

STEP-BY-STEP ASSEMBLY

ENCODER CIRCUIT BOARD ASSEMBLY

Before starting to assemble this kit, be sure you have read the wiring, soldering, and step-by-step assembly information in the "Kit Builders Guide."

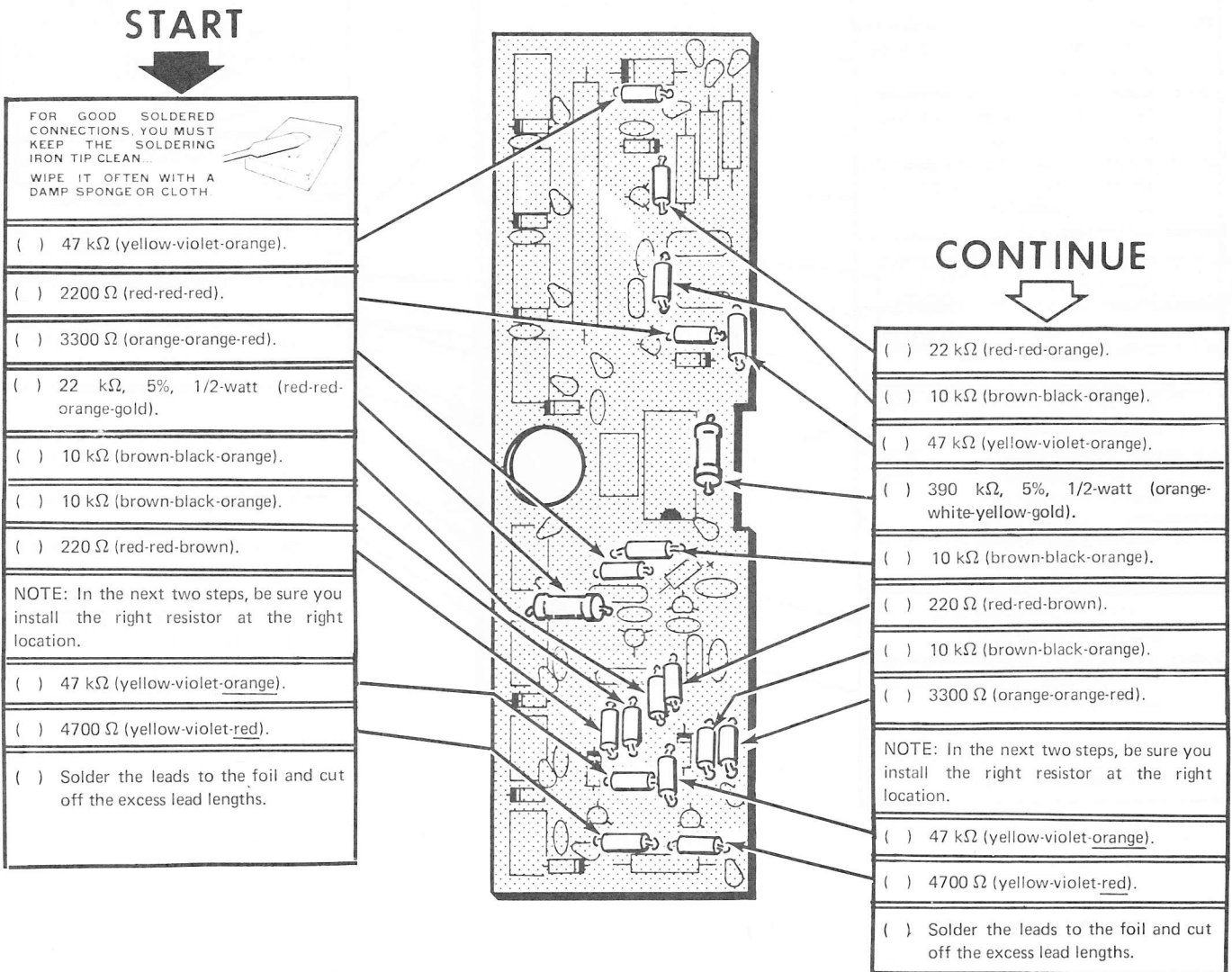
Take your time while assembling the circuit board. Each part should be positioned carefully over its outline on the circuit board, as it is shown in the Pictorial.

