

CIRCUIT DESCRIPTION

CD-31771-01
Issue 6-D
Dwg. Issue 14-D

STEP-BY-STEP SYSTEMS NO. 1, 350A, 355A, 360A OR 35-E-97 INTERCEPTING TRUNK CIRCUIT FROM TRUNK FINDER, CONNECTOR BANK OR INTERCEPTING TRUNK, TO TRUNK TO OPERATOR OFFICE ARRANGED TO TRIP RINGING ONLY DURING RINGING INTERVAL

CHANGES

A. CHANGED AND ADDED FUNCTIONS

A.1 Provision is made to control the timing for automatic disconnect of the switch train and connector on calling party holds and to disable the timing circuit when this circuit is busy.

B. CHANGES IN APPARATUS

B.1 Added

1 - 420B(A) varistor - Fig. 5,
ZD option

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Options ZD and ZE are shown in Fig. 5 for use when connectors are arranged for automatic disconnect on calling party holds.

D.2 The title is changed to show the use of this circuit in 35-E-97 offices:

D.3 The circuit is rated A&M Only for 360A and 35-E-97 offices.

D.4 Circuit Note 109 is added.

D.5 The use of Fig. 5 and Options ZD, and ZE is added in Note 102.

D.6 Reference to Fig. 5 and Options ZD, and ZE is added to Note 103 and Options Used table.

D.7 CAD Figs. 65 and 66 and Equipment Note 202 are added.

1. PURPOSE OF CIRCUIT

1.1 This circuit is used to trip machine ringing on intercepted calls and then to route the call to a trunk to an operator.

2. WORKING LIMITS

2.1 None.

3. FUNCTIONS

3.1 To trip machine ringing when ringing current is received by this circuit.

3.2 To apply a bridge on the tip and ring towards the trunk to the operator as an indication of an incoming call.

3.3 To select an idle trunk to the distant office where Fig. 2 is used.

3.4 To provide a short spurt of intercept tone to the trunk to the distant office.

3.5 To control the timing circuit for automatic disconnect of the switch train and connector on calling party holds and to disable the timing circuit when this circuit is busy.

4. CONNECTING CIRCUITS

When this circuit is shown on a Key-sheet, the connecting information thereon shall be followed.

4.1 Connector Circuit - SD-31737-01*

4.2 Trunk Finder Circuit - SD-31530-01*

4.3 Intercepting Trunk Circuit - SD-32163-01*

4.4 Miscellaneous Alarm Circuit - SD-31974-01*

4.5 Ringing Interrupter Circuit

4.6 Trunk Circuit to Operator Office - SD-31747-01*

4.7 Trunk Circuit to Zero Operator - SD-31752-01*

4.8 Power Ringing Circuit - SD-81225-01*

4.9 Switch Trouble Alm. Ckt. or Misc. Alm. Ckt. - SD-32045-01 (Connector Shelf)

*Typical

DESCRIPTION OF OPERATION

5. SEIZURE

5.1 Figure A and "N" apparatus

When ringing current is received the (P) relay operates connecting the (R) relay

in parallel and the (R) relay operates on the ringing current in turn operating the (C) relay. The combination of the (P) and (RG) condensers and (P) and (R) relays is to prevent the operation of the (C) relay on transient conditions. The (R) resistance removes any residual charge on the (P) and (RG) condensers minimizing the transient voltages when seized for another call.

5.2 Figure A and "J" Wiring

When ringing current is received the (R) relay operates operating the (C) relay. The (R) resistance removes any residual charge on the (RG) condenser minimizing the transient voltages when seized for another call.

5.3 Figure B

When ringing current is received on the opposite side of line from that to which the intercepted station was connected the (P) relay operates short-circuiting the (R) relay so that it does not operate in parallel with the tripping relay if the call is answered during the ringing interval thus bringing in an operator. When ringing current is received on the same side of the line the (R) relay operates operating the (F) relay and in turn the (C) relay.

5.4 (C) Relay Operated

The (C) relay operated, locks to the ground on the sleeve lead, connects the circuit for tripping ringing current during the ringing interval through the (B) and (G) vacuum tubes (or the (B) vacuum tube with "H" wiring and in series with (A) thermistor with "ZA" wiring or resistance (E) with "ZB" wiring or strap with "ZC" wiring) connects the winding of the (H) relay across the tip and ring towards the trunk circuit to the distant office, closes through the "A" lead to the trunk circuit and, where Fig. 2 is used, supplies ground to cause it to search for an idle trunk to the distant operator and supplies audible ringing to the ring of the trunk. The "S" wiring is furnished when this trunk is connected directly to a connector terminal not equipped with a line circuit in order to cause the connector to cut through.

