

KEYBOARD

and

ENCODER



219 W. Rhapsody, San Antonio, Texas 78216

ASSEMBLING YOUR KEYBOARD AND ASCII ENCODER

The encoder parts and the keyswitches mount on the top of the board in the positions indicated by the printed part numbers. Mount the diodes, resistors, capacitors and integrated circuits on the board first. Leave some clearance under the transistors and the diodes. Pull all other parts down against the top of the board. The markings on the diodes will vary. The important thing is to put them in place so that the end of the package with the band, or bands faces the bar portion of the diode symbol printed on the board. The banded end of a diode or rectifier is always the cathode. Solder the parts in place after bending the leads over and trimming them. Your keyboard has four (4) more keys than the version shown in the reprint and six extra diodes to provide the "Clear", "Escape", and "Line Feed" machine commands. Two of the user defined keyswitches are connected directly to pins on the output connector to provide isolated contacts on these two keys.

Mount the keyswitches after all other parts are in place and soldered. The keyswitch contacts may have to be adjusted slightly to make them fit the mounting holes exactly. Due to tolerances inherent in molding plastic there will be some variation in the lead spacing. Push the wire leads gently in the direction needed until the switch will mount down against the board without rocking. Check the switches before they are installed to be sure that they are making contact properly. Solder the switches in place one at a time as they are installed, using as little heat as necessary to get a good solder joint. Excessive heating can distort, or even melt the plastic body and ruin the keyswitch. Check the switch again for proper operation after soldering it in place. This can save a bunch of troubleshooting later. If the switch works properly heat stake the switch in place by melting over the ends of the plastic mounting bosses. This can be done with the tip of your soldering iron.

After all keyswitches have been installed and checked you are ready to install the programming strips on the bottom of the board. These strips mount vertically, at right angles to the main board. You will find a number on each of the four strips and corresponding numbers on the bottom left side of the main board. The etched finger, connection points on the programming strips will match the connection pads on the main board when the strips are in the correct position. Begin with strip #1 which is nearest the top of the main board. Hold it in the correct position and turn it so that the connection fingers match the pads on both sides of the strip. Note that there are two ways the strip may be turned and only one is correct. If the strip's edge is too rough to fit down solidly against the main board, file, or sand the edge flat. Hold, or clamp the strip against the main board and solder the connection points on both sides of the strip to the main board pads. Install the strips #2, #3 and #4 in the same way.

The spacebar and equalizer assembly goes together as follows. Mount a keyswitch on the board in the center of the spacebar area. Mount the two "L" shaped brackets with a notch in the top on each side of the keyswitch in the holes provided. The side of the bracket with the notch should be next to the circuit board edge. These should be fixed in place by melting and flattening slightly the plastic pins on the back side of the board. This can be done with your soldering iron tip. Press one of the equalizer wire retainers into place on the end of the spacebar itself. The hole for the wire should be on the more slanted side of the spacebar that has the four casting bumps. Slip the equalizer wire into the hole in the retainer you have mounted and into the hole on the other you have not yet pressed into place. Press the second retainer into place. Turn the spacebar upside down in front of the board and press the equalizer wire into the notches in the top of the mounting clips. Turn the spacebar over and position it over the keyswitch in the center of the board. Press it down into place.

