer to Figure 1-1 for the following steps. Both batteries should be charged as follows:

- () Observing the polarity of the connectors, connect the charging cable to the battery.

- () Be sure the transmitter switch is turned off.

- () Connect the charging cable to the Transmitter.

NOTE: The batteries will only charge when the ON-OFF switch of the Transmitter is in the OFF position.

If the pilot lamp does not light when the transmitter is plugged into an AC outlet in the following step, unplug the line cord right away. This would indicate that some part in this circuit is faulty or improperly wired. For example, if the pilot lamp did not light, it might be due to a fault in the wiring of the ON-OFF switch, or 4-pin connector. There might also be a fault in the diode, resistor, or pilot lamp that is connected to the ON-OFF switch. Be sure to locate and repair the difficulty before proceeding. Refer to the In Case Of Difficulty section of the Manual on Page 97.

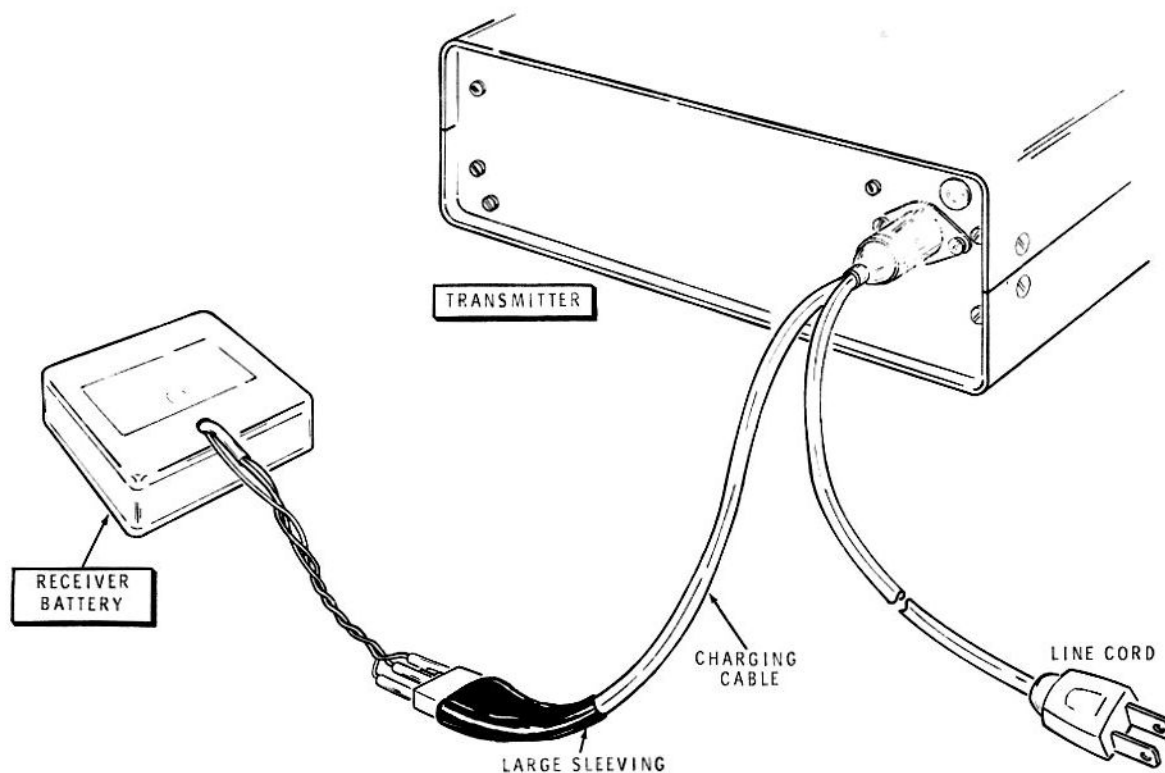


Figure 1-1

() Plug the other end of the line cord into a 105-125 volt 60 Hz AC outlet. The pilot lamp in the Transmitter should light indicating that both batteries are charging.

() At the end of the charging period, remove the line cord from the AC outlet. Then remove the charging cable from the Transmitter, and remove the charging cable from the Receiver battery. Set the units aside until called for later. Do not turn the transmitter On until instructed to do so.

CIRCUIT BOARD ASSEMBLY

ASSEMBLY NOTES

The two circuit boards in the Receiver, when put together, measure approximately two inches square and contain 21 different wires and 106 circuit components. Therefore, it is suggested that you take your time while assembling this kit.

Because the circuit boards are so small, there is not sufficient room on them to letter the value of each component. Therefore, all component locations except for resistors are shown on the boards with only an outline of the component. The locations where resistors are to be installed are filled in. Holes with triangles are used for wires. See Figure 1-2. Use extreme care when installing components so that they fit directly over their outline on the circuit board.

Due to the small foil area around the circuit board holes and the small areas between foils, it will be necessary to use the utmost care to prevent solder bridges between adjacent foil areas. Use only a minimum amount of solder and do not heat components excessively with the soldering iron. Diodes, transistors, etc., can be

damaged if subjected to excessive amounts of heat. Use no larger than a 25 watt soldering iron, allow it to reach operating temperature, and then apply it only long enough to make a good solder connection.

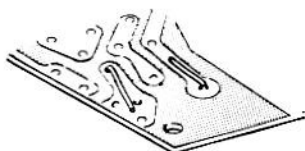
When installing each component, bend its leads flat against the same foil from which they extend, as shown in Figure 1-2. Then cut the leads off approximately 1/16" from the hole on the foil side of the circuit board. This will hold the components in place until they are soldered, and will provide a larger solder area. This larger solder area is important because of the great amount of vibration that the Receiver must withstand.

Resistors will be called out by resistance value (in Ω , $k\Omega$, or $M\Omega$) and color code. Capacitors will be called out by capacitance value and type.

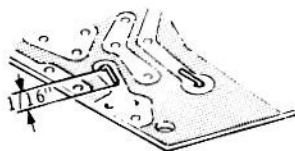
The variable transformers, crystal, and ceramic filters must be seated down onto the circuit board, and no component should be allowed to protrude above the top of the tallest of these items. This will ensure that the unit will fit into its case.

IMPORTANT SOLDER NOTE

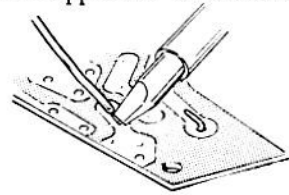
When you install each component, bend its leads flat against the same foil from which they extend, as shown below. It is important that each lead is bent toward the center of a foil pad, or in the same direction as the foil lead to prevent solder bridging between foils. Cut the leads 1/16" from the hole on the foil side of the circuit board. This will hold the components in place until they are soldered, and will provide a larger solder area. This larger solder area is important because of the great amount of vibration that the receiver and servos must withstand. This note applies to the leads of all components being installed in the following steps and pictorials.



BEND LEADS ONTO FOIL FROM WHICH THEY EXTEND



CUT OFF LEADS 1/16" FROM HOLE



SOLDER LEADS TO FOIL WHEN ALL THE HOLES IN A FOIL PAD ARE USED

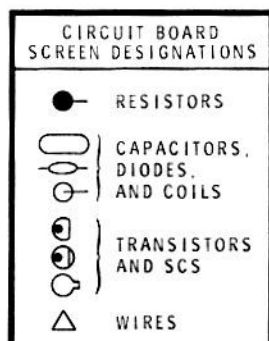


Figure 1-2

Parts mounted on the edges of the circuit board should be tilted toward the center of the board before they are soldered. This is to insure that the parts will clear the ribs of the receiver case.

CIRCUIT BOARD ASSEMBLY

NOTE: Because the circuit boards and connectors are small, and have a tendency to move when being soldered, it is a good idea to hold them in some manner. A simple jig made up of a small board and a pincher clothespin as shown in Detail 2-2A works very well for this purpose. A small vise can also be used.

