

OP—80A

OWNER'S MANUAL

OAE

**Oliver Audio Engineering
1143 North Poinsettia Drive
Los Angeles, California 90046**

PARTS LIST

| | | |
|----------------|------------------------------------|-----------|
| OP-80A-IC1-IC9 | NE555* | \$1.50 ea |
| IC10 | SN7474 | .95 |
| IC11 | SN7437 | .95 |
| C1, C2 | .1mf 10v disc capacitors | .35 |
| R1 | 25-50K In-line Resistor Network | 2.25 |
| R2-R5 | 220 ohm, 1/4 watt | .20 |
| I1-I4 | Red LED* | 1.25 |
| S1 | Precision Sensor Array* | 32.00 |
| WW1 | 16 Pin Wire Wrap Sock et | 1.25 |
| WG1 | 1.647" Precision Wire Guide | .45 |
| WG2 | 1.000" Precision Wire Guide | .45 |
| 24" | Fine Solder | .35 |
| PC1 | OP-80A Printed Circuit Card | 12.00 |
| IM | OP-80A Instruction Manual | 5.00 |
| B1 | Anodized Extruded Aluminum Box | 7.50 |
| DIP48 | DIP Connector w/ 48" Cable | 5.00 |

OPTIONS

| | | |
|-----------|--|-------|
| OP-80A-L1 | Lamp Kit (Mounts to OP-80A Card) Requires approx. 500ma. For use with opaque paper tape. | 19.95 |
| TR1 | OP-80A Tape Transport | TBD |

Include \$2.50 shipping/handling and 6% California sales tax.

*These items are selected and matched devices, Do Not
order separately.

OP-80A OPERATING INSTRUCTIONS

Operation of the OP-80A Paper Tape Reader is straight forward. The paper tape to be read is inserted between the guides and pulled from left to right. Note the position of the OAE arrow ">" and the small sprocket arrow pointing to the fourth sensor from the bottom for proper tape orientation.

In order to read light weight paper tape (semi-opaque) an LED indicator has been provided to facilitate proper alignment of the light source. (Note ...A great deal of feedback-is utilized in the sensor design to reject the 60 cycle AC component emitted by the light source, however, fluorescent light is not recommended as a sources.) To align the reader, place a low wattage Incandescent lamp¹ (15 to 60 watts recommended) over the reader and lower until the SP (Sprocket) LED comes on. The OP-80A is now ready for use.

To test the reader, load a simple bootstrap loader into the computer. The program should run in a loop waiting for the RDA line to go high (or -RDA to go low). When the line goes high, the data should be input through the port. If an acknowledge signal is generated by the input port, it should be sent out over ACK (or -ACK). If no such signal is available, the program must generate one. This may be output through the same port that supplies data to S1 and S2. The program will now return to the initial loop and wait for the neat RDA change.

¹A high intensity lamp with a 12v auto lamp is an excellent light source. I.e., Tensor Model 6500 with bulb #1156.

²Refer to OP-80A SUPPORT SOFTWARE later in this manual.

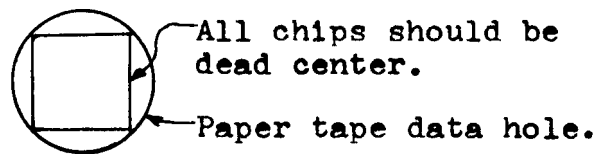
ASSEMBLY

I. INSTALL WIRE GUIDES, SENSOR ARRAY

- A. Mount the long horizontal guides 5/32" above the card. A drill makes an excellent stand-off for this operation. The horizontal guides must be mounted first!

- H. Install the short vertical guides. Use 4 to 6 layers of paper tape between the horizontal and vertical guides for proper spacing.

- C. Drop the sensor on to the card. Watch the placement of pin 1. Thread some paper tape on to the reader. Solder pin 1. With the tape pulled taut, reheat pin 1 and align the sensor as shown below.



- D. Solder all sensor leads. If the paper tape is still not properly centered over the sensor array, adjust the guides with a small pair of pliers.

ASSEMBLY (cont.)

