LIGHT PEN ASSEMBLY

PARTS LIST

```
1  FPT-100  PHOTO  TRANSISTOR
1  SPST  SWITCH
1  470K  RESISTOR
1  1M  OR  500K  POTENTIOMETER
4  4.7K  RESISTORS
1  LM339  QUAD  COMPARITOR
1  7474  DUAL  D-LATCH  FLIP  FLOP
1  7406  HEX  INVERTER  (OPEN  COLLECTOR)
1  7400  QUAD  NAND
5  FEET  OF  4  CONDUCTOR  CABLE
1  12-PIN  MOLEX  CONNECTOR
5  14-PIN  WIRE  WRAP  SOCKETS
1  PERF  BOARD  FOR  WIRE  WRAP  CIRCUIT
1  BIC  PEN
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TOOLS REQUIRED: SOLDER IRON, SOLDER, WIRE WRAP TOOL, HAND TOOLS (NEEDLE NOSE PLIERS, CUTTERS, ETC.)

ASSEMBLY

1) PLACE ALL WIRE WRAP SOCKETS IN THE PERF BOARD FOLLOWING THE DIAGRAM IN FIGURE 1.   NOTE: ONE OF THE SOCKETS IS USED TO HOLD THE RESISTORS.

2) WIRE WRAP THE CIRCUIT ACCORDING TO THE SCHEMATIC. MARK EACH CONNECTION ON THE SCHEMATIC AS YOU FINISH IT (HIGH-LIGHTER PENS ARE GOOD FOR THIS, AS YOU CAN SEE THRU THEM)

3) REFER TO THE LIGHT PEN LAYOUT (FIGURE 1) FOR INSTALLATION OF THE PHOTO TRANSISTOR.   INSULATE ALL LEADS. CABLE LENGTH MAY BE VARIED DEPENDING UPON THE CONFIGURATION OF YOUR SYSTEM. PLUG THE 12-PIN MOLEX CONNECTOR INTO J4. (SEE FIGURE 3)

4) HOOK THE +5 VOLT LEAD TO YOUR +5 VOLT POWER SUPPLY.

5) USE THE LIGHT PEN TEXT PROGRAM FOR THE CALIBRATION OF COMPARITOR NETWORK. YOU WILL HAVE TO ADJUST YOUR DISPLAY FOR A GOOD WHITE ON BLACK PICTURE. THE BRIGHTNESS AND CONTRAST CONTROLS ON YOUR DISPLAY ARE IMPORTANT ADJUSTMENTS FOR PROPER OPERATION OF YOUR LIGHT PEN.

6) TYPE IN THE DEMO PROGRAM. THE BRIGHTNESS CONTROL ON YOUR DISPLAY WILL HAVE TO BE ADJUSTED FOR THE LIGHT PEN TO ONLY DETECT THE WHITE BLOCK CHARACTER (161).

