

6

STEP-BY-STEP SYSTEMS
NO.1, 350A, 355A OR 35-E-97
MISCELLANEOUS CIRCUIT
FOR ANI - TYPE B AND TYPE C
TRUNK FRAMES

CHANGES

B. Changes in Apparatus

B.1 Added

KEY

Designation Code

AR 547B

D. Description of Changes

D.1 FS25 is added and provides the alarm release feature for the Pulse Generator Failure Detector (part of pulse generator circuit).

D.2 App. Fig. 29 provides the apparatus (a non-locking key) for the alarm release feature.

D.3 CAD 1 changed to reflect changes noted in D.1 and D.2.

F. Changes in CD Sections

F.1 Under 4. Connecting Circuits add:

(r) Pulse Generator Circuit - SD-32378-01

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5245-LCB

WECO DEPT 5152-CAW-WEA

STEP BY STEP SYSTEMS
NO. 1, 350A, 355A OR 35E97
MISCELLANEOUS CIRCUIT
FOR ANI - TYPE B AND TYPE C
TRUNK FRAMES

HISTORY COPY

CHANGES

D. Description of Changes

- D.1 FS5 is changed to provide test access lead CL15 (option J) for use with the new ANI coin outgoing trunk circuit arranged for combined special toll, dial zero, and station toll traffic for common control (MF signaling). Lead CL2 is now designated as option K.
- D.2 FS5 is also changed to provide test access leads CL16 and CL17 (option G) for use with the ANI noncoin outgoing trunk circuit arranged for combined special toll, dial zero, and station toll traffic using MF signaling. Leads CL11 and CL12 were previously designated as option T.
- D.3 Circuit Note 106 is changed to show the addition of lead CL15 for the new ANI coin outgoing trunk circuit and of leads CL16 and CL17 for the ANI noncoin outgoing trunk circuit.
- D.4 Circuit Notes 102 and 104 are changed to reflect the above changes.
- D.5 In Circuit Note 102, reference to "CL9 to CL12" is added to the line associated with App Fig. 4.

F. Changes in Description of Operation

- F.1 In SECTION III, the following is added to 4. CONNECTING CIRCUITS:

(r) Common Control Outgoing Coin Trunk Circuit - SD-32551-01.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5223-JMF-COR

STEP BY STEP SYSTEMS
 NO. 1, 350A, 355A, OR 35E97
 MISCELLANEOUS CIRCUIT
 FOR ANI - TYPE B AND TYPE C
 TRUNK FRAMES

TABLE OF CONTENTS	PAGE	SECTION II - DETAILED DESCRIPTION
<u>SECTION I - GENERAL DESCRIPTION</u>	1	
1. <u>PURPOSE OF CIRCUIT</u>	1	
<u>SECTION II - DETAILED DESCRIPTION</u>	1	<u>1. 48-VOLT FRAME TEST BATTERY (FS1)</u>
1. <u>48-VOLT FRAME TEST BATTERY (FS1)</u>	1	1.01 This consists of test terminals for ground, high-resistance ground, and -48 volts, and a jack with -48 volts on the tip and ground on the sleeve.
2. <u>SPARE JACK (FS2)</u>	1	<u>2. SPARE JACK (FS2)</u>
3. <u>REMOTE CONTROL JACK (FS3)</u>	1	2.01 This provides a tip, ring, and sleeve connection between frames and the IDF or MDF, and may be used for a variety of purposes.
4. <u>FRAME LINE BETWEEN FRAMES (FS4)</u>	1	<u>3. REMOTE CONTROL JACK (FS3)</u>
5. <u>TRUNK TEST CONNECTOR RELAYS (FS5), (FS12), (FS21)</u>	1	3.01 The RC jack provides for remote control of the automatic test circuit used for testing trunks on this frame.
6. <u>OUTPULSER SEIZURE FAILURE PEG-COUNT RELAY (FS6)</u>	1	<u>4. FRAME LINE BETWEEN FRAMES (FS4)</u>
7. <u>TALKING BATTERY FILTER AND TALKING BATTERY FILTER FUSE ALARM (FS7 AND FS8)</u>	2	4.01 This provides a jack connecting to the Switchman Talking Line Circuit for talking between frames.
8. <u>48-VOLT FUSE ALARM (FS9 AND FS10)</u>	2	<u>5. TRUNK TEST CONNECTOR RELAYS (FS5), (FS12), (FS21)</u>
9. <u>+130 VOLT FRAME TEST BATTERY (FS11)</u> ..	2	5.01 All the leads from the ANI trunks to the Automatic Trunk Test Circuit required for testing the various features of the trunks are taken through normally open contacts on the FR0, FR1, and FR2 or FR3 relays. This breaks the large multiple of leads between the trunks on various frames and provides a means of isolation in case of trouble on these leads.
10. <u>AUXILIARY FUSE ALARM (FS13)</u>	2	5.02 When a trunk is selected for test after a busy test, ground is connected to the FR lead, operating FR0, FR1, and FR2 or FR3 relays in multiple, closing the trunk leads and test circuit together.
<u>SECTION III - REFERENCE DATA</u>	2	<u>6. OUTPULSER SEIZURE FAILURE PEG-COUNT RELAY (FS6)</u>
1. <u>WORKING LIMITS</u>	2	6.01 The OSF relay is provided to furnish a ground closure of sufficient duration to ensure the operation of a traffic register.
2. <u>FUNCTIONAL DESIGNATIONS</u>	2	
3. <u>FUNCTIONS</u>	2	
4. <u>CONNECTING CIRCUITS</u>	2	
5. <u>MANUFACTURING TESTING REQUIREMENTS</u> ...	3	
6. <u>TAKING EQUIPMENT OUT OF SERVICE</u>	3	
<u>SECTION IV - REASONS FOR REISSUE</u>	3	
<u>SECTION I - GENERAL DESCRIPTION</u>		
1. <u>PURPOSE OF CIRCUIT</u>		
1.01 This circuit provides the necessary miscellaneous equipment required on the trunk frame for ANI trunks. It contains the 48-volt frame test battery, spare jack, remote control jack, frame line jack connector relays for the leads from the Automatic Trunk Test Circuit, outpulser seizure failure peg-count relay, and 130-volt frame test battery.		