II. MOUNT THE FOLLOWING PARTS IN THE ORDER LISTED

- A. Mount all the resistors. Refer to the part placement diagram at the end of this manual.

- B. Install J1.

- C. If you plan to mount the optional light source, (OP-80A-L1),
Install J2.

- D. If your data input port generates a negative going data acknowledge signal (-ACK) jumper point A to ACK. If the acknowledge signal is positive going, jump A to ACK.

- E. Mount all ICs. Watch the placement of pin 1.

- F. Mount the wire wrap socket. Do not cut the pins. They may be needed if additional option cards are purchased.

- G. Mount all the LEDs. Watch the placement of the cathode lead. (The LED chip is mounted to the cathode lead.)

- H. Mount the disc capacitors.

- I. This completes the assembly of the printed circuit card. INSPECT YOUR WORK CAREFULLY. It is suggested you proceed to the cable assembly and interface instructions before assembling the box.

INTERFACE INSTRUCTIONS

Refer to the I/O SOCKET diagram in this manual. Using the diagram, connect the reader to a parallel port in the computer. If you wish to connect the reader to a port with a serial interface already installed, refer to the OP-80A UART INTERFACE BULLETIN.

The parallel interface is very straight forward. The data lines D0 thru D7 are connected to the input port. When data is available, RDA goes HIGH and RDA goes LOW. Either signal may be used to flag the computer through a second input port. After the computer has input the data, it should reset the RDA latch. This is done with a positive or negative pulse (ACK or -ACK) from a computer output port. This same port may also control the buffered LEDS, S1 and S2.

If you do not want to use an output port to reset the RDA latch, you may obtain an ACK (or -ACK) signal from the computer input port. This signal is usually the product of a CPU generated "IN" signal, the decoded port address, and a clock timing signal. Refer to your microprocessor manual for details.

OP-80A

I/O S O C K E T

| | | | | | |
|--------------------------------|---|-------|-------|----|-------|
| DØ | 1 | ● BRN | RED ● | 16 | D1 |
| D2 | 2 | ● ORG | YEL ● | 15 | D3 |
| D4 | 3 | ● GRN | BLU ● | 14 | D5 |
| D6 | 4 | ● VIO | GRY ● | 13 | D7 |
| ACK or $\overline{\text{ACK}}$ | 5 | ● WHT | BLK ● | 12 | SPARE |
| $\overline{\text{RDA}}$ | 6 | ● BRN | RED ● | 11 | S2 |
| RDA | 7 | ● ORG | YEL ● | 10 | S1 |
| GROUND | 8 | ● GRN | BLU ● | 9 | +5vdc |

DØ thru D7 = DATA OUTPUT BYTE

S1 and S2 = STATUS LEDS

RDA = READER DATA AVAILABLE (L)

$\overline{\text{RDA}}$ = READER DATA AVAILABLE (L)

ACK or $\overline{\text{ACK}}$ = ACKNOWLEDGE (Resets RDA and $\overline{\text{RDA}}$) (L) or (L)*

