CD-3H150-01
ISSUE 1
APPENDIX 1D
DWG ISSUE 2D
DISTN CODE 7T11

# 3 ELECTRONIC SWITCHING SYSTEMS

NO. 3

DISTRIBUTE POINT
CIRCUIT

CHANGES

D. Description of Changes

D.1 Made the connectors and wiring for the last eight peripheral decoder groups optional.

D.2 Changed the fuse rating from 0.5 A to 0.180 A.

BELL TELEPHONE LABORATORIES, INCORPORATED

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# 2

ELECTRONIC SWITCHING SYSTEMS

NO. 3

DISTRIBUTE POINT
CIRCUIT

## SECTION I - GENERAL DESCRIPTION

### 1. PURPOSE OF CIRCUIT

1.01 This circuit controls the state relays located primarily on trunks, junctors, and service circuits. These relays are operated and released according to data received from the peripheral pulse distributor (PPD).

### 2. GENERAL DESCRIPTION OF OPERATION

ORGANIZATION

2.01 This circuit is a collection of functionally independent peripheral decoders (PDs). Each PD receives data from the PPD over a dedicated pair of wires and controls the state of 12 relays.

2.02 Two PDs are mounted together on a circuit pack with a common power supply and are referred to as a peripheral decoder group (PDG). A maximum of 24 PDGs can be provided.

2.03 The 12 relays controlled by each PD are organized as four triplets. The three relays for each triplet are typically located in a single circuit.

OPERATION

2.04 A PD operates under control of 7-bit messages received serially over its dedicated pair of wires from the PPD. Each message contains a coded triplet identity and three data bits defining the desired state of the relays in that triplet.

2.05 When a complete message is received, the triplet identity is decoded and the three data bits are loaded into the selected group of three internal memory cells that control the relay drivers.

## SECTION II - DETAILED DESCRIPTION

### 1. OPERATION OF PDs 00 THROUGH 47

1.01 Each PD is a functionally independent unit receiving its input from the PPD on leads DP and DN and driving relays from its outputs on leads PDXX (01-12), where XX represents the PD number (00 through 47). The following description applies to any one of the PDs.

INPUT MESSAGE

1.02 A PD receives a 7-bit message from the PPD on its input leads. Each bit is a positive or negative pulse with a nominal width of 0.5 us. A positive pulse (DPXX positive with respect to DNXX) represents a binary 1 and a negative pulse represents a binary 0. A bit is received approximately every 10 us.

1.03 A complete message consists of seven bits that are shifted serially into a register in the PD. The first and last bits (START and STOP) are always sent as 1 and their presence in the first and last bits of the shift register indicates the receipt of a complete message. The second and third bits identify one of four triplets, and the next three bits are the data to be loaded into the memory cells for that triplet, as shown in Table A.

TABLE A

DATA TO BE LOADED
INTO MEMORY CELLS

| STOP | | | | | START | |
|---|---|---|---|---|---|---|
| 1 | X | X | X | X | X | 1 |
| | C | B | A | (0 | 0 | = Triplet 0) |
| | C | B | A | (0 | 1 | = Triplet 1) |
| | C | B | A | (1 | 0 | = Triplet 2) |
| | C | B | A | (1 | 1 | = Triplet 3) |

1.04 When a 1 is detected in the START and STOP bits of the shift register, the three data bits are loaded into the A, B, and C cells of the identified triplet. The shift register is then cleared to all zeros.

OUTPUT DRIVERS

1.05 Each memory cell which contains a 1 causes its associated output driver to supply a ground for the operation of a relay from a -48 volt battery. Drivers whose memory cells contain a 0 present essentially an open circuit on the output lead.

POWER SUPPLY

1.06 Each PDG contains a power converter that is common to the two PDs in that PDG. It converts the -48 volt input to -7 volts required for internal operation.

## SECTION III - REFERENCE DATA

### 1. WORKING LIMITS

1.01 The -48 volt input supply must be between -42.75 volts and -52.5 volts.

1.02 Each output lead can supply a peak current of 60 mA (45 mA average) to a load operating from a maximum of -52.5 volts.

1.03 Inductive loads should be provided with transient suppression in the form of a diode across the load.

### 2. FUNCTIONAL DESIGNATIONS

2.01 None.

### 3. FUNCTIONS

3.01 Provides means for controlling relays on the basis of serial information received from the PPD.

### 4. CONNECTING CIRCUITS

4.01 When this circuit is listed on a keysheet, the connecting information thereon should be followed.

(a) Control Frame Circuit - SD-3H902-01.

(b) Miscellaneous Frame Circuit - SD-3H903-01.

### 5. MANUFACTURING TESTING REQUIREMENTS

5.01 Since this unit consists of functionally independent circuit packs, there are no testing requirements beyond unit wire verification.

### 6. TAKING EQUIPMENT OUT OF SERVICE

6.01 Each PDG can be taken out of service by removing from service those trunks, junctors, and service circuits that it controls.

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