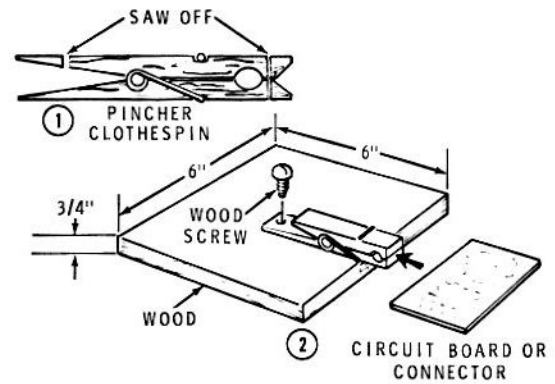
There are no specific steps for soldering the component leads to the foil of the circuit boards. When all the holes in a foil pad have been used, the component leads should be soldered to the foil. This will eliminate the possibility of excessive solder buildup and of covering unused holes. Also, be very careful not to make any solder bridges between adjacent foils.

FOR GOOD SOLDERED CONNECTIONS, YOU MUST KEEP THE SOLDERING IRON TIP CLEAN... WIPE IT OFTEN WITH A DAMP SPONGE OR CLOTH.

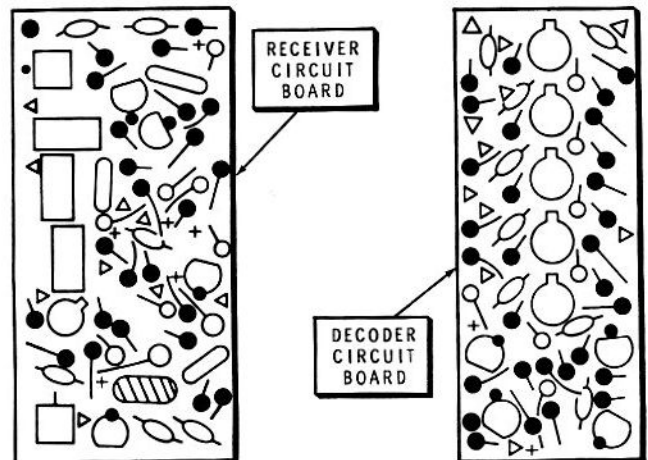


- () Refer to Detail 2-2B and locate the receiver circuit board, (the larger circuit board #85-412) and position it foil side down.

Complete each step on Pictorials 2-2 through 2-5.



Detail 2-2A

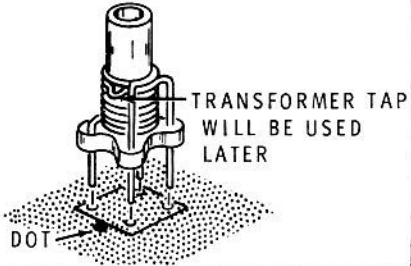


Detail 2-2B

START

CONTINUE

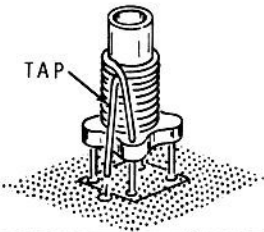
- () T1, the four lead variable transformer. Position the transformer tap over the dot on the circuit board as shown.



- () Ceramic filter (#404-399). Line up the pins of the filter with the correct holes in the circuit board. Then push the filter in place and solder the pins to the foil.

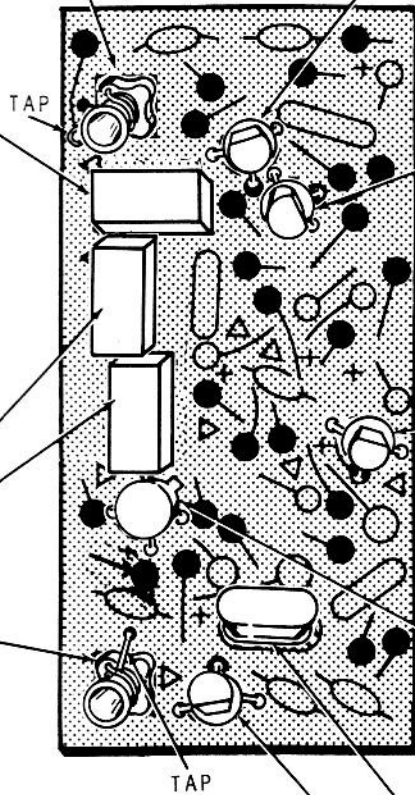


- () Ceramic filter (#404-399).
- () Ceramic filter (#404-399).
- () T2, five lead variable transformer.

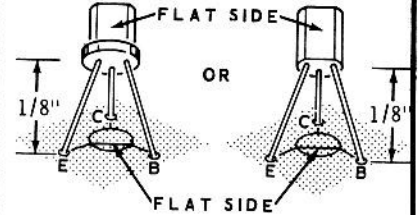


CAUTION: The transistors mounted on this circuit board are not all the same type. Be sure to select each transistor properly by either its part or type number which is stamped on it.

NOTE: Install the transistors in the following manner as shown: First line up the flat of the transistor with the outline of the flat on the circuit board. Then insert the transistor leads into their correct holes.

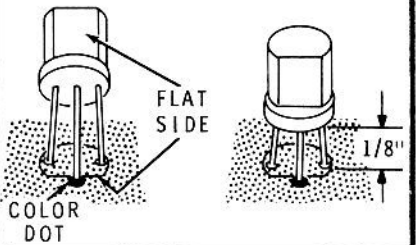


The position of the collector (center) lead is indicated by the dot on the circuit board. Position the transistors 1/8" away from the circuit board. Then solder each lead to the foil and cut off the excess lead lengths.



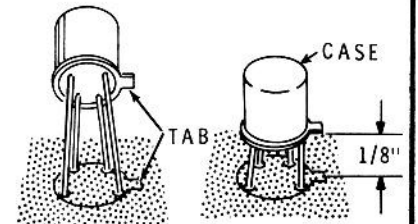
- () Transistor 2N3393 (#417-118).

- () Transistor X29A826 (#417-200). NOTE: Position the center lead toward the flat when installing this transistor only.



- () Transistor 2N5232A/2N3391A (#417-91).

- () Transistor SE5055 (#417-228). NOTE: Position the transistor tab over the tab printed on the circuit board. Do not let this transistor's case touch any other component leads.



- () Crystal.

- () Transistor 16G2349 (#417-164). Position it away from the edge of the circuit board.

PROCEED TO PICTORIAL 2-3.

