STEP BY STEP SYSTEMS
NO. 1 OR 350A OFFICES OR
NO. 355A AND 35E97 OFFICES
WITH TRAFFIC REGISTER CABINETS
TRAFFIC REGISTER CIRCUIT

10

CHANGES

D. Description of Changes

D.1 Items 602, 603, 604 and 605 are added in Note 103 to show use of Fig. 1 and Fig. 4 for lines of AMA Data (Item 602), AIS calls (Items 603 and 604) and Simultaneous Trunk Time-Out (Item 605) peg count registrations.

D.2 Options J and K are added in Fig. 16 and Notes 102 and 104 are changed to provide for compatibility of Fig. 16 with new Electronic Dial Tone Speed Register Ckt.

D.3 Change Fig. 62.

F. Changes in CD Sections

F.1 Change first sentence of Par. 5.01 in Section II, to read:

"This relay when operated connects ground to the T and R leads (Fig. 5, or Fig. 16 with Option K) or closes the loop between the ST and TG leads (Fig. 16 with Option J) to start the dial tone speed register circuit testing."

F.2 Add Items (cp), (cq) and (cr) in Par. 4 of Section III:

(cp) Common Systems - Billing Data Transmitter Circuit - SD-94850-01

(cq) Step By Step Systems - Outgoing Intercept Trunk Circuit for AIS - SD-35037-01

(cr) Common Systems - Misc. Circuit - Trouble Ticketer Frame ANI Type B - SD-95823-01.

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STEP BY STEP SYSTEMS
NO.1 OR 350A OFFICES OR
NO. 355A AND 35E97 OFFICES
WITH TRAFFIC REGISTER CABINETS
TRAFFIC REGISTER CIRCUIT

CHANGES

D. Description of Changes

D.1 Item 601 is added in Note 103 to show use of Fig. 1 and Fig. 4 for peg count registration for 911 Emergency Service Trunk Circuit.

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STEP-BY-STEP SYSTEMS
NO. 1 OR 350A OFFICES OR
NO. 355A AND 35E97 OFFICES
WITH TRAFFIC REGISTER-CABINETS
TRAFFIC REGISTER CIRCUIT

CHANGES

D. Description of Changes

D.1 Connecting information is added to Note 103 for option ZE of Coin Station Test Line Circuit SD-1C297-01.

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STEP-BY-STEP SYSTEMS NO. 1 OR 350A OFFICES OR NO. 355A AND 35E97 OFFICES WITH TRAFFIC REGISTER CABINETS TRAFFIC REGISTER CIRCUIT

TABLE OF CONTENTS

SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.01 This circuit provides connections with auxiliary relays where required, between circuits requiring traffic register and the common systems traffic register cabinet.

SECTION II - DETAILED DESCRIPTION

1. GENERAL

1.01 This circuit provides connections between step-by-step circuits requiring traffic register and the Traffic

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Register Cabinet Circuit. Where a toll office is housed in the same building with the step-by-step office, the two systems may use the same traffic register cabinet but separate connecting circuits are provided for each system. Where automatic ticketing is used in a step-by-step office, a separate circuit is used to provide connection between the automatic ticketing circuits and the Traffic Register Cabinet Circuit. Where the connecting circuit provides a suitable closure for directly operating a 600-ohm register, the direct pulse lead of Fig. 1 is used to provide this connection or may also provide a connection to the EADAS equipment.

2. BATTERY CONTROL RELAY - FIG. 2 AND BATTERY PULSE RELAY - FIG. 6

2.01 Fig. 2 provides battery for the operation of peg count registers and the associated relays of Fig. 10 and 12. The battery is placed under control of a relay since the peg count registers are operated only on days when it is desired to record peg count. The first Fig. 2, with Option Y, also closes the circuit for the battery pulse relay of Fig. 6. This relay operates registers in the register cabinets each 6 seconds. The readings of these registers thus will indicate minutes and tenths of minutes elapsed time while the peg count key is operated. When Option M is used with Option Y, Fig. 2 only serves to operate Fig. 6.

