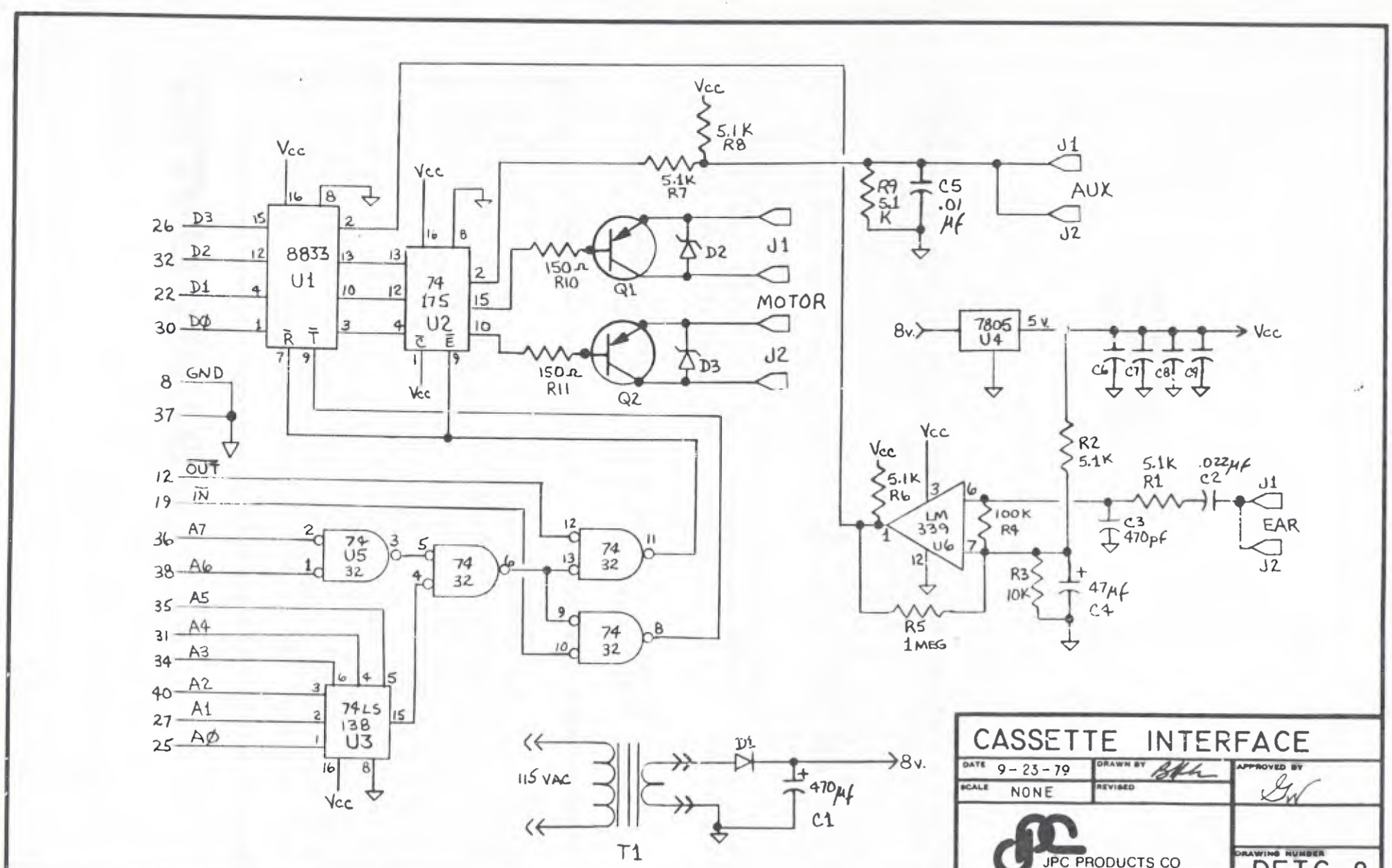


CASSETTE INTERFACE

DATE 9-23-79	DRAWN BY	APPROVED BY	
SCALE NONE	REVISED		

JPC PRODUCTS CO

DRAWING NUMBER DETC-8

GUARANTEE

JPC PRODUCTS COMPANY agrees to repair or replace, at our option, any TC-8 Cassette Interface which the purchaser has determined to be defective. No other warranty is expressed or implied. JPC PRODUCTS COMPANY shall have no liability to any entity with respect to loss or damage alleged to be caused by equipment or computer programs sold by us or by others, including but not limited to lack of merchantability or suitability for any purpose, or for interruption of service, or for loss of business or profits. Computer programs are sold by JPC PRODUCTS COMPANY on a strictly AS IS basis. The repair/replacement guarantee is valid only if the instructions below are followed exactly:

( ) Go over the check list on the next page; many of the TC-8's returned have nothing wrong with them!

( ) DO NOT attempt to repair the TC-8 yourself. The guarantee will not be honored for boards which have been damaged in the process of removing components.

( ) Return the circuit board, the power unit, and the ribbon cable. Remove the circuit board from the metal cabinet.

( ) DO NOT return the metal cabinet. JPC Products will not repair TC-8 units which are returned assembled in the metal cabinet.

( ) Pack the board securely and return to:

JPC PRODUCTS CO.
12021 Paisano Ct.
Albuquerque, N.M. 87112

PARTS LIST

* RESISTORS *

R1,R2	— 5.1 K	OHM 1/4 WATT (GREEN-BROWN-RED)
R3	— 10 K	OHM 1/4 WATT (BROWN-BLACK-ORANGE)
R4	— 100 K	OHM 1/4 WATT (BROWN-BLACK-YELLOW)
R5	— 1 MEG.	OHM 1/4 WATT (BROWN-BLACK-GREEN)
R6,R7,R8,R9	— 5.1 K	OHM 1/4 WATT (GREEN-BROWN-RED)
R10,R11	— 150	OHM 1/4 WATT (BROWN-GREEN-BROWN)

* CAPACITORS *

C1	— 470	MF RADIAL ELECTROLYTIC
C2	— .022	MF DISK (MARKED 223 OR .022)
C3	— 470	PF DISK (MARKED 471)
C4	— 47	MF AXIAL ELECTROLYTIC
C5	— .01	MF DISK (MARKED 103 OR .01)
C6,C7,C8,C9	— .022	MF DISK (MARKED 223 OR .022)

* DIODES *

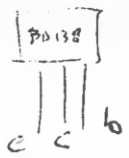
D1	— IN4003	POWER DIODE
D2,D3	— IN5257	33 V. ZENER DIODE

