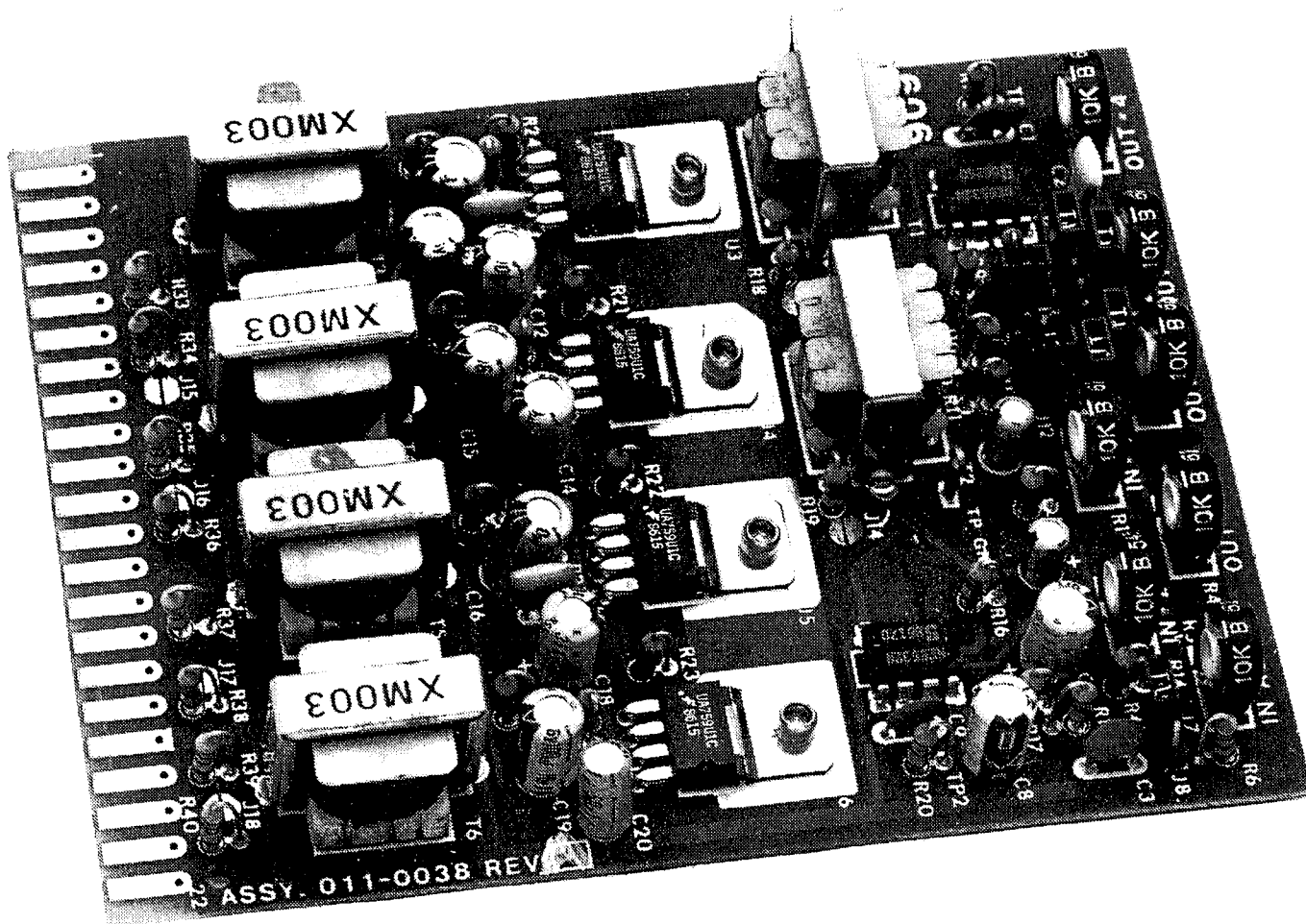


Vega
a MARK IV company

Instruction Manual
098-0299

Model LD-606

Audio Line Driver Card



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INTRODUCTION

The Cetec Vega Model LD-606 audio line driver is a multipurpose audio distribution amplifier card with two transformer-isolated inputs, one operational-amplifier auxiliary/summing junction input, and four high-level transformer-isolated outputs. It is intended to perform a wide variety of line-receiving, summing, audio-distribution, and line-driving functions.