3. OVERFLOW REGISTER RELAY FOR BRANCH OFFICES - FIG. 3

3.01 When all the main office trunks associated with a group of selector repeaters are busy and the main office call is dialed, the calling station receives busy tone in series with relay R which operates, in turn operating SR which is slow in releasing in order to hold over dial pulses, and SR operates the traffic register in the cabinet or operates an EADAS indication.

4. DIRECT BATTERY SUPPLY - FIG. 4

4.01 This figure provides battery for the operation of a maximum of 10 registers where these registers are for overflow, all trunks busy, or other purposes where the register should be capable of operation at any time. In order to insure satisfactory operation of the registers, maximum resistance in this lead between battery and the traffic register cabinet should not exceed 10 ohms.

5. DIAL TONE SPEED REGISTER START RELAY - FIG. 5 OR 16

5.01 This relay when operated connects ground to the T and R leads to start the dial tone speed register circuit testing. A register in the cabinet operates from ground over the D1 to D10 leads as indicated in Note 103, to record the number of trials over the delay limit and other registers operate over the T1 and T10 leads to indicate the total number of trials made. Where Fig. 16 and Option V are used, the operation of the DT relay also places battery on the DT lead to a guard lamp at the Traffic Register Cabinet Circuit.

6. LAST TRUNK BUSY REGISTER - FIG. 7

6.01 When last trunk busy registration is required, the relay of Fig. 7 is connected to the sleeve of the last trunk of the selector level. A relay is required instead of direct connection of the register to the sleeve since the resistance of the registers in the cabinet is too low for direct connection. This relay is slow to operate so that it will not operate on a ground impulse received from a selector arranged to restrict service on certain levels as the selector passes over the tenth terminal. Where trunks are arranged to test busy after the originating party disconnects, and until the called party disconnects, a separate lead from the trunk circuit is provided for register operation. Hence no relay is required in this circuit and the register in the cabinet is operated over Fig. 1.

7. ALL TRUNKS BUSY - FIG. 8, 17 OR 18, AND C

7.01 On each circuit associated with Fig. 8, 17 or 18, and C, a normally closed contact grounds the lead to the AF or ABL relay which is normally operated. When all trunks of a group are busy, this relay releases and closes the path for operating the associated register in the cabinet, or transmitting a ground to EADAS. In Fig. 17 or 18, the release of relay AB or ABL grounds lead A to the Rotary Out Trunk Switch Circuit. The continuity-transfer contacts of relay AB or ABL permit testing the relay by insulating these contacts, and avoid the necessity for unsoldering the lead.

8. ALL TRUNKS BUSY AND BUSYING PORT SELECTING ROTARY OUT TRUNK SWITCHES - FIG. 18 AND FIG. A, B, OR C

8.01 Fig. 18 provides the all trunks busy register relay for post selecting rotary out trunk switch circuits. In Fig. 18 with Fig. A, the all trunks busy register relay ABL corresponds to the trunk subgroup which is common to all the rotary out trunk switch groups. Relay ABL is held normally operated and releases only when all the trunks of the common subgroup become busy. It functions to ground leads B and C which connect to Fig. B. The remaining subgroups of trunks that are associated with only one rotary out trunk switch group will have one all trunks busy register relay ABL (see Fig. 18 and B associated with each trunk subgroup). These ABL relays are normally operated and release only when all the trunks of the subgroups they are associated with become busy. It functions then to relay ground on leads R and C, if present, to leads A and P. This causes the make-busy circuit of rotary out trunk switch group to function, operates the associated register in the cabinet and sends a ground to the EADAS equipment

8.02 When Figs. 18 and C are used, the all trunks busy register relay ABL is held normally operated and releases only when all the trunks of the subgroup or group it is associated with becomes busy. It functions to ground leads A and B.

