

# **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 lamp<sup>1</sup> (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.

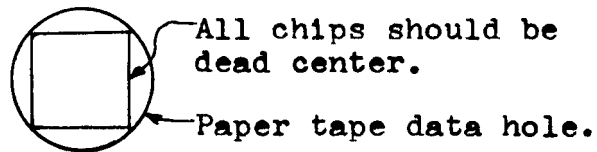
<sup>1</sup>A high intensity lamp with a 12v auto lamp is an excellent light source. I.e., Tensor Model 6500 with bulb #1156.

<sup>2</sup>Refer 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 (⌋⌋)

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

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

POWER = +5vdc @ 175ma MAXIMUM

# OP-80A

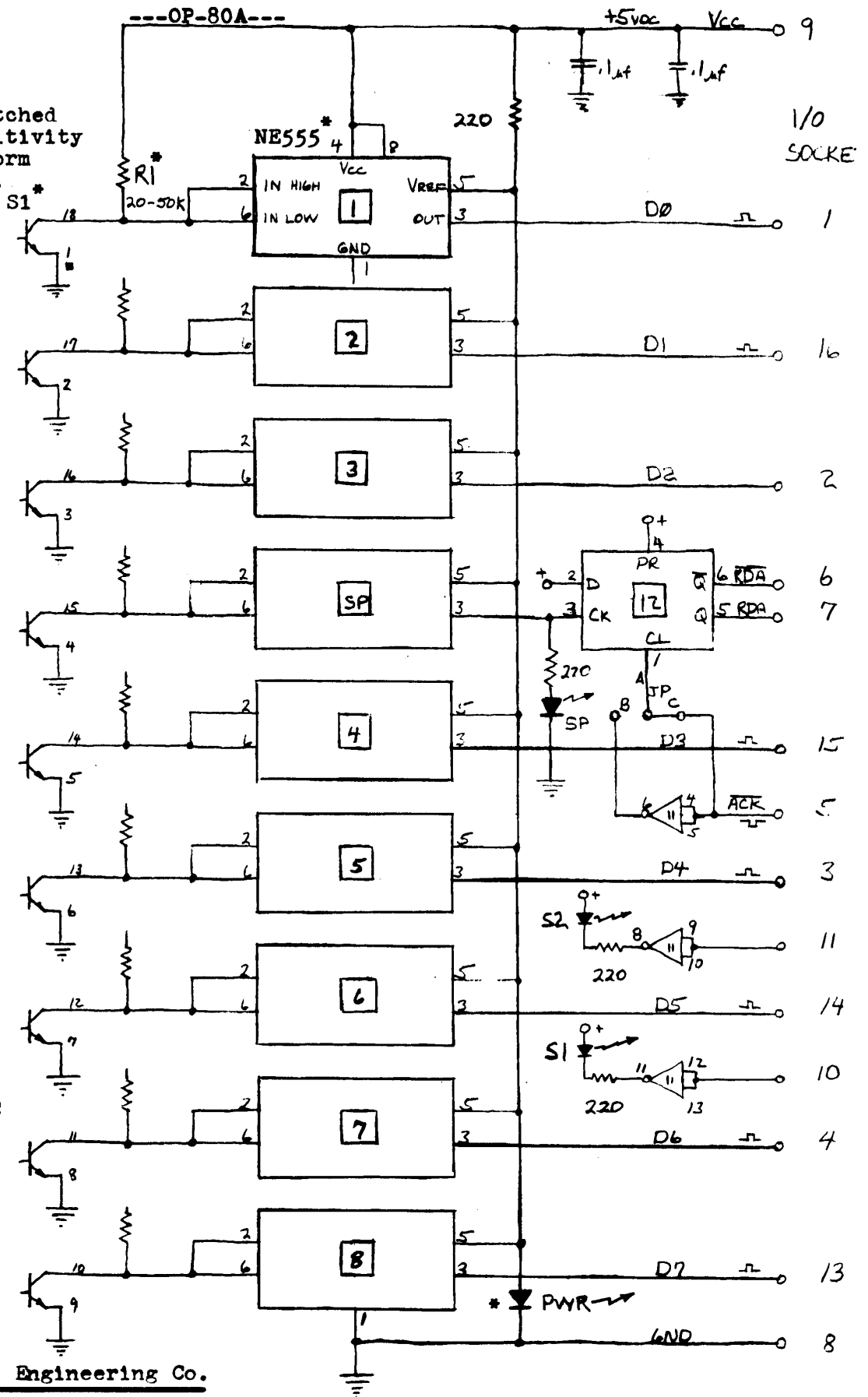
\* Items matched for sensitivity and uniform response.