The LD-606 may be user-configured by means of on-card jumper blocks which determine the operating mode of the card. Many modes are available, including:

- 1) One input drives all four outputs.
- 2) Each transformer-isolated input drives two outputs.
- 3) One input drives two outputs; the other two each drive one output.
- 4) The summing input sums up to twelve audio signals (with external summing resistors) and drives from one to four outputs.
- 5) The two transformer-isolated inputs may be summed with the single-ended input and used to drive all four outputs.

The two transformer-isolated inputs have selectable 10-k-ohm or 600-ohm input impedances, while the nonisolated input may be configured as a summing junction or as a 10-k-ohm single-ended input. The four outputs have high drive capabilities (up to +18 dBm into 600 ohms) and may be optionally configured for high-level bridging use (nominal 2.4-k-ohm output impedance), allowing parallel operation with tone consoles, additional LD-606s, and other equipment. Individual level controls are provided for each output and each input (excluding the single-ended input in summing mode).

SETUP AND ADJUSTMENT

Application of the LD-606 is extremely straightforward. The primary consideration is proper configuration of the card to the desired mode—that is, which input is to drive which output(s). In addition, the desired input impedance for the transformer-isolated inputs must be selected (600 ohms or 10 k ohms). Refer to the schematic on page 3. The card is normally supplied set for 10 k ohms input, but closing J13 or J14 will set the corresponding input to 600 ohms. The output impedance may be 300, 600, or 2400 ohms. A 300-ohm output is obtained by closing the jumpers across the 300-ohm resistors and connecting the load from the transformer center tap to the lower end of the transformer (Pins Y,21; U,17; N,12; and H,7 on the card connector). A 600-ohm output is obtained by using the same configuration and opening the jumpers across the 300-ohm resistors. For 2400 ohms, open the jumpers and connect the load across the entire transformer secondary.

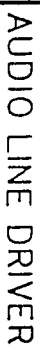
The auxiliary/summing input impedance is fixed at 10 k ohms in the nonsumming mode (J7 closed, J8 open). In the summing mode (J8 closed, J7 open), the input impedance is very low and external summing resistors (10 k ohms recommended) are required. Do not connect a low-source-impedance audio signal directly to the summing input, which would likely damage the card. The two transformer-isolated inputs may also be summed; close J11 and J12 for this mode of operation.

The LD-606 is highly flexible and requires that the on-card jumper blocks be positioned appropriately for the operating mode desired. Configuration may best be accomplished by referring to the schematic and tracing the signal paths. In this way, the jumper configuration necessary to achieve a particular operating mode can be determined. Once the card is configured, levels must be set via the potentiometers. The levels at the outputs of the three input amplifiers may be monitored at test points TP1 thru TP3. The recommended operating level is approximately 0 dBm; while higher levels may be used, the circuits will clip at about +12 dBm, and an allowance should be made for larger than expected input levels. The four outputs may also be independently adjusted; an operating level near 0 dBm across the actual line used is recommended (except for unusual or special applications). The clipping point depends upon the output configuration selected, but is typically +18 dBm.

THEORY OF OPERATION

The circuitry in the LD-606 is relatively simple. Two dual low-noise operational amplifiers are used for the input amplifiers and the bias source, and four medium-power operational amplifiers are used for the output drivers. The two transformer-isolated inputs are configured for a gain of approximately 10 dB. The gain of the auxiliary/summing amplifier is selectable (in the "auxiliary" mode) to either 10 dB or 0 dB (unity gain) by J9 and J10. In the summing mode, gain is a function of the ratio of the summing resistors to the amplifier feedback resistors. For example, if 10-k-ohm external summing resistors are used and J9 is closed, a gain of 6.8 (16.6 dB) will be realized. Generally, J10 should be closed when the summing mode is used, to prevent overload of the amplifier with multiple inputs present.

The output amplifiers have a maximum voltage gain of about 10 dB; however, the transformers have a high turns ratio, and the effective voltage gain is higher (approximately 20 dB for a 300-ohm or 2.4-k-ohm output impedance, and about 14 dB for 600 ohms). The output level should be monitored across the actual line in use (including parallel equipment, if any), because line-impedance variations, the output configuration, and jumpering will affect the level significantly. The output of each amplifier is individually adjustable by means of the potentiometers on the card edge.