9. PEG COUNT REGISTER RELAY FOR SUBSCRIBER LINES WITH ROTARY LINE SWITCH - FIG. 10

9.01 When peg count readings are to be taken, a key in the cabinet is operated, in turn operating relay BC of Fig. 2 which connects battery to the relays of Fig. 10. Each time a rotary line switch restores to normal, battery is momentarily connected to the M lead operating the L relay which locks in series with the L resistor and in turn operates L1. L1 operates the register and short circuits L which will release, in turn releasing L1 and restoring the circuit to normal. L1 is slow in releasing in order to insure sufficient time for operation of the register in the cabinet. L1 operated also sends a ground to EADAS.

10. OVERFLOW REGISTER FOR ROTARY HUNTING CONNECTORS - FIG. 11

10.01 When all the trunks of a PBX group are busy, the connector finding this condition momentarily places battery through a relay on the TM lead and ground on the OS lead, operating relay F. This relay locks up in series with F1 which operates. The resistor A prevents false registration when a connector passes over the last trunk of the group which is busy, but is not in the group dialed, or when the last trunk of the group dialed is seized. Relay F operates the register in parallel with F1 but F1 is slow in operating to allow time for the register to operate. When F1 finally operates, it short circuits F which releases, in turn opening the circuit to the register and releasing F1. An EADAS indication may be sent when F operates.

11. PEG COUNT FOR SELECTORS WHICH ABSORB ALL FIRST DIGITS AND PEG COUNT ON RELEASE - FIG. 12

11.01 Selectors of the type described above operate the release magnet twice on each call. The relays of Fig. 12 are arranged to operate the associated register in the cabinet circuit or EADAS once on each call as follows. When ground is connected to lead R, DA operates. When the ground is removed from lead R, DB operates in series with DA. The next time ground is connected to lead R, DC operates in series with the primary winding of DB. DC opens the circuit through the secondary winding of DB and the winding of DA, allowing DA to release, but DB holds on its primary winding. When ground is finally removed from lead R, DB and DC release, releasing the register in the cabinet circuit.

12. LAST TRUNK BUSY REGISTER - FIG. 13

12.01 When last trunk busy registration is required, the relay of Fig. 13 is connected to the sleeve of the last trunk of the selector level. A relay is required instead of direct connection of the register to the sleeve since the resistance of the registers in the cabinet is too low for direct connection. The A thermistor is used to slow down the operation of the LT relay so that it will not operate while a selector arranged for restricted service passes over a number of terminals multipled to the last trunk. Delay is also required to prevent operation of the register of the last trunk on overthrow when selecting the next to last trunk.

13. CONNECTION OF REGISTERS TO ASSOCIATE CIRCUITS - NOTE 103

13.01 The table of Note 103 indicates the connection of Fig. 1, 3, 5, 6, 8, 10, 11, 12, 13, 15, or 17 to the associated circuits, indicating what figure of this circuit should be used and the designation of the lead in the connecting circuit, as well as the quantities to be provided.

14. DETECTOR GROUP USAGE - FIG. 14 (MAGNETIC COUNTER) AND FIG. 1 AND 4 (REGISTERS)

14.01 Figs. 1 and 4 and Fig. 14 show connections to a counter for recording detector group usage.

15. OVERFLOW REGISTER FOR ROTARY HUNTING CONNECTORS - FIG. 15

15.01 When all the trunks of a PBX group are busy, the connector finding this condition momentarily places battery through a relay on the TM lead and ground on the OS lead operating relay F. This relay locks up in series with F1 which operates. The arrangement of Option N prevents the possibility of activation of relay F on surge currents from the sleeve, experienced previously with Option S. The use of resistors A, Option T, was discontinued when 221KE and 307C types of J position relays were introduced in the rotary hunting connector circuits. F1 operates the register, and EADAS if equipped, and short circuits relay F, which releases. The release of relay F releases relay F1, which, in turn, releases the register. The F1 resistor is used to make relay F1 slow in releasing (a) to prevent possible double registration in the event of connector overthrow and (b) to allow the register sufficient time to operate.