* TRANSISTORS *

Q1,Q2 — 2N6727 OR 92PU51A POWER TRANSISTOR

* INTEGRATED CIRCUITS *

U1	— 8833	— HEX BUFFER
U2	— 74175	— QUAD D FLIP-FLOP
U3	— 74LS138	— 3 TO 8 DECODER
U4	— 7805	— 5 VOLT REGULATOR
U5	— 7432	— HEX OR-GATE
U6	— LM339	— VOLTAGE COMPARATOR



* MISCELLANEOUS *

(2) RECORDER CONNECTORS	(1) 6-32 1/4" HARDWARE
(1) POWER CONNECTOR	(4) 6-32 1/2" HARDWARE
(3) 16 PIN I.C. SOCKETS	(1) HEAT SINK
(2) 14 PIN I.C. SOCKETS	(1) SOLDER
(1) RIBBON CABLE	(2) WIRE
(1) POWER ADAPTOR	(4) RUBBER FEET
(1) TC-8 CABINET	(4) SPACERS
(1) PRINTED CIRCUIT BOARD	

Before you begin assembly of the TC-8, you might like to know what we have found wrong with the TC-8's that other customers have returned for repair. The following is a list of problems found.

34% NOTHING WRONG. In more than 1/3 of the returns, there were no problems at all. The owners had just not read the operating instructions carefully enough.

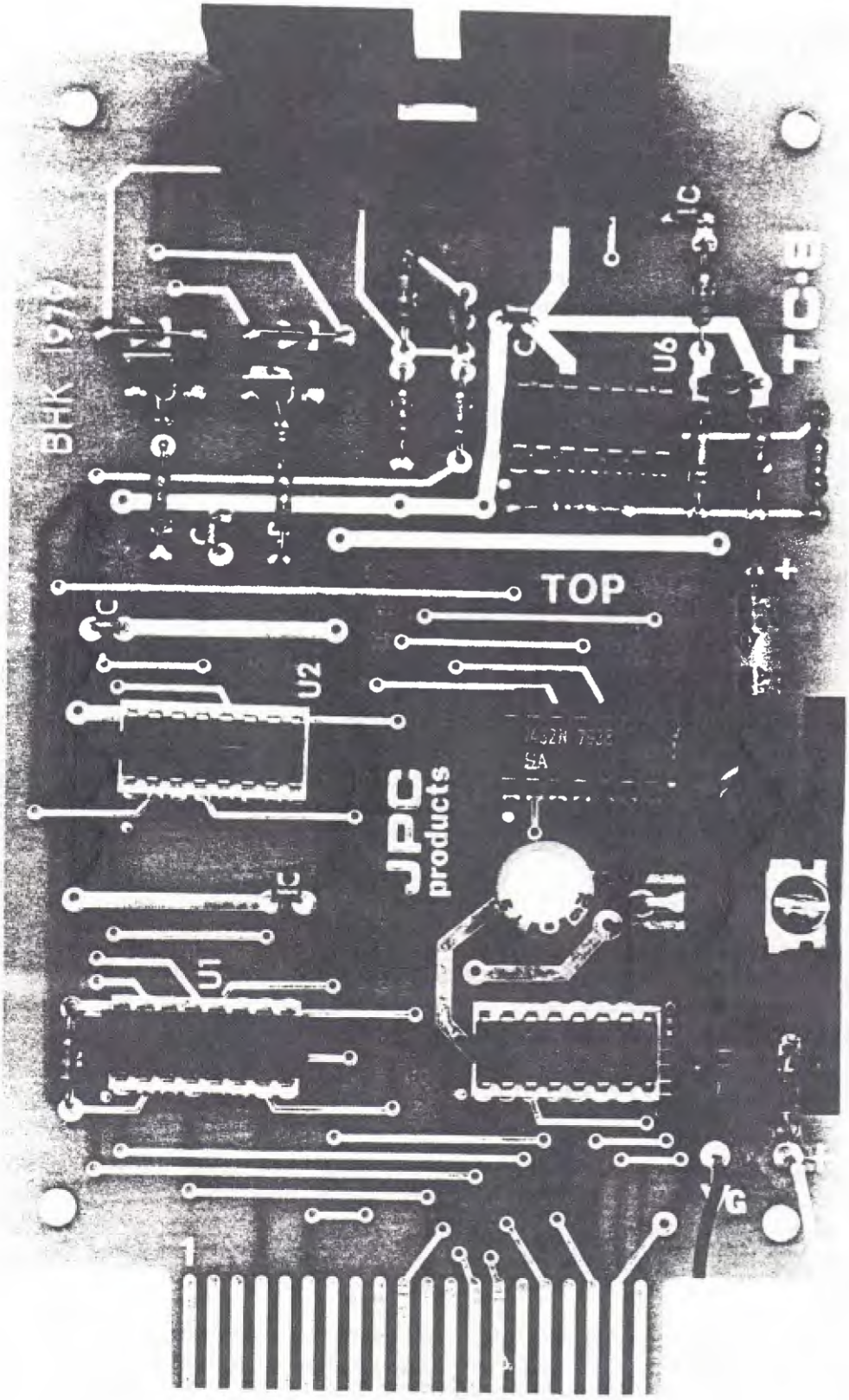
20% POOR SOLDERING. In 1/5 of the returns, pins were left unsoldered or not enough solder was used. The most consistent error was too little heat and solder on the IC socket pins. Look at the sketch in the manual in assembly instruction set 1. Note that the pad and the lead should be well covered with solder. Another consistent error was trying to solder from the top of the board. All soldering must be done on the BOTTOM of the board.

14% PART INSTALLED WRONG. Many IC's were backwards or in the wrong socket. Some IC leads were bent under between the IC and the socket. Some diodes were backward with the band at the wrong end. Some boards had the + lead of C1 in the wrong hole (it should go in the LARGE pad near the '+').

12% BAD PART. This one is our problem.

7% DAMAGED BOARD. In these cases, the owner installed a component incorrectly and then destroyed the board attempting to remove it. In a few cases the owners had soldered the IC's directly to the board (forgetting to use the sockets) and then tried to remove them. DON'T !!

5% MISWIRED POWER CONNECTOR. Several boards had the red and black wires to the power connector connected wrong (swapped). Also found were instances where a short had been caused at the power connector by using too much solder. Some builders had forgotten to trim off excess wire at the connector...a short was the result.


TOP
JPC
products
U2
U6

assembly instructions

( ) Be sure you have read the GUARANTEE information before you begin. Assembly of the TC-8 kit will indicate that you accept the terms of our guarantee.