Resistors will be called out by their resistance value (in Ω , or $k\Omega$) and color code. Resistors are 1/4 watt unless otherwise specified in a step. Capacitors will be called out by their capacitance value and type.

You may find it helpful to place the circuit board on a soft cloth to prevent it from sliding around when it is being soldered. Be very careful not to cover unused holes with solder.

NOTE: It is recommended that you use a soldering iron that is rated at 15 to 25 watts. Its tip should be no wider than 1/8" at its widest dimension. A pyramid or chisel-shaped tip is best. This type of soldering iron will make it easier to assemble the kit, with less chance of solder bridges occurring between foils on the circuit board.

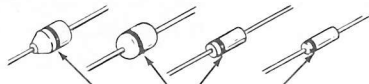
Locate the encoder circuit board (#85-1452-1) and position it as shown in Pictorial 1-1. Then complete the steps in Pictorials 1-1 through 1-5.



PICTORIAL 1-1

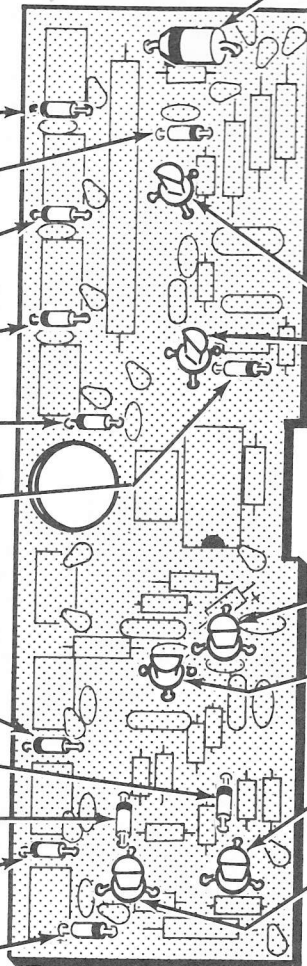
START

NOTE: DIODES MAY BE SUPPLIED IN ANY OF THE FOLLOWING SHAPES. THE CATHODE END OF THE DIODE IS MARKED WITH A BAND OR BANDS. ALWAYS POSITION THIS END AS SHOWN IN THE PICTORIAL.



BAND OR BANDS

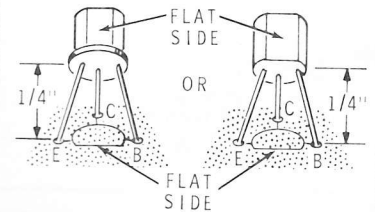
- () 1N4149 diode (#56-56) at D4. Note position of banded end.
- () 1N4149 diode (#56-56) at D11. Note position of banded end.
- () 1N4149 diode (#56-56) at D7. Note position of banded end.
- () 1N4149 diode (#56-56) at D5. Note position of banded end.
- () 1N4149 diode (#56-56) at D8. Note position of banded end.
- () 1N4149 diode (#56-56) at D3. Note position of banded end.
- () Solder the leads to the foil and cut off the excess lead lengths.
- () 1N4149 diode (#56-56) at D9. Note position of banded end.
- () 1N4149 diode (#56-56) at D2. Note position of banded end.
- () 1N4149 diode (#56-56) at D1. Note position of banded end.
- () 1N4149 diode (#56-56) at D6. Note position of banded end.
- () 1N4149 diode (#56-56) at D10. Note position of banded end.
- () Solder the leads to the foil and cut off the excess lead lengths.



CONTINUE

- () 1N2071 diode (#57-27) at D12. Note position of banded end. Solder the leads to the foil and cut off the excess lead lengths.

NOTE: When you install transistors, place the E, B, and C leads of the transistor in the corresponding holes of the circuit board. Position the transistor 1/4" above the circuit board. Solder all three connections of each transistor as it is installed. Cut off the excess lead lengths.

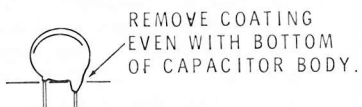


- () X29A829 transistor (#417-201) at Q6.
- () X29A829 transistor (#417-201) at Q5.
- () 2N3393 transistor (#417-118) at Q4.
- () 2N3393 transistor (#417-118) at Q3.
- () X29A829 transistor (#417-201) at Q2.
- () X29A829 transistor (#417-201) at Q1.
- () Check to see that all connections are soldered and that the excess lead lengths are cut off.

