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(EXPI)

INTEGRATED CIRCUIT INTERFACES BETWEEN NUCLEAR INSTRUMENT MODULE AND EMITTER-COUPLED LOGIC LEVELS*

by

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With the advent of emitter coupled logic (ECL) integrated circuits, a need frequently arises for interfacing them with the standard levels of Nuclear Instrument Modules (NIM). Two simple and inexpensive high-speed interface circuits are described here: one is an interface from NIM to ECL levels, the other one from ECL to NIM levels. Both circuits utilize MC1025L integrated circuits (Fig. 1), and use only the single -5.2 V power supply required for the operation of ECL circuits. Both circuits are capable of operation at 100 MHz repetition rates and have rise and fall times of <2.5 nsec.

The NIM to ECL interface (Fig. 2) utilizes one-half of an MC1025L as an emitter follower. The input is of the high-impedance bridging type, the output drives an ECL circuit. Waveforms of the circuit are depicted in Fig. 3. They show a delay of 1 nsec and rise and fall times of <2 nsec of the input pulse between the two input terminals, and a delay of 1.5 nsec and rise and fall times of <2 nsec of the output pulse.

The ECL to NIM interface (Fig. 4) utilizes an MC1025L as an emitter coupled pair. This circuit is driven by the two outputs of an ECL circuit. Waveforms of the circuit, depicted in Fig. 5, show rise and fall times of <2.5 nsec.

FIGURE CAPTIONS

1. Schematic diagram of the MC1025L dual-in-line integrated circuit.
2. Nuclear Instrument Module to Emitter Coupled Logic Interface. Circled numbers designate pin numbers; pins 2, 3, 7, 13, and 14 are connected to -5.2V.
3. Waveforms of the circuit shown in Fig. 2. (a) IN 1, (b) IN 2, (c) OUTPUT. Sensitivity: 0.2 V/major division; Sweep Speed: 2 nsec/major division.
4. Emitter Coupled Logic to Nuclear Instrument Module Interface. Circled numbers designate pin numbers; pin 7 is connected to -5.2 V.
5. Waveforms of the circuit shown in Fig. 4 with each of the four output terminals terminated by 50 ohms to ground. (a) OUT, (b) $\overline{\text{OUT}}$. Sensitivity: 0.2 V/major division; Sweep Speed: 2 nsec/major division.

