E6 REPEATER SOLID-STATE DISABLER

SD-97023-01

DESCRIPTION

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1. GENERAL

1.01 This section describes the solid-state disabler (Fig. 1) designed for use with the E6 repeater. This unit will replace the J99253L-2 disabler (MD) in all circuit applications.

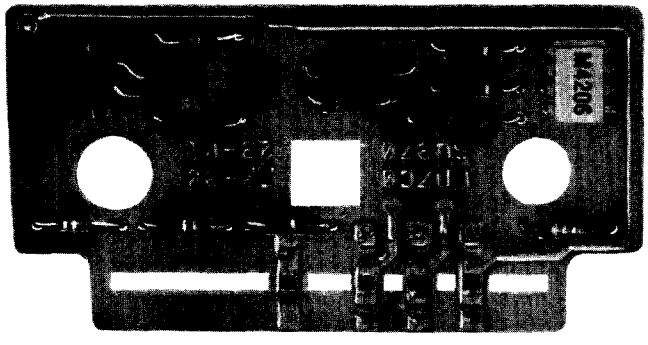

Fig. 1—E6 Solid-State Disabler

1.02 When this section is reissued, the reason for reissue will be given in this paragraph.

1.03 The solid-state disabler (ED-7C077) is intended for use where it is desirable to disable the E6 repeater during idle circuit conditions. Other considerations such as low initial cost, ease of installation, power supply capacity, and energy conservation may make installation of the solid-state disabler feasible for other than "singing" repeaters.

1.04 Disablers must be used on circuits with E6 repeaters when the talk state is stable (no hollow sound or singing) but the idle or signaling state is unstable. Since it is difficult to predict if instability will exist before installation, disablers should be specified when:

(1) A DLL without an idle circuit termination is adjacent to an intermediate E6 repeater

(2) A DLL without an idle circuit termination is located such that the loss of the repeatered portion between the DLL and either terminated end is less than 2 dB

(3) A loaded facility with severe loading irregularities must be used

(4) Nonloaded circuits with intermediate repeaters operated at high gains are terminated in switches at both ends

(5) Circuits subject to wide temperature variations are aligned for low loss end to end without temperature correction.

A disabler will not improve the talk state stability of the circuits above but its use will allow maximum gain on circuits of this type.

1.05 Table A lists the transmission and signaling specifications of the solid-state disabler.

TABLE A

SPECIFICATIONS FOR E6 DISABLER

Transmission:		
Insertion loss	<.1 dB	
Return loss	>30 dB	
Total Harmonic Distortion		
@ 0 dBm	over 60 dB down	
@ 10 dBm	over 60 dB down	
Switching:		
Switching Sensitivity		
Gnd or Loop Start	3.5 mA ±1.5 mA	
Enable Delay	375 — 500 ms	
DC voltage loss		
$T - T_1$	2.9 ±0.3 volts	
$R - R_1$	2.9 ±0.3 volts	
Power Consumption	Idle	Busy
E6 With Solid-State Disabler	1.5 mA	36.5 mA
(—48 volts nominal)		

2. UNIT DESCRIPTION

2.01 The solid-state disabler measures approximately 1-5/8 inches high, 3 inches wide and 1/2 inch deep. The unit is designed to slip over the 501-type connector on the E6 gain unit and does not require additional bay space or wiring. Fig. 2 shows the disabler mounted on the gain unit.

2.02 The unit interrupts the -48 volt power supply ground to the gain unit of the E6 repeater during idle circuit conditions. The circuitry can be divided into two functional parts:

- Line current detection
- Delay circuitry and output switch.

2.03 Line current detection is accomplished using optical isolators. Currents greater than 3.5 mA in either the tip or ring conductors cause the optical isolators to switch on. This threshold assures operation of the disabler in both loop- and ground-start circuits.

2.04 The delay circuitry eliminates the possibility of the E6 being enabled by noise spikes. The optical isolators must remain switched on for 375 milliseconds before the output switch energizes the repeater. The delay circuitry is reset each time the line current goes to zero, thereby keeping the repeater disabled during dial pulse sequences or continuous noise. A schematic diagram of the solid-state disabler is shown in Fig. 3.