PICTORIAL 1-2

START ↓

NOTE: When you install capacitors on this circuit board, remove the excess coating from the leads. Use long-nose pliers to remove this coating.



() .001 μ F disc.

() .001 μ F disc.

() .001 μ F disc.

() .001 μ F disc. Bend this capacitor down against the circuit board.



() .001 μ F disc.

() .001 μ F disc.

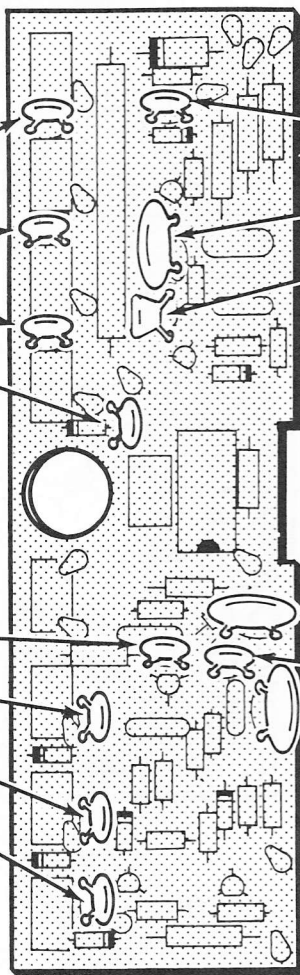
() .001 μ F disc.

() .001 μ F disc.

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



() Solder the leads to the foil and cut off the excess lead lengths.



CONTINUE ↓

() .001 μ F disc.

() .005 μ F disc.

() .022 μ F Mylar.

() .005 μ F disc.

() .001 μ F disc.

() .005 μ F disc.

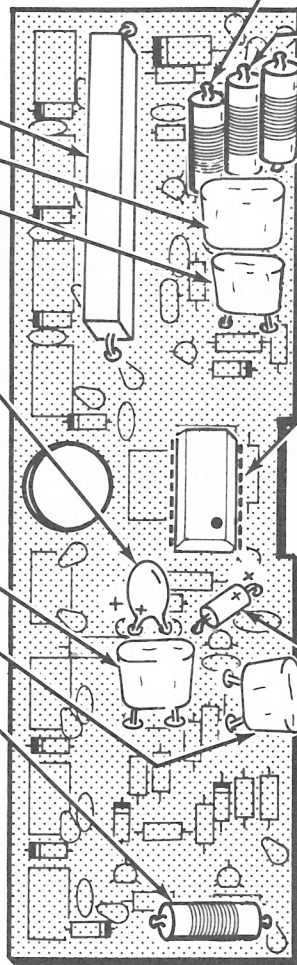
() Solder the leads to the foil and cut off the excess lead lengths.

PICTORIAL 1-3

START



- () 1000 Ω, 10-watt. Position the body of this resistor 1/16" off the circuit board.
 - () .1 μF Mylar.
 - () .047 μF Mylar.
 - () 22 μF tantalum. Position the positive (+) marked lead in the plus (+) marked hole.
- POSITIVE SIGN (+)
- () .033 μF Mylar.
 - () .033 μF Mylar.
 - () RF choke (#45-39) at L1.
 - () Solder the leads to the foil and cut off the excess lead lengths.



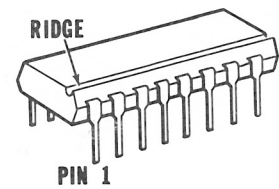
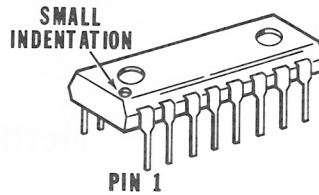
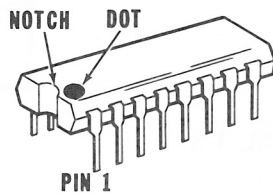
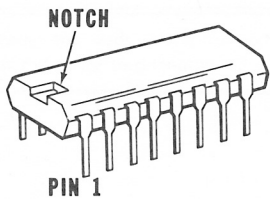
CONTINUE



- () RF choke (#45-39) at L4.
 - () RF choke (#45-39) at L2.
 - () RF choke (#45-39) at L3.
 - () Solder the leads to the foil and cut off the excess lead lengths.
 - () SUCS0127 IC. (#443-689) at IC1. Line up the pin 1 end of the IC with the dot screened on the circuit board. See Detail 1-4A. Then insert the IC leads through the proper circuit board holes and solder the leads to the foil.
- PIN 1
DOT
- () .047 μF tantalum. Match the positive (+) mark on the capacitor with the positive (+) mark on the circuit board. Solder the leads to the foil and cut off the excess lead lengths.
- POSITIVE (+) END