16. LAST TRUNK BUSY REGISTER RELAY FOR AN ANI OUTGOING TRUNK - FIG. 18 AND C

16.01 When last trunk busy registration is required, the relay of Fig. 18 is connected to the register lead of the last choice trunk in each group. When this trunk becomes busy, ground is removed from this lead and this releases the ABL relay which operates the register. The continuity-transfer contacts of relay ABL permit testing the relay by insulating these contacts, avoiding the necessity of unsoldering the lead.

17. ALL TRUNKS BUSY RELAY - FIG. 20

17.01 When all trunks available to rotary selectors are busy, ground is removed from lead BR. This releases the RB relay which transmits a ground to the register cabinet and to the EADAS circuitry when equipped. Grounds are also closed over lead A to prevent the rotary selectors or line circuits from continuous hunting and over the MS lead to start the ringing machine in order to supply busy tone.

18. ALL TRUNKS BUSY REGISTER CIRCUIT - FIG. 21

18.01 Ground is removed from lead BR or B on relay BR when all trunks available only to tandem office subscribers are busy. This releases relay BR which partially closes a series circuit to leads P or P- on relay BR1 and relay BR2.

18.02 Ground is removed from lead BR or C on relay BR1 when trunks available to both tandem office subscribers and rotary selectors are busy. This releases relay BR1 which closes leads P or P- (if relay BR is also released) to the register circuit or to EADAS for all trunks busy to tandme office subscribers registration and partially closes a circuit to relay BR2 for that P or P- lead.

18.03 Ground is removed from lead BR or D on relay BR2 when all trunks available only to rotary selectors are busy. This releases relay BR2 which closes lead P or P- to the register circuit or to EADAS (if relays BR and BR1 are also released) for all master office trunks busy registration and also closes lead P or P- to the register circuit or EADAS (if BR1 is released) to provide an all trunks busy to rotary selectors registration. Relay BR2 also completes the closure of lead A to the rotary selectors to prevent them from continuously hunting.

19. RELAY TEST JACK - FIG. 22

19.01 This jack facilitates testing of relays BR, BR1 and BR2 of Fig. 6, by providing for transfer of these relays from their associated trunks to the adjusting equipient without unsoldering of leads.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

1.01 Maximum resistance leads S of Fig. 2 and 4 to traffic register cabinet: 10 ohms.

1.02 Maximum resistance lead P from traffic register cabinet to ground, Figs. 1, 3, 6, 7, 8, 10, 11, 12, 15, 17, 20, 21, and 23: 30 ohms

2. FUNCTIONAL DESIGNATIONS

2.01 None

3. FUNCTIONS

3.01 Provides a direct pulse lead from the connecting circuit to the traffic register cabinet, Fig. 1.

3.02 Provides a battery control relay to control the operation of peg count register, Fig. 2.

3.03 Provides for overflow registration of rotary and level hunting connectors and branch office selector repeaters, Figs. 11, 15, 1, and 3.

3.04 Provides for last trunk busy registration, Fig. 7.

3.05 Provides for all trunks busy registration, Figs. 8 and 17.

3.06 Provides a battery pulse relay for operating a register to count elapsed time in connection with peg counts, Fig. 6.

3.07 Provides for peg count on subscriber lines with rotary line switches, Fig. 10.

3.08 Provides for peg count on selectors which absorb all first digits, Fig. 12.

3.09 Provides for starting dial tone speed register circuit, Fig. 5.

3.10 Provides all trunks busy indications for rotary out trunk switches in various applications, Figs. 20 and 21.

3.11 Provides connections to EADAS equipment as required.

4. CONNECTING CIRCUITS

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

(a) Traffic Register Cabinet Circuit - SD-95531-01.

(b) Switch Trouble Alarm Circuits or Miscellaneous Alarm Circuits for:

(1) Selector Shelves - SD-32043-01.

(2) Connector Shelves - SD-32045-01.

(3) Miscellaneous Shelves - SD-32048-01.

(4) B Switchboard - SD-31517-01.

(5) Line or Trunk Finder - SD-31514-01, SD-32239-01.

