

CIRCUIT DESCRIPTION

CD-1A110-01  
ISSUE 5B  
APPENDIX 4D  
DWG ISSUE 10D  
DISTN CODE IT99

ELECTRONIC SWITCHING SYSTEMS  
COMMON  
JUNCTOR  
CIRCUIT

CHANGES

B. Changes in Apparatus

B.1 Superseded

Superseded By

L1 (0,1) INDR, 1633A,  
App Fig. 1

L1 (0,1) INDR, 1633F,  
App Fig. 1

L2 (0,1) INDR, 1633E,  
App Fig. 1

L2 (0,1) INDR, 1633K  
App Fig. 1

D. Description of Changes

- D.1 No functional changes have been made, however, the circuit has been adapted to connectorized switchboard cabling of the T, R and T1, R1 leads.
- D.2 CAD 2 option T has been added for connectorization and is rated "special." CAD 1, T, R and T1, R1 leads have been designated as V option.
- D.3 Changed the code of inductors L1 (0,1) and L2 (0,1) from 1633A and 1633E to 1633E and 1633K, respectively, on a class D, no record basis to agree with manufactured product.

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DEPT. 5327-ZAK-JCM

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CIRCUIT DESCRIPTION

CD-1A110-01  
ISSUE 5B  
APPENDIX 3B  
DWG ISSUE 9B

ELECTRONIC SWITCHING SYSTEMS

NO. 1

ARRANGED WITH 2-WIRE FEATURES

JUNCTOR CIRCUIT

CHANGES

D. Description of Changes

- D.1 Removed CAD 2 and added the apparatus arrangement for the 278-type terminal strip to Fig. 1.
- D.2 Changed Circuit Note 104 and Equipment Note 204 and added Equipment 205.

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CIRCUIT DESCRIPTION

CD-1A110-01  
ISSUE 5B  
APPENDIX 2D  
DWG ISSUE 8D

ELECTRONIC SWITCHING SYSTEMS

NO. 1

ARRANGED WITH 2-WIRE FEATURES

JUNCTOR CIRCUIT

CHANGES

D. Description of Changes

D.1 Added information in FS 1 and CAD 1 to provide for connection to service link circuit.

D.2 Added a new CAD 3.

F. Changes in CD Section III

F.1 In part 4, add:

(d) Service Link Circuit - SD-1A281-01.

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ELECTRONIC SWITCHING SYSTEMS  
NO. 1  
ARRANGED WITH 2-WIRE FEATURES  
JUNCTOR CIRCUIT

CHANGES

D. Description of Changes

- D.1 Terminal designations A, B, C, and D were removed from capacitor terminals on capacitors R(C,1) and T(C,1) to make drawings agree with the manufactured product.
- D.2 The title was changed to conform to present engineering standards.

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ELECTRONIC SWITCHING SYSTEMS  
NO. 1  
JUNCTOR CIRCUITSECTION I - GENERAL DESCRIPTION1. PURPOSE OF CIRCUIT

1.01 The junctor circuit is a connecting element between line-link frames, controlled by a signal distributor and monitored by a scanner.

2. GENERAL DESCRIPTION OF OPERATION

2.01 Talking paths between network frames are established through junctors. Two line circuits of an intraoffice call are connected to the opposite sides of the same junctor circuit through paths set up in the line-link frames by orders from the central control. The junctor circuit provides the final closure between the line circuits when relays in the junctor are operated from an associated signal distributor which responds to orders from central control.

2.02 The intraoffice junctor circuit is a 4-terminal network which couples the tip and ring wires of one line circuit to the tip and ring wires of another line circuit. Within the junctor circuit is a transmission circuit which provides capacitive coupling between the two line circuits and supplies talking battery individually to each line. The junctor circuit is designed to operate into 900-ohm impedances.

2.03 Each junctor includes two cut-through relays which are operated from an associated signal distributor. The final closure of each line circuit is controlled by these relays. Supervision of each line circuit is provided by feeding the talking battery to each line through individual ferrod sensors located in an associated scanner.

2.04 The junctor circuits are packaged two to a plug-in package. The connections of a particular junctor circuit to the desired terminals of a line-link frame are made through a junctor grouping frame.

