

Assembly Instructions

Solid State Electronic VOX

2 P.

EC-1300

PARTS LIST

Price Each	Quantity	Parts Supplied
\$.10	1	2. 2 MEGOHM RESISTOR R1 (RED-RED-GREEN) (01236)
1.00	1	2 MEGOHM TRIM POT R2 (04008)
.10	1	3. 3K OHM RESISTOR R3 (ORANGE-ORANGE-RED) (01233)
.10	1	10 OHM RESISTOR R4 (BROWN-BLACK-BLACK) (01234)
.10	1	1 MEGOHM RESISTOR R5 (BROWN-BLACK-GREEN) (01210)
.10	1	33 OHM RESISTOR R6 (ORANGE-ORANGE-BLACK) (01235)
1.00	1	25K OHM TRIM POT R7 (04007)
.50	1	10 uf CAPACITOR C1 (02302)
.50	1	2 uf CAPACITOR C2 (02304)
.65	1	GERMANIUM DIODE CR1 (09004)
1.50	4	NPN SILICON TRANSISTORS Q1, Q2, Q3, Q4 (GREEN DOT) (09015)
1.00	1	PRINTED CIRCUIT BOARD (82553)
2.10	1	RELAY (03605)
	1	No. 4-40 x 1/4" BINDING HEAD SCREW (41016)
	4	No. 4-40 x 5/8" BINDING HEAD SCREWS (41067)
	4	No. 4 x 3/16" SPACERS (45029)
	4	No. 4 HEX NUTS (40007)
	4	No. 4 LOCKWASHERS (42007)
	1	ft. WIRE

Minimum Charge For Replacement Parts \$1.00. Remittance Must Be Made With Order. Specify Description And Part Number. Prices Subject To Change Without Notice.

INTRODUCTION

If you are a beginner, a satisfying, educational and rewarding experience is in store for you. EICOCRAFT introduces you to the exciting world of electronics, by acquainting you with actual electronic parts, and by building a professional printed circuit assembly. In the process of building, you will be going through exactly the same experiences as professional kit-builders or electronic engineers do - you will be reading professional instructions and installations; identifying, connecting and soldering professional parts. The EICOCRAFT instructions will guide you step-by-step all the way. When you finish the last step, you will have completed nothing less than a professional electronic assembly of the most modern type. Most EICOCRAFT projects use solid-state components (called transistors). You will then be in a position to put the assembly to many versatile end uses, as we will describe later. So proceed carefully. You will enjoy as you learn and will have the personal satisfaction of a professional task well done.

If you are a sophisticate, you will find EICOCRAFT kits excellent for those quick around-the-house projects you always wanted to do but didn't have the time to shop for parts. You'll also find that all EICOCRAFT kits are useful assemblies providing utility, as well as personal satisfaction in building. Versatility is a basic characteristic of these kits. You'll see that each EICOCRAFT kit lends itself to a variety of final applications; and also, that many projects are expandable by adding kits together.

You can also always be sure of top quality. EICOCRAFT is an original exclusive concept and product line designed and manufactured in the U. S. A. by EICO - the same company famous for 20 years of leadership in creative electronics.

GENERAL CONSTRUCTION HINTS

1. Install components **FLUSH** with the **COMPONENT** side of the board (see figure 3) and leads protruding from the **COPPERFOIL** side.
2. **OBSERVE POLARITY** as shown when installing capacitors, transistors, and diodes.
3. **CUT** the leads 1/4" from the board and **BEND** back **FLUSH** with the **COPPERFOIL SIDE**.
4. Position the tip of your soldering iron at the junction of the lead and **COPPERFOIL SIDE** and apply solder. Quickly remove your soldering iron after the solder flows around the connection. **USE HEAT AND SOLDER SPARINGLY TO AVOID DAMAGE TO THE BOARD OR COMPONENTS.** **CAUTION: SOLDERING IRON TIP SHOULD BE BRIGHT AND CLEAN, WATTAGE 37 WATTS MAXIMUM, SOLDER ROSIN CORE.**
5. Additional insulated hook-up wire will be necessary for components remotely mounted from the printed circuit board depending upon your individual installation requirements. (See figure 5.)