( ) Check all of the parts against the parts list to be sure that you have them all and that you know which is which.

( ) Read ALL of the assembly instructions before you begin. Identify the parts as you go. Pay special attention to the soldering instructions.

( ) As you begin assembly be sure to position the board as shown in the photograph. All of the components must be on the top side of the board (marked TOP). The leads (wires coming out of the components) go through the board and are soldered on the BOTTOM. DO NOT solder from the top.

( ) Use enough solder and heat. The finished solder at each pin or lead should look like a small pyramid. If it looks like a round blob you used too much solder. If it still looks like a "wire coming out of a hole" then you didn't use enough. Look carefully at the middle sketch in instruction set 1

( ) Install all components tightly down against the board except the very small disk capacitors and the transistors which may stand slightly above the board. Be sure that C1 is pressed down firmly before soldering. Detail 7 in instruction set 4 shows it above the board, but it must be pressed down tightly before soldering.

( ) When you get to instruction set 5, note that it is the SOCKETS that are being installed, NOT the IC's!! The sockets have two rows of holes in the top. The IC's are marked on the top by numbers and letters. Install the SOCKETS.

( ) In instruction set 6, be careful to identify pin 1 of each IC correctly. Pin 1 is always marked, but by various means. Study the IC and detail 9 until you find each pin 1. Then be sure to plug the IC into the socket correctly as shown by the dots and arrows. Double check!!

BEFORE YOU START: These general soldering instructions should be followed throughout assembly of the TC-8 kit.

( ) Select a soldering iron of 25 to 35 watts with a 1/16 inch tip. We recommend the UNGAR Model 1235-S 33 watt heater and a model 7155 tip. Also acceptable is the Radio Shack Cat. No. 64-2082A 33 watt heater with the Cat. No. 64-2084 tip (use the smallest tip). Each of these also requires a handle to hold the heater . . . select the handle which seems most comfortable to you.

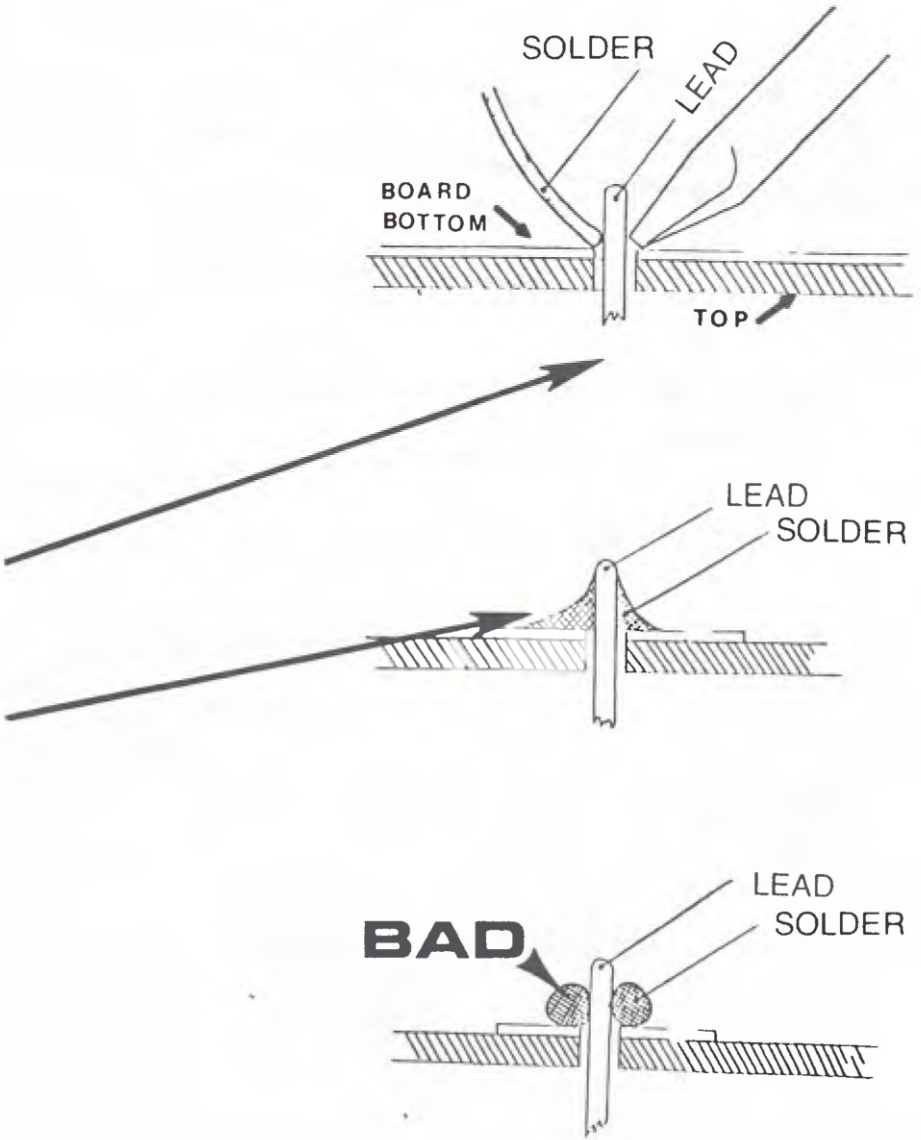
DO NOT USE A SOLDERING GUN! DO NOT USE AN IRON OF MORE THAN 35 WATTS! DO NOT USE ACID CORE SOLDER! Use only the solder provided or a good brand of electronic rosin core solder.

( ) Keep the tip clean. Place a damp sponge near the soldering iron and wipe the tip after each few solder connections. The tip must be covered with solder and rosin. Each time you wipe the tip, recoat (tin) it with fresh solder.

( ) Make sure the iron has thoroughly heated before you start. Push the soldering iron tip firmly against BOTH the lead and the circuit board foil. Heat BOTH for 2 to 3 seconds.

( ) Then apply solder to the lead and foil. IMPORTANT: Let the heated foil and the lead melt the solder. The solder should flow around the lead, down into the hole, and actually climb up the lead a little. Remove the iron and let the connection cool.

( ) Inspect the connection. The solder should be smooth and shiny. If it is grainy or lumpy, or if it is not flowed out on both the lead and the foil, redo the connection. THE KEY IS SMOOTHLY FLOWING SOLDER WHICH COOLS BRIGHT AND SHINY. Make sure that you haven't accidentally made a "solder bridge" between this connection and a nearby pad or lead. Solder bridges are caused by too much solder or a dirty soldering tip.



2

(X) Place the circuit board in front of you so that the edge connector tab is to your left and the component side of the board is face-up, the board should look like the colored illustration.