PICTORIAL 2-2

START

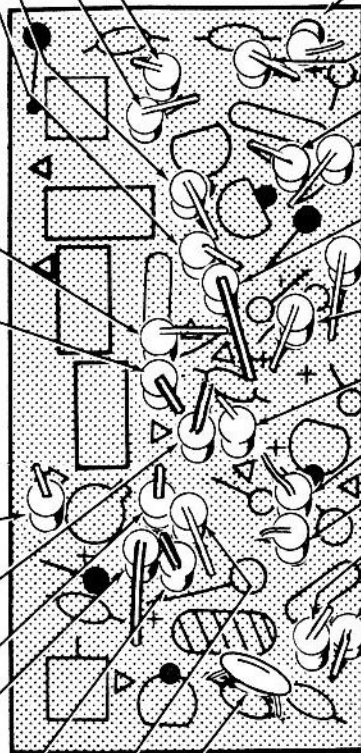


- () 33 k Ω (orange-orange-orange).
 - () 1000 Ω (brown-black-red).
 - () 2200 Ω (red-red-red).
 - () 15 k Ω (brown-green-orange).
 - () 1 μ F Tantalum. Position the positive (+ or red) end on the circuit board.
- POSITIVE
(+ OR RED)
END
- When sleeving is called for, remove and use the indicated length from the solid black wire supplied in this kit.
- () 5600 Ω (green-blue-red). Use 1/4" of sleeving.
- NOTE: In the next step, if you chose 27 MHz operation for your transmitter, install the 470 Ω (yellow-violet-brown) resistor. If you chose 53 MHz or 72 MHz operation install the 1000 Ω (brown-black-red) resistor.
- () 470 Ω (yellow-violet-brown).
 - 1000 Ω (brown-black-red).
- Tilt the resistor toward the center of the circuit board before soldering.
- () 15 k Ω (brown-green-orange). Use 1/4" of sleeving.
 - () 100 Ω (brown-black-brown). Use 1/4" of sleeving.
 - () 2700 Ω (red-violet-red). Use 3/8" of sleeving.
 - () 2.2 μ H RF choke, #45-73, (red-red-gold). Use 3/8" of sleeving.
- NOTE: The RF choke resembles a resistor and may have either color bands or color dots.
- () 5600 Ω (green-blue-red).
 - () 47 pF disc. Tilt it toward center of the circuit board.

CONTINUE

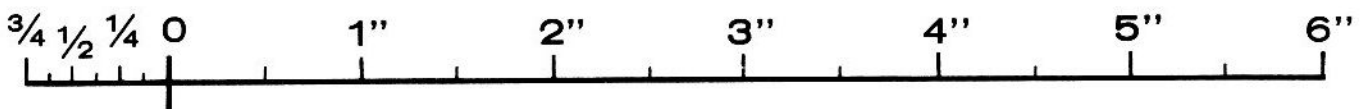


- () 18 k Ω (brown-gray-orange). Tilt toward center of circuit board before soldering.
- () 22 k Ω (red-red-orange).
- () 2200 Ω (red-red-red).
- () 2200 Ω (red-red-red).
- () 22 k Ω (red-red-orange). Use 3/8" of sleeving.
- () 10 k Ω (brown-black-orange).
- () 1000 μ H RF choke (brown-black-red).
- () 100 Ω (brown-black-brown).
- () 1000 Ω (brown-black-red).
- () 27 k Ω (red-violet-orange).
- () 820 Ω (gray-red-brown).
- () 6800 Ω (blue-gray-red).



PICTORIAL 2-3

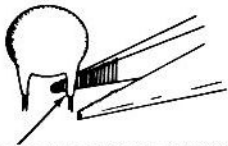
PROCEED TO PICTORIAL 2-4,





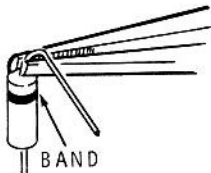
START

() NOTE: 27 MHz band Receivers use 47 pF disc. 53 and 72 MHz band Receivers use 27 pF disc. Tilt toward center of circuit board.

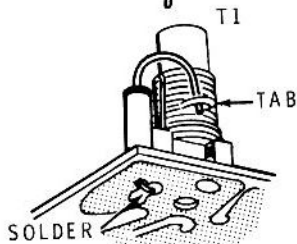
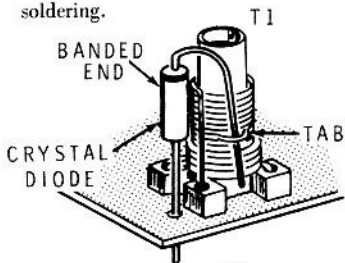


REMOVE INSULATION ON LEADS

NOTE: When installing diodes vertically, hold the diode lead with pliers so the diode is not broken when bending the lead. Bend the lead before installing the diode. Then, position the diode on the circuit board as directed in each step.



() Crystal diode (#56-27). Connect the banded end to the tap on T1. Tilt toward center of circuit board before soldering.



() .01 μ F Mylar.

() .047 μ F tantalum. Position the positive (+ or red) end down. Tilt toward center of circuit board before soldering.

SOLDERING IRON TIP

CONTINUE

() .001 μ F disc. Tilt toward center of circuit board before soldering.

() .033 μ F Mylar.

() 2.2 μ F tantalum. Position the positive (+ or red) end on the circuit board. (Do not confuse with .22 μ F).

() 180 pF tubular ceramic (brown-gray-brown-white).

() Diode 1N4149 (#56-56). Position the banded end up.

() .047 μ F tantalum. Position the positive (+ or red) end up. Use 1/4" of sleeving.

() .0033 μ F disc.

() .047 μ F tantalum. Position the positive (+ or red) end up.

() Diode 1N4149 (#56-56). Position the banded end up.

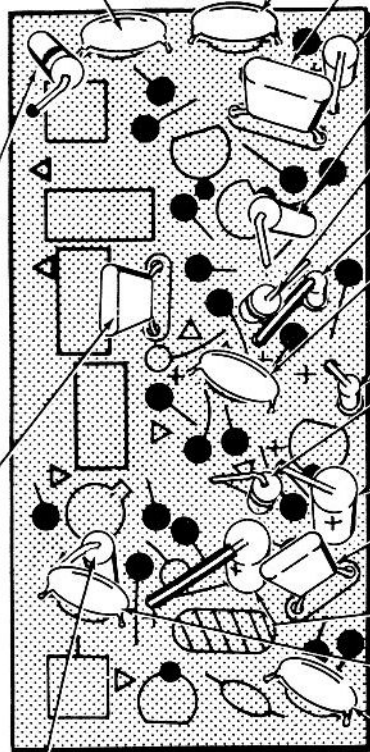
() .33 μ F tantalum. Position the positive (+ or red) end up.

() .01 μ F Mylar.

() 33 μ F tantalum. Position positive (+ or red) end up. Use 1/2" of sleeving.

() 27 MHz band Receivers use 47 pF disc. 53 and 72 MHz band Receivers use 27 pF disc.

() 75 pF disc. Tilt toward center of circuit board.



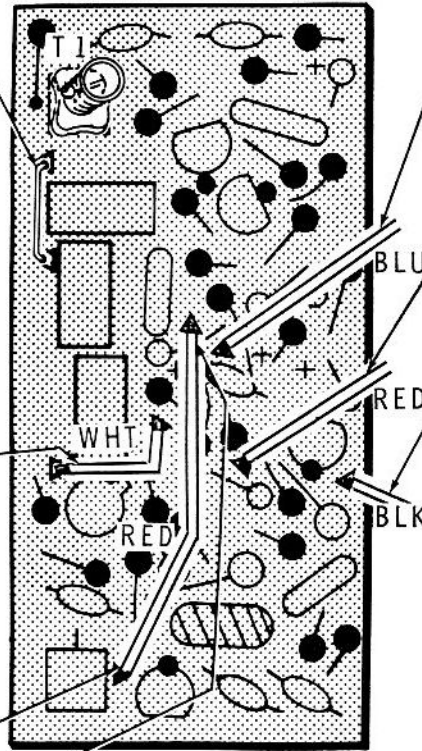
PROCEED TO PICTORIAL 2-5

PICTORIAL 2-4

START



- () Locate a length of cut off resistor lead and cut it to a length of 3/4".
- () Insert the 3/4" wire in the indicated holes.
- NOTE: When preparing the following wires, cut them to the indicated length and remove the proper amounts of insulation from the wire ends. Then twist the wire strands together and melt a minimum amount of solder on the strands to hold them together. Solder each lead as it is inserted into its indicated hole (Δ).
- () 2-1/2" white wire; remove 3/4" of insulation from each end.
- () Insert the white wire ends into their holes using the exposed wire ends like needles. Pull the wire ends through from the copper foil side of the circuit board until the wire's insulation is close to the circuit board. Do not try to lay this wire down against the circuit board.
- () 2-1/2" red wire; remove 1/8" of insulation from one end and 3/4" of insulation from the other end.
- () Insert the 1/8" exposed end of the red wire into its indicated hole (Δ).
- () Insert the remaining end of the red wire like a needle as before.