PICTORIAL 1-4

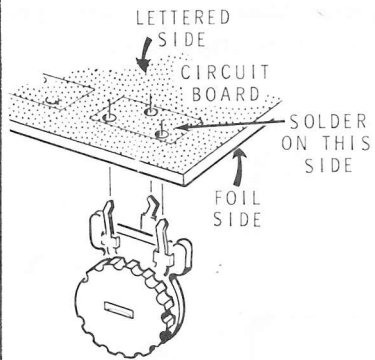
INTEGRATED CIRCUITS MAY BE MARKED IN ANY ONE OF SEVERAL WAYS. USE THIS DETAIL TO IDENTIFY PIN 1.



Detail 1-4A

START ↓

NOTE: In the following steps, install the controls on the foil side (not the lettered side) of the encoder circuit board. Push the control into the proper holes until it snaps in place. Then solder the lugs on the lettered side of the circuit board.



() 10 kΩ control (#10-312) at CHAN 8.

() 10 kΩ control (#10-312) at CHAN 7.

() 10 kΩ control (#10-312) at CHAN 6.

() 50 kΩ control (#10-222) at CHAN 5.

() 50 kΩ control (#10-222) at CHAN 5.

() 10 kΩ control (#10-312) at CHAN 4.

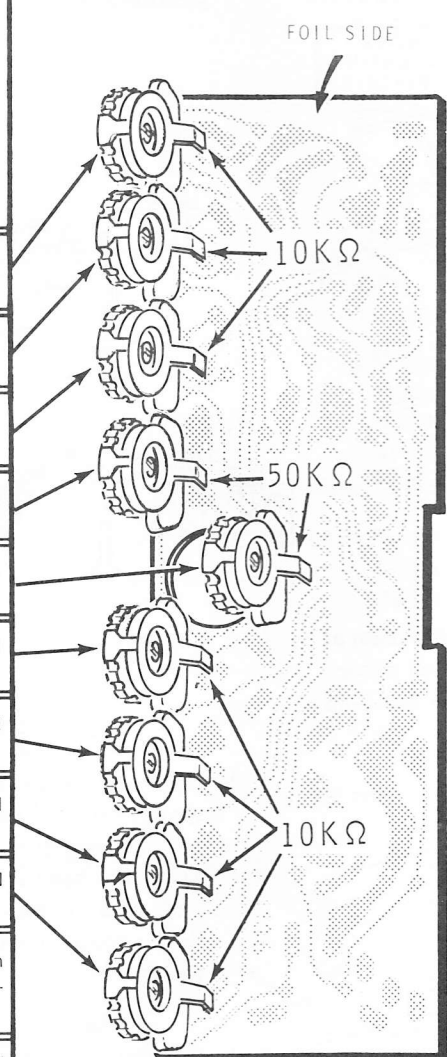
() 10 kΩ control (#10-312) at CHAN 3.

() 10 kΩ control (#10-312) at CHAN 2.

() 10 kΩ control (#10-312) at CHAN 1.

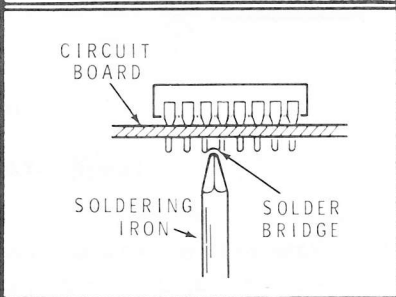
() Check all three connections on each control to make sure they are properly soldered.

() Check to make sure you installed the two 50 kΩ controls in their proper places.



CONTINUE ↓

() Check all connections to make sure they are soldered. Then cut off any excess lead lengths. Refer to the "Circuit Board X-Ray Views" on Page 59 and make sure there are no solder bridges. Especially check the foil areas that the IC is soldered to. If a solder bridge has occurred, clean the soldering iron tip and hold it between the two points that are bridged until the excess solder flows down the tip of the soldering iron.



() Set the circuit board aside until it is called for later.

The remaining resistors will be used later.

PICTORIAL 1-5