(X) Install resistor R6 (5.1 KΩ), (GREEN BROWN RED). Refer to Detail 1. Spread the leads slightly to hold the resistor in place and solder. Trim the leads on the back side of the board to about 1/16 inch.

(X) Install resistor R10 (150 Ω), (BROWN GREEN BROWN). Refer to Detail 1 and install as in the previous step. Solder and trim the leads.

(X) Install resistor R11 (150 Ω), (BROWN GREEN BROWN). Refer to Detail 1. Solder and trim.

(X) Install resistor R8 (5.1 KΩ), (GREEN BROWN RED). Solder and trim.

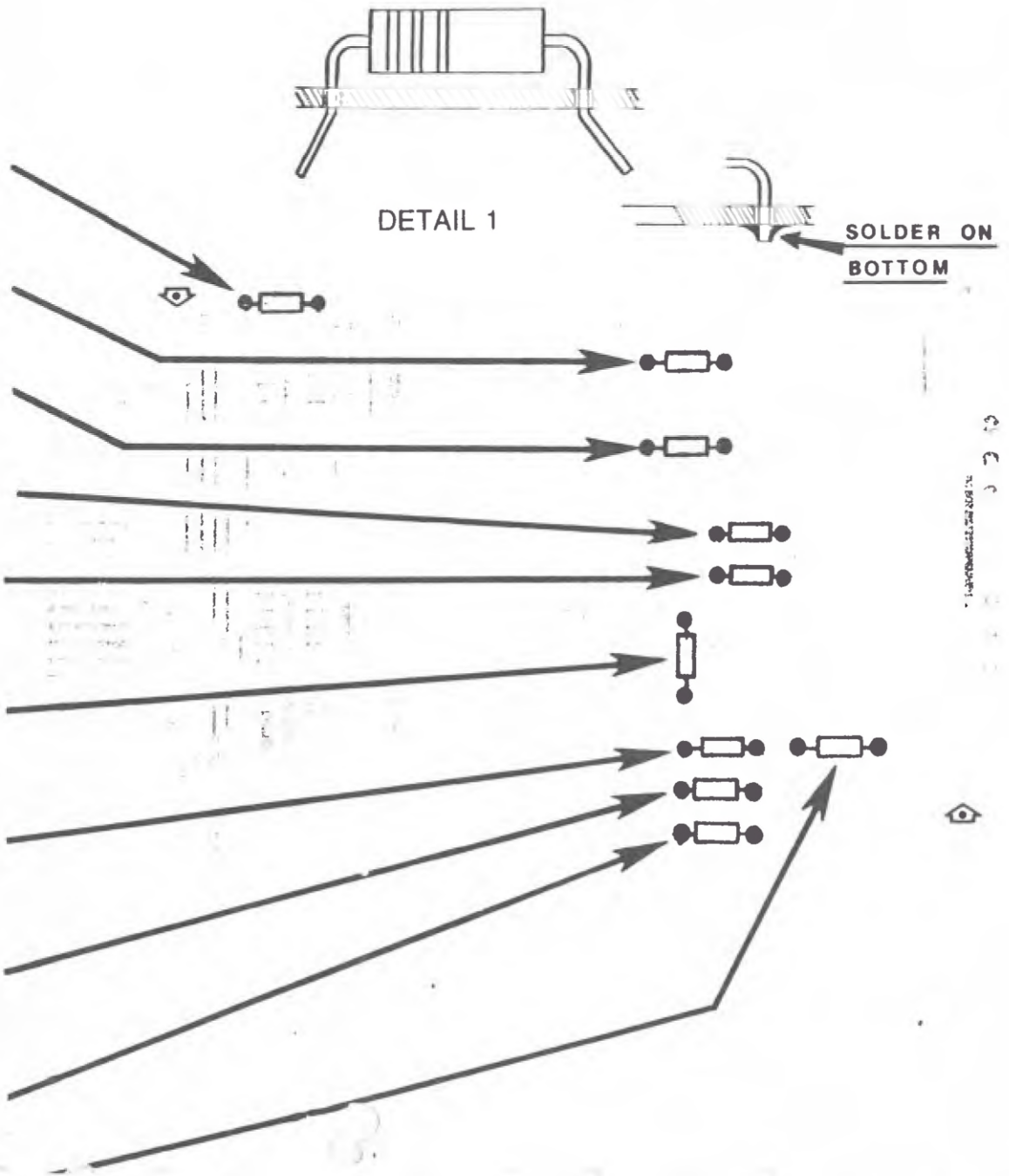
(X) Install resistor R7 (5.1 KΩ), (GREEN BROWN RED). Solder and trim.

(X) Install resistor R5 (1 MEG Ω), (BROWN BLACK GREEN). Be especially careful not to confuse this resistor with one of the 5.1 K resistors which have similar colors. Solder and trim.

(X) Install resistor R4 (100 KΩ), (BROWN BLACK YELLOW). Be especially careful not to confuse this resistor with the 10 KΩ resistor which has similar colors. Solder and trim.

(X) Install resistor R3 (10 KΩ), (BROWN BLACK ORANGE). Again . . . be careful that you use the correct resistor. Solder and trim.

(X) Install resistor R2 (5.1 KΩ), (GREEN BROWN RED). Solder and trim.



3

(X) Install capacitor C9 (.022 mF), (marked 223 or .022). Press the capacitor LIGHTLY down on the board so that it stands about 1/4 inch above it. Refer to Detail 2. Bend the leads slightly on the back of the board to hold the capacitor in place. Solder the leads and trim to about 1/16 inch.

(X) Install capacitor C7 (.022 mF), (Marked 223 or .022). Solder and trim.

(X) Install capacitor C6 (.022 mF). (Marked 223 or .022). Solder and trim

(X) Install resistor R9 (5.1 KΩ). (GREEN BROWN RED). Solder and trim.

(X) Install capacitor C5 (.01 mF), (Marked 103 or .01). Solder and trim.

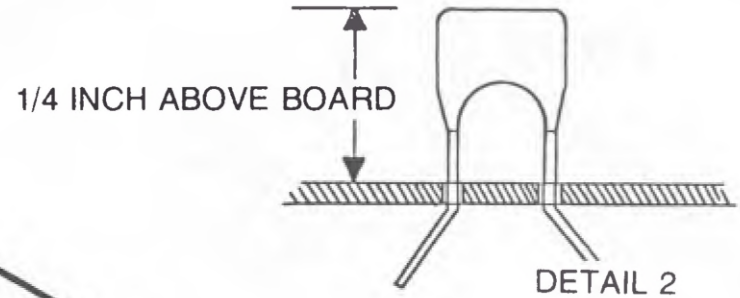
(X) Install capacitor C8 (.022 mF), (Marked 223 or .022). Solder and trim.