POWER = +5vdc @ 175ma MAXIMUM

OP-80A

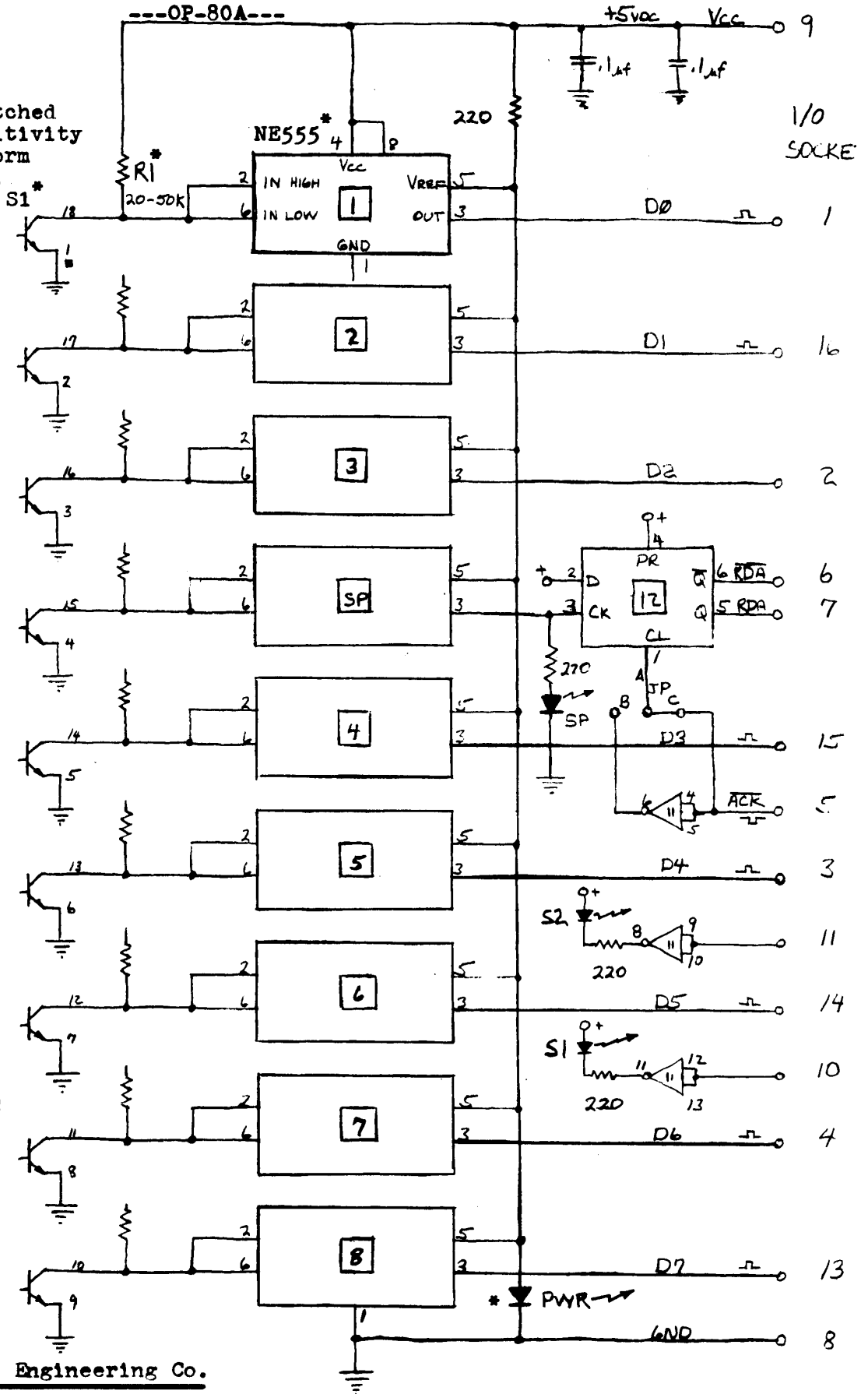
* Items matched for sensitivity and uniform response.