3. INSTALLATION AND TESTS

3.01 The lineup procedure for repeaters with the solid-state disabler is the same as outlined in Section 332-206-200 for repeaters without disablers. The solid-state disabler must be removed for repeater lineup. The disabler is placed on the gain unit connector after removal from the 54B test stand and prior to insertion of the E6 into the bay.

> ***Note:*** It is not possible to operate an E6 repeater equipped with a solid-state disabler in the 54B test stand. The disabler must be removed for all repeater tests.

3.02 When the solid-state disabler is used in E6 bays equipped with test jacks, the following features apply.

(1) The A-side T and R leads may be monitored on the sleeve connections.

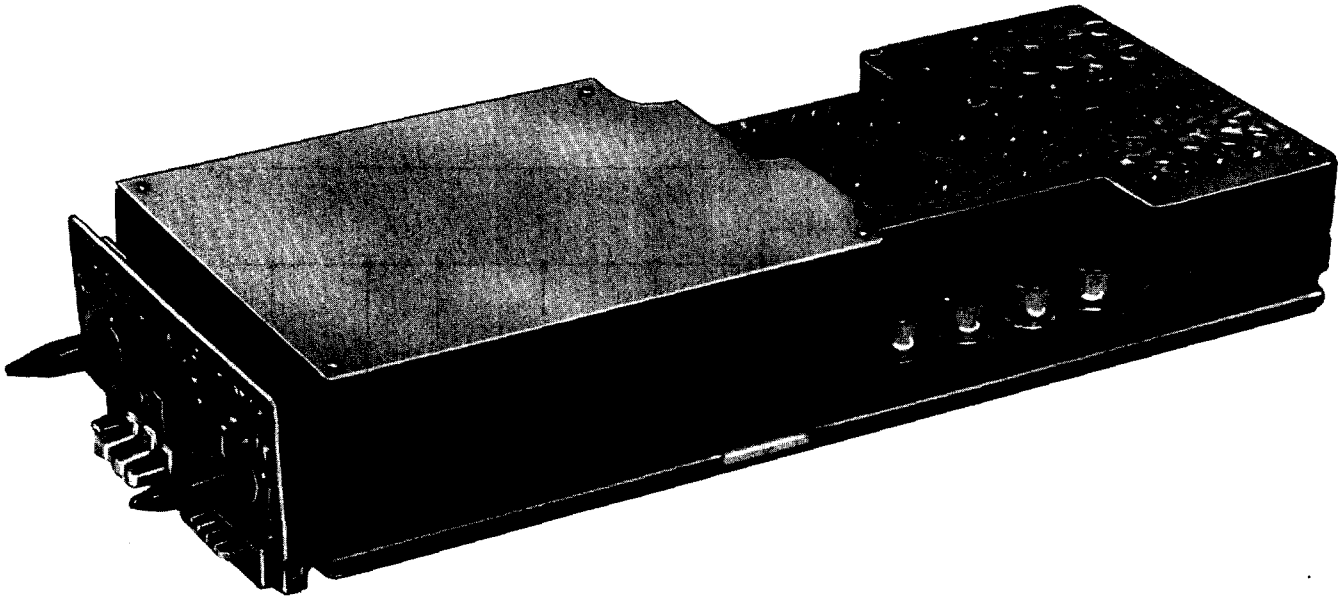

Fig. 2—831-Type Gain Unit Equipped With Solid-State Disabler

(2) The T and R leads may be bridged around the repeater by inserting dummy plugs into both test jacks. The repeater will remain disabled with the LBOs bridged on the line.

(3) The 54A transmission measuring set cannot be used in the test jacks to measure gain on disabler-equipped repeaters because loop current to enable the repeater is not present.

(4) Loss of power to the E6 will result in a cut-through circuit with high loss. The disabler will add slightly to the overall loss.

4. SIGNALING RESTRICTIONS

4.01 The solid-state disabler decreases the supervisory range of circuits by an equivalent battery voltage reduction of 5.8 volts. This means the ring trip range for a circuit with 23 mA of loop current is reduced by 252 ohms.

4.02 The solid-state disabler will increase dial pulse distortion by approximately three percent as compared to circuits without disablers.

4.03 The solid-state disabler cannot be used on repeaters equipped with range extenders. The range extender will perform the disabling function. Labels are shipped with the disabler for application to the front of the repeater housing to indicate those units equipped with solid-state disablers.