(12-PIN MOLEX CONNECTORS MAY BE PURCHASED FROM:
DARE DATA & DESIGN
P.O. BOX 8433
BALTIMORE, MD   21234)

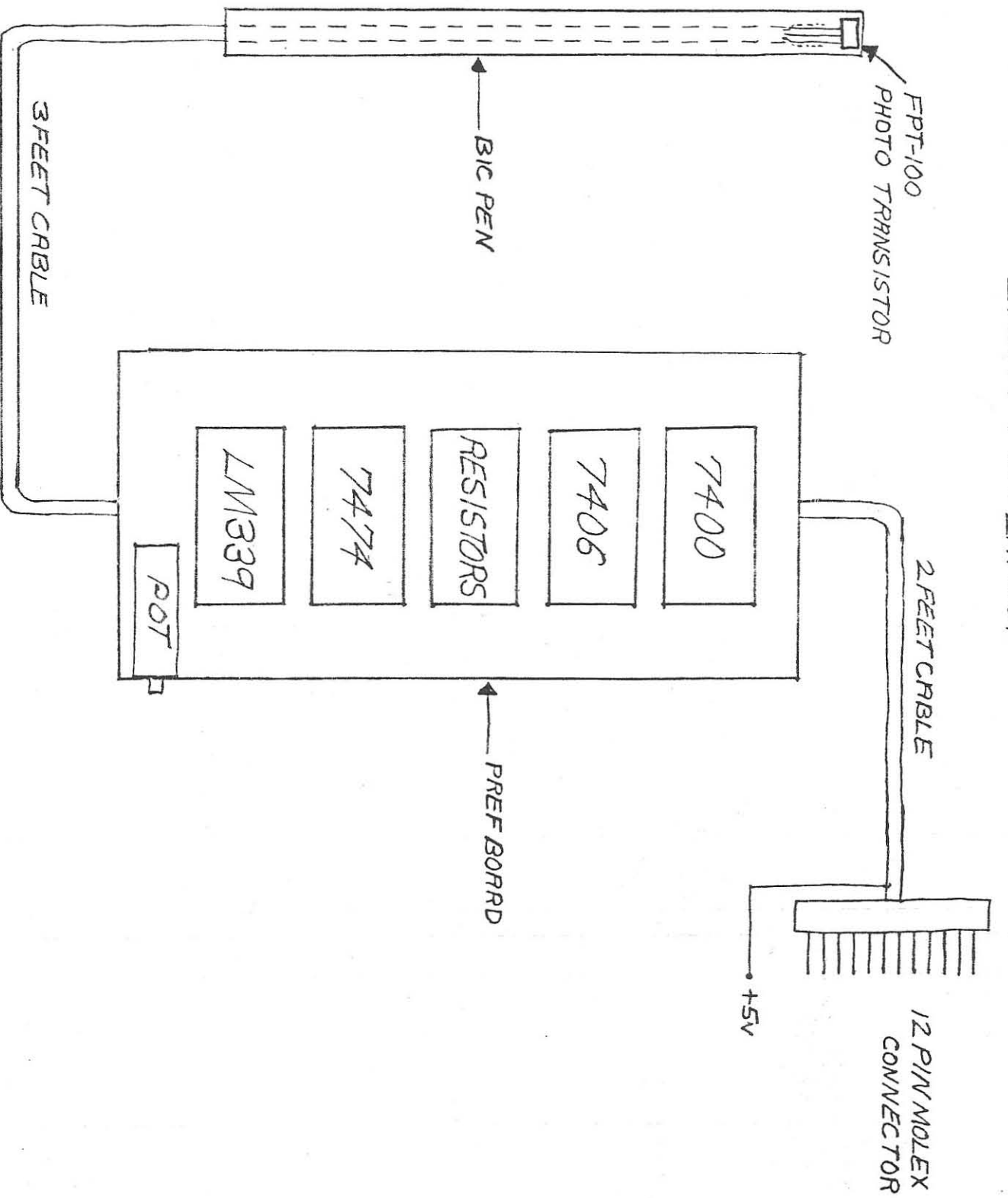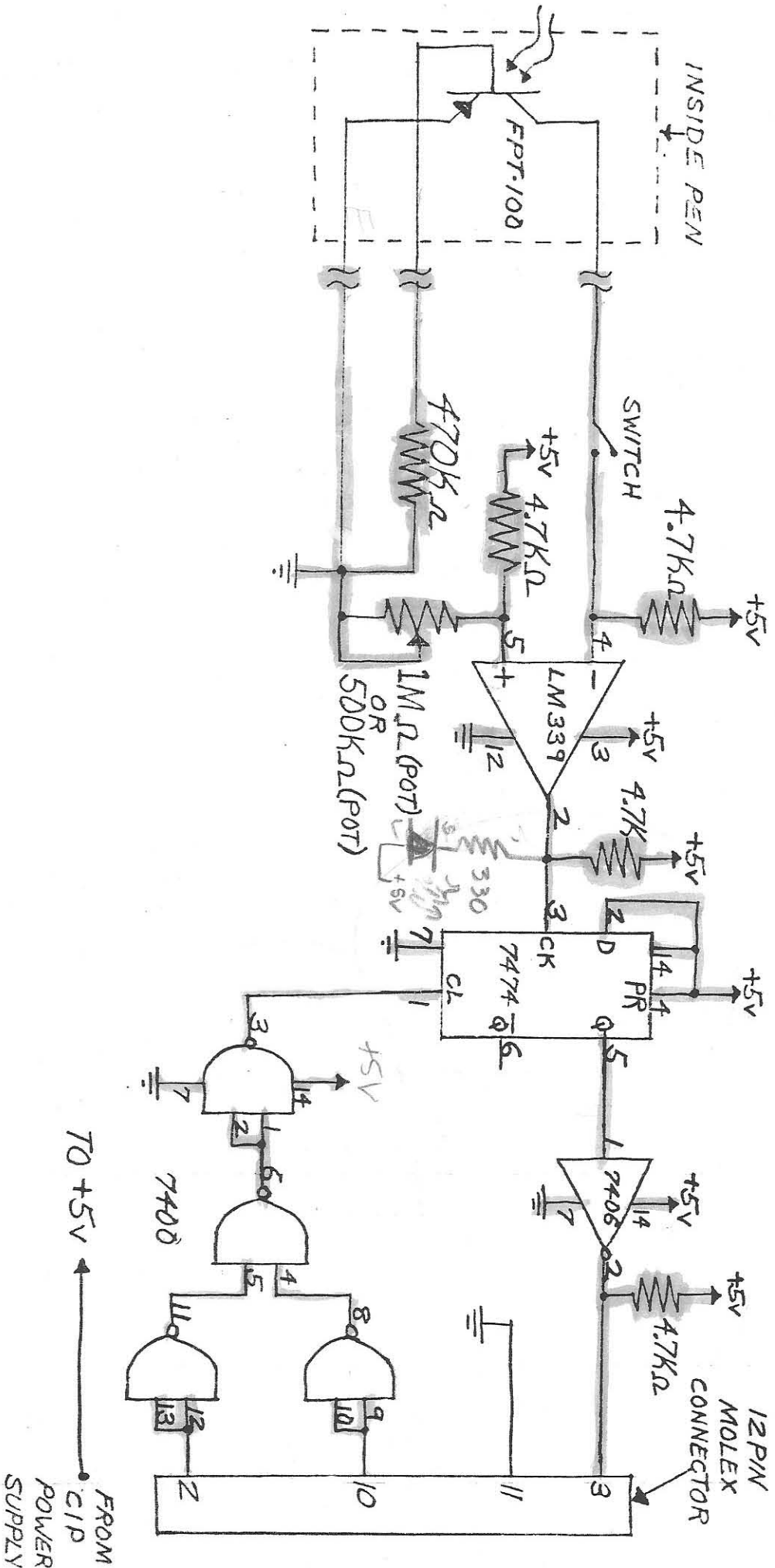LIGHT PEN LAYOUT

FPT-100
PHOTO TRANSISTOR

BIC PEN

3 FEET CABLE

POT

LM339

7474

RESISTORS

7406

7400

PREF BOARD

2 FEET CABLE

12 PIN MOLEX
CONNECTOR

+5v

FIGURE 1

LIGHT PEN (FOR CI)

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10 FORX=1TO10:PRINT:NEXT:DIMNN(44):K=57088:POKE530,1
20 PRINT"*LIGHT PEN:*":PRINT"STATE CAPITOLS QUIZ"
30 PRINT:PRINT"PUT THE PEN OVER THE CORRECT ANSWER
40 INPUT"GIVE ME A NUMBER FROM 1-100";A:FORX=1TOA
50 READA$,B$,C$,D$,E$,F:IFF=31THENRESTORE
60 NEXT:Z=0:Y=0
70 POKEK,63
80 Z=Z+1:READA$,B$,C$,D$,E$,F:IFF=31THENF=3:RESTORE
90 PRINT:PRINT"WHAT IS THE CAPITOL OF"A$:PRINT:PRINT:PRINT:PRINTB$
