

MAY 24 1974 756

CIRCUIT DESCRIPTION

CD-5E037-01  
ISSUE 1  
APPENDIX 2D  
DWG ISSUE 3D

PBX SYSTEMS  
VOLTAGE REDUCTION DETECTOR  
AT MIDPOINT OF VOLTAGE DIVIDER  
NETWORK

CHANGES

D. Description of Changes

D.1 The rating of this circuit is changed from AT&TCo  
Standard to Mfr Disc.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 3224-WVS-RVL

3

PBX SYSTEMS  
VOLTAGE REDUCTION DETECTOR  
AT MIDPOINT OF VOLTAGE DIVIDER NETWORKCHANGESD. Description of Changes

D.1 This circuit is reissued on a No-Record basis per agreement with the Western Electric Standards Organization to change the resistance values of the biasing resistor R(1-5)1 and R(1-5)2 from 15K and 1K ohms to 8.2K and 680 ohms respectively to improve the performance of the circuit.

D.2 On sheet 1, the OFF and ON conditions in information note 302 are revised to reflect the change in the biasing resistors.

D.3 On sheet 3, the values of resistors R(1-5)1 and R(1-5)2 are changed in CFS1 to 8.2K and 680 ohms respectively.

F. Changes in CD Sections

F.1 In SECTION II - DETAILED DESCRIPTION, change the second sentence of paragraph 1.01 to read as follows:

.....When voltage is applied to the circuit, the voltage divider, consisting of

biasing resistors R-1 and R-2, establishes a negative potential to ground at the base of Q-.

F.2 In SECTION II - DETAILED DESCRIPTION, change paragraph 1.03 to read as follows:

1.03 If a voltage divider, consisting of resistors R2 and R3, is applied through external switching to the emitter of Q- such that R2 is equal to or less than twelve times R3, the base of Q- will still remain more positive with respect to the emitter and the transistor will remain off.

F.3 In SECTION II - DETAILED DESCRIPTION, change paragraph 1.04 to read as follows:

1.04 If a third resistor R4 is applied in parallel with R3 to the emitter of Q- such that the combined total resistance of R3 and R4 lowers the emitter potential to 0.8 volts or less, the base of Q- will be more negative with respect to the emitter and the transistor will be driven into saturation.

BELL TELEPHONE LABORATORIES, INCORPORATED

(WECO 2120HW-JJM-WHK)  
DEPT 5337-LAH

PEX SYSTEMS  
VOLTAGE REDUCTION DETECTOR  
AT MIDPOINT OF VOLTAGE DIVIDER NETWORKSECTION I - GENERAL DESCRIPTION1. PURPOSE OF CIRCUIT

1.01 To provide semi-conductor circuit packs which when connected to external voltage divider networks constitute a bridge network to detect and give an indication of a decrease in the midpoint voltage of the voltage divider.

2. TYPES OF CIRCUIT PACKSA. CPS 1

2.01 This circuit pack consists of five transistor detectors mounted on an omplas assembly. Any or all of the five detector circuits may be used to drive an external output relay after detecting a decrease in the midpoint voltage of a voltage divider network.

2.02 Each detector circuit consists of one transistor, two resistors, and one diode. The resistors provide the biasing for the transistor and constitute one leg of the bridge network. The emitter of the transistor is connected through a diode and by external switching to a voltage divider network which constitutes the other leg of the bridge. The emitter-base junction detects an unbalanced condition in the bridge when the midpoint voltage of the voltage divider decreases. This unbalance drives the transistor into conduction. The conduction of the collector-emitter junction drives the external relay.

SECTION II - DETAILED DESCRIPTION1. CIRCUIT DESCRIPTIONA. CPS 1

1.01 The following description assumes that the circuit is energized with -48 volts. When voltage is applied to the circuit, the voltage divider, consisting of resistors R1 and R2, establishes a potential to ground of -3 volts at the base of Q-.

1.02 If the emitter of Q- is open, the base of Q- is more positive with respect to the emitter and the transistor is off (not conducting).

1.03 If a voltage divider is applied through external switching to the emitter of Q- such that R2 is equal to or less than fifteen times R3, the base of Q- will still remain more positive with respect to the emitter and the transistor will remain off.

1.04 If a third resistor R4 is applied in parallel with R3 to the emitter of Q- such that the combined total resistance of R3 and R4 lowers the emitter potential to 2.8 volts or less, the base of Q- will be more negative with respect to the emitter and the transistor will be driven into saturation.

1.05 With a circuit connection as shown in CKT 1, FS1, relay R will operate when the direct ground (R4=0) is applied through Q-.

2. CALCULATIONS OF EXTERNAL RESISTANCE NECESSARY FOR DESIRED OPERATIONA. CPS 1

2.01 The values of external resistance may be determined from information note 302 for use with a -48 volt battery supply.

SECTION III - REFERENCE DATA1. WORKING LIMITS

1.01 The working limits for CP1 are as detailed in information note 302.

2. FUNCTIONAL DESIGNATIONS

2.01 None

3. FUNCTIONS

3.01 To detect a decrease in the midpoint voltage of a voltage divider network.

3.02 To operate an external output relay as an indication of a decrease in the midpoint voltage.

4. CONNECTING CIRCUITS

4.01 When this circuit is listed on a key-sheet, the information thereon is to be followed.

- (a) 756A PBX Line, Link, and Marker Circuit - SD-65741-01.

5. MANUFACTURING TESTING REQUIREMENTS

5.01 The voltage reduction detector circuits shall be capable of performing all the service functions specified in this circuit description and information notes 302 and 303.

6. TAKING EQUIPMENT OUT OF SERVICE

6.01 The information for the removal of the detector circuits from service shall be provided in the various connecting circuits in which the detector circuits are an integral part.

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