SECTION II - DETAILED DESCRIPTION1. JUNCTOR CIRCUIT

1.01 The junctor circuit is shown on SD-1A110-01-2. Inductors L1 and L2 are separate battery feed coils for supplying talking battery to each line. The total dc resistance in each battery feed path of the junctor circuit, including the C-type ferrod sensors in each associated scanner,

is approximately 388 ohms. The ac impedance that each inductor presents across the line is approximately 10,000 ohms. Coupling between the two line circuits is made by means of capacitors R and T. Inductor L3 (1633E) is in series with the coupling capacitors and serves to limit longitudinal lightning-surge currents to values safely below the current rating of the ferreed switches. The windings of inductor L3 are poled to oppose longitudinal currents but are noninductive to metallic currents. Varistor RV, in series with a 186A network, is a voltage-sensitive shunt load which limits the inductive back-voltage produced across inductors L1 or L2, when either the A or B cut-through contacts are released while the far end of the talking path is unterminated.

1.02 Relays A and B are AM2-type magnetic-latching wire-spring relays which are operated from two points in the associated signal distributor. Each relay has a wired-in resistance in series with one of its contact combinations. The operation or release of the relay is checked in the signal distributor by detecting a current step as these contacts open or close. The magnetic-latching relay is controlled by polar signals; -48 volts operates the relay and +24 volts releases the relay. The contacts on relays A and B are used to effect the final closure and initial opening of the tip and ring path in order to avoid making or breaking current by the ferreed switches. The operation or release of relays A and B requires a maximum time of 20 msec after an order has been sent to the associated signal distributor.

1.03 There is no battery feed to the junctor circuit since all battery is fed from the associated scanner and signal distributor. The talking battery, fed from the scanner, is fused with one fuse per two junctors.

1.04 C-type ferrod sensors with a nonoperate current of 9 ma and an operate current of 18 ma are used in the associated scanner. Consequently, a junctor can supervise a maximum external loop of 1940 ohms at minimum office battery voltage. Similarly, the specified minimum leakage resistance of 10K at maximum battery voltage will not indicate a false off-hook condition.

1.05 The junctor circuits are mounted on the junctor frame and are packaged two to a plug-in package. The junctor frame also incorporates the Scanner and Signal Distributor Circuits required to control the junctor circuits.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

- 1.01 Maximum external circuit-loop resistance is 1940 ohms.
- 1.02 Minimum tip to ring open-circuit resistance is 10,000 ohms. The open-circuit resistance specified pertains to the junctor circuit only. No. 1 Electronic Switching System (ESS) office leakage is determined by the nonoperate current characteristic of the line ferrod.
- 1.03 Temperature range is 32° through 115°F.

2. FUNCTIONAL DESIGNATIONS

2.01 Relays

| <u>Designation</u> | <u>Meaning</u>              |
|--------------------|-----------------------------|
| A                  | AM2 Magnetic Latching Relay |
| A                  | AM2 Magnetic Latching Relay |

3. FUNCTIONS

- 3.01 Provides final closure and initial opening of the tip and ring path.
- 3.02 Provides transmission coupling from one line circuit to another line circuit.
- 3.03 Supplies talking battery to each line individually.
- 3.04 Limits lightning-surge currents in the transmission path.

4. CONNECTING CIRCUITS

- 4.01 When this circuit is listed on a keysheet, the information thereon is to be followed.
  - (a) Junctor Grouping Frame Circuit - SD-1A194-01.
  - (b) Junctor Frame Signal Distributor Circuit - SD-1A113-01 or Signal Distributor Circuit - SD-1A216-01.
  - (c) Junctor Frame Scanner Circuit - SD-1A114-01 or SD-1A214-01.

5. MANUFACTURING TESTING REQUIREMENTS

- 5.01 The manufacturing testing requirements of AM2-type relays shall conform to the circuit requirements as stated on SD-1A110-01-4.
- 5.02 Transmission test requirements shall conform to the requirements stated on SD-1A110-01-1.

6. TAKING EQUIPMENT OUT OF SERVICE

- 6.01 Before removing a junctor circuit from its plug-in position, its fuse should be removed to prevent the accidental breaking and making or shorting of the office battery.

SECTION IV - REASONS FOR REISSUE

D. Description of Changes

- D.1 Equipment Note 204 and CAD 2 information are added to provide an improved method for mounting pigtail apparatus.

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