(X) Install capacitor C2 (.022 mF), (Marked 223 or .022). Solder and trim.

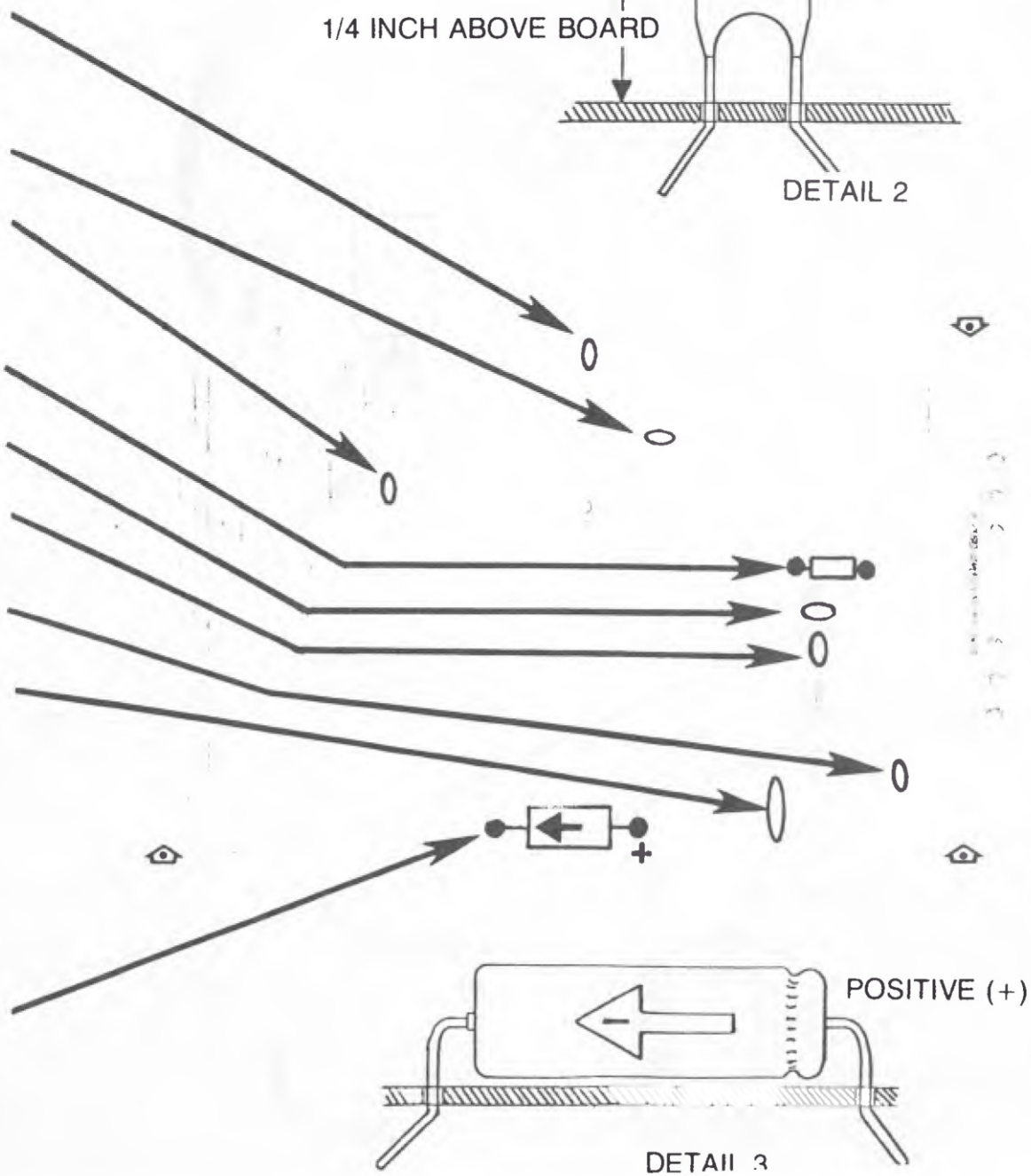
(X) Install capacitor C3 (470 pF), (Marked 471). Solder and trim.

NOTE: Electrolytic capacitors must be installed in the proper orientation. The POSITIVE lead must go to the pad on the board marked with the (+). The positive lead on the capacitor may be marked with a (+) or the negative lead may be marked with a minus (−). Usually an arrow points to the the NEGATIVE lead.

(X) Install electrolytic capacitor C4 (47 mF 16 V). Refer to Detail 3 and install with the positive (+) lead as shown. Bend the leads slightly to hold in place and solder. Trim the leads to 1/16 inch.



DETAIL 2



DETAIL 3

4

NOTE: Diodes must be installed in the proper orientation. The schematic diode symbol is marked on the circuit board: the arrow points toward the CATHODE or BANDED end of the diode when installed correctly.

(X) Install diode D2 (1N5257 33v zener). The banded end should be oriented toward you. Solder and trim.

(X) Install diode D3 (1N5257 33v zener). The banded end should be oriented toward you. Solder and trim.