6.02 Ground is applied to the OSF lead for a short duration each time that an ANI outgoing trunk fails to obtain an outpulser. The OSF lead grounded will operate the OSF relay in this circuit and close ground on the OSF lead to the Traffic Register Circuit. Relay OSF operated will place a shunt on the secondary winding. This shunt on the OSF secondary winding will make it slow to release, thus ensuring a sufficient ground closure to operate the traffic register.

7. TALKING BATTERY FILTER AND TALKING BATTERY FILTER FUSE ALARM (FS7 AND FS8)

7.01 FS8 is provided to supply talking battery to the outgoing trunks. Inductors FCC1 and FCC2 and their associated bypass capacitors FC1 and FC2 provide sufficient reduction in noise arising in the battery supply. Capacitors FC1 and FC2 provide a sufficiently low common impedance to keep crosstalk within permissible limits when the resistance of the associated wiring between capacitors and battery and ground does not exceed 0.02 ohm. A 20-ampere alarm-type fuse is furnished in series with each capacitor. The operation of the 20-ampere fuse connects battery, through the 350-ohm ceramic coated resistor that is part of the fuse mounting housing, to lead B1 or B2 to FS7. This operates the FA relay and lights the FC1 or FC2 lamp and the FA lamp. The operation of relay FA starts a major audible and visual alarm. Removal of the operated 20-ampere fuse silences the alarm and extinguishes the lamps. Resistors FC1 and FC2 are furnished to prevent an open alarm lead if the FC1 or FC2 lamps are removed.

8. 48-VOLT FUSE ALARM (FS9 AND FS10)

8.01 The operation of the 20-ampere feeder fuse followed by the operation of the parallel 1-1/3 ampere pilot fuse, or the operation of any 2-ampere, 1-1/3 ampere, or 1/4-ampere circuit fuse operates the FA relay. This lights the FA lamp and starts a major audible and visual alarm. Removal of the operated fuse silences the alarm and extinguishes the lamp.

9. +130 VOLT FRAME TEST BATTERY (FS11)

9.01 The +130 volt jack supplies +130 volts for testing.

10. AUXILIARY FUSE ALARM (FS13)

10.01 The operation of the A, B, or C feeder fuses followed by the operation of the parallel 1-1/3 or the 1/10 ampere pilot fuses PF1, PF2, or PF3, or the operation of any 1-1/3 ampere or 1/4 ampere circuit fuse operates the FA- auxiliary fuse alarm relay. The operated FA- relay operates the FA relay. This lights the FA lamp and starts a major audible and visual alarm. Removal of the

operated fuse silences the alarm and extinguishes the lamp. The D- and E- resistors of FS15 and FS16 or FS20, or FS23 and FS24 limit the current drain while one of the fuses is operated.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

None.

2. FUNCTIONAL DESIGNATIONS

None.

3. FUNCTIONS

3.01 Connects leads from the outgoing ANI trunks to the Automatic Trunk Test Circuit or the Test and Line Verification Circuit when the FR0, FR1, and FR2 or FR3 relays are operated by the trunk.

3.02 Grounds the OSF lead to operate a register in the Traffic Register Circuit when the ANI trunk operates the OSF relay.

3.03 Provides a frame line between ANI frames.

3.04 Provides 48-volt frame test battery.

3.05 Provides a spare jack for future requirements.

3.06 Provides a remote control jack for the Automatic Trunk Test Circuit.

3.07 Provides a talking battery filter.

3.08 Starts and removes an audible and visual alarm when a filter fuse, pilot fuse, or circuit fuse operates.

3.09 Provides +130 volt frame test battery.

4. CONNECTING CIRCUITS

- (a) Outpulser, Identifier Test Circuit - SD-95815-01.
- (b) Switchman Talking Line Circuit - SD-32021-01.
- (c) Automatic Trunk Test Circuit - SD-32315-01.
- (d) ANI Outgoing Trunk Circuits - SD-32244-01.
- (e) Miscellaneous Alarm Circuit-Register Circuit - SD-31976-01.
- (f) Traffic Register Circuit - SD-30896-01.