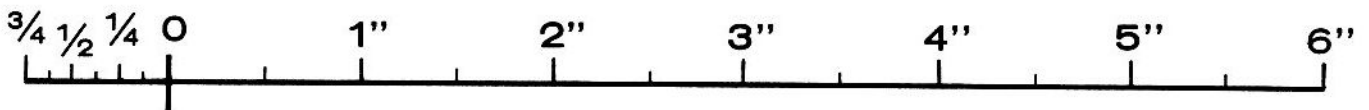
CONTINUE



- () 2-1/2" blue wire; remove 1/2" of insulation from one end only.
- () Insert the blue wire like a needle. The other end will be connected later.
- () 2-1/2" red wire; remove 1/2" of insulation from one end only.
- () Insert the red wire like a needle. The other end will be connected later.
- () 1" black stranded wire; remove 1/8" of insulation from both ends.
- () Insert the black wire. The other end will be connected later.
- () Carefully inspect the circuit board and trim all excess lead lengths close to the foil of the circuit board and make sure all connections are soldered.
- () Set the circuit board aside temporarily.

PROCEED TO PICTORIAL 2-6

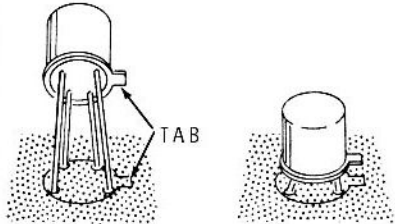
PICTORIAL 2-5



START ↓

() Locate the decoder circuit board (#85-413) and position it foil side down. Complete each step on Pictorials 2-6 through 2-9.

NOTE: In the following steps, install silicon-controlled switches in the following manner, as shown. Align the tab of the switch with the tab outline on the circuit board. Position the body of the switch as close to the circuit board as possible without letting the leads touch the case. Do not crisscross any of the leads.



() Silicon-controlled switch X13B615 (#57-47).

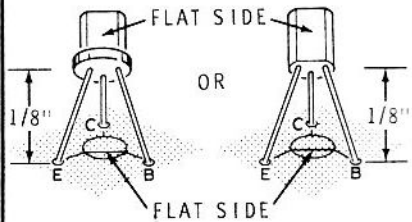
() Silicon-controlled switch X13B615 (#57-47).

() Silicon-controlled switch X13B615 (#57-47).

() Silicon-controlled switch X13B615 (#57-47).

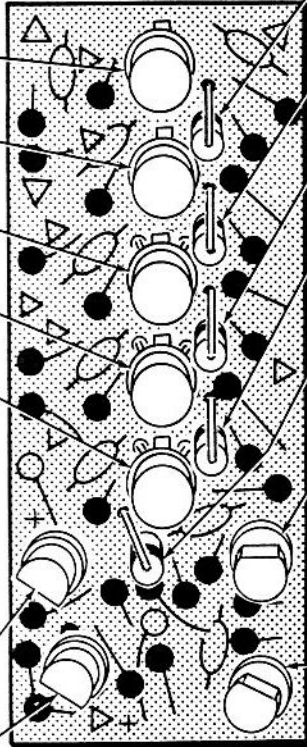
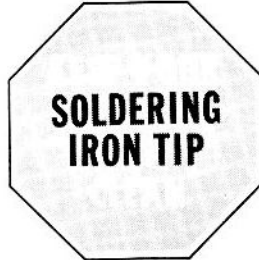
() Silicon-controlled switch X13B615 (#57-47).

NOTE: Install the next two transistors in the following manner as shown:



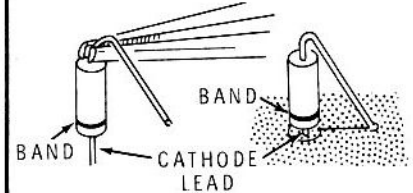
() Transistor 2N3393 (#417-118).

() Transistor 2N3393 (#417-118).



CONTINUE ↓

NOTE: When installing diodes vertically, hold the diode lead with pliers so the diode is not broken when bending the lead. Bend the lead before installing the diode. Then, position the diode on the circuit board as directed in each step. In each installation, the diode lead may touch the silicon controlled switch case. This will not change the operation of the decoder.



() Diode 1N4149 (#56-56). Position with cathode (banded) end down.

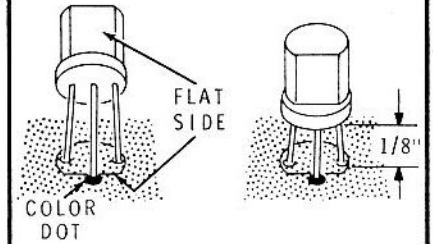
() Diode 1N4149 (#56-56). Position with cathode (banded) end down.

() Diode 1N4149 (#56-56). Position with cathode (banded) end down.

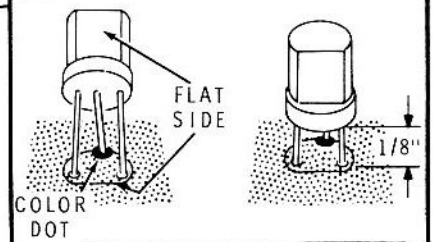
() Diode 1N4149 (#56-56). Position with cathode (banded) end down.

() Diode 1N4149 (#56-56), NOTE: Position with cathode (banded) end up.

() Transistor X29A826 (#417-200). NOTE: Position the center lead toward the flat when installing this transistor only.



() Transistor X29A826 (#417-200).



PROCEED TO PICTORIAL 2-7

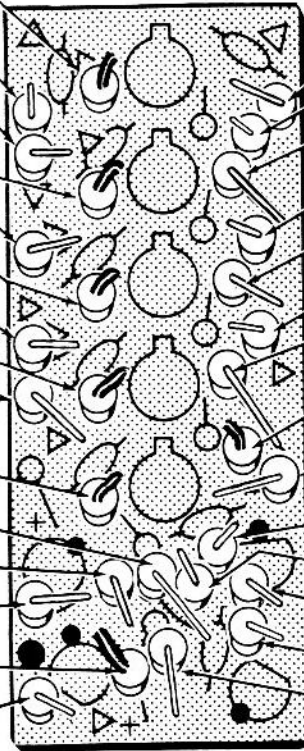
START



CONTINUE



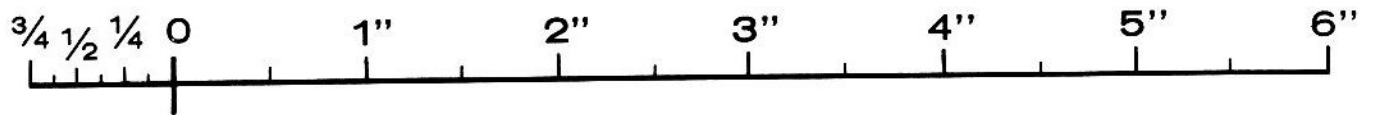
- () 10 kΩ (brown-black-orange). Use 1/4" of sleeving.
- () 1000 Ω (brown-black-red).
- () 1000 Ω (brown-black-red).
- () 10 kΩ (brown-black-orange). Use 1/4" of sleeving.
- () 1000 Ω (brown-black-red).
- () 10 kΩ (brown-black-orange). Use 1/4" of sleeving.
- () 1000 Ω (brown-black-red).
- () 10 kΩ (brown-black-orange). Use 1/4" of sleeving.
- () 1000 Ω (brown-black-red).
- () 4700 Ω (yellow-violet-red). Use 1/4" of sleeving.
- () 4700 Ω (yellow-violet-red).
- () 4700 Ω (yellow-violet-red).
- () 15 kΩ (brown-green-orange).
- () 2200 Ω (red-red-red). Use 1/4" of sleeving.
- () 100 kΩ (brown-black-yellow).



