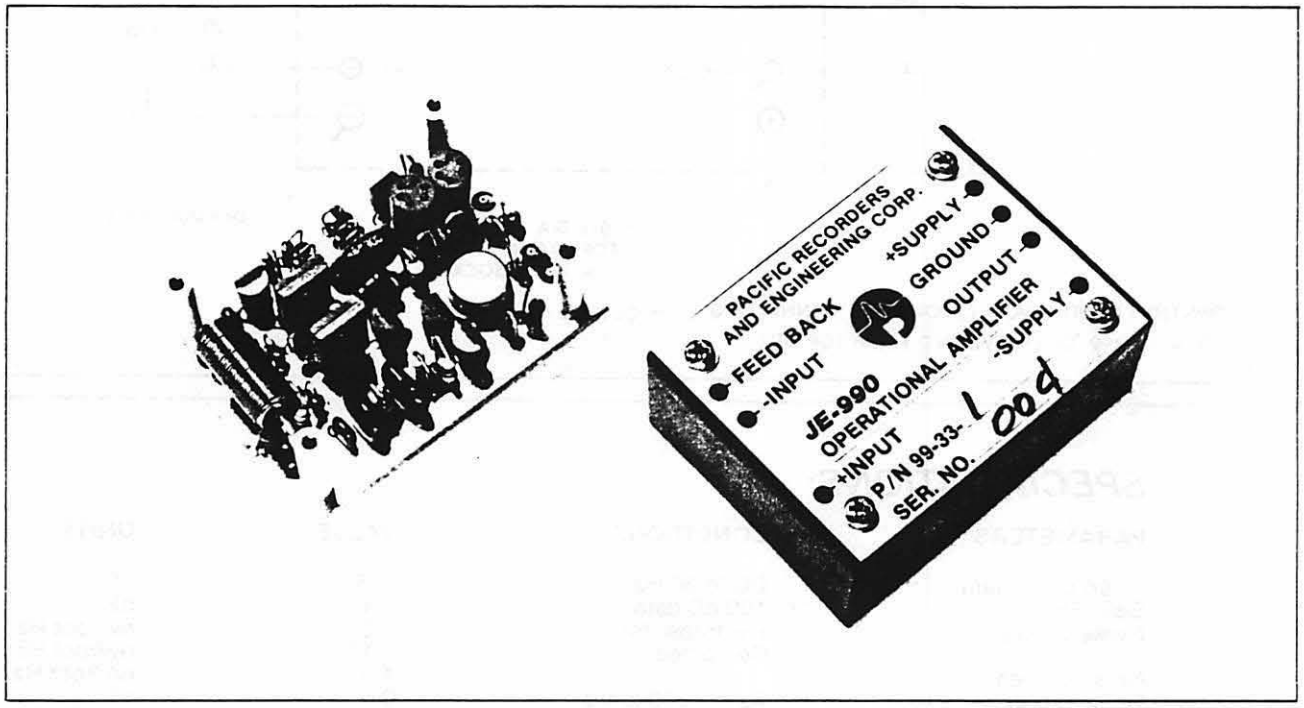
PACIFIC RECORDERS AND ENGINEERING CORPORATION

JE-990
OPERATIONAL AMPLIFIER



The JE-990 is a discrete operational amplifier which has:

Lower: Noise Voltage
Distortion
Gain Error
Output Impedance
Response Time (Delay)

Higher: Slew Rate
Output Voltage
Output Current
Phase Margin (Stability)
Gain Bandwidth Product

than most IC Opamps and earlier Discrete Opamps in common use for audio applications. The design development involved a careful mixture of textbooks, laboratory collected data, and computer calculations and graphics.