- (g) Traffic Register Circuit - SD-31109-01.
- (h) No. 355A Miscellaneous Alarm Circuit - Permanent Signal Timing Circuit - SD-32192-01.
 - (1) Pilot Lamp Circuit - SD-31548-01.
 - (2) Pilot Lamp and Power Alarm Circuit - SD-31573-01.
 - (3) Audible and Visual Alarm Circuit - SD-96188-01.
- (i) Miscellaneous Circuit-Outpulser and Test Frame - SD-32381-01.
- (j) Test and Line Verification Circuit - SD-32379-01.
- (k) AIS Outgoing Trunk Circuit - SD-32352-01.
- (l) ANI Outgoing Trunk Circuit - SD-32245-01.
- (m) ANI Outgoing Trunk Circuit - SD-32342-01.
- (n) ANI Outgoing Trunk Circuit - SD-32344-01.
- (o) ANI Outgoing Trunk Circuit - SD-32367-01.
- (p) ANI Outgoing Trunk Circuit - SD-32542-01.
- (q) ANI Outgoing Trunk Circuit - SD-32543-01.

E - Resistor, KS-8512,L8A, 1000 Ohms, App Fig. 28

B.2 Removed

E - Resistor, KS-8512,L8A, 1000 Ohms, FS20, App Fig. 19

C. Changes in Circuit Requirements Other Than Those Caused by Changes in Apparatus

C.1 Current flow requirements are added for the parallel combination of relays FR0 and FR1.

D. Description of Changes

D.1 FS12 is changed to provide test access leads C1 and CL13 (option R) for use with the new noncoin combined trunk circuit. Leads CL3 and CL4 are now specified as option S and are rated Mfr Disc. to agree with their associated trunk circuit.

D.2 FS21 is added to provide test access leads for the new coin and noncoin combined trunk circuit.

D.3 FS5 is changed to show lead FR as connecting to FS21.

D.4 FS22, FS23, and FS24 are added to provide a fusing arrangement for -48 volt signal battery, +110 volt coin collect battery, and -110 volt coin return battery, respectively, for the two new combined trunk frames.

D.5 FS9 is changed to eliminate the pilot fuse arrangement for fusing -48 volt talk battery for the new combined trunk frames (option N). Option M is added to show the present pilot fuse arrangement for other trunk frames.

D.6 FS13 is changed to show connection to FS22, FS23, and FS24. Reference to Circuit Note 109 is added.

D.7 FS10 is changed to remove connection to FS9. This change was made on Issue 5AR and inadvertently omitted.

D.8 In FS10, an omission is corrected to show 1-1/3 ampere, -48 volt talk battery fusing for FS1, FS5, and FS6 rated as Mfr Disc. since this fusing is replaced by 1-1/3 ampere, -48 volt signal battery per App Fig. 16. This change was made on Issue 6D of SD-32248-01 and was inadvertently omitted.

D.9 In FS10, an omission is corrected to show 1/4-ampere, -48 volt talk battery fusing per App Fig. 5 rated Mfr Disc. since it is replaced by 1/4-ampere, -48 volt signal battery per App Fig. 20. This change was made on Issue 6D of SD-32248-01 and was inadvertently omitted.

D.10 A change is made to delete FS20 and App Fig. 19 from the drawing since there has never been an application for coin return

5. MANUFACTURING TESTING REQUIREMENTS

5.01 This circuit shall perform all service functions specified in this circuit description and shall meet all the standards of the Circuit Requirements table and the Electrolytic Capacitor Test Requirements table.

6. TAKING EQUIPMENT OUT OF SERVICE

6.01 Tests on trunks on the frame cannot be made when the FR0, FR1, FR2, or FR3 relay is blocked nonoperated.

SECTION IV - REASONS FOR REISSUE

B. Changes in Apparatus (Components)

B.1 Added

FR3 Relay, AF24, App Fig. 22

D - Resistor, KS-8512,L8A, 1000 Ohms, App Fig. 27

1/2-ampere fusing in any of the associated trunk circuits.

D.11 Reference to +130 volts and -130 volts is deleted in FS16.

D.12 In FS17, an omission is corrected to show connection to the pulse generator circuit.

D.13 In FS15 and FS16, connection to the battery distributing fuse board or the battery control board for +110 volts and -110 volts, respectively, is rated Mfr Disc.

since the number of distribution fuses for this power is limited at those locations. The +110 volt and the -110 volt leads now connect to the miscellaneous fuseboard.

D.14 Circuit Note 109 is added.

D.15 Circuit Note 106 is changed to show the addition of leads CL13 and CL14 for the new noncoin combined trunk and the new coin and noncoin combined trunk, respectively.

D.16 Circuit Notes 102 and 104 are changed to reflect the above changes.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5223-VJA-COR