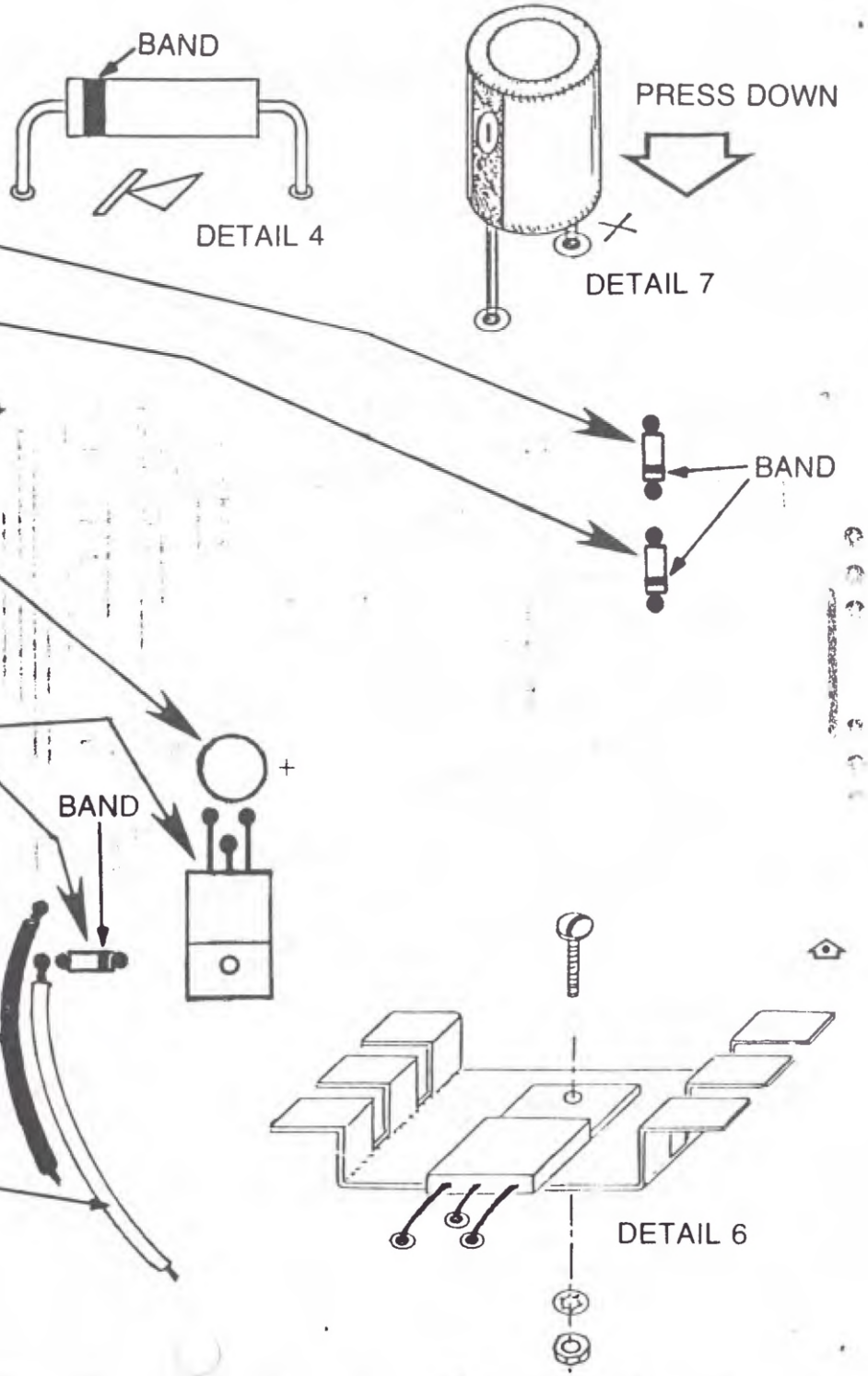
(X) Install electrolytic capacitor C1 (470 mF 16 V). The capacitor must be oriented so that the positive lead is connected to the pad on the board marked with the (+) sign (refer to Detail 7). The arrows usually point to the NEGATIVE (-) lead. Solder and trim.

(X) Install diode D1 (1N4003). This is the larger of the diodes supplied. Note the band and refer to detail 4. The banded end should be oriented toward your right. Solder and trim.

(X) Install the voltage regulator U4 (7805). With the metal tab toward you. guide the 3 leads into the holes in the circuit board (refer to Detail 6). Then carefully bend the regulator toward you and down until the tab hole lines up with the mount hole in the board. Slip the heat sink under the regulator and mount with the 6-32 screw. Be sure the regulator and leads are straight and then solder. Trim the leads on the back to 1/16 inch if necessary.

(X) Install the BLACK power wire in the circuit board hole marked with the (G). Solder and trim.

(X) Install the RED power wire in the circuit board hole marked with the (+). The insulation should be tight down against the board. Be sure that no stray strands of wire cause a short. Solder and trim.



5

NOTE: Transistors must be installed with the proper orientation and must be handled gently. Avoid applying excessive heat when soldering to the board. The flat side of the transistor will be used as a key to the proper orientation.

(X) Install transistor Q1 (Marked 2N6727 or 92PU51A). Refer to Detail 5. Press the transistor LIGHTLY down into the holes, leaving it about 1/4 inch above the board. Be sure the leads are not bent or shorted together. Be sure that the flat side is toward your right. Bend the leads slightly on the bottom to hold in place. Solder and trim the leads.

(X) Install transistor Q2 (marked 2N6727 or 92PU41A). The flat side must be toward your right. Refer to Detail 5. Solder and trim.

NOTE: You were supplied two different types of Integrated Circuit (IC) sockets with this kit. Some have 14 pins and the others have 16 pins. Be careful to install the proper type at each location. When installing the sockets, be sure that each pin enters the corresponding hole in the board and that none are bent under the socket. Be very careful in soldering and don't use too much solder. It is easy to make a solder bridge between two pins if too much solder is used. Solder a pin at each end of the socket and then recheck that the socket is tight against the board before soldering the remaining pins. When you finish, RECKECK TO SEE THAT YOU DIDN'T MISS A PIN.

(X) Install a 16 pin IC socket at U1.

(X) Install a 16 pin IC socket at U2.