(6) Selector Repeater Shelves - SD-32102-01.

(c) Selector Bank Multiple Circuit - SD-32123-01.

(d) Connector Bank Multiple Circuit - SD-32128-01.

(e) Subscriber Line Circuit With Rotary Line Switch - SD-31259-01.

(f) Dial Tone Speed Register Circuit - SD-96403-01.

(g) Level Hunting Connector - SD-31088-01.

(h) PBX Trunk Circuit - SD-31757-01.

(i) B Switchboard Position Circuit - SD-31160-01.

(j) Announcement Trunk Circuit - SD-31362-01 (typical).

(k) Selector Arranged for Peg Count on Cut-Through - SD-31933-01 (typical).

(ℓ) Repeater Circuit - SD-31609-01 (typical).

(m) Trunk Circuit - SD-31795-01.

(n) B Switchboard Link Circuit - SD-31155-01.

(o) Sleeve Repeating Trunk Circuit - SD-31421-01.

(p) Rotary Out Trunk Switch - SD-30868-01 (typical).

(q) Line or Trunk Finder - SD-31530-01 (typical).

(r) Incoming Intercepting Trunk Circuit - SD-95715-01.

(s) Outgoing Trunk to Central Information Desk - SD-31163-01 (typical).

(t) Position Clock Circuit - SD-90409-01.

(u) 10-IPM Interrupter Circuit - SD-96343-01.

(v) B Switchboard Sender - SD-31351-01.

(w) Auxiliary Line Circuit - SD-95607-01.

(x) Coin Long Line Circuit - SD-32053-01.

(y) No. 4A Traffic Usage Recorder Circuit - SD-95738-01.

(z) Traffic Register Camera Control Circuit - SD-95797-01.

(aa) No. 1 - With AMA Transverter Circuit - SD-32203-01 (typical).

(ab) No. 1 or 350A - Identifier Circuit - SD-31957-01.

(ac) No. 1, 350A, 355A, 356A, 360A, 35-E-97 and North Electric Intercepting Trunk Circuit - SD-32202-01.

(ad) Line Concentrator Identifier Circuit - SD-95739-01.

(ae) Central Office Group Alerting Circuit - SD-95883-01.

(af) Answering Time Recorder Circuit - SD-96234-01.

(ag) Rotary Out Trunk Switch Circuit - SD-32253-01.

(ah) ANI Outpulser Circuit - SD-95811-01.

(ai) ANI Outgoing Trunk Circuit - SD-32244-01.

(aj) Vacant Level or Overflow Trunk - SD-31872-01.

(ak) No. 1 and 350A Trunk Finder Circuit - SD-31953-01.

(al) Incoming Register Circuit - SD-32260-01.

(am) Sender Circuit - SD-32261-01.

(an) Decoder Circuit - SD-32262-01.

(ao) Transverter Circuit - SD-32263-01.

(ap) Position Link Circuit - SD-32264-01.

(aq) Group and Alarm Relay Circuit - SD-32194-01.

(ar) No. 2A Traffic Usage Recorder Circuit - SD-96549-01.

(as) Dial Coin Zone Outgoing Trunk Circuit - SD-32317-01.

(at) Concentrating Circuit for Dial Coin Zone Trunks - SD-96524-01.

(au) KS-15947 Totalizer Circuit - SD-95965-01.

(av) Emergency Reporting System Controller Circuit - SD-98057-01.

(aw) Incoming Trunk Register and Connector Circuit - SD-96501-01.

(ax) Register Check and Connector Control Circuit - SD-96504-01.

(ay) TOUCH-TONE Calling Signal to Dial Pulse Converter Circuit - SD- 32328-01.

(az) Originating Register Circuit Outpulsing Controller Circuit - SD-32351-01.

(ba) Converter Finder - SD-33028-01.

(bb) Register Trunk and Link Circuit - SD-32353-01.

(bc) ANI Type C Outpulser Circuit - SD-32375-01.