6. TRUNK SWITCH CIRCUIT, (FIG. 2)

Ground on the "B" lead from the (C) relay of Fig. 1 operates the (TN) relay and the (S) relay in Fig. 2. The (S) relay causes the (A) selector to advance under self-interruption until it finds a non-grounded sleeve terminal indicating an idle trunk to a distant office. As long as a grounded sleeve is encountered by the No. 1 brush the (D) relay of Fig. 2 is short-circuited. When the non-grounded terminal is reached, the (D) relay operates opening the circuit for operating the stepping

magnet of the (A) selector and closing ground from the (C) relay of Fig. 1 to the sleeve lead making the circuit busy.

7. SEIZURE OF TRUNK TO DISTANT OFFICE

When the (C) relay of Fig. 1 operates with Fig. 2 omitted or where Fig. 2 is used when the (D) relay of Fig. 2 operates the (H) relay is connected across the tip and ring operating the line relay of the associated trunk to the distant operator in the same manner that it is operated when seized by a calling subscriber. This causes a line seizure signal to be given to the operator at the distant switchboard. The (H) relay operates under this condition and if Fig. 3 is not provided, removes the audible ringing tone and the ground which was used to insure that the ringing machine was operating.

8. INTERCEPT TONE TO OPERATOR (FIGS. 3 AND 4)

When the "B" lead was grounded by the operation of the (C) relay of Fig. 1, the (TN) relay was operated in parallel with the (S) relay. The (TN) relay starts the ringing machine and partially closes a circuit for connecting tone to the ring lead.

When the operator answers, a ground is placed on the "B" lead by the operator-office trunk to operate the (OA) relay. The (OA) relay connects ringing current to the (D) tube which starts generating a tone which is applied to the ring lead through the (B) condenser. The (OA) relay also releases the (TN) relay which disconnects the tone from the trunk after releasing. The (TN) relay is slow releasing in order to keep the tone connected to the trunk long enough for the operator to hear it. The operator can obtain a second spurt of tone by replugging.

The (D) tube generates tone by conducting current only on the peaks of the ringing current.

9. INTERCEPTING TRUNK BUSY

Fig. 2 is used in all cases where the intercepting traffic is routed over the same group of trunks used by subscribers when they dial the operator. When a separate group of trunks is used, Fig. 1 is connected directly to the trunk to the operator office or distant operator. If these trunks are connected to intercepting levels of local selectors the trunk may be busy from the local selector multiple in which case the (B) relay operates. If this circuit is preceded by a trunk finder the (B) relay operated, opens the circuit for operating the (C) relay and connects ground to the sleeve towards the trunk finder circuit so that intercepted calls will be routed to other trunk finders and trunks.

If this circuit is connected directly to a connector terminal or a trunk circuit which in turn is connected directly to a connector terminal, the (B) relay operated, opens the circuit for operating the (C) relay but does not place a ground on the sleeve. In this case if a call is routed to this trunk machine ringing will continue as long as the trunk is busy from the local selector multiple and may be considered by a subscriber as a "don't answer" indication. If the calling subscriber whose call was routed thru a selector multiple of this trunk disconnects before the intercepted call thru the connector terminal is abandoned, then the connector terminal call proceeds as described above. When an intercepted call thru a connector terminal is received and progresses to the point where the (C) relay operates first, when ground is connected to the sleeve lead of the local selector multiple thru the operation of the relays of the trunk circuit by connecting the (H) relay across the tip and ring.

If Fig. 3 is used, intercepted local selector levels should not be connected directly to the master-office trunks because no tone would be sent to the operator on calls intercepted from selector levels.

10. AUTOMATIC DISCONNECT OF CONNECTORS ON CALLING PARTY HOLDS (FIG. 5 - ZD OR ZE OPTION)

10.1 When connectors are arranged to automatically disconnect on calling party holds after a predetermined time and the connector group is furnished with intercept trunks the timing for disconnect is under control of these trunks.

10.2 If the intercept trunks are idle when the calling party fails to replace his receiver on hook after the called party disconnects, a timing circuit is started from ground in the Switch Trouble Alarm Circuit or Miscellaneous Alarm Circuit.

10.3 If the intercept trunks are busy when the calling party fails to replace his receiver on hook after the called party disconnects, the timing circuit is disabled. Ground from the S lead over leads TS & TS1 through the A varistor with ZD option or directly to the Switch Trouble Alarm Circuit or Miscellaneous Alarm Circuit with ZE option operates a relay to open the timing circuit.

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