100 PRINT:PRINT:PRINTC$:PRINT:PRINT:PRINTD$:PRINT:PRINT:PRINTE$
110 S=0:DI=53796
115 FORX=1TO11
120 NN(X)=PEEK(DI+X):POKEDI+X,161:NEXT
130 FORX=1TO15:NEXT:I=PEEK(K):S=S+1:IFI=253THEN200
140 FORX=1TO11:POKEDI+X,NN(X):NEXT:DI=DI+96:IFDI>54100THENDI=53796:S=0
150 GOTO115
200 POKEK,255:FORX=1TO11:POKEDI+X,NN(X):NEXT:POKEDI+12,22:IFS=FTHEN250
210 PRINT:PRINT:PRINT"WRONG":IFZ=20THEN300
220 FORX=1TO750:NEXT:GOTO70
250 PRINT"RIGHT!":FORX=1TO800:NEXT:Y=Y+1:IFZ=20THEN300
260 GOTO70
300 PRINT:PRINT:"YOU GOT "Y" OUT OF 20 RIGHT"
310 END
500 DATA ALABAMA, COLUMBIA, HELENA, MONTGOMERY, LANSING,3
510 DATA MISSISSIPPI, ST. PAUL, PIERRE, AUGUSTA, JACKSON, 4
520 DATA NEW MEXICO, SANTE FE, RALEIGH, TUCSON, SALINA, 1
530 DATA IOWA, BOISE, DES MOINES, LITTLE ROCK, SALEM,2
540 DATA WASHINGTON, SEATTLE, OLYMPIA, SPOKANE, CONCORD, 2
550 DATA WYOMING, LINCOLN, TOPEKA, PROVIDENCE, CHEYENNE, 4