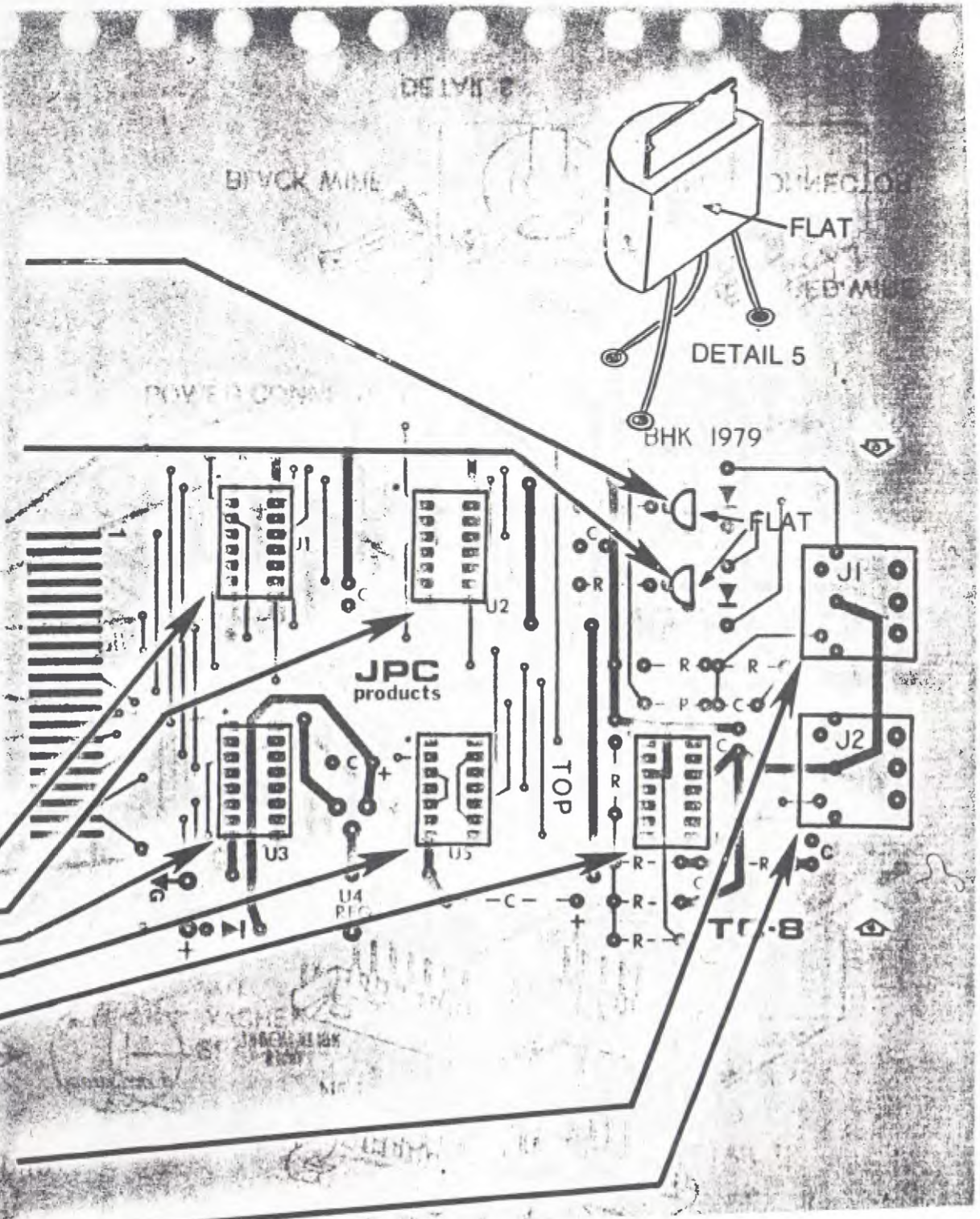
(X) Install a 16 pin IC socket at U3.

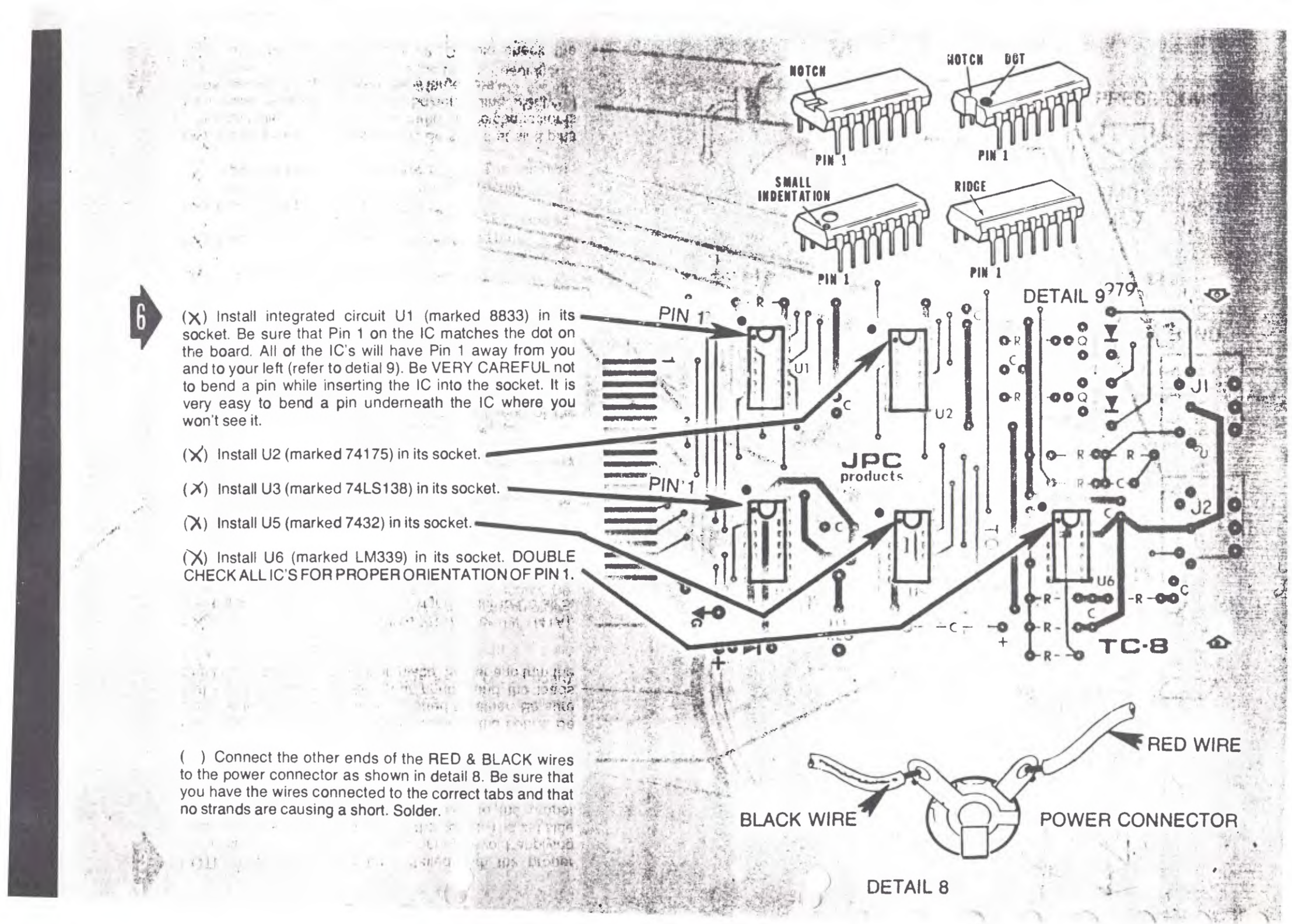
(X) Install a 14 pin IC socket at U5.

(X) Install a 14 pin IC socket at U6.

(X) Install recorder connector J1. Be sure that all 8 pins enter the holes in the board. Be sure that the connector is tight down against the board. Solder, using plenty of solder and heat, especially on the 3 large tabs.