Transistor Lead Identification.

All transistors on EICOCRAFT kits are identified by color dots. (Refer to Parts List.) Install all transistors by referring to figure 1 for correct transistor lead identification.

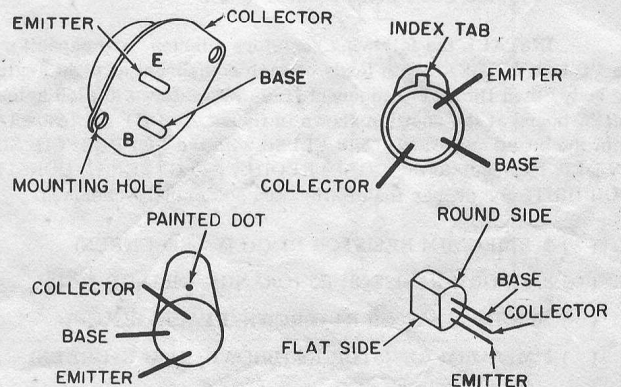


Figure 1. Transistor Lead Identification

Diode Identification.

Figure 2 identifies the polarity of the diodes which are used in EICOCRAFT kits:

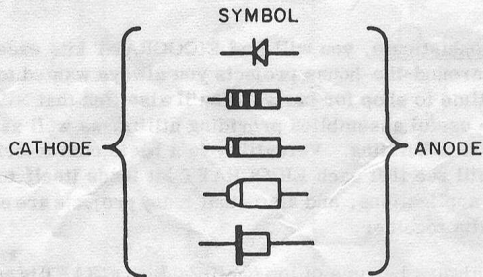


Figure 2. Diode Polarity Identification

Component Mounting.

Figure 3 shows component mounting and mounting of the completed printed circuit board to the optional case using the mounting hardware supplied.

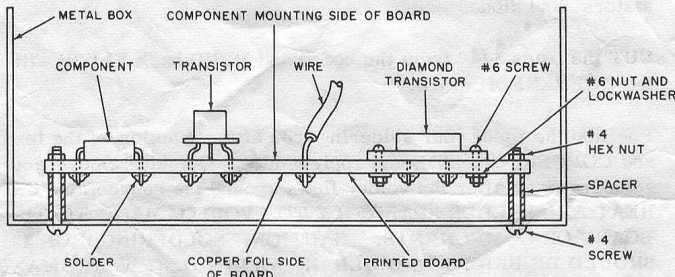


Figure 3. Component Mounting, Side View

ASSEMBLY PROCEDURE

Assemble your EICOCRAFT kit as follows, using figure 4 on the opposite page. After you have completed each step, make a checkmark or cross out the number next to the step so that you will have a record of your work.

1. () ORIENT printed circuit (PC) board as shown in figure 4 with the COPPERFOIL SIDE down.

INSTALL the following resistors, diodes, and capacitors on the PC board. BEND both leads of each component at right angles to the body, then INSERT component leads into the two drilled holes in the PC board at the position shown in figure 4. CUT the leads 1/4" from the board and BEND back FLUSH with the COPPERFOIL SIDE. SOLDER the leads to the COPPERFOIL. See GENERAL CONSTRUCTION HINTS for proper installation and soldering techniques.

2. () 2.2 MEGOHM RESISTOR R1 (RED-RED-GREEN)
3. () 3.3K OHM RESISTOR R3 (ORANGE-ORANGE-RED)
4. () 10 OHM RESISTOR R4 (BROWN-BLACK-BLACK)
5. () 1 MEGOHM RESISTOR R5 (BROWN-BLACK-GREEN)
6. () 33 OHM RESISTOR R6 (ORANGE-ORANGE-BLACK)