- () 15 kΩ (brown-green-orange). Tilt toward center of board before soldering.
- () 100 kΩ (brown-black-yellow).
- () 15 kΩ (brown-green-orange).
- () 100 kΩ (brown-black-yellow).
- () 15 kΩ (brown-green-orange).
- () 100 kΩ (brown-black-yellow).
- () 15 kΩ (brown-green-orange).
- () 100 kΩ (brown-black-yellow). Use 1/4" of sleeving.
- () 15 kΩ (brown-green-orange). Tilt toward center of circuit board before soldering.
- () 4700 Ω (yellow-violet-red).
- () 47 kΩ (yellow-violet-orange).
- () 15 kΩ (brown-green-orange).
- () 4700 Ω (yellow-violet-red).
- () 1500 Ω (brown-green-red).

PROCEED TO PICTORIAL 2-8

PICTORIAL 2-7



START



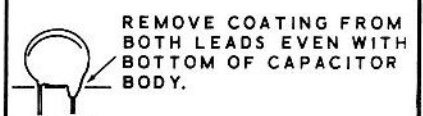
NOTE: When a wire is called for, cut it to length, remove 1/4" of insulation from one end, and position the prepared end in the indicated hole (Δ), Solder the wire to the foil. The other end will be connected later.

() 7" blue wire.

NOTE: When installing three wires in the same hole, twist the ends of the three wires together and melt a minimum amount of solder on the strands.

() Three 7" white wires, Insert the three wires into the same hole.

NOTE: When installing disc capacitors, remove any excess coating from the leads. Use long-nose pliers to remove this coating.



() .001 μF disc.

() Three 7-1/2" black stranded wires, Insert the three wires into the same hole.

() 7-1/2" green wire.

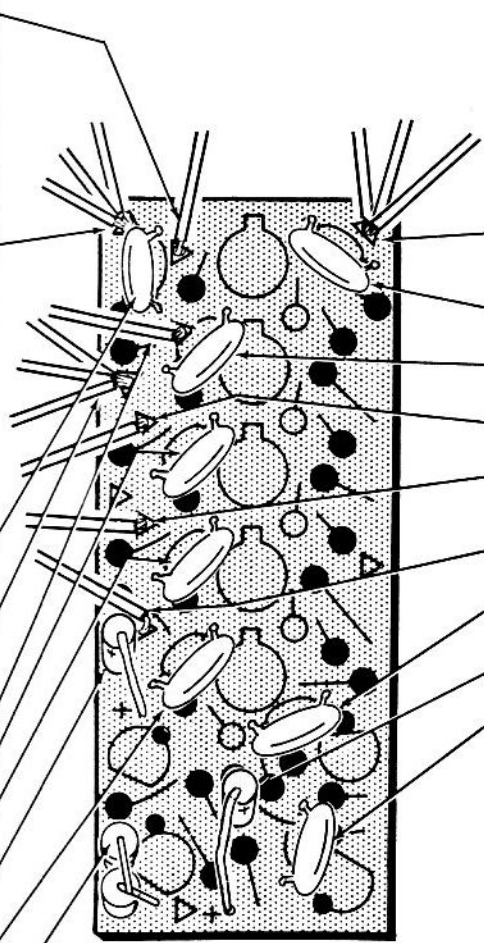
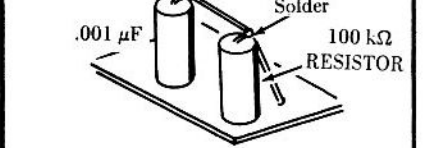
() .005 μF disc.

() .005 μF disc.

() .22 μF tantalum, Position with positive (+) or red end up.

() .005 μF disc.

() .001 μF (brown-black-red-yellow) tubular ceramic. Connect to the top lead of the 100 kΩ resistor (brown-black-yellow).



CONTINUE



() Three 7-1/2" red wires, Insert the three wires into the same hole.

() .001 μF disc.

() .005 μF disc.

() 7-1/2" yellow wire.

() 7-1/2" orange wire, Make sure you use the proper hole.

() 8" brown wire.

() .005 μF disc.

() .047 μF tantalum, Position with the positive (+) or red end up.

() .005 μF disc.

PROCEED TO PICTORIAL 2-9

PICTORIAL 2-8

START



() Position the receiver and decoder circuit boards as shown (foil side down) for final wiring.

() Remove 1/8" of insulation from the free end of the red and blue wires coming from the receiver circuit board. Then twist the wire strands of each lead together and melt a minimum amount of solder on the strands to hold them together.

() Insert the black wire,

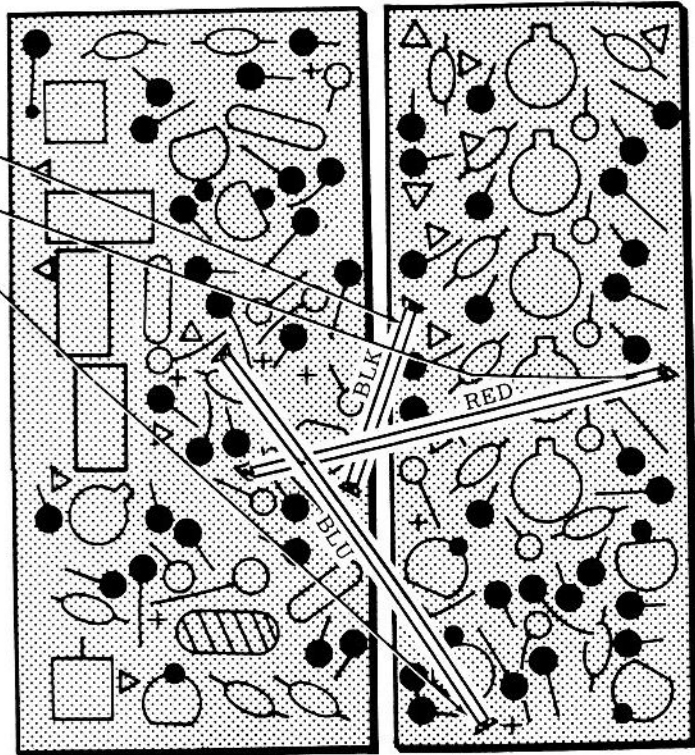
() Insert the red wire,

() Insert the blue wire,

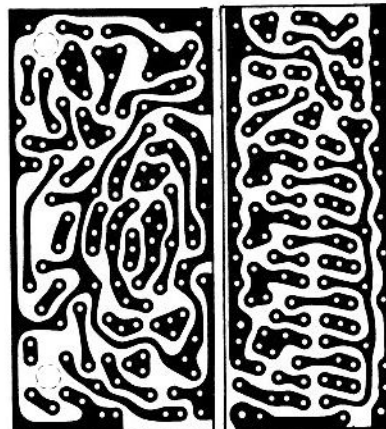
() Solder all three connections to the foil and cut off the excess lead lengths.

() Compare your foil pattern against those shown to make sure there are no solder bridges. To make it easier to locate solder bridges, it is suggested that you clean the foil side of the circuit board and remove the rosin. This can be done by using a small stiff brush (toothbrush) and lacquer thinner or dope thinner. Only a very small amount of these chemicals are required. Do not get them on the component side of the circuit board or in the coils.

NOTE: This completes the assembly of the circuit boards. Check the component side to make sure that a lead from any one component is not touching the lead of any other component.