OP-80A
High Speed
Paper Tape
Reader

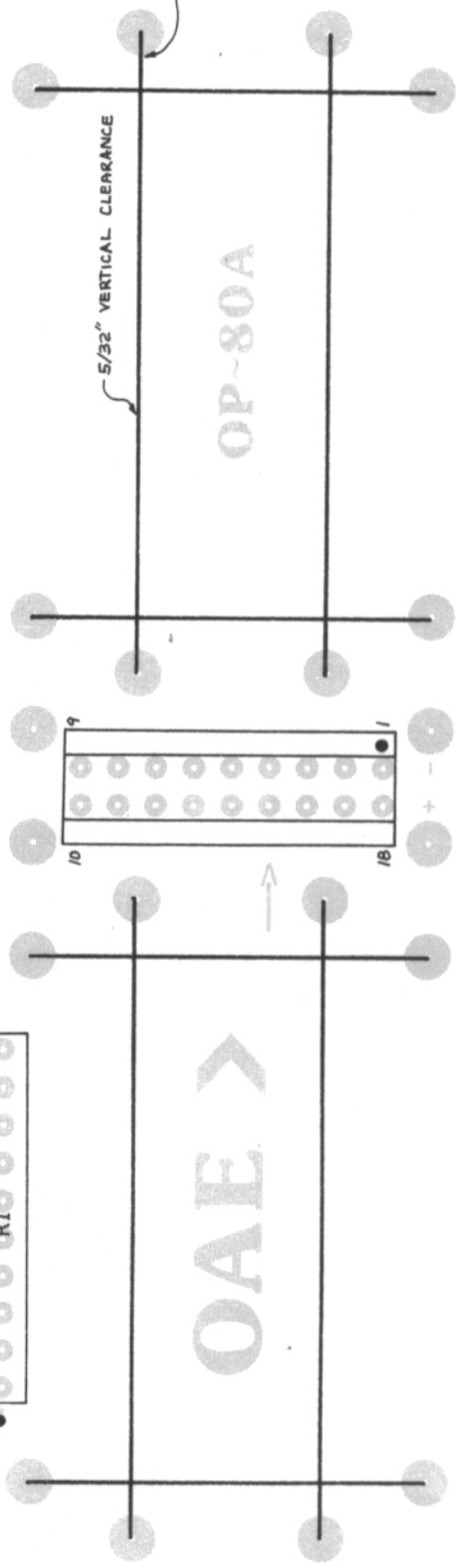
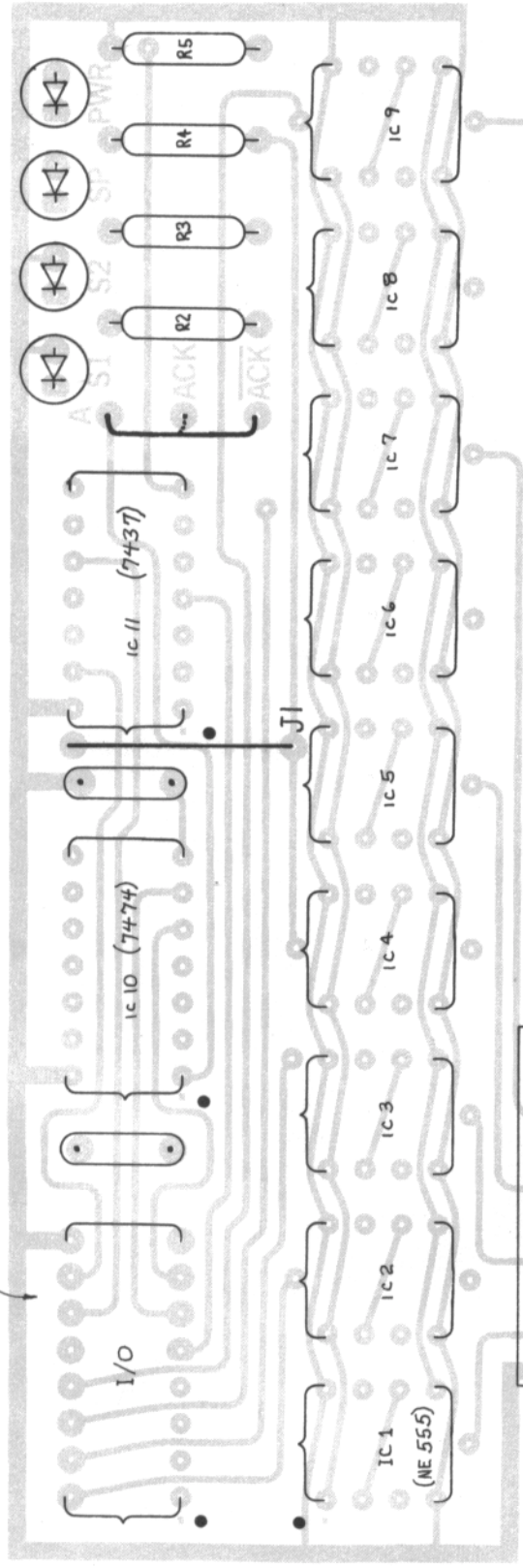
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Preliminary
Schematic

Jumper A to B
for ACK (L) or
or
Jumper A to C
for ACK (L)



DO NOT CUT GUIDES
ON I/O SOCKET!