5. REFERENCES

5.01 The following references contain additional information regarding the E6 repeater.

SECTION	TITLE
332-206-100	E6 Repeater Description
332-206-200	E6 Repeater Alignment Procedure
332-206-500	E6 Repeater Tests and Adjustments
DRAWING	**TITLE**
SD-97023-01	E6 and E7 Telephone Repeater Battery Supply and Connecting Circuits

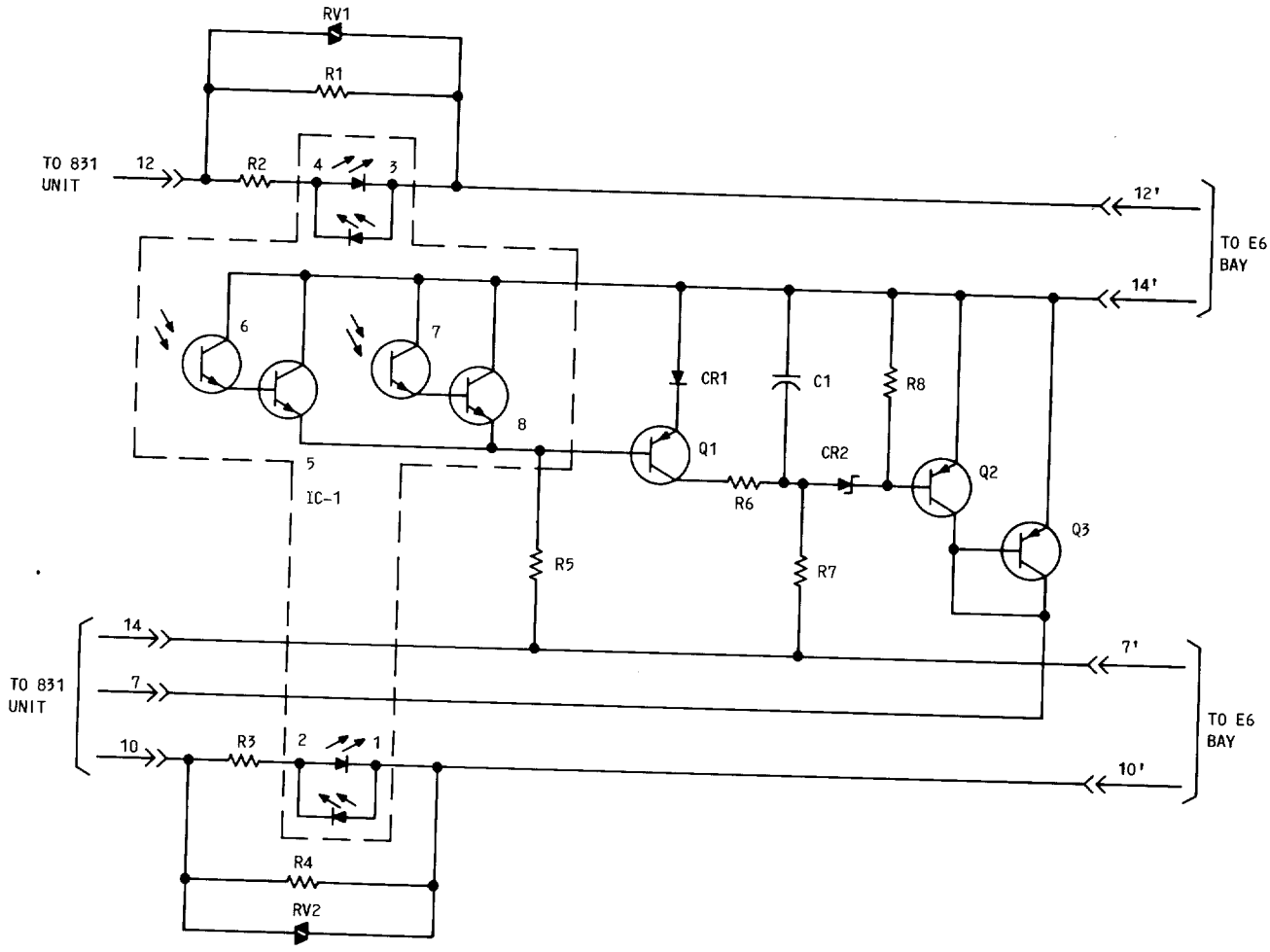

Fig. 3—Schematic Diagram of E6 Solid-State Disabler