FINISH

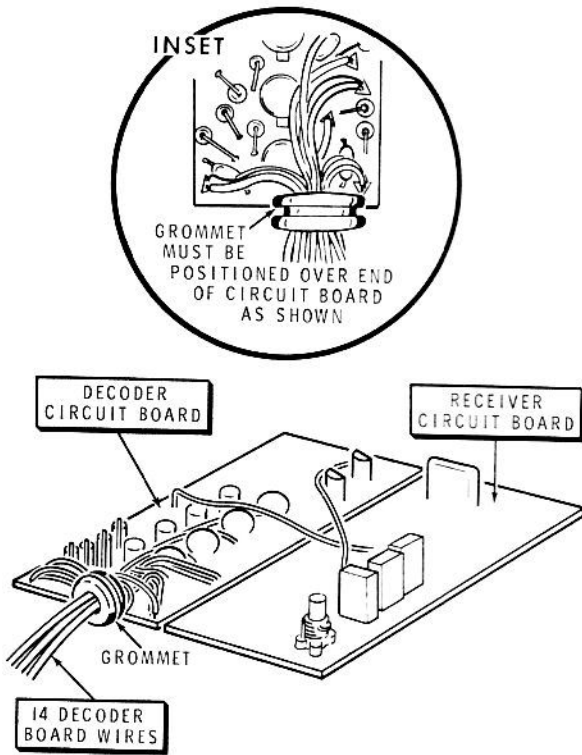


PICTORIAL 2-9

WIRING

Refer to Detail 2-10A for the following steps.

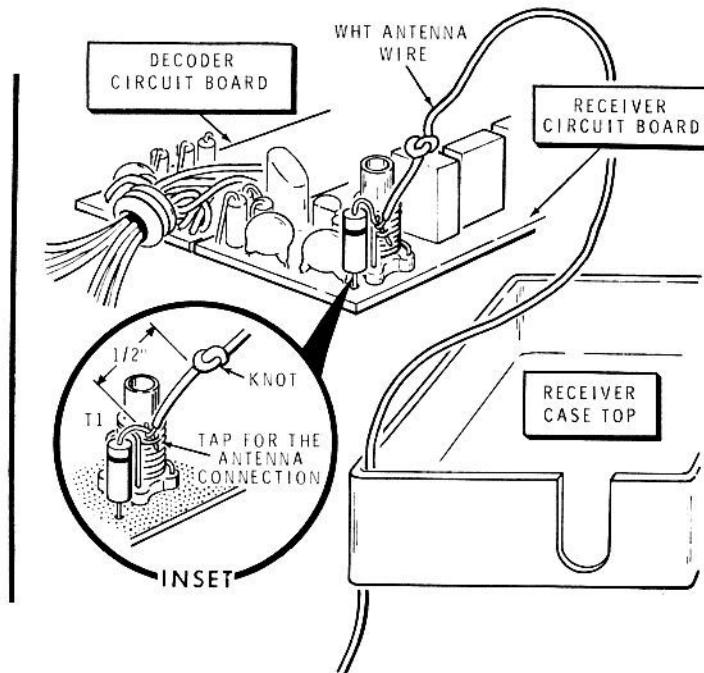
- () Position the fourteen decoder circuit board wires around the decoder components as shown.
- () Slip a rubber grommet over the fourteen decoder circuit board wires. Position the wires and grommet as shown in the inset drawing.



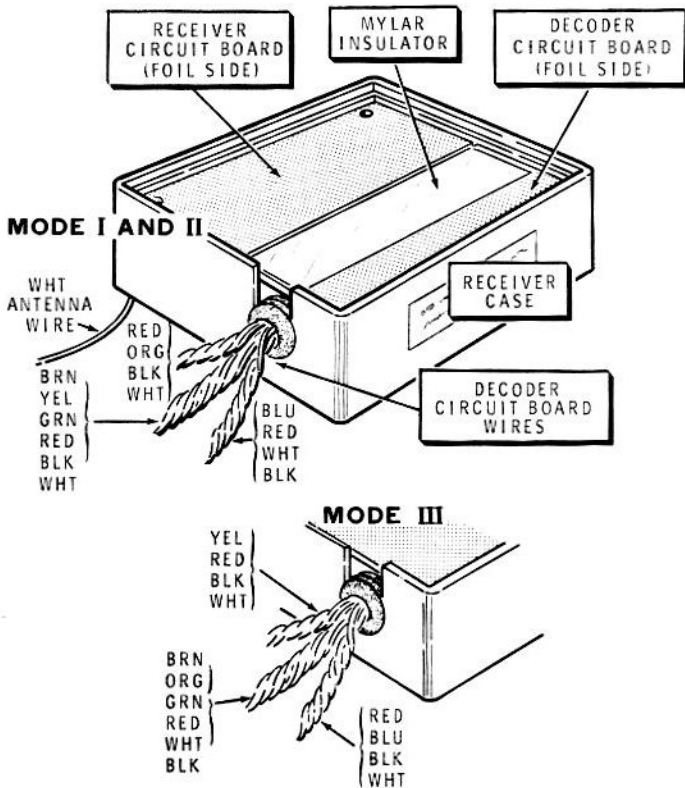
Detail 2-10A

Refer to Detail 2-10B for the following steps.

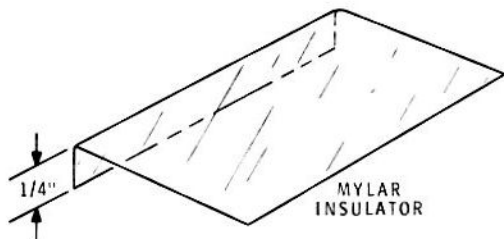
- () Remove 1/8" of insulation from one end of the 36" white wire. Tie a small knot in this wire 1/2" from the end of the wire.
- () Refer to the inset drawing and form a hook in the wire. Connect the hook to the top lead of the diode (S-1).
- () Locate the receiver case and insert the 36" antenna wire through the small hole in the case top. NOTE: This hole may have to be enlarged in some of the cases.



Detail 2-10B



PICTORIAL 2-10

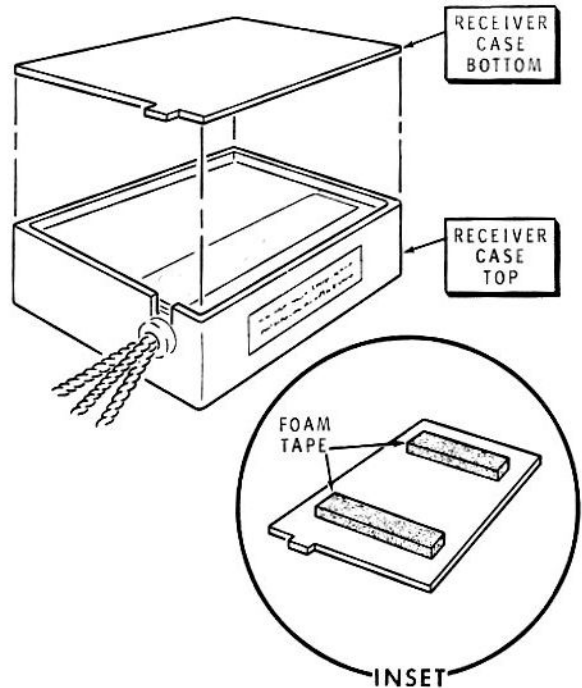


Detail 2-10C

- () Refer to Detail 2-10C and bend the Mylar insulator to the shape shown.

Refer to Pictorial 2-10 for the following steps.

- () Insert the 1/4" section of the Mylar insulator between the circuit boards as shown and position the circuit boards into the case. Be sure the fourteen decoder wires, rubber grommet, and 36" antenna wire are positioned so the circuit boards fit properly into the case.



Detail 2-10D

- () Cut the foam tape into two equal lengths.
- () Refer to the inset drawing on Detail 2-10D. Remove the paper backing from the two lengths of foam tape and install the tape on the inside of the case bottom.
- () Place the case bottom into position.
- () Remove the paper backing from the FCC label and press the label into place on the side of the receiver case as shown.