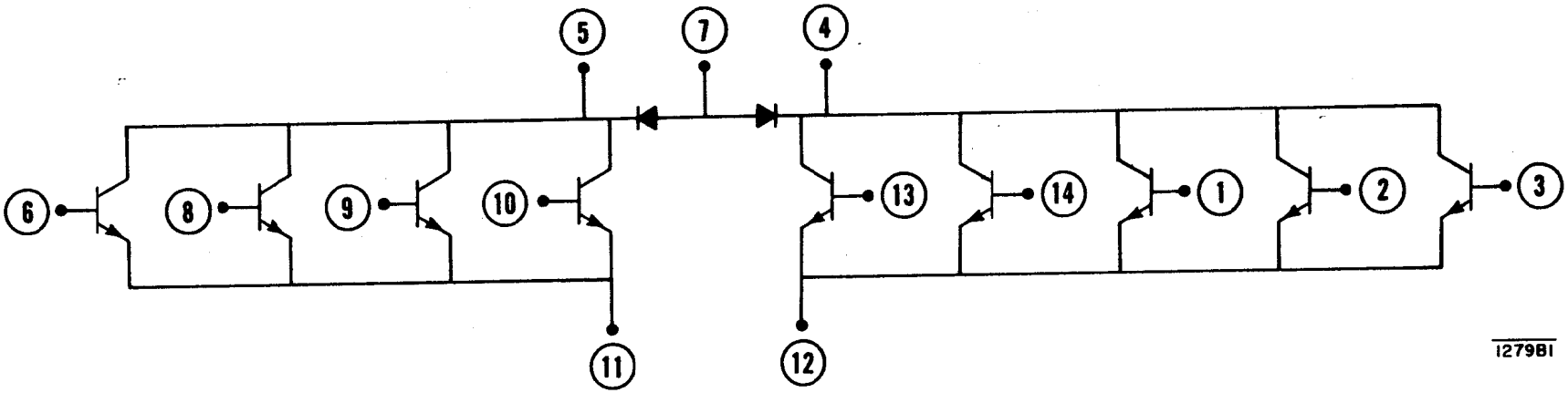

Fig. 1

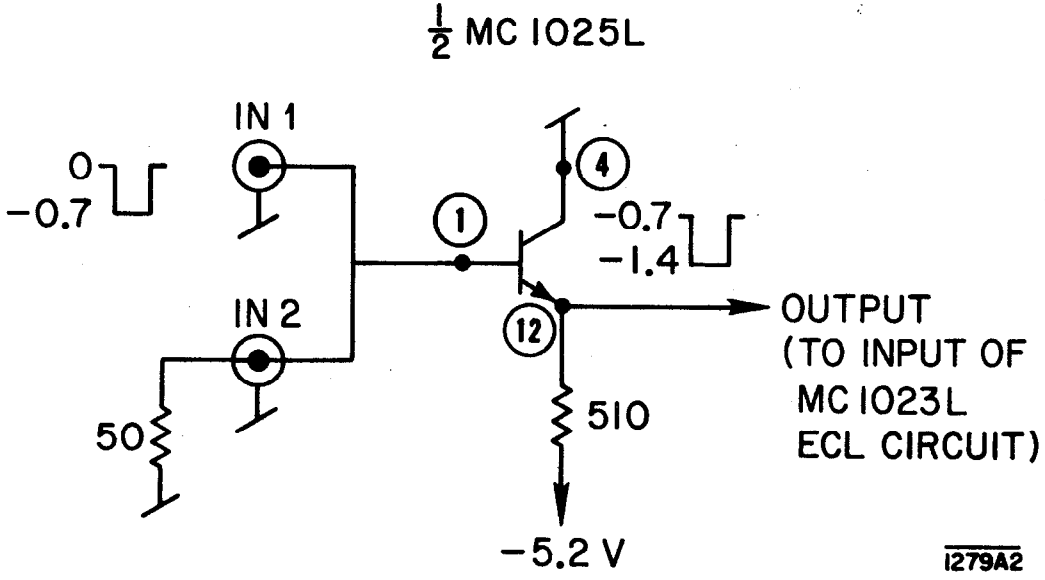
½ MC 1025L
IN 1
0
-0.7
IN 2
50
1
4
-0.7
-1.4
12
OUTPUT
(TO INPUT OF
MC 1023L
ECL CIRCUIT)
510
-5.2 V
1279A2