560 DATA NEVADA, PHOENIX, CHARLESTON, CARSON CITY, BATON ROUGE, 3
570 DATA CONNECTICUT, FRANKFORT, BOSTON, ATLANTA, HARTFORD, 4
580 DATA IDAHO, BOISE, LANSING, DOVER, AUGUSTA, 1
590 DATA NEW YORK, BUFFALO, ALBANY, ROCHESTER, SYRACUSE, 2
600 DATA WISCONSIN, MILWAUKEE, MADISON, GREEN BAY, WAUSAU, 2
610 DATA PENNSYLVANIA, SCRANTON, PITTSBURGH, YORK, HARRISBURGH, 4
620 DATA OHIO, DAYTON, CINCINNATI, COLUMBUS, CLEVELAND, 3
630 DATA KANSAS, WICHITA, KANSAS CITY, TOPEKA, SALINA, 3
640 DATA COLORADO, DENVER, PUEBLO, BOULDER, TRINIDAD, 1
650 DATA CALIFORNIA, LOS ANGLES, SACRAMENTO, SAN DIEGO, OAKLAND, 2
660 DATA ALASKA, ANCHORAGE, JUNEAU, FAIRBANKS, NOME, 2
670 DATA ARIZONA, PHOENIX, TUSCON, FLAGSTAFF, WINSLOW, 1
680 DATA DELAWARE, NEW CASTLE, WILMINGTON, NEWARK, DOVER
690 DATA MARYLAND, BALTIMORE, SALISBURY, ANNAPOLIS, CUMBERLAND,31
1150 GOTO115
OK