| | | | | | |
|------|----|----|----|------|-------------------------------------|
| 0000 | | | | 0000 | * < PAPER TAPE LOADER > |
| 0000 | | | | 0001 | * |
| 0000 | | | | 0002 | * USE THIS PROGRAM TO LOAD SOFTWARE |
| 0000 | | | | 0003 | * PACKAGE #1 |
| 0000 | | | | 0004 | * |
| 0000 | | | | 0005 | ORG 0000 |
| 0000 | | | | 0006 | SP EQU 6 |
| 0000 | | | | 0007 | * INTEL TAPE LOADER |
| 0000 | 31 | 00 | D4 | 0009 | LXI SP,0D400H |
| 0003 | CD | 06 | 00 | 0010 | CALL READ |
| 0006 | CD | 45 | 00 | 0020 | READ CALL TTYIN |
| 0009 | FE | 3A | | 0025 | CPI ':' |
| 000B | C2 | 06 | 00 | 0030 | JNZ READ |
| 000E | CD | 2A | 00 | 0035 | CALL CHAR |
| 0011 | 57 | | | 0040 | MOV D,A |
| 0012 | C8 | | | 0045 | RZ |
| 0013 | CD | 2A | 00 | 0050 | CALL CHAR |
| 0016 | 67 | | | 0055 | MOV H,A |
| 0017 | CD | 2A | 00 | 0060 | CALL CHAR |
| 001A | 6F | | | 0065 | MOV L,A |
| 001B | CD | 2A | 00 | 0056 | CALL CHAR |
| 001E | CD | 2A | 00 | 0070 | LOOP CALL CHAR |
| 0021 | 77 | | | 0075 | MOV M,A |
| 0022 | 23 | | | 0080 | INX H |
| 0023 | 15 | | | 0085 | DCR D |
| 0024 | C2 | 1E | 00 | 0090 | JNZ LOOP |
| 0027 | C3 | 06 | 00 | 0095 | JMP READ |
| 002A | | | | 0100 | * |
| 002A | | | | 0105 | * |
| 002A | CD | 45 | 00 | 0110 | CHAR CALL TTYIN |
| 002D | CD | 3D | 00 | 0115 | CALL HEX |
| 0030 | 07 | | | 0120 | RLC |
| 0031 | 17 | | | 0125 | RAL |
| 0032 | 17 | | | 0130 | RAL |
| 0033 | 17 | | | 0135 | RAL |
| 0034 | 5F | | | 0140 | MOV E,A |
| 0035 | CD | 45 | 00 | 0145 | CALL TTYIN |
| 0038 | CD | 3D | 00 | 0150 | CALL HEX |
| 003E | 83 | | | 0155 | ADD E |
| 003C | C9 | | | 0160 | RET |
| 003D | | | | 0165 | * |
| 003D | | | | 0166 | * |
| 003D | D6 | 30 | | 0170 | HEX SUI 48 |
| 003E | FE | 0A | | 0175 | CPI 10 |
| 0041 | D8 | | | 0180 | RC |
| 0042 | D6 | 07 | | 0185 | SUI 7 |
| 0044 | C9 | | | 0190 | RET |
| 0045 | | | | 0195 | * |
| 0045 | | | | 0200 | * |
| 0045 | DB | 00 | | 0205 | TTYIN IN 0 |
| 0047 | E6 | 40 | | 0206 | ANI 64 |
| 0049 | CA | 45 | 00 | 0207 | JZ TTYIN |
| 004C | DB | 01 | | 0210 | IN 1 |
| 004E | D3 | 01 | | 0215 | OUT 1 |
| 0050 | E6 | 7F | | 0216 | ANI 127 |
| 0052 | C9 | | | 0220 | RET |

DUMP 0000 0052

0000 31 00 D4 CD 06 00 CD 45 00 FE 3A 02 06 00 CD 2A
0010 00 57 C8 CD 2A 00 67 CD 2A 00 6F CD 2A 00 CD 2A
0020 00 77 23 15 C2 1E 00 C3 06 00 CD 45 00 CD 3D 00
0030 07 17 17 17 5F CD 45 00 CD 3D 00 83 C9 D6 30 FE
0040 0A D8 D6 07 C9 DB 00 E6 40 CA 45 00 DB 01 D3 01
0050 E6 7F C9