(X) Install recorder connector J2. Double check the





6

(X) Install integrated circuit U1 (marked 8833) in its socket. Be sure that Pin 1 on the IC matches the dot on the board. All of the IC's will have Pin 1 away from you and to your left (refer to detial 9). Be VERY CAREFUL not to bend a pin while inserting the IC into the socket. It is very easy to bend a pin underneath the IC where you won't see it.

(X) Install U2 (marked 74175) in its socket.

(X) Install U3 (marked 74LS138) in its socket.

(X) Install U5 (marked 7432) in its socket.

(X) Install U6 (marked LM339) in its socket. DOUBLE CHECK ALL IC'S FOR PROPER ORIENTATION OF PIN 1.

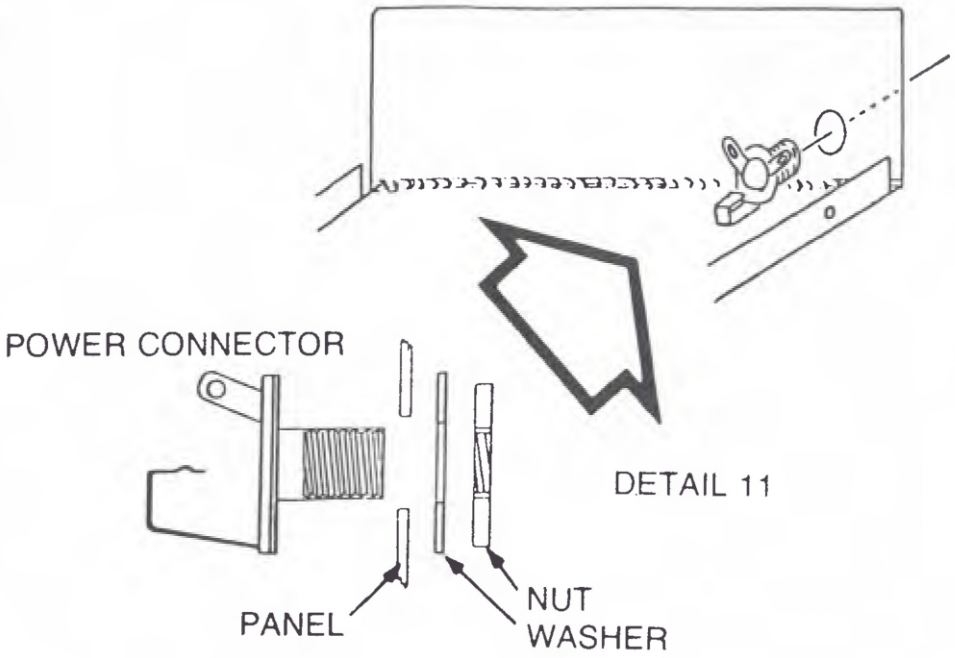
( ) Connect the other ends of the RED & BLACK wires to the power connector as shown in detail 8. Be sure that you have the wires connected to the correct tabs and that no strands are causing a short. Solder.

7.

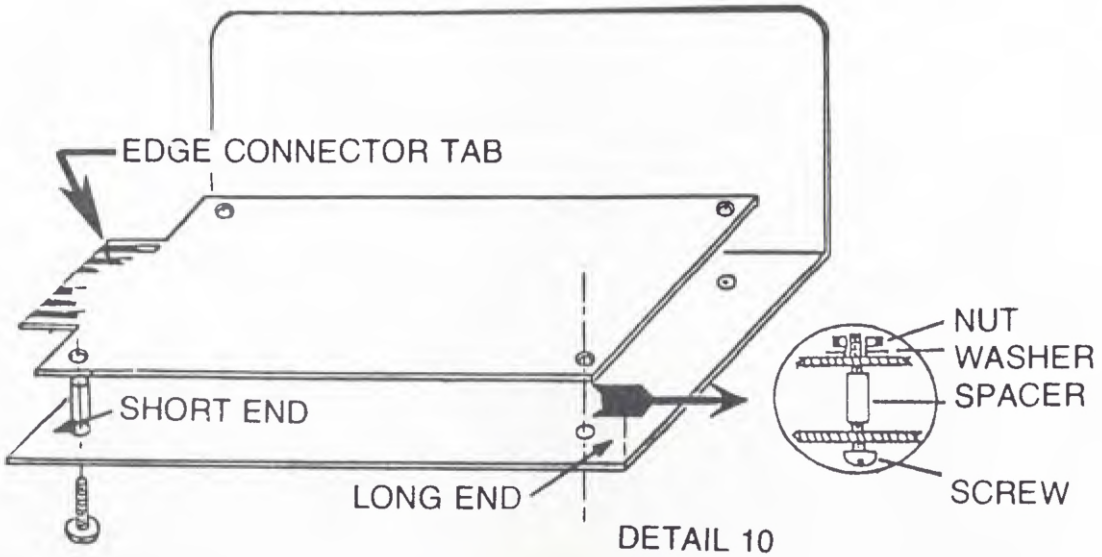
( ) Install the circuit board in the bottom section of the cabinet using the 1/4 inch spacers and the 1/2 inch 6-32 hardware. Refer to detail 10. Note that the board must be installed so that the edge connector tab is toward the SHORT end of the cabinet. Tighten all 4 screws.

( ) Install the power connector in the top part of the cabinet. Refer to detail 11 and install the connector from the inside. Secure with the flat washer and nut provided. Tighten carefully to avoid marring the paint. Check again that there are no short circuits at either end of the wires. Fold the wires back toward the inside of the cabinet and install the top piece onto the bottom piece so that the power connector is above the edge connector tab. Secure with the 4 sheet metal screws provided. Refer to Detail 12. Attach the rubber feet to the bottom.

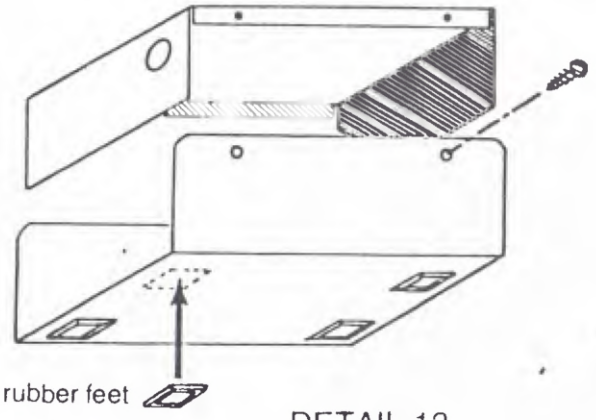
This completes assembly of the TC-8 kit. Refer to the connection and operation instructions.



DETAIL 11



DETAIL 10



DETAIL 12