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LIST

10 POKE530,1:A=57088:FORX=1TO10:PRINT:NEXT
20 PRINT"***LIGHT PEN***"
30 PRINT" WHEN THE PEN IS PLACED ON TOP  OF A WHITE BLOCK, THE STATUS
35 PRINT"WILL GO  FROM 'OFF' TO 'ON'
40 PRINT"AND THE KEYBOARD INPUT  WILL GO FROM 255 TO 253
60 PRINT" STATUS    CODE
70 PRINT" -----    ----
75 FORX=1TO10:PRINT:NEXT:E=53929
80 POKEE,161:POKEE+1,161:POKEE+32,161:POKEE+33,161
90 POKEE+7,161:POKEE+12,161:D=53832
100 REM TURN ON PEN
110 POKEA,63:FORX=1TO10:NEXT
120 B=PEEK(A):REM GET STATUS
130 IFB=253THEN200:REM FOUND SOMETHING
140 POKEA,255:REM CLEAR LIGHT PEN
150 D$="OFF   255":GOSUB300:GOTO110
200 POKEA,255:D$="ON    253":GOSUB300:GOTO110
300 FORY=1TOLEN(D$):POKED+Y,ASC(MID$(D$,Y,1)):NEXT:RETURN
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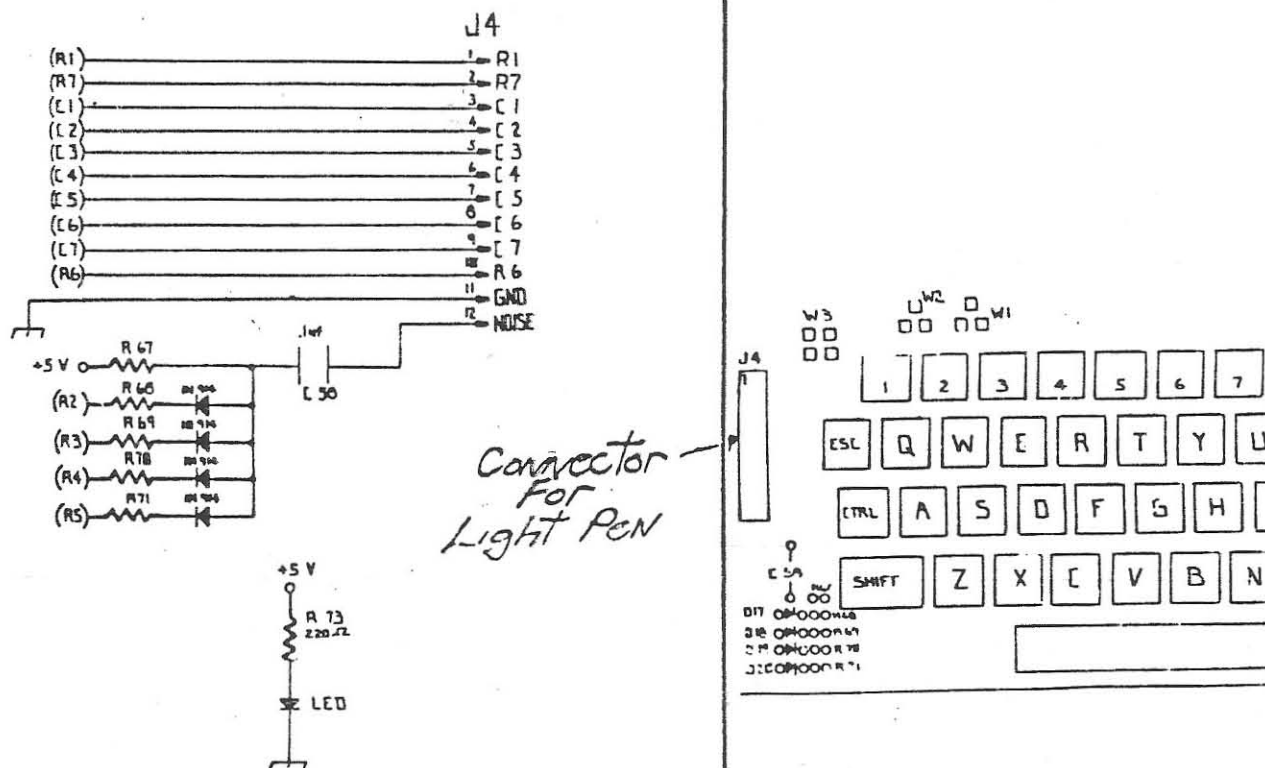

FIGURE 3