7. () 10 uf CAPACITOR C1. OBSERVE POLARITY AS SHOWN.
8. () 2 uf CAPACITOR C2. OBSERVE POLARITY AS SHOWN.
9. () GERMANIUM DIODE CR1. (See figure 2 for diode polarity identification.)
10. () INSERT the 3 lugs of 2 MEGOHM TRIM POT R2 into the corresponding holes in the PC board and SOLDER them to the COPPERFOIL.
11. () INSTALL 25K OHM TRIM POT R7 in the same manner as described in step 10. Note that the lugs on this pot are inserted to face the opposite direction than in the previous step.
12. () SLIP the two leads from the relay into the corresponding holes in the PC board, with the relay positioned as shown in figure 4. ATTACH the relay FIRMLY to the PC board with the No. 4-40 x 1/4" screw, then solder the two relay leads to the COPPERFOIL.
13. () ORIENT the leads of NPN SILICON TRANSISTOR Q1 (GREEN DOT) as shown in GENERAL CONSTRUCTION HINTS and INSTALL on the PC board at the position shown. DO NOT USE EXCESSIVE HEAT WHEN SOLDERING.
14. () INSTALL TRANSISTOR Q2 (GREEN DOT) in the same manner as described in step 13.
15. () INSTALL TRANSISTOR Q3 (GREEN DOT) in the same manner as described in step 13.
16. () INSTALL TRANSISTOR Q4 (GREEN DOT) in the same manner as described in step 13.
17. () PREPARE 5 pieces of insulated wire. CUT to the desired lengths. Actual length depends upon the distance for remotely mounted components. (See figure 5.) STRIP 1/4" of insulation from each end of the 5 wires. PUSH one end of each wire into the (A), (B), (+), and (-) holes from the component side of the PC board. BEND each lead flush with the COPPERFOIL SIDE and solder.

CHECKING YOUR WORK

Check that each soldered connection is bright and clean, and that solder is not bridged across conductors on the foil side of the board. Make sure that the transistors are mounted correctly and that the polarities of capacitors C1 and C2 and diode CR1 have been observed.

APPLICATIONS

With this last step, you have completed the assembly of the EC-1300. This 4-transistor voice-operated switch assembly is now capable of many potential uses. You have the choice of putting it to one or more final applications and to change these uses at any time you wish. You can use it for any application where you desire that an audio signal (speaking, whistling, singing, playing an instrument, etc.) turn on or turn off an external device. (See insert A of figure 6.) For example, use it as a voice control to turn OFF the sound in a TV set during commercials. If you desire, let it turn ON a tape recorder when you talk, sing, or play into a microphone. You can use it to turn on a remote alarm when the VOX acts as a baby sitter near a sleeping child. Once the relay in this unit is energized, it will stay energized for a preset time, depending upon your setting of R7, the adjustable time delay control.

OPERATION AND MOUNTING OF YOUR COMPLETED KIT

Connect a 6-volt battery (or EICOCRAFT EC-900 Power Supply) to the + and - printed circuit board leads as shown in figure 5. An SPST switch can be connected between the PC board and the negative terminal of the battery as shown in figure 5. Connect a crystal microphone (not supplied) to the B (hot side) and A (common side) holes in the PC board, and solder. To increase the sensitivity of the VOX, use an audio shielded cable for the microphone connections. Now connect the two control wires to the relay on the PC board. If you want the relay to OPEN the external circuit, connect these wires to the normally closed contacts, 1 and 2. (See figure 5.) To CLOSE the external circuit after the relay is energized, connect these wires to contacts 2 and 3.

In order to adjust your completed kit, proceed as follows:

1. Set the delay control R7 (figure 4) fully clockwise.
2. When all connections are completed, speak or whistle into the microphone and adjust sensitivity control R2 (figure 4) with a small screwdriver until the relay closes.
3. When you stop speaking or whistling into the microphone, the relay should open. This is the proper setting for sensitivity control R2. The exact setting required to operate the relay at the desired audio level may be accomplished by trial and error.
4. Adjust delay control R7 (figure 4) so that the relay remains closed for the desired interval.

Note

The delay time is determined by the values of R7 and capacitor C2. (See figure 6.) If C2 is increased in value, the maximum delay time will be increased. If C2 is made smaller, the maximum delay time will be decreased.