At this point in the construction of your GD-19 system, you must decide which mode of operation you will be using. The three modes of operation in popular use today are:

| | Left Control Stick | Right Control Stick |
|----------|--------------------|---------------------|
| Mode I | Rudder-Elevator | Aileron-Throttle |
| Mode II | Rudder-Throttle | Aileron-Elevator |
| Mode III | Aileron-Throttle | Rudder-Elevator |

Select the mode you prefer and follow the receiver wiring instructions under that particular heading. If you are unfamiliar with model control, we suggest that you follow Mode II instructions, or consult a local modeler for advice on which Mode to use. The mode of operation is one of personal preference and all work equally well.

The decoder circuit board wires will now be twisted into three groups. Refer to the heading of the Mode you have selected and perform the given operations.

MODES I AND II

- () Group an orange, red, black, and white wire together and twist the leads together.
- () Twist together a red, blue, black, and white wire to form a second group.
- () Twist together the remaining six decoder wires (green, brown, yellow, red, black, and white).

Proceed to Connector Wiring.

MODE III

- () Group a yellow, red, black, and white wire together and twist the leads together.

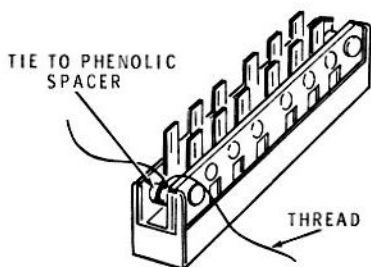
- () Group a blue, red, black, and white together and twist the wires into a second group.
- () Twist together the remaining six decoder wires (brown, orange, green, red, black, and white).

CONNECTOR WIRING

- () Cut the wire ends in each group so they are even with the end of the shortest wire of that group.
- () Remove 1/8" of insulation from the end of each of the fourteen wires. Then twist the small strands together, and melt a small amount of solder on the exposed end of each wire.
- () Cut fourteen 1/2" lengths of sleeving.
- () Place a 1/2" of sleeving over each of the fourteen wires.

For Mode I or II operation, refer to Pictorial 2-11A (fold-out from Page 51) and connect these twisted wires to the large block connector and two 4-lug sockets.

For Mode III operation, refer to Pictorial 2-11B (fold-out from Page 51) and connect these twisted wires to the large block connector and two 4-lug sockets.



Detail 2-12A

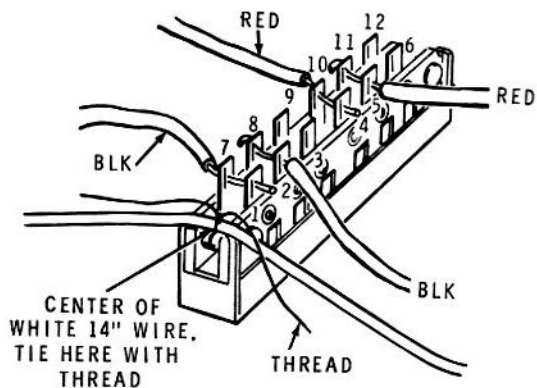
RECEIVER BATTERY SWITCH WIRING

Refer to Detail 2-12A for the following step.

NOTE: The slide switch is symmetrical and may be positioned either way.

- () Tie a length of thread, about 5" long to the phenolic spacer as shown.

Refer to Detail 2-12B for the following steps.



Detail 2-12B

Prepare the following lengths of wire by removing 1/4" of insulation from only one end of each wire. Twist together the small wire strands of each lead. Then melt a small amount of solder on the exposed end of each wire to hold the separate strands together. The other ends of the wires will be prepared later.

| COLOR | LENGTH |
|-----------|--------|
| () Black | 8" |
| () Black | 8" |
| () Red | 8" |
| () Red | 8" |

NOTE: Where 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.

Connect the prepared ends of the red and black wires to the slide switch as follows. The other ends of these wires will be connected later. **NOTE:** The pincher clothespin can be used to hold the switch while soldering.

- () 8" black through lug 7 (S-2) to lug 1 (S-1).
- () 8" black through lug 2 (S-2) to lug 8 (S-1).
- () 8" red through lug 10 (S-2) to lug 4 (S-1).
- () 8" red through lug 5 (S-2) to lug 11 (S-1).
- () Cut a 14" length of white wire (but do not prepare the ends). Position the center of this wire as shown in Detail 2-12B and tie it in place with the thread. Do not cut the ends of the thread off yet.

Refer to Pictorial 2-12 for the following steps.

- () Fold the red, black, and white wires together and tie them as shown. The thread ends may now be trimmed off.

The six wires from the receiver switch will now be separated into two groups. Complete the following steps for each wire group. Two check off spaces are provided in front of each step for this purpose.

- () () Select a red, white, and black wire and twist them into a group.
- () () Cut the ends of the three wires so they are even with the end of the shortest wire in the group.
- () () Remove 1/8" of insulation from the end of each of these wires. Melt a small amount of solder on the exposed end of each wire.
- () () Place 1/2" of sleeving over each wire.



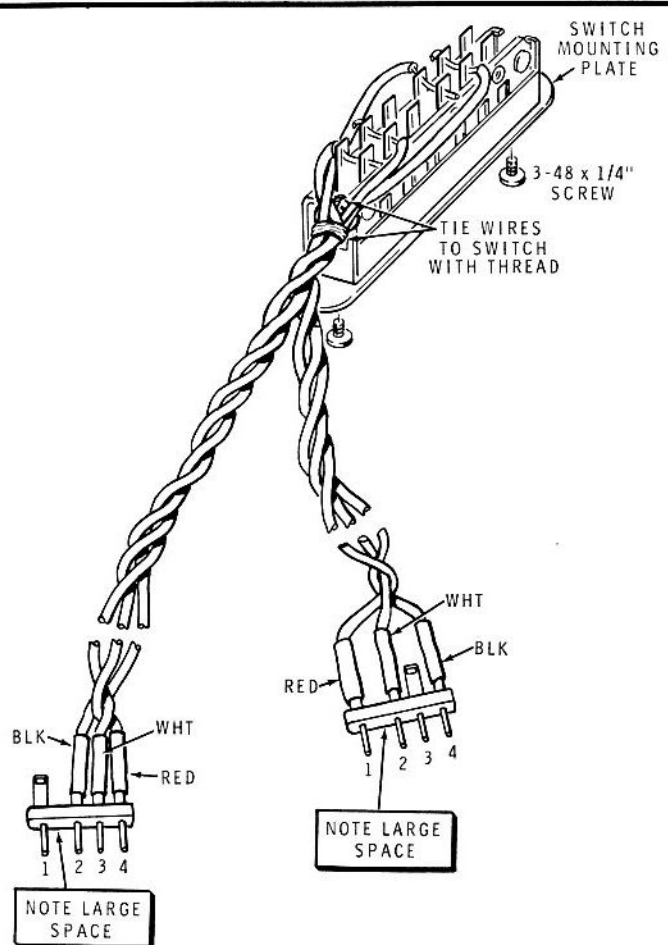
Refer to Pictorial 2-12 and connect the wires to the two 4-pin plugs as shown. Note the wide space between pins 1 and 2.

Connect the wires to a four pin plug as follows:

- () Red to pin 4 (S-1).
- () White to pin 3 (S-1).
- () Black to pin 2 (S-1).
- () Temporarily mount the switch mounting plate onto the switch with two screws.