OP-80A  
High Speed  
Paper Tape  
Reader

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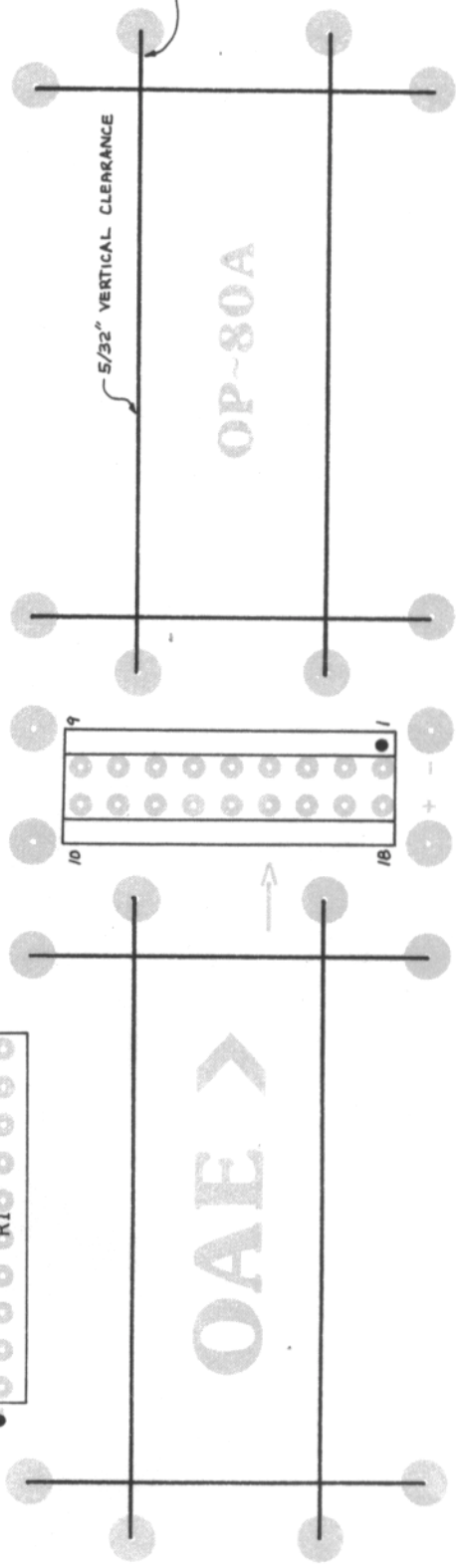
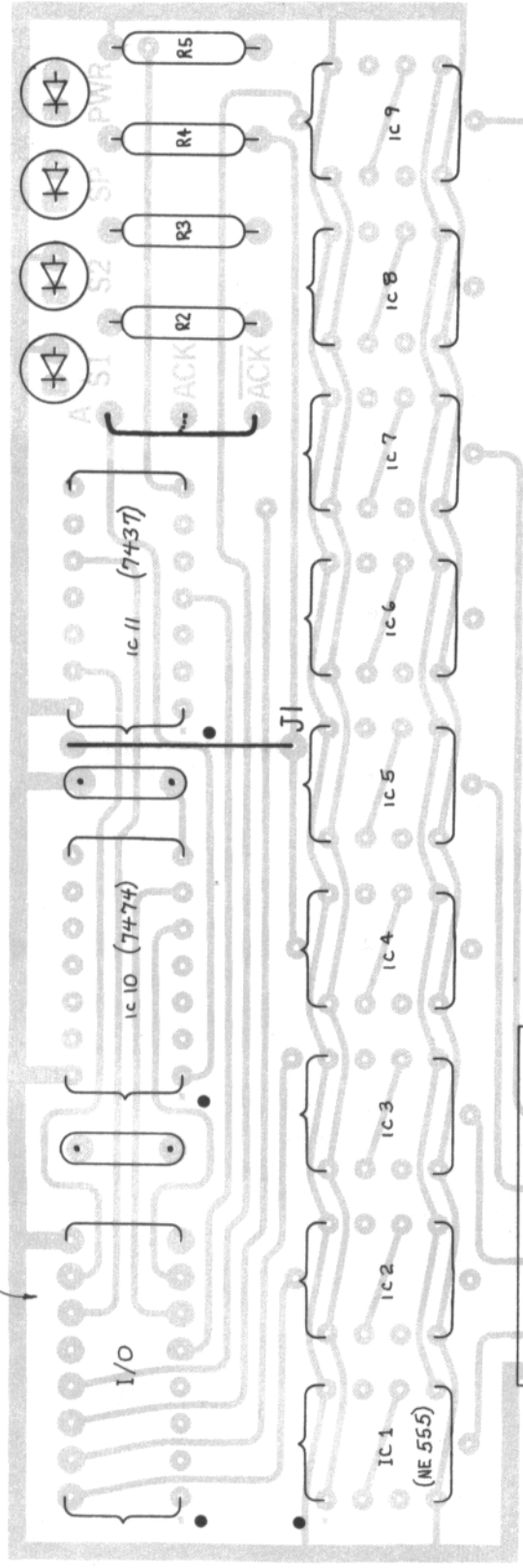
Preliminary  
Schematic

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