CAUTION

The contacts of the relay are capable of switching 10 watts maximum load. If 115 volts AC at high loads is to be controlled, an additional remote relay is required. This relay coil is energized by the relay of the EC-1300. (See insert A of figure 6 for remote relay wiring.)

The remote relay contacts should be capable of handling the required high wattage load. The coil voltage may be AC or DC supplied from an external source of not more than 10 watts.

The completed kit can be mounted in a compact metal cabinet as shown in figure 3. Despite its small size, it is both rugged and dependable.

The schematic diagram for this kit is shown in figure 6.

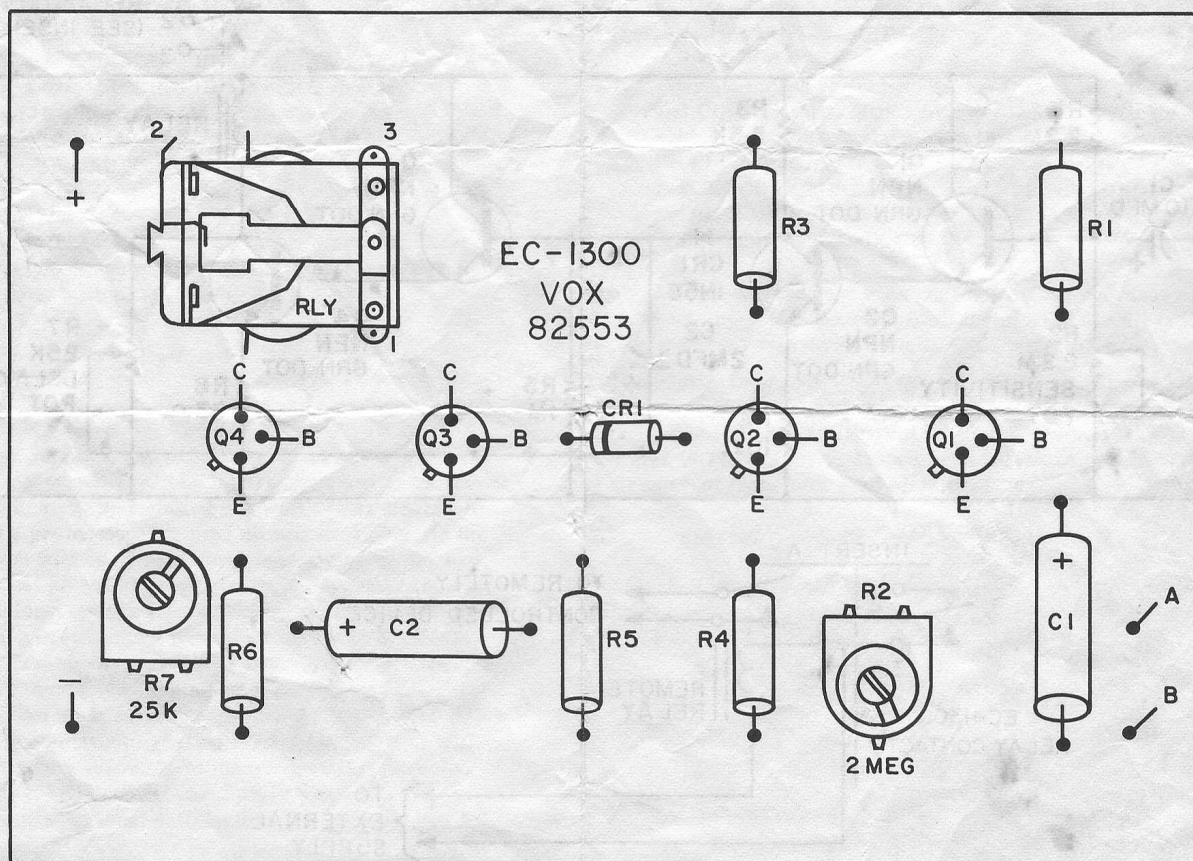


Figure 4. Printed Circuit Board