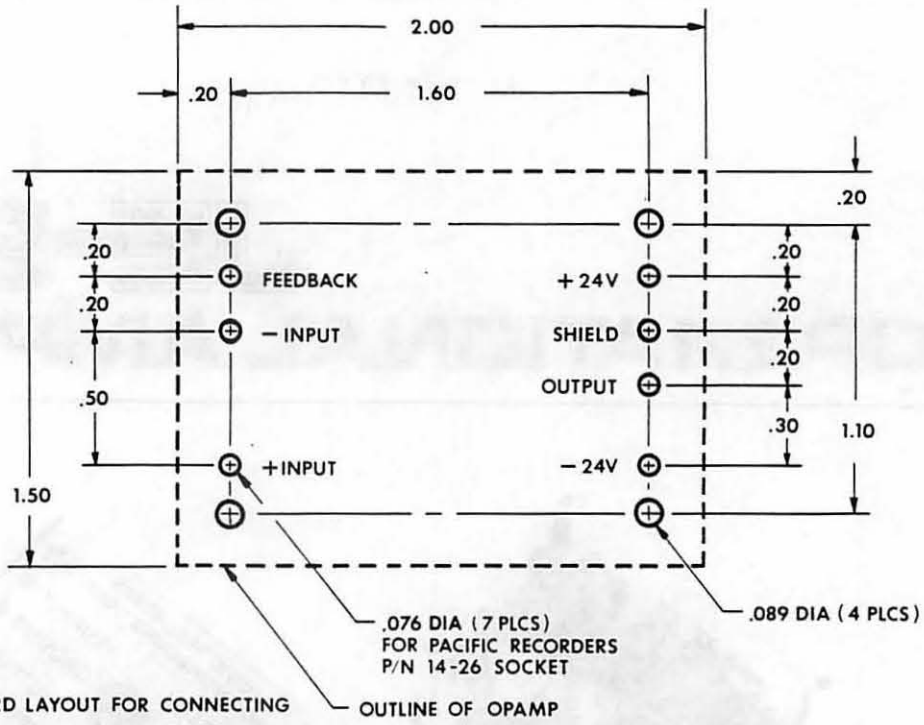
The JE-990 is assembled on a glass epoxy, double-sided P.C. board. The component side of the P.C. board is a ground plane which further enhances amplifier stability, and also reduces susceptibility to R.F. The amplifier module is unpotted, and is supplied with full technical documentation. Easy servicing is provided through silkscreened component designations on the P.C. board.

APPLICATIONS

There are a wide variety of applications for the JE-990. Applications include:

- Input stage for any application where the source impedance is 2500 ohms or less
- Line output amplifier for driving a 75 ohm load up to +25dBv (Re: 0.775v) or 39 volts peak-to-peak
- Summing amplifier
- Active filter requiring a high degree of stability
- Laboratory preamp for extending sensitivity of noise or distortion measurements.

There are currently two models of the JE-990 available. The JE-990-15 is optimized for operation with bi-polar 15 volt supplies, and the JE-990-24 for bi-polar volt operation.



PRINTED CIRCUIT BOARD LAYOUT FOR CONNECTING TO A JE-990 OPAMP VIEWED FROM TOP SIDE

SPECIFICATIONS:

PARAMETERS	CONDITIONS	VALUE	UNITS
Open Loop Gain	DC to 30 Hz	125	dB
Gain Error	100 dB gain	0.4	dB
Noise Voltage	Per transistor	0.8	nv/root Hz
	Combined	1.13	nv/root Hz
Noise Current		1.0	nA/root Hz
Noise Figure	Rs = 1000 ohms	0.6	dB
Equivalent	Shorted Input	−133.7	dBv Re:0.775 v
Input Noise	BW = 20 kHz		
Max Input Level	Unity gain	+25	dBv Re:0.775v
Input Impedance	Non-Inverting	>10	megohms
Input Bias Current		+2.2	uA
Max Output Level (bipolar 24 volt supply)	RL = 75 ohms	+25	dBv Re:0.775v
Max Output Current		260	mA peak
Distortion 20 kHz	RL = 75 ohms		
+25dBv	Gain = 40 dB	0.03	% THD
	Gain = 20 dB	0.004	% THD
	RL = 600 ohms		
	Gain = 40 dB	0.0026	% THD
Slew Rate	RL = 150 ohms	18	V/us
	RL = 75 ohms	16	V/us
Large Signal BW	RL = 150 ohms	145	kHz
Small Signal BW	Unity gain (ft)	10	MHz
Gain BW Product	10 kHz—100 kHz	>50	MHz
Phase Margin	10 MHz	>38	degrees
	<2 MHz	>60	degrees
Response Time	Unity gain	<20	ns
Supply Current	No Load	25	mA
Supply Voltage	Bi-polar	15 or 24	V

Specifications subject to change without notice or obligation.

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