(bd) No. 3B Traffic Usage Recorder Circuit - SD-99359-01.

(be) Large MJ Mobile Radil Telephone System - Line Circuit - SD-2R001-01.

(bf) Large MJ Mobile Radio Telephone System - Marker Circuit - SD-2R004-01.

(bg) Large MJ Mobile Radio Telephone System - Link Circuit - SD-2R008-01.

(bh) Small MJ Mobile Radio Telephone System - Sender Register - SD-2R051-01.

(bi) Small MJ Mobile Radio Telephone System - Link Circuit - SD-2R054-01.

(bj) Small MJ Mobile Radio Telephone System - Line Circuit - SD-2R049-01.

(bk) No. 1, 350A, or 355A With Common Control - Decoder Circuit - SD-32356-01.

(bl) No. 1, 350A, or 355A With Common Control - Translator Circuit - SD-32355-01.

(bm) Non-CAMA Multifrequency Outgoing Trunk Circuit - SD-32369-01.

(bn) Service Observing Desk No. 12 Telephone Circuit - SD-95528-01.

(bo) Service Observing Desk No. 7 or 9 Telephone Circuit - SD-96317-01.

(bp) Selector Circuit - SD-33003-01.

(bq) Auxiliary Line Circuit for Pre-Postpay Service - SD-31873-01.

(br) Finder - SD-31908-01.

(bs) Rotary Hunting Connector - SD-31738-01.

(bt) Trunk Circuit - SD-31844-01.

(bu) Power Ringing Circuit - SD-80779-01.

(bv) Miscellaneous Circuit - ANI Trunk Frames - SD-32248-01.

(bw) Subscribers Rotary Line Switch With Lockout - SD-31898-01.

(bx) Pulse Correcting Repeater Circuit - Incoming or Outgoing - SD-32184-01.

(by) Pulse Correcting Repeater Circuit - Outgoing From Local or Toll Selector Mult - SD-32346-01.

(bz) Outgoing Information Trunk Circuit - SD-32170-01.

(ca) Permanent Signal Master Control and Timing Circuit - SD-33036-01.

(cb) Traffic Data Converter Circuit - SD-95968-01.

(cc) Recorder and Recorder Connector - SD-25872-01.

(cd) EADAS Traffic Data Converter - SD-3B213-01.

(ce) EADAS Read Terminal - SD-3B214-01.

(cf) Coin Station Test Line Circuit - SD-1C257-01.

(cg) Pretranslator and Pretranslator Connector - SD-32513-01.

(ch) TOUCH-TONE Type D - Converter Circuit - SD-35032-01.

(ci) TOUCH-TONE Type D - Miscellaneous Circuit - SD-35035-01.

(cj) Electronic Dial Tone Speed Register - SD-3B504-01.

(ck) PBX-AIOD Translator Circuit - SD-99319-01.

(cl) PBX-AIOD-Type A1 - Station Identification Test Circuit - SD-1C005-01.

(cm) PBX-AIOD-Type A2 - Station Identification Test Circuit - SD-1C235-01.

(cn) PBX-AIOD-Type A2 - Data Link Converter Circuit - SD-1C233-01.

(co) Auxiliary Line Circuit Arranged for Measured Rate INWATS Service - SD-99439-01.

SECTION IV - REASONS FOR REISSUE

A. Changed or Added Functions

A.1 To monitor loop closure points for circuits requiring low noise terminations.

B. Changes in Apparatus

B.1 Added

Figs. 20 and 21

D. Description of Changes

D.1 Figs. 20 and 21 are added to allow this circuit to function in a 355A or 35E97 office.

D.2 References to Figs. 20 and 21 are added to the Options Used Index and Notes 101, 102, 103 and 104. New Note 116 is added. Additions are made in the Circuit Requirements Table.

D.3 The title box and supporting information column is changed to add reference to 355A and 35E97 offices.

D.4 Change CAD Fig. 58 and add CAD Figs. 68 and 69.

Note: This reissued circuit description incorporates changes made in appendices to the previous circuit description.

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