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IBM INDUSTRIAL PRODUCTS

LINE AMPLIFER (LA-1A)
MODULE P/N 841576

361476

Functional Description

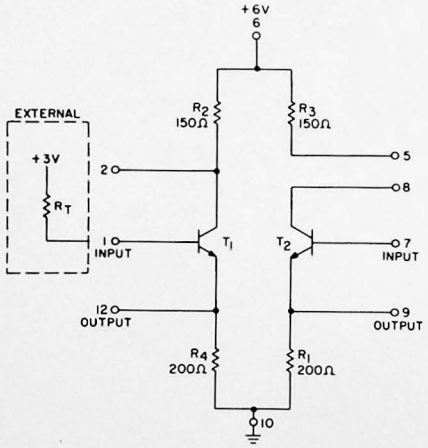
The Line Amplifier, LA-1A, is used to tap a transmission line at two or more locations, the tapped connections must present a high impedance to the transmission line to prevent loading.

The terminating resistor (R_T) is external and connected only on the LA-1A at the receiving end of the transmission line. There can be only one R_T connection per transmission line. For a 93Ω transmission line R_T should be a 100Ω resistor.

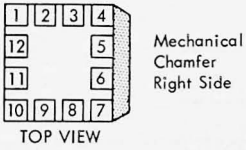
T_1 is an emitter follower. Resistor R_2 is used to obtain emitter follower stability.

In normal operation the L.A. drives an AI or AOI module.

Schematic

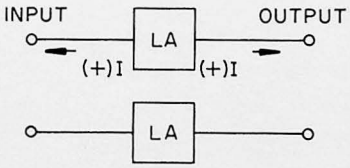


Terminal Configuration



Pins 2, 3, 4 and 11 Leave Open

Block Diagram



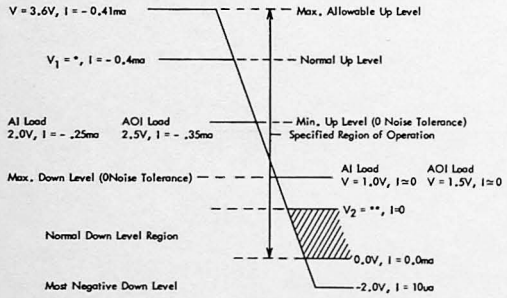
Maximum Ratings

Input Voltage = 3.6V
Output Voltage = 6.0V
I_E = 23ma

LA-1A Module Functional Tests

TESTS	TERMINAL CONDITIONS												°C	ADDITIONAL LOAD REQUIREMENTS	VARIABLE	LIMITS		UNITS
	1	2	3	4	5	6	7	8	9	10	11	12				MIN	MAX	
DC ON	525Ω to +2.88V					+5.76V				GND		V_O	25		V_O	1.9		V
DC ON						+5.76V	525Ω to +2.88V		V_O	GND			25		V_O	1.9		V
DC OFF	+0.9V					+6.24V				GND		V_O	75	CONSTANT CURRENT OF 1.8ma INTO TERM. 12	V_O		0.45	V
DC OFF						+6.24V	+0.9V		V_O	GND			75	CONSTANT CURRENT OF 1.8ma INTO TERM. 9	V_O		0.45	V

Input Requirements



*This voltage is determined from the chosen value of R_T and its power supply return voltage, and is computed as follows.

V_1 = (Min. value of power supply) − (Max. value of R_T) (.4 ma) η

where η = number of LA's connected to the line.
R_T = resistance in KΩ; the equivalent resistance of R_T must equal 100Ω to properly terminate the transmission line.

** V_2 is determined from the saturation level of the driver and the IR drop of the line.

V_2 = .3V + (line Res/ft.) (line length to LA in ft.) (I)

where I = current flowing in transmission line when the line driver is "ON".

Output Specifications

Since the L.A. normally drives either an AI-2A or an AOL-2A and no other loads, the usable output is that of the driven AI-2A or AOI-2A. Refer to these circuits for output specifications.

Maximum Power Supply Current Requirements (per module)

	ON	OFF
+6V	26ma	0

Maximum Power Dissipation (per module)

ON	OFF
164.8mw	2.4mw

Average Normal Power Dissipation $= \frac{\text{NOMINAL ON + NOMINAL OFF}}{2} = 74.1\text{mw}$

General Wiring Rules (For Printed Circuit Wire - 10 Mil Width Lines)

The input line length from the L.A. to the terminated line must not exceed 6 inches. This will insure the stability of the L.A. The maximum output length should not exceed 60 inches unless longer delays can be tolerated.