LD-606 SPECIFICATIONS

Input Voltage: +10 to +18 Vdc

DC Input Current: Approximately 50 mA at 13 Vdc driving one output at 600 Ω with +10 dBm out. Approximately 64 mA driving two outputs at 600 Ω with +10 dBm out

Input Impedance for Balanced Inputs: 10 k/600 Ω , solder-bridge selectable

Input Impedance for Single-Ended Input: 10 k Ω , with J8 open and J7 closed; approximately 100 Ω , with J8 closed and J7 open, for use as a summing input (summing resistors required; 10-k Ω recommended)

Input Level Range (Input 1,2,3): Approximately 50 dB, adjustable from -27 dBm to +20 dBm maximum for 0 dBm output, with 600 ohms input impedance

Signal-to-Noise Ratio: Better than 66 dB at -20 dBm in and +5 dBm out

Output Impedance: 300, 600, and 2400 Ω , selectable (impedance matched), for each of four balanced outputs; two single-ended low-impedance outputs also provided

Maximum Output: Approximately +18 dBm for 600- Ω configuration into 600- Ω load; approximately +21 dBm for 300- Ω configuration into 600- Ω load; approximately +15 dBm for 2400- Ω configuration into 600- Ω load. Approximately 50 dB output level range

Frequency Response: +2 dBm from 100 Hz to 10 kHz

THD: 0.15% at 1 kHz with 0 dBm in, +10 dBm out

Operating Temperature: 0°C to +70°C

Size: 0.75 H, 3.6 W, 4.7 D in; 1.9 H, 9.1 W, 11.9 D cm

WARRANTY

Cetec Vega signaling products are guaranteed to be free from defects in materials and workmanship for a period of three years from the date of shipment. Warranty is for factory repair or replacement only.

LD-606 PARTS LIST

Part No.	Description	Ckt Sym
010-0611	Model LD-606 audio line driver	----
001-1764	JK-22 connector kit	----
011-0038	LD-606 PCB assembly	----

098-0299	Instruction manual for LD-606	----
065-0381	PCB for LD-606	----
102-0370	220 pF cer. cap., S2L, 5%, 50 V	C1 C3 C4 C9
105-1007	0.01 μ F mylar cap. 20%, 100 V	C2 C11 C17
112-1646	1.0 μ F elec. cap., mini, 25 V	C5 C6
112-1676	100 μ F elec. cap., 16 V	C7 C8 C10 C12 C13 C14 C15 C16 C18 C19 C20
112-1678	1.0 μ F elec. cap., 50 V, NP	
130-0725	10 k Ω var. res., log PC, hadj	R1 R2 R3 R4 R5 R12 R14
136-0003	8.2 Ω comp. res., 5%, 1/4 W	R29 R30 R31 R32
136-0020	100 Ω comp. res., 5%, 1/4 W	R6
136-0030	680 Ω comp. res., 5%, 1/4 W	R18 R19
136-0031	820 Ω comp. res., 5%, 1/4 W	R33 R35 R37 R39
136-0036	2.2 k Ω comp. res., 5%, 1/4 W	R21 R22 R23 R24
136-0040	4.7 k Ω comp. res., 5%, 1/4 W	R15 R17 R25 R26 R27 R28
136-0048	22 k Ω comp. res., 5%, 1/4 W	R9 R10 R11 R13 R16 R41

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136-0054	68 k Ω comp. res., 5%, 1/4 W	R7	286-1772	36-pin strip tin connector	----
		R8			
		R20	318-0246	10 k Ω CT/10 k Ω CT xfmr	T1
136-0266	300 Ω comp. res., 5%, 1/4 W	R34			T2
		R36	318-0260	8-1200 Ω xfmr	T3
		R38			T4
		R40			T5
					T6
286-1766	Jumper plug connector	J1			U1
		J2	425-0202	5532 dual RL600 opamp IC	U2
		J3			U3
		J6	425-0235	UA759 IC	U4
		J7			U5
		J9			U6
		J12			
286-1768	Test-point pin	TPGND	523-0081	1/8 x 1/4 pop rivet	----



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