CIRCUIT DESCRIPTION

CD-3H130-01
ISSUE 1
APPENDIX 1D
DWG ISSUE 2D
DISTN CODE 7T11

4

ELECTRONIC SWITCHING SYSTEMS

NO. 3

15C REMREED GRID
CIRCUIT

CHANGES

B. Changes in Apparatus

B.1 Superseded	Superseded By
App Fig. 1	App Fig. 1 (Option Z) and App Fig. 2 (Option Y)

D. Description of Changes

D.1 The 296C-1C code switches used in the 15C remreed grid have been redesignated 296D-1C and redesigned to eliminate the external straps previously required to complete the PNPN connections. The redesign eliminates all front terminals associated with the control circuitry on each switch.

F. Changes in CD Section I

F.1 In 2.01, change the code designation from 296C-1C to 296D-1C.

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DEPT 5341-RLB-LEG

ELECTRONIC SWITCHING SYSTEMS

NO. 3

15C REMREED GRID CIRCUIT

SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.01 The 15C remreed network grid is the basic apparatus unit used to form stage III of the No. 3 ESS switching network. A multiplicity of 15C grids is mounted on the No. 3 ESS control frame (SD-3H902-01) and provides the means of establishing 2-wire metallic paths between wire B links and circuit B links.

2. GENERAL DESCRIPTION OF OPERATION

2.01 A 15C grid contains four 296C-1C type remreed switch packages. The 1C-type switches are arranged in 8 x 8 matrices (ie, 8 x 8 means eight inputs and eight outputs per switch). There are two such matrices per switch pack or eight per grid.

2.02 The 15C grid is wired so that eight wire B links and eight circuit B links from each concentrator group are terminated at the eight switch matrices in the grid.

2.03 Wire B links terminate on the vertical or column side of stage III switches and the circuit (junctor) B links terminate on the horizontal or row side. With this arrangement, any connection made through the network will be via junctor circuits.

2.04 Control paths having similar levels on the horizontal sides of all switches are multipled. Similar levels on the vertical sides of all switches are also multipled.

2.05 Control connections to the individual switches within a grid are made via a terminal field on the rear of the grid. Tip-ring terminals on the wire side of a switch are accessed via the same rear terminal field while tip-ring terminals on the circuit side of a switch are accessed from either the rear terminal field or the front terminals on each 1C-type switch.

2.06 To set up a 2-wire path through a 15C grid, a stage III switch and an input and output level must be selected. The switch selected is determined by the second-stage output switch and level selection via wire and circuit B links. The concentrator groups selected will determine the input and output levels selected on the third-stage switch. A high-current pulse is applied to the control path in order to close the remreed crosspoints in the talking path. Diodes, PNPNs, and node resistors are used to make the selections. The 1C-type switch packages contain the switch selection PNPNs, node resistors, and level and gate selection diodes. The remaining control circuitry is located on pluggable circuit packs separate from the grids.

SECTION II - DETAILED DESCRIPTION

1. PULSE PATH (FS 1)

1.01 The selection of a particular path through the 15C grid is a function of the selection of different PNPNs, both within the 15C grid and in the pulse path selectors located in other parts of the network.

1.02 For example, if the lowest level on the vertical side of switch S3S0 is selected and the lowest level on the horizontal side of the same switch is chosen; the corresponding current pulse from the stage III access circuitry would enter on lead POL0 to terminal R501 and S3S0, proceed through the vertical coils of eight crosspoints, a diode, a PNPN, and exit through another diode and the horizontal coils of eight crosspoints to terminal R211 of the switch pack to path PIL0. From this point, the pulse returns to the pulser via the third-stage access circuit and peripheral control circuit.

1.03 The selection of a particular switch within a grid is made by selection

of the PNPN within that switch. The selection of a particular PNPN is determined by the coincidence of a positive current source applied to a gate select lead of the PNPN by decoder/drivers and a near ground potential applied to the 430-ohm node resistor from the node selector. Two diodes are provided with each gate select lead of a PNPN to provide access from either controller 0 or 1. These diodes also protect the controllers from the high voltage pulses applied to the control paths.

1.04 It is possible for a special release current pulse to enter the grid through the PRL lead. To release the crosspoints previously operated (see 1.02), the release pulse would enter the grid on path PRL, proceed through the PNPN in S3S0, through a diode through the horizontal coils of eight remreed crosspoints, and exit on path PIL0. To close a crosspoint, there must be coincident current in the horizontal and vertical control windings. Current passing through only one winding will release that crosspoint; the current pulse only passes through the horizontal coils of the crosspoints, thereby releasing them.

2. TALKING PATH (FS 2)

2.01 The talking path schematics show symbolically the internal tip-ring wiring of the remreed switches. This symbolic representation indicates between which terminals a connection may be established.

2.02 Tip-ring terminals on the wire side of the 1C-type switches are given dual-access points on the rear terminal strip. Tip-ring terminals on the circuit side of the switches have appearances on the front and rear terminals with the rear-access points being brought to the rear terminal strip via the backplane wiring. The dual appearance of both the wire and circuit terminals is necessary in order to provide the capability of wiring the switches into 16 by 16 matrices. This configuration is necessary when an office requires eight or more network frames and a second control frame.

2.03 Circuit B links from the junctor and junctor control circuits are the inputs to the third-stage tip and ring paths and wire B links to the second-stage switches are the outputs.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

1.01 None.

2. FUNCTIONAL DESIGNATIONS

Designation	Meaning
aNS3Sb	Switch select gate lead, controller a (0 or 1), switch b
CRab	Talking path, circuit side, ring lead switch a, level b
CTab	Talking path, circuit side, tip lead switch a, level b
NN3	Node resistor ground lead
PILa	Pulse path, input level a
POLa	Pulse path, output level a
PRL	Release order pulse path
WRab	Talking path, wire side, ring lead switch a, level b
WTab	Talking path, wire side, tip lead switch a, level b

3. FUNCTIONS

3.01 This circuit is capable of performing all functions described in Section II of this circuit description.

4. CONNECTING CIRCUITS

4.01 When this circuit is listed on a keysheet, the connecting information is to be followed:

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

5. MANUFACTURING TESTING REQUIREMENTS

Intermediate Requirements

5.01 None.

End Requirements

5.02 This circuit should be tested to verify that it is wired in accordance with the schematic and wiring drawings and that the circuit is capable of performing all functions stated in this circuit description.

5.03 Additional manufacturing testing requirements are specified in X-18273.

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