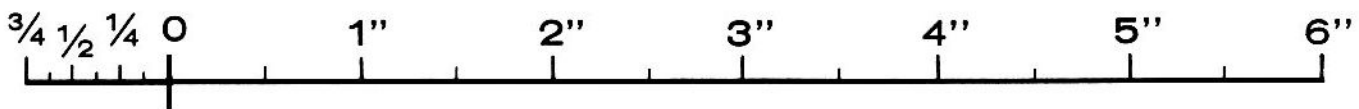
Connect the wires to a four pin plug as follows:

- () Black to pin 4 (S-1).
- () White to pin 2 (S-1).
- () Red to pin 1 (S-1).
- () Push the six lengths of sleeving over the lugs and twist the wires up tight to the ends of the sleeving. Temporarily set the switch aside.



PICTORIAL 2-12

Proceed to the Servo section of the Manual.

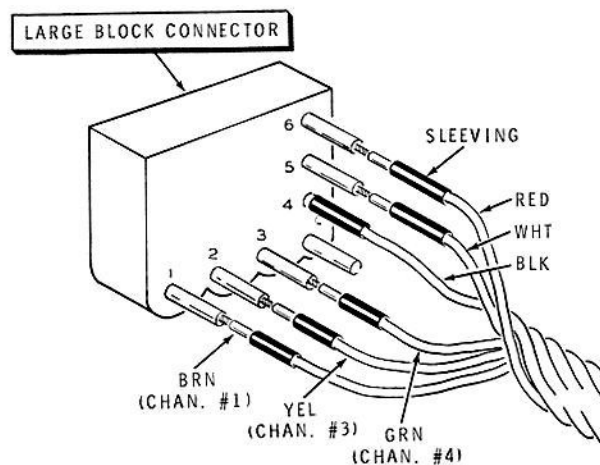


WIRING FOR MODES I AND II OPERATION

LARGE BLOCK CONNECTOR

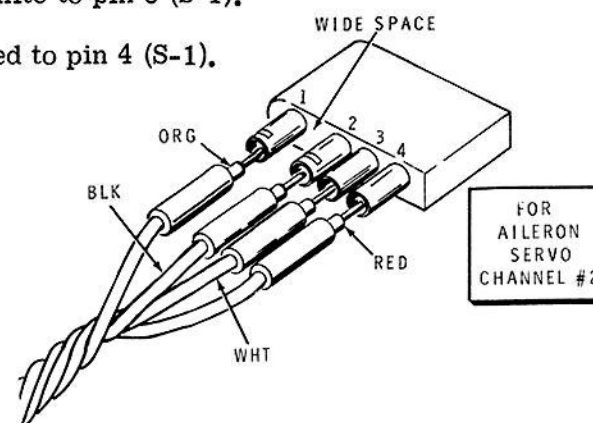
Connect the wires to the large block connector as follows:

- () Brown to pin 1 (S-1).
- () Yellow to pin 2 (S-1).
- () Green to pin 3 (S-1).
- () Black to pin 4 (S-1).
- () White to pin 5 (S-1).
- () Red to pin 6 (S-1).



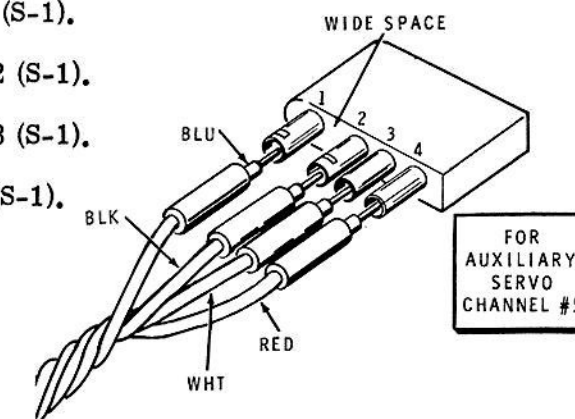
Connect the wires to a 4-lug socket as follows:

- () Orange to pin 1 (S-1).
- () Black to pin 2 (S-1).
- () White to pin 3 (S-1).
- () Red to pin 4 (S-1).



Connect the wires to a 4-lug socket as follows:

- () Blue to pin 1 (S-1).
- () Black to pin 2 (S-1).
- () White to pin 3 (S-1).
- () Red to pin 4 (S-1).



- () Push the 14 lengths of sleeving over the lugs and twist the wires up to the ends of the sleeving.

Set the Receiver aside temporarily and proceed to Receiver Battery Switch Wiring.

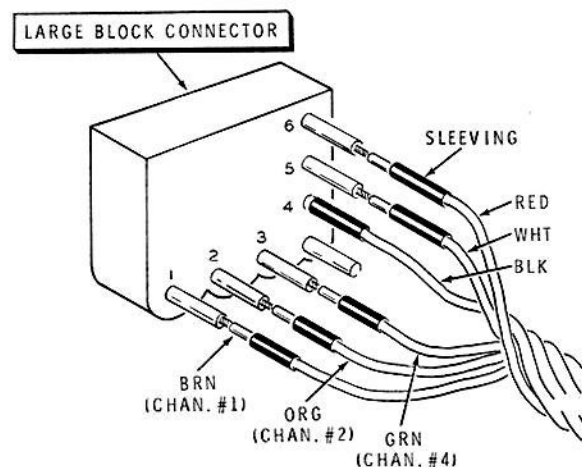
PICTORIAL 2-11A

WIRING FOR MODE III OPERATION

LARGE BLOCK CONNECTOR

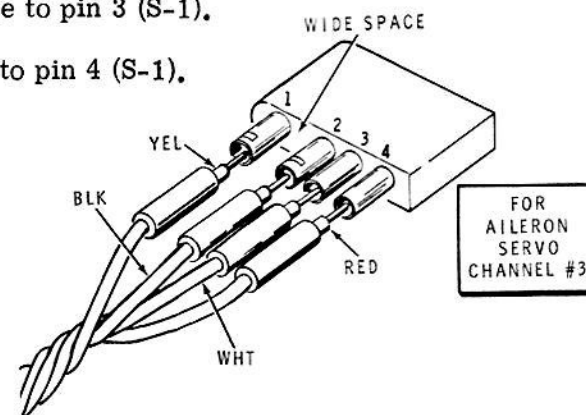
Connect the wires to the large block connector as follows:

- () Brown to pin 1 (S-1).
- () Orange to pin 2 (S-1).
- () Green to pin 3 (S-1).
- () Black to pin 4 (S-1).
- () White to pin 5 (S-1).
- () Red to pin 6 (S-1).



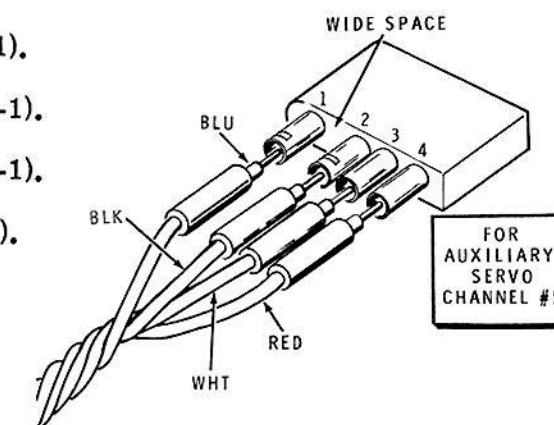
Connect the wires to a 4-lug socket as follows:

- () Yellow to pin 1 (S-1).
- () Black to pin 2 (S-1).
- () White to pin 3 (S-1).
- () Red to pin 4 (S-1).



Connect the wires to a 4-lug socket as follows:

- () Blue to pin 1 (S-1).
- () Black to pin 2 (S-1).
- () White to pin 3 (S-1).
- () Red to pin 4 (S-1).



- () Push the 14 lengths of sleeving over the lugs and twist the wires up to the ends of the sleeving.

Set the Receiver aside temporarily and proceed to Receiver Battery Switch Wiring.

PICTORIAL 2-11B