Fig. 2

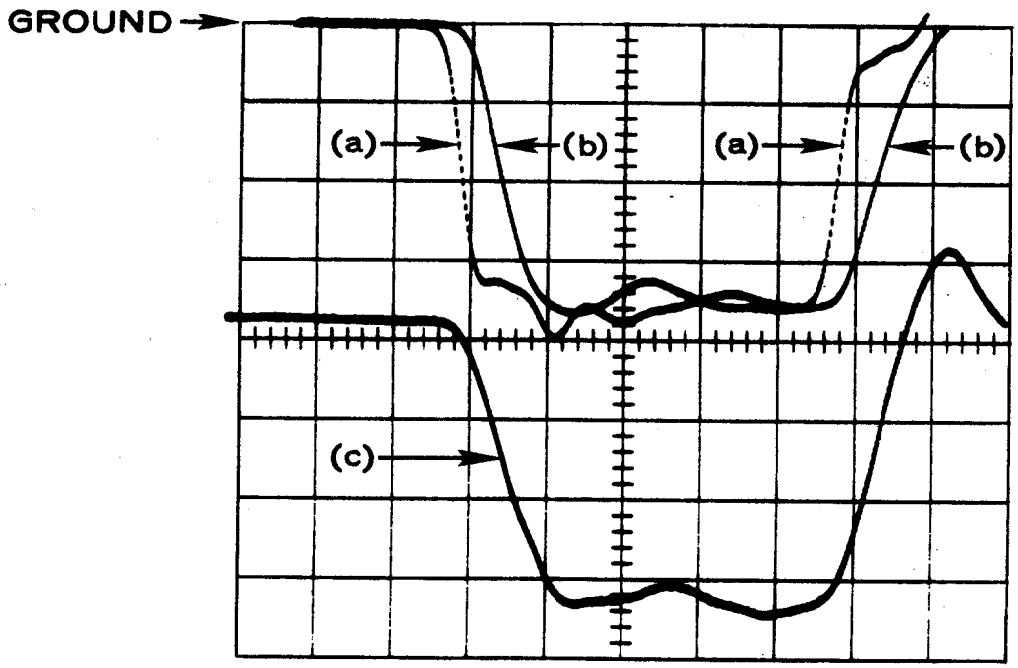

Fig. 3

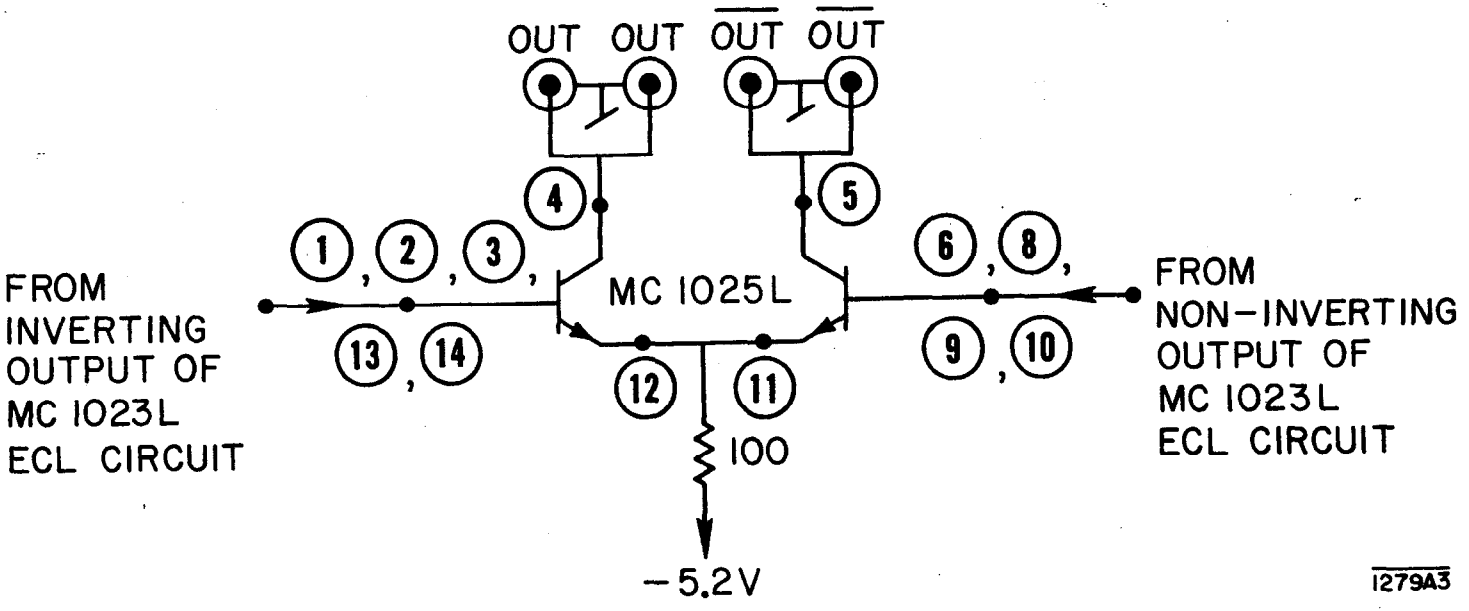
OUT
OUT
$\overline{OUT}$
$\overline{OUT}$
4
5
1, 2, 3,
6, 8,
MC 1025L
FROM
INVERTING
OUTPUT OF
MC 1023L
ECL CIRCUIT
13, 14
12
11
9, 10
FROM
NON-INVERTING
OUTPUT OF
MC 1023L
ECL CIRCUIT
100
−5.2V
1279A3

Fig. 4

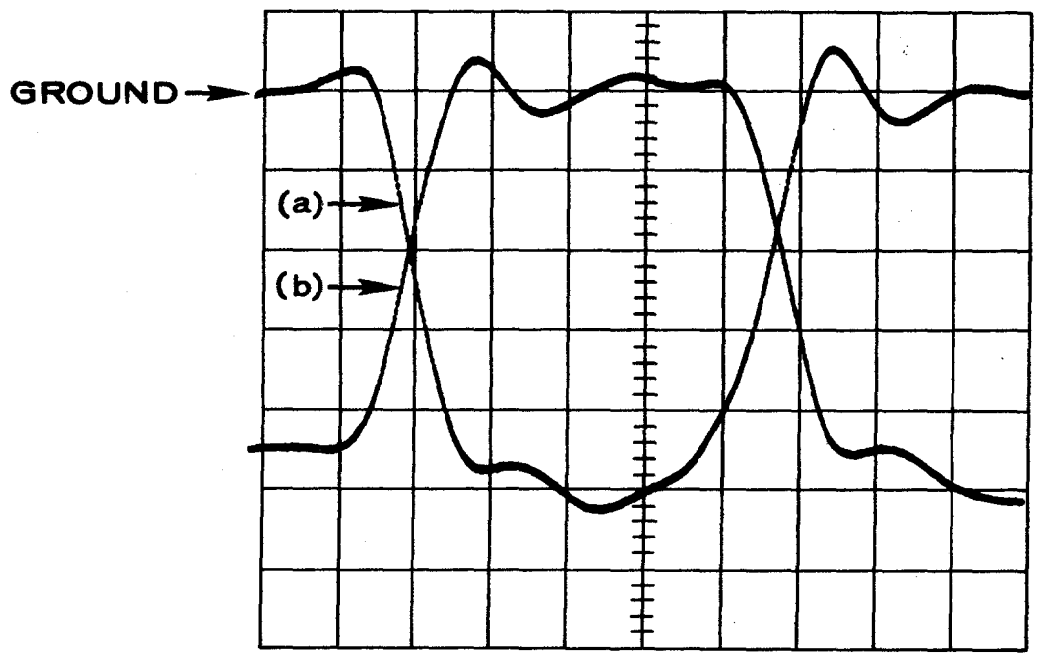

Fig. 5