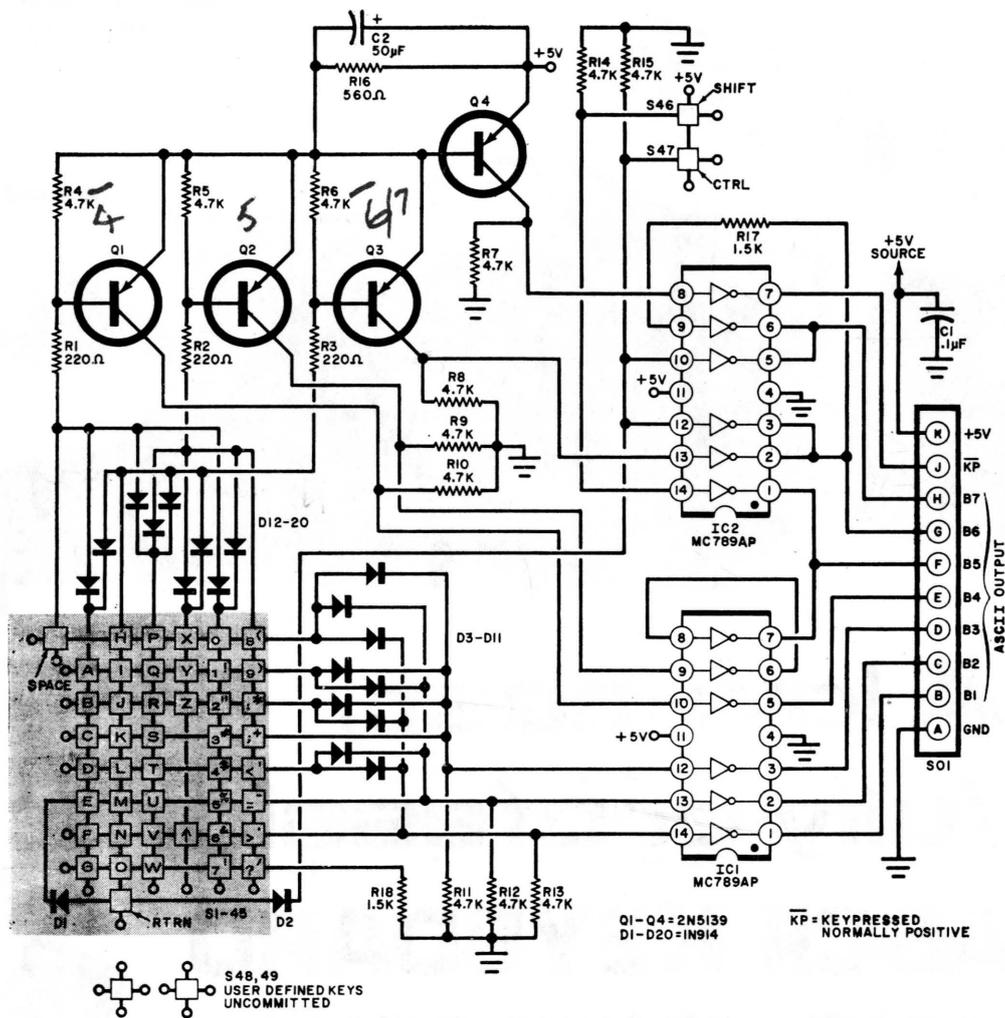


Fig. 1. The 48 keys are arranged in a 6-by-8 matrix as shown in block at lower left. The encoder, Q1 through Q4 and IC1 and IC2, provides the proper output.

PARTS LIST

C1—0.1- μ F, 10-volt disc ceramic capacitor
 C2—50- μ F, 10-volt electrolytic capacitor
 D1-D20—1N914 diode
 IC1, IC2—MC789AP hex inverter (no substitute)
 Q1-Q4—2N5139 transistor
 R1-R3—220-ohm, $\frac{1}{4}$ -watt resistor
 R4-R15—4700-ohm, $\frac{1}{4}$ -watt resistor
 R16—560-ohm, $\frac{1}{4}$ -watt resistor
 R17, R18—1500-ohm, $\frac{1}{4}$ -watt resistor
 S1-S49—Keyswitches (Mechanical Enterprises LFW-CT)
 S01—Socket (Molex 09-52-3103)

Misc.—Keytops (two-shot molded) (shift and return are $1\frac{1}{2}$ width); spacebar with equalizer and #2-56 mounting hardware; pc board (see text); #6 mounting hardware; solder; etc.

Note—The following are available from Southwest Technical Products, 219 W. Rhapsody, San Antonio, TX 78216: actual-size pc foil patterns and component installation diagram free on request; pc board, etched and drilled #Kb at \$17.50; complete kit of all parts #KBC at \$39.50 plus postage for 3 lb.

